

PROGRESS REPORT
North Central Region
Sustainable Agriculture Research and Education (SARE) Program

Progress Report Year: 2013

Project Title: Economic Evaluations of Aquaponics

Project Number: FNC

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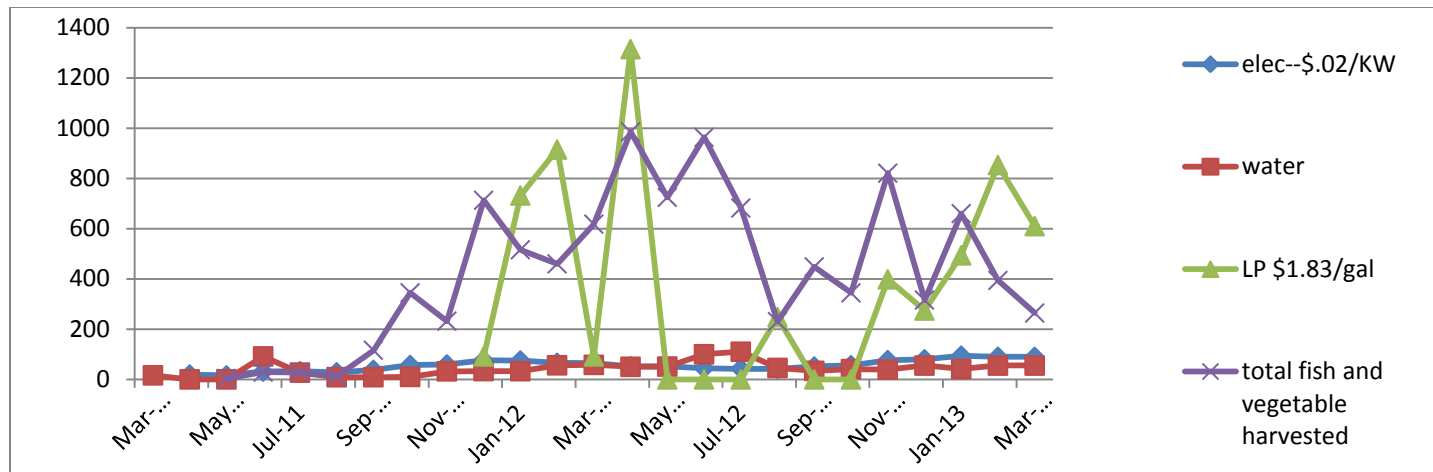
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WORK ACTIVITIES/RESULTS

The start date of this project (13 April 2012) is roughly one year after I received my first fish. 2012 was spent correcting some of the mistakes I made from the first year and continuing to learn, refine, and grow the operation. In the original plans for the greenhouse I got some of my ratios wrong for saving water. Water tests showed in 2012 that my theory was correct and redoing and adding media beds resulted in better water quality and healthier fish and plants. Grant funds were used to monitor water quality and tissue sample with an outside lab source. The other correction was adding more greenhouse square footage which improved the ventilation of the greenhouse in the summer. However, it hurt the heating efficiency in the winter. Although water temperature was maintained at 72 degrees F all winter and air temperature never went below 50 degrees F, plant growth rates seemed to slow for all plants and tomato production went down. I feel there is something environmental I am still missing. More research is needed. Again, grant funds were used in water and tissue samples with an outside lab source.

RESULTS



Graph 1

Graph 1 above plots utilities used vs. value of crops harvested. Although there are spikes in the amount of LP used, after the aquaponics system is established, vegetable and fish production easily covers utilities throughout the year. Labor is the biggest consideration. With a full time farming operation I have found that I have to hire 90% of the labor for both the aquaponics and high tunnel operations. As of now (April 2013) production does not cover labor and workman's comp insurance. However if I provided all the labor this could be reconsidered. One of the biggest things we have struggled with is marketing of the product and developing the market for the product. All labor numbers also includes time spent marketing and delivering produce.

Although, the time frame is not officially part of this grant, the first year of operation for aquaponics did not produce a lot of marketable vegetables. The reason for this is it will take a while for the system to mature and establish many of the micronutrients for the plants. If someone is planning to start aquaponics they should not plan on any income for 3 to 6 months after establishing plants in the system. Hopefully someone will figure out a way to get thru this time period quicker. It should be noted that any additional fertilizer for the plants should be approached carefully because of potential harm to the fish. Aquaponics is a balance between the fish, bacteria, and plants. If you kill the fish using additional fertilizer you will delay the aquaponics system becoming fully operational.

After the first year, not much difference has been noticed between vegetables grown in dirt vs. vegetables grown in aquaponics.

PLAN FOR 2013

Next winter (2013-2014) we will make some modifications to our high tunnel to hopefully produce vegetables all the way thru the winter. This will give us

a comparison for months of garden crops that normally are not available. Also, we will continue to dive into different crops and/or greenhouse environmental issues to help improve the economic bottom line during the winter months.

There has been an increased interest in producing herbs in both the high tunnel and aquaponically. The goal is to increase production from the greenhouse and high tunnel. Observations will continue and experiments are ongoing.

Outreach will continue as we open our doors to interested people and potential entrepreneurs. Hope fully we can cultivate relationships with the Iowa State University aquaponics system and the Des Moines Area Community College (DMACC) and Southwestern Iowa Community College (SWCC) production horticulture classes.

As of right now (April 2013), no further large field days are planned for 2013.

OUTREACH

Outreach has been huge for this project. There is a lot of interest in aquaponics, especially at the hobby/family /part-time business level. Although no grant funds have been used, the website generates two emails/phone calls/tours per month from people interested in getting started and trying to make business and family decisions as far as how big, labor, money, etc. I am very blunt and honest with these people with my level of knowledge, mistakes I've made, and resources I know.

It is important to note, that I am an organic grain and livestock farmer with little to no knowledge of greenhouse production or gardening. My interest in gardening is what led me to aquaponics (my garden always failed for lack of time to weed properly and there is no weeding in aquaponics). Most of the people/families I talk to are at the same level I was when I started or have a little more gardening experience. Thus, I can talk at their level and about things they need to consider. My operation gives prospective entrepreneurs and/or hobbyists a look at aquaponics systems based on the University of the Virgin Islands System, media bed type aquaponics, high tunnel gardening, as well as NFT hydroponics. This allows them to see firsthand how the different operations are managed and work; as well as construction, and capital considerations.

Field days were also planned for the fall of 2012. These days were on October 27, 2012 with 40 plus visitors; November 17, 2012 with around 60 visitors and December 15, 2012 with 50 plus visitors. These days not only allowed education but would also dispose of myths such as "the lettuce tastes like fish".

In November of 2012, I assisted the Atlantic FFA in an aquaponic project by providing fish, and a small tour to four members and the instructor. December 2012 also brought 28 4-H members and parents of the Wichita Wildcats 4-H club.

The club members enjoyed the activity of weighing fish. January 2013 brought 24 Cass Pioneer 4-H members and their parents who also assisted in weighing fish. The greenhouse has inspired several different 4-H projects.

Just this month, *Market to Market* an Iowa Public Television (IPTV) program came out as part of a story they were producing on aquaponics and sustainable agriculture, which will air sometime during the summer of 2013. Also, on April 9, 2013, 23 members of Women For Panora's Future (WFPPF) enjoyed the aquaponics tour and were intrigued that I employed a lot of stay-at-home parents as part-time labor.

Education outreach has also been huge with the Panorama Community School Biology classes. At the end of each semester 15 to 20 biology students tour the aquaponics greenhouse. Aquaponics is a great way for students to see firsthand the nitrification cycle, and water quality, as well as discussing evaporation, transpiration, and water conservation. This is the same with the 4-H groups that have come thru. The greenhouse has inspired several different 4-H projects.