

PROGRESS REPORT 2010
North Central Region
Sustainable Agriculture Research and Education (SARE) Program

Project Title: Comparing the pasture restoration potential and financial viability of Cornish Cross vs. Red Broilers, in combination with heritage pastured hogs, for a small pastured poultry operation in NE Minnesota

Project Number: FNC09-758

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Website: We do not have our own website yet (hopefully soon). However, we are one of two farmer case studies being featured by the Minnesota Institute for Sustainable Agriculture. You can see a “sneak preview” now, and eventually the full case study of our farm at <http://sustagprofiles.info>.

WORK ACTIVITIES

The experimental field block (Figure 1) was set-up to create a strip that was pastured by hogs parallel to a strip that was not pastured by hogs. Each “hog strip” contained three chicken treatments (e.g. Red Broilers, Cornish Cross Broilers, and no bird control). Every other pen/plot of chickens was followed by seeding or no seeding with a 50:50 white and red clover mix. The overall experimental design provides us with a minimum of 35 plots throughout the season from each of 12 treatments including:

- 1) grazing by hogs only (no chickens) - seeded
- 2) grazing by hogs and Cornish Cross Broilers - seeded
- 3) grazing by hogs and Red Broilers - seeded
- 4) grazing by Cornish Cross Broilers only (no hogs) - seeded
- 5) grazing by Red Broilers only (no hogs) - seeded
- 6) no grazing – seeded
- 7) grazing by hogs only (no chickens) - not seeded
- 8) grazing by hogs and Cornish Cross Broilers - not seeded
- 9) grazing by hogs and Red Broilers - not seeded
- 10) grazing by Cornish Cross Broilers only (no hogs) - not seeded
- 11) grazing by Red Broilers only (no hogs) - not seeded
- 12) no grazing – not seeded

The objective of this design was to allow us to test the pasture rejuvenation potential of hogs and two different breeds of broilers alone or in combination, and whether or not seeding was required to provide the desired forage enhancement following the various grazing treatments.

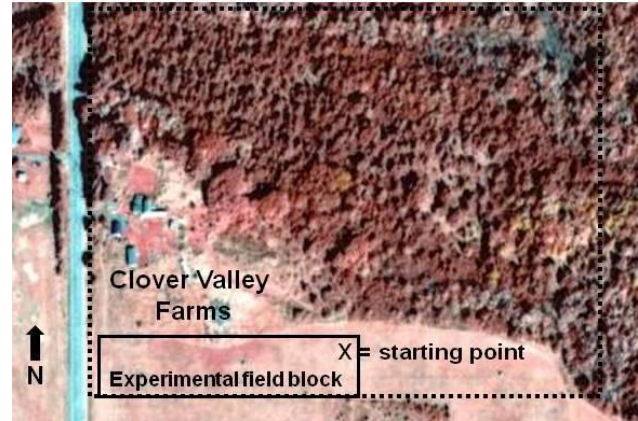
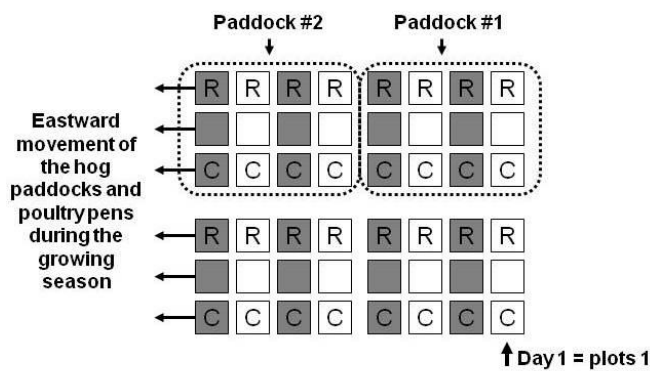


Figure 1. Hogs were placed on pasture in the NW corner of the experimental field block on April 25th, 2010 and moved every 7-15 days. Chickens were placed on pasture June 28th, 2010 using 8 by 10 ft Salatin Style pens established inside and outside the hog paddock area on the far west side of the block. “R” indicates pens containing 50 Red Broilers, “C” indicates pens containing 50 Cornish Cross Broilers and the blank boxes indicate the “no bird” controls. White boxes indicate pens/plots that were seeded with a 50:50 white and red clover mix and the gray boxes indicate pens/plots that were not seeded.



The field trial activities started April 25, 2010 with the establishment of the first of what would be 15 rotational hog paddocks. Figure 1 shows where in our pasture the experiment took place and the set-up and movement of the hog paddocks and chicken pens throughout the field season. The hog paddock was a portable electric fence with an approximately 164 ft perimeter set about 30 ft wide, to accommodate

the establishment of 3 chicken treatments (Cornish Broilers, no bird control, and Red Broilers), and about 40 ft long to accommodate 4 plots of each treatment. So, each paddock covered approximated 12 experimental plots (four plots of each of the three bird treatments). The first paddock was established on April 25th with six approximately 40 lb feeder hogs (Tamworth-Herford crosses). An 8 by 14 ft Port-a-Hut provided shelter in the paddock and contained a 2 hopper, 300 lb capacity feeder. An 80 gallon tank with 2 founts was used. The paddock and hogs were moved for the first time on May 15th and 7 to 15 days after that, based on the level of

rooting/sod break up that had been achieved. We attempted to standardize the level of disturbance as best we could with of goal of about 80 percent disturbance before each move. In addition to the available pasture forage the hogs were fed a 16 percent transitional organic swine starter ration (ave. 40 lbs/animal/week) until they reach about 100 lbs. (10 weeks) at which time they were switched to a 14 percent transitional organic swine grower ration for 14 weeks until finished (ave. 132 lbs/animal/week). Feed was purchased from Mark Thell (4 Quarter Holdings) in Wrenshall, MN.



The chicken pens were 8 by 10 ft (2.5 ft tall) Salatin style pens that contained 50 birds of each breed (Cornish Cross or Red Broilers), or an 8 by 10 ft control plot with no birds (Figure 1). All chickens were placed on pasture on June 28th, 2010 at 3 weeks of age. The pens were moved daily in the morning to encourage maximum foraging during the daylight hours. Each pen contained a 5 gallon galvanized water font that was filled in the morning and evening each day. Feed

was provided in the evening using two 22 lb capacity feed hoppers in each pen. The total amount of feed added to each pen each day was recorded (about 10 lbs a day early in the season to about 25 lbs a day at the end). Sufficient feed was added every day to ensure that some was left in the morning, when any uneaten feed was removed to prevent overheating of birds during the day, and to encourage foraging. In addition to the available pasture forage broilers were fed a 19 percent transitional organic poultry grower ration until processing (8 weeks of age for Cornish and 14 weeks of age for Red Broilers). Feed was purchased from Mark Thell (4 Quarter Holdings) in Wrenshall, MN.

Seeding of alternate plots was done using a 50:50 red and white clover mix. Each pen/plot was flagged and labeled (wire stake flags on the N and S corners of each plot) after that section of the pasture was moved over by the hogs (plots in the no hogs strip were flagged at the same time) with every other plot designated to be seeded. Plots designated to receive seeding had a pre-measured amount of seed (.04 lbs of each seed type which translated to a rate of about 3,200,000 live pure seeds per acre). Seed was spread by hand over the 8 by 10 ft plot area after being grazed by hogs or after being grazed by chickens. Therefore, the plots grazed by both were seeded after the hogs but before the chickens grazed that plot, however, those plots being grazed only by chickens were seeded after the chickens. We chose this method because we wanted to compare seed establishment under the different conditions. This also added a seasonal element to

the plant establishment part of the experiment, so we could see if the timing of seeding had a substantially different impact on any subsequent pasture forage enhancement.

RESULTS

Since this is the first year of a 3 year study, we did not expect, nor find, any differences in finished weights, feed consumption rates and the economics for the hogs or a given breed (i.e. Cornish followed by seeding with clover vs. Cornish followed by no seeding). This year's data will provide the baseline against which we measure changes in the coming years. We are very interested to see if feed consumption rates, costs and/or finished weights change in the coming years in response to any changes we may see in plant abundance or composition in relation to the impacts of hog grazing, chicken grazing, seeding or the various combinations.

There was no significant difference in finish weights between the two different groups of Cornish Broilers (Figure 2). While the average finish weights of the Cornish Broilers were slightly higher in the pen following the hogs, the overall in the range of weights in each overlapped so much that there was no significant difference. The finish weights of the Red Broilers were significantly higher for the birds in the pen following the hogs compared to the birds in the pen not following the hogs (Figure 2). This was unexpected and we are not sure why this was the case. This pen was on the far north edge of the experimental block and did appear to have more available forage. We will confirm this in the plant sampling planned for spring 2011.

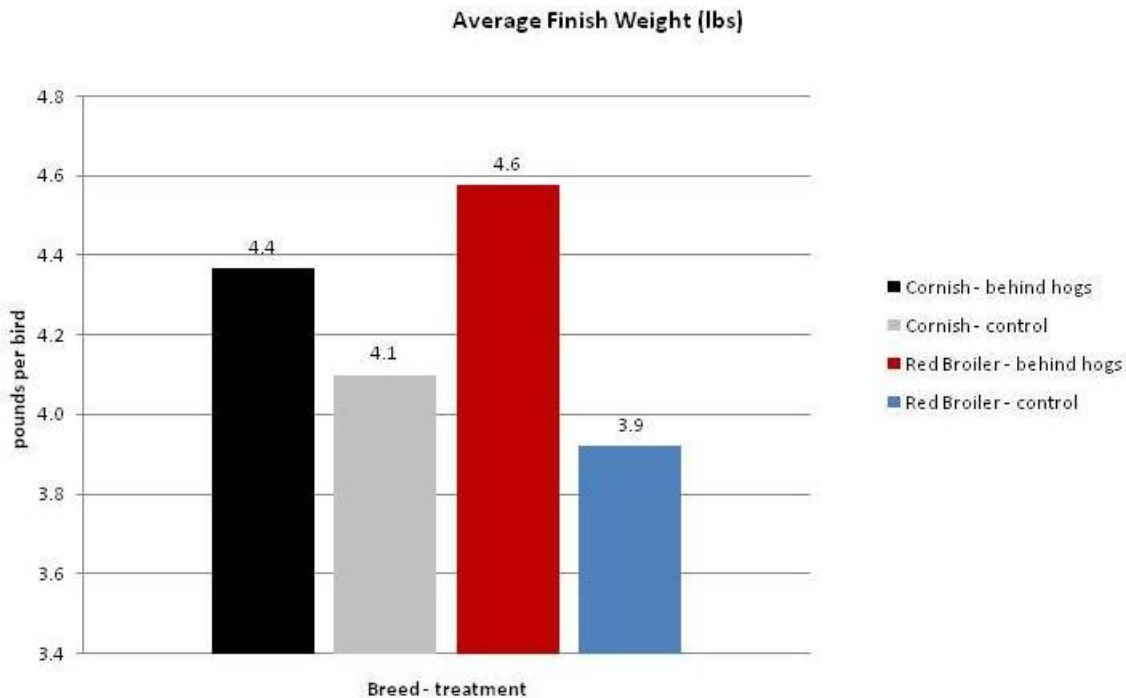


Figure 2. The average finished weights of the Cornish Broilers and Red Broilers when grazed behind the hogs vs. when grazed alone on pasture (50 birds per 8 by 10ft Salatin Style pen). The difference between the average Cornish weights was not significant, but the average weight of the Red Broilers grazed behind the hogs was higher than those grazed alone on pasture.

The Cornish had much lower feed cost per bird than did the Red Broilers (Figures 3), largely because it took 14 weeks to grow out the Red Broilers versus 8 weeks for the Cornish. Overall, the average feed cost per finished pound of bird was between \$0.94 - \$0.97 for the Cornish and between \$1.60-\$2.23 for the Red Broilers. There was no significant difference in feed costs for a given breed whether they grazed behind the hogs or grazed alone. Our hope is that with increased pasture quality we will see better growth at a lower feed cost with the Red Broilers making them more economical to raise (our customers do like them).

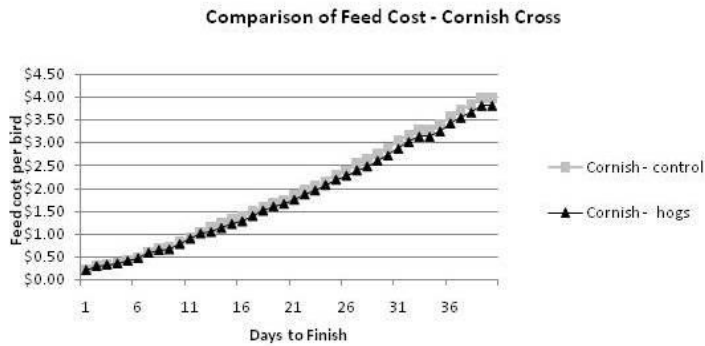
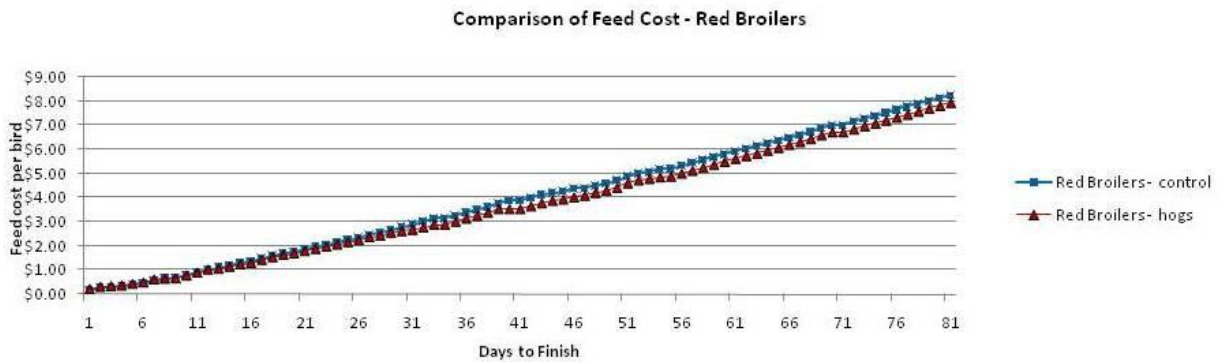


Figure 3. Comparison of the average feed cost per bird for Cornish Broilers vs. Red Broilers when following the hogs vs. when grazed alone.



The average hanging weight of our hogs was 220 lbs, the quality of the meat excellent! The total average cost per animal was \$615 (excluding labor) and the average gross income per hog at \$2.95 per lb was \$650. We are exploring alternative feed sources for the hogs to try to bring down feed costs, and hope that the improved pasture will also yield better growth with less feed.

We enjoy raising hogs and our customer waiting list is long, so we expect to continue working with them

to improve both quality and our bottom line.

Three issues arose this year that will affect interpretation of our data and our work plan for the coming year. First, we were unhappy with the growth rates and economic performance of the Red Broiler variety in general and the variability in growth rates and finished weights between pullets and cocks. Next year, we intend to raise cocks only for 11 to 12 weeks (rather than straight run for 14 weeks) and will change to the Freedom Ranger which has been shown to have better growth qualities than the variety we raised in 2010 (SARE project “Alternative Broiler Breeds in 3 Pastured Poultry Systems”). Second, we expected to be able to conduct plant sampling throughout summer 2010 (i.e. each plot sampled 8 weeks after chicken/hog treatments when over it and it received seed/no seed treatment). However, as the season progressed we realized that the plant establishment and growth patterns over the season were very inconsistent. Therefore, we will be conducting plant sampling in all the plots in the spring of 2011. This will allow for more consistent measures of the plant response based on the various hog, chicken and seeding treatments received without the confounding influence of the seasonal weather conditions and/or the time since a plot was grazed, seeded or not seeded. That said, the visual differences in the strips where chicken grazed vs. did not graze are quite striking (Figure 4).

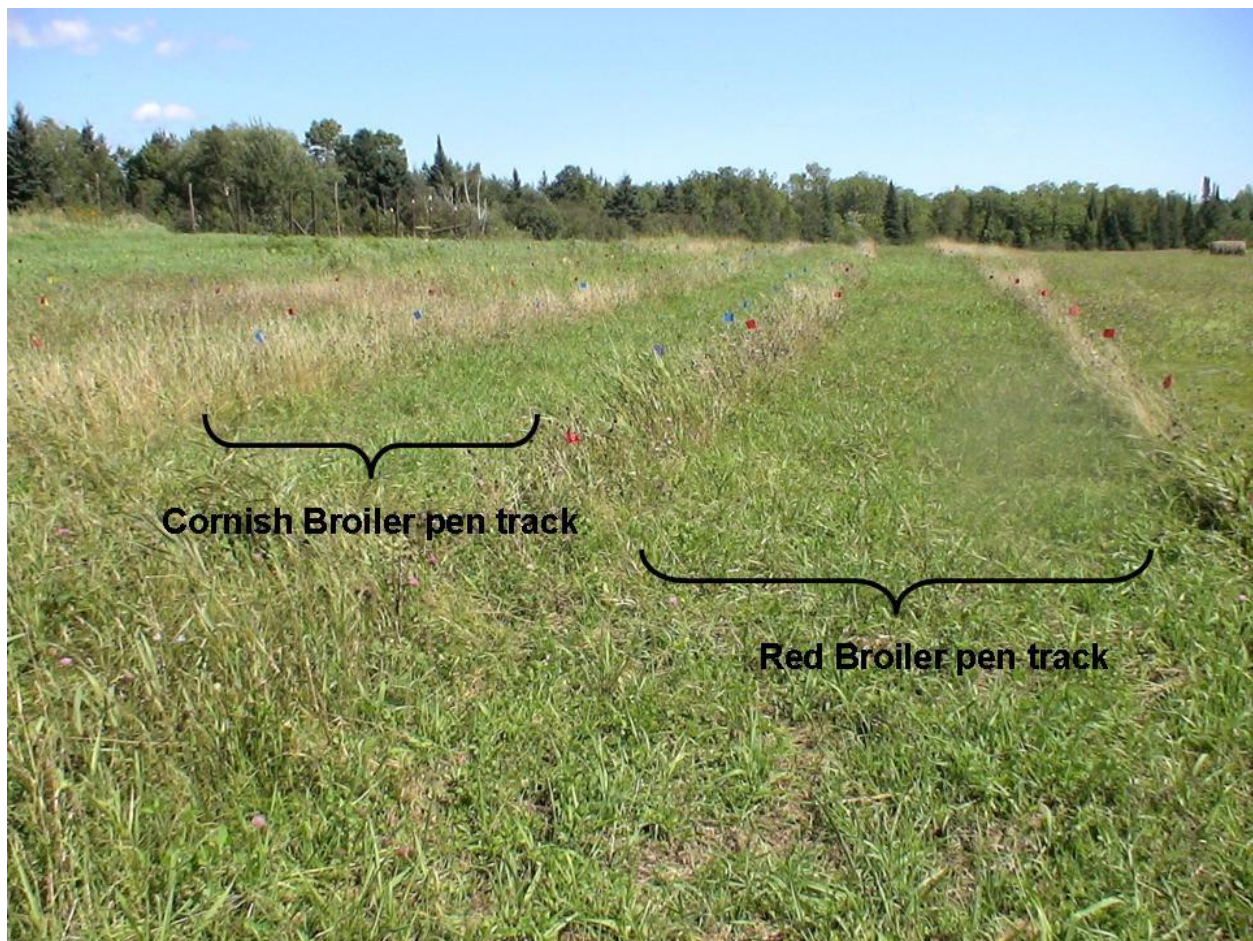


Figure 4. The strip on the right (large bracket) is the path followed by the pen containing Red Broilers; the strip on the left (small bracket) is the path followed by the pen containing the Cornish Broilers. The narrow margin between the strips and the area to the far left in the picture show areas ungrazed by the chickens.

Finally, there was substantial variability in the level of rooting and compaction by the hogs depending on the position of the Port-a-Hut shelter in the portable paddock and whether or not there was substantial rain during the time the paddock was in a given place (7 to 10 days) and as the hogs aged. Therefore, the position of the Port-a-Hut relative to a given treatment (i.e. Cornish vs. Red Broilers vs. no bird control) was intentionally changed with each paddock move so one treatment did not receive disproportionately large levels of rooting and compaction simply due to the location of the hog shelter. Detailed notes were kept as to the location and the plots that were affected by the shelter and will either be dealt with differently or perhaps excluded from analysis to address this issue. Similarly, as the hogs aged they rooted the area much more quickly so we moved the paddocks more frequently in order to try to standardize the level of disturbance plots received throughout the season. However, following two particularly heavy rain events the subsequent soil disturbance was much greater than during drier periods. Again detailed notes will allow us to address this issue in analysis.

WORK PLAN FOR 2011

All plots will be sampled for plant species/type and relative biomass in late May or early June 2011, prior to placing chickens on pasture to graze the end of June. In each plot, a randomly located 1 sq. foot area will be clipped and all plant matter sorted, identified and dried, then weighted to document the botanical diversity and total biomass for each treatment.

In the experimental field block established in 2010, the chicken grazing treatments will be repeated in the strips that were grazed and not grazed by hogs as shown in Figure 1, using the same methods as described above. Daily feed consumption will be recorded for each pen of birds as will be the final processing weights of all birds in each pen. Hogs will not be grazed in the experimental block again this year because we want to see how the poultry respond to any changes in pasture forage as a result of 2010's grazing treatments.

OUTREACH

First, we hosted a fall field day, Oct 2nd, 2010 from 10am to 3pm attended by about 30 people and gave individualized tours for about 60 customers who toured the project when picking up their products at our farm. The fall timing of the field day in 2010 was intended to give people an opportunity to see the multiple features of our diversified farm operation. As this was the first year of our project, we also wanted to see how the field day will work, so didn't want to recruit hundreds of people to this event. We definitely felt that having a small event will help us plan for bigger events in the coming years.

In summary of our field day, we pressed about 1,200 lbs of apples yielding a bit more than 67 gallons using two backyard presses. We conducted 5 farm tours throughout the day for a total of about 30 people, including:

1. The pasture where flagging from the pasture rejuvenation project clearly showed differences in the various treatments, discussions of the broilers we raise, marketing direct to customers and our management operation; and they also got to meet our 5 pastured hogs and see their rotational paddock system in operation;
2. Our newly purchased and set-up Mobile Poultry Processing Unit which we will use for our operation and also rent to other small producers for on farm processing at their farms;

3. Our newly planted apple/pear orchard with deer fencing with discussions of the root stocks and varieties and how/why it will be incorporated into the poultry grazing system next year;
4. the homestead orchard, with fruit still on the trees, so we could discuss orchard restoration and management and different varieties;
5. Our hen coop(s) and their rotational pasture/hoop houses for summer and winter foraging and 2 day-old chicks in the brooder, results of our developing breeding program for our laying flock;
6. Our year-round solar greenhouse with discussions about perennial herb growing and the seasonality/plants for such a greenhouse (no supplemental light or heat).



Second, since a portion of the funding for this project came from a Minnesota Department of Agriculture Sustainable Development grant, this project will be featured in their 2010 Greenbook. Finally, the MISA is featuring our farm as one of their case study farms which will be unveiled in spring/summer 2011. A “sneak peak” is viewable at <<http://sustagprofiles.info>.> and the final profile, with extensive descriptions, pictures and video clips of our farm will include a feature on the role of on-farm research in the development and growing success of our operation.

For 2011, we could definitely advertize more broadly, and intend to do so in the future, for farm-based field days. With very limited advertizing this year we saw about 30 visitors, so we’d expect a more intense advertising effort would yield a much large turnout. Additionally, we are planning to conduct a webinar in 2011 with Wayne Martin, UMN Small Livestock extension, to reach a broader geographic group of folks who do not have the opportunity to come to our farm personally.