**NCR-SARE Youth Grant Project**

**Final Report Form**

Use this form to write the final report on your project. Use as much space as necessary to answer the questions. You are not restricted to the space on this form. The report may be prepared on a computer or handwritten. Electronic reports are preferred; please write or print clearly if you hand write your report. Submit the report to the North Central Region - Sustainable Agriculture Research and Education (NCR-SARE) Office by the due date listed on your contract.

**1. PROJECT IDENTIFICATION**

* Name: Mark Quee
* Address: 1951 Delta Ave.

 City: West Branch State: IA Zip Code: 52358

* Phone: 319 530 3782
* E-mail: farm@scattergood.org
* Website:
* Project Title: Green Manure vs. Brown Manure in an Organic Vegetable System
* Project Number: YNC\_10-023\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Project Duration: This is an on-going experiment, though for purposes of the grant, it will conclude on March 15, 2012
* Date of Report: March 15, 2012

As you write your final report, think about sustainable agriculture practices like those listed below. Be sure to describe these or any other sustainable agriculture practices you learned about as part of your project.

SUSTAINABLE AGRICULTURE PRACTICES RELAVENT TO THIS EXPERIMENT:

* Rotational Grazing
* Soil Erosion Control
* Soil Quality Improvement
* Cover Crops
* Crop/Landscape Diversity
* Nutrient Management
* Value-Added and Direct Marketing
* Poultry and Small-Scale Livestock Production
* Holistic/Systems Approaches to Farming and Ranching
* Organic Agriculture

**2. PROJECT DESCRIPTION AND RESULTS**

What Sustainable Agriculture issue did you explore?What sustainable agriculture knowledge did you gain? Please be specific and include your project goals and activities, and the results of your project as indicated on this form. Provide enough details that someone else could try your project.

**A. BACKGROUND.** Before receiving this grant, were you involved in any sustainable agriculture activities? If so, briefly describe them.

Yes, I have been the Farm Manager at Scattergood Friends School since 2003. We raise 10 acres of certified organic fruits and vegetables, as well as grass-finished, rotationally grazed beef and lamb for student consumption. I am also actively involved in Practical Farmers of Iowa and other local organizations promoting sustainable agriculture.

**B. GOALS.** List your project goal(s). What were you trying to accomplish?

* Our primary goal was to employ students in setting up a long term experiment studying the differences in fertility maintenance using animal manure products and plant-based cover-cropping.
* This experiment was the outcome of an Advanced Biology class unit on experiment design, so another goal was to provide a real-world application of classroom curriculum.
* In addition to the design component, another goal was to get students actively involved in the organic gardens maintained by the school. Students were responsible for laying out the project, starting seeds and transplanting, weeding, collecting harvest data and livestock care.
* A final goal is to give students an opportunity to work with real data and to create meaningful statistics and documents describing processes and results.

**C. PROCESS.** Describe the steps involved in carrying out your project and the reasons behind the choices you made. Why did you use this approach? Please be specific so that others can gain from your experiences.

|  |  |  |  |
| --- | --- | --- | --- |
| G1 | G2 | G3 | CONTROL |
| B1 | B2 | B3 |  |

* Siting: One of our first decisions was where the experiment should be sited. We had just transitioned approximately 3 acres from organic pastures to garden use, and considered this an ideal site since the soil would be relatively uniform and free of the influences of organic vegetable production. Taking into consideration the dimensions of our machinery and the plot, we flagged and staked out an area approximately 100 feet east-west and 50 feet north-south, creating eight separate plots:
* Soil Testing: To get some baseline measurements on soil fertility, we combined 8 samples from each of the B, G and CONTROL areas and sent them to Midwest Labs for SC3 tests because it is thorough and affordable.
* Variety Selection: In addition to soil tests, we decided to collect harvest data and selected plants that have different fertility needs, as well as are industry standards, hopefully ensuring seed availability into the future. For a leafy green, we chose Packman Broccoli, for a fruiting plant we chose Raven Zucchini, and for a root crop, we chose Red Ace Beets.
* (Trans)planting: The zucchini and broccoli plants were started indoors and transplanted when weather conditions were appropriate. In order to have the proper number of plants at the correct time, two successions of each were started. Beets were direct sown.
* Weeding: All areas were weeded on the same day and the same way. This primarily involved a Glaser wheel hoe and hand tools.
* Harvesting: Each crop presented different challenges in data collection, though for each we disregarded edges and collected data only from interior plants. Zucchini: Since larger is not better, we could not weigh the fruit, but decided instead to count marketable fruit during the plants’ productive lifespans. For broccoli, we counted the number of plants that could produce a marketable head (at least 6” across) and collected individual head diameter data. For beets, we randomly selected an interior 10 linear feet from each row, washed the beets and weighed the row production with the leaves and stems on.
* Livestock and Covercrops: Using electric temporary woven fencing, we grazed three Katahdin rams on the Brown side from July 27-Aug 5. On Aug 5 we rototilled the crop and livestock residue and drilled in a cover crop mix of oats and field peas in all areas except the control plot. On Sept 1we introduced turkeys to the Brown side, where they rotationally grazed until Nov 1.
* Gearing up for Year 2: In spring 2012 we will have the soil tested from each of the treatment areas, and repeat another production year, but rotating the cash crops to maintain good management practices.

**D. PEOPLE.** List people who assisted with the project and explain how they were involved. Please include educators, farmers and ranchers, parents and other family members, friends, or others who may have helped you. Also, list any personnel from a public agency, such as the Extension Service, Natural Resources Conservation Services or Soil and Water Conservation Districts who may have assisted with this project.

* Sarah Harper-Smith and the Advanced Biology Class: Sarah’s class designed the experiment, helped site and plot it, and did the transplanting and sowing.
* Practical Farmers of Iowa provided technical assistance with transitioning the land from pasture to garden and have helped with information on cover cropping and grazing.
* Council of International Visitors to Iowa Cities (CIVIC) was visiting the farm and offered assistance with redesigning the control areas to take into account possible nutrient migration due to the slope of the land.
* Dana Foster, Sam Taylor, Caleb Smith and Sebastian Ashley are Scattergood Farm employees who assisted with maintenance, harvest and data collection.
* Mike Severino is the new Advanced Biology teacher at Scattergood who will continue this experiment in his classes in the future.

**E. RESULTS.** What were the results of your project? Were the results what you expected? If not, why? Are there changes you would make if trying this project again or recommending it to others?

Since this was the first year of a longitudinal study, our results were primarily establishing the baseline of data with which to compare future data. So far, the only thing I will change in subsequent years is starting larger successions of the broccoli and zucchini in order to ensure a longer window of optimal transplants. Spring weather is fickle in Iowa.

A summary of the Data:

* Broccoli: Average head size ended up identical (6.83”), though the green side produced a higher percentage of success (green = 54/55; brown = 45/50).
* Zucchini: Again, the green side outperformed the brown side with 11.2 marketable fruit per plant versus 8.4 marketable fruit per plant.
* Beets: the results were reversed here with brown out producing green by averaging 14.532 pounds per 10 linear feet, versus 12.504#/10feet. The control bed was almost perfectly consistent with the green plot averaging 12.576#/10feet.

**F. DISCUSSION.** Sustainable agriculture is farming and ranching that is good for the environment, profitable, and socially responsible. Which aspects of sustainable agriculture did you learn about through your project? How has this affected you, your parents, or others in your community?

This project included many aspects of sustainable agriculture, beginning with the use of cover crops and rotational grazing in managing nutrients and improving soil quality in a certified organic vegetable system. The big question that we are trying to answer is whether cover cropping can maintain nutrients as well as manure applications. By collecting harvest data as well as soil testing, we can glimpse not only the importance of objective measures (NPK + micro nutrients), but also the natural systems that enable vegetables to grow. Since our trial beds have a gentle slope, it will also be interesting to see in which system nutrients are more likely to migrate. The future effects remain to be seen. Since we have livestock that can graze on our gardens, we will likely continue to do so, even if we discover that cover cropping alone can maintain fertility. However, we will certainly gain much experience with the effect on nutritional requirements of three very different crops and this may impact some of our practices in the future.

**3. OUTREACH**

How did you share information from your project with others? Who were you trying to reach? What methods did you use for telling others about: a. Your project, b. Project activities or events, c. Project results? Be sure to include the names and dates of outreach activities and events and the number of people who attended. Was there media coverage of your project? Do you have any plans for future outreach?

Scattergood Friends School Farm welcomes many visitors throughout the year and I have been asked to give several presentations which included brief descriptions of this experiment. For the most part, of the three directives above, our outreach has been restricted to a.) our project, since no specific activities were planned for this project and results are not yet determined.

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| Date | Group Title | # of people | On-Farm visit or Presentation |
| May 23, 2011 | Council for International Visitors to Iowa Cities | 10 | On-Farm Visit |
| August 9, 2011 | Iowa City Chamber of Commerce Ag Subcommittee | 25 | On-Farm Visit |
| September 18, 2011 | Iowa City Field to Family Festival Culinary Bike Ride | 120 | On-Farm Visit |
| September 30, 2011 | Cedar Rapids Unitarian Universalist Fellowship | 10 | Presentation |
| October 1, 2011 | Practical Farmers of Iowa Field Day | 80 | On-Farm Visit |
| October 22, 2011 | Scattergood Homecoming | 20 | On-Farm Visit |
| November 4, 2011 | Small Farm Journal Conference and Tradeshow | 100+ | Presentation |

Please enclose any press releases, news clippings, flyers, brochures, or publications developed during this project. Also send any photos that might be helpful in telling your story to others. Please be sure to get permission to use the photos if they include other people. For photos with youth, you will need their parent’s permission. Please fill out and turn in a NCR-SARE Image Consent form along with your photos.

**4. PROGRAM EVALUATION**

As a participant in the North Central Region SARE sponsored Youth Grant program, do you have recommendations for the regional Administrative Council about this program? Is there anything you would like to see changed?

One complication was the delay in starting due to the livestock safety clearance. Hopefully this step is now fully integrated into the application process and will not interfere with starting time-sensitive experiments in the early spring. Otherwise, everything was well-explained and clear.

Please submit your final report to: Joan Benjamin at: benjaminj@lincolnu.edu or:

Joan Benjamin

NCR-SARE

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If you have questions, please contact Joan Benjamin, NCR-SARE Associate Regional Coordinator at: 573-681-5545, 1-800-529-1342 or benjaminj@lincolnu.edu.