

The Grass Isn't Greener:

Exploring the Motivations for and Barriers to Home Gardening in Rhode Island

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Executive Summary

Food production and consumption in Rhode Island must be understood within a national and even global context because the average food item travels between 1,500 and 2,500 miles before reaching a consumer's plate.¹ Moreover, modern, industrial farms often grow only one or two crops and depend upon synthetic pesticides and fertilizers, heavy machinery and large-scale irrigation, which in turn depend upon natural gas and oil reserves. According to a recent Cornell University study, production of the average American diet requires more than 500 gallons of oil per person per year.² These factors combine to create a host of consequences that significantly impact human health and the environment, such as global climate change and high levels of air, water and soil pollution.

In the face of such overwhelming problems, it is sometimes difficult to find the motivation for personal action, despite the fact that profound issues like climate change demand - in addition to top-down policy - a combination of many actions at the individual level. This is one reason why vegetable gardening is such an attractive prospect. In addition to empowering an individual against the large scale consequences of our food supply, growing some of one's own food combats more tangible problems faced by Rhode Island residents and their communities. Gardening can reduce diet-related diseases, high grocery bills, and childhood obesity, while increasing self sufficiency, promoting exercise, reducing stress and providing hands-on education for children and adults. As Michael Pollan once wrote, growing even a little of one's own food is "one of those solutions that, instead of begetting a new set of problems - the way 'solutions' like ethanol or nuclear power inevitably do - actually beget other solutions, and not only of the kind that save carbon."³

While I advocate for the increase of local food through community gardening, vacant lot gardening and small scale farming, this thesis focuses almost exclusively on the value of home vegetable gardening. Aside from avoiding the need for land acquisition, the proximity of front and backyards to homes provides a number of benefits for growing food: visibility encourages tending and provides more security for produce while pre-existing water supplies prevent the need for costly installation.

Rhode Island's front and backyards possess the potential to grow the most local and nutritious food possible, and although some residents are already growing their own food, it is clear that there is room for many more gardens in the state. A large portion of my research therefore focuses on the reasons why most Rhode Island citizens do not grow a portion of their own food, and conversely, what motivates those who do.

With the ultimate goal of increasing the number of home gardens in Rhode Island, I interviewed customers at farmers markets, a population I believed would be the most amenable to the idea of gardening at home. These interviews revealed a number of barriers that are both common and possible to address. Two of the most significant barriers found were perceived or real concerns about soil contamination and a general lack of knowledge about growing food. Notably, I found that many current gardeners also struggle with lack of knowledge, which they feel significantly affects their success in the garden.

Taking into consideration the information gathered from my interviews, I recommend a number of ways in which home vegetable gardening might be expanded in Rhode Island. I focus specifically on the recommendation of garden coaching in which an experienced gardener is matched with a person who lacks the knowledge or confidence necessary to grow food successfully in their front or backyard. I highlight this recommendation because it is both feasible at the present time and because it has the potential to address many of the barriers brought up during my interviews. Lastly I discuss how the garden coaching recommendation was put into action in collaboration with the University of Rhode Island Master Gardener program.

I. Introduction

Last summer I was given the opportunity to help with the creation of a large vegetable garden. Gardening was a completely new experience for me and one that I would not have undertaken if it weren't for the initiative and support of others. Mid-way through the summer my typical graduate school eating habits of pizza or a simple sandwich transformed into lush, green salads made brilliant by the contrast of yellow peppers, wine-colored radishes and orange carrots or juicy sandwiches filled with tomatoes sweeter than any grocery store in the area could provide. I learned that kale and swiss chard, though previously foreign and unappealing to me in the grocery store, were delicious when cooked properly, and that eggplant, when home-grown and home cooked, is my favorite food. With the garden came intellectual and psychological nourishment too. I learned basic skills that had gone almost three decades unlearned and found contentment at the end of the day directly attributable to the sunshine, the exercise and the sense of accomplishment gained from participating in an activity where progress and success were readily achieved.

In addition to the increase of my own quality of life, I saw that gardening had broader environmental benefits as well. At a time when the landfill in Johnston, RI was filling up, I was able to avoid the packaging that comes along with food from a grocery store or restaurant, and my food wastes could be re-used some time in the future in the form of compost. I was also using much less water in the garden than is demanded by a typical Rhode Island lawn and avoiding fertilizers, pesticides and gas-powered mowers altogether. The most significant environmental benefit however, was that much of my

food did not have to travel in order to reach my plate. Each time I harvested and ate a vegetable from the garden I was avoiding, on average, more than 1500 miles of transport.⁴

The benefits I saw from my experience with gardening may be some of the same reasons why journalist Michael Pollan considers gardening “one of the most powerful things an individual can do”⁵ or why community activist Heather Flores encourages gardening with the following statement:

Whether you live in an apartment, in the suburbs, on a farm, or anywhere in between, growing food is the first step toward a healthier, more self-reliant, and ultimately more ecologically sane life. Gardening may seem like just a hobby to many people, but in fact growing food is one of the most radical things you can do: Those who control our food control our lives, and when we take that control back into our own hands, we empower ourselves toward autonomy, self reliance, and true freedom⁶

Perhaps like these authors, I began gardening with the knowledge that I had enough money allotted for a garden’s every need, that there was enough time available to nurture each plant, that the soil I began with was healthy and that expert gardeners were close at hand with encouragement and advice. I had a wealth of resources that most would-be gardeners do not begin with. What then, does the average Rhode Islander face when deciding to start a garden, and even if all the resources were to fall into place, how much interest or need is there for the average citizen to start growing their own food? Furthermore, even if it were apparent that gardens are beneficial and feasible for the average citizen, how might they be encouraged?

There is evidence that Rhode Islanders do recognize or have a need for the benefits of fresh, locally grown food. This is indicated by the wait lists at many

community gardens around the state. Outside of community gardens, Rhode Island's local food movement is alive and well thanks primarily to the hard work of local farmers, but also to the efforts of organizations like Farm Fresh Rhode Island, which connects local consumers and local farmers in increasingly creative and successful ways. The numbers of shares through Community Supported Agriculture (CSA) increase every year, more school gardens are beginning to take root and farmers' markets continue to grow and expand in the state. The most recent USDA census from 2007 (the census is conducted every five years) states that among New England states, Rhode Island ranks first in direct market sales as a percentage of all farm sales, and fifth in the nation in farms with organic sales.⁷ This interest and support for fresh, local farm-grown or community garden-grown food is well deserved, but what about complementing these valuable strategies with one that comes from an even more local source?

To some people in Rhode Island, vegetable gardening is not a novel idea. There are Rhode Islanders who were gardening in their yards long before I thought about picking up a shovel. Still, the phenomenon is a small one: one study suggests that only 1.6% of families in Providence grow their own food.⁸ What encouragement or circumstances do average Rhode Island citizens need to begin digging up their back - and perhaps even their front - lawns?

My questions must be considered within the context of Rhode Island's current economic landscape, which has undergone a drastic change. From November 2007 to March 2009, Rhode Island's unemployment rate rose from 5.1 to 10.5 percent.⁹ An unemployed individual who earned the median household income of \$53,568 annually in

2007 now receives only \$15,106 in unemployment benefits per year, an income that is considered below the poverty level for a family of three.¹⁰ This new group of unemployed individuals must now contend with rising food prices, as do those who have been dealing with low income on a more chronic basis. In a study of local food costs, the Rhode Island Community Food Bank found that the weekly cost of groceries in the state increased by six percent from September 2007 to September 2008, and according to the USDA, food prices will continue to rise.¹¹

Low income, joblessness, high food prices and the fact that many families who are eligible for food stamps do not receive them (the most recent data indicates that 44% of those eligible do not participate)¹² have combined to increase food insecurity in Rhode Island significantly. Gardens often become more popular during difficult economic times, as seen in Rhode Island during the 1930's and 40's. As the economy continues to falter, can home gardening again be a more widespread method of cushioning the impact of high food costs and low income?

My research will assess whether the expansion of home gardening is a feasible and appropriate strategy for easing some of the economic, environmental and health issues Rhode Island citizens face today and if so, how Rhode Island citizens can be provided with the right tools to begin successful home gardens. In short, this thesis is an attempt to do the following three things:

- Illustrate why home gardening has the potential to be immensely beneficial - as it has been historically - to Rhode Island's citizens and environment, particularly in the context of our current economic landscape and renewed environmental sensitivity

- Specify the reasons why most Rhode Island citizens do not grow a portion of their own food, by identifying the barriers they face to starting or improving a vegetable garden as well as illustrating the ways current gardeners have found the tools and motivation to begin

- In full consideration of the barriers faced by non-gardeners as well as the motivations of current gardeners, recommend ways to encourage and provide assistance to Rhode Island citizens to go from grass to garden in order to increase environmental health, community wellbeing and food security in Rhode Island

II. The Case for Gardens in Rhode Island

Food production and consumption in Rhode Island must be understood within a national and even global context, because the average food item travels between 1,500 and 2,500 miles before reaching a consumer's plate.¹³ In the last few decades there has been increased attention paid to the environmental impacts caused by the distance food travels. The term "food miles," was coined in the 1990's¹⁴ and has become a common term. Grocery stores today are much more likely to use signs and labels identifying a food's state or country of origin than they were a decade ago, making local foods easier to identify, and as a result, easier to purchase. Farmers' markets full of foods from exclusively local sources have increased. Despite these efforts, food travels as much as 25% farther than it did in 1980.¹⁵ This is because large scale farming that depends heavily on food storage and transportation is artificially cheap. As a scientist from the Worldwatch Institute explains,

include the subsidies for gasoline and roads, the effects of smog and global warming, the ecological fallout from the industrial farms that supply the distribution center, and a range of other hidden costs, and the "efficiency" of long-distance food begins to fade away...because these costs are mostly unaccounted for – not paid directly by the consumer, farmer or supermarket.¹⁶

Modern, industrial farms often grow only one or two crops and depend upon synthetic pesticides and fertilizers, heavy machinery and large-scale irrigation, which in turn depend upon natural gas and oil reserves. According to a recent Cornell University study, production of the average American diet requires more than 500 gallons of oil per person per year.¹⁷ As such, U.S. food production is responsible for a significant portion of the world's greenhouse gas emissions.

Based on data from the Food and Agriculture Organization (FAO) of the United Nations, the agricultural sector contributes 13.5% of greenhouse gases to the earth's atmosphere, including carbon dioxide, methane, and nitrous oxides.¹⁸ Notably, the FAO does not include the entire life cycle of the food chain in this figure. If the greenhouse gases associated with agricultural waste, processing facilities and transport were taken into account, the FAO's figure would be much higher than 13.5%. Agriculture slightly exceeds the transportation sector in greenhouse gas contribution (transportation represents 13.1%), yet transportation is much more directly linked to climate change and other environmental problems in the media and most likely in consumers' minds. A home gardening movement is a feasible first step to creating awareness of the role our food supply plays in climate change. A movement of this kind sends the message that individuals can have an effect on environmental problems such as climate change not just with the type of car they drive or the amount of oil they use to heat their home, but also with the food choices they makes every day.

Growing a portion of food in home gardens is certainly not *the* solution to the tremendous problem of climate change, but there is no single solution. Solving the problem of climate change requires a multifaceted plan; it demands many strategies working together, one of which is local food production. Food production in the form of home gardening requires no chemical pesticides or fertilizers, no packaging, processing, transport or storage. Thus, gardening is a powerful tool, and because it can be implemented at home, it is a way to take individual action and a way to empower oneself and one's community as we face one of the most serious issues of our time.

The act of gardening has a global environmental implication, but it also has a very local one. In other words, gardens offer many environmental benefits that have more direct effects on the health of Rhode Island communities. For example, vegetable gardens provide an alternative to the standard green lawn.

Americans spend an estimated forty billion dollars each year on grass, and expend time and energy on countless hours of maintenance.¹⁹ In this way, Rhode Island residents are typical Americans: they fertilize, apply pesticides, water and mow their lawns (or hire someone to do so), and never receive a harvest in return. While expensive and time consuming, these inputs also exact a hefty environmental toll.

Lawns in the United States receive much heavier pesticide application per acre than most other land area in the United States, including agricultural areas²⁰ Rhode Island, filled with thousands of plots of grass, is no exception. Whether postage-sized in city centers like Providence, or more substantial in suburban areas like East Greenwich, the lush, green, pesticide-laden lawn is ubiquitous. This heavy pesticide use has implications for wildlife and humans through direct contact or indirect contact through groundwater contamination. Of thirty commonly used lawn pesticides, 19 are linked with cancer or carcinogenicity, 13 are linked with birth defects, 21 with reproductive effects, 26 with liver or kidney damage, 15 with neurotoxicity, and 11 with disruption of the endocrine system.²¹ In contrast to the typical lawn, the organic garden provides a beautiful, lush space without the use of potentially harmful chemicals.

Lawns also have a huge impact on water resources. Water sustains Rhode Island's needs for domestic activities such as sanitation and drinking water, recreation, healthy wildlife habitats, and growing industrial and agricultural sectors, among other

things. Rhode Island is not typically thought of as a water-scarce state, but the concerns over potential water shortages in the future are legitimate. This is due to many factors, including high rates of development in areas that depend on ground water, rising residential summer usage and the contamination of some water supplies. Residential and commercial usage now accounts for 75% of water use in the state, and in the summer, Rhode Island uses more water for the purpose of keeping lawns green than for all industry in the state.²² Thus, there are many factors that threaten the quantity of our water supply, but the way we pamper our lawns is the most significant.

Rhode Island may not only benefit from an alternative to the status quo (the unhealthy green lawn) but may also find it a necessity. Unlike grass, vegetable gardens serve more than just an aesthetic purpose and can be sustained by drip irrigation. This method of irrigation saves a significant amount of water, but unfortunately is not an effective method for watering grass. Lawns are generally watered by sprinklers, which are 25-35% inefficient. Drip irrigation, on the other hand, reduces runoff and evaporation by releasing water slowly and closer to the root zone where it is needed. According to the University of Rhode Island, drip irrigation is typically 90% efficient.²³

In light of the environmental benefits alone, increased food production at home is an attractive prospect, but home gardens address more than just environmental issues. Gardening can play a role in alleviating many of the problems Rhode Island citizens are faced with today. As Michael Pollan has stated, “growing even a little of one’s own food is one of those solutions that, instead of begetting a new set of problems - the way ‘solutions’ like ethanol or nuclear power inevitably do - actually beget other solutions, and not only of the kind that save carbon.”²⁴ Gardens can create self sufficiency,

promote exercise, and reduce stress. They can also provide a way to control the quality and safety of food, and can be a valuable tool for teaching a wide range of subjects ranging from botany and weather hydrology to the cycle of life and death. Furthermore, home gardening in particular may be the best method of delivering these benefits.

Proximity to homes presents a number of advantages not offered by community or vacant lot gardens: the visibility of home gardens encourages tending and provides more security for produce, and pre-existing water supplies avert the need for costly installation.

Perhaps one of the most attractive aspects of increasing home gardens in Rhode Island is the potential benefit to Rhode Island's children. Last summer I invited my two young nieces to pick some vegetables in my garden. They were surprised that carrots came from the ground and that tomatoes could come in so many different varieties. I had never seen them so excited about food. That evening after preparing a garden-fresh meal, my sister told me that they had never eaten vegetables with such zeal. The experience with my nieces reinforces what many studies have shown: that hands-on experience with gardening increases vegetable preference in children.²⁵ As obesity rates linger at high levels and access to highly processed, sugary foods becomes easier and easier, influencing Rhode Island's children to make healthier decisions about what they eat has never been more important.

As Rhode Island residents face the economic downturn, now is a particularly attractive time to increase home food production. Though home gardens are not free, they have the potential to save a significant amount of money, and although all eyes are on gas prices, rising food costs can present an even greater problem because on average, 13% of household spending goes to food whereas only 4% goes to gasoline.²⁶ Food from

the back or front yard can supplement food purchased at grocery stores at a time when family income is decreasing and food prices are highly volatile (from 2007 to 2008 the price of fresh vegetables increased by 6.3% according to the U.S. Department of Agriculture)²⁷ Beyond increasing the food security of Rhode Island residents, home food production benefits the local economy as a whole by freeing up money for discretionary spending. As an article in the Boston Globe noted in 2008, “As with energy, higher food costs cut into discretionary income that buys everything from cars to computers to movie tickets and drives the consumer-based US economy.”²⁸

If there is any question as to whether gardens can feasibly ease some of the problems we face, we just have to look to our history. In 1943, 20 million gardens were producing 8 million tons of food in the United States.²⁹ Many of these gardens were victory gardens, which were grown as a way to reduce pressure on the food supply during wartime. Today we have many other factors to seek victory over: an unsustainable food supply, an addiction to oil, threats from climate change, and startling rates of diet-related diseases.

As Rhode Island once again faces an economic crisis, there remains a plentiful and largely untapped resource in the state: the thousands of small plots that make up our yards. These plots have the potential to produce a staggering amount of food while benefiting the environment on a global and local scale and improving quality of life on a community and individual level.

III. Unearthing the Barriers & Motivations to Starting a Garden in Rhode Island

Methods

A large portion of my research focuses on the reasons why most Rhode Island citizens do not grow a portion of their own food, and conversely, what motivates those who do. To begin to unpack this question, I identified some “key informants” in the Rhode Island community, or those who were most likely to have thought about this question and even, perhaps, done some of their own research on the topic. Those who offered the most insight were individuals from the following entities: The University of Rhode Island Master Gardeners, an organization that trains community members and supports a number of outreach activities about environmentally sound gardening practices; South Side Community Land Trust, an organization that provides access to land and education for people in Greater Providence for the purpose of growing food sustainably and in some cases, access to markets and training necessary for making the sale of produce a profitable business; Farm Fresh Rhode Island, an organization that connects local Rhode Island farmers with local Rhode Island customers through farmers’ markets, education and outreach; The Children’s Garden Network of Rhode Island, an organization that provides networks and resources for the creation and support of school gardens; the Rhode Island Historical Preservation & Heritage Commission, whose historian, Sarah Zurier is studying the history of vegetable gardening in Rhode Island; the Apeiron Institute for Sustainable Living, an organization that promotes sustainable living practices through programs such as school fieldtrips, teacher training, a clean energy expo and a center that models energy efficiency and edible landscapes; Seven Arrows

Farm, landscapers who install ready-made gardens for Rhode Island residents; and other local landscape companies.

My discussions with representatives of these organizations focused on what the most common barriers might be for potential gardeners, and what has motivated or assisted those who currently garden. A host of reasons for both surfaced. As one master gardener stated, “I doubt that there is any common denominator and I say this because I know *many* gardeners and everyone has their own story.” However, from these discussions I was able to identify the following themes:

1. Some people lack the space to create a garden. Rhode Island has the second highest population density in the nation, making open space unavailable to many, particularly in cities like Providence and Pawtucket.
2. Some people lack the time. It was noted, however, that this barrier is often linked to how people decide to balance different priorities. As one person said, “The common factor, an intangible, is passion. If you want to garden you most likely will.” Essentially, a special interest and personal drive is usually a necessity to overcome other demands on time.
3. Some people feel they lack the knowledge or information necessary to begin or maintain a garden.
4. Some people fear that they may have contaminated soil. As one person noted, “Lead containing soil and soil containing arsenic and copper from pressure-treated wood is a hidden danger, if one grows vegetables for food consumption.” Lead was noted most frequently, and was the highest concern for soil safety, a result of Rhode Island’s industrial history, and the past use of lead-based paint on

buildings and in leaded gasoline. Though there are ways of getting around this barrier (by building raised beds, for example), methods to overcome lead contamination present a bigger time commitment and can be costly. As one landscaper said, “how many people can afford to haul out tons of soil for a small veggie garden? Only the dedicated, that's for sure. It does make a big difference to start with excellent soil”

When asked about the motivations of current gardeners, many people cited more reasons why residents *should* garden than why they actually do. These responses ranged from psychological benefits: “Little space is needed to create a refreshing, nurturing space to be in or walk by. The city is such a brutal environment without plants,” to a variety of environmental benefits: gardens offer an alternative to unproductive lawns and are a more welcome habitat for insects and animals. As to the direct reasons why people decide to garden, the economy, environmental conscientiousness, and cultural inclination (a passion and knowledge for gardening is passed down from the previous generation) were most often cited.

Informed by my discussions with the key informants, I wanted to hear first-hand experiences that would enhance and add to the opinions I had received from the experts. Therefore, my next step was to enter the “real world” of Rhode Island residents. By doing so I hoped to obtain a richer, more detailed picture of why Rhode Islanders do or do not garden. Thus, the study called for a qualitative design with the use of intensive interviewing.

After deciding upon the main design of the study, my next task was to choose a target population. With the ultimate goal of increasing backyard gardening in Rhode

Island, I wanted to choose a population that would contain both current gardeners and those who might be open to gardening but for certain obstacles. I also wanted to choose a population that might be more agreeable to the idea of starting a garden than the general population (in order to create change it makes the most sense to start with those most willing to make that change). With these objectives in mind, customers at farmers' markets seemed to be a good target population. For one thing, farmers' market customers tend to value freshly picked, local food, or at the least have been exposed to it. In addition, people who frequent farmers' markets may do so because they are interested in protecting their environment, their own health or the health of their communities; interests that are also promoted by home gardens.

When considering the advantages and disadvantages of farmers' market customers as my target population, my initial concern was that this population would not be diverse enough. People who frequent farmers' markets are often stereotyped as Caucasian and wealthy, a population to which I would not want to limit my study. This idea was reinforced by my experiences at the Union Square Market in New York City. It seemed that most of the clientele (with a few exceptions such as myself) were wealthy Manhattanites willing to pay \$4 for a cucumber. However, a closer look at the Rhode Island market system told me that I would not be limiting my exposure to a certain race or socioeconomic status. First, markets exist in a diversity of areas from city centers like downtown Providence to suburban or even exurban areas like Narragansett. Second, they exist in both wealthy areas like East Greenwich and less affluent areas like Pawtucket. This diversity is partially secured by Farm Fresh Rhode Island whose ideals include providing the low income neighborhoods surrounding Providence (markets Farm Fresh

manage reach as far away as Woonsocket, RI) access to fresh, healthy produce. With this goal in mind, they make sure to organize markets in areas that normally would not have them, or where bus service from less affluent neighborhoods is easily accessible.

Rhode Island farmers' markets also increase the diversity of their customers by the ways in which people are able to pay for goods (also a credit to Farm Fresh Rhode Island, who has ensured that all of their markets have the capacity to accept a variety of payment types). In addition to cash and credit cards, markets accept food stamps (now known as the Supplemental Nutrition Assistance Program [SNAP]), Women Infants and Children (WIC) checks, and Senior Coupons. According to the Rhode Island Department of Health, \$115,600 in WIC checks was redeemed at Rhode Island farmers' markets in 2008 (for more detailed information see Appendix A).³⁰ This means that ultimately the only thing that farmers market customers must have in common is their exposure to fresh, local produce.

My next goal was to design a study that could be appropriately and successfully implemented at a market setting. This setting demanded a short list of questions that were straightforward and that would allow for brief or expansive answers depending on what an individual had time for and was comfortable providing. The outline of the interviews is as follows, allowing for changes if the answers provided did not allow for a logical transition into the next question:

- Was there a reason why you decided to come here today rather than a grocery store?
- Have any of these reasons made you think about growing your own food?

If the individual already has a vegetable garden:

- Why in particular did you decide to start a vegetable garden?

If the individual does not have a vegetable garden:

- Why haven't you tried to start a vegetable garden? Are there certain barriers you face?

While sticking to this basic outline, I could make allowances for prompts and follow-up questions in order to encourage people to expand upon their statements or clarify their meaning. For example, if someone told me they did not garden because their yard was too small, I could ask how big the yard actually is (follow-up question) to determine whether there was an actual or perceived lack of space for gardening, or if someone told me they decided to start gardening because of health reasons, I could ask them to talk more about that (prompt) until I knew whether they were referring to the exercise they receive from gardening activities, the nutrients received from fresh vegetables, the avoidance of chemicals from conventionally grown food or some other reason. By utilizing a general outline while allowing for a dialogue (as opposed to an inflexible survey design) I could approach each person in the same way while still being able to extract a full understanding of each individual's situation.

With the interview protocol in my head and carrying a tape recorder, batteries and a notebook, I ventured to the following farmers' markets: Hope High School, Providence, RI; Pawtucket, Pawtucket, RI; Blackstone River State Park, Lincoln, RI; Woonsocket, Woonsocket, RI; East Greenwich Academy Field, East Greenwich, RI; Colt State Park,

Bristol, RI; University of Rhode Island, South Kingstown, RI and Fishermen's Memorial State Park, Narragansett, RI.

I completed a total of 62 intensive interviews, of which 55 were recorded by tape recorder and seven by notebook (these seven individuals requested not to be tape recorded). For ethical and other reasons, I made sure to ask each individual for permission to record their interview. I also avoided questions regarding income, health or other potentially sensitive or private issues. The only personal information I requested from an individual was a zip code so I could identify any location-related patterns without collecting identifying information. When complete, the interviews were transcribed into a Microsoft Word document, then coded and put into a Microsoft Excel document (see Appendix B) so that I could more easily identify the major and ancillary themes raised by the interviewees.

Findings

The 62 individuals interviewed included - fortuitously - 31 gardeners and 31 non-gardeners. The gardeners began growing their own food for many different reasons, the most popular being their desire to have access to fresh, high quality food. This reason was closely followed by family influence, such as parents or grandparents passing on their knowledge or love for gardening, the simple enjoyment of gardening, environmental interests, the desire to avoid chemical pesticides or fertilizers, the desire to save money, and the desire to maintain nutritional health. Other reasons included being influenced by the "Back to the Land" movement in the 1960's, the desire to improve or maintain psychological health, the desire to teach or positively influence children, and to support

community beautification. The most common problem gardeners faced was a lack of knowledge or skill that challenged their success. This problem was followed by lack of time, transience (moving frequently or traveling during the growing season) lack of space, and the presence of pests.

Non-gardeners faced some of the same problems, but lack of space and time, or a general lack of interest were the most common. After these obstacles, soil contamination was the most significant barrier to starting a garden. This problem was followed by age, a lack of knowledge or skill, transience (moving frequently or traveling during the growing season), a preference to buy food grown by farmers (why grow if it is freshly available at farmers' markets?), and a preference for a grassy yard.

Motivations

Food Quality and Freshness

68% of the gardeners cited food quality and freshness as a motivating factor for starting a garden and 42% of non-gardeners stated that this reason either motivated them to choose farmers' markets over grocery stores, or would be a motivating factor for starting a garden in the future. Thus, exposure to high quality, fresh food is probably the strongest influence on deciding to grow one's own food. Many people discussed their experience eating freshly grown food with an almost religious zeal. One woman discussed her love for freshly picked vegetables by saying, "Oh, and fresh tomatoes! You can't beat it... nothing like it... there's nothing like going out, when a tomato is warmed

by the sun, taking it, washing it a little and sitting there eating it with some salt...very good, especially when it is warm from the sun.”

Family Influence

Family influence also played a key role in many gardeners' decision to start a garden (this was stated as a motivation to garden by 39% of the gardeners). In some cases this influence was closely tied to having had exposure to high quality, fresh food. One woman told me that her passion for gardening originated from the taste of fresh vegetables at a relative's farm when she was young: “when I was very little I went with my aunt to her mother's farm which was quite large...that was my first experience, and I remember - I was about five or six - taking a tomato from the vine and sitting on the porch (and) eating it...it was so wonderful.” The other major factor that influences those with relatives who have gardened is that knowledge and skills are often passed down from generation to generation. Those who have seen a garden grow or have been involved with a relative's garden know that it can be done. Ripping up a lawn to start a garden does not seem as intimidating if past experience suggests it will be a successful endeavor, and a person who has been exposed to gardening in the past is more likely to know how to deal with soil fertility, contamination, pests, etc, and how to cook and preserve the food that comes from the garden.

Environmental Interests/Concerns

Environmental concerns or interests also ranked highly on the list of reasons why gardeners decided to grow their own food (23% of gardeners stated that consideration for

the environment was a significant factor). Environmental interests or concerns included limiting the distance food must be transported, eating according to the season, decreasing a carbon footprint, avoiding food produced by unsustainable farming practices and increasing sustainability in general.

Chemical Avoidance/ Food Safety

Although not quite as high on the list as other factors (20% of gardeners said they grew their own food because of safety concerns), those who grew food because of food safety were very vocal about this issue. People concerned over food safety fell into two categories: those who were worried about food-borne illness and those who were worried about the application of artificial fertilizers and pesticides to soil and plants, the latter being the most common concern. One woman decided to grow her own food because of her experience living across from an apple orchard which used heavy pesticide applications throughout the season. The woman watched her neighboring farmer spray pesticide from the time the apple blossoms budded to shortly before the apples were picked. Experiencing firsthand the practices used to produce conventionally grown food made the woman worry about her family's health, so she decided to start her own garden. In her own yard she could use natural growing methods and be aware of exactly what went into the soil. Most people concerned over safety simply wanted their food to be organic and found that growing their own produce was a good way of acquiring organic food.

Economic Concerns

As I began the interviews, I expected many people who grew their own food to tell me they did so because they were trying to save money. While a number of people cited this reason as a motivating factor for starting their garden (16% of gardeners) this motivation was not as significant as I anticipated. The more significant finding perhaps, is that 19% of the non-gardeners seemed to suggest that the economy was a big concern, and that if their financial situation were to deteriorate in the future, they may be motivated to start a garden. When asked if she had thought about growing her own food, one woman said, “Yes, thought about it...can’t find the time for it, but yes...but I don’t know, you know, it depends on how things go with the prices and stuff. I mean, we have the space for it, just not the time.” Statements like this suggest that economic factors may influence the priority placed upon growing food.

1960’s “Back to the Land” Movement

One motivation for gardening that I did not foresee when beginning the interviews was influence from the “Back to the Land” movement, a social phenomenon beginning in the mid 1960’s that countered such things as growing consumerism, large-scale industrial agriculture and pollution, inspiring urban to rural migration. 10% of gardeners stated that this movement still influences them to grow their own food today. Closely linked to environmental interests and the desire to be self-sufficient, the “Back to the Land” movement apparently had a long-lasting, significant effect on some of the current gardeners. Another movement mentioned by a few of the interviewees was the victory garden movement during the First and Second World Wars. Although not a direct

influence on the gardeners, some mentioned that this movement affected their parents' decisions to grow food. Considering the reasons behind these two movements (depression, war, environmental stress), one may wonder if the conditions we face today are suitable for a similar movement.

Teaching/Influencing children

Although only one of the gardeners mentioned their children as a reason why they gardened, 10% of the non-gardeners said that they might consider gardening so that their children could have the experience. Although it was usually the parent that possessed this thought this was not always the case. One woman I spoke with had her little girl with her, a child of about eight. The woman said that the girl had been growing a few things at school and had since been pressuring her mother to start a garden at home, something the mother was considering because she knew it would be a valuable experience for her daughter.

Barriers

Lack of Space

Lack of suitable space, which includes lacking enough square footage to grow plants, lacking enough sun and possessing soil that is too rocky, was the largest barrier to gardening. As expected, this problem existed more in urban centers like Providence and Pawtucket than in the suburban and exurban areas of Rhode Island. When asked, most people who cited space as a barrier to gardening had not considered container gardening or plants that would be successful in shadier conditions. If a person stated that their yard

was too small, I tried to follow up by asking how much space was actually available. From this line of discussion, I realized that some people who thought they lacked the space for a garden assumed that more room is needed for a successful garden than is necessary. Thus, sometimes lack of space was a perceived - rather than actual - problem. For example, one man who did seem to have enough room for growing vegetables stated, “I grow mostly flowers – no vegetables – no, I don’t have the yard for it – I wish I could though.”

Time Constraints/Lack of Interest

I group the barriers of time and interest into the same category because often times they are one in the same. A person may have said that they do not have the time to garden, but in reality just may not consider gardening a priority. This is illustrated by the woman I spoke about previously who did not have time to garden but might consider it depending on “how things go with the prices and stuff.” Others who did not mention time as a factor stated simply that they did not want to put the effort into gardening. As one man plainly stated, “I do not garden. It is too much work and I’m just not interested.”

Concern about Soil Contamination

Concern about soil contamination prevented 13% of non-gardeners from growing some of their own food. Many people in this category seemed to have a lot of interest in gardening but were turned away by their concern over the safety of their soil. Mostly people were worried about lead originating from paint from old houses. Less cited concerns included contaminants from diesel trucks and industrial processes. When

asked, most of the people with concerns about contamination told me that they had not had their soil tested. As one man said, “I used to grow my own tomatoes and lettuce and stuff like that...now I don’t do it because the soil is no good –it is filled with chemicals” This particular man lived in a rural area and moved to his current home in Pawtucket, RI. He had not gotten his soil tested or had any particular reason to believe his soil to be contaminated, other than the fact that he was living in an urban area in Rhode Island. Thus, it is difficult to tell whether most of the concerns about soil contamination are real or perceived.

Lack of Knowledge or Skill

10% of non-gardeners cited lack of knowledge as a barrier to gardening. Most of these people were afraid that they would be unsuccessful if they started a garden and therefore did not try. Interestingly, 23% of those who did garden also cited lack of knowledge as a problem. Although they had enough confidence to start a garden, they still felt that their lack of skill or know-how made their gardens much less successful than they could be. This is illustrated by a statement made by a gardener from Woonsocket: “We do not have very good luck with growing things...I’ve had gardens over the years, but I think I’ve tried to crowd too much stuff in too small of a spot...and then I never follow through with it... I still don’t have a clue – I mean, when to fertilize? What to use? How much? When? I just kind of play it by ear.” From my interviews it became clear that a little guidance could go a long way for both non-gardeners and gardeners.

Conclusion

Interviews with Rhode Island gardeners suggested that gardening is a valuable activity that produces many gifts: wonderful tasting, fresh, cheap and nutritious food, a clear sense of accomplishment, physical and psychological strength, environmental wellbeing and other benefits more difficult to name. When asked why she grew her own food, one gardener from East Greenwich told me:

I love stuff that's fresh, and there is something really wonderful about working in the ground with your hands (and thinking) this is *my* tomato and I saw it grow up from a little baby tomato to a big tomato... It is the joy of gardening but it is also the quality of the food...and it is also the idea too I suppose, somewhere buried in the back of my mind that I'm not driving somewhere and spending gas and all kinds of thing to acquire this. I'm just walking out my door and picking it.

I also learned that many non-gardeners would be very interested in growing their own food if it weren't for a barrier or two, and that with a little guidance or the right set of tools might also experience the joy of walking out their door and picking their very own tomato.

IV. Recommendations

Interviews with customers at farmers' markets confirmed many of my ideas about the factors that prevent Rhode Island residents from growing food. I expected to find that some people are concerned about soil contamination and that others simply find the prospect of digging into their lawn intimidating. There were other barriers however, that I did not expect to find. I did not know that a significant number of people think they need a larger space than is necessary for a vegetable garden, or that some decide that their soil is contaminated based upon where they live rather than on the results of a soil test. I am able to reflect on these and other variables - expected and unexpected - as well as the driving forces that produce gardens because people were very generous with their time and points of view during the interview process. So it is with the insight given to me by Rhode Island residents that I am able to recommend a number of ways in which backyard vegetable gardening might be expanded in the state.

Landscape services

The state of Rhode Island has many landscaping companies; there are more than 25 landscaping or lawn maintenance companies in Providence alone. According to the latest Business Quarterly Survey conducted by the American Society of Landscape Architects (ASLA), landscape architects are struggling in the current economy, with two-thirds of respondents reporting below average billable hours last quarter. Furthermore, nearly one-third of firms reported demand for alternatives to traditional lawns, with top reasons being lowering upkeep time and maintenance (44%), saving money on utility or maintenance costs (42%) and reducing environmental harm (28%).³¹ These findings

suggest that the economic climate combined with current customer interests and concerns may demand more creative services and marketing if a landscape company is to maintain a strong client base and successful business.

My interviews with farmers' market customers suggest that many people have an interest in having freshly grown food as close at hand as their backyard but lack the time it takes to create a vegetable garden. Others have the time and the interest but do not know how to begin, particularly if they face specific problems like potentially contaminated soil. Landscapers have the opportunity to fill these gaps where interest in vegetable gardening is present and sufficient financial resources are available, yet time or experience is lacking. A landscape service that involved vegetable garden installation rather than abnormally green lawns or shrubs would address environmental and local food interests. To some extent this type of service would also address economic concerns because a customer would be getting a return on their investment (fresh vegetables). Proof that this type of model is feasible and can in fact be successful is found in the company Seven Arrows Farm located close to the border of Rhode Island in Attleboro, MA.

Through word of mouth, their website and newsletters, Seven Arrows began marketing a "backyard sustainability garden" in 2008. They describe the service as a ready-made garden that starts with a site consultation and includes a frame, compost, loam, seeds, seedlings and installation service. The customer can do as much or as little preparation and planting work as they care to. Through an interview with the owner of Seven Arrows Farm I learned that the garden service was by all accounts successful in its

first season, having installed fifteen gardens, and will continue this year. Speaking with others who offer landscape services in Rhode Island, I found that few had ever provided vegetable garden installation, citing lack of demand from their clients (only two out of about 15 landscapers mentioned that they had provided edible landscape installation once or twice in their careers), but the example of Seven Arrows suggests that companies merely have to specifically offer and market this service in order to find a demand for it. Thus garden installation services are a win-win for landscapers and residents alike. Customers receive fresh food and a healthy environmental setting in lieu of an unproductive lawn or other inedible landscape without the initial effort, and landscapers retain or obtain customers who are no longer interested in a traditional landscape or who never were. Of course this type of service is not an adequate solution for those who do not have the money to pay a landscaper or those who are interested in gardening particularly because it can save money on food bills (a Seven Arrows Farm “backyard sustainability garden” that is 10 feet by 10 feet and 10 inches deep costs \$650 with installation, or \$380 without installation). Nor would this service appeal to those who want to engage in the full experience of gardening. Using a landscaping service may take away some of the joy or sense of self sufficiency a vegetable garden can give its owner. Thus landscapers are suitable for a certain subset of the population facing certain barriers (such as a lack of knowledge or time) and for those who have enough dispensable income for such a service. Other strategies are more appropriate for different populations with different sets of obstacles and resources.

Green Job Training: Vegetable Garden Planning, Installation and Maintenance

As my research suggests, an increase in initiatives like the Seven Arrows Farm sustainability garden program may support a market not yet identified by the average Rhode Island landscaper. However, this type of service requires workers who are knowledgeable about vegetable varieties, soil conditions and topics ranging from lead contamination to vegetable-eating pests. In order to appeal to an environmentally conscientious clientele, these workers would need to be well trained in sustainable and organic gardening practices. By working for an established landscaper or creating their own vegetable garden initiative, trained workers such as these could provide for themselves while making their communities healthier and more sustainable.

In March of 2008, Groundwork Providence, a local organization self described as “an education organization dedicated to building a cleaner, safer, more beautiful city through environmental programs,”³² undertook an adult job training feasibility study. The study states that:

Awareness of the role of greenhouse gasses in global climate change has created a shift in governmental thinking. As building codes are rewritten and revised, there is an increased emphasis on sustainable development and conservation, including more sustainable ways to provide agricultural and landscaping services. Consumers are feeling the pain of rising costs and increasingly aware of the dangers of further environmental degradation. These economic and policy changes have created a growing need for construction workers, landscapers, nurserymen and agricultural workers with knowledge of sustainable practices.³³

In line with these ideas, Groundwork now offers a tuition-free sustainable landscaping training program for unemployed and underemployed individuals, also offered for a fee to other interested individuals. Although the number of trainees now employed in the landscaping industry is unclear as of now, the program has been deemed successful

enough to continue. The training consists of about sixteen two-hour sessions teaching a wide variety of landscaping skills, from tree pruning to xeriscaping. Only one session focuses specifically on edible plants, and deals with incorporating fruits and vegetables into a landscape dominated by non-edible plants.

Although the introduction of a wide variety of skills makes for a well rounded trainee, there is room to focus more attention on vegetable gardening in Groundwork's training sessions. A working knowledge of how to plan, install and maintain vegetable gardens could distinguish a trainee from others with basic landscaping skills because a skill such as this has the potential to attract an additional clientele: those with environmental interests and a desire to incorporate sustainable practices into their homes. This is especially true now, as interest for local, fresh food and sustainable living is on the rise.

A focus on vegetable garden installation also gives a trainee skills that could be marketed in a more entrepreneurial fashion, meaning a trainee may be able to offer his or her skills to the public through a stand-alone business without an intermediate employer. Starting a full landscaping business, on the other hand, may be unrealistic for a new trainee; after a single training program, it is more realistic that an individual could grasp the skills necessary to install and maintain vegetable gardens whereas learning the various skills necessary to start a full landscaping business would require additional experience or apprenticeship. In addition, the market of specifically installing and maintaining vegetable gardens has not yet been tapped into, whereas many traditional landscapers already exist in Rhode Island.

Part of Groundwork's training session includes information about marketing a trainee's skills and provides assistance with resumes and cover letters. With a training session focused on vegetable garden maintenance and installation, Groundwork could also train people on how to market vegetable garden services as a stand-alone business, thereby preparing individuals for employment while empowering them to be entrepreneurial and self-reliant.

According to the latest figures from the bureau of labor statistics, Rhode Island's unemployment rate is 10.5%. Due to the current financial crisis, most states in the nation are experiencing high rates of unemployment. In response, the federal government passed the American Recovery and Reinvestment Act in February of 2009 in order to provide a stimulus to the U.S. economy. This stimulus package includes \$20 billion for investment in a cleaner, greener economy, including \$500 million for green job training. In February Senator Jack Reed of Rhode Island announced that \$1.1 billion of this federal aid would go to Rhode Island for the purposes of saving and creating jobs and to get the economy moving again, and that \$116 million of that money would be invested specifically in creating "green" jobs, making the state cleaner and more energy efficient and to preserving coastal and marine resources. Therefore, funding for green job training - including vegetable garden maintenance and installation - is available, even at a time when other types of funding are disappearing.

At this time, Groundwork is in a unique position to help unemployed and underemployed individuals while producing a service that creates beauty and sustainably in Rhode Island's communities. Availability of funds for green job training combined

with an elevated interest in local food and environmental stewardship make the viability and success of a vegetable garden training program achievable.

Information sharing

As I was collecting information at farmers' markets this year, my role was as a researcher. However, as I asked people questions about growing food, many people began to see me as a resource and began asking me questions about starting a garden, or asking me to address particular problems they were having with their current garden. This made me realize that having a knowledgeable gardener set up a table at farmers markets for the express purpose of sharing information on starting and maintaining a garden would be a useful service.

Sharing information in this manner is not a new idea and the University of Rhode Island Master Gardeners do a good job at this type of information sharing through Master Gardener Information Kiosks. My recommendation then, is to provide this type of service in a more established manner. Knowledgeable gardeners could be asked to sign up to attend a weekly farmers market every week or every other week with information at hand. Ideally this would happen in every farmers' market in Rhode Island, depending of course on the availability and commitment of volunteers. This way, a farmers' market customer would come to know that their local farmers' market is not only a place for fresh produce but also for educational resources on gardening. A very visible and reliable service like this would make a new gardener more likely to reach out when help is needed. Also, the visibility of this service simply gets people thinking about growing food; it is a reminder that gardening is a viable option that might be considered.

To maximize the effectiveness of the information tables, they could be stocked with a sheet providing annotated URLs and a short list of books to help a gardener once they no longer had access to the knowledgeable volunteer. My research suggests that a list of updated URLs and books providing the following information would be particularly helpful to new gardeners:

- Starting a garden (general information about where to begin, including soil health, tilling, planting, etc.)
- Gardening in minimal sun or small spaces (emphasizing that a small space can produce a significant amount of food)
- Gardening organically
- Dealing with pests in the city and the suburbs
- Starting a garden the economical way
- How to test soil (the URL for the University of Massachusetts explaining soil testing procedures, including how and where to send the soil is sufficient)
- Dealing with soil contamination
- Starting a compost system
- Building healthy soil
- Constructing a raised bed garden
- Planting in Rhode Island (the University of Rhode Island Master Gardener planting calendar for Rhode Island is a very useful source)

(For an example handout to provide at farmers' markets see Appendix C)

My experience at farmers' markets suggests that there would never be a lack of customers eager to utilize information tables providing in-person advice as well as written material, especially if customers could regularly expect the presence of these tables at their local market. The Master Gardener program already possesses the expertise to support this service. Depending on the capacity of the program in regard to the availability of volunteers, increasing the number of kiosks at farmers markets around the state could be very feasible and unlike hiring a landscaper which comes at a charge to the gardener, lack of funding is not an issue. Handouts cost a nominal amount and the tables would rely on volunteers rather than paid staff.

Though increased information tables at farmers' markets sounds like a fairly simple idea, they could go a long way towards promoting home gardens. As mentioned in the last section, my conversations with gardeners revealed that many people who grow food do so because they were influenced by a parent, grandparent or other close relation. As we get farther away from the generations that were likely to garden, that type of knowledge sharing becomes less common. If gardens are to flourish in the present day, knowledge must be shared in new and different ways, and the sharing of gardening advice at farmers markets is one of them.

Garden Coaching

A more direct method of information sharing can be found in a relationship between mentor and mentee. Garden coaches, unlike landscapers, could be of assistance to the more do-it-yourself type interested in the full experience of gardening or in saving money, but perhaps lacking in the knowledge or confidence necessary to begin growing

their own food. Matching experienced gardeners with inexperienced gardeners resembles the relationship between parent and child or grandparent and grandchild through which information about growing food has traditionally passed, and through which many of the gardeners I interviewed decided to begin growing food.

When researching the idea of coaching, I found that there are many people in the United States who call themselves garden coaches. As a 2008 article from Slate Magazine states, “A few years ago, there were a handful of people calling themselves garden coaches; now many are getting organized,”³⁴ Susan Harris, a garden coach from Maryland has started a worldwide directory of garden coaches which now includes over 100 coaches providing services all over the nation.³⁵ Many of these people consider coaching their full-time job and charge a fee for time spent with their mentee; the typical cost is \$60 - 100 an hour, with a minimum requirement of two hours per session. This service is generally defined as visiting a person’s home and giving them advice on the spot, additional advice comes only with more site visits (and more fees) when requested by the home owner.

My recommendation is to establish a garden coaching program here in Rhode Island that would rely on volunteers and would therefore be free of cost to the participant. This would ensure that the service could be available to a wide range of Rhode Island residents (not just those with a lot of exposable income). Another difference from the coaching businesses I’ve mentioned would be that following a site assessment, a coach could be available via e-mail or phone for follow-up questions that would not necessarily require another site visit.

Garden coaches have the ability to address many of the barriers I heard about when speaking to non-gardeners as well as the concerns of current gardeners, and if there are experienced Rhode Island gardeners willing to volunteer, the problem of funding would not exist. Thus, its potential for far reaching effects combined with the fact that it is feasible make the coaching program my foremost recommendation and the one that I will focus on in this thesis.

V. Implementing a Recommendation: Garden Coaching

Although my interviews revealed that there were more common barriers to gardening than a lack of knowledge or skill, this barrier stood out as one that could feasibly be addressed. The most cited reasons for not growing food, such as lack of space, time constraints and lack of interest are much more difficult to tackle. Additionally, lack of knowledge or skill was most commonly cited as the reason why current gardeners found their efforts unsuccessful. Those who reported the most success growing food often had a parent or grandparent who had passed along their knowledge of gardening from one generation to the next. Although this type of knowledge sharing cannot be replicated, there are aspects of it that can be emulated with a mentor-mentee relationship.

Reflecting upon my interviews, it seemed that those who did not experience gardening growing up needed to somehow acquire gardening advice and confidence by some other means, and that “garden coaches,” or experienced gardeners acting as mentors, might be just the thing. However, reality does not always work according to well thought-out recommendations. I first had to find out if Rhode Island residents would be willing to accept help from a coach and equally as important, I had to find out if there were experienced gardeners in Rhode Island who had the interest, time and enthusiasm to share their knowledge with neighbors they do not know.

As I concluded my outdoor farmers’ market interviews, produce was getting sparser and the season of outdoor farmers’ markets was coming to a close. Fortunately for Rhode Island farmers and residents as well as for my research, Farm Fresh Rhode Island has organized a winter farmers’ market. The market began in December 2008 at

Hope Artiste Village, right over the Providence border in Pawtucket. Farm Fresh afforded me a space at the market where I could set up a table and talk to customers about my recommendations. This gave me the perfect opportunity to gauge whether or not there was genuine interest in garden coaching. I attended four of the Saturday markets, finding each time an enthusiasm for the idea from both non-gardeners and current gardeners looking to be more successful.

During the last two farmers' markets I attended I focused my attention on asking people who were interested in having a coach to "sign up" by giving me their name, email, zip code, and any specific issues they were experiencing, such as contaminated soil or shady conditions, as well as special interests such as raised bed gardening or organic gardening. This information would be valuable to have on hand before matching an inexperienced gardener with a coach. I received information from 35 people, many of whom expressed a great deal of excitement about the idea. As expected, a large percentage of the people who signed up were simply interested in receiving advice about getting a vegetable garden started. However, there were a myriad of concerns and interests communicated to me. Below is a list of things people thought a coach could help them with:

Starting a vegetable garden (twelve people)

Possible or confirmed soil contamination (eight people)

General advice for improvement – low yield in the past (four people)

Gardening in minimal sun (three people)

Issues with pests: bugs, grubs, woodchucks (three people)

Interested in raised beds (two people)

How to expand a current garden (two people)
How to be successful at container gardening (two people)
Help starting a school garden
Making good use of worm castings
Gardening organically
Elderly gardening – how to grow food with less maintenance
Wilting tomatoes
How to convert a perennial garden into a vegetable garden
Concern about gardening over a septic tank's leach field

This list of concerns and interests suggests that a coaching relationship could help someone start or maintain a vegetable garden, but it could also address specific barriers, including common ones like soil contamination and shady yards, and less common ones like woodchucks and leach fields. Hearing these concerns and the enthusiasm in which they were communicated also confirmed that people were eager to share their gardening problems and ready to accept advice.

Willing participants, however, only make half of a garden coaching program. During the process of gauging interest from would-be or novice gardeners, I was also thinking of ways to establish a group of veteran gardeners ready to share their experience and enthusiasm. Although I could have recruited experienced gardeners in the same way I recruited inexperienced ones, there was a different route suggested by my advisor that would prove to be much more effective: tapping into the well-established University of Rhode Island (URI) Master Gardener Program.

The URI Master Gardener Program began in 1977. Since then more than 1500 people have become Master Gardeners. As the URI website states, the title Master Gardener is a “prestigious designation given only to those who successfully train in various aspects of plant science and complete an internship of 50 hours of volunteer work as part of the URI Master Gardener program of the Cooperative Extension Education Center.”³⁶ The training consists of sixteen weeks of classes lasting two and a half hours each week and includes topics such as soil and plant nutrition, plant physiology, pests and diseases, plant propagation, composting, pesticide safety, and fruit and vegetable production.

I knew that if the URI Master Gardeners were to establish a coaching program under their auspices, the chances of the program being successful and stable would greatly increase, as would the chances of it continuing beyond my involvement. The most obvious benefit of establishing the program through the Master Gardeners is that they offer a large pool of experienced gardeners ready to volunteer in their respective communities. Additionally, inexperienced gardeners might have more confidence in volunteers from an established program than in uncertified volunteers, and for good reason: Master Gardeners have to complete a certain number of education hours and possess a certain level of experience in order to call themselves such. More importantly, by joining and completing the Master Gardener Program, participants have proven their passion for gardening, their enthusiasm for reaching out to the public and their willingness to spend time volunteering. In essence, Master Gardeners should make perfect coaches.

In addition to the pool of volunteers, the Master Gardener Program offers established lines of communication: a frequently viewed website, volunteer email lists and phone numbers to call with enquiries. The Master Gardeners also have a hotline, an 800 number Rhode Island residents can call with questions about their gardening issues: a nice complement to a coaching program. Lastly, the Master Gardeners possess strong leadership; there are paid staff members committed to making the Master Gardener program a success.

Considering the enthusiasm of potential participants and the potential of the Master Gardener Program to provide effective coaches, one question remained: would the coordinators of the Master Gardener Program agree that there is a need for garden coaching in Rhode Island and would they have the capacity to support such a program? Fortunately, my advisor Harold Ward, a Master Gardener himself, was able to set up a meeting with the coordinator of the Master Gardener Program, Rosanne Sherri and the Master Composter and Recycler Program manager and special events manager, Sejal Lanterman. This meeting allowed me to propose the idea of garden coaching as a Master Gardener program. It was evident from the start of our meeting that Rosanne and Sejal were committed to furthering the mission of the Rhode Island Master Gardener Program: education, outreach and sustainability;³⁷ not only were they willing to put in the work to establish a coaching program, they were very enthusiastic about the idea and ready to begin.

After our meeting, Rosanne and Sejal recruited eleven Master Gardeners who were interested in being coaches by using the e-mail list that contains all of the active

Master Gardeners. The next step in the process was to develop and then hold a training session for the Master Gardeners interested in becoming coaches. We decided to do this at the Center for Environmental Studies at Brown University in order to attract Master Gardeners who live in the Providence area.

As expected, introductions in the beginning of the three-hour training session revealed that the participants had a rich history of vegetable gardening; many had more than a decade of experience growing food, and many also had a good deal of experience helping others to start and maintain gardens. One of the participants had even been paid to provide garden coaching services to people in her area.

Out of respect for the participants' high level of knowledge and experience, it was important to select topics that would enhance the group's ability to be effective coaches rather than merely covering what they already knew. Another method used to show respect for the participants' experience was to encourage discussion among the group. Although there was always a person leading the training session, participants were encouraged to share their knowledge and experience, which proved to be very valuable. One participant shared an easy and inexpensive method of keeping deer out of a garden by using fishing line. Another participant informed the group about a local company (Smithfield Peat) where loam and compost could be purchased at a fair price.

The first part of the training was devoted to introductions and an explanation of how the program came about. I explained my research and how I knew that there was an interest for coaches in Rhode Island. Next, I explained the basic role of a coach

according to what Sejal, Rosanne, Harold and I had discussed in our meeting. This included the following:

The basic Role of a Coach:

- A coach's role starts after receiving the name and contact information of a new gardener
- The coach then contacts the new gardener to set up a convenient time to do a site assessment at their home
- After the site assessment the coach may receive follow up e-mails or phone calls with further questions from the new gardener

Other details of the Program:

- People interested in having a coach are those who want to start a vegetable garden or those who have not been as successful as they would have liked with a current garden
- Coaches should help with vegetable gardens only, not with flower gardens
- A coach's role is to provide advice; no physical labor is expected
- Participants are encouraged to get their soil tested through the University of Massachusetts, Amherst before being matched with a coach

Other topics covered in the training session were:

- Drip irrigation (Harold)
- Lead contaminated soil (Harold)
- Building a raised bed garden
- Organic gardening
- Integrated pest management
- Gardening in minimal sun (Rosanne)
- Container gardening (Rosanne)

(See Appendix D for the PowerPoint of the training session)

Participants were also provided with a checklist to refer to during a site visit (see Appendix E) and a client contact form, which in addition to recording the new gardener's contact information can also be used for taking notes during the site visit (Appendix F). Lastly, the participants were provided with a number of useful handouts, including a Rhode Island planting calendar, an example of a completed soil test from the University of Massachusetts, Amherst, and information about lead contamination (for a full list of handouts see Appendix G). Lastly, the participants were provided with a list of useful web links (see Appendix H).

At this time, Rhode Island residents are just starting to be matched with trained Master Gardener coaches (at last count twelve mentees had been matched with coaches), and the program is considered a pilot project. An evaluation process will take place at the end of the season, and if the evaluations indicate positive results, the Master Gardeners may very well expand the program. This seems like a logical progression, as coaching fits perfectly into the mission of the Master Gardener Program: to provide education about environmentally sound gardening practices, to provide outreach through educational community projects and to promote sustainability in all educational and outreach activities.³⁸

Success of the pilot project may also resound with those at South Side Community Land Trust. South Side helps low income residents grow healthy, affordable food by providing access to land along with education about sustainable growing

practices. South Side also has a Farm Business Incubator Program described by South Side as:

(An) innovative program providing farmers from low-income and immigrant communities with land, support, and technical assistance at SCLT's Urban Edge Farm. Incubator Farmers learn to grow, harvest, and market their own produce. The Incubator farmers are guided by a four year curriculum that includes organic farming methods and techniques along with business and marketing classes. Upon graduation, SCLT helps farmers relocate onto their own land and continue their for-profit businesses.³⁹

If the Master Gardener coaching program proves to be successful on a volunteer basis, South Side may be more willing to take the idea of coaching a step further by exploring the possibly as a business opportunity for their members. In such a scenario, a member of South Side could learn not only to market the food that he or she grows, but how also to market the knowledge he or she has acquired on the way to becoming a successful organic farmer.

Katherine Brown, director of South Side Community Land Trust has informed me that South Side is always looking for good business opportunities for their farmers, and she has shown a particular interest in the coaching endeavor. As previously mentioned, garden coaches in other parts of the nation are able to earn \$60 - 100 per hour for their services. Although the amount Rhode Island residents would be willing to pay for such a service is not yet clear, the coaching pilot project may help to show that Rhode Islanders would also value a coaching service, thereby making it more attractive as a business proposition.

Faced with economic instability, Rhode Island has endured budget cuts across many sectors, affecting everything from public schools to homeless shelters. Thus,

public funding for any new program is difficult to come by. This is one of many reasons why the generosity of volunteers and the continued strength of the Master Gardener Program are so valuable. The worse the economic conditions, the greater the need there is for productive green spaces in Rhode Island, and the Master Gardeners seem prepared to meet this challenge.

If Michelle Obama's South Lawn vegetable garden has just a fraction of the influence Eleanor Roosevelt's did during World War II, there will soon be an influx of Rhode Island residents ready to garden but lacking in the food-growing knowledge their ancestors may have possessed. With the success of the Master Gardener pilot coaching project, we may see volunteers all over Rhode Island ready to fill this void.

VI. Conclusion

This thesis is a call to re-imagine the way private land is utilized in Rhode Island; to imagine a landscape dominated by lush, prolific vegetable gardens rather than sterile, unproductive lawns. Promisingly, national seed sales have risen dramatically in the past few years (see appendix I), and my research suggests that Rhode Island residents share this revitalized interest in growing food. During my interviews at farmers' markets, I learned that many of the Rhode Island residents I spoke with would start vegetable gardens if it weren't for a number of barriers, many of which could be overcome with the right type of support. These barriers include fear about lead contamination, lack of knowledge about growing food, and the notion that growing vegetables requires more space than is actually necessary.

For those who have some disposable income but do not have the time or the desire to do all the work themselves, landscapers or trainees from green job programs could be of help with garden planning, installation and maintenance, whereas educational efforts like kiosks at farmers' markets and garden coach relationships could assist those who are interested in a cheaper, more do-it-yourself approach. Through my interviews I also learned that these educational efforts could help current gardeners as well; even though they have had the courage to begin, current gardeners suggested that more knowledge about vegetable gardening would increase their success and make them less likely to give up.

Times have changed drastically since the 1930s and 40s when victory gardens were common, but today Rhode Island finds itself in another deep recession and once

again at war. This time, however, the environmental crises we face are even more profound: heightened levels of air, water and soil pollution, urban and suburban sprawl, water scarcity and climate change, to name a few. These new crises call for the adoption of a more permanent gardening movement. But the call for more home gardens in Rhode Island is not just about avoiding doom and gloom; it is also about opportunities to be seized: beautifying the community, empowering residents and increasing quality of life.

Rhode Island's yards contain the potential to grow the most local and nutritious food of all, and unlike most community gardens, home gardens confront no issue of land acquisition, and usually do not require the costly installation of a water source. In addition, gardens in close proximity to a home are more likely to receive the care and security they need, and produce acquired outside the front or back door can be used for a meal at any time, not just after a conscious effort of planning, harvesting and transport.

Despite the extensive benefits vegetable gardens could offer Rhode Island's communities, most people still do not grow any of their own food, and the challenge that remains - as this thesis attempts to address - is to confront what prevents most Rhode Island residents from converting their grass into vegetables. It is my hope that the recommendations offered in this thesis will play a role in addressing some of these barriers, and ultimately lead to an increase of home gardening in Rhode Island.

Of all the recommendations offered in this thesis, the garden coaching program seems to show the greatest potential for the immediate future. A few days ago, I witnessed the success of the first garden coach-mentee relationship, which will soon result in a new vegetable garden on Laurel Avenue in Providence. As more residents are

matched with coaches, the future of the coaching program and the future of home gardening in Rhode Island look bright.

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Appendix A

WIC Checks Redeemed at Rhode Island Farmers' Markets in 2008

Market Name	WIC		Group
	Redeemed	%	
Armory Prov	\$25,400	22.0%	Farm Fresh
Pawtucket	\$18,900	16.4%	Farm Fresh
Broad St. Prov	\$13,500	11.7%	Farm Fresh
Hope High	\$12,900	11.2%	Farm Fresh
Woonsocket	\$11,100	9.6%	Farm Fresh
Kennedy Plaza	\$6,400	5.5%	Farm Fresh
Goddard SP	\$4,700	4.1%	DEM
Haines SP	\$3,800	3.3%	DEM
Pawtuxet Village	\$3,800	3.3%	Pawtuxet
Colt SP	\$2,400	2.1%	DEM
Middletown	\$2,400	2.1%	Aquid Gro
Westerly	\$1,800	1.6%	Wstrly LT
Newport	\$1,400	1.2%	Aquid Gro
Lincoln (Rt. 295)	\$1,300	1.1%	DEM
URI	\$1,200	1.0%	S Kingstwn
Scituate	\$1,100	1.0%	Scituate
Pastore Complex	\$900	0.8%	DEM
Capitol Hill	\$800	0.7%	DEM
Marina Park	\$600	0.5%	S Kingstwn
North Kingstown	\$500	0.4%	Coastal Gr
Fishermen Mem	\$400	0.3%	DEM
Brown University	\$300	0.3%	Farm Fresh
Total Farm Fresh	\$88,500	76.6%	
Total DEM	\$14,300	12.4%	
Total Markets	\$115,600	100%	

WIC season June-Oct 2008. Source: RI Dept of Health

Source: Rhode Island Department of Health. "2008 WIC usage at the Farmers' Market" as cited in on the Farm Fresh Rhode Island website. February 25, 2009. Retrieved March 31, 2009:
<http://www.farmfreshri.org/blog/2009/02/25/2008-wic-usage-at-the-farmers-market/>

Appendix B

Interviews Compiled in Excel

GARDENERS - INFLUENCES		Total	% of total
Food Quality/Freshness	21	31	67.74
Family (parents/grandparents) influence	12	31	38.71
Enjoyment	11	31	35.48
Environmental concerns/interests	7	31	22.58
Chemical avoidance/food safety	6	31	19.35
Economy	5	31	16.13
Physical health	5	31	16.13
1960's "back to the land" movement	3	31	9.68
Psychological health	2	31	6.45
Teach/influence children	1	31	3.23
Community beautification	1	31	3.23
Friend (other than family) influence	1	31	3.23

PROBLEMS FACED BY GARDENERS		total	% of total
Lack of knowledge/skill	7	31	22.58
Time	3	31	9.68
Transience (summer travel or moving often)	2	31	6.45
Space (lack of available land)	1	31	3.23
Pests	1	31	3.23

NON-GARDENERS - BARRIERS		total	% of total
Space (includes lack of sun, rocky soil)	11	31	35.48
Time constraints	8	31	25.81
No Interest	6	31	19.35
Concern about soil contamination	4	31	12.90
Age	4	31	12.90
Knowledge/skill	3	31	9.68
Transience	2	31	6.45
Food available elsewhere	2	31	6.45
Preference for grass	1	31	3.23

NON-GARDENERS INTERESTS MENTIONED		total	% of total
Food Quality/Freshness	13	31	41.94
Economy	6	31	19.35
Chemical avoidance/food safety	5	31	16.13
Teaching/influencing children	3	31	9.68
Environmental concerns/interests	2	31	6.45
Enjoyment	2	31	6.45
1960's "back to the land" movement	2	31	6.45
Government benefits (WIC, Senior Coupons)	2	31	6.45
Psychological health	1	31	3.23
Physical health	1	31	3.23
Family (parents/grandparents) influence	1	31	3.23

Appendix C

Example Sheet of URLs and Books to Provide at Farmers' Markets

URLs

Planting a garden: general information on how to begin:

<http://www.ext.vt.edu/pubs/envirohort/426-312/426-312.html>

Options for removing sod:

<http://www.finegardening.com/how-to/articles/4-ways-to-remove-sod.aspx?nterms=74884>

Vegetables you can grow in minimal sun:

http://www.inthegardenonline.com/picks_10vegforshadeC21.htm

Vegetable gardening in small spaces - container gardening:

<http://www.extension.iastate.edu/Publications/PM870B.pdf>

Gardening organically:

<http://www.gardening.cornell.edu/factsheets/orgmatter/index.html>

Dealing with pests:

<http://vegetablemdonline.ppath.cornell.edu/cropindex.htm>

Getting the most economic value from your garden:

<http://www.ext.vt.edu/pubs/envirohort/426-335/426-335.html>

Soil testing through the University of Massachusetts, Amherst:

<http://www.ext.vt.edu/pubs/envirohort/426-335/426-335.html>

Information about lead contamination:

<http://www.extension.umn.edu/distribution/horticulture/DG2543.html>

Information about composting:

<http://vegweb.com/composting/resources.shtml>

Building healthy soil:

<http://www.gardeners.com/Building-Healthy-Soil/5060,default.pg.html>

Example instructions for a raised bed garden:

<http://www.thisoldhouse.com/toh/how-to/intro/0,,20258509,00.html>

University of Rhode Island Planting Calendar for Rhode Island:

<http://www.urimga.org/RIVegPlantingGrid.pdf>

Full length books for inspiration and education:

In Defense of Food by Michael Pollan

Animal, Vegetable, Miracle by Barbara Kingsolver

Fresh Food From Small Spaces: The Square Inch Gardener's Guide to Year-Round Growing, Fermenting and Sprouting by R.J. Rupenthal

Appendix D

PowerPoint of Garden Coaching Training, 3/14/09

GARDEN COACHING



You can do it, we can help

Introductions

- Nora Buckman
- Harold Ward
- Rosanne Sherry
- Sejal Lanterman

How can home gardens be increased in Rhode Island?

- Interviews at farmers' markets
- The Master Gardeners pilot project
- Public demand/why do people want a coach?

Overview of the morning

- **Effectively advising a new gardener**
 - the coach's role
 - maintaining boundaries
 - the checklist
- **Special Topics**
 1. drip irrigation
 - [Break]
 2. lead contaminated soil
 3. building a raised bed garden
 4. organic gardening
 5. pest management, IPM
 6. gardening in minimal sun
 7. containers gardening

The coach's role – basic outline



- Matching coaches and new gardeners: the process
- Arranging the site visit
- Making a site visit & giving advice
- Following up with e-mails or phone calls

Maintaining boundaries



- Edibles only
- Only one site visit expected
- No physical labor – advice only
- Limited follow-up with e-mails/ phone calls

What advice might you give here?



How about here?



Site assessment

- Helping the gardener choose the most appropriate spot for their garden

- Sunlight
- Water availability
- Size



Site assessment, continued

- Reviewing soil test results with your gardener

- Examples of completed soil tests
- How should the soil be amended in these cases?
- What materials are needed?



Site assessment, continued

- Are there any special requirements?

- Soil contamination
- Minimal sun



- Is container gardening more appropriate here? Raised bed gardening?

Materials

What materials are needed? Where can they be found?



- Topsoil
- Organic material
- Lime
- Gardening tools
- Fencing
- Lumber
- Hardware
- Rototiller

Tilling options

- **Manual labor and a shovel**
- **Use a Rototiller**
 - consider removing sod altogether - benefits
 - **Rent a rototiller from a tool rental company**
 - Example:
 - Rhode Island Rental, Warwick, RI 401-738-9731
 - Small rototiller might fit into the back of a car
 - \$37.15/day, \$14.86/two hours
 - **Hire a local landscaper to rototill for you**
 - prices vary

Fencing options



- **In a less urban area, deer may be a serious problem**
- **Netting is an easy alternative to more costly fencing:**
 - Millennium Heavy Duty Deer Fence
 - polypropylene, 8 ft x 100 ft roll is \$200
 - <http://www.invisible-deer-fence.com/installation/installation3.htm>



Installation

Looking through the eyes of a person who has never gardened before, what steps would you convey?

- **Breaking up the ground**
- **Building the right soil**
- **Adding compost and other amendments**
- **Constructing a raised bed if necessary**



Planting


- **What is appropriate to plant and when**
 - Choosing plants appropriate for the site and this particular gardener's likes and dislikes
 - Common vegetables and when to plant them in RI (see URI MG handout)



Topic #1: Drip irrigation

Why drip irrigation?

- Conserves water: less evaporation, runoff
- Saves time and energy
- Appropriate for medium to large gardens



Drip irrigation continued

- The logistics
- Materials needed (see handout)
- www.dripworksusa.com
- Tour of the garden



Topic #2: Lead contamination

- Lead occurs naturally in U.S. soil, with levels ranging from 7 – 20 parts per million (ppm)
- Two main sources of contamination:
 - Lead-based paint from old buildings
 - Lead from auto emissions (banned in 1970's in the U.S, but lead persists in the soil)

Acceptable lead levels – vary according to source

- Children are at a much higher risk for lead poisoning
- The University of Minnesota suggests the following levels, which can be considered risk adverse:
 - A level of 100 ppm or less should be considered safe for gardening if children are present
 - A level of 300 ppm or less should be considered safe for gardening if no children are present
- According to the EPA, levels under 400 ppm are not a concern for children or for adults

Lead contamination levels: yet another source

From URI's Landscape Horticulture Program:

Relative Lead Levels	Extracted Lead (ppm)	Total Lead (ppm)
Low	0 - 32	0 - 499
Medium	33 - 110	500 - 999
High	111 - 857	1000 - 3000
Very high	Above 857	Above 3000

Minimizing lead availability to plants

- Locate garden away from buildings and streets if possible
- Maintain soil PH above 6.5
above this level, lead is less available to plants
- Add organic matter to the soil:
 - Well-rotted manure
 - Neutral (non-acid) peat
 - compost

Exposure to lead in the garden

- The most dangerous source of exposure to lead in the garden is **direct ingestion of soil**
- However, uptake by plants is possible and may be a concern when lead levels in soil are high
- **Leafy vegetables** (chard, lettuce) and the **surface of root crops** (radishes, carrots) have the highest concentrations of lead
- Lead does not readily accumulate in the fruiting part of vegetables (corn, tomatoes, squash, strawberries)

Limiting exposure to lead in the garden

- Remove outer leaves of leafy crops
- Peel all root crops
- Wash all produce thoroughly with water and vinegar (1%), or soap (0.5 %)

Topic #3:
Building a raised bed garden



- Talk about handout
- Use wood that is not treated with arsenic: this is no longer available to purchase
- If the soil has a high amount of contamination, landscape fabric and 10" minimum fill is necessary

Wood alternatives for raised beds

- Trex: when price is not a concern
 - reclaimed wood and plastic
 - does not rot, mildew does not grow
 - no toxic chemicals or preservatives
- Plastic Lumber RI:
 - <http://www.plasticlumberri.com/>
 - much more expensive than wood
 - 4x12 garden kit at Plastic Lumber RI = \$595

Topic #4
Gardening Organically

- Many people I interviewed were interested in gardening organically – people have different ideas about what organic means
- One definition:
 - A method of gardening utilizing only organic materials, such as manure, peat moss, and compost, and rejecting inorganic materials, such as rock phosphate, ammonium, insecticides, and pesticides
- United States Department of Agriculture Certified Organic definition:
 - only use methods that maximize soil health, conserve water and reduce air pollution
 - no synthetic fertilizers, pesticides or hormones
 - must use organic seeds and may not use banned chemicals; and substances for at least three years before a crop can be considered organic

Topic #5
Integrated Pest Management (IPM)

- **“A method used to control pests in an environmentally responsible manner. By reducing our dependence on pesticides, IPM protects the environment and our health... IPM practices include monitoring, modifying pest habitat, protecting natural enemies, and when needed, the use of pesticides”**

- USDA/University of Massachusetts

Topics #6&7:
Rosanne

- ▣ Gardening in minimal sunlight
- ▣ Container gardening

Appendix E

Garden Coach Checklist

- What amount of sun? Full sun half sun full shade
- Is the site level?
- What's the soil pH and nutrient levels per UMASS test?
- The lead level of this site is
- Is there access to water with a hose? Does water have to be carted in jugs?
- The client prefers to be organic or conventional or not concerned
- Children will be involved in the garden? Ages?
- The client is especially conscious of economic value from the garden
- Is vandalism a concern?
- Is the client interested in food preservation? Freezing, canning, other storage?
- Do they have a few hours a week to keep the garden operating?
- Do they want to try raised beds?
- Do they want to try containers?
- Do they have access to a balcony or roof for containers?
- What seems to be the barrier for this client to get working in the garden?
 - Lead or other contaminants
 - Concern over "chemicals"
 - Time
 - Space
 - Rent vs. Own

Appendix F

Garden Coach Client Contact Form

Client's name _____

Address _____

Day phone _____ **Evening Phone** _____

Email _____

Best time and way to be contacted _____

Best time to visit _____

Backyard Coach assigned _____

Garden Notes:

Appendix G

List of Handouts Provided for Garden Coaches

- Garden Coach Checklist
- Client Contact Form
- List of helpful URLs (see following appendix)
- “Lead in the Home Garden and Urban Soil Environment” by the University of Minnesota
- Example Plans for a Raised Bed Garden
- Drip Irrigation: Suggested Vendor and Sample Plan
- Soil Test Brochure (Form and Instructions for Soil Sampling) from the University of Massachusetts, Amherst
- Examples of Completed Soil Tests from the University of Massachusetts, Amherst
- Planting Plan for Rhode Island by the University of Rhode Island Master Gardeners

Appendix H

List of URLs Provided for Garden Coaches

Gardening and lead contaminated soil:

University of Minnesota: “Lead in the Home Garden and Urban Soil Environment”
<http://www.extension.umn.edu/distribution/horticulture/DG2543.html>

Cornell University: “Children, Gardens and Lead”
<http://www.hort.cornell.edu/gardening/factsheets/misc/cgandlead.html#solution>

University of Rhode Island: “Lead in Garden Soils”
<http://www.uri.edu/ce/factsheets/sheets/lead.html>

US Environmental Protection Agency: “Lead in Paint, Dust and Soil”
<http://www.epa.gov/lead/>

Drip Irrigation:

One company that carries drip irrigation equipment:
<http://dripworksusa.com/>

Fencing:

<http://www.invisible-deer-fence.com/installation/installation3.htm>

Raised Bed – example plans:

<http://www.thisoldhouse.com/toh/how-to/intro/0,,20258509,00.html>

General – Vegetable Gardening:

<http://www.vegetablegardener.com/>

<http://www.ext.vt.edu/pubs/envirohort/426-312/426-312.html>

<http://www.gardening.cornell.edu/factsheets/orgmatter/index.html>

Pests:

Cornell IPM Fact Sheet for Vegetables:
<http://www.nysipm.cornell.edu/factsheets/vegetables/default.asp>

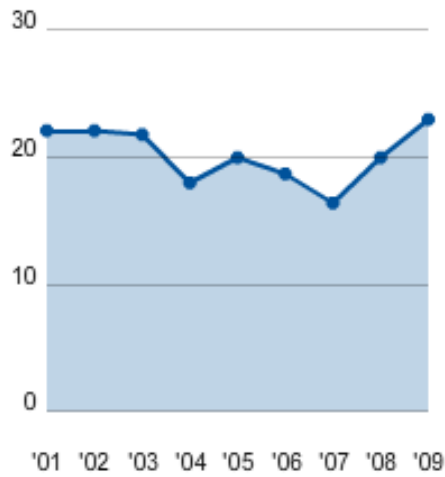
Cornell Disease Factsheet:
<http://vegetablemdonline.ppath.cornell.edu/cropindex.htm>

U Mass/USDA: “What is Integrated Pest Management?”
http://www.umass.edu/umext/schoolipm/ipm_multi_language.pdf

Appendix I

U.S. Seed Sales, 2001-2009 (2009 Projection)

**Number of U.S. Homes Buying Vegetable Seeds
(In millions with 2009 projection)**



Source: National Gardening Association
USA TODAY

Source: Horovitz, Bruce. "Recession Grows Interest in Seeds, Vegetable Gardening."
USAtoday.Com, February 20, 2009. Retrieved March 29, 2009:
http://www.usatoday.com/money/industries/food/2009-02-19-recession-vegetable-seeds_N.htm