

IMPROVEMENT OF THE RICE COMMUNITY GARDEN
FINAL REPORT

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ENST 400: Independent Study

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

The primary objective of this independent study project was to investigate and implement ways to improve the Rice Community Garden (“the Garden”) for the long run. The investigation involved examination of other community gardens in Houston and at other colleges, and interviews with experienced community gardeners and key figures involved with the Garden. Implementation involved planning and organization, contacting the appropriate people for help, applying for funding, execution of long-term physical improvements, and publicity efforts.

1.2 INTRODUCTION TO COMMUNITY GARDENING

A community garden can be defined as a plot of land, owned by an individual, group, or organization, that is dedicated to horticulture with benefits to the community. This definition is my own, based on the information I have gathered this semester, because there is no formal definition broad enough to encompass the diverse forms and functions of community gardens. It is not clear when community gardening were first conceptualized. Some of the earliest known community gardens were the Victory Gardens of World War II, planted by some 20 million Americans in backyards, empty lots, and even city rooftops in response to a government call for individuals to provide their own fruits and vegetables in light of the shortages in labor and transportation (Reinhart). Today community gardens vary in size (from a single bed up to several acres), work force (from one or two volunteers to hundreds of people with individual plots), purpose (harvest for oneself, donation to needy, educational, or therapeutic), and lifespan (one season to several decades). The benefits to the community may include development of skills for growing one’s own food, helping to feed the needy, having an outdoor volunteering space, providing habitat for native species, and beautification of the neighborhood.

Community gardens exist on public and private lands and in urban and rural areas around the world. A shining example of an urban community garden is the Clinton Community Garden in the Hell’s

Kitchen neighborhood of New York City. Transformed from a 100 x 150 ft abandoned lot in 1979, the garden now has permanent parkland status in the city and boasts flower beds, shrubbery, trees, lawns, paths, an herb garden, a rock garden, a beehive, a rose bed, a grape arbor, and a Native American medicinal plants bed (Clinton). The success of the Clinton Community Garden, as with all community gardens, hinged on the involvement of dedicated volunteers from the community who worked together to ensure the physical health of the garden as well as the presence of the garden within the community.

Several books have been written on community gardening. I will mention a few that sound promising, though I have yet to read them: *City Bountiful: A Century of Community Gardening in America* (Lawson 2005, University of California Press); *25 Years of Community Gardening* (Moroz 2006, American Community Gardening Association); *A Handbook of Community Gardening* (Naimark 1982, Boston Urban Publishers); *Creating Community Gardens* (Johnson 1970, Charles Scribner's Sons). Urban Harvest's Leigh Ann Jones Garden Library is located at the Urban Harvest office and houses more than 600 books as well as audio tapes, videos, and magazines on a variety of gardening topics (Urban Harvest).

1.3 INTRODUCTION TO THE RICE COMMUNITY GARDEN

1.3.1 Overview

The Rice Community Garden was conceptualized in 1996 and broke ground on March 20, 1999. It is located on campus between Mudd Lab and Hicks Kitchen, at what is now Entrance 21. There are six garden beds totaling 496 square feet: five 4 x 20 ft beds and one 4 x 24 ft bed. All six beds are raised and are surrounded by 8 x 8 x 8 in cement blocks. While the Garden is mainly devoted to growing vegetables and fruits, one of the Garden's beds is reserved for herbs, flowers and plants that will attract butterflies, hummingbirds and beneficial insects. The Garden is believed to be the first community garden at any undergraduate institution in Texas (Durbin).

1.3.2 Goals and Benefits

From the start, the goals of the Garden have been “to promote volunteer service, to promote the social, healthful, and educational benefits of gardening, and to promote awareness of hunger in the local

community” (RSVP). The idea is that by volunteering in the Garden, one will enjoy the satisfaction of helping to improve the lives of others, the pleasure of working with one’s peers, and the relaxing benefits of working outdoors with one’s hands. More importantly, the fruits of the volunteers’ labor (literally) will be donated to an organization that will distribute the produce to needy individuals who might not otherwise have access to fresh produce (RSVP).

1.3.3 Relationships with Other Campus Organizations

The Garden is a special project of the Environmental Committee of the Rice Student Volunteer Program (RSVP). RSVP was founded in 1985 and functions as a programming board that organizes service opportunities for the Rice community. It serves as an all-purpose liaison between Rice University and the Houston community, though it is not the only volunteering organization on campus. RSVP is funded primarily through the \$2 “blanket tax” fee collected from each student at the beginning of the year. One or two students chair the entire RSVP organization and are selected each year through a formal application process by the director of the Community Involvement Center (CIC). The committee system was implemented in 1995, and the four other committees are Children, Education, Health, and Hunger and Homelessness. Each committee is chaired by one or two students elected each year by RSVP members. Anyone in the Rice community can join any committee they wish with no application. Other activities of the Environmental Committee include annual trips to volunteer at a permaculture farm, trail work and maintenance at Hermann Park and Houston Arboretum a few times a year, and other occasional activities that fall under the category of volunteering for the environment. Like the other committees, the Environmental Committee receives a \$250 budget per academic year. Much of this amount is allotted to the Garden, since other committee events do not require much funding.

While the Garden is officially sponsored by RSVP, it also receives ad-hoc but important funding and/or advice and support from the Department of Ecology and Evolutionary Biology (EEB) and Facilities Engineering and Planning (FE&P). Its relationships with the Rice Environmental Club, Student Association Environmental Committee, and other campus organizations are not formally defined; others hear about the Garden primarily through friends or club members involved with the Garden.

1.3.4 Status as of January 2006

As of January 2006 the Garden had maintained its six beds, though the soil levels had dropped from being level with the cement blocks to 2-5 inches below the top edge of the cement blocks. The original crop rotation schedule had been abandoned, and records of varieties planted had been intermittent since 2000. The soil quality was clay-like, though there were also layers of sand. Snail shells had been found in the soil, along with May beetles (June bugs). From 2002-2005 I recall that the garden had limited productivity, with only a few grocery bags full of harvest being delivered to the shelter each semester.

From 2002-2005 participation in the Garden usually involved six or less volunteers each Sunday morning. Most of the volunteers were undergraduates recruited through flyers around campus, RSVP, and word-of-mouth (friends bringing friends). There was one active graduate student during the 2003-2004 school year who had since graduated. The Garden has been a consistent volunteering site in RSVP's Outreach Day, a campus-wide volunteering day held once per semester, during which anywhere from two to a dozen volunteers may participate.

2 PRELIMINARY RESEARCH

2.1 HISTORY OF THE RICE COMMUNITY GARDEN

The information provided here on the history of the Garden is based on: (1) a binder of notes and e-mail correspondences dating back to 1999 that was passed on to me from the previous student coordinator; (2) a file on the Garden at the Woodson Research Library in Fondren Library, composed of e-mails printed by Gerrienne Scaad, pictures from the groundbreaking, and articles in the *Rice News* and *Rice Thresher*, all from 1999; and (3) my e-mail correspondence this semester with former student coordinators. These sources are far from truly objective or comprehensive, and I apologize for any misrepresented facts that result from subjective or insufficient information.

2.1.1 The Birth of the Garden

The key players in the creation of the Garden appear to have been Paula Wynn ('99) and Amanda Barnum ('01), then the External Vice-Chair and Environmental Committee Chair, respectively, of RSVP. Originally the Garden was planned for a space near the old Wiess College, and the current location was chosen as a “temporary home.” Due to space limitations, the original space could not be claimed by the Garden and so has remained in its current location. According to Ms. Wynn, Eusebio Franco, Director of Custodial & Grounds, was the one who finally secured the current plot of land for the Garden.

The process of creating a garden required the support of many members of the Rice Community as well as support from outside the hedges. In an article in the *Rice News* dated April 19, 1999, Wynn was quoted as saying, “We’re flying by the seat of our pants here. All these problems keep coming up, like the weather.” In the same article Barnum was quoted as saying, “We didn’t really know what we were doing, we just knew that we needed a garden” (Durbin). These quotes provide clues to the audacity of the original garden creators in jumping in despite their inexperience.

Much of the technical knowledge about gardening came from Shelly Johnson, a consulting specialist working in Mudd Lab, her husband Roy Johnson, and several other staff members. Dr. Bob Randall from Urban Harvest, a local nonprofit organization dedicated to community gardening, also provided a great deal of technical guidance in the creation of the Garden. Dr. Randall came to Rice to give a free introductory class on starting a community garden in February 1999 and was greeted by nearly 100 students, faculty, and staff (Durbin). A recruiting mass e-mail was sent out to the entire campus through the alldepts@rice.edu mailing list. A list of tools needed was posted on the website. During the spring of 1999 Ms. Schaad sent out e-mails advertising a summer “adopt-a-plot” program (rental of Garden space for a nominal fee), but I have been unable to contact her and do not know of the outcome of that program.

A groundbreaking ceremony, complete with a live band and free food, was scheduled for March 19, 1999, but the event was rained out. The six beds were constructed from March 20-April 11, 1999, in

the conformation depicted in Appendix A that has remained unchanged. At the start, the beds were filled with a specially-formulated, well-fertilized soil mixture.

2.1.2 Physical Changes

In July, 1999, the paths surrounding the beds were mulched with weed-block. Today the paths are covered with grass. A 4-ft tall trellis was installed in bed 1 in December, 1999. A lime tree was planted in bed 2 in Spring, 2000, and has since grown to approximately 10 ft tall and is very productive. A subsurface irrigation system was attempted in 2000 but because of summer abandonment, the system broke and was removed. Another subsurface irrigation system was attempted in Spring 2005 by members of Engineers Without Borders (EWB), but also because of summer abandonment and perhaps flaws in the system (and the graduation of the EWB members), the system was deemed inoperable in Fall 2005 and removed.

Some time during 1999-2000 the Garden became a donation garden, with the harvest going to Casa Juan Diego, a shelter for immigrants and refugees. Ms. Barnum noted that initially the group tried to plant “exciting” vegetables like kolrabi, but then Ms. Wynn and other students realized that they needed to plant food that would be more culturally appropriate for and appreciated by the people served by Casa Juan Diego. They delivered harvests to the shelter on a weekly basis, but as productivity gradually decreased from 2000-2003, the 40-minute round-trip drive to the shelter became less frequent and less practical. As Casa Juan Diego grew, it established its own community garden, and in Spring 2005 Sara Leibovich and other community gardeners decided that it was best to choose a shelter that was smaller, closer to Rice, and could benefit more from fresh produce from an organic community garden. Omega House, a live-in hospice facility for HIV/AIDS patients less than a 10-minute drive away, was then chosen as the new recipient of the Garden’s harvest.

2.1.3 Maintenance, Leadership, and Group Dynamics

Since its groundbreaking in 1999, the Garden has seen cycles of use and disuse, productivity and atrophy. Many crops have been grown successfully, but because the majority of volunteers since 1999 have been undergraduates, the summer months prove challenging for the care and maintenance of the

Garden. Often much work must be done at the beginning of the fall semester to clear away the overgrown weeds from the summer. Megan Wilde noted that during her time as coordinator (2000-2003) it was increasingly difficult and frustrating to find and keep regular volunteers.

Interestingly, the relationship between students and staff involved with the garden has not always been agreeable. Towards the end of 1999 there was escalating tension between the students, who knew less about gardening, and the staff, who knew a lot about gardening and began to dominate the planning and work in the Garden. In the file at the Woodson Research Library, I found a series of e-mails from December 1999 and January 2000 in which staff and students debated the fate of the garden and its management.

In an e-mail from Mr. Johnson (then an associate at Sid Richardson college; has since left Rice), he summarized the situation as follows: (a) The problem: no student participation in planning and tending of the garden, everything is done by a small group of faculty, staff, a grad student, and himself; (b) The proposed solution: scrap everything done so far and start over by intensive recruiting of students, who will be committed because they are in charge; (c) Problems with proposed solution: completely unappreciative of work that has gone into garden so far; have yet to find students who have any knowledge about gardening or the dedication to acquire that knowledge on their own; (d) Proposed alternative solution: continue running garden as well as possible; recruit heavily; offer a college course that teaches the fundamentals of gardening, so that students will be both equipped and motivated to manage the garden.

The students eventually had to involve the Office of Student Affairs to ensure that they could continue to be the primary caregivers and planners for the Garden. The argument given was that the faculty and staff were not giving the students enough of a chance to truly take ownership over the garden, and that planning for the garden was a valuable learning experience for students. As a result many of the regular staff members discontinued their involvement in the garden at the beginning of 2000. Since then, staff involvement has been low to nonexistent.

The primary garden leadership position of “student coordinator” is passed down from year to year, a process through which knowledge may be expanded but also potentially lost. The following is a chronology of all student coordinators to date:

Spring 1999	Paula Wynn ('99) and Amanda Barnum ('01)
Fall 1999	Amanda Barnum, Sue Wang ('02), and Megan Wilde ('03)
Spring 2000	Amanda Barnum and Megan Wilde
Fall 2000	Sue Wang and Megan Wilde
Spring and Fall 2001	Sue Wang
Spring 2002	Sue Wang and Megan Wilde
Fall 2002 – Spring 2003	Megan Wilde
Fall 2003	Shalene Jha ('04)
Spring 2004 – Spring 2005	Sara Leibovich ('05)
Fall 2005 – Spring 2006	Jennifer Wang ('06)
Fall 2006 – Spring 2007	Heather Johnson ('07), Roque Sanchez ('09), Jeremy Caves ('09)

2.2 COMMUNITY GARDENING AT OTHER COLLEGES

Several colleges around the United States have their own community gardens with varying function, structure, space, and resources. Based on e-mail correspondence with people affiliated with a few of these gardens, I have created a table summarizing basic information and key attributes (Appendix C). I have also drawn some conclusions about college gardens, from which I then devised potential improvements to the Garden:

- (1) Students cannot be the sole source of leadership for campus community gardens. They have other commitments, they sometimes are ineffective leaders, and they graduate, sometimes without assurance of passing down their knowledge and expertise. Therefore there must be more varied leadership consisting of other, more long-term members of the community;
- (2) In addition to more varied, long-term leadership, maintenance of campus community gardens should involve more of the community instead of relying solely on students. Make it a true “community garden” through recruitment of underrepresented groups, such as faculty, staff, alumni, and neighbors;
- (3) The Garden is a good place for learning and mentoring. This is important. At Brown University the community garden is used for classes on gardening for public high school students. At

Bowdoin College they use their 1.5 acres of farm space for collaborations with classes in architecture, economics, and biology. This helps with funding. While Rice obviously has a different situation, we need to remember that the Garden is not just a volunteering space but a learning space as well. The use of the Garden for class collaborations is a good future goal. To that end, it may be wise to first establish it as a space with educational potential. Rice students and community should be educated about the methods and benefits of community gardening;

- (4) Summers and other vacations are problems for all school gardens. Managers need to ensure someone is there over the summer to take care of the Garden. Hiring summer staff is a good option, provided funding is available;
- (5) Expansion of the Garden is desirable because it would provide more substantial harvests (for donation or perhaps for use in the campus dining halls) and enhance the garden's presence on campus. This requires a larger work force and a larger space, which may not be feasible at Rice. There is, however, the possibility of expanding a few beds at a time to the east of the current space, with the additional benefit of having more beds out in the sunshine.

2.3 COMMUNITY GARDENING IN HOUSTON

There are more than 100 community gardens in and around Houston supported by Urban Harvest. Community garden volunteers are growing fruits and vegetables for donation, to educate students, to provide therapy, and to sell and to take home (Urban Harvest). During the course of this semester I visited a few gardens in the Rice area and compiled information about other gardens. Appendix D summarizes basic information and key attributes about some gardens in the area. Based on the information from Houston gardens, I came to the following conclusions and potential improvements to the Garden:

- (1) Make better use of the wonderful resource that is Urban Harvest. They have classes, books, seeds, and most importantly, people who know how to maintain an organic community garden in Houston or at least are enthused about it. Many classes are free for community gardeners. A \$40

yearly membership for organizations will get us valuable newsletters, access to their seed library, and discounts on other classes;

- (2) Houston has a nearly year-round growing season, so to achieve maximum productivity there can be no real “off-season.” Special care must be taken around frost times and during the summer;
- (3) Houston has unique opportunities for the use of sustainable resources: rainwater catchment systems for irrigation and solar energy for irrigation pumps, hose timers, or other electrical needs. Long-term cost reduction (not to mention reduced ecological footprint) may outweigh the additional upfront cost;
- (4) A community garden is often the big dream of one person. In order for it to really thrive, there must be at least 2-3 dedicated people, a feeling of community cooperation, and a steady source of funding for upkeep. “Gardens die all the time,” according to Jenny Campbell, the Membership Coordinator at Urban Harvest. Sometimes the Garden barely meets the minimum requirement for survival. We must establish a group composed of various individuals from the community who will work together to oversee the Garden and ensure its survival.

3 IMPROVEMENT OF THE RICE COMMUNITY GARDEN JANUARY – APRIL, 2006

3.1 PHYSICAL IMPROVEMENTS

3.1.1 Soil Testing

Soil testing is recommended for all gardens to monitor nutrient content and to guide fertilization and plantings. Soil testing had never before been performed at the Garden. With \$120 provided by RSVP for this “long-term improvement,” soil testing was performed in early February, 2006. The company I chose was Texas Plant & Soil Lab in Edinburg, and I sampled soil from each of the six beds as per their online instructions. The results are detailed in Appendix E. Based on these results, the following changes to the soil can be made in the future (see diagram of garden in Appendix A):

All beds	Increase soluble Ca by adding any form of sulfur or humus/microbial acidification
All beds	Build potassium reserves
Beds 2, 3, 5, 6	Add more nitrate

3.1.2 Special Purchases

Aside from the normal Garden expenses throughout the year (seeds, fertilizer, topsoil, and printing costs), which are usually sufficiently covered by the RSVP Environmental Committee's budget, additional money is needed to make investments for long-term improvements. Such "capital expenses" may include tools and equipment that can be used for many years, perennial plants or trees, soil amendments, etc. These costs generally exceed the Committee's budget, and funding must be obtained through other means. RSVP has a special fund for such needs, and future coordinators should negotiate with the RSVP chairs to obtain those funds. Dr. Harcombe may be willing to provide some money through CSES. Nancy Rowe of Groundskeeping has also been able to provide certain supplies (pitchfork, hose spooler) for free.

Item	Purpose	Purchased From	Cost	Funding Source
1 lb. red worms	To increase productivity of compost bin	www.greenculture.com	\$20	RSVP Envi. Committee budget – No negotiations, included in normal expenses
Soil testing	To check current nutrient levels to determine future soil improvements	Texas Plant & Soil Lab, Inc. – Edinburg, TX	\$108 /6 beds	RSVP special funds – Negotiated with RSVP chairs
Wheelbarrow	To transport topsoil, mulch, and other heavy items around garden and campus if necessary	Lowe's Meyerland – Houston, TX	\$70	CSES – Negotiated with Dr. Harcombe

3.1.3 Establishment of Donation Relationships with Rice Coffeehouse and North Servery

There is a large amount of organic waste produced on campus. While the amount that the Garden can use is very small, it is a healthy exercise to use all that we can in our efforts to make the Garden a

more sustainable operation. I arranged for weekly pickups of spent organic coffee grounds from the Rice Coffeehouse (one 5-lb bucket per week). The coffee grounds can be used in the compost bin or directly in the beds to increase acidity and nitrogen content. I also arranged for pickups of vegetable scraps from the North Servery kitchen that can be dumped in the compost bin, also in 5-lb buckets. The fresh organic matter provides good feed for the redworms, which then vigorously turn out valuable compost.

3.2 PLANNING, MANAGEMENT, AND OUTREACH IMPROVEMENTS

3.2.1 Creation of 5-Year Crop Rotation Plan

Crop rotations help to improve or maintain soil fertility, reduce erosion, reduce the build-up of pests, reduce the risk of weather damage, reduce the reliance on agricultural chemicals, and increase net yields. I developed a 5-year crop rotation schedule with the help of Dr. Randall's *Year Round Vegetables, Fruits and Flowers for Metro Houston* (hereafter shortened to *Year Round Vegetables*). The crop rotation schedule is given in Appendix F. Detailed planting times and information on plants and varieties can be found in *Year Round Vegetables*.

3.2.2 Creation of Oversight Materials for Garden Coordinators

The manual was compiled from my work this semester, my experiences with the Garden over the last four years, and Dr. Randall's *Year Round Vegetables*. The manual is available for download in a Portable Document Format (PDF) on the Rice Community Garden website (see below and Appendix I). The creation of the manual was an obvious choice – I have learned a great deal this semester, and I want to ensure future coordinators will not have to go through the same things again. The result I envision is that future coordinators will have a comprehensive reference so that anything they need for the Garden will be right at their fingertips. The manual also includes a logbook so that volunteers can record what they did at the garden, observations, and suggestions.

3.2.3 Creation of Active Website

Many student organizations have their own websites, which usually contain an overview of the organization and contact information. Websites can be useful tools for publicity on- and off-campus,

providing general or detailed information, and keeping interested parties informed of current events related to the organization. An organization's website is most useful when it is actively maintained and provides current information.

A website was created for the Garden in 1999 but had been defunct since 2000. This semester a student working for Rice University Information Technology created a new website for the Garden at no cost, using the information found on the old garden website. I then updated the content on the website with the Garden's current information. There is a special section that displays the upcoming schedule of group sessions and an updated to-do list. This section, provided it is properly maintained, will be very useful in letting gardeners know what is going on in the Garden and what they can do to help. The coordinators' manual and planting and crop rotation schedules can also be found on the website. The URL for the website is given in Appendix I.

3.2.4 Increasing Community Garden Volunteerism and Visibility

Volunteerism and visibility go hand-in-hand, and many of my publicity efforts aimed to accomplish both. I publicized the Garden and recruited volunteers through flyers and e-mails to various listservs around campus, including ustudents@rice.edu (residential colleges) and alldepts@rice.edu (all departments). Richard Johnson helped me contact *Rice News* so that an article could be written on the efforts to increase non-student participation (see Appendix H). I spoke to the Staff Advisory Council's Staff Development Committee and engaged their interest in the community garden as part of their volunteerism theme. I also created one-page information sheets about the Garden, of which 150 copies were handed out to staff at RiceFest 2006. The result of these efforts is that six new staff and community members are now involved with the Garden. They will be helping to maintain the Garden over the summer by watering, weeding, mulching, and harvesting. During the school year they will either participate in group gardening sessions or tend to the Garden on their own according to the to-do list posted on the website.

3.2.5 Creation of Community Gardening College Course

It is increasingly common that young people do not know where their food comes from, how to grow their own food, and why it is important to be, in Dr. Randall's words, "horticulturally literate." The importance stems from the global status quo of diminishing energy supplies, decreasing biodiversity, persistent poverty and hunger, and climate change. Community gardens may be venues for educating students about a broad range of biological and environmental problems.

To this end I worked with Dr. Randall and the peer academic advisors (PAAs) at Jones and Brown Colleges to try to create a 2-credit "college course" for Fall 2006 entitled "Environmental Sustainability through Community Gardening and Permaculture." College courses are offered by each residential college each semester and can range from 1-3 credits. The college masters and an associates board decide on the budget for each course and work with the instructors (who do not have to be affiliated with Rice) and faculty affiliates to ensure smooth operation.

While the proceedings did not go through for Fall 2006, I have planned to push for the class for Spring 2007. Dr. Randall has already created a syllabus for the course, which will include lessons on community gardening and permaculture, an exam and a paper, and significant practical component in the Garden. Dr. Harcombe will find someone in the Department of Ecology & Evolutionary Biology to be the faculty affiliate, as he will be on sabbatical in Fall 2006 when arrangements are typically made for Spring 2007 college courses. In anticipation of Dr. Harcombe's absence, discussion will hopefully take place in May 2006 between the faculty affiliate, Dr. Randall, the PAAs, the college masters, and the associates board so that the issue can be decided before the summer

While the success of this course will not be determined for another year, it is my hope that it will help students rethink food, its sources, and its lifecycle. The course will also help increase visibility of the Garden around campus and train people in effective garden maintenance.

4 CONCLUSIONS

4.1 LESSONS LEARNED

- (1) **Management.** The successful management of a community garden requires foresight, planning, and organization. The tools and resources I have created this semester (planting and crop rotation schedules, manual, website, contacts) should give future Garden leaders a good start. Another lesson in management is that older members of the Rice community tend to be more experienced gardeners, and students tend to be much less experienced. If students do not take responsibility for the garden and devote time and energy to learning about gardening and maintaining the garden, then staff and faculty may feel the need to fill in the missing pieces and manage the garden for the students. This is what caused the conflict between staff and students in 1999-2000, and it is easily preventable if students can be adequate primary managers with the support of older community members.
- (2) **Labor required.** Given proper management, a community garden of our size does not require a lot of labor—perhaps 6-10 people who rotate to water the Garden during the week and meet for 1-2 hours each week to work as a group. This conclusion is based on my observations this semester. An average of 4-5 people came to group gardening sessions this semester, and I found that at the low end of the range (1-2 people), very little got accomplished during the session, while at the high end of the range (7-8 people), almost all of the necessary tasks were completed at the end of the 90-minute session. This group of 6-10 people can also easily set up a daily maintenance schedule. Additional help can be utilized for daily maintenance and to reduce time pressure on the core group.
- (3) **Community.** It is important to ensure that volunteers enjoy the time they spend working on the Garden. Enjoyment can come from chatting and sharing insights with other group members, spending time outdoors, working on a community service project, or having a long-term relationship with a natural space. To accomplish these goals it is essential to develop a sense of

community among the Garden's volunteer force. The community atmosphere will keep people coming back and will instill in them the feelings of responsibility and belonging. During our Sunday group sessions, we volunteers have consulted each other on our maintenance methods, brainstormed ideas for improving the Garden, and given each other advice about gardening, school, and beyond. The result is that over the course of volunteering at the Garden this year, I have developed friendships with the other volunteers and rely on their support, advice, and humor.

- (4) **Funding.** The Garden is unique in its funding needs as a volunteer project in that it is located on campus. All the seeds, soil, and other necessary physical expenses must be provided internally, whereas for off-campus volunteering efforts, the costs to RSVP are only for publicity, transportation, and snacks. The funding needs are also somewhat unique with respect to larger campus organizations and departments at Rice in that a little money goes a long way for the Garden. Funding, then, is adequately provided by RSVP, and it is also encouraging that additional money for capital improvements is available through RSVP, CSES, and potentially FE&P. Additionally, the Garden has a gift fund set up under the CIC, and donations can be made online. Detailed information about donations is given in Appendix J.
- (5) **Location.** The current location of the Garden is a limitation in two ways: (1) The beds are partially shaded by nearby trees and will become more so as the trees grow larger over the years. (2) The location in a less-frequented area of campus hinders visibility and campus presence.

4.2 RECOMMENDATIONS FOR FUTURE PHYSICAL IMPROVEMENTS

- (1) Add top soil to top of cinderblocks;
- (2) Possibly move a few beds into the area just east of the current site so that they can get more sun. Pruning the trees is not a viable option because the trees will not be getting any smaller as time goes on, and the problems of shade and slow-decomposing live oak leaves will not get any better;

- (3) If North Servery can continue to provide vegetable scraps for composting, another compost bin may be added and a two-bin rotation set up so that there is a higher turnaround rate for fresh compost. The worm population will automatically adjust to the amount of available feed stock;
- (4) Install a rainwater catchment system so that the Garden's substantial water needs can be met more sustainably;
- (5) Create a sign to mark the Garden and increase visibility;
- (6) Plant zinnias or other flowers good for cutting and using the fresh blooms as a fundraiser;
- (7) If the Garden can show increased interest and improved maintenance over the next few years, it is possible that additional beds may be added in the area adjacent to and east of the current site. Future coordinators will need to contact FE&P, who own the land for the current site and its adjacent area.

4.3 RECOMMENDATIONS FOR ORGANIZATIONAL IMPROVEMENTS

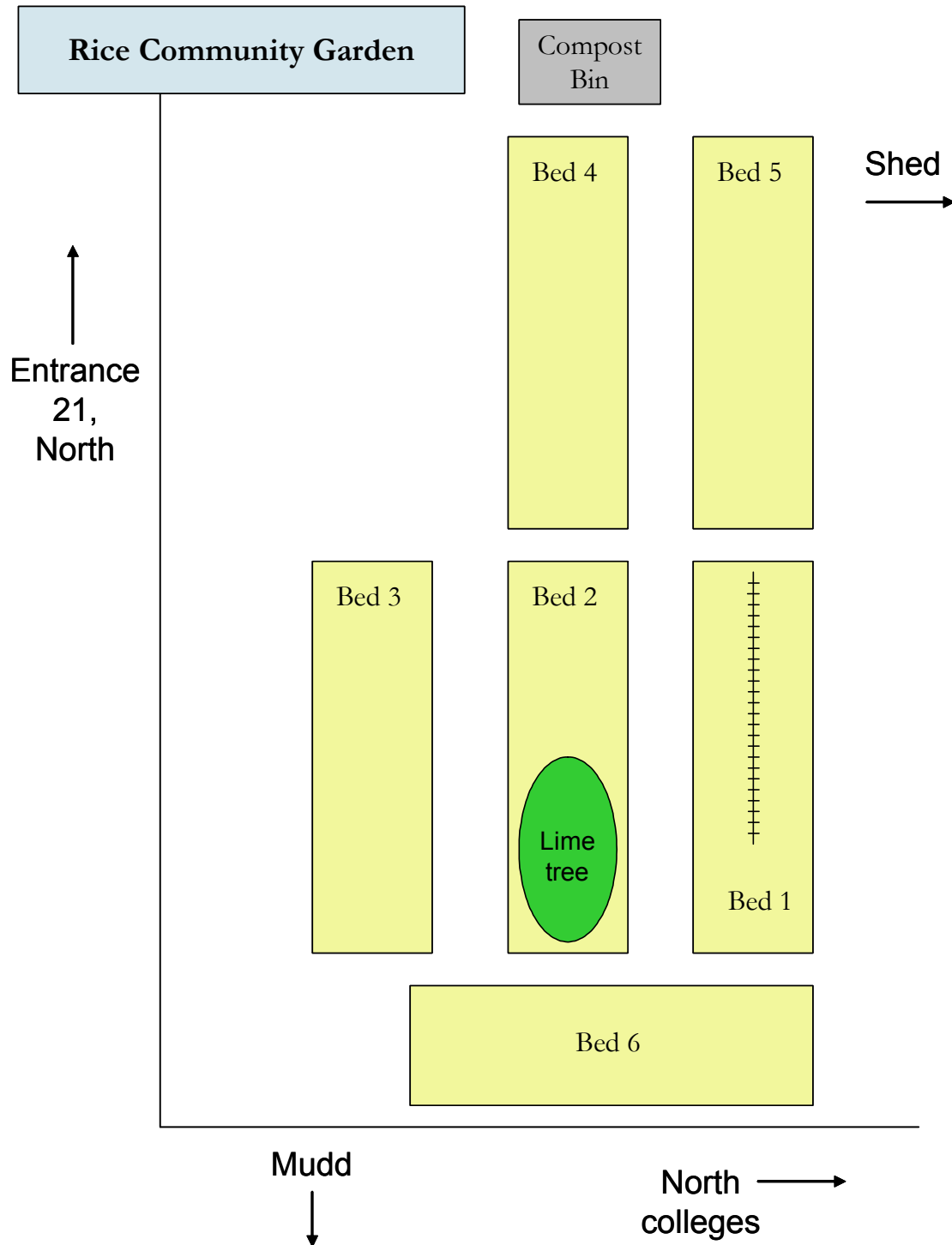
- (1) Hold monthly meetings to discuss progress of garden and short- and long-term goals;
- (2) Utilize website to publish a frequently updated schedule and to-do list so that everyone is in the know about the latest conditions at the Garden;
- (3) Establish deeper relationships with RSVP by recruiting volunteers and educating volunteers about the importance of the Garden. There is also potential for the development of volunteer activities with each of the five committees. In addition to the obvious connection with the Environmental Committee, the Garden is connected to the Health Committee in that it provides food for a hospice, to the Hunger and Homelessness Committee by encouraging growing one's own food, and to the Children and Education Committees by providing a volunteering and/or learning opportunity for children;
- (4) Establish more formal ties with other student organizations such as Rice Environmental Club, the Student Association Environmental Committee, the Student Recycling Council, college environmental committees and food reps, and so on;

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- (5) Hold an annual picnic party at the Garden with a live band, refreshments, and fresh salad from the Garden;
- (6) Hold an annual information/recruitment session in the first few weeks of the school year at a meeting space on campus (perhaps in the Student Center). Provide fresh limeade.

5 APPENDIX

5.1 APPENDIX A: DIAGRAM OF THE GARDEN (NOT TO SCALE)



5.2 APPENDIX B: IMPORTANT CONTACTS

5.2.1 Appendix B1: Within the Rice Community

Carlyn Chatfield

Web Coordinator, Enterprise Applications
214 Mudd Building
713-348-4819 (office)
carlyn@rice.edu

Carlyn was the one who approached me with the offer to make a new Garden website. She then assigned the actual design and creation of the website to a student, Sohum Misra ('09), smisra@rice.edu.

Eusebio Franco

Director, Custodial & Grounds, Facilities Engineering & Planning
117A FE&P Offices
713-348-5349 (office)
efranco@rice.edu

I did not work with Mr. Franco this semester, but based on his efforts in obtaining land for the Garden at its inception, he may be a good contact for future land needs.

Mac Griswold

Director, Community Involvement Center
Community Involvement Center, RMC Cloisters
713-348-6163 (office)
griswold@rice.edu
<http://www.ruf.rice.edu/~service/>

Mac is the go-to guy for the volunteering side of things. He can get you in touch with the right people in the university or elsewhere.

Dr. Paul Harcombe

Professor, Ecology & Evolutionary Biology
Co-Director, Center for the Study of Environment and Society
103B Anderson Biological Lab
713-348-4924 (office)
harcomb@rice.edu

Dr. Harcombe knows a great deal about plants and ecology, knows about some of the Garden's history, and is a good resource for other contacts

John Hunter

Science & Engineering Librarian, Fondren Library
Chair, Staff Development Committee of Staff Advisory Council
Fondren Library
713-348-3892 (office)
hunter@rice.edu

John can help find staff who are interested in volunteering.

Richard Johnson

Sustainability Planner, Facilities Engineering & Planning
FE&P Offices

713-348-5003 (office)

rrj@rice.edu

<http://sustainability.rice.edu/>

Richard is a good resource for other sustainability-related projects on campus and is a good point of contact for FE&P

Joyce Myles

Residential Dining Manager, North Servery

713-348-3061 (office)

joyce@housing.rice.edu

Just for reference. Note that to collect kitchen scraps for the compost bin, there is no need to contact Joyce. Simply bring the empty bucket into the kitchen area and ask any of the staff members to fill it up for you. They will let you know when to pick up the full bucket.

Karen Overgaard

Master Gardener

281-367-6684 (home)

281-460-2806 (cell)

kareno@houston.rr.com

Karen is the mother of a Rice student and is very knowledgeable about gardening and composting.

Nancy Rowe

Grounds Specialist, Facilities Engineering & Planning

Groundkeeping Offices

713-348-2488 / 713-348-3383 (office)

ner@rice.edu

Nancy drives past the Garden every day on her golf cart and generally looks out for it. She is a good resource for gardening supplies and other needs. She is also very knowledgeable about gardening.

Ron Smith

Grounds Superintendent, Facilities Engineering & Planning

Groundskeeping Offices

713-348-2488 (office)

rasmith@rice.edu

Ron can arrange for mulch to be delivered to the garden. He is another good point of contact for FE&P

Arie Wilson

Assistant Editor, *Rice News*

402C Lovett Hall

713-348-6773 (office)

arie@rice.edu

Arie wrote the Rice News article on the Garden published in March 2006.

Appendix B2: Outside the Rice Community

Marguerite Dunn

Coordinator, Herod Elementary School Garden
5627 Jason, Houston, TX 77096
713-664-4315 (home)
713-806-1396 (cell)
mapadunn@sbcglobal.net

Marguerite is the mastermind and driving force behind the Herod Elementary School Garden and can provide information about community gardening and funding. While she is not directly affiliated with Rice, her husband is a Rice alumnus.

Scott Howard

Coordinator, North Montrose Civic Association Community Garden
1914 W. Clay, Houston, TX 77019
713-524-1290 (home)
713-346-1208 (work)
scott.howard@worthaminsurance.com

Scott is very involved with Urban Harvest and is an experienced community gardener. He visited the Rice Community Garden briefly in Spring 2005 and would like to see the Garden improve.

Bob Randall

Executive Director, Urban Harvest
1900 Kane St, Houston, TX 77007
713-880-5540
bob@urbanharvest.org
<http://www.urbanharvest.org/>

Bob knows a lot about organic community gardening, though his availability is limited. He is responsive to e-mail and should be a good contact for gardening questions.

5.3 APPENDIX C: SUMMARY OF COMMUNITY GARDENS AT OTHER COLLEGES

	Brown Community Garden	Grinnell College Campus Garden	Bowdoin Organic Garden
Location	Providence, RI	Grinnell, IA	Brunswick, ME
Contact & E-mail	Rachel Betesh rachel_betesh@brown.edu	Katrina Funk funkkatr@grinnell.edu	Katherine Creswell katherinecreswell@gmail.com
Website	http://envstudies.brown.edu/dept/places/garden/information.htm	http://web.grinnell.edu/cps/galf/a/student_garden/student_garden.htm	http://www.bowdoin.edu/sustainablebowdoin/organic-garden/index.shtml
Size & Facilities	<ul style="list-style-type: none"> • 12 small, individual plots • Small greenhouse for seedlings • 3-bin compost system 	<ul style="list-style-type: none"> • 6 raised vegetable beds • Smaller beds for flowers & herbs • Area for natives 	<ul style="list-style-type: none"> • 1.5 acres, half of which are under cultivation. More like a farm. • Small 2-season greenhouse, • Shed • 4 compost bins
Purpose	<ul style="list-style-type: none"> • Educational/mentoring tool • Individuals can decide on purpose of harvest, generally private 	<ul style="list-style-type: none"> • Harvest used in campus dining halls and donated to Mid-Iowa Community Action 	<ul style="list-style-type: none"> • Harvest used in two campus dining halls • Poorer quality harvest donated to food bank
Who Does What	<ul style="list-style-type: none"> • <u>Gardeners</u>: Neighbors, grad students, librarians, undergrads. Most not affiliated with university. Age range 1-92. • <u>Managers</u>: Brown students, change every year or two 	<ul style="list-style-type: none"> • <u>Gardeners</u>: Environmental Action Group students in charge of organization, labor, etc. • <u>Managers</u>: Students pass on leadership position at end of year. • <u>Summer</u>: Possible paid student positions sponsored by CPS 	<ul style="list-style-type: none"> • <u>Gardeners</u>: Students • <u>Other</u>: Architecture, economics, biology, soils classes • <u>Managers</u>: Full time paid position + 2 students who work 5-6 hours/week • <u>Summer</u>: Students persuaded dining to pay them in exchange for produce
Notes and Positive Attributes	<ul style="list-style-type: none"> • Monthly newsletter • Monthly potluck dinners • Annual party • Great sense of community 	<ul style="list-style-type: none"> • Recently got more steady funding from Center for Prairie Studies (CPS) 	<ul style="list-style-type: none"> • 2 successful seasons so far • Presence in curricula brings about funding/support from school • Works well: wages come from dining services, leadership by non-peer • Twice-monthly meetings • Support of a local farmer
Challenges	None mentioned	<ul style="list-style-type: none"> • Haphazard/varied funding from Environmental Action Group, President, sale of recycled notebooks, personal, facilities management • Summer abandonment when garden is most productive 	<ul style="list-style-type: none"> • Still not enough help, both in terms of gardening and managing • Access to equipment • Funding: plenty of money from Student Activities Fund, but spent all on good compost to improve soil fertility

5.4 APPENDIX D: SUMMARY OF COMMUNITY GARDENS AROUND HOUSTON

	Urban Harvest Teaching Garden	Herod Elementary School Garden	N. Montrose Civic Association Garden
Location	1900 Kane St., 77007	5627 Jason, 77096	1914 W. Clay, 77019
Contact (see Appendix B2 for more info)	Dr. Bob Randall bob@urbanharvest.org	Marguerite Dunn mapadunn@sbcglobal.net	Scott Howard scott.howard@worthaminsurance.com
Website	http://www.urbanharvest.org/volunteer/handsonlearning.html	http://www.urbanharvest.org/directory/nmontrose/northmontrose.html	http://www.urbanharvest.org/directory/herod/herod.html
Size & Facilities	<ul style="list-style-type: none"> • 10 raised vegetable beds • Wide variety of fruit trees • Changing compost systems 	<ul style="list-style-type: none"> • 21 raised beds, mostly vegetable, some herbs and flowers • Compost bin • Supply shed 	<ul style="list-style-type: none"> • 4 raised vegetable beds • 1 herb bed • Supply shed • Compost heap
Purpose	<ul style="list-style-type: none"> • Teaching garden / educational tool for Greater Houston area 	<ul style="list-style-type: none"> • Teaching garden / educational tool for students 	<ul style="list-style-type: none"> • Donation garden • Community volunteer space
Who Does What	<ul style="list-style-type: none"> • <u>Gardeners</u>: Urban Harvest staff and volunteers. Group sessions: Tue Fri 4-6pm (Oct-Apr), 5-6:30pm (May-Sep) • <u>Managers</u>: Urban Harvest staff 	<ul style="list-style-type: none"> • <u>Gardeners</u>: About 4 regular volunteers, Group sessions Wed 8-10am • <u>Managers</u>: Marguerite does everything-- coordinating with teachers, administration, and parents 	<ul style="list-style-type: none"> • <u>Gardeners</u>: Scott and wife Bridget who live next door, 20 community volunteers, core reliable group of 5-10 people. Group sessions: variable weekend times • <u>Managers</u>: Scott and N. Montrose Civic Association. E-mails about group workdays
Notes and Positive Attributes	<ul style="list-style-type: none"> • Learn from Dr. Randall and other Houston horticultural experts • Volunteers may take share of harvest at each session 	<ul style="list-style-type: none"> • Solar powered irrigation system • Every elementary school class can participate • Beautifully maintained, productive garden • Thousands of dollars from Parent-Teacher Organization and outreach fund of ExxonMobil (Marguerite's husband Paul is employee) • Began crop rotation in spring 2006, to replace beds separated by class 	<ul style="list-style-type: none"> • Steady volunteers because residential area • Scott and Bridget can keep constant eye on garden • Several young citrus trees
Challenges	None mentioned	<ul style="list-style-type: none"> • Coordination with teachers—making sure garden is part of science curriculum • Ensuring upkeep of garden by students • Need more grown-up volunteers 	<ul style="list-style-type: none"> • Want to set up rainwater collection system • Mostly self-funded

5.5 APPENDIX E: SOIL TESTING RESULTS

Four pages of test results from Texas Plant & Soil Lab can be found at the end of this report.

5.6 APPENDIX F: 5-YEAR CROP ROTATION PLAN

Bed 6 is devoted to perennials, herbs, and flowers, and is **not** rotated. Beds 1-5 may be rotated as follows. A key to the table below appears on the next page. Gardeners may experiment with other plants within the family. Gardeners are encouraged to consult Randall's *Year Round Vegetables* for detailed planting times (pp. 136-141) and more information on crop rotation (pp. 119-121).

Crop Rotation Table

Bed	Year 1 (2006)	Year 2 (2007)	Year 3 (2008)	Year 4 (2009)	Year 5 (2010)
1	Leg/Okra	Lett/Tom/Brass	Cuke/Beet/Lett	Onion/Cant	Rad/Sweet/Carr
2	Rad/Sweet/Carr	Leg/Okra	Lett/Tom/Brass	Cuke/Beet/Lett	Onion/Cant
3	Onion/Cant	Rad/Sweet/Carr	Leg/Okra	Lett/Tom/Brass	Cuke/Beet/Lett
4	Cuke/Beet/Lett	Onion/Cant	Rad/Sweet/Carr	Leg/Okra	Lett/Tom/Brass
5	Lett/Tom/Brass	Cuke/Beet/Lett	Onion/Cant	Rad/Sweet/Carr	Leg/Okra

Family descriptions, suggested plants, and climate preferences

Family name and most common plants (Bold: alias in Rotation Table)	Suggested plants (gardeners can try others, of course. See pp. 117-118)	Climate preference (see pp. 116-117 for details)
<i>Fabaceae</i> (legumes) The Bean & Pea Family Leg	Peas Beans (bush and pole) Lentils	All / depends on variety
<i>Chenopodiaceae</i> The Beet Family Beet	Beets	Moderate Not summer
<i>Brassicaceae</i> The Cabbage-Mustard-Radish Family Brass / Rad	Cabbage Broccoli Cauliflower Chinese broccoli Collards	Cool Not summer
<i>Apiaceae</i> The Carrot Dill Family Carr	Carrots Celery	Roots: plant in early fall Non-roots: plant in late fall
<i>Asteraceae</i> The Lettuce Sunflower Daisy Family Lett	Lettuce Sunflower	Flowers: warm and hot Edibles: cool
<i>Malvaceae</i> The Okra Family Okra	Okra	Hot
<i>Liliaceae</i> The Onion Lily Family Onion	Onions Multiplying onions Garlic Leeks Chives	Plant in winter
<i>Cucurbitaceae</i> The Squash Melon Cuke Family Cuke (1, 2) Cant (3, 4)	1. Cucumbers 2. Squashes 3. Melons 4. Pumpkins	Warm Hot
<i>Convolvulaceae</i> The Sweet Potato Family Swee	Sweet potatoes	Hot
<i>Solanaceae</i> The Tomato Nightshade Family Tom	Tomatoes Sweet peppers Chiles Eggplant	Moderate Hot

5.7 APPENDIX G: INTERVIEWS

5.7.1 Appendix G1: Interview with Bob Randall

Dr. Bob Randall is the Executive Director of Urban Harvest, a Houston nonprofit organization dedicated to the promotion of community gardening. Some good ideas Dr. Randall had for the organization of garden: (1) Set up a committee composed of students/faculty/staff to oversee garden. Monthly meetings. (2) Educate the Rice community on the importance of growing your own. (3) Make a manual for future student coordinators and anyone else involved. May be in print or electronic form. (4) Basically need to coordinate leadership with multiple backups.

5.7.2 Appendix G2: Interview with Mac Griswold

Mac Griswold is the Director of the Community Involvement Center, 2004 to present, and he oversees RSVP. When I met with him we took a tour of garden so that he could assess the current condition of the Garden and compare it with the information in the old binder. He offered to get in touch with the appropriate people to make some physical improvements such as changing the plumbing from a hot water line to a cold water line and putting up a sign. Since he oversees most of the volunteering programs at Rice, he is a valuable resource for the volunteering side of things, and his position may allow him easier access to communication with important individuals at Rice who can help with the Garden. He is very willing to help improve the organizational structure and physical condition of the Garden. He says that the Garden, as a program of RSVP's Environmental Committee, has access to funding for long-term capital improvements.

5.7.3 Appendix G3: Interview with Karen Overgaard

Karen Overgaard is a Master Gardener and the mother of Rice student. She had some good ideas about keeping volunteers committed: (1) Post list of things that need to be done each day. This encourages people to take personal responsibility. (2) Give volunteers concrete positive feedback. This can be accomplished by keeping track of hours worked, and after a certain number of hours the volunteers can get a free t-shirt, hat, totebag, coupons for coffee (need sponsors) or even a certificate

of appreciation signed by someone important. Ms. Overgaard also visited the Garden and advised that mulching should be a first priority in physical improvements.

5.8 APPENDIX H: *RICE NEWS* AND *RICE THRESHER* ARTICLES

Photocopies of the original printings of these articles can be found at the end of this report.

(1) *Rice Thresher* Article, April 1999

(2) *Rice News* Article, April 1999

Available online at: <http://media.rice.edu/media/NewsBot.asp?MODE=VIEW&ID=3642>

(3) *Rice News* Article, March 2006

Available online at: <http://media.rice.edu/media/NewsBot.asp?MODE=VIEW&ID=8345>

5.9 APPENDIX I: RICE COMMUNITY GARDEN WEBSITE

Created by Rice Information Technology; maintained by the Garden's student coordinators.

Actual URL: <http://www.ruf.rice.edu/~rsvpgard/>

Shorter, permanent URL: <http://www.rice.edu/garden>

5.10 APPENDIX J: DONATIONS TO THE RICE COMMUNITY GARDEN

The Rice Community Garden is a project of RSVP, which is part of the CIC. The CIC has a special gift fund number for the Rice Community Garden: G82158. This fund number can be confirmed on the following website, which contains instructions for donors and a link for making donations online: <http://www.ruf.rice.edu/~service/cicgeneral/donor.htm>

6 REFERENCES

Clinton Community Garden. <<http://www.clintoncommunitygarden.org/>>

Durbin, Dana. "Garden of Good Will." *Rice News* April 15, 1999.

Randall, Bob. *Year Round Vegetables, Fruits and Flowers for Metro Houston*. 12th ed. Houston: Year Round Gardening Press, 2005.

Reinhart, Claudia. "Victory Gardens." *Wessels Living History Farm*. Accessed 03 May 2006.

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Urban Harvest. <<http://www.urbanharvest.org/>>