

*A Palatable Planted Poultry Pasture  
at Good Spring Farm*

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## **Introduction**

### *Chicken at Good Spring Farm*

Good Spring Farm has been raising pastured poultry for approximately thirteen years. At one time the chickens were certified organic, but because of the high cost of the feed and of transporting the feed to New Brunswick, the chickens are now fed conventional feed. The chickens are still antibiotic and hormone free and they are pastured.

There are three breeds of chicken at Good Spring Farm: 1) New Hampshires, 2) Black Australorpes, and 3) Good Spring Selects. The New Hampshires and Black Australorpes are a dual purpose bird, being useful for both egg production and meat. The Good Spring Selects are the primary meat bird.

The pasturing process at Good Spring Farm is called day ranging. Chickens are let out within a fenced area during the day and are locked up at night in range huts on the pasture, not back in the barn. They are locked up to protect them from the elements and from predators. The range huts are made from a wooden frame and wire mesh. A tarp is over the top to allow for a dry shelter for chickens when it is raining.

### *Chicken Nutrition*

When the hens begin laying eggs, the chickens begin eating a layer ration. Before egg laying, the chickens are fed a grower ration. For additional protein, roasted and ground soy bean is added to the feed. Chickens need “protein sources that have a complete complement of amino acids”(O’Reilly, 2006, p. 63) If there is a lack of these amino acids, chickens “may grow slowly, show poor health and development and be inclined to pecking or cannibalism”(O’Reilly, 2006, p. 63).

Depending on the time of year, the chickens are pastured in a pasture typically containing clover, grasses, and various weeds. Because chickens are omnivores, pasturing is beneficial for the birds in providing insects and worms to eat as well as vegetation. A pastured chicken is getting a diet better suited for its physiology.

Besides the dietary benefits of pasturing the chickens, other benefits include:

- exercise, fresh air, and sunlight for chickens,
- better tasting, healthier chicken for the customer,
- chicken manure that builds the soil and works well in an organic crop rotation program.

Good Spring Farm's poultry pasture is the focus of the project.

### **Project Purpose**

Instead of having a pasture of spontaneously growing plants, a pasture was planted for the chickens. The purpose of planting a pasture was to provide different plant species for the chickens to eat. The focus of the project was seeing what plant species would be palatable to the chickens.

### **Materials and Methodology**

The first steps in creating a planted pasture were buying the seed and preparing the plot.

Some of the seed was purchased at the Fredericton Co-op store and some was leftover or seed given to Good Spring Farm. The purchased seed included oilseed radish, forage peas, hairy vetch, and hullless oats. Seed included in the mix that was given to the farm were flax and alisa clover and leftover lettuce seed was also included in the pasture mixture.

The amount of seed available for the experiment included:

- 15 lbs of vetch

- 14 lbs of oilseed radish
- 88 lbs of forage peas
- 88 lbs of hullless oats
- 3.5 lbs of flax
- approximately 0.5 lbs of alisa clover
- approximately 2 cups of prizehead lettuce

The seed portions were then divided in half to have a total of 104.5 lbs of seed mixed for the experimental pasture. These 104.5 lbs of seed were mixed with inoculant in a wheelbarrow before seeding.

Preparing the pasture plot consisted of rotovating the entire area and spreading compost over the plot. Because of other pressing farm duties, the plot was rotovated again before seeding in order to kill weeds.

After the land was prepared the seed was sown by hand. Fifty pounds of the mixed seed was sown on a section measuring 8m X 59.125m (area = 473m<sup>2</sup>). This first section was seeded on July 17<sup>th</sup>.

A second section was seeded on August 9<sup>th</sup>. The rest of the remaining 104.5 lbs were seeded on the second pasture – 54.5 lbs of seed mix. The second section was the same size as the first section.

After the first pasture had significant growth, meaning they were past the cotyledon stage, the proportions of each plant in the pasture were measured. The proportions were measured by randomly placing a cardboard cutout square measuring 1' X 1' on the pasture and counting the plants in the square. This was done four times throughout the pasture and the proportions found are displayed in the following table.

<i>Plant Species</i>	<i>No. per sq. foot</i>	<i>% per sq. foot</i>
Vetch	1.75	4.9
Radish	16.75	47.2
Peas	6.25	17.6
Oats	10.25	28.9

Flax	0	0
Clover	0	0
Lettuce	0.5	1.4
<i>Total plants per sq. foot</i>	35.5	

The proportions were devised by calculating the mean. This method of discovering the proportions, however, was not found to be completely accurate. Based on observation, the pasture probably was comprised of much more vetch. The flax seed may not have been viable and therefore didn't sprout. The clover did not begin growing until after the experiment was completed. Weeds in the pasture included barnyard grass, pigweed, chickweed, lambs quarters, and crabgrass, but in very small amounts.

On August 16<sup>th</sup>, the chickens were first let out on the first pasture. The group of chickens on the pasture was all the same age and had been raised together since they hatched. They were fed grain in the morning when let out of the range huts and grain again in the evening. The group of chickens also consisted of all three types of chickens at Good Spring Farm.

For collecting data on what the chickens ate, observation was used. The chickens were observed foraging for half and hour a day. These half hours were done randomly – sometimes in the morning, afternoon, or evening.

The fenced area where the chickens were allowed to roam was 7.25m X 17.69m (area = 128.25m<sup>2</sup>) with the range hut in the middle of the area. Pasturing happened within this area for approximately 5 - 7 days and then the fence and range huts were moved. The range huts and fence were moved 4 times on the first section.

Unfortunately, when the first planted pasture was exhausted by the chickens, the second pasture had not grown enough to pasture the birds on it. The chickens were then

moved to a natural pasture. Because of this change, it was not possible to do feed conversions on the planted pasture fed chickens. At the time of writing this report, chickens had not been on the second planted pasture plot.

## **Results and Discussion**

The majority of the data came from observing the chicken foraging habits for half an hour each day they were on the planted pasture in order to see what plants were eaten by the chickens. Some samples of the observation notes are as follows:

August 22:

- 3:10 – 3:40 pm
- sunny day, breeze NW, variable cloudiness
- first day on new pasture, moved fence
- eating radish, peas, oats, vetch, wild mustard flowers
- eating leaves as opposed to stems of plants
- eating stuff at head height

August 23:

- 2:00 – 2:30 pm
- sunny and some cloud
- most of pasture is trampled
- radish is popular
- also eating peas and oats
- needing to crouch, duck more for food (because of trampling)
- chickens not fond of yellow foliage, spit it out
- seem to prefer to eat what is planted over weeds
- some pecking at radish stems too

August 29:

- 10:35 – 11:05 am
- cloudy, yesterday was rain
- chickens were put on pasture at 10:30
- eating oats, peas, radish, vetch
- this is the second on this section
- this pasture is much higher
- some of the radish is flowering
- eating a lot of peas, peas seem to be more dense in this section, peas are definitely more prominent, taller than radish, vetch, oats, everything
- pasture is trampled around the range hut and where feed trays are

- chickens eat forage along the edge of trampled area
- I have a bunch pecking at my boots
- they're eating more pea plant stalks too, not just leaves
- most chickens are foraging in plants, but few looking for bugs in dirt or maybe looking for grain
- in the past sections, the radish and oats are making a comeback

The main conclusion provided from the observational data is that the planted pasture successfully provided the chickens with plants they would eat. Oilseed radish, hairy vetch, forage peas, and hullless oats were all eaten by the chickens. Of all that grew from seed, the lettuce was not observed to be eaten by the chickens. The reason it was not eaten is believed to be due to the lettuce's stunted growth and yellow foliage. The other plants grew up quickly around the few lettuce plants resulting in poor growth.

A sample of the planted pasture was analyzed for its nutritional benefits. Samples were also taken from the natural pasture that the chickens would usually be pastured on. The results are summarized in the following table along with the nutritional information from the feed given to the chickens.

<i>Analysis Performed</i>	<i>Research Pasture</i>	<i>Natural Pasture</i>	<i>CountryRite Grower Krums</i>
Dry Matter %	10.9	19.5	n/a
Crude Protein %	2.1	3.8	16
Calcium %	0.19	0.17	n/a
Phosphorus %	0.04	0.06	0.65
Magnesium %	0.05	0.05	n/a
Potassium %	0.40	0.51	n/a
Copper ppm	0.8	1.9	n/a
Iron ppm	38	423	n/a
Manganese ppm	3	11	n/a
Sodium %	0.01	0.00	0.16
Zinc ppm	4	6	n/a

The natural pasture provides better nutrition, generally, for the chickens than the planted pasture, especially in protein content. The planted pasture, however, does provide other benefits that depending on the farmer's plans, may provide a better fit in the farms overall operations.

The benefits of the planted pasture are in soil building and/or amending and weed control. Depending on the crop rotation of a farm, a planted poultry pasture may serve a greater purpose than a natural pasture.

The planted pasture was comprised of annuals that are often also used by organic farmers for cover crops. Oilseed radish is a brassica with a tap root that brings nutrients and fertility closer to the soil surface. It winterkills and decomposes quickly to release nutrients into the soil. Hulless oats are a grain that contains carbonaceous material that is slower to decompose, but add organic matter to the soil. The forage peas and hairy vetch are both legumes that fix nitrogen and with their succulent foliage, decompose quickly to provide nutrients to the soil. The combination of these plants should provide a cover crop that both provides humification to the soil and has a low carbon:nitrogen ratio to decrease nitrogen tie-ups. Also, being that this field is a poultry pasture the soil gained further fertility from the chicken manure.

Observation of the research plot also showed excellent weed control. There were significantly fewer weeds growing in the research pasture than in the natural pasture, which is mostly weeds, and in the other fields on the farm. It will be interesting to see what the weed pressure will be in this field in the following season.

It is important to note that this pasture was planted later in the season. Oilseed radish, for example, is better to plant as a late season cover crop to avoid it from bolting and seeding. If planted earlier in the season, the radish would have potentially bolted, making for little foliage for the chickens to eat and also becoming a weed problem in the following year.

Before going ahead with a planted pasture, a farmer must also consider the costs entailed. The costs of the planted pasture are both in the direct costs of buying seed and in more indirect costs of time. Time was spent cultivating the plot and in feeding the crop with compost, although not much compost was needed because the plot was then fed by the chicken manure. The seed mix also had to be mixed and seeded. The time and money spent on the planted pasture may be a deciding factor for a farmer when deciding whether or not to plant a poultry pasture.

### **Conclusion**

The purpose of the planted poultry pasture was met in that the chickens were provided with a mix of plants that they all ate.

Planting a poultry pasture also has other benefits and limitations in the overall operations of the farm. Besides providing the chickens with a different variety of plant species, the planted pasture can also be useful as a cover crop and for smothering weeds. The cost of planting a pasture is the main limiting factor in making a planted pasture a regular part of the crop rotation on a farm.

Nutritionally, the planted pasture did not provide as much protein or calcium to the chickens as the natural pasture. Protein is important for raising

meat birds and the calcium is important for egg production. The nutrition of a planted pasture could be improved by adding other plant species, including plants that attract more insects. A planted pasture mix, therefore, can be altered to provide more for the chickens, where a natural pasture cannot. More research will need to be done first to find out what other plant species the chickens will eat.

The time of year of planting a pasture will also determine the plants for the mix. This pasture was planted later in the season, but if planted earlier, perhaps it wouldn't have supported brassicas and a replacement could be included, such as buckwheat or chicory. Continually seeding and changing mixes over an entire season, however, can be costly and time consuming.

Perhaps the next stages in the research into planted poultry pastures are in cost-benefit analysis and feed conversion. These issues were both out of the scope of this project, but would be important deciding factors for farmers considering planting a poultry pasture.

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