Short life in Sustainability

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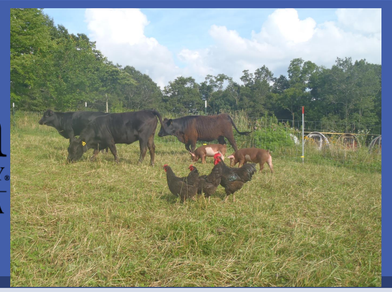

Introduction

My name is Tyler Higgins and I am an Appropriate Technology major at Appalachian State University who has recently participated in a sustainable agriculture study in the Sustainable Development Department for ASU. I am interested in efficient energy use with a concentration in alternative energy sources. I wish to develop small-scale alternative energy systems for households motivated by my plans for homesteading without compromising the American quality of life. Learning about sustainable agriculture and sustainability has been invaluable in developing my goals for small-scale alternative energy and food systems. I learned that developing free-range integrated poultry systems can create a situation in which one system can positively affect another system without extra inputs. The SSARE project **Integrating Free-Range Poultry with Ruminant and Agroforestry Production** #LS10-226 is a 3 year project to look at the benefits of an integrated pastured chicken system.

Materials and Methods

I lived at the SD farm for over 6 weeks and, during the project, was exposed daily to sustainable horticulture and livestock practices. At the SD Farm, I personally put together an integrated system while working with livestock. The integrated system included grazing heritage cattle heifers (Dexter), heritage pastured pigs (Tamworth x Hereford), and heritage chicken layers (Java, mottled and black). I also worked with a local farm (New Life Farms) side-by-side with owner Cory Bryk who raises pastured poultry, pigs, and horticultural crops. This farm sells weekly at the Watauga County farmer's market, has 12 CSA members, and processes poultry. My project had four objectives; details are below.

Two groups of pastured chicken eggs are to be tested for microbial activity: 1) Control and 2) Integrated. The Control group of layers (four Java and four Buttercup Sicilian/Silkie/Lakenvelder) were housed in a portable house with access to pasture and were contained with electronet fencing in a small enclosure (625 ft^2). There were no cattle or pigs or other livestock on this pasture. The Integrated group of three Black Java layers were incorporated in a ½ acre pasture with two pigs and three heifers. The chickens were housed in portable poultry pens at night and had free range of the pasture during the day. The pigs were sheltered at night and had two feed troughs and a watering barrel. The cows had a water tank and a mineral feeder. The animals had natural and artificial shade. After three weeks, eggs from each group will be tested for microbial activity.

Integrated Field

Control Group

Results and Discussion

Obj. 1. Experience practical hands-on learning in integrated agricultural systems

New Life Farms offered me great insight in the inner-workings of a small-scale farming operation. Cory Bryk always answered my questions willingly and we worked alongside each other daily. His farm is 8-10 acres and grows on a north-facing slope. During my work with New Life Farms, I assisted in activities such as establishing plants in rows, weeding beds, harvesting produce, thinning produce, packaging produce, starting seeds in a greenhouse, and processing chickens. Cory is only in his third year of operation, but he has a wide variety of crops such has collards, squash, carrots, beets, potatoes, kale, and many other greens. His irrigation system is gravity-fed through drip tape; but he didn't need it with excessive precipitation. He has many enterprises such as meat, eggs, CSA, flowers, and vegetables. This is good security for a farmer in case a crop fails. Cory does not use any fertilizers or harmful pesticides. I learned this is good for the soil eco-system and reduces fossil fuel input; however, there are too many weeds to pick. Cory uses buckwheat as a cover crop and it will also attract beneficial insects. He saves on labor costs by hiring interns with stipends and has a wide volunteer base through the university, for he is an ASU graduate, and through his wife, for she is a local. He rents the land, so incorporations of perennials and soil-building practices are limited. He does not mulch the gardens and most time is spent weeding. He integrates pigs in his garden beds during the off-season to up-root perennial weeds (burdock), but I believe he could integrate ducks, during the growing season, to pick out small weeds. I also believe if he put in more inputs in the beginning, with mulches, he would have more time to spend with other enterprises or his family, and there may be less soil erosion and weeding.

At the SD Farm, I lived and worked with a student community who live at the farm to take care of it. We shared dinners, a bathroom, and knowledge. I learned from Tony about wild edibles and fermentation of grains for better health. From Dan, I learned about baking and the joy of juicing, and, from Adam, I learned about construction techniques. The residents assisted in any questions I had and were quite wonderful to have as resource.

In the field, things were not easy. The cows disliked and kicked the pigs and everyone robbed feed from each other. However, there were solutions, for the chickens were the smallest and weakest, the cows the biggest, and the pigs the smartest. It was a challenge to keep the animals from raiding each others' feeds and residences.

Hands-on experiences included:

-Feed amount and types for different animals
-Feed trough construction
-Shade panel construction
-Selection for desirable chicken traits
-Tagging chickens
-Hot wire assembly
-Silage excavation
-Mobile processing unit training
-Chicken processing
-Hog mover construction
-Learning animal behavior

Portable pig housing

Portable poultry pens

Portable shade panels

Obj. 2. Investigate the impact on microbial status of eggs of integrating poultry with cattle operation

In an integrated system, chickens are, inevitably, going to pick apart the dung patties of cows and pigs in search of beetles. In our case, more contact between the pigs, chickens, and cows occurred than expected due to the home invasions; the pigs invaded the poultry homes and the cows invaded the pig home.

After three weeks of species integration, eggs from the Control Java layers and from black java layers from the Integrated pasture are to be collected and sent to NC State University for analysis. The object is to determine the microbe activity in the two systems to determine if the integrated pasture layer system contained more harmful microbes (*Salmonella* spp.) then the control layer pasture.

Obj. 3. Develop enterprise budgets for integrated livestock systems.

I learned an enterprise budget is a tool to be used by a farmer to project profitability for different operations using a list of revenue and expenses per unit of product (Kay et al. 2008). There are very few enterprise budgets for sustainable livestock enterprises; however, the SSARE project team is developing an integrated enterprise budget to include grass-fed cattle and free-range poultry.

Obj. 4. Develop outreach materials for SD sustainable poultry outreach website

I have written a summary of the Southern SARE free-range poultry project to be posted on the SD Sustainable Poultry Outreach website at http://sd.appstate.edu/faculty/anne-fanatico#poultry. My poster will also be posted at this page describing my experience for others.

References

Kay, Ronald D., William M. Edwards, and Patricia A. Duffy. 2008. Farm Management. 6th Edition. McGraw-Hill Publishing Co., NY.

An integrated system is efficient and allows cattle, pigs, and chickens to use the same pasture, but it has its challenges. A good method of separation is, ironically, a key issue in an integrated pasture. Integrated foraging is the goal but with a separation of housing and feed concentrates. The cows were curious and investigated anything new. The cows rubbed against everything, knocking over small feeders and water pails, and robbed feed. This was avoided by putting the feed and water inside the poultry pen, enclosing the pig trough so only the pigs could get to it, and using a barrel with a nozzle on a pallet so the pigs could water themselves ensuring the cows could not knock it over easily. The entry door to the pig house was reduced in size so the cows could not invade their home. More work needs to be done to keep out the chickens from the pig feed, but so far, it has not been a big issue.

The results of the egg microbial analysis will be included in the project's final report.

Pasturing poultry has also been found to reduce the cost of feed due to buffet-style foraging. The practice may reduce parasites in chickens and ruminants with foraging on high-tannin forages and the act of chickens picking apart the parasite harboring cow dung patties. This research has been on-going with SSARE to ascertain the benefits of free-range pastured poultry.

Conclusions

This experience contained invaluable knowledge and opened my eyes to the hard work that goes into sustainable food production. I now know the phrase, "there is not enough hours in a day" and have gained more respect for the small farmer. My confidence has increased with my ability to complete projects and my people skills have been honed while living and working with the sustainable farm's student community. I have learned more about systems and closing the loop between production and waste. Sustainability takes insight, vision, hard-work, and is not easy, but it can benefit the community, the earth, and future generations. I look forward to sharing my experience and knowledge with colleagues, family, and friends.

Astute observations

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