NCR-SARE Youth Educator Grant Project

Final Report

PROJECT IDENTIFICATION

- Name: Fredric Miller
- Address: Department of Horticulture, Joliet Junior College, 1215 Houbolt Road
  City: Joliet State: IL Zip Code: 60431
- Phone: 815-280-2740
- E-mail: **fmiller@jjc.edu**
- Website: www.jjc.edu

- Project Title: **Urban Agriculture Summer Institute (UASI)**
- Project Number: YENC14-075
- Project Duration:
- Date of Report: 12/8/2014

PROJECT DESCRIPTION AND RESULTS

BACKGROUND

The Urban Agriculture Summer Institute (UASI) is designed to provide students with a hands-on urban agriculture experience. UASI seeks to build pathways for entry into a STEM-related area by providing interdisciplinary field research training examining the ecological, social, economic, and ethical implications of the food production system. Students will learn critical thinking and analytical techniques, and utilize the JJC Horticulture Land Lab (HLL) to develop, address, and complete an applied research question centered on sustainable agriculture or horticulture production. This basic knowledge is applied towards an understanding of critical issues in sustainable food production.

Dr. Fredric Miller, JJC Horticulture Professor, is the Project Director (PD). Dr. Miller used brochures, the JJC webpage and JJC Farmer's Market program to promote the institute to all JJC students, prospective area high school/college students, and to the JJC community at large. The PD contacted schools interested in participating to identify potential students. Students were encouraged to apply and were competitively selected to participate in the institute (10 maximum). The students were required to share why he/she wants to be a part of the program; their personal educational goals; list two project areas of interest; commit to 112-hours of instruction; and provide two reference letters.

The UASI starts in June and depending on student availability and school district calendars, runs for seven weeks, Monday through Thursday for four (4) hours per day. The HLL is located at the main campus on a five acre site adjoining the JJC LEED certified greenhouse. The HLL consists of a vineyard, two high tunnels (30 x 60 feet), a hydroponic stacker system, a raised bed production area, agro-forestry plots, and a small fruit and tree fruit production area. In 2013, JJC initiated a Farmers Market, located near the HLL, funded through the USDA's Farmers Market Promotion Program.

Mornings were spent working on individual applied research projects and the afternoon session involved discussions on assigned readings and progress of individual research projects.

Students selected from the following areas in which they would like to conduct their field research project:

- Agro-Forestry (AF)
- Cover Crops (CC)
- Farmers Market Program (FMP)
- High Tunnel Production (HTP)
- Hydroponics
- Small and Tree Fruit Production (STFP)
- Viticulture

The PD selected a UASI Program Manager and subject matter mentors (SMM's) who worked directly with the students and provided guidance for their field research projects. Students met with their respective SMM's to define their project topic.

GOALS

- to **successfully and effectively research the literature** for a research topic.
- to apply the **scientific method** in an applied field research.
- to design and demonstrate **critical thinking for applied research**.
- **to administer appropriate, efficient and accurate sampling methods** for collecting field data.
- **to interpret and summarize data** in a manner that end users can implement.
- to apply a basic **understanding of applied research subject matter areas** and related current issues and challenges requiring investigation.
- to investigate the importance of **weather** related events and their impact on crop production, pest management, and irrigation.
- to **acquire skills in preparing an oral presentation** on their project and learn to interact with peers/mentors in a constructive manner.
- to develop awareness of the **importance of "good science" and its application** to the real world.

  Students were expected to implement a systems approach to their applied field research project.

PROCESS

The Urban Agriculture Summer Institute (UASI) originated to mirror other summer educational experiences such as sports, science, and music camps. Initial steps included assessing the available infrastructure (i.e. horticulture land lab) including high tunnels, an operating vineyard, small fruit and tree fruit plantings, hydroponic systems, and the agro-forestry research plot. Once the subject matter mentors (SMM's) and myself had a good idea of what we could offer students, the SMM's began looking at what would be an appropriate time commitment for students (i.e. 6-8 week commitment) and how many hours per day students would contribute. Ideally, we wanted students to be involved in crop-related projects from the inception through harvest, but that was not practical or possible. Students generally do not get out of school until the second week of June and go back in mid-August. The June date was much too late to start planting most crops and yields really start coming in by mid-August. Other activities, such as vacations and family commitments compete for their time. Therefore we had to dial back our expectations.

Announcements for the UASI were circulated through JJC, local high schools, high school career fairs, and JJC community life-long learning program. As with most pilot projects, we found personal contacts and one-on-one communication to be the most effective in recruiting students. Once a pool of student applicants was identified, we began conducting one-on-one interviews to assess the student's area interest, ability to commit to a long term project, to work independently, work as a team member, adjust and adapt; overall persona, practical experience, and character. Students were asked to identify their future educational and career goals.

Once the student interns were selected, I personally met with each one to better identify and define their project interests. This included identifying a specific research topic area (i.e. evaluating sweet potato varieties), reviewing the scientific method, discussing what resources were available, and how realistic was the project. Because of the time constraints mentioned above, a good deal of planning took place during the spring months prior to the field season to make sure plant material was ordered and available and other details were in place so the project could start on time and have a reasonable chance of success.

As it turned out, because of differences in school schedules, extended school make-up days due to snow storms, and other commitments, some of the students were able to start in late May while others were not available until mid-June. This turned out to be a mixed blessing. Some of the preliminary work (i.e. planting) had to be done before the students arrived, but for the students starting later, they were able to be available later in the cropping season (early to mid-September) and were able to see some of the "fruits of their labor".

Once the projects started, as project director, I tried to meet with my students at least several times per week. This included informal "pow-wows" in the field discussing issues over lunch breaks, and formal times in the classroom. In some cases, we were worked side by side on projects. In addition, I encouraged the students to help each other with various aspects of their projects. In this way, they learned from each other, experienced peer collaboration (critical in the real world), understood problems that others faced and how the "other half lives". Students indicated they benefited from this experience rating these interactions a definite "plus" in their post project evaluations.

Community Impact: As outlined above, students served as ambassadors and educators for promoting and applying sustainable practices with their peers/social contacts and in their local communities, schools and neighborhoods. Through the UASI, additional students will be exposed to and may develop an interest in sustainability and related subjects, and also may consider participating in programs offered through their communities and institutions of higher learning. Through the outreach efforts of the 2013 and 2014 UASI student interns, several new candidates have expressed interest in participating in the 2015 UASI.

PEOPLE

- Mr. David Bartz, Assistant Professor of Horticulture (landscape design and construction)
- Mr. Steve Brockman, JJC Farm Manager (cover crops and farmer's market)
- Ms. Beverly Cavanaugh, JJC Community Outreach Program (program promotion)
- Ms. Caryn Genens, JJC Greenhouse Manager (hydroponics and vegetable production)
- Mr. Ruben Lanting, JJC Grants Office (grant budgeting)

- Ms. Kelly Larson, JJC Grants Office (grant writing and reporting)
- Dr. Fredric Miller, Professor of Horticulture, Project Director (agroforestry, cover crops, high tunnels, IPM, and small and tree fruit production)
- Ms. Lisa Perkins, Professor of Horticulture (high tunnels, viticulture, hydroponics)
- Mr. Dan Romano, JJC Horticulture Graduate (viticulture, hydroponics)
- Ms. Dorothy Rosier, JJC Horticulture Graduate (farmer's market)
- Ms. Donna Theimer, Professor of Horticulture (farmer's market project director)
- Mr. Richard Faltz, Fox Valley Winery (viticulture consultant and collaborator)

RESULTS

At the conclusion of the projects, a post UASI evaluation was conducted. A summary of the evaluation is presented in Section E - Table 1. Overall, there was a 41% improvement in evaluation scores (2.9 versus 1.7) from the inaugural UASI (2013) to 2014. Areas showing the most improvement include better direction in STEM career choices, field work, applied research, critical thinking, and adequate guidance and direction. A majority of students indicated they learned a great deal about independent field research and how to work collaboratively with other students. Like any new program, there are definite areas requiring improvement including better defined project goals and objectives, better mix of theory and practice, and better scheduling of tasks and personnel.

The PD evaluation rating realized a 50% improvement from 2013 to 2014 (2.6 versus 1.3). Areas showing improvement from 2013 to 2014, included communication, learning atmosphere, critical thinking, courtesy and respect, feedback, and PD expectations. As the PD for the UASI, I realized how easy it is to spread myself too thin. Most students need a considerable amount of supervision and instruction in how to conduct field research. Another factor was students joining the program after the planting phase. It is much harder to "plug-in" a student into an ongoing project. Anticipating student needs, equipment, and the weather are always challenging. As Project Director, I recommend you do not over extend yourself either with your own projects or take on too many students. Try to remember the *six to one management rule. It is very hard to manage more than six people at any one time.* To help with the six to one rule, make sure you have good SMM's as well. The SMM's will make a huge difference in the quality of your program, insuring it is a profitable experience for all, and helping you keep your sanity.

An expectation of the internship is for students to present a seminar on their research project and findings either to JJC students or students at their home institution. Several students presented their results to my JJC entomology class in November, 2014. The students did a very good job of outlining their project, its applicability and relevance, research findings including statistical analysis, issues they faced in conducting the research, ways of improving the experimental design, and additional research questions to be investigated. I was very impressed and pleased with their presentations and for the exposure it provided to my JJC students, and future interest for the UASI program.

Table 1. Summary of Urban Ag Summer Institute (UASI) post project evaluation (2013-2014)

Question #[1]	**Mean Response – 2013**[2]	**Mean Response – 2014**
UASI - Program		
1	2.5	1.6
2	3.5	1.9

3	4.0	1.6
4	2.5	1.4
5	2.5	1.7
6	4.0	2.0
7	3.5	1.7
8	3.0	2.0
9	1.5	1.7
10	1.0	1.0
11	3.0	1.4
12	3.0	1.0
Mean	**2.9**	**1.7**
UASI – Project Director		
1	3.0	1.6
2	2.0	1.3
3	3.0	1.7
4	1.5	1.1
5	3.0	1.4
6	3.0	1.3
7	2.0	0.7
8	3.0	1.3
9	2.5	1.0
Mean	**2.6**	**1.3**

[1]List of evaluation questions are listed below

[2]Based on a rating scale of 1=Excellent; 2=Good; 3=Fair; 4=Poor; 5=Needs Improvement

Table 2. Summary of Urban Ag Summer Institute (UASI) post project evaluation (2013-2014)

Evaluation Question

UASI PROGRAM

1. Did the UASI provide better direction in your STEM career choices after high school or college?

2. Did the UASI help you develop and grow your ability to think critically and problem solve?

3. Was the field work helpful in developing your abilities to conduct applied research?

4. Did you feel the project was appropriate for your educational background and experience?

5. Were the expectations and demands of the project reasonable and attainable?

6. Were the project objectives clearly presented and discussed?

7. Were you provided appropriate instruction and guidance for carrying out projects and gathering data?

8. Was there a good mix and integration of theory with practice?

9. Did the project encourage critical thinking and development of the scientific method?

10. Overall, how would you rate the UASI experience?

11. Would you recommend this program to other high school and/or community college students?

UASI PROJECT DIRECTOR (PD – FREDRIC MILLER)

1. Did the PD communicate clearly?

2. Did the PD create an atmosphere that promotes learning?

3. Did the PD encourage and foster discussion and critical thinking?

4. Did the PD treat students with courtesy and respect?

5. Did the PD provide useful and helpful feedback on conducting your field research?

6. Did the PD communicate his/her expectations for field work, project objectives and attendance?

7. Did the PD respond appropriately to student's questions and concerns?

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[1]Response Code: 1=excellent; 2=good; 3=fair; 4=poor; 5=needs improvement

8. Please list three (3) things you learned/ benefited from by participating in the UASI

9. Please list three (3) ways in which the UASI program class could be improved

FEEDBACK AND COMMENTS (2013 and 2014):
POSITIVES

- Good atmosphere for conducting research and learning (2)
- Learned a lot about independent field research work and project design (7)
- Learned how to improvise when things did not go as planned
- Learned a lot about entomology and how it relates to agriculture production (3)
- Creating my presentation at the conclusion of the project
- Freedom to think critically and gather data
- Given room to make mistakes and learn from them
- Learned a lot about cover crops and their use
- Learned how work collaboratively with other students (4)
- Great experience (4)

IMPROVEMENTS

- Better job of scheduling tasks and personnel (3)
- More collaborative effort among students in completing field tasks (2)
- Have irrigation system in place before season starts
- More assistance in making field decisions

DISCUSSION

As the PD, I learned more about how millenialists think, their outlook on work, careers, and the future. Based on my experience, I offer the following opinions. Generally, students have lot of distractions (i.e. family, work, social life, technology, and finances). Candidly, I have observed academics is rarely at the top of the list. In addition, of course, students are much more technologically savvy and having the latest electronic gadgetry is important.

Students coming from four-year liberal arts colleges tend to have a greater knowledge of how to conduct field research projects, analyze the data, and summarize their findings. In contrast, students coming from two year programs (AAS or AS degree) have more hands-on experience, are comfortable in the field, and enjoy being outside.

Young people require a more "fluid schedule", may lack a sense of urgency in getting something done in a timely manner (*there is always tomorrow*), do not realize that living organisms do not take vacations or holidays, and want to work from 9:00ish to 3:00ish. In my humble opinion,

they want to have it all at 18-20 years of age. Being an older adult and coming from a more traditional background, requires me to make major adjustments in my expectations, how to manage students in the field, project follow through and completion, demonstrate more patience, and keep a sense of humor. Having two (2) teenagers at home definitely helps me.

The differences in generational backgrounds and priorities needs to be taken into consideration and is a significant part of the equation when conducting interviews, designing projects, following up on project completion, maturity, and work ethic. You will probably have some students that do not pan out or do not have what it takes. Over the years, I have been blessed with many good student interns but, you have to be careful on the selection process to make sure you make good choices, otherwise, it can be a long, hot, and somewhat frustrating summer field experience.

As for changes, I would offer the following suggestions. Realize it will take more time than you think, assume students will need a lot of guidance, try to anticipate needs and resources as much as possible, and do not set your goals or expectations too high. There are a lot of bright and energetic students out there. The challenge is to find them, steer them into your program, and support their efforts. As any teacher will tell you, all it takes is a bright student every once in a while to make your day and help you remember why you enjoy teaching☺.

OUTREACH

Dissemination: The grant award was disseminated through various outlets, promoting awareness of project outcomes at the local level. The students presented their findings to their UASI peers and JJC classes. Students also provided tours of the HLL during the weekly JJC Farmers Market (mid-May to September). The following organizations visited the HLL:

- Local elementary school groups
- Boy Scouts interested in earning the newly created Sustainability merit badge and/or other related merit badges
- Visiting international students and faculty
- JJC Horticulture Career Days and recruiting events
- Tours given to non-horticulture students (i.e. Biology-107 students)

Registration Fee: Plans are to offer the UASI for 2015. Due to restricted and college-wide level funding, a modest and affordable registration fee will be required in 2015 and going forward to cover UASI costs for supplies and equipment. There are no plans to offer stipends due to lack of funding.

PROGRAM EVALUATION

I think the NCR-SARE Youth Educator Grant program is great! I greatly benefited from the opportunity to work with interested and enthusiastic young people and to watch them develop their professional and academic talents. Based on the post UASI evaluations, it is apparent that the students also benefited in honing their technical skills and better defining their career and vocational goals. Several students from the 2014 institute indicated they are considering graduate education in the environmental science field.

In addition, the NCR-SARE Youth Educator Grant program provided a catalyst to promote our JJC UASI program, and to encourage more young people to consider STEM related careers.