

Using Pasture Poultry as a Nitrogen Return for Summer Slump Grazing of Rape by Sheep



**Greenwood Acres Farm
Springfield, WV**

Final Report
**Northeast Sustainable Agriculture and
Research Education**

Using Pasture Poultry as a Nitrogen Return for Summer Slump Grazing of Rape by Sheep

FNE 03-475

HC 86 Box 404
Springfield, WV 26763

(304)822-5688
GAFWV@yahoo.com

2. Goals

1. To determine the productivity of Salatin Cages for poultry to rotate on midsummer rape.
2. To determine the nitrogen replacement to rape during cage rotation of poultry following lambs.
3. To determine the tenderness variation of cockerel vs. capons at fifteen weeks on rape rotation.

3. Farm Profile:

Greenwood Acres Farm is a lamb production farm located in Springfield, West Virginia. We manage forty ewes on rotational grazing and have used Kale, Rape, and Turnip to extend the grazing season into the winter months. Our market is to maximize the lambs produced that will be sold direct to consumer through the carcass market.

4. Participants

Isaac Lewis	Farm Manager and Production Coordinator
Becky Lewis	Soil Scientist and Forage Production
Marissa Rodgers	Project Assistant Public Relations
Payton Umstott	Production Manager, Pilgims Pride
Steve Ritz	Brassica Grazing Specialist

5. Project Activities-

Spring 2003

A. Production of Salatin Style Cages was conducted in spring to prepare for rotation through the Barnapoli Rape. The Rape seed was broadcast

seeded on 1.5 acres of land. The soil was dry tilled and germination was indicated at fourteen days. A poor germination was regarded due to cold wet season. Patch reseeding was conducted to promote density. [Original soil test was conducted.]

B. Year One- 200 chicks were brought unto the farm and were handled in the facility until fully feathered. At that time the group was split down into two groups of fifty for acclimation. After acclimation the birds were placed into cages.

C. The lambs were introduced to an isolated group of rape to acclimate them to the digestibility of the product. The lambs were weighed and moved to the first paddock to begin the study.

D. At week three the chicks were moving through the rape when severe death rates were recorded. Upon consultation with poultry professionals an error in amount of light and crowding were evident. At week four we removed fifty percent of remaining chicks to avoid crowding and at week five only two percent of original chicks remained. At this point the study was terminated.

Spring 2004

A. In an attempt to repeat the study to tackle the faulty results recorded in 2003, we repeated the study with modification. We lowered the cages to 2.5 feet tall to remove excess light. We covered the sides and roof with Horticulture Grade shade cloth to remove excess light. We acquired 100 chicks to start the study. We borrowed a beak trimmer to de-beak chicks to cut down the effects of cannibalism. We noticed less pressure in the cages. The rape was planted and lambs were weighed and prepped in the same manner as 2003. The fluctuation was seen in lamb weights only based on genetics of a new ram used in 2004. The rape was mauled during the first pass of the cage and cannibalism had already started prior to the completion of the first pass of the cage was completed. The bird manure produced was very minimal and at week 2 of rotation only seven birds of Cage A and nine of Cage B were still alive. At week four the rape was mauled to loss and such a small amount of birds remained. I can record that the rape did remain for the summer was grazed and lamb weight was five percent higher than the previous year. The study was terminated.

6. Results

When producing data for this study we will focus on the following goals as outlined in the experiment. Note: The study was terminated both years because of the death loss of the fowl during this study.

A. Will poultry regenerate nitrogen to increase protein rape?

**This goal in the study was not clearly tested. The poultry was not held at high enough concentration to produce the nitrogen necessary to fluxuate nitrogen levels needed to be noticed. Therefore it is unknown impact of the regeneration of rape with nitrogen produced by chicken waste.

B. Do capons possess tenderness advantages over cockerels in long term brassica grazing systems?

**This goal was not efficiently reached because mortality rates were too high to slaughter the birds. Rotations were seized on Day 30 on both studies. The 2004 records were stopped on Day 20 and 23 respectively.

C. Will rape respond to nitrogen for subsequent grazing by sheep?

**The sheep effectively grazed the summer slump grazing paddocks for three rotations in 2003 and four rotations in 2004, with considerable weight gain in 2004. This is without the presence of poultry for the last rotations. We

D. Addressing Mortality in Birds

***As you can see from Figure 1-4 in the appendix of this report, mortality rates were very high during the two years of the study with the use of industry based information. The study was modified in 2004 with the hope that increased productivity would be gathered from birds that are less crowded with less light. Unfortunately, on Day 20 of the rotation the mortality rates on five week old birds was elevated to considerable loss per day.

7. Conditions

2003: Site conditions for 2003 were variable in the spring rape planting with very cold nights and a wet season. The rape germination was much less than expected based on previous season's response. A replant

seeding was conducted to increase the population of rape plants. As weather changed the density of plants was reached.

Our form is very irregular and the slope does change as the grazing is conducted. This will have some impact of the Salatin Style Cages as they are pushed up and down the slope.

The strongest condition affecting the success of this project was the impact of cannibalism of chicks found in the study. Near Day 15 of the rotation cannibalism was noticed and was severe in the days of 22-26. This caused the test to be stopped. The manure accumulated was minimal and the replacement of nitrogen into the area for nitrogen regeneration of the rape was in unrecorded amounts.

2004: This year we used de-beaked chicks to target cannibalism. These chicks actually became cannibalistic in the cages sooner in rotation than in the previous years. This was a much smaller group of animals. This set of data is very different from the industry accepted practices using the Salatin cage system. The shaded sides didn't help the problem.

8. Economics

The Banopoli rape has effectively been used on our farm to enhance the summer grazing season. Other brassicas have been used to extend grazing into winter months. The brassicas provide an excellent source of protein to overcome the summer drift and supply protein for pre-lambing periods in the winter. This extension has provided heavier gains on market feeder lambs during summer grazing. Secondly, we find that ewes are stronger and after grazing the ewes increased production the following season. Turnip, Kale, and Rape have been used in the winter to extend grazing, and ewes perform well for upcoming lambing seasons.

Since 2004 we have not used moving cages to raise poultry. I would be interested in electric mesh grazing of poultry in the future. However I am skeptical of the response I may achieve.

9. Assessment

We have again used rape and other brassicas with lambs and ewes to increase productively. We are comfortable with the results we are achieving through this method of production.

To address grazing poultry in the future I speculate that using electro-net poultry netting to house the birds would yield greater results. This will prevent the mauling of the rape plants by the cages. I feel that the additional space provided to the birds will provide less risk of cannibalism. This will help with housing pressure and cannibalism. The only issue would be the nitrogen return to the rape. I mention and note that losing birds is more detrimental financially than the nitrogen return to the soil.

To focus on caponizing, I recommend that we go to non- meat type capons to decrease the mortality of the birds. The birds seemed to do better in the lengthy weeks needed to complete this study. As birds get heavy they lay more which can lead to protrusion of the vent and can lead to promoting cannibalism.

10. Adoption

We will no longer implement grazing of poultry using Salatin style cages on our farm enterprises. We are looking to use grazing poultry through the use of electro net free range methods. After two years of data in the area, we better stick to what is working for us. We are having great success in the area of grazing Brassicas. We will continue to use this extended and enhanced grazing technique in the future.

11. Outreach

Found in Appendix B you will find a brochure designed to focus on the use of rape to beat summer slump. The flyer was used as placemats for local dinner meetings and was distributed to students as a resource for grazing poultry. The flyer was well received. We received good feed back from the poultry side of production. We now have a few select groups of farmers using turnip, kale and rape to extend grazing on both cattle and sheep. We view this as the true success of the project. We are happy that some farmers are seeing the financial returns by using something that works for us on our farm.

12. Report Summary

The purpose of this project conducted on Greenwood Acres Farm in Springfield, West Virginia was to determine if rape summer crops could be supplemented nitrogen produced by chickens grazed in Salatin style cages.

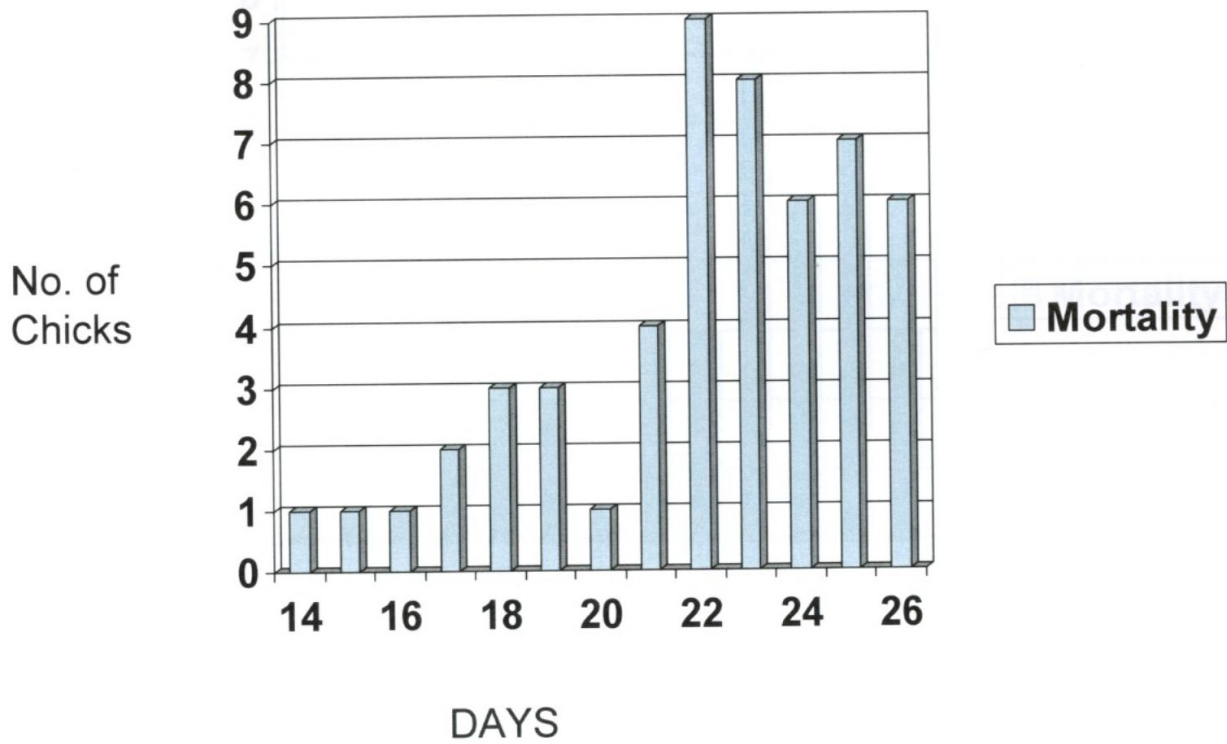
We used Salatin cages to move two and a half week old fully feather chickens (cockerels) through summer rape fields grazed by spring feeder lambs. In 2004 the study was rerun to determine the impact of 2003 data. Birds suffered cannibalism during both studies regardless of the modification made to cage design and bird morphology. The lambs performed both years with consistent data to show the impact of Summer Drift rape grazing. However, the rape did not survive the multiple movements of the cages across the field which did have some impact on the 2003 grazing schedule.

To complete this concept, I would recommend the free range use of electro net poultry netting to run the birds. This will reduce the damaging of the thick rape stems. It will also expand the movement of birds is an attempt to reduce the presence of cannibalism. To work in the capon industry, I recommend the use of non-meat birds. This should reduce the lying of birds and increase movement that will aid in the reduction of cannibalism in the flock. I feel that the integration of Brassicas, sheep and poultry can be achieved. I feel that farmers can endure the benefits of the protein that brassicas present. I also feel that poultry can be integrated into farming operation as a subsidiary to their current operation. Many factors effect the profitability of poultry none is more detrimental that the mortality exhibited by cannibalism.

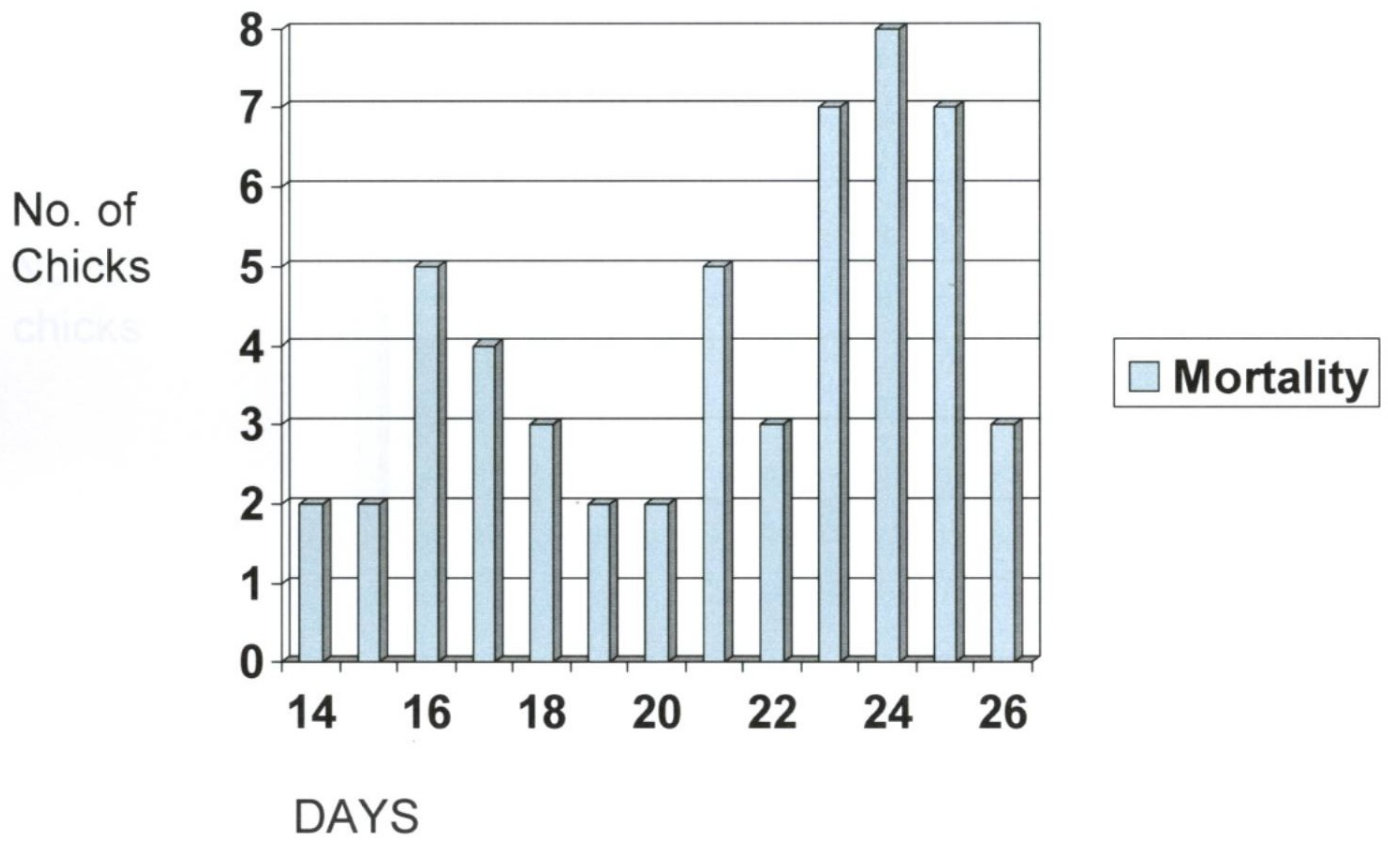
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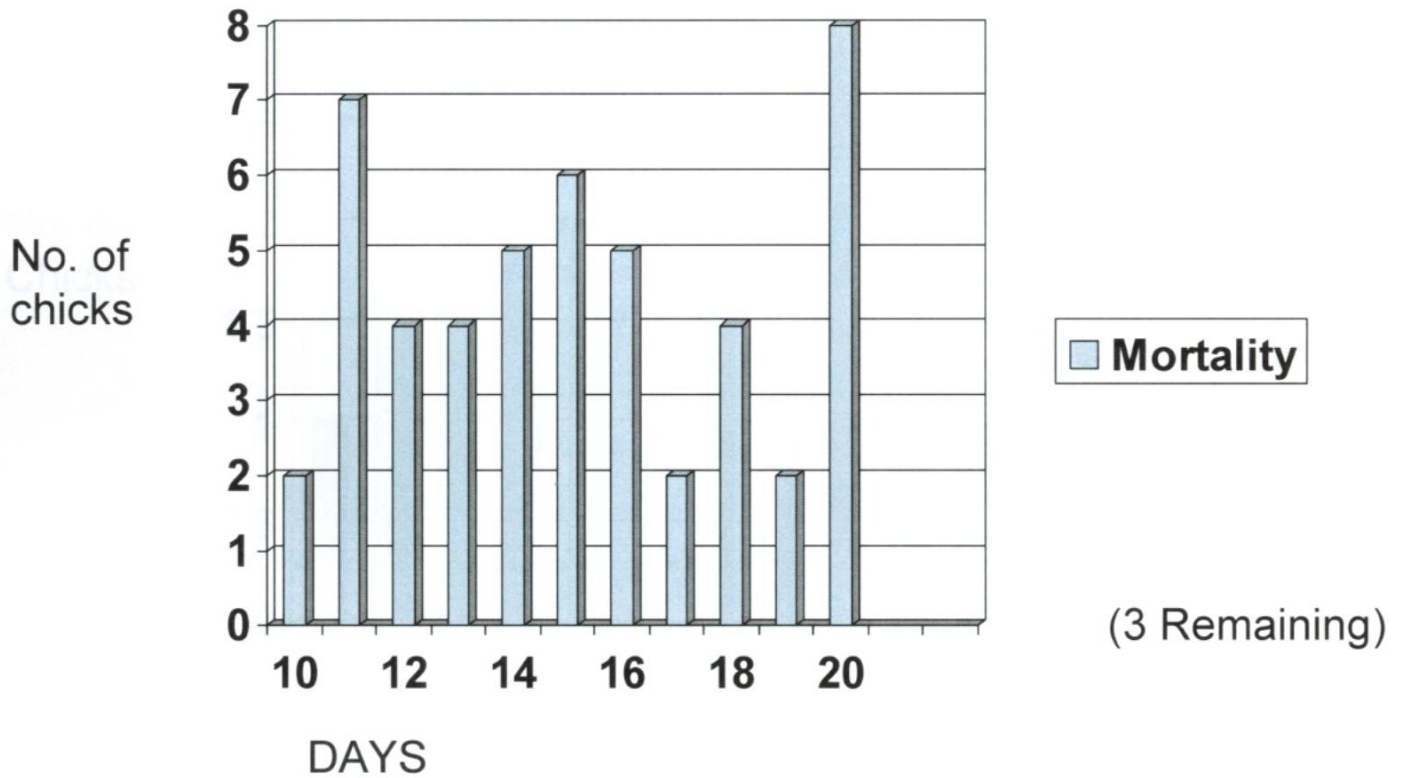
Mortality Rates for Group A 2003



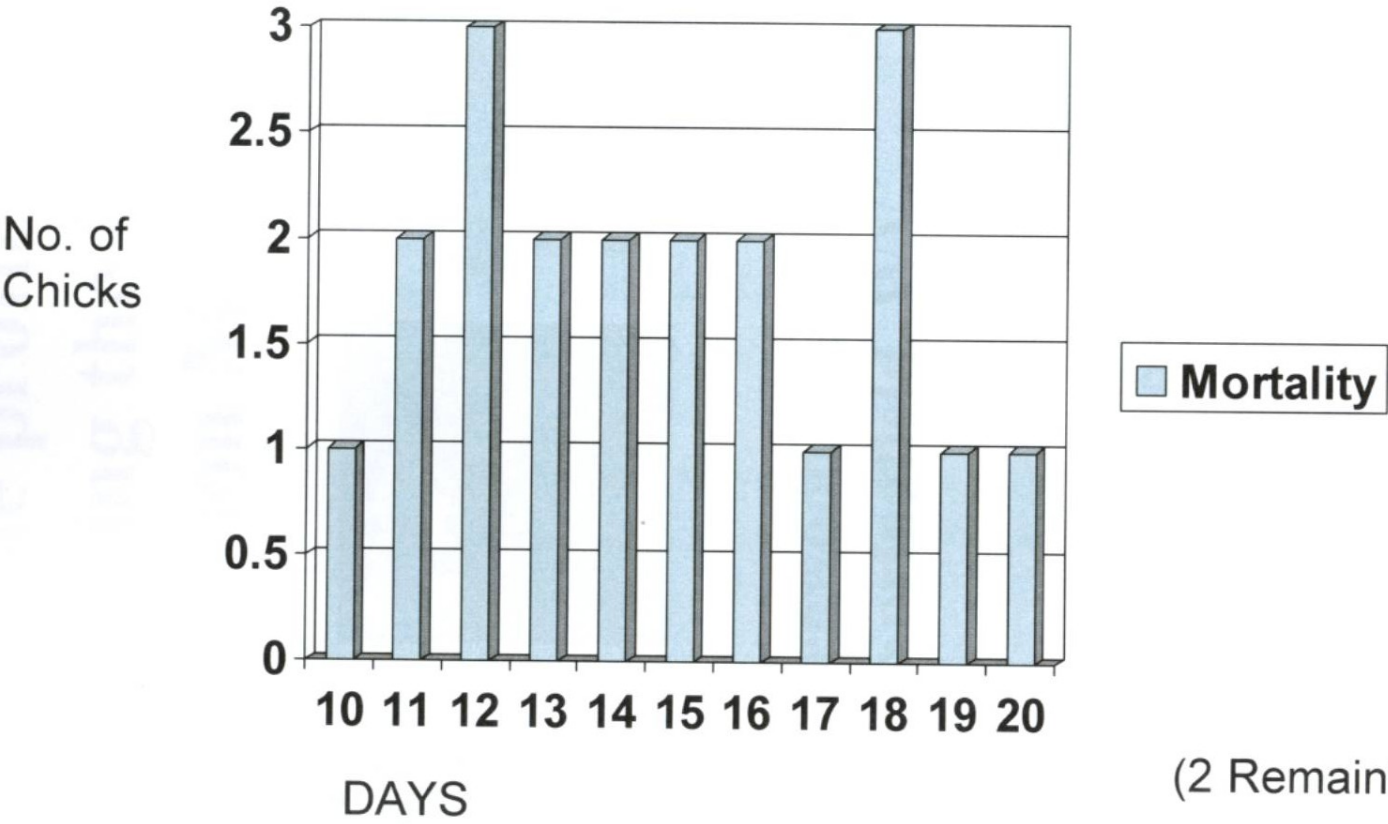
Mortality Rates for Group B 2003



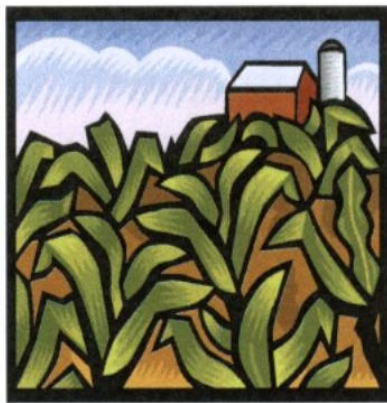
Mortality Rates for Group A in 2004



Mortality Rates for Group B in 2004



Increase the profits of your farm by using the following production Methods!







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Grazing of Rape by Sheep**

This Just Makes Sense!!



- *Extend the Grazing Season By the use of a Brassica* 
- *Subsidize your current income with a Poultry Related Enterprise* 
- *Reduce the Productivity of your pasture land by the increase in Nitrogen deposits made by poultry* 
- *Have a product that is fresh from the farm to attract potential Buyers.* 

The following information was gathered while conducting research for SARE right here in the Potomac Highlands.

For more information about extended Grazing and the Use of Brassicas

Please Contact:
Isaac Lewis
(304)822-5688

Becky Lewis
(304) 298-4795

