DESIGNING A COMMUNITY VEGETABLE GARDEN FOR AIDS PROJECT WORCESTER

Interactive Qualifying Project Report completed in partial fulfillment
Of the Bachelor of Science degree at
Worcester Polytechnic Institute, Worcester, MA

Submitted to:

Professor Robert Krueger (advisor)
Professor D. Richard Brown (co-advisor)

In Cooperation With
Joe McKee, ***; Martha Akstin, ***; Priscila Rodriguez, ***
AIDS Project Worcester

Julius Jones, ***
Regional Environmental Council

Robert Grady

Lee Hermsdorf-Krasin

Jason Reynolds

Evan Sawyer

March 5, 2010

Advisor Signature

Co-advisor Signature

Executive Summary-

A community garden can often be a profound way to connect communities and link them to significant change. These programs have endless positive effects within these communities and can be instrumental in providing people with sustained access to healthy foods. They can be help rehab former industrial sites and can bring people together in common purpose. This powerful force is experiencing resurgence all over the country. We hope our work on this project will help organizations, like our sponsor, to realize and tap into this growing network of positive benefits and collaboration.

This project is aimed at creating a nutritional resource which will be used to enhance the health and well-being of a group of people. A community garden will be a foundation of positive change within any community. It provides access to healthy foods, growing and nutritional knowledge, as well as a productive outlet for the community. A well-reasoned garden implementation plan will establish all of the specific information necessary for initiating a community garden. In addition, to this resource we have also created a prototype garden. These materials are designed to consider and inform every minute or major step of creating a new garden space. The prototype is an example of our best recommendations. It is prepared to clearly, visually depict how the garden would be organized under these ideal recommendations. Consultation of these materials will make the consideration and decision making process for the garden much simpler and straightforward. Our biggest goal in this project is to ensure that we create a single informational source which is whole, well-reasoned, durable, and attends to all the considerations of creating a community garden.

Goals-

For this project we identified several important goals which we believed would direct the success of the project. The first and most important goal was to provide our sponsor, AIDS Project Worcester, with a comprehensive handbook and visual prototype garden that they could use to guide them through the complexities of establishing a community garden. This goal has many other objectives which will be discussed later on. These two resources are the major deliverables of our project and contain all pertinent information which guided the project over the course of seven weeks. Each document, when used in conjunction, will make each step for APW clear and obvious. These documents are hand-tailored for the needs of APW and its clientele, but are by no means restricted solely to this use. Each resource has detailed information specific to the Worcester area which could be adjusted slightly to fit the needs of any organization looking to establish a community garden. The

full realization of this project and these goals will come through continued use and adjustment of our garden manual and prototype garden.

Objectives-

There were many varying research avenues which needed to be thoroughly investigated to fully understand and inform all of the many arenas associated with this goal. These objectives ranged from site location to nutrient compositions. We had to concentrate our attention first into understanding some of the nutritional needs of the clientele at APW. We used this information to create a food list which was specific for the overall nutritional needs of this population. We created lists of foods which detailed yields and climatic information. The intersection of these various informational arenas produced a list of crops which we ranked. The ranking system is the final stopping point for one to establish the best crops to grow in this area; which ones are most beneficial and which are more fringe. This system allows one to examine all of the relevant plant statistics and to choose a variety of plants that will satisfy the diversity of the community. Another critical objective was site planning. This included site placement, and physical construction of the garden. We compiled and ranked sites according to important factors (proximity, visibility, water hook ups, soil condition, and size). This list of sites gave us parameters to examine as we decided on the physical makeup of the garden and its structures.

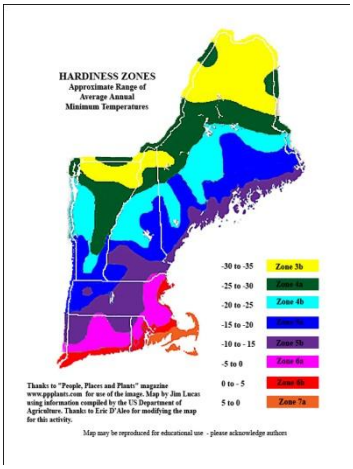
HIV/AIDS in Worcester-

In the City of Worcester there are approximately 1,900 people living with HIV/AIDS. To further complicate this problem many of these people live below the federal poverty line, earning less than $10,000 annually. They also still face intense discrimination, a problem which has countless other issues associated with it. The socioeconomic climate described makes normal tasks enormous for those living with HIV/AIDS. Housing, nutrition, and access to medical care are among the most difficult issues this population has to struggle with daily. It is therefore very difficult for these people to maintain a healthy diet, an incredibly important task to ensure a healthy lifestyle. While most people are aware that they should be getting more nutritious food they can't always afford to do so.

Fortunately there are not-for-profit organizations in Worcester that ease some of these burdens. AIDS Project Worcester is one of these organizations and has been working to help people living with HIV/AIDS for the past 23 years. They operate a facility which gives their clientele access to services, such as a food bank, to help alleviate some of these problems. APW is able to deliver services to a

diverse population of 512 and an extended network of 1,529 people. They already distribute foods to their clients but have no way of giving out fresh fruits and vegetables. Combining the fresh produce of a community garden with the existing food distribution network would be a tremendous benefit for APW and its population.

Methodology-



The completion of this project required substantial planning and logistical consideration. It was necessary for us to consider a variety of information groups to finish with a reasoned approach for building and maintaining a community garden. These groups included: demographics of APW, nutritional considerations, and garden feasibility characteristics. These three broad groups had various areas within them which also needed additional research; site location falls within garden feasibility characteristics, for instance. Combining and assessing the information from these three avenues gave us the parameters for our decision making process.

We gathered our data in the form of interviews, surveys, and archival research. This process allowed us to directly address the people within APW whom this program would potentially help. We gathered cultural data which was meant to target cultural preference, a factor we wanted to represent in the composition of the garden.

Next we gathered relevant information regarding nutrition. This arena contains information on the healthiness of crops. We then compared this information against the nutritional needs of the APW clientele, which came from interviews with nutritionists specializing in HIV/AIDS. The nutritional data informed our project about the types and scale of crops which need to be grown to have lasting impact.

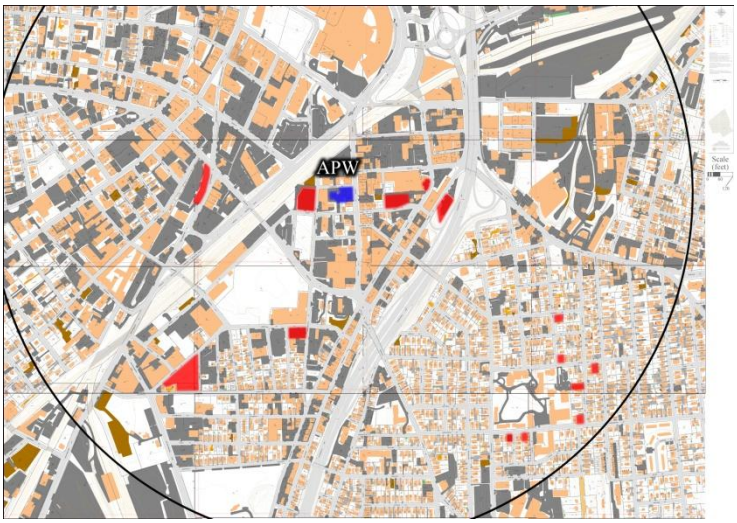
Finally, we extensively researched the physical requirements of establishing a community garden in the heart of downtown Worcester. This information ranged from site locations to soil composition. The majority of this research was gathered from interviews with landowners and gardening experts. Pulling together and assessing this information led to the creation of our prototype manual, a visual summarization of our best recommendations. This prototype will be used to visually

show a mock-up of the garden using our best recommendations from each of the three areas detailed above.

Findings-

This section will detail the major findings and conclusions of this project. These findings are organized under three main categories, appropriate crops, potential sites, and optimal design. These three sections have many other considerations associated with them and with the final conclusions which will be outlined below.

The first section, appropriate crops, classifies the types of plants and foods which would be best suited and most beneficial for APW. Establishing this ranking came as a result of three crop parameters. First, the crops had to be feasible for growing in the New England climate. Next, they had to meet or exceed the nutritional needs of the APW clientele. Lastly, these crops were evaluated for their cultural suitability; decisions for this section were garnered through interviews with APW clients. The refinement of these three sections yielded a final list of appropriate crops; further ranking, according to nutritional merit, produced a ranked final list of crops any of which are suitable for the garden.



The next section of this project required we investigate all potential sites and make final rankings of these locations. The sites were evaluated on criteria which were comprised of both essential and preferential requirements. We again articulated the physical parameters of a site, as we did with crops, and established a list of 15 possible sites. We then awarded the top five sites a rank according to how well they met the preferential needs of the garden, such as proximity and visibility. This list of sites will give APW an opportunity to choose the site which they believe best suits their needs and the scope of this undertaking.

The final section of recommendations covers many of the logistical concerns of establishing a garden. It is intended to

inform APW of all the physical questions that would arise as they establish this garden. We made recommendations ranging from bed construction to soil composition. We recommended that APW construct raised beds, a decision which will mitigate the need to remediate post industrial sites. Other suggestions included using pressure treated lumber instead of more expensive ones, like cedar and redwood. We also found that using ¾ inch screened loam and compost would provide ideal soil. This soil can be purchased most inexpensively from Busy Bee nursery in Holden at a cost of $310 for 16 cubic yards, delivered. These garden recommendations are intended to make the building and set up of the garden simple and easy as all of the technical garden procedures are included.

These three informational sections are the last stop for APW as they establish their community garden. Everything garden related, from the subtle to the obvious, has been included in our findings to make building an easy undertaking with the correct preparation and organization.

Recommendations-

The final section of this report is intended to inform APW of any other considerations which are important and don't neatly fall into one of the previous categories. We believe it is very important for APW to become part of the Regional Environmental Council of Worcester. This organization has been in the business of community gardening for over three decades and would be an invaluable partner for our community garden. Another crucial component of the garden is its staffing. Based on our interviews with REC we recommend that any garden of the size and variety we are aiming for should be staffed by a single full time manager. Volunteer labor will be directed and oriented by this staff member. This is an important consideration for the long term success of the garden; proper management is just as important as the crops which will dot the garden. A final suggestion is to utilize the City of Worcester and its enormous compost heap. The City will donate the necessary compost to the garden upon formal request, a need which APW could not meet on its own.

Conclusion-

Establishing a major community garden in Worcester is undoubtedly a complex and arduous task but its benefits are well worth it. We hope that our project and its research will be an asset which can minimize the footwork APW has to dance through in order to see their final vision. Our biggest hope is that our research can help facilitate the creation of this garden so it can be realized and become an operational asset for the community.

APW Garden IQP

Community Garden Group

Robert Grady, Jason Reynolds, Lee Hermsdorf-Krasin, & Evan Sawyer

AIDS Project Worcester Community Garden

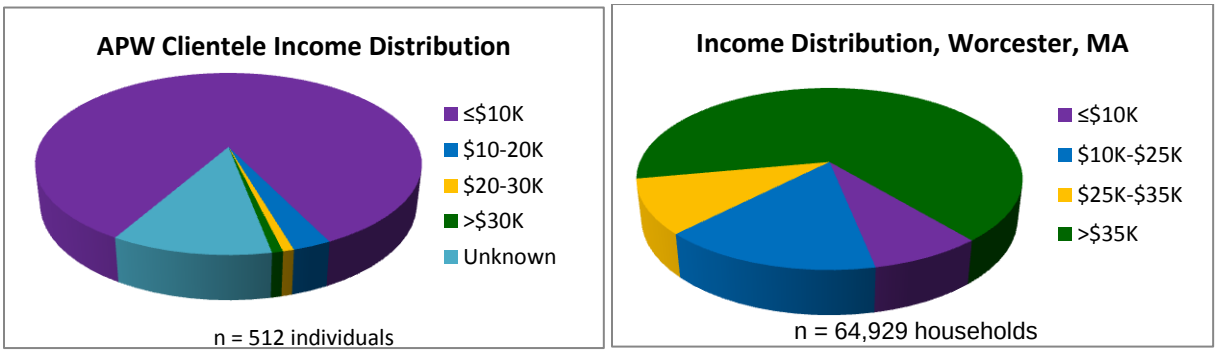
Robert Grady
Lee Hermsdorf-Krasin
Jason Reynolds
Evan Sawyer

Introduction

Poor nutrition is a common issue for people living with HIV/AIDS. Although scientific understanding of HIV/AIDS has progressed significantly since it was first discovered in the early 1980s (Center for Disease Control, 2001), certain misconceptions about HIV/AIDS are still prevalent. Because of this, discrimination against people that test positive for HIV/AIDS is common even now. People with HIV/AIDS often have a harder time finding employment and/or gaining insurance, and in severe cases, may become chronically unemployed. Because HIV/AIDS is a disorder of the immune system, proper nutrition is particularly important to people with HIV/AIDS. This is more difficult, however, for unemployed individuals.

AIDS Project Worcester (APW) is a not-for-profit AIDS Service Organization that provides support services to 512 people living with HIV/AIDS and 1,529 people who are affected by it, all in the Worcester, Massachusetts region (AIDS Project Worcester, 2008). Of these people, 96% live below the federal poverty line. For a more complete breakdown of income, see **Figure 1** below.

Figure 1: Income distributions of APW clientele and of Worcester, MA population.



AIDS Project Worcester found that proper nutrition was a significant issue for its clientele. This issue was likely linked to the income status of the majority of the clientele, as individuals with limited means often buy more processed foods than unprocessed. Processed foods, while often cheaper, are less healthful than unprocessed foods. Processed foods also tend to last longer in storage than unprocessed foods, so food pantries and other charities are more likely to carry processed foods, and in greater quantities than unprocessed foods. Even APW is forced to use more processed foods

than unprocessed at times, due to factors such as growing seasons and budget constraints. These factors contribute to continued use of processed foods

APW also suspected that a lack of understanding about nutrition and food preparation may contribute to the poor nutrition of its clientele. As many of the clients are impoverished, they may not necessarily have been taught the basics of food preparation and nutrition. This adds more restrictions to their diet, and thus further limits nutritional options.

To combat all of these problems APW proposed the idea of a community vegetable garden, used and maintained by APW clients, with a joint teaching program that would educate APW clients in nutrition and food preparation methods. In addition to providing agricultural experience and fresh produce, a community garden would have a positive aesthetic effect on the surrounding neighborhood, and reduce the amount of processed foods consumed by APW clients. It would also provide an inexpensive method for brownfield remediation. Furthermore, the education program would provide APW clients with the tools necessary to continue to eat healthfully should they no longer require the direct support of APW. Agricultural skills learned from working in the garden may also enable APW clients to find employment at a later time. The goal of this project, therefore, was to provide AIDS Project Worcester with the foundation of knowledge and research necessary to design and build a community vegetable garden.

In order to achieve the project goal, several smaller objectives were first accomplished. First, we gathered detailed & relevant data, in order to provide a conclusive understanding of the problem and its possible solutions. We gathered both qualitative and quantitative data, using interviews, first-hand examination, and other methods. Second, we organized and compiled the data for easy interpretation. Finally, we made conclusions based on the data and our interpretations thereof. We then used these conclusions to create the reference manual and prototype garden design, which contained our recommendations to APW on designing and building the garden. The intellectual property of this manual and prototype design will be given to APW, who will then be able to use the information and designs to construct a community vegetable garden at their discretion.

It is our expectation and our hope that this project will lead to a greater availability of fresh produce and a more complete understanding of nutrition for the APW clients. We also predict that it will provide a moderate amount of income for the clients and/or for APW itself, as surplus may be sold. Hopefully, the project will also lead to a greater awareness in the community of the efforts of AIDS Project Worcester.

Background

Introduction

In order to understand the various aspects of the project, we investigated several areas of background information. Three of these subjects were particularly important: 1) APW's goals; 2) General data on HIV/AIDS, nutrition, and APW; and 3) The fundamentals of a community garden. APW had certain goals regarding the community garden. The primary goal was the remediation of client malnutrition through fresh produce provided by the community garden. Side goals included potential for expansion and a program for nutritional & culinary education. These goals allowed us to refine some aspects of the project. We then looked at some of the basic information about APW: client base, programs, resources, etc, to further hone the project. We also researched HIV/AIDS and proper nutrition, both key aspects of our IQP. Our final avenue of inquiry involved research into the definition and general makeup of a community garden. This data provided us with knowledge necessary to properly design such a garden. These latter two subjects are discussed in greater detail below.

Nutrition, APW, & HIV/AIDS

HIV/AIDS affects nutrition on many levels. It affects the nutrition of the individual, of the household, and of the community. Conversely, poor nutrition increases the risk of infection with HIV, as well as an individual's vulnerability to secondary infections & other effects of HIV/AIDS (Haddad & Gillespie, 2001). Therefore, proper nutrition is particularly important to people living with HIV/AIDS, and should be a driving factor in the makeup and implementation of the community garden. Furthermore, since many people living with HIV/AIDS suffer from poor nutrition (Hsu, Bencharz, Macallan, & Tomkins), we must keep in mind that the community garden must be able to provide for a variety of diets, as individuals with poor nutrition often require specialized diets.

APW gives fresh foods to their clients so they may have a more balanced diet. According to the FDA, that means they should be eating six oz. of grains, 2.5 cups of vegetables, 2 cups of fruit, 3 cups of dairy, 5.5 oz. of meat and beans, and as little fat or sweets as possible each day. It is crucial for people living with HIV/AIDS to have access to foods with more vitamins, minerals, and antioxidants which can all be found in vegetables. This is why a community garden would be most beneficial to the clients of APW. Frozen and canned foods are known to be less nutrient rich than fresh foods. Bringing a community garden to the area would be most beneficial to the clients of APW because it gives them easy access to the fresh foods with these nutritional benefits. Even with fresh foods someone with HIV/AIDS may still have a deficiency. This is where some believe supplements are the

answer. A study in Tanzania showed a multivitamin taken daily for four years reduced the risk of death by 30% in women and children. However, other studies show that vitamins can have a negative effect. Vitamin A was shown to increase the risk of mother-to-child transmission by 40% in Tanzania. These choices are best left to a nutritionist. Understanding the health differences of each client and their specific needs is the important balancing role that each nutritionist must play. This helps prevent syndromes such as AIDS wasting syndrome and Lypodystrophy syndrome. The overall objective for a nutritionist is to make sure their client has a good diet and healthy eating habits, lessening the need for vitamins and supplements.

Healthy eating for someone living with HIV/AIDS can mean all the difference. It can change the quality of living, the number of hospital visits, the number of invasive surgeries, and can be the greatest factor between life and death. Lack of a proper diet can lead to many things the worst of which is AIDS wasting syndrome (AWS). AWS is a leading problem for people with HIV/AIDS and is defined by a loss of 10% or more body weight. Losing body fat is not a major concern. The loss of lean body mass, muscle and other tissue, is the main concern. AWS can leads to a highly increased risk of opportunistic infections, morbidity, and mortality.

The effects of AWS are now controllable with highly active antiretroviral therapy (HAART). That does not mean AWS cases are no longer seen. Lypodystrophy syndrome (LDS) can often hide the effects of AWS. LDS causes a redistribution of body fat. Fat is usually lost in the cheeks, temples, arms, legs, and buttocks. Then fat is gained in the neck, upper back, and abdomen. These two changes can have seriously negative effects on the person. It can cause discomfort while sleeping or breathing and increases the risk of high blood pressure, heart attack, and stroke.

Without proper nutritional guidance someone with HIV/AIDS can be subjected to a downward spiral. Poor nutrition leads to nutritional deficiencies which can heighten HIV symptoms and cause a litany of other problems. The means for prevention is a healthy diet with as much nutrients as one can get.

Community Gardens

To better understand the benefits of a community garden and how one could help AIDS Project Worcester we had to take a look at the history of the concept itself, as well as previous, successful community garden projects. As stated a large issue facing lower income communities is access to fresh

fruits and vegetables, and as a result a large portion of a low income diet is made up of heavily processed foods. These foods are usually high in sodium and other preservatives, and often are high in cholesterol and saturated fats as well. A community garden has the potential to help alleviate some of these problems and increase access to fresh food. To better understand the benefits of a community garden and how one could help AIDS Project Worcester we had to take a look at the history of the concept itself, as well as previous, successful community garden projects.

The concept behind a community garden is nothing new, the modern model for urban community gardens date back to the late 19th early 20th century during, emerging as a widespread model during the great wars in response to food shortages. (Dickinson, 2003) The idea is to build a garden which is open to and sustained by a community or group of people, and in return those people benefit from the products of the garden. Community gardens have seen prevalence during times of economic strife as a means to help increase access to food. In addition increasing access to fresh foods encourages healthier eating which helps mitigate some of the health problems associated with low income living.

Community gardens also have many other subtle yet significant benefits in society. In New York City community gardens were found to help decrease illegal activities and crime rates. (Englander, 2001) When a vacant lot went unused it had a chance to become a site for drug dealing, however when a site was utilized for a community garden it became a place of activity, decreasing drug dealing and anonymous crime. In addition community gardens also help decrease the idleness of youth, which help keep them off the streets and out of gangs. Community gardens also help improve the city aesthetically. Sites that were previously unused were accumulating garbage, but when a site was utilized as a community garden the trash accumulation ceased. By keeping crime rates down and by demonstrating that the community is invested in itself community gardens have been shown to increase what is referred to as the "quality of life." One of the important things that corporations look for when setting up an office is the quality of life in the area. So by raising the quality of life community gardens encourage commerce and raise property values.

Worcester itself has a history with community gardening. One of the most prominent groups that help communities set up a community garden is the Regional Environmental Council. The REC

has been in operation since 1971, their mission is to help impoverished areas by providing access to cheaper healthier food through urban community gardening. Currently the REC maintains 40 community gardens throughout the Worcester area. In addition they run a farmers market, dubbed Main South Farmers Market, which allows the operators of the community gardens to distribute the products of their gardens to a larger community at a low price. In addition the The Regional Environmental Council operates a youth outreach program, YouthGROW, which helps disadvantaged youth learn skills needed for sustaining a community garden, and provides a paid opportunity. The REC is not the only successful community gardening program in the region. The Food Project operates in the Greater Boston Area in a similar fashion to the REC. The Food Project works with 140 teenagers and thousands of additional volunteers to produce nearly a quarter of a million pounds of food every year to help impoverished communities get nutritious food at a reduced cost. (Project, 2010)

Another function which community gardens can serve in Worcester is the remediation of "brownfield" land. The term "brownfield" refers specifically to land with abandoned commercial or industrial facilities, which may include structures such as abandoned textile factories or malls. However brownfield renovation isn't just limited to commercial and residential redevelopment. Another way of reusing brownfield land is to simply raze the land, turn up the soil, treat it and then replant. This can take form of a public parks or gardens. By establishing community gardens on brownfield land it serves the city on many different levels.

Clearly community gardens are a successful model for helping disadvantaged populations such as the one APW serves gain access to nutritional food. There is no doubt that a community garden will be of great use to AIDS Project Worcester, and through our research we will outline how to maximize the efficiency of the garden.

Methodology

Introduction

This project is aimed at providing AIDS Project Worcester with a nutritional resource which will be used to enhance the health and well-being of its clients by leaving the organization with a refined garden implementation plan and prototype garden. These materials, intended to be the most important resource for APW, are step by step considerations of the entire garden undertaking. The prototype is an example of our best recommendations. It was prepared to clearly, visually depict how the garden would be organized under these ideal recommendations. Consultation of these materials will make the considerations for the garden much simpler and straightforward. Our biggest goal in this

project was to ensure that APW has access to our research and can base their decisions from a single source which is whole, well-reasoned, and durable.

This overarching goal has been realized through extensive research and careful compilation of relevant data and statistics from four sub-sections of informational importance. These sections are organized as follows. Section 1, APW Client Demographics, contains information related to the cultural differences and needs which must be represented in our research. It informs the project of these cultural differences and makes recommendations within the final product to strengthen the impact of its effect. Section 2, HIV/AIDS & Nutrition, contains information pertinent to the organization and its clients, and is the organizational beginning of the project and identifies the scale of need within this community. Section 3, Best Garden Practices, focuses more broadly on the operation and startup of a community garden. This informational arena produced much of the shape of the prototype garden. These four distinct research areas contain all possible pertinent information, their organization and refinement produced the final recommendations of this project.

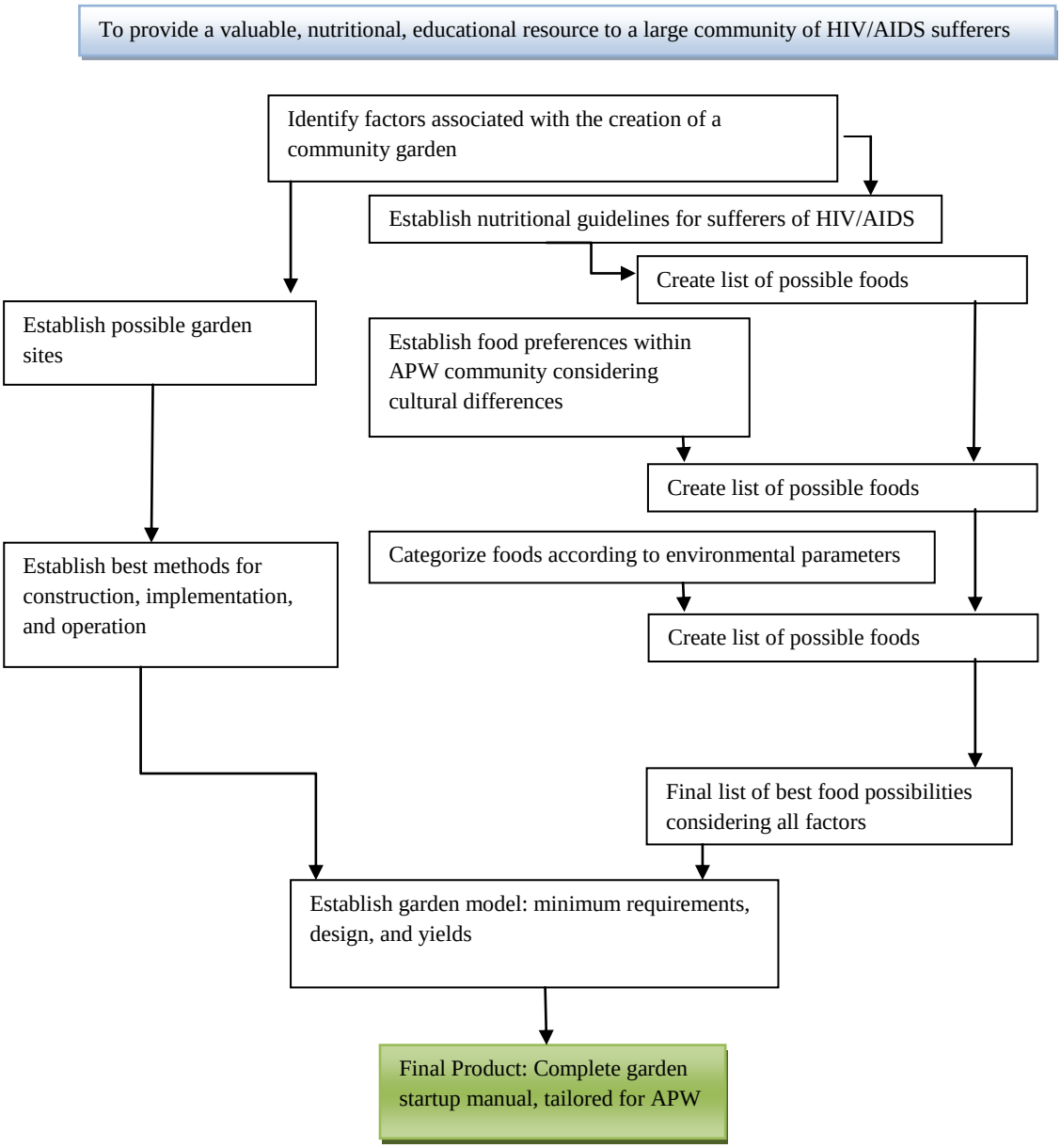


Figure 2: Methodology Organization

Culture

Our first avenue of investigation was identifying cultural preferences of the APW clientele. As mentioned above, there is significant diversity among people who are HIV/AIDS positive, particularly the APW clientele. As culinary traditions often vary between cultures, the garden must accommodate the cultural diversity of the APW clientele, and provide a broader array of culinary options than might be present in a conventional garden. This would provide a foundation for our subsequent research.

The data necessary to ensure proper accommodation of these varied culinary needs was gathered through informational interviews and a survey. Twenty clients of APW were asked specific questions about food consumption and preparation, and a survey with similar questions was distributed among the APW clientele.

This information was then compiled and ranked according to feasibility (some crops cannot be grown in the New England climate), yields, nutritional values, and other various merits. The data were then used to guide the independent research previously mentioned. The final product of the interview was a baseline network of foods, which were researched extensively until a satisfactory list of potential foods, representative of the cultural diversity within APW, was compiled. This list was further refined during later stages of the project, as factors such as nutritional value and gardening best practices were examined.

HIV/AIDS research and goals

A parallel task to identifying cultural preferences was investigating the relationship between nutrition and HIV/AIDS. Here we sought to understand the dynamics between nutrition and HIV/AIDS. More specifically, we identified what foods would provide the necessary vitamins and minerals to those living with AIDS or HIV positive. In order to find these dynamics, the nutritional issues faced by people living with HIV/AIDS were researched thoroughly. There are several nutritionists on staff at AIDS Project Worcester (AIDS Project Worcester, 2008). They were interviewed first, as were some of the individuals served by AIDS Project Worcester, in order to gain data on the nutritional problems commonly faced by people with HIV/AIDS, and common sources of nutrition for such individuals. This served as the foundation for the primary body of research data. This body was expanded by exploration of further avenues, including but not limited to:

- Interviewing other nutritionists that specialize in treating people with HIV/AIDS, and
- Research in scientific journals and other primary sources

These avenues helped us understand the requirements for planning this community garden. One, the vegetable or fruit had to be nutritionally beneficial to a person living with HIV/AIDS. Two, the clients of APW had to have the knowledge of how to cook these foods and wanted them to be grown. Three, the crops had to be hearty enough to be grown in the unpredictable New England environment.

These three criteria had to be met before we could move on to make the prototype garden and handbook. To accomplish the first objective we needed to know about the specific deficiencies associated with HIV/Aids. We obtained the information regarding the nutritional benefits from

interviews with a nutritionist and personal research. The interview was eye opening in relation to the specifics of the nutritional deficiencies. We held the interview before we started research because we wanted to narrow our scope so we did not do unnecessary research. Once the scope was narrowed we could start on researching each vegetable or fruit for its specific benefits. Both of these procedures helped to define the recommended crops for the handbook and the prototype.

To accomplish the second objective we had to survey and interview the clients of APW. To learn the needs and wants of the clients of APW we interviewed a randomly selected number of clients. In these interviews we learned more about the cooking and eating habits of APW's clientele. In having these interviews limited to a certain number we did not get an accurate proportion of the demographics. To make sure we had a broader view of APW's cliental we used surveys. These surveys asked about what they knew of gardening and their conditions. Along with what foods they regularly acquired from APW and what age and gender they are to help us more accurately define our beneficiaries. In doing these interviews and surveys we had a much more defined list of fruits and vegetables. Once the cultural preferences and specific nutritional needs of the APW clientele had been identified, research into the design of the garden itself could begin.

Garden design

Our last objective was accomplished through interviews of local community gardens and personal research. We conducted interviews with YouthGrow and UGROW to better understand the climatic limitations of New England. The personal research identified some of the crops that may not have grown in a typical New England garden but could easily survive the conditions.

These three objectives narrowed and focused the crops we chose to be grown in APW's garden. Crops that could not be grown in a New England climate were removed from consideration, as were crops in which APW clients showed no interest. Therefore, the nutritional output of the community garden is equally dependent on each of the objectives.

Best Gardening Practices

Once the garden's design began to take shape, best gardening practices were considered, both for plants in general and for the Worcester area specifically. This included research into many different areas including climate data, pest control, plant management, and garden maintenance.

Before doing anything regarding gardening practices it was important to identify which crops are incapable of growing in the New England climate. Tropical plants are an obvious example of what we can't grow here. In addition we need not consider plants such as tree fruits or other plants that require some sort of special growing environment, such as rice. The climate in New England is

notable for its bizarre weather patterns and general unpredictability. Because of this it is extremely difficult to predict how the weather will behave in the incoming growing season. In addition to this, the growing season in New England is short albeit intense. All these factors combined make any new venture into gardening and farming in the area a risk. We researched how well certain plants can survive adverse weather conditions by researching what conditions they are capable of growing in. Information regarding this was readily available through material published by organizations such as the REC, the Massachusetts Department of Agricultural Resources, and the Northeastern Organic Farming Association. By taking into account the duration of the growing seasons for individual plants we could assess how risky planting certain crops would be. For example if a plant has a very short season that starts right after the last frost it would be a risky recommendation because it is difficult to predict exactly when the last frost occurs. Another factor when assessing risk to consider is plant maintenance. It would not be good if we were to recommend a high maintenance plant that would require a lot of time and effort to take care of, only to have it rot due to abnormal weather conditions. By taking all of these into consideration we were able to compile a more in depth list of feasible plants for the garden.

Plant selection was only the first step. When we narrowed down the list even further by using the information collected from the AIDS Project Worcester clientele, we then concerned ourselves with the best practices for the actual gardening process. Given the decision to use a raised bed system we researched proper gardening methods for growing in the beds. A large majority of this information was obtained from materials provided by the REC. The first part was to research proper planting methods. Traditional row sowing would be inadequate for the beds as it is an inefficient use of space, so we researched planting methods using a Square Foot Planting system. The only major difference between these planting methods is the spacing of seeds, whereas factors such as seed depth, watering and composting stay the same. In some cases plants must be started early and then transplanted to the beds as opposed to just growing them from seeds in the beds. The soil itself was a concern as well; we needed to research how to optimize the soil for growing. Using organic material, compost, is one of the most common ways to help plants grow, so we researched just how much to add to the beds to make the soil as fertile as possible. As we learned there is a correct way to do the actual mulching and composting process, which is outlined in the REC document on composting. All of this data was collected from other existing organizations such as UGROW and The Food Project which have extensive knowledge in urban gardening environments.

We then researched proper growing techniques for the beds. Watering was one of the largest factors to consider, it was important to outline exactly how many times a day and how much water to

use. In addition to this we also researched the water lines in Worcester as part of our site selection process which helped us determine the best watering methods. Weeding is another essential part to sustaining the garden, documenting which plants to pull was an important step. Another very important aspect to gardening practices is pest control. We researched more "organic" pest control methods which will help with keeping the costs of running the garden down by skipping the expense of pesticides. This also keeps poisons off of the produce grown, resulting in a more healthful final product. Another gardening practice we considered was the actual management of the plants. Some plants are significantly more difficult to grow than others because they require a special attention to the growing process. We needed to research the proper method for controlling vine plants in the garden, for example when using a trellis, we needed to find out how large or how high it needed to be. Knowing when to harvest a plant is the final step in the gardening process, we needed to outline exactly when a plant is ripe and ready to pick. In addition in order for the garden to be self sustaining we had to research how to properly collect and store seeds for the next season.

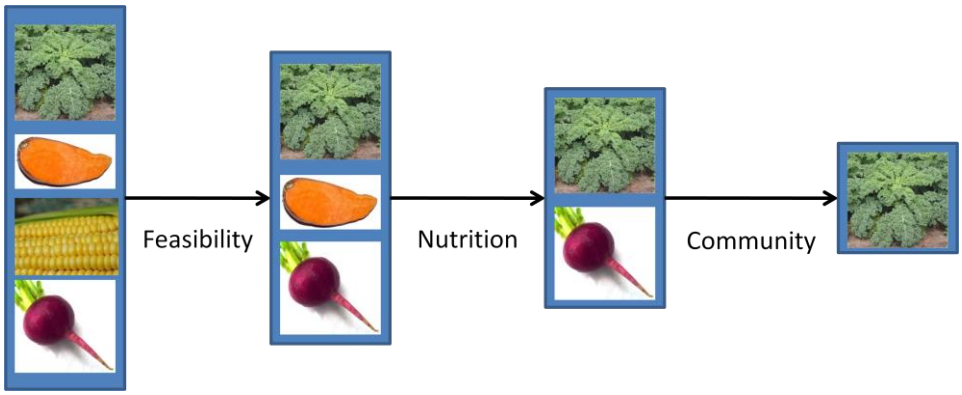
Project Handbook

The final result of all of this research was an Instruction manual for APW. This crucial portion of the project was structured to inform APW of the research elements and conclusions we derived during our seven week undertaking. It visually shows all of the elements associated with the startup and the day to day operations of the garden. We believe that this medium was the best way to communicate our findings to those in charge of creating the garden. It contains our final analysis, which is a succinct implementation plan, as well as the related research which led us to our analysis. Including both the research information as well as the final recommendations will give APW insight into our decision making process and shows the depth of variables which were considered to make the final analysis. This context will enable APW to question our logic or modify the garden plan in the future with the same information we used and gathered. Our decisions were based from extensive research of each important section. We then developed this research through interviews and surveys. Using multiple information sources gave us the background and context necessary to give complete and useful recommendations and best practices for the garden. The complete manual will be the single source for APW to go to for each major development in the project. It has detailed information on site locations, garden building styles, climate data, crop choices, and garden maintenance. Utilizing all of the information collected within the manual will make every step of building the garden as easy as following a recipe to cook the food.

Findings

Potential Crops

At the conclusion of our research we found 33 fruits, vegetables, and herbs that met our requirements. When we searched for potential crops we had to consider three factors that would narrow our final list. We had to make sure that the plants we chose would grow in this climate first and foremost. Secondly we had to make sure the crops we chose would be nutritionally beneficial to the clientele of APW. Finally we took into consideration the preferences of the clientele. As we considered each vegetable or fruit we also considered the cost for each and decided on the best possible breed for each plant. When all was said and done we ended up with our finalized plant list.



As mentioned before, the first factor we had to consider was whether the different plants would grow in the New England climate. Worcester is in the Hardiness Zone 5b which means defines what type of plants will grow in the area. We had to take our list of potential crops and make sure that all of them would grow in the area. If one crop did not have the hardiness to grow in Worcester it was removed from the list. This insured that APW would not be spending their time trying to grow crops that could not survive in the Worcester climate.

In addition we were able to create a very detailed breakdown of the nutritional data of different crops compiled from all of the data collected. This breakdown insured that our crops would benefit the nutritional needs of APW. According to the nutritionist some of the more important compounds we should be looking for in the foods we grow are antioxidants, which help reduce the risk of certain diseases. Antioxidants include vitamin C, carotenes (β-carotene and retinol,) and vitamin E, specifically α-tocopherol. In our list strawberries and sweet peppers are high in vitamin C, while sweet potatoes and carrots are high in carotenes, which made them important to consider when making final recommendations. In addition to raw nutritional data some of the plants on our list are what are called super foods, which are foods with very high nutritional density. Super foods are quite advantageous to

us because they'll provide a large amount of nutrition while taking up minimal space in the garden. Cauliflower, celery and chard are examples of some of the super foods on our list. We also gained a lot of information from the clientele themselves regarding their nutritional needs. For example we noticed a trend in the clientele of APW where a lot of them are suffering from anemia, a condition that is a result of a low red blood cell count or a shortage of the protein hemoglobin. This is often a result of someone not getting enough iron in their diet. We therefore gave special consideration to plants that are high in iron such as tomatoes and potatoes. Some of the clients that we interviewed had issues with blood clotting and other circulatory related problems which in some cases are most likely a result of high cholesterol, saturated fat and sodium intake from processed foods. Fortunately, fresh vegetables and fruit are low in all of these, and to contrast some foods such as raspberries contain omega-3 and -6 fatty acids which have more beneficial effects. After we considered the nutritional benefits of each plant, we made sure they met the requirements of someone living with HIV/AIDS.

Finally we considered the preferences of the clientele of APW. This was done through interviews and surveys. We found that some plants, beets and eggplant, we not desired by all the clientele at APW. This made these two crops lower on our final list but were still considered because of their nutritional value. There were no crops that the majority of the clientele did not like.

Asparagus
Basil
Beans
Beets
Broccoli
Cantaloupe
Cabbage
Carrots
Cauliflower
Celery
Chard
Cilantro
Collard Greens
Cress
Cucumbers
Eggplant
Garlic
Kale
Lentils
Lettuce
Mint
Nasturtium
Onions
Oregano
Peppers, Hot
Peppers, Sweet
Potatoes, Irish
Potatoes, Sweet
Raspberries
Sorghum
Sorrel
Strawberries
Tomatillos
Tomatoes
Turnip
Zucchini

Also during our research, we found that it would likely be most cost-effective for APW to purchase plants through REC. While it is possible to purchase seeds in bulk from online suppliers, REC is local, and provides a discount to members of its network. While researching cost data, we also found that costs for any given vegetable can vary greatly between varieties. For example, the "Jersey Giant Hybrid" variety of asparagus costs between $6.30 and $8.38 per oz. (at 600 seeds/oz), while the

"Mary Washington" variety costs between $1.25 and $4.00 per oz. (also at 600 seeds/oz) [values taken from the Mountain Valley Seeds online catalog, Jan-Feb 2010]. Therefore, when finalizing the list of potential crops, cost of a given variety must also be considered, in addition to considering nutritional and climatic data of said variety.

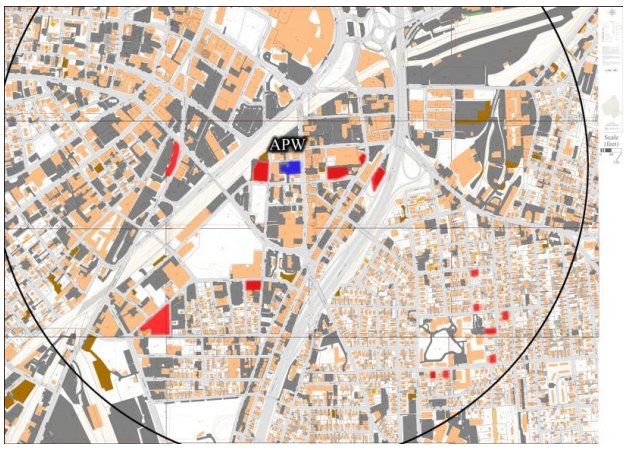
Once we had finalized our list of crops we had to consider all of the possible garden locations that APW could obtain. Also we had to consider what characteristics these sites should possess.

Possible Sites

In our search for a suitable garden site we found that sites that met, all or most of, APW's requirements were ranked as the best choices. In this case the sites with the longest walking distance were not considered as seriously as the sites that were closer to APW. A closer garden would increase the ease in which it could be run. Managing the garden and the people that work in it would be at most a ten minute walk away. A short distance would help encourage the staff of APW to lend a hand in either the management or labor of the garden. This would increase the likely hood of more people being willing to work in the garden. It also encourages people who are handicapped or less mobile to help when they could. Also when the crops were harvested it would be much easier to keep them fresh the closer they are to storage. This will help prevent the fresh vegetables from becoming rotten or ruined in transportation.

Exposure was a big consideration with each site. We found that the more sun exposure and public exposure a site had the more desirable it was. Good sun exposure would be crucial for a New England garden as the growing season is short enough. It would also play a role in the choice of crops that would grow in the garden because of the specific conditions. Along with good sun exposure, the garden had to have some positive impact on the community. The top five sites we chose are in a busy area that can easily be seen and recognized. This would help produce a positive impact for the community and hopefully encourage other people or organizations to show support.

In terms of the garden itself we had to consider two major conditions. For one, we found that raised beds would be the most beneficial whether they are needed or not. The reason we first chose raised beds was because of some of the sites are paved. This would cut out the majority of labor required to start the garden. Raised beds would also help us more accurately determine the costs of



the garden. Making the garden much more mobile and versatile is also another plus to raised beds. This method also serves to effectively remediate former industrial sites inexpensively. Secondly, a supply of water was needed for the garden. Most of the sites that we looked at did not have a building to collect rainwater off of, which would have been ideal. So for each site we recorded whether it had water lines near it by way of fire hydrant. Water hook up is extremely important to the garden because of the unpredictable environment that we live in.

Lastly we considered the amount of area that site had to offer and who owns the land. We found that to start off the garden we would suggest using twenty eight by four beds. This would yield close to 600 square feet. So our minimum site would have to be close to 1,200 square feet. This would provide enough room to build and work comfortably and still allow some room for expansion. In our top five sites we have at least ten times the minimum area required. This gives plenty of room for expansion and has the capacity to support a lot of people. The last and possibly the biggest obstacle of gaining a garden site is the owner of the land. Two of our top five sites are owned by a British run company. This creates a big void in which APW would have to bridge. Along with big companies, APW would have to deal the State of Massachusetts with some of the other sites. So, a small local company or a personally owned piece of land would be much easier to obtain.

The selection of our top 5 potential sites yielded us a specific set of parameters we had to work with to establish recommendations for the garden. These came from a process of analyzing the similarities and differences between the sits and choosing a method which worked effectively for each. From this data we came up with a set of specific suggestions which are detailed in the next section, optimal design.

Top Five Site Locations							
Site Location	Sun Exposure		Visibility		Needs Raised Beds		Rank
Address	Good	Poor	Good	Poor	Yes	No	1 to 5
(26 Gold St) Wymon Gordon Lots	x		x		x		1
183 Southbridge Street (Greens opposite Coney Island)	x		x			x	2
112 Harding Street	x			x	x	x	3
80 Lafayette Street	x		x		x		4
46 Barclay Street	x			x		x	5

Owner	Area	Water		Walking Distance	Rank
	Square Feet	Yes	No	Approximate Walking Time From APW	1 to 5
Precision Castparts Corp. UK	Any size garden	x		.1 Miles/ 2 minutes	1
State Of Mass	15000	x		.4 Miles/ 8 minutes	2
MB Metals Inc.	20000	x		.3 Miles/ 4 minutes	3
Precision Castparts Corp. UK	23000	x		.3 Miles/ 6 minutes	4
Worcester Acadamy	12000	x		.8 Miles/ 15 Minutes	5

Optimal Design

This section is to be used to inform and organize cost, material types, and construction of the garden space. These findings are derived from interviews with REC, online research, and in-store price comparisons. From these information sources we established a garden system which will be long lasting and cost effective. Other considerations, such as accessibility, directed us to choose a raised bed garden system. This type of garden is easy to maintain because of its raised design. Each bed will be eight by four, and three feet deep. A width of four feet is ideal because it's small enough that the center can be reached from either side with relative ease, but large enough to maximize growing space. A height of three feet was chosen to increase accessibility to the elderly and handicapped, and along the same vein the beds will be spaced so that they are wheelchair accessible. Each bed is self contained and APW can build as many or as few as are needed. The beds are also relatively portable, allowing for easy rearranging/relocation of the garden. The included cost list is arranged to quickly estimate the cost of growing the garden in the future.

The materials needed for each raised bed were also critical. We used the same informational sources to create a full materials list. It is cost effective and safe to build with pressure treated lumber.

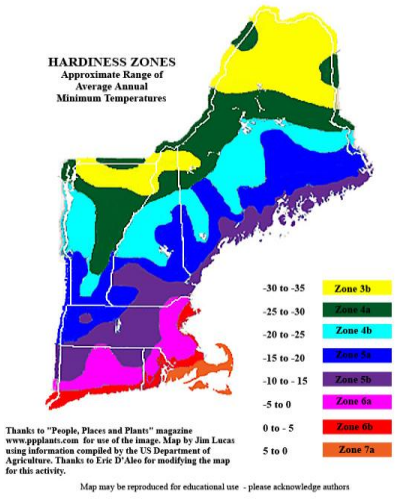
This wood is cheap, and locally available. Other wood types, such as redwood and cedar, were considered because of their natural rot and insect resistance but were far too costly. Another option for the raised bed design is to outfit each bed with a temporary greenhouse to extend the growing season. This design is inexpensive and very desirable for cold New England springs and falls.

Another important factor in garden building is the water delivery system. We reviewed Worcester water and sewer maps as a way of establishing which sites had proximity to the city water system. We annotated those sites in our site data sheet. However it isn't enough to simply be close to a water main, APW would then need to contact the city to have them erect a spigot in the garden site off of the main line. From here APW can simply run drip hoses or set out sprinklers, two low cost options.

The final major material consideration was growing medium. A mixture of screened loam and compost is very nutrient rich. It will create a balanced soil composition which will be excellent for growing for many seasons to come. The soil-compost mixture can be made on site and the compost delivered free of charge by the City of Worcester.

Recommendations

Gardening Best Practices



We were able to gather a lot of information regarding growing conditions specific to the Worcester area from the Regional Environment Council. The USDA classifies overall growing seasons in regions of the United States using a "hardiness" scale. Worcester is in a hardiness zone of 5A, which means that we can expect the last frost date to be in the early weeks of May, and the first frost date to occur between September 30th and October 30th. In addition we were able to establish the growing seasons for specific plants for each specific plant. We found some crops to be resistant to cold weather which is an advantage considering that our last frost can be expected in early May and the first can happen as early as late September, but due to New England weather it's never a guarantee. Examples of crops that are resistant to cold are collard greens, cabbage and kale. Also, in order to provide fresh produce the majority of the year we needed to find different crops that would grow at different times of the year. Lettuce is a crop that doesn't do well in warm weather because it bolts in the heat, so it works really well as an early crop in the spring and late crop in the autumn.

Conversely summer squashes such as zucchini do really well in the warm weather, and should be planted no earlier than when the average outside temperature is around 60 to 70˚F. Another fact we discovered is that we must be very specific when recommending some crops because certain species grow better than others in this region, for example certain species of melons and onions grow better in this climate than others.

Plant maintenance was a very important factor in our recommendation process because we didn't want to present APW with a garden plan that would be too difficult to manage. We found that lettuce, strawberries and turnips are low maintenance plants; they are easy to grow with minimal effort. In addition, a majority of the clients we interviewed indicated that they enjoy or use lettuce in their diet. When taking into consideration this and the preferences collected from the clients of APW we moved these plants up in our final recommendation list. That's not to say that we didn't completely discard plants which require a higher level of maintenance because in many cases they are plants which are desirable by the APW clientele. Melons require a lot of maintenance because they need to be planted inside weeks before the last frost so they can be transplanted right away, and they have vines which need to be tamed. However they yield a large amount of produce, about 100lbs per 100 ft^2, and contain a lot of important nutrients, specifically Vitamin C which is an antioxidant.

Information pertaining to the actual seeding and planting methods also greatly helped us determine the feasibility of plants. Not all plants should be directly sown in a bed, some should be grown in a controlled environment then transplanted. Tomatoes for example should be grown inside six to eight weeks prior to the last frost, and then transplanted outside, meaning they will require some extra maintenance. The transplanting process itself requires special techniques. If a plant is grown indoors it must be "hardened-off" before moving it outdoors. This process involves exposing it to outdoor conditions in increasing increments, for example moving it outside for one hour on the first day, two and a half hours on the second, four hours on the third, et cetera. In some cases we found that certain crops could be grown in the region, however due to a couple of reasons dropped them really low on our recommend list to AIDS Project Worcester. For example although sweet corn can be grown in the area and a lot of the clientele eat corn as part of their regular diet, it requires a lot of space and yields little food in return.

Conclusion

This project was an opportunity to collaborate with AIDS Project Worcester to create a solution for their clientele's food and nutritional needs. This effort was accomplished over a 14-week period

and required significant research into three main areas: the demographics of APW clients, HIV/AIDS nutritional needs, and garden characteristics. After identifying these areas as the most crucial for the development of our project, we conducted interviews, distributed surveys, and performed archival research. This process gave us specific insight into APW's needs and gave us the data we needed to form recommendations and conclusions. Our first group of findings dealt with appropriate crops. A list of 40 crops was created which are rated according to the preferences of the clientele and the nutritional benefit of each crop. Next, we established a list of 13 potential sites. These locations had to meet strict parameters, both essential (size, water, condition) and preferential (proximity, visibility). The top 5 sites were ranked and chosen from the group for performing exceptionally in one or more of these areas. The final finding we created was an optimal design for the garden. The section prior to this describes some of these conditions. This included a prototype garden and was intended to be a succinct summation of our best recommendations for developing the garden. These 3 findings will deliver the necessary information APW must consider when they establish their community garden in the future. This information has been organized in a garden manual and prototype garden for easy referenced by APW and other entities in the future.

Bibliography

AIDS Project Worcester. (2008). *Population Served*. Retrieved January 2010, from AIDS Project Worcester Website: http://www.aidsprojectworcester.org/populationserved.html

Center for Disease Control. (2001, June 1). *Morbidity and Mortality Weekly Report.* Retrieved January 2010, from http://www.cdc.gov/MMWR/PDF/wk/mm5021.pdf

Dickinson, J. S. (2003, September). *Community Gardens: Lessons Learned From California Healthy Cities and Communities*. Retrieved February 22, 2010, from National Center for Biotechnology Information: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447988/

Englander, D. (2001). *New York's Community Gardens - A Resource at Risk.* Retrieved February 23, 2010, from The Trust for Public Land: http://www.tpl.org/content_documents/nyc_community_gardens.pdf

Haddad, L., & Gillespie, S. (2001, June). Effective Food and Nutrition Policy Responses to HIV/AIDS: What We Know and What We Need to Know. 30. Retrieved 4 Dec 2009 from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.58.5749&rep=rep1&type=pdf. doi: 10.1.1.58.5749

Hsu, J., Bencharz, P., Macallan, D., & Tomkins, A. (n.d.). Macronutrients and HIV/AIDS: a review of current evidence. *Consultation on Nutrition and HIV/AIDS in Africa: Evidence, lessons and recommendations for action* . Retrieved 5 Dec 2009 from http://www.who.int/nutrition/topics/Paper%20Number%201%20-%20Macronutrients.pdf

Project, T. F. (2010). *The Food Project: About Us*. Retrieved February 10, 2010, from The Food Project: http://thefoodproject.org/about-us

Ltd, B. a. (2008). *WorcesterMassachusetts,USA*. Retrieved Dec. 4, 2009, from Worldclimate.com: http://www.worldclimate.com/cgi-bin/data.pl?ref=N42W071+2200+199928C

Public Works & Parks. (n.d.). Retrieved Dec. 2, 2009, from www.WorcesterMA.gov: http://www.ci.worcester.ma.us/dpw

Worcester County Vacant Land For Sale. (2009). Retrieved Dec. 4, 2009, from Loopnet.com: http://www.loopnet.com/Massachusetts/Worcester-County_Vacant-Land-For-Sale/

African food staples. (n.d.). Retrieved from http://www.afrol.com/archive/food_staples.htm

Wittmeyer, E.C. (n.d.). *Growing potatoes in the home garden*. Retrieved from http://ohioline.osu.edu/hyg-fact/1000/1619.html

Cantaluppi, Carl J. (n.d.). *Growing asparagus in the home garden*. Retrieved from http://ohioline.osu.edu/hyg-fact/1000/1603.html

Lycopene-mayoclinic. (2009, September 1). Retrieved from http://www.mayoclinic.com/health/lycopene/NS_patient-lycopene

Vorvick, Linda. (2009). Vitamin A. *Medline plus medical encyclopedia*. Retrieved 5 Dec 2009 from http://www.nlm.nih.gov/medlineplus/ency/article/002400.htm

Lister, Sam. (2005, September 15). A Diet rich in beans may mean more protection against cancer. *Times Online*, Retrieved from http://www.timesonline.co.uk/tol/news/uk/article566680.ece

Stamos Kovacs, Jenny. (2009). Beans: Protein-Rich Superfoods. *Webmd*. Retrieved (2009, December 5) from http://www.webmd.com/diet/features/beans-protein-rich-superfoods

Expected vegetable garden yields. (2009, August 26). Retrieved from http://www.lsuagcenter.com/en/lawn_garden/home_gardening/vegetables/Expected+Vegetable+Garden+Yields.htm

Nutrition facts: sorghum. (n.d.). Retrieved from http://www.nutritiondata.com/facts/cereal-grains-and-pasta/5732/2

Nutrition facts: eggplant. (n.d.). Retrieved from http://www.nutritiondata.com/facts/vegetables-and-vegetable-products/2858/2

Bender, David. (2005). Health Information for Sorghum. *Encyclopedia.com*. Retrieved (2009, December 3) from http://www.encyclopedia.com/doc/1O39-sorghum.html

Instruction Garden Manual

Community Garden Group

Robert Grady, Jason Reynolds, Lee Hermsdorf-Krasin, & Evan Sawyer

APW Community Garden Instruction Manual

Robert Grady, Lee Hermsdorf-Krasin,
Jason Reynolds, & Evan Sawyer

Table of Contents

List of Tables & Figures

Figures

Tables

Introduction

Welcome. This manual will walk you through the short-term design and setup of a community vegetable garden, specifically tailored for AIDS Project Worcester. Within the manual, you will find recommendations on where to build the garden, how to build it, what to grow, and how to effectively manage the garden. This manual is not a complete guide to long-term maintenance of the garden, nor is it a collection of plans for each possible site. Rather, it contains the fruits of all of our research, compiled in a useful, easy-to-understand format. Firstly, it contains the principles behind community gardens and their construction, and therefore is not limited to a certain group of sites. Secondly, it contains recommendations on the makeup of the garden, based on the nutritional and cultural needs of the AIDS Project Worcester clientele, and suggestions regarding management of the garden. Finally, it contains all of our raw data in an appendix for easy reference. A prototype garden is also included as an example.

The prototype provides an example of what the garden might look like. It is based upon the recommendations provided in this manual, and designed for the most desirable site. It may also provide a starting point from which AIDS Project Worcester may launch their program, using the prototype as their initial garden and expanding upon it in the years to come as they see fit.

Site Locations

Ranking of Top 5

In the search for all the possible sites in Worcester several criteria were considered. The main four criteria on which sites were evaluated were sun exposure, water availability, size, and cost. These four determining factors were followed by two preferential factors, public visibility and proximity to APW, which we had to consider for the specific case of APW. In the following list the top five choices will be described along with a visual.

5) The fifth choice was an empty lot of land at 46 Barclay Street. This site meets all four or the main criteria. It is 12,000 square feet which is ten times more than the minimum garden size. This allows for more movement and the option for garden growth. This site also meets the sun exposure and cost requirements. Eight hours of sunlight is the minimum amount needed and the plot of land is owned the Worcester Academy. The fact that Worcester Academy owns the plot of land makes it easier for APW to obtain because Worcester Academy is very involved in the community and will most likely help APW. The reason this site is number five is because it does not meet the two preferential requirements for APW. It's one of the farthest sites considered, 15 minutes walking, and is in a more rural area. Public exposure would not have such a big impact as some of the top choices.

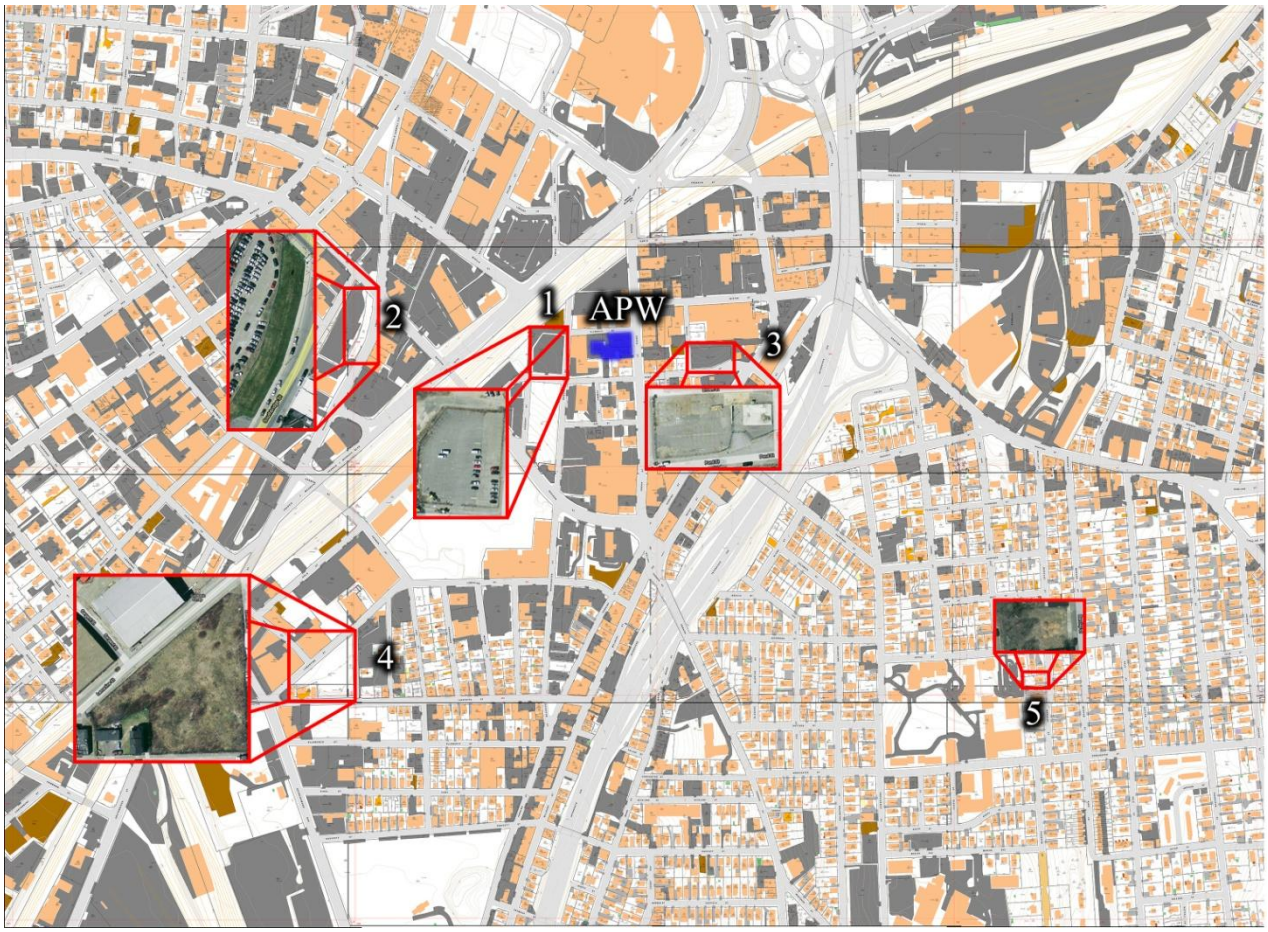
4) Site number four is a paved lot at 80 Lafayette Street. This lot meets three of the main four requirements. The cost is the one main factor that it does not meet. Precision Castparts Corp., in England, is the company that owns this land. This is will make it much more difficult for APW to obtain this plot of land. Even though this site would be harder to obtain it is considered higher on the list because it meets the preferential criteria. It's only a six minute walk from APW and it is in a much more public area.

3) The third site that was chosen, 112 Harding Street, also meets all four of the main criteria. It gets enough sun light, big enough for two gardens, possible water hook up, and a local Worcester Company owns the land. The best thing about this site is that it is only a 4 minute walk from APW making access for staff and clientele easy. The one downfall of this garden is the fact that is surrounded by buildings and on a side street. Public visibility is a small price to pay for a site of that a size and that close.

2) Site number two is 183 Southbridge Street and meets all four main criteria. It gets enough sun light; big enough for two gardens, possible water hook up, and is owned by the State of Massachusetts. Since the State owns this plot of land it would take longer to acquire. The fact that this site is on a major route through Worcester and only an 8 minute walk from APW outweighs the wait for obtaining the land.

1) The top site is at 26 Gold Street. This is directly behind APW and would make running the garden and the people caring for it much easier. It is also in viewing site of route 22. The same major route through Worcester mentioned beforehand. These two characteristics of the garden outweigh the fact that it's owned by Precision Castparts Corp. If APW can obtain this site they will be much better off. Along with the first two preferential criteria it also meets the remaining three main factors. It is large enough to hold three of the minimum gardens, gets enough sunlight, and has the possibility for water hookup.

Site Location Map



Scale: 1" = 500 ft

Construction

Materials List

This section is meant to inform and describe all the materials which would potentially be used in the community garden. It will primarily deal with the raised bed gardening structures. Any other important materials will be covered by this section. References to these materials and their costs can be found in the appendix, figure .

The bulk of this list includes all of the materials which will be necessary to build the raised bed structures. The most important item on the list is the type of wood to be used. Cedar prices were included because of the wood's natural rot resistance, but this wood is extremely cost inefficient. Pressure treated lumber is the most cost effective option and pricing information from the top three local lumberyards is included. Also included is the pricing information for 4x4x12 boards, which require 2x6x12 trim boards and 6x6x12 boards which require 2x8x12, trim. Our recommendation is to use 4x4x12 boards and 2x6x12 trim. The thicker wood was included as a secondary option to make the beds more rigid. Each bed (8 ft. long by 4 ft. wide by 3 ft. deep) will require 18 boards and 2 pieces of trim, totaling $226.54if purchased from Leader Home Centers in Barre, Massachusetts. We believe the initial garden should be comprised of 20 raised beds, at a total lumber cost of $4,530.80. This will yield the garden a growing space of 640 square feet, more than suitable for a pilot garden.

The beds will also require a tremendous amount of soil. A single truckload will deliver approximately 17 cubic yards of ¾ screened loam, a perfect growing medium. Each truckload will fill 5 full garden beds at a cost of $320 per delivered truckload from Busy Bee Nursery in Holden, Massachusetts. The total cost for this amount of loam would be $1280.

It is also important to use the proper fasteners when constructing the beds. We chose 6 inch Timberlok band timber fasteners. These screws are easy to drive, and will save time during

construction. They are also very strong and would keep the beds together if they ever needed to be transported in the future. These screws cost $115.80per box of 250. Each box would contain enough screws to build two beds. The garden would therefore require 10 boxes of these fasteners, at a total cost of $1,158. The image in the following section shows the fastening pattern which should be used to construct the beds which determined the total number of screws necessary. Deck screws should be used to fasten the trim pieces to the top of the beds, once constructed. This will provide temporary tool storage, but will also serve to make the garden easier to work in. The trim is optional, but is relatively cheap and quite beneficial for appearance and usability. The deck screws used should be 3.5 inch galvanized deck screws, total cost less than $20.

The final item addressed in the materials section is an optional design addition which would be used to convert each individual raised bed into a covered greenhouse. This can be accomplished by draping polyethylene sheeting over PVC frames installed within each of the beds. This addition can potentially extend the growing season by several weeks. The materials are low-cost and can quickly transform a raised bed into a miniature greenhouse. A single roll of 6ML plastic sheeting will cover approximately 13 beds. This plastic costs just $94 with each of the other materials (flex PVC, rigid PVC, galvanized pipe straps), totaling less than $20 for the same space. It is not necessary to convert all the beds to be covered because not all plants will thrive in the early spring and late fall; converting at least half would be sufficient. This must be completed when the beds are built and cannot be easily accomplished once they have been filled.

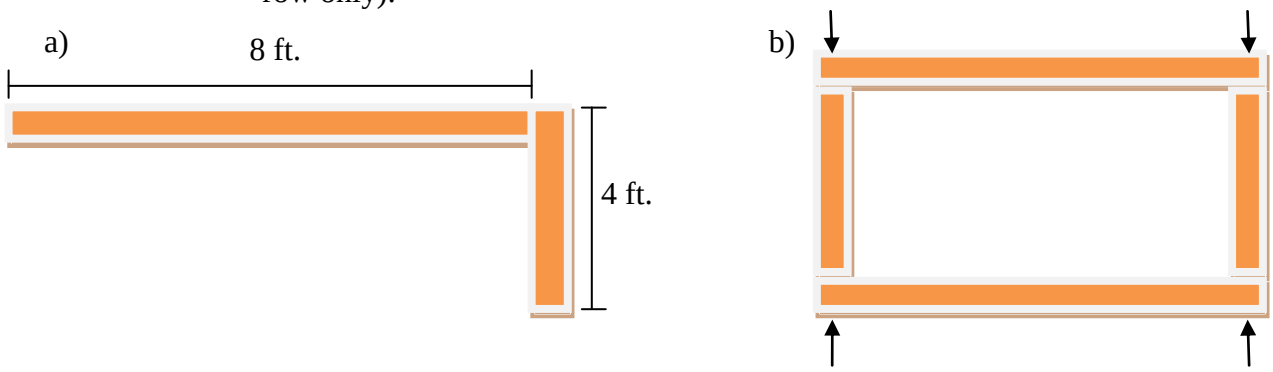
A few other necessities have been included in the material list. Weed block fabric is not essential but can be used atop the fill to block weeds from growing. Manure may need to be used at the start of each season and has also been included; a single bag will cover 2 beds at a cost of $5. Fencing should be a priority in whichever site is chosen and should be estimated and installed by a professional.

Construction Methods

This section will detail the information necessary for constructing the structures of the garden. This would include the raised beds, and optional greenhouse structure. It is imperative that these instructions be followed to ensure that each bed will be structurally sound and capable of extended future use.

Raised Bed Construction- The raised bed construction is simple and has been designed to be easy to build and install. Each bed will need to be constructed from 18 pieces of pressure treated lumber. (NOTE: Construction instructions remain the same for both 4x4'' and 6x6'' lumber; larger timber fasteners must be used with the thicker lumber.) Each 12 foot piece of lumber must be cut so each board yields an 8 foot and 4 foot length (see **Figure 3.1a** below). This ensures that each piece of lumber, when cut, will make one side and one width piece. After the lumber has been cut to the proper lengths construction on the individual raised bed can begin. The first layer should be laid out and secured with fasteners horizontally. This should be done by installing 4 fasteners as shown below in **Figure 3.1b**.

Figure 3.1: a) Lumber cut pattern. b) Fastener attachment points (first row only).

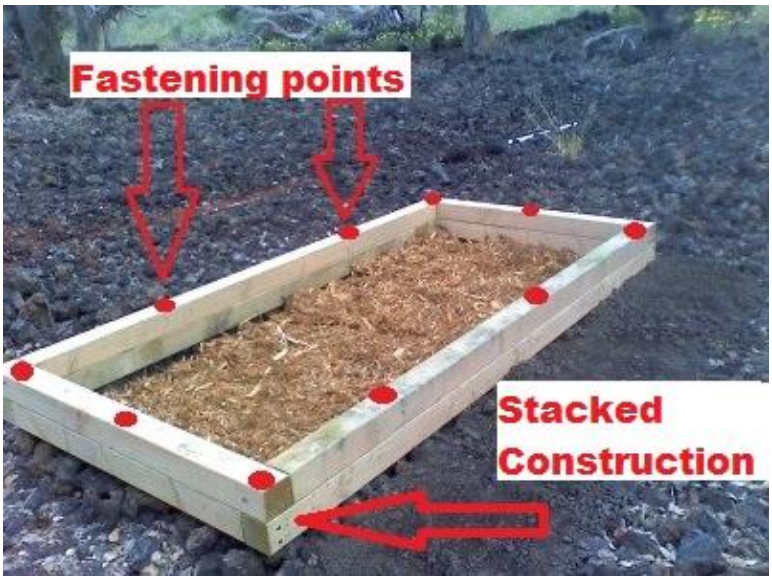


Leveling and securing the first row is a crucial step for the rest of the bed to come out correctly. Shims can be added to the base of the bed to make certain it will sit relatively level on the earth. The rows following the first must then be laid out in a "stacked" design. **Figure 3.2** clearly depicts this style of construction. This design is meant to add rigidity to the beds and make them capable of surviving

Figure 3.2: Stacked construction of raised beds.

transportation. Staggering the joints also makes the beds visually appealing. Each row sitting atop the first (9 rows total) must be secured vertically at the 10 points depicted in **Figure 3.3**. These fastening points will snug each row together to create the final bed, standing 3 feet tall. Figure shows inset pictures of the corners of two raised beds similar to those which will be constructed. The final step is to cut the trim (same 8 ft. and 4 ft. lengths as previous) and affix it to the top of the bed. Each board (2x6x12, or 2x8x12 for 6x6 lumber) should have 45 degree cuts at each end so the boards neatly cover the top of the bed. These trim pieces will be affixed using deck screws. Once each of the rows and the trim is firmly secured and the bed sits complete it is ready to be outfitted with the optional temporary greenhouse.

Figure 3.3: Fastening points (all rows after first)



Optional Temporary Greenhouse- The greenhouse structure is very simple to build and can be used to extend the growing season of some plants. These structures must be built *before* each bed is filled; attempting to add them after the garden has been established would be much more difficult. Each structure is comprised of four main components: plastic sheeting (greenhouse cover), flexible

PVC (greenhouse frame), rigid PVC (holds greenhouse frame), and galvanized pipe straps (secure rigid PVC to raised bed). You will need (6) 1'' diameter Rigid PVC pieces, (3) 6+ foot flexible PVC pieces, (24) 1'' pipe straps, and one roll of 6ML plastic sheeting 100x20 feet in area. The first step is to secure 6, 1'' rigid PVC pipes to the inside of the raised bed. These should sit flush with the top trim piece and should be 8 inches long. These hollow PVC posts need to be firmly attached with the 1'' galvanized pipe straps as shown in **Figure 3.4**. The 6 holder should be placed on each corner of the bed, with 2 centered to the middle. The result will be a firm holder for the PVC frame which will wrap over the bed. The next step is to determine the proper length for the flexible PVC which is ½'' in diameter. This should be approximately 6 feet but may need to be longer to guarantee that each frame is tall enough for plants to grow under it. All three sections of flexible PVC must then be cut the same length for the sheeting to sit uniformly over the frames. Once these steps are complete the flexible PVC can be hooped over the bed and will sit inside of the 1'' tubes which were fastened to the insides of the bed, as indicated in **Figure 3.5**. This completes the rough structure of the temporary greenhouse. The final step will be to cut the polyethylene sheeting down the long way making (2) sheets each 100x10. The long sections can then be draped over the frame and secured using zip ties, or tucking the plastic into the bed once it has been filled. This is the final step

Figure 3.4: Mounting a frame holder.

Figure 3.5: Installing PVC frames.

in constructing the optional temporary greenhouse feature.

Preparation

Climate Information: Worcester lies in Zone 5B of the United States Hardiness Zone Map. The first frost date of winter is expected to happen between September 30th and October 30th, and the last frost date of winter is expected to happen in the first weeks of May.

Transplanting: Some crops will need to be started early in order for them to grow in their optimal growing season. This means sowing the seeds and growing them inside. Before moving them outside the plants must be "hardened-off." This is done by placing the plants outside in subsequent days in increasing increments of time. For example on the first day place the plant outside for 1 hour, on the second day for 2.5 hours, on the third day for 4 hours, on the fifth day for 5.5 hours, and on the final day for 7 hours. Once the process is finished the plants can be transplanted to the beds.

It is critical that you do this process at ideal times in preferable weather conditions. Never harden-off plants mid day because the sunlight can damage the unprepared plants. Hardening-off is best done in cloud cover, and in the evening when the sun is least intense.

For the actual transplanting process, dig a hole in the soil in the bed slightly larger than the container in which the seedling is growing. Then, carefully pry the entire plant and the surrounding soil out of the container. If there are roots that are tangled at the bottom of the root ball gently loosen them from each other. Set the root ball in the hole that you dug in the bed and fill it with soil. For vegetable plant bury the plants up to the first set of leaves, this will keep the seedling from drying out too quickly.

Appropriate Crops

This list of appropriate crops has been determined through extensive research based on dietary values and information gathered from a sample of AIDS Project Worcester clients. It is by no means an absolute requirement for running a garden, but rather a collection of our best recommendations to maximize the nutritional value of the garden with regards to overall crop yield and the preferences of the APW clients.

Each crop was ranked based on three criteria (listed in order of decreasing importance): Feasibility, nutritional value, and community preference. If a crop could not be grown, either due to climatic restrictions (for example, yams) or design restrictions (for example, corn), we removed it from our consideration. We then used the other factors to rank the crops from least to most desirable.

List of Recommended Crops

The final list of crops encompassed 36 fruits, herbs, and vegetables. The fruits and vegetables were ranked according to nutritional value and community preference, as explained later on. See **Table 4.1** below for an alphabetical list of crops.

Table 4.1: List of recommended crops.

Asparagus		Lettuce
Basil		Head
Beets (roots *and* greens)		Leaf (Green-leaf, Red-leaf)
Broccoli		Romaine
Cabbage		Mint
Cauliflower		Nasturtium
Celery		Onions
Chard		Oregano
Cilantro		Peppers, Hot
Collard Greens		Peppers, Sweet
Cress		Potatoes, Irish
Cucumbers		Potatoes, Sweet
Eggplant		Raspberries
Garlic		Snap beans
Kale		Green
Legumes		Yellow (aka "Wax beans")
Black beans		Sorghum
French beans		Sorrel
Kidney beans		Strawberries
Navy beans		Tomatillos
Pinto beans		Tomatoes
White beans		Turnips
Yellow beans		Watermelon
Lentils (sprouts *and* seeds)		Zucchini

Crop Nutritional Data

As previously mentioned, we ranked each crop both on nutritional value and on community preference. See **Tables 4.1-4.4** below for the complete rankings. Because herbs are rarely used in significant amounts, nutritional value was not taken into account when ranking the herbs considered. See **Table 4.5** below for the separate herb rankings.

Table 4.2: Fruits & vegetables ranked by nutritional value

Crop	*Ranking*		*Crop*	*Ranking*
Hot peppers	4,046		White beans	416
Kale	2,838		Strawberries	405
Turnip greens	1,839		Kidney beans	403
Chard	1,805		Yellow beans	392
Cress	1,726		French beans	367
Beet greens	1,632		Yellow snap beans/Wax beans	362
Collard greens	1,604		Onions	343
Sweet potatoes	1,509		Raspberries	323
Sweet peppers	1,421		Potatoes	311
Lentils	1,380		Zucchini	299
Carrots	1,234		Cucumbers	291
Broccoli	1,020		Tomatoes	281
Romaine lettuce	959		Green snap beans	270
Red-leaf lettuce	762		Celery	228
Cantaloupe	488		Turnips	215
Pinto beans	473		Tomatillos	214
Cabbage	468		Beets	209
Lentil sprouts	457		Green-leaf lettuce	162
Navy beans	455		Head lettuce	151
Cauliflower	440		Eggplant	125
Asparagus	439		Sorghum	0
Black beans	419		Watermelon	0

Table 4.3: Fruits, vegetables, & herbs ranked by community preference.
(Rankings were estimated for crops marked in red)

Crop	*Ranking*		*Crop*	*Ranking*
Oregano	100.0		Beet greens	85.7
Potatoes	100.0		Cabbage	85.7
Asparagus	95.2		Cantaloupe	85.7
Broccoli	95.2		Celery	85.7
Romaine lettuce	95.2		Chard	85.7
Onions	95.2		Collard Greens	85.7
Tomatoes	95.2		Kale	85.7
Watermelon	95.2		Lentil sprouts	85.7
Basil	90.5		Lentils	85.7
Carrots	90.5		Sweet peppers	85.7
Cucumbers	90.5		Sweet potatoes	85.7
Garlic	90.5		Raspberries	85.7
Green-leaf lettuce	90.5		Sorghum	85.7
Red-leaf lettuce	90.5		Sorrel	85.7
Head lettuce	90.5		Strawberries	85.7
Hot peppers	90.5		Tomatillos	85.7
Black beans	85.7		Turnip greens	85.7
French beans	85.7		Zucchini	85.7
Kidney beans	85.7		Eggplant	81.0
Navy beans	85.7		Mint	81.0
Pinto beans	85.7		Nasturtium	81.0
Green snap beans	85.7		Turnips	81.0
Yellow snap beans	85.7		Cress	76.2
White beans	85.7		Cauliflower	71.4
Yellow beans	85.7		Beets	61.9

Table 4.4: Final rankings of fruits and vegetables, based on nutritional *and* preferential data. (Data marked in red contain estimated preferential data).

Crop	*Ranking*		*Crop*	*Ranking*
Hot peppers	3,661		Strawberries	347
Kale	2,433		Kidney beans	345
Turnip greens	1,576		Yellow beans	336
Chard	1,547		Onions	327
Beet greens	1,399		French beans	315
Collard greens	1,375		Cauliflower	314
Cress	1,315		Potatoes	311
Sweet potatoes	1,293		Yellow snap beans/Wax beams	310
Sweet peppers	1,218		Raspberries	277
Lentils	1,183		Tomatoes	268
Carrots	1,116		Cucumbers	263
Broccoli	971		Zucchini	256
Romaine lettuce	913		Green snap beans	231
Red-leaf lettuce	689		Celery	195
Asparagus	418		Tomatillos	183
Cantaloupe	418		Turnips	174
Pinto beans	405		Green-leaf lettuce	147
Cabbage	401		Head lettuce	143
Lentil sprouts	392		Beets	129
Navy beans	390		Eggplant	122
Black beans	359		Sorghum	0
White beans	357		Watermelon	0

Table 4.5: Final rankings of herbs (and the sole flower), based purely on preferential data.

Herb	*Ranking*
Oregano	100.0
Basil	90.5
Garlic	90.5
Sorrel	85.7
Mint	81.0

To calculate the above rankings, several nutrients were taken into account: Omega-3 Fatty Acids, Total Carbohydrates, Fiber, Protein, Vitamins A, B_1-B_6, B_9, C, E, & K, Calcium, Copper, Iron, Magnesium, Phosphorus, Potassium, and Sodium. Each of these nutrients was then ranked in one of three "tiers" (as seen below in **Table 4.5**). The Percent Daily Value was calculated for each nutrient (using the highest possible value based on the preparation methods researched), and then multiplied by a number between 1 and 3, as determined by the Tier (see **Table 4.5**). This gave the Nutritional Ranking shown in **Table 4.2** above. To calculate the Preferential Ranking for each crop, the number of negative responses from the surveys was totaled. This number was then divided by 21, and the resulting percentage subtracted from 100%. The final percentage was then used as a unit-less number

for the ranking. For example, there were a total of 3 negative responses for Collard Greens. Subtracting that from 21 gives us 18, and dividing 18 by 21 gives ~87.5%, resulting in a ranking of 87.5. To calculate the final ranking, the Nutritional Ranking was multiplied by the Preferential Ranking (as a percentage).

Table 4.6: Nutritional "tiers," as used in the ranking system.

Tier	**Tier 1**	**Tier 2**	**Tier 3**
Nutrients	Protein Total Carbs Vitamin A Vitamin B_3 Vitamin C Vitamin E	Fiber Calcium Copper Iron Magnesium Phosphorus Potassium Vitamin B_1 Vitamin B_2 Vitamin B_5 Vitamin B_6 Vitamin B_9	Omega-3 Fatty Acids Sodium Vitamin K
Multiplier	3	2	1

The complete set of nutritional data is included in the Appendix (**Table A.4**).

Planting & Growing Instructions

Asparagus

Asparagus is a fickle plant because of their planting method. They take a full year before they can start being harvested, so it's important to buy one year old root system's referred to as "crowns" if you want to harvest as soon as possible.

When to Plant

Planting is best done after the soil has warmed to an average of 50° F, mid May is a safe bet.

How to Plant

May be planted as seeds or as 1-year-old crowns. Takes 2 years before first harvest with seeds, 1 year with crowns. Plant 1-4 seeds/crowns per square foot. Plant no deeper than 5 to 6 inches.

Maintenance

During the first year do not harvest the asparagus but rather allow it to mature. When the spears reach about 8 to 9 inches in length the tips will open and the plant will produce fern like structures which produce food for the crown structure.

Maturity

One year after planting the asparagus can be harvested when they reach a length of 7 to 9 inches.

Harvesting

Cut the asparagus around the base. Do not cut below the soil as this can damage the root system.

Basil

When to Plant

Plant basil when the soil is warm, ~60 °F. Basil transplants fairly well, and therefore may be started indoors as early as the 3rd week of April, after which it may be transplanted outdoors in the 1st week of June.

How to Plant

Plant/transplant 10-12 inches apart in beds. Cover seeds with ¼ inch of soil (no more). Germination should occur within 3-9 days.

Maintenance

Basil mostly needs even, low-volume watering.

Maturity

Depending on the variety, basil will mature within 30-50 days.

Harvesting

Begin harvest sparingly once plants seem large enough to spare a few leaves. Start with leaves at the tops of the branches, removing up to several inches at a time. Constant harvest encourages continuous growth.

Handle basil **delicately**, as the leaves are easily bruised/blackened. Do NOT wash basil, as this may remove the aromatic oils responsible for the fragrance of basil.

Beans

When to Plant

You may plant beans outdoors by the 3rd week of July.

How to Plant

Sow 1-2 inches deep, 6-8 inches apart in all directions, in a sunny, well-drained area. For optimal germination rate, point the eye of each seed down. Pole beans will germinate in ~14 days, while bush beans will germinate in ~7 days. For maximum yields, begin maintaining even soil moisture **early**.

Maintenance

Apply mulch to maintain even soil moisture and reduce weeds. Weed carefully around the roots. To support pole beans, use a trellis, set of stakes, or another, similar method.

Maturity

Depending on the variety, beans will mature after 65-100 days.

Harvesting

Frequent (nearly daily) harvesting encourages production, while pods left to ripen will stop production. Pick shell beans when plump but tender.

Beets

When to Plant

Beets may be planted once the last frost leaves the ground, or ~1 month after the last frost date. However, warm spells may cause early plantings to go to seed prematurely.

How to Plant

Place seeds 2-3 inches apart in rows 1-2 feet apart, in ½ inch of soil. To increase germination rate, soak seeds for two hours prior to planting, and maintain adequate seed-to-soil contact. Beets grow best in soil without roots and rocks.

Maintenance

Beets prefer full sun. Fertilization with seaweed products may be beneficial. Weeding early is *key*. If a root emerges from the ground, cover it with soil again.

In order to keep animals out, wire fencing or another, similar method may be required.

Maturity

Most varieties are considered mature when the root reaches a diameter of 1.5-3 inches.

Harvesting

At any one time, up to ⅓ of each plant's leaves may be safely harvested.

Harvest when the roots reach a diameter of 2-3 inches. To avoid bruising, pull by hand. Twist off the tops, leaving ~1 inch of stem.

To store, layer in boxes & store at 32 °F.

Broccoli

When to Plant

Start planting broccoli indoors 5 to 7 weeks before the last frost date.

Broccoli will germinate in 3 to 10 days at between 50 and 85 degrees.

The crop grows best between 60 and 65 degrees. It is primarily a Spring and Fall crop and the heat of the summer often diminishes yields. Plant early spring or late summer.

How to Plant

Sow ¼ inch deep.

Transplant outdoors, into rows 16 to 24 inches apart, when seedlings are 6 inches tall and have 4 or 5 true leaves.

Maintenance

Broccoli prefers full sun, but partial shade will prevent the crop from going to seed prematurely during warm spells

Maturity

Broccoli needs between 45 and 85 days to mature, depending on its variety.

Harvesting

Broccoli is ready to harvest when the heads are dark green or dusky violet for purple varieties – the central head should be harvested first.

Cut the stalk to leave several inches of it on the plant

Small, compact heads offer the best flavor; and yellowing heads are overripe.

Cabbage

When to Plant

Start seedlings indoors 4 to 6 week before transplanting outside, or as early as a month before the last expected frost date.

For a Fall crop, transplant outside anytime around the middle of June.

How to Plant

Plant ¼ inch deep and (or transplant to) about 16 to 18 inches apart, farther if larger heads are desired.

Set plants outdoors when daytime temperatures reach 50 degrees and seedling have a minimum of three true leaves.

Take care not to subject seedlings nighttime temperatures below 60 degrees.

Maintenance

Side-dress with well rotted manure, if available, three weeks after transplanting outside.

Mulch heavily to maintain soil moisture.

If plants are growing fast, or starting to crack then twist the plant a half turn and pull up slightly to slow its growth.

Constantly wet leaves are prone to disease so do not water foliage in humid or cool weather.

As plant matures, water less frequently.

If leaves start to yellow, provide a nitrogen boost with manure tea

Maturity

Cabbage will mature anywhere between 60 and 110 days, depending on variety.

Harvesting

Use a sharp knife to remove each head from its stalk when it is firm, glossy, and approximately the size of a softball.

Leave stalks to produce a second crop of smaller heads.

Cantaloupe

See **Melon**.

Cauliflower

Cauliflower is a cool weather plant that can be grown in the spring and fall. It comes in a couple varieties, the most common being white headed cauliflower. We will want to use a self blanching cultivar to reduce maintenance

When to Plant

Start spring corps ten weeks before the last expected frost date inside, then set transplants out four to five weeks before the first frost when the soil temperature has reached an average of 50° F.

How to Plant

Transplant

Maintenance

Cauliflower is sensitive to light, and if the heads are exposed they'll be essentially ruined. To prevent this leaves must be tied up above the head as soon as the head becomes visible through the inner leaves, usually occurs when it's about 2" to 3" in diameter.

Maturity

Usually reaches maturity about 5 to 15 days after tying the head.

Harvesting

When the heads have reached the appropriate size for the cultivar, usually about 6” in diameter.

Celery

Celery requires a long growing season with relatively cool temperatures. In addition the root system is very close to the surface so it requires a lot of moisture. Seedlings shouldn’t be exposed to temperatures below 55° F which will cause the plant to bolt.

When to Plant

The growing season for celery usually starts in the spring. They must be transplanted so if you are starting from seeds start growing the seeds inside 70 to 85 days before transplanting them. It is safe to transplant when the weather has stabilized past the final frost, so mid May is a good bet.

Maintenance

Seedlings must be kept moist to prevent them from drying out.

Maturity

Plants are ready to harvest 90 to 120 days after transplanting.

Harvesting

Start harvesting celery when the stalks are large enough to use, and up until the first fall frost. Cut individual stalks as needed, starting with the outer, or cut the root of the plant just below the crown.

Chard

When to Plant

Plant 2-4 weeks before the last frost date

How to Plant

Broadcast directly in rows or sow seeds 8 inches to the foot

Rake to cover the seeds in ½ inch of soil cover

Like beets each "seed" contains more than one seed

Thin slowly until plants are 8-10 inches apart (the thinning can be eaten)

Plant in rows that are 18-24 inches apart

Maintenance

This easy to grow plant has a deep root and is resilient to changes, i.e. is viable to live

Treat with manure tea when there are four true leaves

Keep the soil moist because dry soil causes them to bolt

Cover with shade cloth if temperatures reach 80 degrees

Maturity

56 days

Harvesting

Pick or cut outer leaves as needed

Cilantro

Cilantro is an herb used in many different dishes. It is an annual cool season herb.

When to Plant

In hot weather cilantro will bolt, so seeds should be sown soon after the last frost. It can't withstand a hard frost but will survive light freezes.

How to Plant

Plant the seeds a quarter inch deep eight to twelve inches apart.

Harvesting

You can pick a few leaves at a time once the plants grow to be about six inches tall.

Collard Greens

When to Plant

For transplanting, sow seeds indoors 4 weeks before last frost.

For seeding outside, sow seeds 8 to 10 weeks before the first frost and then thin to 1 foot apart.

Given the high germination rate, do not over seed.

How to Plant

Sow seed ¼ inch deep 12 to 18 inches apart.

Maintenance

Depending on variety, collards will mature between 75 and 80 days.

Maturity

Start picking outer leaves when the plant is 1 foot tall, taking care to leave at least 2/3 behind to feed to rest of the plant.

Taste will improve after frost.

It is important to harvest collards often so as to promote the health and growth of the plant

Harvesting

Start picking outer leaves when the plant is 1 foot tall, taking care to leave at least 2/3 behind to feed to rest of the plant.

Taste will improve after frost.

It is important to harvest collards often so as to promote the health and growth of the plant

Cress

When to Plant

Early spring, as soon as the soil can be worked.

How to Plant

Broadcast seed, cover *very* lightly with soil or compost.

Maintenance

Perform succession plantings every 2-3 weeks until the weather warms.

Harvesting

Cut or pinch out tips as needed, "cut-and-come-again." Cut plants once they're 3-4" tall. Quick regrowth when cut back to ½".

Cucumbers

When to Plant

Plant inside during the first week in May.

How to Plant

Plant 3 or 4 seeds ½ inch deep in a sunny, well-drained area and wait about 6 to 10 days for germination.

Transplant between 18 and 30 inches apart, when the nights are reliably above 50 degrees – temperatures below 40 degrees will retard growth.

Maintenance

Take care to shade cucumbers – particularly soon after transplanting – from exceptionally sunny spurts, as the crop is easily sunburned.

Cucumbers require routine deep soaking of the soil directly around them in dry weather; however, take care not to create standing water, as the crop will not tolerate this.

Weed by hand but avoid handling wet foliage to prevent the passing of disease.

Fertilizing the ground with dried seaweed may make the plants more pest resistant.

Though not essential, growers may pinch off the main stem after it has produced 6 to 8 leaves, which will encourage the production of side shoots.

Maturity

Depending on variety, cucumbers will mature in between 55 and 60 days.

Harvesting

Harvest the fruits by gently twisting them from their veins.

Pick regularly before they mature, or just before the flower falls of the tip of the cucumber, to ensure season-long production.

Eggplant

When to Plant

Start eggplant indoors, 6 to 9 weeks before the expected last frost date.

How to Plant

To ensure the best germination rate, soak seeds overnight to soften them.

Plant ¼ inch deep and wait 8-10 days for germination to occur.

As eggplant is particularly fond of heat – seeds germinate best between 75 and 90 degree soil temperatures – use a heating pad to raise the soil temperature.

When the outside air temperature is reliably around 65 degrees or above and soil temperature is at least 60 degrees, transplant into the garden 18 inches apart.

Maintenance

To ensure the best germination rate, soak seeds overnight to soften them.

Plant ¼ inch deep and wait 8-10 days for germination to occur.

As eggplant is particularly fond of heat – seeds germinate best between 75 and 90 degree soil temperatures – use a heating pad to raise the soil temperature.

When the outside air temperature is reliably around 65 degrees or above and soil temperature is at least 60 degrees, transplant into the garden 18 inches apart.

Maturity

Eggplant matures in between 100 and 150 days, depending on variety.

Harvesting

Pick when fruit is no longer than 3 to 5 inches long or 4 inches in diameter and before the skin loses its luster.

When harvesting, take care to leave a small amount of stem attached to each fruit.

If the seeds are brown, the fruit is overripe.

Garlic

Garlic takes a very long time to mature, and interestingly enough is a winter crop.

When to Plant

Plant in September/October.

How to Plant

Break the garlic bulb into cloves. Plant two inches deep with ends pointed up. Cover with mulch for the winter.

Maintenance

Minimal maintenance required

Maturity

The garlic will be ready to harvest the following july.

Harvesting

Cut the bulb at base.

Kale

When to Plant

If starting indoors, kale may be planted during the first week in March.

How to Plant

Plant ½ deep and wait 3 to 10 days for germination.

Transplant 15 to 18 inches apart during the last week in April.

Maturity

Kale will mature in between 55 and 65 days, depending on variety.

Harvesting

Harvest outer leaves first and leave bottom leaves to feed top leaves.

Harvest larger leaves for cooking and smaller leaves for salads.

Kale typically can be harvested through the winter, even without protection.

Lentils

How to Plant

Plant seeds 1" apart, or seedlings 4-5" apart. Add aged compost to bed before sowing. Require 10 days at 68 °F for germination.

Maintenance

Keep evenly moist, but do not water them once the pods have begun to dry. Once plants are 5" tall, side-dress w/ compost tea. Repeat at flowering.

Aphids are a known problem. Control by pinching out infested areas, or hosing off plant with water.

Maturity

80-110 days.

Harvesting

Harvest pods once they have matured & hardened. Leave unshelled until ready for use. Can also be used similar to snap beans; harvest these ~70-80 days after sowing (they should still be green).

Lettuce

When to Plant

Early Spring and Fall

How to Plant

½ to ¼ inch deep

Plants in rows 12- 14 inches apart

Rows 14 inches apart

Maintenance

Plant in partial shade to discourage bolting

Maturity

Harvestable leaves take between 45- 65 days

A full head of lettuce on the other hand can take from 60 – 95 days

Harvesting

The leaf can begin to be picked when there are 4-5 mature leaves of useable size (keep picking until the seed stalk appears or leaves become bitter).

The head should be cut at soil level with a sharp knife and refrigerated immediately, harvest in the morning for the best carotene and quality.

The plant can withstand a frost, but needs to be covered before a severe frost.

Can be an Early crop, first part of the season or at any time.

Melon

When to Plant

Plant indoors 6 to 8 weeks before transplanting.

How to Plant

Sow several seeds ½ inch deep and thin to the most vigorous one

Harden plants off by setting outside in a sunny spot a few days (take care to bring them in at night) before transplanting.

Transplant outside late in the season, when the soil is 70 to 80 degrees

Consider using infrared-transmitting black plastic mulch in order to keep the soil warm during the night.

Maintenance

Even if using black plastic, several inches of mulch will help retain moisture and keep the plants disease free – apply when the plants begin to vine.

Take care to provide a large amount of water after transplanting and as fruits develop.

Fertilize with well rotted manure when the fruits set and again two weeks later using manure tea.

To encourage heavier fruit production, encourage side shoot formation by pinching off the main growing stem after it has produced five large leaves – side shoots may be pinched off after forming 3 leaves.

Maturity

Depending on variety, melons may mature between 90 and 130 days.

Harvesting

Ripe fruits will easily separate from the vine, with little to no resistance – just picking it up should be sufficient.

For watermelons, look at the ground spot or the bottom surface of the melon; and if it is turned from a light straw color to gold orange or rich yellow, then it is ripe

Mint

When to Plant

When the ground has warmed.

How to Plant

Scatter seeds in planting area, cover *lightly* with ¼" soil. Moisten the soil. May also be transplanted from cuttings.

Maintenance

Keep soil moist, but not soggy. Mulch will help retain moisture.

Harvesting

May be harvested as soon as it begins to grow in the spring.

Nasturtium

When to Plant

After *all* frosts (Memorial Day weekend).

How to Plant

Seeds: sow in a thoroughly watered 1"-deep trench, with the seeds approximately 12-15" apart. Water lightly after sowing. Water later *only as necessary*.

Plants: water plants thoroughly before transplanting. Dig a trench deep enough for the plants while they drain. Thoroughly water trench & allow to drain. Remove plants from containers, and **GENTLY** remove ~⅓ of soil from bottom of plant. Place plants in trench, ~8-10" apart. Replace soil, tamp down, and water lightly.

Maintenance

Water **only as necessary**. Do ***not*** fertilize.

Maturity

Reach maturity within the year.

Harvesting

Harvest blooms and leaves, leaving a few blooms for reseeding. Gather seeds for replanting.

Onions

When to Plant

Onions may be planted as soon as the soil is dry and workable in Spring.

How to Plant

Plant 1" deep and 3-4" apart in double rows, with 6-10" between rows. Can be grown closer in order to harvest every other onion as a green onion.

Maintenance

Shallow hoeing and cultivation are key, particularly early on. Side-dress w/ nitrogen-rich fertilizer every 2-3 weeks, but stop when the necks begin to feel soft (within 3 weeks of harvest). Water well during dry spells.

Maturity

Matures within 150 days of germination for seeds, 100 days from sets (bulbs). Pull green/spring onions as necessary, by the stems, any time after torches are too tall to eat raw.

Harvesting

Harvest as desired after maturation. Green onions should be harvested when stems are ~¼" thick.

Oregano

When to Plant

When the temperature reaches 65-75 degrees, which is usually around the **third week in may**

How to Plant

Plant the seed shallow, at surface level, 1/8” deep 18” apart from one another with 20” of space between rows

Maintenance

These plants need relatively low maintenance with a low water level

Maturity

58 days

Harvesting

The plants are harvested best when dried

Do not wash leaves as that will eliminate aromatic oils

Peppers

When to Plant

Peppers should be started inside at least 2 months before the nighttime temperatures are consistently in the mid to high 60s, perhaps as early as the middle of March.

How to Plant

Seeds should germinate in three weeks at about 70 degrees.

Harden seedlings off a week or two before the last frost date.

To strengthen plants, clip off any blossoms that form prior to transplanting outdoors.

Transplant outside 12 to 24 inches apart when the soil temperature reaches 60 degrees, perhaps the last week in May.

As peppers prefer a location with full sun, take care to transplant in the evening or on a cloudy day to avoid sun scorch.

Maintenance

Evenly moist soil is necessary.

Use a thick but light mulch like straw or grass clippings – black plastic mulch is also an alternative.

Maturity

Depending on variety, peppers will mature in between 55 and 80 days.

Harvesting

Pick peppers as soon as they are useful to promote the growth of others.

For maximum vitamin C content in sweet peppers, wait until the fruits turn red or yellow.

Potatoes

I. Irish

When to Plant

Potatoes may be planted as early as two weeks before the last frost but are likely to rot in the ground if subjected to an extended period of cool, wet weather; so many opt to wait until late March or even later.

How to Plant

Potato "seeds" are the eyes of the potatoes themselves

Plant pieces with 2 to 3 eyes 12 inches apart, in a furrow as deep as one's soil permits, and cover with 3 to 4 inches of soil.

5 to 8 pounds of cuttings should cover a 100 foot row.

Maintenance

Make sure to replenish the soil covering the tubers (a process called "hilling") as necessary, in order to prevent their overexposure to the sun.

Hilling may be stopped once blossoms emerge.

Maturity

Early-, middle-, and late-season potato varieties will mature in 70 to 90, 90 to 120, and 120 to 140 days, respectively.

Harvesting

Most varieties of potato may be dug up and eaten after the first blossoms appear, as these blossoms signal the readiness of the plants first "new" potatoes. Generally this first harvest can be

accomplished without terminating growth of the plants. To do this, pull aside the soil near the bottom of the plants and gently pull off tubers around one inch in diameter. This practice is traditionally called "grabbling."

After the foliage begins to wither and die, the remaining tubers should be fully grown.

If the weather is not very hot or very wet, the crop will keep in the ground for several weeks; however, the crop should be dug up prior to the first frost.

Take care not to eat green potatoes, as they may contain unsafe levels of a toxic substance called solanine.

II. Sweet

When to Plant

Early in the season, as soon as the ground can be worked.

How to Plant

Start seedlings ("slips") with a tuber cut in half lengthwise. Lay it in a shallow pan of wet peat moss or sand, cut side down. Cover tightly with plastic wrap, but unwrap when sprouts appear. Slip may be transplanted when it is 4-8" tall, with 4-5 leaves.

Maintenance

Weeding is key until the vines take hold.

Harvesting

Dig up tubers when foliage begins to turn yellow & mature. Be careful, as they bruise easily. Cure for a few days, then store just below room temperature.

Raspberries

When to Plant

Early autumn.

How to Plant

Prepare bed with sandy soil, incorporating plenty of organic matter into it (see http://www.backyardgardener.com/plants/graspberry.html for more details).

Maintenance

In the first spring, as soon as the growth buds appear to be swelling, cut back canes to a "visibly live bud" ~10" above soil level. In the second summer, after all fruit has been harvested, cut all fruited canes down to soil level. See http://www.backyardgardener.com/plants/graspberry.html for more details.

Harvesting

No harvest the first year. Full harvest subsequent years.

Sorghum

Sorghum is a fast-growing, warm season crops that require good fertility and moisture to perform well. Under such conditions, their tall, rank growth provides excellent weed suppression. Such heavy growth can be difficult to cut and incorporate if left unmanaged. Sorghum is considered a cover crop meant for soil enrichment, and to help the crop rotation process.

When to Plant

Sow when the soil is fully warmed, it is a summer crop.

How to Plant

Sorghum is directly seeded. Plant the grains about 4 inches apart in rows.

Maintenance

Sorghum requires little maintenance due to its resistance to drought.

Maturity

Usually matures about 100 days after planting. The mature stalk will look something like corn except the grains are in a tight cluster at the top.

Harvesting

When the plants turn yellow-brown, cut off the seed heads and about a foot of the stem, and bring them inside, away from birds. You may need to harvest the crop before its fully ripened, so it must be dried for a few weeks before it can be ground. When it has dried, rub the heads to loosen the grain, and winnow to get rid of the hull and stock.

Sorrel

Unable to find sufficient information. The only data that could be found is that it is very hardy, and grows like a weed.

Strawberries

Starting to grow strawberries from scratch is a labor intensive process. Strawberries prefer a slightly acidic soil, a pH of 5.8 to 6.2 is ideal. It's also important to choose a variety of strawberry that will grow well in the New England climate. Varieties we suggest are: redchief, cavendsih, earliglow, allstar, and sparkle. Also, strawberries shouldn't be planted where tomatoes, potatoes, peppers or eggplants were growing in the previous four years.

When to Plant

Seedlings should be planted as soon as the soil is dry enough to prepare in the spring.

How to Plant

Strawberries should be planted deep enough to bring the soil half way up the compressed stem or crown. Pack the soil firmly around the plants, and irrigate immediately after planting. The plants should be 18 inches apart in rows with 48 to 52 inches between rows.

Maintenance

After planting the crown will produce a few leaves and flower buds. During the first year the flowers should be pinched off to encourage runner growth.

Maturity

Depending on the variant strawberries can reach maturity anywhere from early on in the growing season to mid season.

Harvesting

Harvest when berries are a ripe red color

Tomatoes

When to Plant

Start plants indoors 6 to 8 weeks for the last frost date, perhaps the first week in April.

Transplanting should take place after all danger of frost has passed.

How to Plant

Start plants indoors 6 to 8 weeks for the last frost date, perhaps the first week in April.

Transplanting should take place after all danger of frost has passed.

Maintenance

Most varieties of tomato will mature in between 55 and 85 days.

Maturity

Cage or stake each plant, as necessary.

Pruning helps to speed up maturity, but may reduce overall yields in trade of better initial fruits.

Watering deeply and less frequently will be more beneficial than frequent and light watering.

If possible, keep leaves dry during watering, so as to minimize the spread of disease.

A weekly spray of compost tea will enhance plant vigor.

Harvesting

Pick either when fruits are (1) a full red color or (2) green and firm, allowing them to ripen on a window sill that gets sun.

Tomatillos

Tomatillos are plants native to Mexico however they will grow in the New England climate as well. They need as much sunlight as possible.

When to Plant

Its best to start the tomatillos six to eight weeks prior to the last expected frost date. Transplant when the temperature reaches a constant average of 50° F.

Maintenance

Tomatillo vines can either be tamed use a trellis or allowed to sprawl. We recommend that you use a trellis to increase space efficiency.

Harvesting

When the husk appears dry and papery and the fruit is firm the tomatillos are ready to be harvested.

Turnips

When to Plant

Turnip seed will germinate anytime after soil temperatures climb above 40 degrees.

Crops may be planted as soon as the soil can be worked in the spring but many prefer planting a fall crop about 8 to 10 weeks before the first frost.

Soil temperatures in the range of 50 to70 degrees are ideal for fast growth.

How to Plant

For a spring or fall crop, plant ¼ inch deep, with a minimum of 5 to 6 inches of space in all directions – for a summer crop increase planting depth to ½ inch.

Maintenance

When plants reach 5 inches in height, mulch with several inches of well-rotted compost.

Maturity

Depending on variety, turnips will mature in between 30 and 60 days.

Harvesting

Harvest the greens as soon as they are large enough to pick, leaving at least 2/3 of them intact on the plant.

When harvesting the roots, take care to loosen the earth at the base of the leaves, so as not to disturb surrounding roots.

In many varieties, the small roots are the most tender and may be harvested when they are between 1 and 3 inches in diameter.

Watermelon

See **Melon**.

Zucchini

When to Plant

If starting indoors, plant anytime between 14 and 28 days after the last frost date and transplant when soil reaches 70 degrees or more.

If starting outdoors, wait to plant until soil temperature has reached between 60 and 70 degrees.

How to Plant

If starting indoors, plant in hills 3 to 4 feet apart or, alternatively, space them every 4 to 8 inches in rows that are 3 to 4 feet apart.

If starting outdoors, plant 1 to 1 ½ inches deep in hills and thin to 2 to 3 plants per hill when plants are 2 to 3 inches tall.

Maintenance

If starting indoors, plant in hills 3 to 4 feet apart or, alternatively, space them every 4 to 8 inches in rows that are 3 to 4 feet apart.

If starting outdoors, plant 1 to 1 ½ inches deep in hills and thin to 2 to 3 plants per hill when plants are 2 to 3 inches tall.

Maturity

Depending on variety, zucchini will mature in between 50 and 70 days.

Harvesting

Pick slender varieties of zucchini when the fruit is approximately 4 to 8 inches in length; and pick the ball-shaped varieties when the fruit is approximately 4 to 8 inches in diameter.

Harvest should take place during dry weather and the harvester should either gently twist ripe fruits off the plant or, alternatively, use a sharp knife to remove the fruit from the plant

Gardening Management

When maintaining a community of the size we're recommending garden management will be a very important factor, the garden will only yield food if it is taken care of every day. Maintenance entails a couple important jobs for keeping the garden healthy. These include:

- Watering
- Weeding
- Pest Control
- Special Plant Management

Initially the work will likely have to be volunteer, which means that you'll need people who are willing and able to commit to an absolute schedule of garden maintenance. Volunteers with need to be organized and checked up on to make sure they are capable of performing their duties each week. Therefore we recommend that a fulltime garden management position is established who will be responsible for keeping the people tending to the garden organized.

Minimum Needs

Watering

It goes without saying that watering the garden will be extremely important. Water is a main ingredient in photosynthesis, without water the plant dies. As such it is important the garden be watered every day.

Some plants will require the soil to be moister than others. We've included this information in the growing section, so refer to that section for the watering requirements for different plants.

Weeding

Weeds are invasive plants which use the resources in the soil, taking them away from the plants that we want to grow. The main problem with weeds is that they can grow rapidly, and can easily get out of hand if not kept under control. As such it will be important that the garden is kept free of weeds as much as possible. This means going out every day or at least every other day and weeding. While it seems like a lot of work doing so will prevent much more work having to be done if the weeds get out of hand. The raised bed system will make pulling weeds much easier because of their height, and because the soil isn't as compacted as it is in in-ground gardens.

Weeding can be done either by hand or with a hand tool such as a claw. We recommend pulling by hand because it reduces the possibility of accidently damaging the root structure of existing plants. The most important part of the weeding process is removing the roots of the weeds to ensure that that particular weed doesn't grow back.

Pulling weeds when they are small also mitigates the work, because they'll come lose easier and they'll be easier to distinguish from the plants you're actually growing. To help distinguish between weeds and your plants it would be advantageous to tag the plants you're growing. Also when pulling the weed make sure to hold down any nearby plants so that you don't accidently pull them too if the root structures are tangled. You can use the weeds you pull as part of a compost pile (see section on composting.)

Pest Control

Pest control will be an important aspect to maintaining the garden. We encourage you to explore methods of organic pest control as much as possible. Pesticides are not harmful if applied correctly however learning how to do so and the actual application process is labor intensive and more importantly a step that can be skipped all together. There are some basic techniques that can be applied to help control some of the pests in New England.

The most basic way to control pests is purely physical. For example in New England slugs can cause a number of problems in gardens. The raised bed structure will help mitigate but not eliminate the problem. The easiest way to get rid of slugs is to physically remove them, either by picking them off of the plants or trapping them under boards at night and then removing them. Another method for slug removal that is reported to work is to place jar lids with beer in them in the garden. The slugs are attracted to the sugars, they drink the beer and then drown.

Other Procedures

Composting

For starting the garden compost can be delivered from the City of Worcester, however one option that should be considered is composting onsite for future growing seasons. Compost is an important part to a healthy garden because of how nutritionally rich it is. In addition it increases the absorption of rainwater in the soil which helps reduce the amount of watering needed.

The first step in composting is to build a compost bin. Ideally bins should be at least 27 cubic feet (3 feet wide by 3 feet deep by 3 feet tall.) This can be constructed using rot resistant wood, wire mesh, fencing material or a combination of these materials.

The second step in composting is the actual ingredients. For a successful compost pile there are four required ingredients: Water, air, greens and browns. Combining these four in proper proportions is required to get nutritionally rich compost.

Greens: Grass clippings, green leaves, fresh prunings, and fruits and vegetable scraps.

Browns: dry, woody material such as woodchips, twigs, sawdust and paper. Materials such as papers should be shredded prior to adding to the pile to increase aeration.

Water: It's important that the pile stay moist, but not too moist as it will suffocate the pile.

Air: It's important to keep the pile well aerated to encourage growth of bacteria which break down organic material into the desired components.

A large part of the composting process is keeping the pile aerated. This encourages the growth of aerobic bacteria which break down the biomass into the desired nutrients. If the pile is not aerated correctly instead it promotes the growth anaerobic bacteria which don't do what we want. A sign of anaerobic bacteria growth is a very pungent smell coming from your compost pile. If this occurs the compost must be turned and aerated.

For more information consult the Region Environmental Council guide to composting.

Plant Data Archiving

The yields of each plant will be of interest in the long run because it will allow you to see which plants are growing better and which ones are being used more. The easiest way to do this is recording raw numbers for a couple pieces of information:

- The number of seeds or seedlings you planted for each plant
- The amount of bed space they occupy. (This will be easy to calculate based on square foot markers.)
- The weight of the fruits and vegetables for the season
- The weight of any food that goes to waste

The area that a crop takes up is important because it will give you a better idea of what plants are giving you the best bang for your buck. A plant that takes up an entire bed and yields a hundred pounds per year is not as efficient as a crop that takes up half a bed and produces the same mass of food. This will help you chose what you want to grow more of in the future with regards to efficiency.

The weight of food that goes to waste is a no brainer, if people aren't eating a specific food, don't bother growing so much of it. Likewise, if a specific food is being consumed constantly, consider growing more of it.

The thing to keep in mind when observing the weight of the yearly yield is that this number can be misleading and must be observed with respect to the plant. For example, in melons the thick skin makes up enough of the plant to be considered significant with regards to weigh. Since the rind isn't always consumed ten pounds of tomatoes may actually be more food than ten pounds of melons.

This concludes the AIDS Project Worcester Community Garden Instruction Manual. We hope it has proved useful to you.

Acknowledgements

We would like to thank the Regional Environmental Council for their assistance in our research. They provided many resources which were invaluable in determining gardening procedures, potential crops, and more.

We would also like to acknowledge the contribution of the following groups and publications:

- Mountain Valley Seeds Catalog: http://mvseeds.com/
- Burpee: http://www.burpee.com/
- NutritionData: http://www.nutritiondata.com/
- BackyardGardener.com: http://www.backyardgardener.com/plants/graspberry.html
- VeggieHarvest: http://www.veggieharvest.com
- How To Garden Advice: http://www.howtogardenadvice.com/plant_list/herb/grow_mint_peppermint_spearmint.html
- Heirloom Organics: http://www.heirloom-organics.com/
- New England Vegetable Management Guide: http://www.nevegetable.org/
- Weekend Gardener: http://www.weekendgardener.net/
- Ohio State University Fact Sheets: http://ohioline.osu.edu/hyg-fact/1000/1603.html
- Gardening Know How: http://www.gardeningknowhow.com/
- University of Maine Cooperative Extension: http://www.umext.maine.edu/onlinepubs/PDFpubs/2067.pdf
- Culture Change: http://culturechange.org/
- City of Worcester: http://www.ci.worcester.ma.us/
    - Assessor's Grid Index Map: http://www.ci.worcester.ma.us/finance/assessing/index-grid-map

- Property Values: http://www.ci.worcester.ma.us/e-services/search-public-records/property-values

- Alabama Cooperative Extension System: http://www.aces.edu/dept/com_veg/yield_veg_crop_se.pdf
- Our Garden Gang: http://ourgardengang.tripod.com/
- Modern "Victory Garden": http://www.modernvictorygarden.com/
- Hoover Fence Co.: http://www.hooverfence.com/
- The Food Project: http//thefoodproject.org/
- Popular Mechanics: http://www.popularmechanics.com/
- eartheasy: http://www.eartheasy.com/

A. Appendix

Site Data

Table A.1: Possible sites

Site Location	Sun Exposure		Visibility		Needs Raised Beds		Owner
Address	Good	Poor	Good	Poor	Yes	No	
111 Dorchester Street	x			x		x	Worcester Academy
(26 Gold St) Wyman Gordon Lots	x		x		x		Precision Castparts Corp. UK
112 Harding Street	x			x	x		MB Metals Inc.
99 Penn Street	x			x		x	Oak Hill CDC
82 Dorchester		x		x		x	Oak Hill CDC
65 Penn Street	x			x	x		Oak Hill CDC
74 Dorchester	x			x		x	Oak Hill CDC
38 Aetna		x		x		x	Oak Hill CDC
64 Washington Square	x		x			x	City Of Worcester
183 Southbridge Street	x		x			x	State Of Mass
(Greens opposite Coney Island)							
1 Lamartine St	x			x	x		Precision Castparts Corp. Uk
51 Water Street	x		x			x	Goldman, Sylvia C
80 Lafayette Street	x		x		x		Precision Castparts Corp. Uk
46 Barclay St	x			x		x	Worcester Acadamy

Table A.1: Possible sites (cont.)

Site Location	Area	Water		Walking Distance	Rank
Address	Square Feet	Yes	No	Approximate Walking Time From APW	1 to 5
111 Dorchester Street	4200	x		.8 Miles/ 15 minutes	
(26 Gold St) Wyman Gordon Lots	Any size garden	x		.1 Miles/ 2 minutes	1
112 Harding Street	20000	x		.3 Miles/ 4 minutes	3
99 Penn Street	3438	x		.7 Miles/ 12 minutes	
82 Dorchester	3218	x		.7 Miles/ 12 minutes	
65 Penn Street	3997	x		.5 Miles/ 10 minutes	
74 Dorchester	2708	x		.6 Miles/ 11 minutes	
38 Aetna	3995	x		1 Mile/ 15 minutes	
64 Washington Square	30000		x	.5 Miles/ 10 minutes	
183 Southbridge Street (Greens opposite Coney Island)	15000	x		.4 Miles/ 8 minutes	2
1 Lamartine St	5600	x		.3 Miles/ 6 Minutes	
51 Water Street	5500	x		.2 Miles/ 4 Minutes	
80 Lafayette Street	23000	x		.3 Miles/ 6 Minutes	4
46 Barclay St	12000	x		.8 Miles/ 15 minutes	5

Construction Data

Table A.2: Materials List

	4x4x12	6x6x12	2x6x12	2x8x12	
Redwood					
	N/A	N/A	N/A	N/A	
Cedar					
Leader	$75.00	$234.00	$76.44	$102.00	
H.D	N/A	N/A	N/A	N/A	
Lowes	N/A	N/A	N/A	N/A	
Pressure Treated					
Leader	$11.75	$25.59	$7.52	$9.43	$226.54 / Raised bed by leader
H.D.	$12.97	$30.97	$8.97	$11.97	
Lowes	$11.97	$32.97	$8.97	$11.97	

Greenhouse cover	
Sheeting	$94
Rigid PVC - 1"x10'	$2.06
Flex PVC - 1/2"x10'	$1.03
1" Pipe Straps	$.50/ea

Other Essentials	
Timber Fasteners	$115.8/250 screws
Deck Screws	$3.50/lb
Weed Block	$14.97
Fencing	Contact specialist
Manure	$5 / bag

	Bond	**Leahy**	**Busy bee**	
Soil	$510	$361.20	$320	$1280 total cost of loam for 20 beds
				4 loads of loam for 20 beds

Numbers & Addresses

Flo's country Farmstand, 163 Maple Ave, Rutland, MA	(508) 886-6406
Leader Home Centers, 99 South Barre Road, Barre, MA 01005-8827	(978) 355-4371
Leahy Excavating, 1403 Wachusett Street, Jefferson, MA 01522-1530	(508) 829-2180
Bond Sand Gravel & Asphalt, 98 North Spencer Road, Spencer, MA 01562-1402	(508) 885-2480
Home Depot- 130 Goldstar Blvd, Worcester, MA	(508) 852-6260
Lowes- 533 Lincoln Street, Worcester, MA	(508) 595-1450

Interview Data

Table A.3: Interview data.

#	*Cultural Heritage*	*Pref. Foods*	*Fruits/Veggies in Cultural Cooking*
1	Italian-American	Italian; different American dishes	Tomatoes, Eggplant, Peppers (mostly Sweet)
2	Hispanic	A little bit of everything	Onions, peppers, cucumbers, tomatoes
3	Hispanic/Italian	All foods, particularly hot & spicy	Cauliflower, broccoli, carrots, rhubarb, strawberries
4	Irish	A little of everything	Carrots, tomatoes, peppers, onions, celery
5	Italian-American	Italian, American, Irish	Tomatoes, basil, carrots, potatoes, peppers, onions, salad, zucchini
6	African-American	American	Green beans, collard greens, green peppers, tomatoes
7	Hispanic: Puerto Rico	Rice, plantains, bananas, grains	
8	Hispanic: Puerto Rico	Any	Tomatoes, potatoes, carrots, cabbage
9	Carribean Islander, child of God	Healthy foods	Stir-fry vegetables, everything green, loves veg's
10	Puerto Rican, Italian, Black	All types of foods	Rice & beans, sweet peas, green beans, cucumbers, lettuce, collard
11	Spanish	Chinese	Salad, rice, collard greens
12	Spanish	Spanish (rice, beans, chicken), American	Lettuce, tomatoes, onions, pickles, grn peppers
13	Southern, African	Southern foods	Collard greens, tomatoes
14	Native American	Various	Fruits: Apples, bananas, blueberries, pineapples Veggies: Pretty much anything except beets & turnips
15	Hispanic	Any	Salads (lettuce, tomatoes, red onions), Fruits for breakfast
16	Hispanic: Puerto Rico	Wide variety	Tomatoes, green peppers
17	African-American	Variety is good	Cabbage, broccoli, carrots
18	African-American		Bananas, oranges, apples, potatoes, summer squash, high fiber
19	Hispanic	Spanish (rice, beans, chicken)	Carrots, celery, lettuce, beans, broccoli,

#	*Cultural Heritage*	*Pref. Foods*	*Fruits/Veggies in Cultural Cooking*
			bananas
20	American	American	Corn, green beans, broccoli (occasionally)
21	African-American: Cape Verde	Chinese	Broccoli, mixed veggies, corn, zucchini, spinach, yams, collard greens, greens, summer squash

Table A.3: Interview data (cont.)

#	*Foods Not Eaten*																									
	Asp	**Basil**	**Beets**	**Brocc**	**Cbbg**	**Carr.**	**Caul**	**Cel.**	**Coll.**	**Cress**	**Cuc.**	**E-plt**	**Grlc**	**Lttc**	**Mint**	**Nast**	**On.**	**Oreg**	**HPep**	**Spep**	**I-Pot**	**S-Pot**	**Sorr**	**Tom.**	**Turn.**	**Wtml**	**Zucc**
1							X			X																	
2			X		X		X																				
3																											
4																											
5																			X								
6																											
7			X				X					X			X												X
8			X					X			X	X			X	X				X		X	X				X
9																											
10		X		X	X	X	X	X	X		X		X	X			X			X		X		X		X	
11																											
12			X																								
13																											
14			X																						X		
15																											
16										X																	
17																											
18			X							X				X H		X							X		X		
19		X	X						X						X	X									X		X
20			X		X	X	X	X	X	X		X	X	X L					X	X		X			X		
21	X						X			X		X			X	X							X				
T	1	2	8	1	3	2	6	3	3	5	2	4	2	3	4	4	1	0	2	3	0	3	3	1	4	1	3

Table A.3: Interview data (cont.)

#	*Deficiencies*														
	Na	**Fe**	**I**	**Ca**	**Mg**	**K**	**Vit. A**	**B1**	**B2**	**B3**	**B12**	**Vit. C**	**Vit. D**	**Vit. E**	**Vit. K**
1															
2				X		X									
3															
4		X		X				X	X	X	X	X			
5															
6		X													
7															
8															
9															
10		X											X		
11															
12															
13															
14		X													
15															
16															
17															
18															
19															
20		X				X									
21		X				X					X		X		
S-Tot	0	2	0	0	0	2	0	0	0	0	1	0	1	0	0
Total	0	6	0	2	0	3	0	1	1	1	2	1	2	0	0

Table A.3: Interview data (cont.)

#	*Deficiency Durations*				
	Deficiency 1	**Deficiency 2**	**Deficiency 3**	**Deficiency 4**	**Deficiency 5**
1					
2	Just recent, a little > 1 year				
3					
4	5 years, allergy to anise				
5					
6	4 years. Current				
7					
8					
9					
10	Anemic since childhood				
11					
12					
13					
14	~2 years. Had a period where Fe levels were okay, but they've gone down again				
15					
16					
17					
18					
19					
20					
21	~the past 6 months				

Table A.3: Interview data (cont.)

#	*Greatest Nutritional Need*								
	Carbs	**Minerals**	**Proteins**	**Vitamins**	**Dairy**	**Fruits**	**Grains**	**M&B**	**Veg.**
1		X		X					
2						X			X
3									
4									
5									
6									
7									
8			X						
9			X	X					
10			X			X			X
11				X					
12									
13		X	X	X		X			
14									
15		X		X					
16			X						
17									X
18									
19				X					
20	X								
21				X		X			X
Total	1	3	5	7	0	4	0	0	4

Table A.3: Interview data (cont.)

#	*Gardening/Farming Exp?*	*Grew What?*
1	Has a large garden	Green/yellow beans; lettuce; eggplant; tomatoes; cucumbers; green/yellow/red peppers; yellow/green squash; basil; oregano; thyme
2		
3	Gardening, Farming	*Garden:* Peppers (sweet & hot), tomatoes, cabbage, lettuce, deep green lettuce *Farm:* Big agricultural farms hated picking green beans strawberries
4	Home garden, every summer	
5	Lived in desert, has intimate knowledge of growing & gardening. Has worked on a farm.	*Farm:* Strawberries, apples, had to sustain high desert plain.
6	None. Interested in gardening, though.	
7	Basics, a long time ago	
8		
9	Yes (herb garden)	Tomatoes, peppery cukes, broccoli, cabbage, collard greens, hot peppers, basil, chives, oregano
10	Had a pocket garden in NY, also grew tropical fruits in FL	
11		
12	Has gardened before	Tomatoes, lettuce, cukes, etc.
13	Helped w/ friend's garden	Collard greens, string beans, tomatoes
14	Gardened previously.	Beans, peas, peppers, tomatoes, squash, pumpkin, scallions, lettuce, cukes, broccoli, cauliflower, watermelon
15	When younger.	Carrots, tomatoes, potatoes, celery, grapevine, cabbage… a "little bit of everything"
16	Garden last year; Had own garden on brother's farm	Tomatoes, cucumbers
17	Yes	Celery, lettuce, tomato, peppers, corn, squash, beans
18	Yes	
19	Has a garden in the summer. Worked on a farm a long time ago	Beans, tomatoes, pumpkin, peppers, lettuce
20	None	
21	None	

Table A.3: Interview data (cont.)

#	*Feedback*	*Notes*
1		Generally good nutrition. Vitamin/Mineral needs minor.
2		Would very much like to participate in a garden.
3		Tony Massa. Very interested in helping. "Stay away from sodium"
4		Patricia Castellano
5		Dominic Castellano. "Would like to be involved in all aspects" of the community garden
6		Takes iron supplements.
7		
8		
9		Nut allergy Angella Allison. Willing to help w/ maintenance, organic advice
10		No Okra. Has information on growing. Jennifer Colon. Willing to help in day-to-day ops.
11		Would be willing to help
12		Angel Acevedo. Willing to help with either management OR planting
13		Willing to help in fields
14		On 2 diets: Diabetic, Consistent Carb. Lactose intolerant. Can't do "citrus-y" stuff. Jennifer Vincent. Willing to help either with management OR with maintenance/gardening
15	Herbs	Eats a bit of everything, uncertain about "greatest nutr. need" Maria Merced. Willing to help either in administration or in maintenance.
16		Would like to help w/ working in the garden, watering
17		David W (APW). Would like to participate in a more active way, maybe management

#	*Feedback*	*Notes*
18	Needs fibre	Would like to help.
19		
20		John Berry. Willing to help in any capacity.
21		Francine Coleman (staff) Would very much like to be involved.

Crop Data

Table A.4: Crop nutritional data (nutrients per serving)

Crop	*Preparation*	Cal.	Fats & Fatty Acids (g, mg)						Carbohydrates (g)				Prot. (g)
			Total	*Sat.*	*Unsat.*	*ω-3*	*ω-6*	*Total ω*	*Total*	*Starch*	*Sugar*	*Fiber*	
Asparagus	Raw	20.0	0.1 g	0.0 g	0.1 g	10.0 mg	40.0 mg	50.0 mg	4.0 g	0.0 g	1.9 g	2.1 g	2.2 g
	Boiled	22.0	0.2 g	0.0 g	0.1 g	29.0 mg	76.0 mg	105.0 mg	4.1 g	0.0 g	1.3 g	2.0 g	2.4 g
Basil	Fresh	23.0	0.6 g	0.0 g	0.5 g	316.0 mg	73.0 mg	389.0 mg	2.7 g		0.3 g	1.6 g	3.2 g
	Dried	251.0	4.0 g	0.2 g	2.7 g	1509.0 mg	659.0 mg	2168.0 mg	61.0 g		1.7 g	40.5 g	14.4 g
Beans, Black	Boiled	132.0	0.5 g	0.1 g	0.2 g	105.0 mg	126.0 mg	231.0 mg	23.7 g			8.7 g	8.9 g
Beans, French	Boiled	129.0	0.8 g	0.1 g	0.6 g	287.0 mg	166.0 mg	453.0 mg	24.0 g			9.4 g	7.0 g
Beans, Kidney	Boiled	127.0	0.5 g	0.1 g	0.3 g	170.0 mg	108.0 mg	278.0 mg	22.8 g		0.3 g	6.4 g	8.7 g
Beans, Navy	Boiled	140.0	0.6 g	0.1 g	0.6 g	177.0 mg	136.0 mg	313.0 mg	26.3 g	15.4 g	0.4 g	10.5 g	8.2 g
Beans, Pinto	Boiled	143.0	0.7 g	0.1 g	0.3 g	137.0 mg	98.0 mg	235.0 mg	26.2 g	15.1 g	0.3 g	9.0 g	9.0 g
Beans, Snap (Green)	Boiled	35.0	0.3 g	0.1 g	0.1 g	89.0 mg	56.0 mg	145.0 mg	7.9 g		1.5 g	3.2 g	1.9 g
Beans, Snap (Yellow) [aka. “Wax beans”]	Boiled	35.0	0.3 g	0.1 g	0.1 g	89.0 mg	56.0 mg	145.0 mg	7.9 g		1.5 g	3.2 g	1.9 g
Beans, White	Boiled	139.0	0.4 g	0.1 g	0.2 g	69.0 mg	83.0 mg	152.0 mg	25.1 g		0.3 g	6.3 g	9.7 g
Beans, Yellow	Boiled	144.0	1.1 g	0.3 g	0.6 g	212.0 mg	253.0 mg	465.0 mg	25.3 g			10.4 g	9.2 g
Beets	Raw	43.0	0.2 g	0.0 g	0.1 g	5.0 mg	55.0 mg		9.6 g	0.0 g	6.8 g	2.8 g	1.6 g
	Boiled	44.0	0.2 g	0.0 g	0.1 g	5.0 mg	58.0 mg		10.0 g	0.0 g	8.0 g	2.0 g	1.7 g
	Raw (Greens)	22.0	0.1 g	0.0 g	0.0 g	4.0 mg	41.0 mg		4.3 g		0.5 g	3.7 g	2.2 g
	Boiled (Greens)	27.0	0.2 g	0.0 g	0.1 g	6.0 mg	65.0 mg		5.5 g		0.6 g	2.9 g	2.6 g
Broccoli	Raw	34.0	0.4 g	0.0 g	0.0 g	21.0 mg	17.0 mg		6.6 g	0.0 g	1.7 g	2.6 g	2.8 g
	Boiled	35.0	0.4 g	0.1 g	0.2 g	119.0 mg	51.0 mg		7.2 g	0.0 g	1.4 g	3.3 g	6.7 g
Cabbage	Raw	25.0	0.1 g	0.0 g	0.0 g		17.0 mg		5.8 g	0.0 g	3.2 g	2.5 g	1.3 g
	Boiled	23.0	0.1 g	0.0 g	0.5 g	14.0 mg	9.0 mg		5.5 g	0.0 g	2.8 g	1.9 g	1.3 g
Cantaloupe	Raw	34.0	0.2 g	0.1 g	0.1 g	46.0 mg	35.0 mg	81.0 mg	8.8 g	0.0 g	7.9 g	0.9 g	0.8 g
Carrots	Raw	41.0	0.2 g	0.0 g	0.1 g	2.0 mg	115.0 mg		9.6 g	1.4 g	4.7 g	2.8 g	0.9 g
	Boiled	35.0	0.2 g	0.0 g	0.1 g	1.0 mg	87.0 mg		8.2 g	0.2 g	3.5 g	3.0 g	0.8 g
Cauliflower	Raw	25.0	0.1 g	0.0 g	0.0 g	27.0 mg	11.0 mg		5.3 g		2.4 g	2.5 g	2.0 g

Crop	*Preparation*	Cal.	Fats & Fatty Acids (g, mg)						Carbohydrates (g)				Prot. (g)
			Total	*Sat.*	*Unsat.*	*ω-3*	*ω-6*	*Total ω*	*Total*	*Starch*	*Sugar*	*Fiber*	
	Boiled	23.0	0.5 g	0.1 g	0.2 g	167.0 mg	50.0 mg		4.4 g	0.0 g	2.1 g	2.3 g	1.8 g
Celery	Raw	16.0	0.2 g	0.0 g	0.1 g		79.0 mg		3.4 g	0.0 g	1.8 g	1.6 g	0.7 g
	Boiled	18.0	0.2 g	0.0 g	0.1 g		75.0 mg		4.0 g	0.0 g	2.4 g	1.6 g	0.8 g
Chard	Raw	19.0	0.2 g	0.0 g	0.1 g	7.0 mg	63.0 mg		3.7 g		1.1 g	1.6 g	1.8 g
	Boiled	20.0	0.1 g	0.0 g	0.0 g	3.0 mg	25.0 mg		4.1 g		1.1 g	2.1 g	1.9 g
Cilantro	Fresh	23.0	0.5 g	0.0 g	0.3 g		40.0 mg		3.7 g	0.0 g	0.9 g	2.8 g	2.1 g
	Dried	279.0	4.8 g	0.1 g	2.2 g		328.0 mg		52.1 g		7.3 g	10.4 g	21.9 g
Collard Greens	Raw	30.0	0.4 g	0.1 g	0.2 g	108.0 mg	82.0 mg		5.7 g		0.5 g	3.6 g	2.5 g
	Boiled	26.0	0.4 g	0.0 g	0.2 g	93.0 mg	70.0 mg		4.9 g		0.4 g	2.8 g	2.1 g
Cress	Raw	108.0	1.3 g	0.2 g	1.0 g	18.0 mg	586.0 mg		25.1 g		4.1 g	2.7 g	3.3 g
	Boiled	108.0	1.3 g	0.2 g	1.0 g	18.0 mg	586.0 mg		25.1 g		3.2 g	2.8 g	3.3 g
Cucumbers	Raw, peeled	32.0	0.7 g	0.0 g	0.4 g	76.0 mg	152.0 mg		5.5 g	0.0 g	4.4 g	1.1 g	2.6 g
	Raw, unpeeled	23.0	0.6 g	0.0 g	0.4 g	65.0 mg	130.0 mg		3.8 g	0.0 g	3.1 g	0.7 g	1.9 g
	Pickled, dill	12.0	0.2 g	0.0 g	0.0 g	2.0 mg	2.0 mg		2.2 g	0.1 g	1.4 g	0.7 g	0.6 g
	Pickled, sour	15.0	0.1 g	0.0 g	0.0 g	5.0 mg	28.0 mg		3.6 g	0.8 g	1.7 g	0.5 g	0.7 g
	Pickled, sweet	12.0	0.1 g	0.0 g	0.1 g	32.0 mg	24.0 mg		2.6 g		1.3 g	1.1 g	0.6 g
Eggplant	Raw	11.0	0.2 g	0.1 g	0.1 g	46.0 mg	34.0 mg		2.3 g	0.0 g	1.1 g	1.2 g	0.3 g
	Boiled	91.0	0.4 g	0.1 g	0.1 g	60.0 mg	46.0 mg		21.2 g		18.3 g	1.0 g	0.6 g
Garlic	Raw	24.0	0.2 g	0.0 g	0.1 g	13.0 mg	63.0 mg		5.7 g		2.4 g	3.4 g	1.0 g
Kale	Raw	35.0	0.2 g	0.0 g	0.1 g	15.0 mg	78.0 mg		8.7 g		3.2 g	2.5 g	0.8 g
	Boiled	149.0	0.5 g	0.1 g	0.2 g	20.0 mg	229.0 mg	249.0 mg	33.1 g		1.0 g	2.1 g	6.4 g
Lentils	Mature, Raw	50.0	0.7 g	0.1 g	0.4 g	180.0 mg	138.0 mg		10.0 g			2.0 g	3.3 g
	Mature, Boiled	28.0	0.4 g	0.1 g	0.2 g	103.0 mg	79.0 mg		5.6 g		1.3 g	2.0 g	1.9 g
	Sprouts, Raw	353.0	1.1 g	0.2 g	0.7 g	109.0 mg	404.0 mg		60.1 g		2.0 g	30.5 g	25.8 g
	Sprouts, Stir-fried	116.0	0.4 g	0.1 g	0.3 g	37.0 mg	137.0 mg		20.1 g		1.8 g	7.9 g	9.0 g
Lettuce, Head	Raw	106.0	0.5 g	0.1 g	0.3 g	38.0 mg	181.0 mg		22.1 g				9.0 g
Lettuce, Leaf	Raw, Green-leaf	101.0	0.5 g	0.1 g	0.3 g	35.0 mg	166.0 mg		21.2 g				8.8 g
	Raw, Red-leaf	14.0	0.1 g	0.0 g	0.1 g	52.0 mg	21.0 mg	73.0 mg	3.2 g	0.0 g	2.0 g	1.2 g	0.9 g
Lettuce, Romaine	Raw	15.0	0.2 g	0.0 g	0.1 g	52.0 mg	24.0 mg		2.8 g	0.0 g	0.8 g	1.3 g	1.4 g
Mint (Spearmint)	Fresh	16.0	0.2 g						2.3 g	0.0 g	0.5 g	0.9 g	1.3 g
	Dried	17.0	0.3 g	0.0 g	0.2 g	113.0 mg	47.0 mg	160.0 mg	3.3 g	0.0 g	1.2 g	2.1 g	1.2 g
Nasturtium		44.0	0.7 g	0.2 g	0.4 g	338.0 mg	54.0 mg		8.4 g			6.8 g	3.3 g
Onions	Raw	285.0	6.0 g	1.6 g	3.5 g	2792.0 mg	446.0 mg		52.0 g			29.8 g	19.9 g
	Sweet, Raw												
	Boiled	40.0	0.1 g	0.0 g	0.0 g	4.0 mg	13.0 mg		9.3 g	0.0 g	4.2 g	1.7 g	1.1 g
	Sautéed (Yellow)	32.0	0.1 g						7.5 g	0.0 g	5.0 g	0.9 g	0.8 g
Oregano	Dried	44.0	0.2 g	0.0 g	0.1 g	4.0 mg	70.0 mg		10.1 g		4.7 g	1.4 g	1.4 g
Peppers, Hot	Raw, green	132.0	10.8 g			660.0 mg	4810.0 mg		7.9 g	0.0 g		1.7 g	0.9 g
	Raw, red	306.0	10.3 g	2.7 g	5.9 g	4180.0 mg	1050.0 mg	5230.0 mg	64.4 g		4.1 g	42.8 g	11.0 g

Crop	Preparation	Cal.	Fats & Fatty Acids (g, mg)						Carbohydrates (g)				Prot. (g)
			Total	Sat.	Unsat.	ω-3	ω-6	Total ω	Total	Starch	Sugar	Fiber	
	Sun-dried	40.0	0.2 g	0.0 g	0.1 g	5.0 mg	104.0 mg		9.5 g		5.1 g	1.5 g	2.0 g
Peppers, Sweet	Raw, green	40.0	0.4 g	0.0 g	0.2 g	11.0 mg	228.0 mg		8.8 g		5.3 g	1.5 g	1.9 g
	Raw, red	324.0	5.8 g	0.8 g	3.6 g	23.0 mg	3056.0 mg		69.9 g		41.1 g	28.7 g	10.6 g
	Raw, yellow	20.0	0.2 g	0.1 g	0.1 g	8.0 mg	54.0 mg		4.6 g	0.0 g	2.4 g	1.7 g	0.9 g
	Boiled, green	31.0	0.3 g	0.0 g	0.1 g	25.0 mg	45.0 mg		6.3 g	0.0 g	4.2 g	2.1 g	1.0 g
	Boiled, red	27.0	0.2 g	0.0 g					6.3 g	0.9 g			1.0 g
	Sautéed, green	28.0	0.2 g	0.0 g	0.1 g	10.0 mg	96.0 mg		6.7 g		3.2 g	1.2 g	0.9 g
	Sautéed, red	28.0	0.2 g	0.0 g	0.1 g	10.0 mg	96.0 mg		6.7 g		4.4 g	1.2 g	0.9 g
Potatoes, Irish	Boiled w/ skin	127.0	11.8 g	1.6 g	8.2 g	770.0 mg	5130.0 mg		4.2 g		2.2 g	1.8 g	0.8 g
	Baked in skin	133.0	12.7 g	1.6 g	8.0 g	775.0 mg	4944.0 mg		6.6 g	0.0 g	4.3 g	1.8 g	1.0 g
Potatoes, Sweet	Boiled w/o skin	87.0	0.1 g	0.0 g	0.0 g	10.0 mg	32.0 mg		20.1 g		0.9 g	1.8 g	1.9 g
	Baked in skin	93.0	0.1 g	0.0 g	0.1 g	13.0 mg	43.0 mg		21.2 g	17.3 g	1.2 g	2.2 g	2.5 g
Raspberries	Raw	76.0	0.1 g	0.0 g	0.1 g		61.0 mg		17.7 g	5.2 g	5.7 g	2.5 g	1.4 g
Sorghum		90.0	0.2 g	0.0 g	0.1 g	4.0 mg	60.0 mg		20.7 g	7.0 g	6.5 g	3.3 g	2.0 g
Sorrel		52.0	0.7 g	0.0 g	0.5 g	126.0 mg	249.0 mg	375.0 mg	11.9 g	0.0 g	4.4 g	6.5 g	1.2 g
Strawberries	Raw												
	Frozen, Unsweetened												
Tomatillos	Raw	32.0	0.3 g	0.0 g	0.2 g	65.0 mg	90.0 mg		7.7 g	0.0 g	4.9 g	2.0 g	0.7 g
Tomatoes	Raw	35.0	0.1 g	0.0 g	0.1 g	23.0 mg	31.0 mg		9.1 g		4.6 g	2.1 g	0.4 g
	Cooked	32.0	1.0 g	0.1 g	0.6 g	16.0 mg	402.0 mg		5.8 g	0.0 g	3.9 g	1.9 g	1.0 g
Turnip	Greens, Raw	18.0	0.2 g	0.0 g	0.1 g	3.0 mg	80.0 mg		3.9 g	0.0 g	2.6 g	1.2 g	0.9 g
	Greens, Boiled	18.0	0.1 g	0.0 g	0.1 g	2.0 mg	42.0 mg		4.0 g		2.5 g	0.7 g	0.9 g
	Roots, Raw	32.0	0.3 g	0.1 g	0.1 g	84.0 mg	36.0 mg		7.1 g		0.8 g	3.2 g	1.5 g
	Roots, Boiled	20.0	0.2 g	0.1 g	0.1 g	64.0 mg	28.0 mg		4.4 g		0.5 g	3.5 g	1.1 g
Watermelon	Raw	28.0	0.1 g	0.0 g	0.1 g	40.0 mg	12.0 mg		6.4 g		3.8 g	1.8 g	0.9 g
Zucchini	Raw w/ skin	22.0	0.1 g	0.0 g	0.0 g	32.0 mg	9.0 mg		5.1 g		3.0 g	2.0 g	0.7 g
	Boiled w/ skin	30.0	0.2 g	0.0 g	0.1 g		50.0 mg		7.5 g	0.0 g	6.2 g	0.4 g	0.6 g

Crop	Preparation	Vitamins (%DV)										Minerals (%DV, mg)						
		A	B1	B2	B3	B5	B6	B9	C	E	K	Ca	Cu	Fe	K	Mg	Na	P
Asparagus	Raw	15%	10%	8%	5%	3%	5%	13%	9%	6%	52%	2%	9%	12%	6%	3%	2.0 mg	5%
	Boiled	20%	11%	8%	5%	2%	4%	37%	13%	7%	63%	2%	8%	5%	6%	3%	14.0 mg	5%
Basil	Fresh	106%	2%	4%	5%	2%	8%	17%	30%	4%	518%	18%	19%	18%	8%	16%	4.0 mg	56%
	Dried	188%	10%	19%	35%		116%	69%	102%	37%	2143%	211%	68%	233%	98%	106%	34.0 mg	49%
Beans, Black	Boiled	0%	16%	3%	3%	2%	3%	37%	0%			3%	10%	12%	10%	17%	1.0 mg	14%
Beans, French	Boiled	0%	9%	4%	3%	2%	5%	19%	2%			6%	6%	6%	11%	14%	6.0 mg	10%
Beans, Kidney	Boiled	0%	11%	3%	3%	2%	6%	33%	2%	0%	10%	4%	11%	12%	12%	10%	1.0 mg	14%
Beans, Navy	Boiled	0%	16%	4%	3%	3%	7%	35%	1%	0%	1%	7%	10%	13%	11%	13%	0.0 mg	14%
Beans, Pinto	Boiled	0%	13%	4%	2%	2%	11%	43%	1%	5%	4%	5%	11%	12%	12%	12%	1.0 mg	15%

Crop	*Preparation*	Vitamins (%DV)										Minerals (%DV, mg)						
		A	*B1*	*B2*	*B3*	*B5*	*B6*	*B9*	*C*	*E*	*K*	*Ca*	*Cu*	*Fe*	*K*	*Mg*	*Na*	*P*
Beans, Snap (Green)	Boiled	14%	5%	6%	3%	1%	3%	8%	16%	2%	20%	4%	3%	4%	4%	5%	1.0 mg	3%
Beans, Snap (Yellow) [aka. “Wax beans”]	Boiled	2%	5%	6%	3%	1%	3%	8%	16%	2%	20%	5%	5%	7%	9%	6%	3.0 mg	39%
Beans, White	Boiled	0%	8%	3%	1%	20%	5%	2%	0%	5%	4%	9%	14%	21%	16%	16%	6.0 mg	11%
Beans, Yellow	Boiled	0%	12%	6%	4%	2%	6%	20%	3%			6%	9%	14%	9%	18%	5.0 mg	18%
Beets	Raw	1%	2%	2%	2%	2%	3%	27%	8%	0%	0%	2%	4%	4%	9%	6%	78.0 mg	4%
	Boiled	1%	2%	2%	2%	1%	3%	20%	6%	0%	0%	2%	4%	4%	9%	6%	77.0 mg	4%
	Raw (Greens)	127%	7%	13%	2%	3%	5%	4%	50%	7%	500%	12%	10%	14%	22%	17%	226.0 mg	41%
	Boiled (Greens)	153%	8%	17%	2%	3%	7%	3%	42%	9%	605%	11%	13%	11%	26%	17%	241.0 mg	4%
Broccoli	Raw	12%	5%	7%	3%	6%	9%	16%	149%	4%	127%	5%	2%	4%	9%	5%	33.0 mg	7%
	Boiled	31%	4%	7%	3%	6%	10%	27%	108%	7%	176%	11%	3%	4%	8%	5%	41.0 mg	7%
Cabbage	Raw	2%	4%	2%	1%	2%	6%	11%	61%	1%	95%	4%	1%	3%	5%	3%	18.0 mg	5%
	Boiled	2%	4%	2%	1%	2%	6%	8%	62%	1%	136%	5%	1%	1%	6%	4%	8.0 mg	3%
Cantaloupe	Raw	68%	3%	1%	4%	1%	4%	5%	61%	0%	3%	1%	2%	1%	8%	3%	16.0 mg	1%
Carrots	Raw	334%	4%	3%	5%	3%	7%	5%	10%	3%	16%	3%	2%	2%	9%	3%	69.0 mg	4%
	Boiled	341%	4%	3%	3%	2%	8%	3%	6%	5%	17%	3%	1%	2%	7%	2%	58.0 mg	3%
Cauliflower	Raw	0%	4%	4%	3%	7%	11%	14%	77%	0%	20%	2%	2%	2%	9%	4%	30.0 mg	4%
	Boiled	0%	3%	3%	2%	5%	9%	11%	74%	0%	17%	2%	1%	2%	4%	2%	15.0 mg	3%
Celery	Raw	9%	1%	3%	2%	2%	4%	9%	5%	1%	37%	4%	2%	1%	7%	3%	80.0 mg	2%
	Boiled	10%	3%	3%	2%	2%	4%	5%	10%	2%	47%	4%	2%	2%	8%	3%	91.0 mg	2%
Chard	Raw	122%	3%	5%	2%	2%	5%	3%	50%	9%	1038%	5%	9%	10%	11%	20%	213.0 mg	5%
	Boiled	122%	2%	5%	2%	2%	4%	2%	30%	9%	409%	6%	8%	13%	16%	21%	179.0 mg	3%
Cilantro	Fresh	135%	4%	10%	6%	6%	7%	16%	45%	13%	388%	7%	11%	10%	15%	6%	46.0 mg	5%
	Dried	117%	83%	88%	54%		30%	69%	945%	5%	1700%	125%	89%	236%	128%	174%	211.0 mg	48%
Collard Greens	Raw	133%	4%	8%	4%	3%	8%	41%	59%	11%	638%	14%	2%	1%	5%	2%	20.0 mg	1%
	Boiled	162%	3%	6%	3%	2%	6%	23%	30%	4%	550%	14%	2%	6%	3%	5%	16.0 mg	3%
Cress	Raw	138%	5%	15%	5%	2%	12%	20%	115%	4%	677%	8%	9%	7%	17%	10%	14.0 mg	8%
	Boiled	93%	4%	9%	4%	2%	8%	9%	38%	2%	479%	6%	6%	4%	10%	6%	8.0 mg	5%
Cucumbers	Raw, peeled	1%	2%	1%	0%	2%	3%	3%	5%	0%	9%	1%	4%	1%	4%	3%	2.0 mg	2%
	Raw, unpeeled	2%	2%	2%	0%	3%	2%	2%	5%	0%	21%	2%	2%	2%	4%	3%	2.0 mg	4%
	Pickled, dill	4%	2%	2%	0%	1%	1%	0%	1%	0%	49%	4%	2%	2%	3%	2%	875.0 mg	3%
	Pickled, sour	4%	0%	1%	0%	0%	0%	0%	2%	0%	59%	0%	4%	2%	1%	1%	1208.0 mg	1%
	Pickled, sweet	15%	2%	2%	1%	1%	1%	0%	1%	2%	59%	6%	1%	1%	3%	2%	457.0 mg	2%
Eggplant	Raw	1%	3%	2%	3%	3%	4%	5%	4%	1%	4%	1%	4%	1%	7%	3%	2.0 mg	2%
	Boiled	1%	5%	1%	3%	1%	4%	3%	2%	2%	4%	1%	3%	1%	4%	3%	1.0 mg	1%
Garlic	Raw	0%	13%	6%	4%	6%	62%	1%	52%	0%	2%	18%	15%	9%	11%	6%	17.0 mg	15%
Kale	Raw	308%	7%	8%	5%	1%	14%	7%	200%		1021%	14%	14%	9%	13%	8%	43.0 mg	6%
	Boiled	272%	4%	4%	2%	0%	7%	3%	68%	4%	1021%	7%	8%	5%	7%	5%	23.0 mg	3%

Crop	*Preparation*	Vitamins (%DV)										Minerals (%DV, mg)						
		A	*B1*	*B2*	*B3*	*B5*	*B6*	*B9*	*C*	*E*	*K*	*Ca*	*Cu*	*Fe*	*K*	*Mg*	*Na*	*P*
Lentils	Mature, Raw	1%	58%	12%	13%	21%	27%	120%	7%	2%	6%	6%	26%	42%	27%	31%	6.0 mg	45%
	Mature, Boiled	0%	11%	4%	5%	6%	9%	45%	2%	1%	2%	2%	13%	19%	11%	9%	2.0 mg	48%
	Sprouts, Raw	1%	15%	8%	6%	6%	9%	25%	28%			2%	18%	18%	9%	9%	11.0 mg	17%
	Sprouts, Stir-fried	1%	15%	5%	6%	6%	8%	17%	1%			1%	17%	17%	8%	9%	10.0 mg	15%
Lettuce, Head	Raw	10%	3%	1%	1%	1%	2%	7%	5%	1%	30%	2%	1%	2%	4%	2%	10.0 mg	2%
Lettuce, Leaf	Raw, Green-leaf	148%	5%	5%	2%	1%	4%	10%	11%	1%	217%	4%	1%	5%	6%	3%	28.0 mg	3%
	Raw, Red-leaf	150%	4%	5%	2%	1%	5%	9%	6%	1%	175%	3%	1%	7%	5%	3%	25.0 mg	3%
Lettuce, Romaine	Raw	174%	5%	4%	2%	1%	4%	34%	40%	1%	128%	3%	2%	5%	7%	3%	8.0 mg	3%
Mint (Spearmint)	Fresh	81%	5%	10%	5%	3%	8%	26%	22%			20%	12%	66%	13%	16%	30.0 mg	6%
	Dried	212%	19%	84%	33%	14%	129%	132%	0%			149%	77%	486%	55%	151%	344.0 mg	28%
Nasturtium																		
Onions	Raw	0%	12%	3%	2%	1%	6%	5%	18%	0%	1%	2%	1%	2%	4%	2%	4.0 mg	29%
	Sweet, Raw	0%	3%	1%	1%	1%	6%	6%	8%	0%	0%	2%	3%	1%	3%	2%	8.0 mg	3%
	Boiled	0%	3%	1%	1%	1%	6%	4%	9%	0%	1%	2%	3%	1%	5%	3%	3.0 mg	4%
	Sautéed (Yellow)		3%	2%	0%	2%	10%	0%	3%	3%	27%	2%	1%	1%	4%	2%	12.0 mg	3%
Oregano	Dried	138%	23%	19%	31%		61%	69%	83%	94%	777%	158%	47%	244%	48%	68%	15.0 mg	20%
Peppers, Hot	Raw, green	24%	6%	5%	5%	1%	14%	6%	404%	3%	18%	2%	9%	7%	10%	6%	7.0 mg	10%
	Raw, red	19%	5%	5%	6%	2%	25%	6%	239%	3%	17%	1%	6%	6%	9%	6%	9.0 mg	4%
	Sun-dried	530%	5%	71%	43%	10%	41%	13%	52%	16%	135%	4%	11%	34%	53%	22%	91.0 mg	16%
Peppers, Sweet	Raw, green	7%	4%	2%	2%	1%	11%	2%	134%	2%	9%	1%	3%	2%	5%	2%	3.0 mg	2%
	Raw, red	63%	4%	5%	5%	3%	15%	11%	213%	8%	6%	1%	1%	2%	6%	3%	4.0 mg	3%
	Raw, yellow	4%	2%	1%	4%	2%	8%	6%	306%			1%	5%	3%	6%	3%	2.0 mg	2%
	Boiled, green	9%	4%	2%	2%	1%	12%	4%	124%	2%	12%	1%	3%	3%	5%	2%	2.0 mg	2%
	Boiled, red	59%	4%	2%	2%	1%	12%	4%	285%	8%	6%	1%	3%	3%	5%	2%	2.0 mg	2%
	Sautéed, green	5%	3%	3%	3%	1%	10%	0%	295%	7%	27%	1%	1%	2%	4%	2%	17.0 mg	1%
	Sautéed, red	55%	4%	6%	5%	2%	18%	0%	271%	15%	21%	1%	1%	3%	6%	3%	21.0 mg	2%
Potatoes, Irish	Boiled w/ skin	0%	7%	1%	7%	5%	15%	2%	22%	0%	3%	1%	9%	2%	11%	5%	4.0 mg	4%
	Baked in skin	0%	4%	3%	7%	4%	16%	7%	16%	0%	2%	1%	6%	6%	15%	7%	10.0 mg	7%
Potatoes, Sweet	Boiled w/o skin	315%	4%	3%	3%	6%	8%	1%	21%	5%	3%	3%	5%	4%	7%	5%	27.0 mg	3%
	Baked in skin																	
Raspberries	Raw																	
Sorghum		384%	7%	6%	7%	9%	14%	1%	33%	4%	3%	4%	8%	4%	14%	7%	36.0 mg	5%
Sorrel		1%	2%	2%	3%	3%	3%	5%	44%	4%	10%	2%	4%	4%	4%	5%	1.0 mg	3%
Strawberries	Raw	0%	2%	1%	2%	1%	2%	6%	98%	1%	3%	2%	2%	2%	4%	3%	1.0 mg	2%
	Frozen	1%	1%	2%	2%	1%	1%	4%	69%	1%	3%	2%	2%	4%	4%	3%	2.0 mg	1%
Tomatillos	Raw	2%	3%	2%	9%	2%	3%	2%	20%	2%	13%	1%	4%	3%	8%	5%	1.0 mg	4%
Tomatoes	Raw	17%	2%	1%	3%	1%	4%	4%	21%	3%	10%	1%	3%	1%	7%	3%	5.0 mg	2%
	Cooked	10%	2%	1%	3%	1%	4%	3%	38%	3%	3%	1%	4%	4%	6%	2%	11.0 mg	3%
Turnip	Greens, Raw	232%	5%	6%	3%	4%	13%	49%	100%	14%	314%	19%	18%	6%	8%	8%	40.0 mg	4%

Crop	*Preparation*	Vitamins (%DV)										Minerals (%DV, mg)						
		A	*B1*	*B2*	*B3*	*B5*	*B6*	*B9*	*C*	*E*	*K*	*Ca*	*Cu*	*Fe*	*K*	*Mg*	*Na*	*P*
	Greens, Boiled	153%	3%	4%	2%	3%	9%	29%	46%	9%	459%	14%	13%	4%	6%	5%	29.0 mg	3%
	Roots, Raw	0%	3%	2%	2%	2%	4%	4%	35%	0%	0%	3%	4%	2%	5%	3%	67.0 mg	3%
	Roots, Boiled	0%	2%	1%	1%	1%	3%	2%	19%	0%	0%	3%	1%	1%	5%	2%	16.0 mg	3%
Watermelon	Raw	11%	2%	1%	1%	2%	2%	1%	13%	0%	0%	1%	2%	1%	3%	2%	1.0 mg	1%
Zucchini	Raw w/ skin	4%	3%	8%	2%	2%	11%	7%	28%	1%	5%	1%	3%	2%	7%	4%	10.0 mg	4%
	Boiled w/ skin	22%	3%	2%	2%	1%	4%	4%	8%	1%	5%	1%	4%	2%	7%	5%	3.0 mg	4%

Table A.5: Crop growing data.

Plant	*Climate Data*	*Growing*					*Notes*
		Light	**Planting & Timing**	**Soil**	**Spacing & Depth**	**General**	
Asparagus	Long rest period dur. winter. Avg. summer growing temp. of 65-75 °F	Full sun	Spring, as soon as ground can be worked.	~6.0-8.0 pH (prefers 6.5-7.5). Requires regular fertilization.	Place in a trench 12-18" wide, 6" deep. Cover crown w/ 2" soil, gradually fill rest of trench as plants grow.	--	All-♂ varieties produce thicker spears. All-♀ varieties often have overcrowding issues. 1-year old plants/crowns preferable. **Companion Planting:** Basil, calendula, parsley, tomatoes.
Jersey Giant		--	--	--	--	--	All-♂. Light harvest after 1 year, full thereafter (Burpee).
Mary Washington		--	--	--	--	--	All-♀. Light harvest after 2 years, full thereafter.
Basil	Best conditions: daytime temperature of 75 °F, nighttime temperature of 65 °F. Germination requires 70-80 °F. Nighttime temperature must not drop below 10 °C (50 °F).	Full sun	**N/A**	5.5-7.0 pH.	--	--	Shelter from cold winds. **Companion Planting:** Attracts butterflies & insects. Stimulates growth of companion plants (esp. tomatoes & peppers). Said to repel white flies. Basil & rue *do not grow well* near ea. other.

Plant	*Climate Data*	*Growing*					*Notes*
		Light	**Planting & Timing**	**Soil**	**Spacing & Depth**	**General**	
Beets	Germination temp. range: 50-85 °F Growth temp. range: 60-65 °F	Full sun	As early as 30 days before the "frost-free" date in area. Successive plantings @ 3-4 wk intervals for cont. supply.	~6.0-7.5 pH. Compost/well-rotted manure along w/ pure wood ashes mixed in pre-planting.	Square Foot Planting: 16/sq ft Seed depth: 1/2 inch	Earliest plantings can fail if it is too cold and wet. Sow every 3 weeks from mid April through mid August for a continual supply. Germination: 5 days (S, T) Height: Short	Best "seed" = cluster of seeds in dried fruit. **Companion Planting:** Bush beans, cabbage family, corn, leeks, lettuce, onions, radishes.
Broccoli	Germination temp. range: 50-85 °F Growth temp. range: 60-65 °F	Prefers full sun, but will tolerate partial shade.	Early Spring: plant "young, vigorously growing plants"	6.0-7.5 pH.	Square Foot Planting: 1/sq ft Seed depth: 1/2 inch (S, T)	Transplant in late April for early crop. Direct seed May-June for fall crop. Harvest the central head before flower buds open. Then enjoy the tasty side shoots, which the plant produces all summer long. Water regularly throughout the season. Germination: 4-7 days (S, T) Height: Medium	Use row covers to prevent pests. **Companion Planting:** Bush bean, beet, carrot, celery, chard, cucumber, dill, lettuce, onion family, potato, spinach, tomato.
Cabbage	Germination temp. range: 45-95 °F Growth temp. range: 60-65 °F	Prefers full sun, but will tolerate partial shade.	*Early Cabbage* Transplant s.t. it "matures before the heat of summer" *Late Cabbage* Start dur. heat of mid-summer	~6.0-7.5 pH.	Square Foot Planting: 1/sq ft Seed depth: 1/2 inch (S, T)	Transplant in late April for early crop. Direct seed May-June for fall crop. Water regularly throughout the season. Weed early & aggressively. Direct seed or Transplant Germination: 5 days Height: Medium	
Cantaloupe	Germination temp. range: 75-95 °F Growth temp. range: 65-75 °F	Full sun	Plant after soil is warm & dry, and danger of frost has passed. May need transplants if we wish to start early.	~6.0-7.5 pH. **NO** extremes			Sheltered location. **Companion Planting:** Corn.

Plant	*Climate Data*	*Growing*					*Notes*
		Light	**Planting & Timing**	**Soil**	**Spacing & Depth**	**General**	
Carrots	Germination temp. range: 45-85 °F Growth temp. range: 60-65 °F	Full sun, but will tolerate light shade.	Spring, as soon as soil mellows.	~5.5-7.0 pH.	Square Foot Planting: 16/sq ft Seed depth: 1/4-1/2 inch	Carrots can be sown at 3 week intervals from late April to early August. An alternative way to plant is to broadcast seed evenly over the soil in a square. With your fingers scratch the surface of the soil gently mixing the seeds into the top quarter inch of soil. Lightly tamp down soil so seeds are in contact with it. Thin to 2-3 inches apart after germination. Keep soil moist and weed-free after planting. Germination: 6 days (DS) Height: Short	Digging helps harvest w/o a hitch. **Companion Planting:** Beans, Brussels sprouts, cabbages, chives, leaf lettuce, leeks, onions, peas, peppers, radishes, tomatoes.
Cauliflower	Germination temp. range: 45-85 °F Growth temp. range: *Day:* 60-70 °F *Night:* 50-60 °F	Prefers full sun, but will tolerate partial shade.	Best from transplants. Spring: don't transplant < 2-3 wks before avg frost-free date. Must be planted s.t. it matures before heat of summer, but is not injured by cold. Autumn: ~same time as Fall Cabbage.	~6.0-7.0 pH.	Square Foot Planting: 1/sq ft Seed depth: 1/2 inch	Transplant 4-5 week old seedlings in late April/early May after danger of hard frost has passed. Water regularly throughout the season. To keep the head white, leaves must be tied up around the head as soon as the heads become visible through the leaves. Germination: 6 days (T)	

Plant	*Climate Data*	*Growing*					*Notes*
		Light	**Planting & Timing**	**Soil**	**Spacing & Depth**	**General**	
						Height: Medium	
Celery	Germination temp. range: 60-70 °F Growth temp. range: 60-65 °F, w/ nights > 40 °F	Full sun	**N/A**	6.0-7.0 pH.			**Companion Planting:** Everything *except* carrots, parsley, dill, & parsnips.
Chard	Germination temp. range: 70-75 °F Growth temp. range: 45-75 °F	Prefer full sun, but will tolerate light shade	Seed directly in early- to mid-spring.	6.2-7.0 pH.			
Cilantro	Germination temp. range: 50-70 °F Growth temp. range: "cool"	Full/major sun	**N/A**	5.5-7.0 pH.			Sheltered location. **Companion Planting:** Assists anise germination, hinders germination of fennel. Grows well w/ chervil. Attracts honeybees.
Collard Greens	Unable to find. Due to its similarity to cabbage, will assume similar climate unless other data is found.	Unable to find data. Until other data is found, will assume similar to cabbage.	Early spring for summer harvest, midsummer for fall & early winter harvest	5.5-6.8 pH.	Square Foot Planting: 9/sq ft Seed depth: 1/4 inch	Spinach germinates best in cool, moist soil so plant every 1-2 weeks from late March through mid May. Sow in August for a fall harvest. Spinach will tend to "bolt" (make flowers and seeds) during the summer heat. Germination: 7-14 days (S) Height: Short	
Cress	Germination temp. range: 55-65 °F Growth temp. range: 50-70 °F *(soil)*		**N/A**				
Cucumbers	Germination temp. range: 60-95 °F Growth temp. range: 65-75 °F	Full sun	Plant after danger of frost, & after soil warms (Spring).	~5.5-7.0 pH.	Square Foot Planting: 2/ft of trellis Seed depth: 1/2 inch	Grow on a trellis to conserve space. If you are not growing them vertically, leave two squares for each plant	**Companion Planting:** Bush beans, cabbage family, corn, dill, eggplant, lettuce, radishes, peas, tomatoes.

Plant	*Climate Data*	*Growing*					*Notes*
		Light	**Planting & Timing**	**Soil**	**Spacing & Depth**	**General**	
						so that they can sprawl out on the ground. Plant seeds or starts in late May when the soil has warmed up and danger of frost is past. Be careful not to disturb the roots of these seedlings. Germination: 3-4 days (S, T) Height: Medium-Tall	
Eggplant	Germination temp. range: 75-90 °F Growth temp. range: 70-85 °F	Full sun	Best from transplants. Transplant once risk of frost has passed, and soil has warmed	~5.5-6.5 pH	Square Foot Planting: 1/sq ft Seed depth: 1/4 inch	Must be transplanted to develop mature fruit in New England. They need plenty of sun and heat. Plant transplants when the weather has warmed up, in early June. Germination: 7-14 days (T) Height: Medium	Don't grow in the same ground that has been used for tomatoes or potatoes w/in last 2 years. **Companion Planting:** Bush beans, peas, peppers, potatoes.
Garlic	Germination temp. range: 60-80 °F Growth temp. range: "cool"	Full sun	**N/A**	4.5-8.3 pH.	Square Foot Planting: 16/sq ft Clove depth: 2 inches (pointed end up)	Break up bulb into individual cloves. Plant cloves in September/October after other crops are harvested. Cover with mulch for the winter. The garlic will be ready to harvest next July. For an early garlic treat, be sure to snip off the curlicue flower buds that appear in May and June. The buds (called scapes) are delicious when grilled, stirfried or sautéed .	**Companion Planting:** Most vegetables, *except* beans & peas.

Plant	*Climate Data*	*Growing*					*Notes*
		Light	**Planting & Timing**	**Soil**	**Spacing & Depth**	**General**	
						Height: Medium	
Lentils	Cool, semi-arid. Unable to find further data.	Data could not be found	**N/A**	6.0-8.0 pH.			
Lettuce	Germination temp. range: 40-80 °F Growth temp. range: 60-65 °F	Full sun Spring/Fall, Partial sun Summer.	Leaf & Romaine: Plant anytime in spring when soil dry enough to rake surface. Should be 1 mo. or more before the really hot days of summer start. 2+ subsequent plantings at 10-14 day intervals provides cont. supply Head: Must be transplanted, more care. Set transplants in garden as weather stabilizes.	~6.0-7.0 pH	Square Foot Planting: 4 lettuce /sq ft Seed depth: 1/8 inch	Seed or transplant at ten-day intervals starting in early April. When it gets hot, lettuce tends to "bolt" or send up its seed stalks before the plant is fully mature. Try to use "slow bolt" varieties since they will not become bitter as quickly. During the hottest part of the summer, plant lettuce where it will get some shade. Germination: 7-14 days (S, T) Height: Short-Medium	**Companion Planting:** Does well with most vegetables; carrots, garlic, onions and radishes are best.
Mint	Germination temp. range: 60-80 °F Growth temp. range: "cool"	Full sun	**N/A**	5.6-7.5 pH			**Companion Planting:** Alleged to repel aphids, cabbage pests, & flea beetles.
Nasturtiums/Nasturtia	Can be grown in a New England climate	Full sun	**N/A**				Needs good drainage
Onions	Germination temp. range: 50-95 °F Growth temp. range: 55-75 °F	Full sun	**N/A**	6.0-7.5 pH	Square Foot Planting: 16/sq ft Seed depth: 1/4 inch Set depth: 1 inch	Onions can be started from sets (small bulbs that can be purchased at nurseries or ordered from seed catalogs) or transplanted starting in mid-April. If you start with a flat of seedlings, separate them into individual	**Companion Planting:** Beets, cabbage family, carrots, kohlrabi, lettuce, parsnips, peppers, spinach, strawberries, tomatoes, & turnips.

Plant	*Climate Data*	*Growing*					*Notes*
		Light	**Planting & Timing**	**Soil**	**Spacing & Depth**	**General**	
						plants. Keep onions well weeded and give them an inch of water each week. The bigger the plants get before the Summer Solstice (June 21), the bigger the onions you'll grow. Germination: 4-5 days (T, Sets) Height: short	
Oregano	Germination temp. range: 60-70 °F Growth temp. range: "cool"	Full sun	**N/A**	6.0-8.0 pH			
Peppers, Hot	Germination temp. range: 65-95 °F Growth temp. range: 70-85 °F	Full sun [projected based on Sweet Pepper data]	**N/A**	~5.5-7.0 pH.			[Projected based on Sweet Pepper data] Sheltered area. **Companion Planting:** Carrots, onions, parsnip, peas and basil.
Peppers, Sweet	Germination temp. range: 65-95 °F Growth temp. range: 70-85 °F	Full sun	**N/A**	~5.5-7.0 pH.	Square Foot Planting: 1/sq ft Seed depth: 1/4 inch (T)	Peppers need lots of sun and heat to grow well. Must be transplanted in New England. Set transplants out early June. Early maturing varieties will do the best. Germination: 10-15 days (T) Height: Medium	Sheltered area. **Companion Planting:** Carrots, onions, parsnip, peas and basil.
Potatoes, Irish	Germination temp. range: 65-70 °F Growth temp. range: 50-65 °F	Full sun	**N/A**	~5.0-6.5 pH.			**Companion Planting:** Bush beans, cabbage family, corn, parsnips, peas.
Potatoes, Sweet	Germination temp. range: 60-85 °F Growth temp. range: 65-		**N/A**	5.0-6.0 pH.			

Plant	*Climate Data*	*Growing*					*Notes*
		Light	**Planting & Timing**	**Soil**	**Spacing & Depth**	**General**	
	75 °F						
Raspberries	Temperate climate. Unable to find further data.	Full sun	**N/A**				Relatively high-maintenance. Requires pruning, and is susceptible to a variety of diseases/pests. See article in "Sources" for more detail.
Sorghum	Soil temperature ~70 °F	Full sun (inferred)	**N/A**				
Sorrel	Germination temp. range: Growth temp. range:	Full/partial sun (inferred from experience)	**N/A**	Acidic soil (from experience)			
Strawberries	Dependent on variety. Am certain a New England variety can be found easily.	Full sun	**N/A**	5.5-6.5 pH. High moisture levels, but *not* waterlogged.			Due to high moisture requirements, grow very well in raised beds. Requires mulching in winter for protection.
Tomatilloes	Germination temp. range: 70-80 °F Growth temp. range: Unable to find	Full sun	**N/A**	6.0-7.0 pH.			
Tomatoes	Germination temp. range: 60-85 °F Growth temp. range: 70-75 °F	Full sun	**N/A**	~5.5-7.5 pH.	Square Foot Planting: 4 per 4'x4' block, or 2 under 4' of trellis Seed depth: 1/4 inch	Must be transplanted to develop mature fruit in New England. Transplant outside in late May to early June. "Indeterminate varieties" need to be trellised or staked and should be pruned back to the best 2-4 leaders (main stalks) on each plant. "Determinate varieties" don't need to be pruned, and will sprawl a little more. Withholding water after mid August will	Good air circulation is preferred. **Companion Planting:** Asparagus, basil, bush beans, cabbage family, carrots, celery, chives, cucumbers, garlic, lettuce, onions, & peppers.

Plant	*Climate Data*	*Growing*					*Notes*
		Light	**Planting & Timing**	**Soil**	**Spacing & Depth**	**General**	
						force the vines to ripen more fruit. Removing all young flower clusters after mid September will help the remaining fruit ripen as well. Germination: 6-14 days (T) Height: Tall	
Turnip	Germination temp. range: 65-70 °F Growth temp. range:	Full sun	**N/A**				**Companion Planting:** Onion family, peas.
Watermelon	Germination temp. range: 75-95 °F Growth temp. range: 65-75 °F	Full sun	**N/A**	~5.5-6.5 pH.	Square Foot Planting: 1/2 sq ft Seed depth: 1/2 inch (S, T)	Transplant or direct seed only after the soil has warmed up, late May to early June. When transplanting, be very careful not to disturb the roots. Melon vines take up a lot of space so grow them up a sturdy trellis or train the vines to grow over the edge of the raised bed and across your yard. Water regularly till fruits are set, then decrease water. Hope for a hot summer.	**Companion Planting:** Corn.
Zucchini	Germination temp. range: 70-95 °F Growth temp. range: 65-75 °F	Full sun	**N/A**	6.0-7.5 pH.	Square Foot Planting: 1 per 3 ft x 3 ft block Seed depth: 1/2-1 inch (S, T)	Seed or transplant after the soil has warmed up (late May to early June). Mound soil in center of 3 foot by 3 foot space about	**Companion Planting:** Celery, corn, onion, radish.

Plant	*Climate Data*	*Growing*					*Notes*
		Light	**Planting & Timing**	**Soil**	**Spacing & Depth**	**General**	
						4 inches high, plant 1-2 seeds in center of mound. Note: one or two mounds usually provide more than enough of squash for most families. Harvest several times a week so fruits don't grow too big and lose flavor.	

Depth:
(T) = Transplant
(S) = Direct Seed

Germination:
(T) = Transplant
(S) = Direct Seed

Table A.6: Crop cost data.

Plant	**Mountain Valley Seeds**				**Burpee**					
	Dollars per Ounce		*Dollars per Pound*		*Rate 1 (varies)*		*Rate 2 (varies)*		*Rate 3 (varies)*	
	Lower	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*
Asparagus	600 seeds/oz				$/50 seeds		$/100 seeds		$/25 roots	
Jersey Giant Hybrid[1]	$ 6.30	$ 8.38	$ 59.85	$ 63.00	--	--	--	--	$ 24.97	$ 30.50
Mary Washington	$ 1.25	$ 4.00	$ 18.00	$ 20.00	$ 1.98	--	$ 3.96	--	$ 12.47	$ 16.75
Basil	Varies (17,000-21,000 seeds/oz)				$/50 seeds		$/100 seeds		$/1000 seeds	
Dark Opal[3]	$ 3.75	$ 4.75	--	--	--	--	--	--	--	--
Dwarf Greek[3]	$ 4.51	$ 6.57	$ 72.16	--	--	--	--	--	--	--
Genovese[3]	$ 0.83	$ 3.00	$ 13.28	--	--	--	--	--	--	--
Italian Large Leaf[3]	$ 0.62	$ 3.00	$ 9.92	--	--	--	--	--	--	--
Lemon[3]	$ 2.96	$ 4.36	$ 47.36	--	--	--	--	--	--	--
Licorice[3]	$ 3.88	$ 4.46	$ 62.00	--	--	--	--	--	--	--
Lime[3]	$ 4.00	$ 5.60	--	--	--	--	--	--	--	--
Purple Ruffles[3]	$ 12.10	$ 13.97	--	--	--	--	--	--	--	--
Siam Queen[3]	$ 12.10	$ 13.97	--	--	--	--	--	--	--	--
Sweet Dani[2,3]	$ 4.05	$ 4.50	--	--	--	--	--	--	--	--
Thai[3]	$ 3.75	$ 5.50	$ 60.00	--	--	--	--	--	--	--
Beets	1200 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Bull's Blood	$ 1.31	$ 3.25	$ 18.80	$ 21.00	$ 0.83	--	$ 1.65	--	--	--
Burpee's Red Ball	--	--	--	--	$ 0.42	--	$ 0.84	--	--	--
Chicago Red Hybrid	--	--	--	--	$ 0.71	--	$ 1.41	--	--	--
Chioggia	--	--	--	--	$ 0.49	--	$ 0.99	--	--	--
Cylindra	$ 0.39	$ 0.53	$ 5.94	$ 6.25	$ 0.56	--	$ 1.13	--	--	--
Cylindra [Organic]	--	--	--	--	$ 0.74	--	$ 1.48	--	--	--

Plant	Mountain Valley Seeds				Burpee					
	Dollars per Ounce		Dollars per Pound		Rate 1 (varies)		Rate 2 (varies)		Rate 3 (varies)	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Detroit Dark Red	$ 0.31	$ 0.47	$ 4.46	$ 4.95	$ 0.19	$ 0.42	$ 0.38	$ 0.84	--	--
Detroit Dark Red [Organic]	--	--	--	--	$ 0.56	--	$ 1.13	--	--	--
Early Wonder Tall Top	$ 0.31	$ 0.47	$ 4.46	$ 4.95	--	--	--	--	--	--
Golden Globe	--	--	--	--	$ 0.99	--	$ 1.98	--	--	--
Little Chicago Hybrid	--	--	--	--	$ 0.42	--	$ 0.84	--	--	--
Red Heart Hybrid	--	--	--	--	$ 0.56	--	$ 1.13	--	--	--
Scarlet Prince	--	--	--	--	--	--	--	--	--	--
Broccoli	9000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Bonanza Hybrid	--	--	--	--	$ 1.24	--	$ 2.48	--	--	--
Flash	--	--	--	--	$ 1.31	--	$ 2.63	--	--	--
Georgia's Favorite Hybrid Blend	--	--	--	--	$ 3.69	--	--	--	--	--
Green Goliath	--	--	--	--	$ 0.49	--	$ 0.98	--	--	--
Packman Hybrid[1]	$ 0.92	$ 1.01	$ 9.20	--	--	--	--	--	--	--
Waltham 29	$ 0.45	$ 3.00	$ 6.48	$ 7.20	--	--	--	--	--	--
Cabbage	7000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Chinese, Orient Express	--	--	--	--	$ 0.74	--	$ 1.48	--	--	--
Chinese, Toy Choi Hybrid	--	--	--	--	$ 0.99	--	$ 1.98	--	--	--
Chinese, Two Seasons Hybrid	--	--	--	--	$ 0.56	--	$ 1.13	--	--	--
Copenhagen Market	$ 0.68	$ 0.81	$ 10.95	--	--	--	--	--	--	--
Danish Ballhead	$ 0.68	$ 0.81	$ 10.95	--	--	--	--	--	--	--
Golden Acre	$ 0.42	$ 0.49	$ 6.75	$ 7.50	--	--	--	--	--	--
King Slaw	--	--	--	--	$ 1.24	--	$ 2.48	--	--	--
Late Flat Dutch	$ 0.68	$ 0.81	$ 10.95	--	--	--	--	--	--	--
Mammoth Red Rock	$ 0.56	$ 3.25	$ 9.00	--	--	--	--	--	--	--
Pak Choi Joi Choi	--	--	--	--	$ 0.74	--	$ 1.48	--	--	--
Pok Choi White Stem	$ 0.68	$ 0.81	$ 10.95	--	--	--	--	--	--	--
Red Acre	$ 0.68	$ 0.81	$ 10.95	--	--	--	--	--	--	--
Cantaloupe	7000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Ambrosia Hybrid	--	--	--	--	$ 2.88	$ 4.92	$ 5.75	--	--	--
Burpee Hybrid	--	--	--	--	$ 2.88	$ 4.92	$ 5.75	--	--	--
Hale's Best	--	--	--	--	$ 4.92	--	--	--	--	--
Hearts of Gold [Organic]	--	--	--	--	$ 7.90	--	--	--	--	--
Honey Bun Hybrid	--	--	--	--	$ 5.25	--	--	--	--	--
Sweet'n Early Hybrid	$ 0.68	$ 0.81	$ 10.95	--	$ 4.92	--	--	--	--	--
Carrots	19000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Big Top	--	--	--	--	$ 0.17	--	$ 0.33	--	$ 3.30	--
Burpee A#1 Hybrid	--	--	--	--	$ 0.13	--	$ 0.25	--	$ 2.50	--
Chantenay Red Core	$ 0.50	$ 3.25	$ 7.20	$ 8.00	--	--	--	--	--	--
Danvers 126 Half-Long [Organic]	--	--	--	--	$ 0.20	--	$ 0.40	--	$ 3.95	--
Danvers Half-Long (128)	$ 0.50	$ 3.25	$ 7.20	$ 8.00	--	--	--	--	--	--

Plant	Mountain Valley Seeds				Burpee					
	Dollars per Ounce		Dollars per Pound		Rate 1 (varies)		Rate 2 (varies)		Rate 3 (varies)	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Danvers Half-Long (Heirloom)	--	--	--	--	$ 0.07	--	$ 0.15	--	$ 1.48	--
Imperator 58	$ 0.50	$ 3.25	$ 7.20	$ 8.00	--	--	--	--	--	--
Kaleidoscope	--	--	--	--	$ 0.25	--	$ 0.50	--	$ 4.95	--
Little Finger	$ 0.69	$ 3.25	$ 9.92	$ 11.04	$ 0.10	--	$ 0.20	--	$ 1.97	--
Nantes Half-Long	--	--	--	--	$ 0.10	--	$ 0.20	--	$ 1.97	--
Orange Rocket Hybrid	--	--	--	--	$ 0.13	--	$ 0.26	--	$ 2.63	--
Purple Dragon	--	--	--	--	$ 0.25	--	$ 0.50	--	$ 4.95	--
Rainbow Hybrid	--	--	--	--	$ 0.45	--	$ 0.90	--	--	--
Royal Chantenay	$ 0.50	$ 3.25	$ 7.20	$ 8.00	--	--	--	--	--	--
Scarlet Nantes	$ 0.50	$ 3.25	$ 7.20	$ 8.00	--	--	--	--	--	--
Scarlet Nantes [Organic]	--	--	--	--	$ 0.25	--	$ 0.49	--	--	--
Short 'n Sweet	--	--	--	--	$ 0.10	--	$ 0.20	--	$ 1.97	--
Sugarsnax Hybrid	--	--	--	--	$ 0.30	--	$ 0.59	--	--	--
Super Root	--	--	--	--	$ 0.40	--	$ 0.79	--	--	--
Sweet Treat Hybrid	--	--	--	--	$ 0.13	--	$ 0.26	--	$ 2.63	--
Thumbelina	--	--	--	--	$ 0.10	--	$ 0.20	--	$ 1.97	--
Touchon	--	--	--	--	$ 0.07	--	$ 0.15	--	$ 1.48	--
Cauliflower	7000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Colored Mix	--	--	--	--	$ 6.58	--	--	--	--	--
Early White Hybrid	--	--	--	--	$ 1.48	--	$ 2.95	--	--	--
First White Hybrid	--	--	--	--	$ 2.95	--	--	--	--	--
Self Blanche	$ 1.10	$ 3.68	$ 17.60	--	--	--	--	--	--	--
Snowball Y [Organic]	--	--	--	--	$ 2.47	--	$ 4.94	--	--	--
Snowball Y Improved	$ 1.07	$ 1.29	$ 17.12	--	--	--	--	--	--	--
Celery	70000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Utah 52-70	$ 1.76	$ 3.68	$ 17.60	--	$ 0.20	--	$ 0.39	--	--	--
Chard	1300 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Bright Lights	$ 12.60	$ 15.23	$ 201.60	--	--	--	--	--	--	--
Fordhook Giant	$ 0.31	$ 0.41	$ 4.60	$ 5.00	$ 0.60	--	$ 1.20	--	--	--
Fordhook Giant [Organic]	--	--	--	--	$ 1.98	--	$ 3.95	--	--	--
Lucullus	$ 0.36	$ 0.41	$ 5.20	$ 5.80	--	--	--	--	--	--
Rainbow Mixture	$ 2.19	$ 3.50	$ 35.00	--	--	--	--	--	--	--
Rhubarb	$ 1.03	$ 4.95	$ 14.00	$ 16.50	$ 0.70	--	$ 1.40	--	--	--
Ruby Red	$ 0.56	$ 3.00	$ 9.00	--	--	--	--	--	--	--
Cilantro	3000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Cilantro/Coriander	--	--	--	--	$ 0.98	--	$ 1.97	--	--	--
Cilantro/Coriander [Organic]	--	--	--	--	$ 1.32	--	$ 2.63	--	--	--
Slow Bolt	$ 0.98	$ 2.75	$ 5.60	$ 6.00	--	--	--	--	--	--
Collard Greens	8000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Georgia Southern	$ 0.31	$ 0.38	$ 4.50	$ 5.00	--	--	--	--	--	--

Plant	Mountain Valley Seeds				Burpee					
	Dollars per Ounce		Dollars per Pound		Rate 1 (varies)		Rate 2 (varies)		Rate 3 (varies)	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Morris Heading	$ 0.31	$ 0.38	$ 4.50	$ 5.00	--	--	--	--	--	--
Vates	$ 0.31	$ 0.38	$ 4.50	$ 5.00	--	--	--	--	--	--
Georgia Collards	--	--	--	--	$ 0.18	--	$ 0.37	--	--	--
Cress	??? seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Curled (Broadleaf)	$ 0.59	$ 3.00	$ 9.50	--						
Upland	$ 0.59	$ 3.50	$ 9.44	--						
Cucumbers	1000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Armenian Yard-Long	$ 0.63	$ 3.25	$ 9.00	$ 10.00	--	--	--	--	--	--
Boston Pickling	$ 0.46	$ 3.00	$ 2.08	$ 7.40	--	--	--	--	--	--
Burpee Hybrid II	--	--	--	--	$ 4.92	--	--	--	--	--
Burpee Pickler (Pickling)	--	--	--	--	$ 1.48	--	$ 2.95	--	--	--
Burpless #26 Hybrid[1]	$ 2.50	$ 3.50	$ 25.00	--	--	--	--	--	--	--
Burpless Beauty	--	--	--	--	$ 7.92	--	--	--	--	--
Bush Champion	--	--	--	--	$ 3.58	$ 4.92	$ 7.16	--	--	--
Bush Crop	$ 6.50	$ 7.51	--	--	--	--	--	--	--	--
Diva Hybrid[1]	$ 1.10	$ 3.00	$ 11.00	--	--	--	--	--	--	--
Double Feature Hybrid (Dual Use)	--	--	--	--	$ 5.64	--	--	--	--	--
Early Pride Hybrid	--	--	--	--	$ 3.58	$ 4.92	$ 7.16	--	--	--
Fanfare Hybrid[1]	$ 2.50	$ 4.00	$ 23.00	$ 25.00	$ 5.83	--	--	--	--	--
Lemon	$ 1.03	$ 3.85	$ 14.85	$ 16.50	--	--	--	--	--	--
Oriental Express Hybrid[1]	$ 1.60	$ 3.50	$ 13.00	$ 16.00	--	--	--	--	--	--
Pickalot Hybrid (Pickling)	--	--	--	--	$ 6.58	--	--	--	--	--
Picklebush (Pickling)	--	--	--	--	$ 4.92	--	--	--	--	--
Salad Bush Hybrid[1]	$ 8.40	$ 9.70	$ 69.20	$ 84.00	$ 8.25	--	--	--	--	--
Spacemaster	--	--	--	--	$ 4.92	--	--	--	--	--
Straight Eight	--	--	--	--	$ 1.48	--	$ 2.95	--	--	--
Straight Eight [Organic][6]	--	--	--	--	$ 1.88	--	$ 3.75	--	--	--
Streamliner Hybrid	--	--	--	--	$ 4.92	--	--	--	--	--
Sugar Crunch Hybrid	--	--	--	--	$ 6.58	--	--	--	--	--
Sweet Slice Hybrid[1]	$ 3.30	$ 3.98	$ 28.08	$ 33.00	--	--	--	--	--	--
Sweet Success Hybrid[1]	$ 14.00	$ 16.17	$ 140.00	--	--	--	--	--	--	--
Sweeter Yet Hybrid[1]	$ 2.50	$ 3.50	$ 22.50	$ 25.00	--	--	--	--	--	--
Wisconsin SMR [Pickling]	$ 0.46	$ 3.00	$ 6.66	$ 7.40	--	--	--	--	--	--
Yellow Submarine	--	--	--	--	$ 5.83	--	--	--	--	--
Eggplant	6000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Bambino Hybrid	--	--	--	--	$ 3.75	--	--	--	--	--
Black Beauty	$ 1.25	$ 4.00	$ 20.00	--	$ 4.92	--	--	--	--	--
Black Beauty [Organic][6]	--	--	--	--	$ 5.42	--	--	--	--	--
Fairy Tale Hybrid[1]	$ 5.31	$ 6.14	$ 53.10	--	$ 8.75	--	--	--	--	--
Gretel Hybrid[1]	$ 8.00	$ 10.08	$ 80.00	--	--	--	--	--	--	--

Plant	Mountain Valley Seeds				Burpee					
	Dollars per Ounce		*Dollars per Pound*		*Rate 1 (varies)*		*Rate 2 (varies)*		*Rate 3 (varies)*	
	Lower	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*
Hansel Hybrid[1]	$ 6.00	$ 6.93	$ 60.00	--	--	--	--	--	--	--
Ichiban Hybrid[1,4]	$ 1.26	$ 3.00	$ 12.60	--	--	--	--	--	--	--
Millionaire Hybrid	--	--	--	--	$ 4.92	--	--	--	--	--
Purple Blush Hybrid	--	--	--	--	$ 4.92	--	--	--	--	--
Purple Rain Hybrid	--	--	--	--	$ 8.25	--	--	--	--	--
Rosa Blanca	--	--	--	--	$ 4.92	--	--	--	--	--
Garlic	??? seeds/oz				$/bulb		$/oz		$/lb	
Chinese Leeks	$ 2.06	$ 3.00	$ 32.96	--	--	--	--	--	--	--
Early Italian	--	--	--	--	$ 1.49	$ 2.24	$ 1.12	--	--	--
Elephant Garlic	--	--	--	--	--	--	$ 1.12	--	--	--
Extra Select	--	--	--	--	$ 1.49	$ 1.79	$ 1.12	--	--	--
Silver Rose	--	--	--	--	$ 1.49	$ 2.24	$ 1.12	--	--	--
Kale	8500 seeds/oz				--		--		--	
Lacinato	$ 1.50	$ 4.00	$ 24.00	--	--	--	--	--	--	--
Vates Blue Scotch Curled	$ 0.44	$ 4.00	$ 6.70	$ 7.00	--	--	--	--	--	--
Lentils	420 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Lentil Sprouts	--	--	$ 2.53	$ 4.40						
Lettuce, Head	16000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Great Lakes 118[3]	$ 1.24	$ 3.50	--	--	--	--	--	--	--	--
Iceberg (A)	--	--	--	--	$ 0.20	--	$ 0.39	--	--	--
Igloo	--	--	--	--	$ 0.40	--	$ 0.79	--	--	--
Radicchio Red Surprise	--	--	--	--	$ 2.48	--	$ 4.95	--	--	--
Salinas[3]	$ 1.05	$ 1.49	--	--	--	--	--	--	--	--
Summertime[3]	$ 3.81	$ 4.98	--	--	$ 0.38	--	$ 0.75	--	--	--
Lettuce, Leaf	16000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Black Seeded Simpson[3]	$ 0.53	$ 3.00	--	--	$ 0.15	--	$ 0.30	--	$ 2.95	--
Black Seeded Simpson [Organic]	--	--	--	--	$ 0.20	--	$ 0.40	--	$ 3.95	--
Flying Saucer Series	--	--	--	--	$ 3.32	$ 3.95	--	--	--	--
Gourmet Blend	--	--	--	--	$ 0.18	$ 0.30	$ 0.36	$ 0.59	$ 3.58	--
Green Ice	--	--	--	--	$ 0.13	$ 0.20	$ 0.26	$ 0.39	$ 2.56	--
Heatwave	--	--	--	--	$ 0.40	--	$ 0.79	--	--	--
Lolla Rossa[3]	$ 3.22	$ 3.98	--	--	--	--	--	--	--	--
Oakleaf[3]	$ 0.53	$ 3.00	--	--	--	--	--	--	--	--
Prizehead[3]	$ 0.53	$ 3.00	--	--	--	--	--	--	--	--
Prizeleaf	--	--	--	--	$ 0.40	--	$ 0.79	--	--	--
Red Sails[3]	$ 4.27	$ 5.25	--	--	--	--	--	--	--	--
Red Salad Bowl	--	--	--	--	$ 0.40	--	$ 0.79	--	--	--
Royal Oak Leaf	--	--	--	--	$ 0.25	--	$ 0.50	--	--	--
Ruby Red[3]	$ 0.76	$ 3.00	--	--	--	--	--	--	--	--
Salad Bowl	--	--	--	--	$ 0.26	--	$ 0.53	--	--	--

Plant	Mountain Valley Seeds				Burpee					
	Dollars per Ounce		*Dollars per Pound*		*Rate 1 (varies)*		*Rate 2 (varies)*		*Rate 3 (varies)*	
	Lower	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*
Salad Bowl [Organic]	--	--	--	--	$ 0.20	--	$ 0.40	--	$ 3.95	--
Salad Bowl Green[3]	$ 0.54	$ 3.00	--	--	--	--	--	--	--	--
Santa Fe (Summer Batavia)	--	--	--	--	$ 0.14	$ 0.20	$ 0.28	$ 0.40	$ 2.75	$ 3.95
Simpson Elite	--	--	--	--	$ 0.30	--	$ 0.59	--	--	--
Lettuce, Romaine	16000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Braveheart	--	--	--	--	$ 0.40	--	$ 0.79	--	--	--
Cimmaron[3]	$ 1.04	$ 3.00	--	--	--	--	--	--	--	--
Little Caesar	--	--	--	--	$ 0.30	--	$ 0.59	--	--	--
Parris Island Cos[3]	$ 0.48	$ 3.00	--	--	--	--	--	--	--	--
Vivian	--	--	--	--	$ 0.50	--	$ 0.99	--	--	--
Mint	N/A				$/50 seeds		$/100 seeds		$/1000 seeds	
Spearmint	--	--	--	--	$ 0.40	--	$ 0.79	--	--	--
Nasturtiums/Nasturtia	175 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Jewel Mix	$ 0.81	$ 4.00	$ 12.96	--						
Onions	8000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Candy Hybrid[7]	--	--	--	--	$ 4.32	$ 5.58	$ 8.65	$ 11.17	--	--
Crystal White Wax (Pickling)	$ 2.38	$ 3.75	$ 34.20	$ 38.00	--	--	--	--	--	--
Exhibition[7]	--	--	--	--	$ 4.32	$ 5.58	$ 8.65	$ 11.17	--	--
Red Burgundy	$ 1.75	$ 3.50	$ 14.25	$ 28.00	--	--	--	--	--	--
Red Delicious Hybrid	--	--	--	--	$ 0.66	--	$ 1.32	--	--	--
Salad Red	--	--	--	--	$ 0.83	--	$ 1.65	--	--	--
Snow White Hybrid	--	--	--	--	$ 0.38	--	$ 0.75	--	--	--
Sweet & Early Hybrid	--	--	--	--	$ 0.49	--	$ 0.98	--	--	--
Texas Supersweet[7]	--	--	--	--	$ 4.32	$ 5.58	$ 8.65	$ 11.17	--	--
Walla Walla Sweet[7]	--	--	--	--	$ 4.32	$ 5.58	$ 8.65	$ 11.17	--	--
Oregano	??? seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Common Italian	$ 10.86	$ 13.13	--	--	--	--	--	--	--	--
Greek Strain	$ 25.00	$ 27.26	--	--	--	--	--	--	--	--
Peppers, Hot	4000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Anaheim Chili	$ 1.65	$ 3.50	$ 26.40	--	$ 1.48	--	$ 2.95	--	--	--
Ancho/Poblano	--	--	--	--	$ 1.48	--	$ 2.95	--	--	--
Big Thai Hybrid	--	--	--	--	$ 6.25	--	--	--	--	--
Biker Billy Hybrid	--	--	--	--	$ 6.58	--	--	--	--	--
Caribbean Red	--	--	--	--	$ 6.58	--	--	--	--	--
Cayenne Long Red	$ 1.88	$ 3.25	$ 30.08	--	$ 1.48	--	$ 2.95	--	--	--
False Alarm Hybrid	--	--	--	--	$ 6.58	--	--	--	--	--
Garden Salsa Hybrid[1]	$ 4.60	$ 5.57	$ 46.00	--	--	--	--	--	--	--
Habeñero	--	--	--	--	$ 6.58	--	--	--	--	--
Holy Mole Hybrid[1]	$ 6.16	$ 7.11	$ 61.60	--	--	--	--	--	--	--
Hot Lemon	--	--	--	--	$ 8.25	--	--	--	--	--

Plant	Mountain Valley Seeds				Burpee					
	Dollars per Ounce		*Dollars per Pound*		*Rate 1 (varies)*		*Rate 2 (varies)*		*Rate 3 (varies)*	
	Lower	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*
Hungarian Yellow Wax Hot	$ 2.00	$ 3.50	$ 32.00	--	$ 1.48	--	$ 2.95	--	--	--
Jalapeño	--	--	--	--	$ 1.48	--	$ 2.95	--	--	--
Jalapeño Early [Organic][6]	--	--	--	--	$ 1.98	--	$ 3.95	--	--	--
Large Cherry	--	--	--	--	$ 1.13	--	$ 2.25	--	--	--
Mariachi Hybrid[1]	$ 6.50	$ 9.00	$ 65.00	--	$ 9.90	--	--	--	--	--
Mucha Nacho[1]	$ 6.60	$ 8.50	$ 66.00	--	--	--	--	--	--	--
NuMex Big Jim	$ 3.13	$ 4.98	$ 50.08	--	--	--	--	--	--	--
Pasilla Baijo	$ 6.00	$ 7.26	--	--	--	--	--	--	--	--
Piñata Mix	--	--	--	--	$ 7.92	--	--	--	--	--
Red Cherry Hot	$ 5.50	$ 6.99	$ 88.00	--	--	--	--	--	--	--
Ristra Cayenne Hybrid	--	--	--	--	$ 6.58	--	--	--	--	--
Salsa Delight Hybrid	--	--	--	--	$ 6.58	--	--	--	--	--
Santa Fe Grande	$ 1.88	$ 3.75	$ 30.08	--	--	--	--	--	--	--
Serrano Chili	--	--	--	--	$ 1.48	--	$ 2.95	--	--	--
Spanish Spice Hybrid	--	--	--	--	$ 3.75	--	--	--	--	--
Thai Dragon	$ 24.00	$ 27.00	--	--	--	--	--	--	--	--
Tam Jalapeño	$ 1.69	$ 3.50	$ 27.00	--	--	--	--	--	--	--
Yellow Cayenne Hybrid	--	--	--	--	$ 3.75	--	--	--	--	--
Zavory	--	--	--	--	$ 8.25	--	--	--	--	--
Peppers, Sweet	4000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Jupiter[1]	--	--	$ 5.85	$ 6.50	--	--	--	--	--	--
Purple Beauty[1]	$ 1.06	$ 3.00	$ 10.56	--	--	--	--	--	--	--
Yolo Wonder L	$ 1.51	$ 4.00	$ 24.16	--	--	--	--	--	--	--
Keystone Resistant Giant	$ 1.75	$ 4.60	$ 28.00	--	--	--	--	--	--	--
Banana	$ 1.88	$ 4.95	$ 30.08	--	$ 1.48	--	$ 2.95	--	--	--
California Wonder TMR	$ 1.88	$ 5.00	$ 30.08	--	$ 3.95	--	--	--	--	--
Hungarian Yellow Wax Sweet	$ 2.03	$ 5.41	$ 32.48	--	--	--	--	--	--	--
Jumper Hybrid[1]	$ 2.50	$ 3.50	$ 20.00	$ 25.00	--	--	--	--	--	--
Bell Boy Hybrid[1]	$ 4.00	$ 5.00	$ 40.00	--	$ 5.94	--	--	--	--	--
Golden Cal Wonder	$ 4.28	$ 5.74	$ 68.48	--	--	--	--	--	--	--
Gypsy Hybrid[1]	$ 4.40	$ 5.00	$ 41.80	$ 44.00	$ 6.58	--	--	--	--	--
Big Bertha Hybrid[1]	$ 4.50	$ 5.00	$ 40.80	$ 45.00	$ 1.98	--	$ 3.95	--	--	--
North Star Hybrid[1]	$ 4.70	$ 5.00	$ 42.20	$ 47.00	--	--	--	--	--	--
Blushing Beauty Hybrid[1]	$ 4.80	$ 5.80	$ 40.00	$ 48.00	$ 1.98	--	$ 3.95	--	--	--
Giant Marconi Hybrid[1]	$ 5.17	$ 7.00	$ 46.40	$ 51.70	$ 13.17	--	--	--	--	--
Super Heavyweight[1]	$ 5.38	$ 6.57	$ 48.40	$ 53.82	--	--	--	--	--	--
Red Cherry, Sweet	$ 5.75	$ 6.95	$ 92.00	--	--	--	--	--	--	--
Big Red	$ 8.79	$ 9.70	--	--	$ 1.48	--	$ 2.95	--	--	--
Big Dipper	--	--	--	--	$ 1.98	--	$ 3.95	--	--	--
California Wonder [Organic][6]	--	--	--	--	$ 1.98	--	$ 3.95	--	--	--
Carnival Hybrid Mix	--	--	--	--	$ 1.98	--	$ 3.95	--	--	--

Plant	Mountain Valley Seeds				Burpee					
	Dollars per Ounce		*Dollars per Pound*		*Rate 1 (varies)*		*Rate 2 (varies)*		*Rate 3 (varies)*	
	Lower	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*
Cubanelle	--	--	--	--	$ 2.25	--	--	--	--	--
Big Daddy	--	--	--	--	$ 5.94	--	--	--	--	--
Chinese Giant	--	--	--	--	$ 5.94	--	--	--	--	--
Costa Rican	--	--	--	--	$ 5.94	--	--	--	--	--
Red Popper	--	--	--	--	$ 5.94	--	--	--	--	--
Tangerine Dream	--	--	--	--	$ 6.58	--	--	--	--	--
Bananarama	--	--	--	--	$ 8.25	--	--	--	--	--
Early Crisp Hybrid	--	--	--	--	$ 8.25	--	--	--	--	--
Golden Baby Belle	--	--	--	--	$ 8.25	--	--	--	--	--
Golden Giant II Hybrid	--	--	--	--	$ 8.25	--	--	--	--	--
Great Stuff Hybrid	--	--	--	--	$ 8.25	--	--	--	--	--
Pinot Noir Hybrid	--	--	--	--	$ 8.25	--	--	--	--	--
The Godfather Hybrid	--	--	--	--	$ 8.25	--	--	--	--	--
Red Delicious Hybrid	--	--	--	--	$ 9.90	--	--	--	--	--
Flavorburst Hybrid	--	--	--	--	$ 11.88	--	--	--	--	--
Orange Belle Hybrid II	--	--	--	--	$ 16.50	--	--	--	--	--
Potatoes, Irish	N/A				$/10 mini-tubers		--		--	
All Blue	--	--	--	--	$ 15.75	$ 18.95	--	--	--	--
Daisy Gold	--	--	--	--	$ 15.75	$ 18.95	--	--	--	--
Huckleberry	--	--	--	--	$ 15.75	$ 18.95	--	--	--	--
Kennebec	--	--	--	--	$ 15.25	$ 30.50	--	--	--	--
Red Gold	--	--	--	--	$ 15.75	$ 18.95	--	--	--	--
Red Pontiac	--	--	--	--	$ 15.25	$ 30.50	--	--	--	--
Rose Finn Apple	--	--	--	--	$ 15.75	$ 18.95	--	--	--	--
Russet Norkatoh	--	--	--	--	$ 15.25	$ 30.50	--	--	--	--
Russian Banana	--	--	--	--	$ 15.75	$ 18.95	--	--	--	--
Swedish Peanut Fingerling	--	--	--	--	$ 15.75	$ 18.95	--	--	--	--
Yukon Gold	--	--	--	--	$ 15.75	$ 18.95	--	--	--	--
Potatoes, Sweet	N/A				$/12 bareroots		$/25 bareroots		--	
Beauregard	--	--	--	--	$ 13.50	--	$ 18.95	--	--	--
Bush Porto Rico	--	--	--	--	$ 13.50	--	$ 18.95	--	--	--
Centennial	--	--	--	--	$ 13.50	--	$ 18.95	--	--	--
Georgia Jet	--	--	--	--	$ 13.50	--	$ 18.95	--	--	--
Vardaman	--	--	--	--	$ 13.50	--	$ 18.95	--	--	--
Raspberries	N/A				$/5 plants		$/10 plants		--	
Anne	--	--	--	--	$ 17.87	$ 19.95	$ 35.74	--	--	--
Caroline	--	--	--	--	$ 17.87	$ 19.95	$ 35.74	--	--	--
Heritage	--	--	--	--	$ 15.75	$ 17.75	$ 31.50	--	--	--
Jewel	--	--	--	--	$ 28.47	$ 31.50	$ 56.94	--	--	--
Killarney	--	--	--	--	$ 15.75	$ 17.75	$ 31.50	--	--	--

Plant	Mountain Valley Seeds				Burpee					
	Dollars per Ounce		*Dollars per Pound*		*Rate 1 (varies)*		*Rate 2 (varies)*		*Rate 3 (varies)*	
	Lower	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*
Sorghum					--		--		--	
Sorrel	??? seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Large-leaf Sorrel	$ 1.56	$ 3.00	$ 19.60	$ 25.00	--	--	--	--	--	--
Strawberries	N/A				$/25 plants		$/50 plants		--	
Albion	--	--	--	--	$ 11.97	$ 15.75	$ 23.94	--	--	--
Earliglow	--	--	--	--	$ 11.97	$ 15.75	$ 23.94	--	--	--
Northeaster	--	--	--	--	$ 11.97	$ 15.75	$ 23.94	--	--	--
Seascape	--	--	--	--	$ 11.97	$ 15.75	$ 23.94	--	--	--
Tribute	--	--	--	--	$ 11.97	$ 15.75	$ 23.94	--	--	--
Tomatilloes	10000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Gigante	--	--	--	--	$ 1.58	--	$ 3.16	--	--	--
Grande Rio Verde	$ 5.25	$ 5.98	--	--	--	--	--	--	--	--
Toma Verde	--	--	--	--	$ 1.18	--	$ 2.36	--	--	--
Tomatoes	10000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Ace 55 VF[3]	$ 2.10	$ 3.50	--	--	--	--	--	--	--	--
Beefmaster Hybrid[1,3]	$ 2.85	$ 4.20	--	--	--	--	--	--	--	--
Beefsteak[3]	$ 2.45	$ 3.28	--	--	--	--	--	--	--	--
Best Boy Hybrid	--	--	--	--	$ 4.92	--	--	--	--	--
Better Boy Hybrid[1,3]	$ 2.40	$ 3.25	--	--	$ 6.58	--	--	--	--	--
Big Pink	--	--	--	--	$ 8.75	--	--	--	--	--
Big Rainbow	--	--	--	--	$ 3.95	--	--	--	--	--
Black Krim	--	--	--	--	$ 3.95	--	--	--	--	--
Black Pearl Hybrid	--	--	--	--	$ 8.75	--	--	--	--	--
Black Truffle Hybrid	--	--	--	--	$ 6.58	--	--	--	--	--
Bloody Butcher	--	--	--	--	$ 2.50	--	--	--	--	--
Bonny Best[3]	$ 11.00	$ 12.00	--	--	--	--	--	--	--	--
Brandy Boy Hybrid	--	--	--	--	$ 8.25	--	--	--	--	--
Brandywine	--	--	--	--	$ 4.92	--	--	--	--	--
Brandywine Pink[3]	$ 12.50	$ 13.75	--	--	--	--	--	--	--	--
Brandywine Red	--	--	--	--	$ 4.92	--	--	--	--	--
Brandywine Red [Organic]	--	--	--	--	$ 6.58	--	--	--	--	--
Bucks County Hybrid	--	--	--	--	$ 6.25	--	--	--	--	--
Burpee's Big Boy Hybrid[1,3]	$ 2.00	$ 3.50	--	--	$ 4.92	--	--	--	--	--
Burpee's Bunch Hybrid	--	--	--	--	$ 8.75	--	--	--	--	--
Celebrity Hybrid[1,3]	$ 2.75	$ 4.95	--	--	--	--	--	--	--	--
Champion II Hybrid[1,3]	$ 2.00	$ 4.50	--	--	--	--	--	--	--	--
Early Girl Hybrid[1,3]	$ 1.80	$ 4.60	--	--	--	--	--	--	--	--
Goliath Hybrid[1,3]	$ 3.00	$ 4.20	--	--	--	--	--	--	--	--
Grapette Hybrid[1,3]	$ 3.33	$ 5.50	--	--	--	--	--	--	--	--
Hamson (DX-52-12)[2,3]	$ 4.00	$ 6.00	--	--	--	--	--	--	--	--

Plant	Mountain Valley Seeds				Burpee					
	Dollars per Ounce		*Dollars per Pound*		*Rate 1 (varies)*		*Rate 2 (varies)*		*Rate 3 (varies)*	
	Lower	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*
Heartland Hybrid[1,3]	$ 2.20	$ 2.50	--	--	--	--	--	--	--	--
Husky Red Hybrid[1,3]	$ 2.50	$ 3.50	--	--	--	--	--	--	--	--
Jet Star Hybrid[1,3]	$ 1.80	$ 5.00	--	--	--	--	--	--	--	--
Juliet Hybrid[3]	$ 2.00	$ 6.00	--	--	--	--	--	--	--	--
Keepsake[3]	$ 2.20	$ 2.40	--	--	--	--	--	--	--	--
LaRoma II Red[3]	$ 1.74	$ 3.50	--	--	--	--	--	--	--	--
Napa Hybrid Grape Tomato	--	--	--	--	$ 8.75	--	--	--	--	--
Oregon Spring[3]	$ 11.55	$ 13.37	--	--	--	--	--	--	--	--
Patio Hybrid[3]	$ 0.70	$ 0.80	$ 6.00	$ 7.00	--	--	--	--	--	--
Red Grape[3]	$ 13.00	$ 15.00	--	--	--	--	--	--	--	--
Red Pear[3]	$ 5.65	$ 6.52	--	--	--	--	--	--	--	--
Rio Grande[3]	$ 2.33	$ 4.00	--	--	--	--	--	--	--	--
Roma[3]	$ 2.49	$ 3.98	--	--	--	--	--	--	--	--
Rutgers[3]	$ 2.20	$ 4.38	--	--	--	--	--	--	--	--
Sugary[3]	$ 4.60	$ 7.00	--	--	--	--	--	--	--	--
Sunsugar Hybrid[3]	$ 3.90	$ 12.65	--	--	--	--	--	--	--	--
Super Fantastic Hybrid[3]	$ 4.30	$ 5.00	--	--	--	--	--	--	--	--
Thessaloniki[3]	$ 9.22	$ 13.75	--	--	--	--	--	--	--	--
Viva Italia Hybrid[3]	$ 1.60	$ 3.50	--	--	--	--	--	--	--	--
Yellow Pear[3]	$ 5.63	$ 7.15	--	--	$ 0.98	--	$ 1.97	--	--	--
Yellow Pear[3] [Organic][6]	--	--	--	--	$ 1.32	--	$ 2.63	--	--	--
Tomatoes, Cherry	10000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Cherries Jubilee	--	--	--	--	$ 24.75	--	--	--	--	--
Cherry Roma	--	--	--	--	$ 8.25	--	--	--	--	--
Gardener's Delight	--	--	--	--	$ 2.95	--	--	--	--	--
Gardener's Delight [Organic][6]	--	--	--	--	$ 3.65	--	--	--	--	--
Juliet Hybrid	--	--	--	--	$ 6.25	--	--	--	--	--
Large Red Cherry[3]	$ 2.36	$ 3.98	--	--	--	--	--	--	--	--
Little Girl Hybrid	--	--	--	--	$ 4.92	--	--	--	--	--
Sugar Snack Hybrid	--	--	--	--	$ 8.75	--	--	--	--	--
Sun Gold Hybrid	--	--	--	--	$ 8.25	--	--	--	--	--
Supersweet 100 Hybrid[3]	$ 1.87	$ 3.85	--	--	$ 4.92	--	--	--	--	--
Sweet Baby Girl Hybrid	--	--	--	--	$ 6.58	--	--	--	--	--
Sweetheart of the Patio	--	--	--	--	$ 24.75	--	--	--	--	--
Tumbler Hybrid	--	--	--	--	$ 19.75	--	--	--	--	--
Turnip	12000 seeds/oz				$/50 seeds		$/100 seeds		$/1000 seeds	
Seven Top[5]	$ 0.25	--	$ 4.00	--	--	--	--	--	--	--
Watermelon	Varies (See first column)				$/50 seeds		$/100 seeds		$/1000 seeds	
Calsweet (675 seeds/oz)	$ 0.88	$ 3.25	$ 12.60	$ 14.00	--	--	--	--	--	--
Crimson Sweet (746 seeds/oz)	$ 0.81	$ 3.25	$ 11.60	$ 13.00	--	--	--	--	--	--

Plant	Mountain Valley Seeds				Burpee					
	Dollars per Ounce		*Dollars per Pound*		*Rate 1 (varies)*		*Rate 2 (varies)*		*Rate 3 (varies)*	
	Lower	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*
Jubilee (308 seeds/oz)	$ 0.69	$ 3.00	$ 8.00	$ 11.00	--	--	--	--	--	--
Sangrea Hybrid[1] (663 seeds/oz)	$ 4.65	$ 5.63	$ 46.50	--	--	--	--	--	--	--
Striped Klondike Blue Ribbon (489 seeds/oz)	$ 0.69	$ 3.25	$ 10.45	$ 11.00	--	--	--	--	--	--
Sugar Baby (616 seeds/oz)	$ 0.50	$ 3.00	$ 7.20	$ 8.00	--	--	--	--	--	--
Sweet Beauty Hybrid[1]	$ 6.60	$ 9.10	$ 66.00	--	--	--	--	--	--	--
Yellow Doll Hybrid[1] (834 seeds/oz)	$ 8.00	$ 10.00	$ 80.00	--	--	--	--	--	--	--
Yams	N/A				$/50 seeds		$/100 seeds		$/1000 seeds	
Zucchini	Varies (See first column)				$/50 seeds		$/100 seeds		$/1000 seeds	
Zucchini Aristocrat[1] (180 seeds/oz)	$ 4.05	$ 4.62	$ 36.45	$ 40.50	--	--	--	--	--	--
Zucchini Black Beauty (230 seeds/oz)	$ 0.41	$ 3.00	$ 5.94	$ 6.60	--	--	--	--	--	--
Zucchini Cashflow Hybrid[1]	$ 3.22	$ 3.75	$ 32.15	--	--	--	--	--	--	--
Zucchini Eight Ball Hybrid[1] (200 seeds/oz)	$ 3.10	$ 3.60	$ 31.00	--	--	--	--	--	--	--
Zucchini Elite Hybrid[1] (216 seeds/oz)	$ 3.60	$ 9.60	$ 33.00	$ 36.00	--	--	--	--	--	--
Zucchini Greyzinni Hybrid	$ 3.75	$ 7.00	$ 60.00	--	--	--	--	--	--	--
Zucchini Italian Striped (230 seeds/oz)	$ 0.63	$ 0.75	$ 9.00	$ 10.00	--	--	--	--	--	--
Zucchini Spineless Beauty Hybrid[1]	$ 2.30	$ 2.50	$ 23.00	--	--	--	--	--	--	--
Zucchini, Golden	$ 1.13	$ 3.85	$ 17.20	$ 18.00	--	--	--	--	--	--

LEGEND
Not regularly purchased by APW
(Cost field) Measured in $/100 and $/1,000 seeds, instead of $/oz and $/lb, respectively
(Cost field) Measured in $/1,000 and $/10,000 seeds, instead of $/oz and $/lb, respectively

FOOTNOTES	
1.	Instead of "$/oz" and "$/lb", measurements are "$/100 seeds" and "$/1,000 seeds", resp.
2.	Instead of "$/oz" and "$/lb", measurements are "$/1,000 seeds" and "$/10,000 seeds", resp.
3.	Assuming no more than 8 oz will be purchased at a time (standard: max 5 lb)
4.	Only available "treated"
5.	Assuming no more than 1 lb will be purchased at a time (standard: max 5 lb)
6.	# seeds per packet extrapolated from non-organic/organic variety
7.	Sold "by the plant" instead of "by the seed"

Crop Yield Data

Crop Yield		
Plant	**Type**	**Yield (Varies)**
Basil	Dark Opal	16 Cups/plant
	Dwarf Greek	*
	Genovese	*
	Italian Large Leaf	*
	Lemon	*
	Licorice	*
	Lime	*
	Purple Ruffles	*
	Siam Queen	*
	Sweet Dani	*
	Thai	*
Beets	Bull's Blood	10,800 lbs/acre
	Cylindra	*
	Detroit Dark Red	*
	Early Wonder Tall Top	*
	Golden Detroit	*
	Ruby Queen	*
Broccoli	Packman Hybrid	6,600 lbs/acre
	Waltham	*
Cabbage	Copenhagen Market	13,700lbs/acre
	Danish Ballhead	*
	Golden Acre	*
	Late Flat Dutch	*
	Mammoth Red Rock	*
	Pok Choi White Stem	*
	Red Acre	*
Carrots	Chantenay Red Core	19,400lbs/acre
	Canvers Half-Long	*
	Imperator	*
	Little Finger	*
	Royal Chantenay	*
	Scarlet Nates	*
Cauliflower	Self Blanche	10,800lbs/acre
	Snowball Y Improved	*
Celery	Utah 52-70	40,000 lbs/acre
Corn, Sweet	BC 0801 Hybrid	
	Early Sunglow Hybrid	
	Honey & Cream Hybrid	
	IO Chief Hybrid	
	Jubilee Hybrid	
	NK 199 Hybrid	
	Silver Queen Hybrid	no longer considered
Cress	Curled (Broadleaf)	12.5 tons/acre**
	Upland	*
Cucumbers	Armenian Yard-Long	8,400lbs/acre
	Boston Pickling	*
	Burpless #26 Hybrid	*

Crop Yield		
Plant	**Type**	**Yield (Varies)**
	Bush Crop	*
	Diva Hybrid	*
	Fanfare Hybrid	*
	Lemon	*
	Oriental Express Hybrid	*
	Salad Bush Hybrid	*
	Sweet Slice Hybrid	*
	Sweet Success Hybrid	*
	Sweeter Yet Hybrid	*
	Wisconsin SMR [Pickling]	*
Eggplant	Black Beauty	108 lbs/100sqft
	Fairy Tale Hybrid	*
	Gretel Hybrid	*
	Hansel Hybrid	*
	Ichiban Hybrid	*
Garlic	Garlic Chives	120 lbs/100sqft
Lentils		700 lbs/acre
Lettuce, Head	Great Lakes 118	9,100lbs/acre
	Salinas	*
	Summertime	*
Lettuce, Leaf	Black Seeded Simpson	9,100lbs/acre
	Lolla Rossa	*
	Oakleaf	*
	Prizehead	*
	Red Sails	*
	Ruby Red	*
	Salad Bowl Green	*
Lettuce, Romaine	Cimmaron	9,100lbs/acre
	Parris Island Cos	*
Mint		80 tons/acre**
Nasturtiums/Nasturtia	Jewel Mix	N/A
Onions	Red Burgandy	19,800lbs/acre
	Crystal White Wax [Pickling]	*
Oregano	Common Italian	.66lbs/plant
	Greek Strain	*
Peppers, Bell	Banana	15lbs/25ft
	Bell Boy Hybrid	*
	Big Bertha Hybrid	*
	Big Red	*
	Blushing Beauty Hybrid	*
	California Wonder TMR	*
	Giant Marconi	*
	Golden Cal Wonder	*
	Gypsy Hybrid	*
	Hungarian Yellow Wax Sweet	*
	Jumper Hybrid	*
	Jupiter	*
	Keystone Resistant Gian	*
	North Star Hybrid	*
	Purple Beauty	*
	Red Cherry, Sweet	*

Crop Yield		
Plant	**Type**	**Yield (Varies)**
	Super Heavyweight	*
	Yolo Wonder L	*
Peppers, Hot	Anaheim Chili	50 lbs/20plants
	Cayenne Long Red	*
	Garden Salsa Hybrid	*
	Holy Mole Hybrid	*
	Hungarian Yellow Wax Hot	*
	Mariachi Hybrid	*
	Mucha Nacko	*
	NuMex Big Jim	*
	Pasilla Baijo	*
	Red Cherry Hot	*
	Santa Fe Grande	*
	Thai Dragon	*
	Tam Jalapeno	*
Potatoes, Irish		22,000 lbs/acre
Potatoes, Sweet		17,500 lbs/acre
Sorrel	Large-Leaf Sorrel	2.5 tons/acre
Tomatilloes	Grande Rio Verde	Could not find
Tomatoes	Ace 55 VF	200 lbs/100sqft
	Beefmaster Hybrid	*
	Beefsteak	*
	Better Boy Hybrid	*
	Bonny Best	*
	Brandywine Pink	*
	Burpee Big Boy Hybrid	*
	Celebrity Hybrid	*
	Champion II Hybrid	*
	Early Girl Hybrid	*
	Goliath Hybrid	*
	Grapette Hybrid	*
	Hamson DX	*
	Heartland Hybrid	*
	Husky Red Hybrid	*
	Jet Star Hybrid	*
	Juliet Hybrid	*
	Keepsake	*
	LarRoma II Red	*
	Large Red Cherry	*
	Oregon Spring	*
	Patio Hybrid	*
	Red Grape	*
	Red Pear	*
	Rio Grande	*
	Roma	*
	Rutgers	*
	Sugary	*
	Sunsugar Hybrid	*
	Super Fantastic Hybrid	*
	Supersweet 100 Hybrid	*
	Thessaloniki	*
	Viva Italia Hybrid	*

Crop Yield		
Plant	**Type**	**Yield (Varies)**
	Yellow pear	*
Turnip	Seven Top	12,000 lbs/acre
Watermelon	Calsweet	100 lbs/100sqft
	Crimson Sweet	*
	Jubilee	*
	Sangrea Hybrid	*
	Stiped Klondike Blue Ribbon	*
	Sugar Baby	*
	Sweet Beauty Hybrid	*
	Yellow Doll Hybrid	*
Yams		12,000 lbs/acre**
Zucchini	Zucchini Aristocrat	10,500 lbs/acre
	Zucchini Black Beauty	*
	Zucchini Cashflow Hybrid	*
	Zucchini Eight Ball Hybrid	*
	Zucchini Elite Hybrid	*
	Zucchini Greyzinni Hybrid	*
	Zucchini Italian Striped	*
	Zucchini Spineless Beauty Hybrid	*
	Zucchini, Golden	*

Legend	
*	Same as Above
**	mass produced

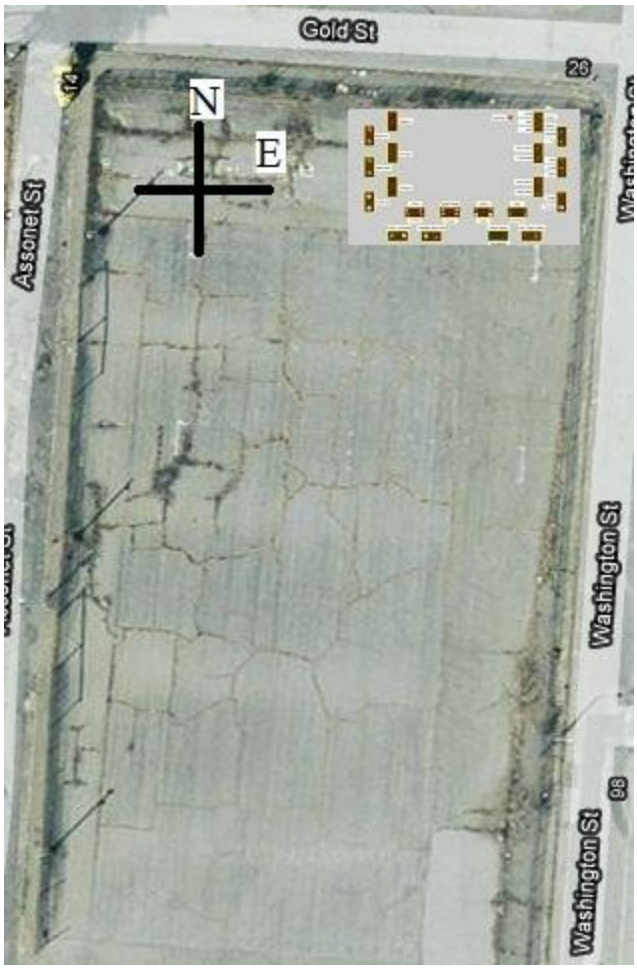
Garden Design & Layout

Community Garden Group

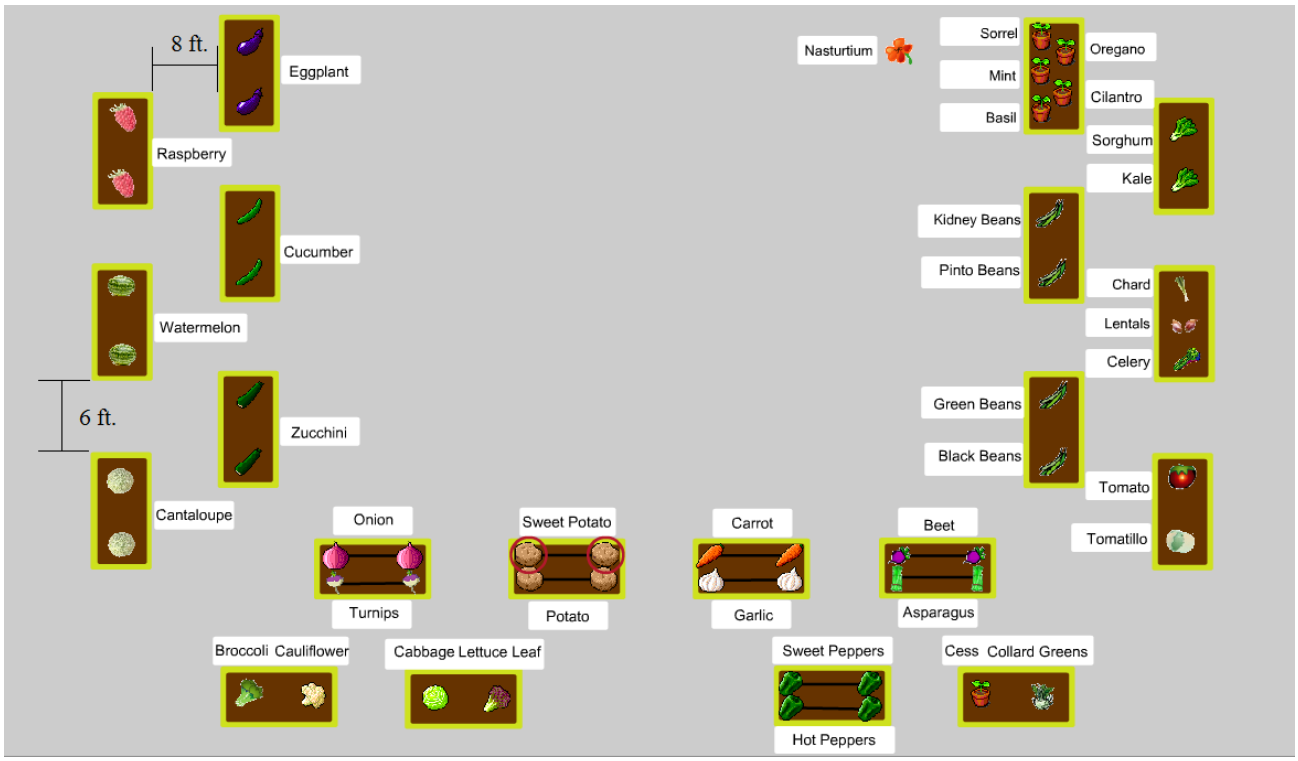
Robert Grady, Jason Reynolds, Lee Hermsdorf-Krasin, & Evan Sawyer

Garden Design & Layout

For the design of AIDS Project Worcester's garden the number one site was chosen. The image to the right shows how much space this start up garden would take. This design is a recommendation bases off the ease of access to each bed and takes into account how much growing space each plant needs. For instance plants that spread or grow outward, such as watermelons and cucumbers, were given their own beds. Also plants that grow taller than others were placed in the back rows (looking from the middle) so that locating a certain plant would be easier.



The image on the next page shows the actual layout of the garden down to where plants are grown and the minimum space in between beds. The minimum space would allow people to work on each bed and still have enough room for traffic in between. The open space in the middle of the garden would allow for materials, dirt or compost, to be placed. This would make distributing the material the same distance in all directions.


8 ft.
Eggplant
Raspberry
Cucumber
Watermelon
6 ft.
Zucchini
Cantaloupe
Nasturtium
Sorrel
Mint
Basil
Oregano
Cilantro
Sorghum
Kale
Kidney Beans
Pinto Beans
Chard
Lentals
Celery
Green Beans
Black Beans
Tomato
Tomatillo
Onion
Turnips
Sweet Potato
Potato
Carrot
Garlic
Beet
Asparagus
Broccoli Cauliflower
Cabbage Lettuce Leaf
Sweet Peppers
Hot Peppers
Cess Collard Greens