

St. Lawrence County Extension Learning Farm

3 Acre Field Birdsfoot Trefoil

Canton, NY

- Soil Type: Muskellunge
- Soil pH: 5.9
- Buffer pH: 6.0
- P: 2 lbs/acre
- K: 75 lbs/acre
- Ca: 1,932 lbs/acre
- Mg: 300 lbs/acre
- % OM: 2.9



Soil Preparation and Planting

- **Plowed in 2013**
- **Disked 2 or 3 times for weed suppression in 2014**
- **Planted with no till seeder June 4th, 2014**
- **Pardee BFT seeded at 7-8 lb per acre with Sunset II Timothy at 4 lb per acre**
- **Mowed for weeds Aug 6th, 2014**
- **Fertilized Oct 15th, 2014**
- **Manure spread October 21st, 2014**

Cool Spring, planted June 4th, did not emerge until June 18th, photo on July 7th



July 21, 2014



Aug 5, 2014 –



Aug 5th, 2014 – weeds getting to be a problem



After mowing on Aug 6th, 2014 for weed suppression



August 18, 2014



The 3 acre field had been divided into 4 “plots” of equal size

- 2 plots had been designated as inorganic with the plan that herbicides could be used on them if necessary (mowing seemed to control weeds well enough that we never used herbicides) and inorganic fertilizer.
- 2 plots were designated as organic with the plan that no herbicides would be used on them and only organic fertilizers would be applied.

of plants on 8/22 to 8/26 per sq. ft.

Plot	BFT	Forage Legumes	Forage Grasses	BL Weeds	Sedges
1	5	2	3	2	0
1	8	3	4	1	0
1	2	10	3	1	0
1	2	11	2	1	0
2	9	7	2	0	13
2	3	4	3	0	0
2	5	5	10	1	9
2	4	5	4	3	8
3	7	1	7	3	4
3	0	7	2	3	4
3	3	2	9	2	8
3	6	3	7	2	3
4	5	0	6	0	3
4	5	2	6	2	0
4	6	0	2	4	0
4	6	3	7	3	0

Growth by October 1st, 2014



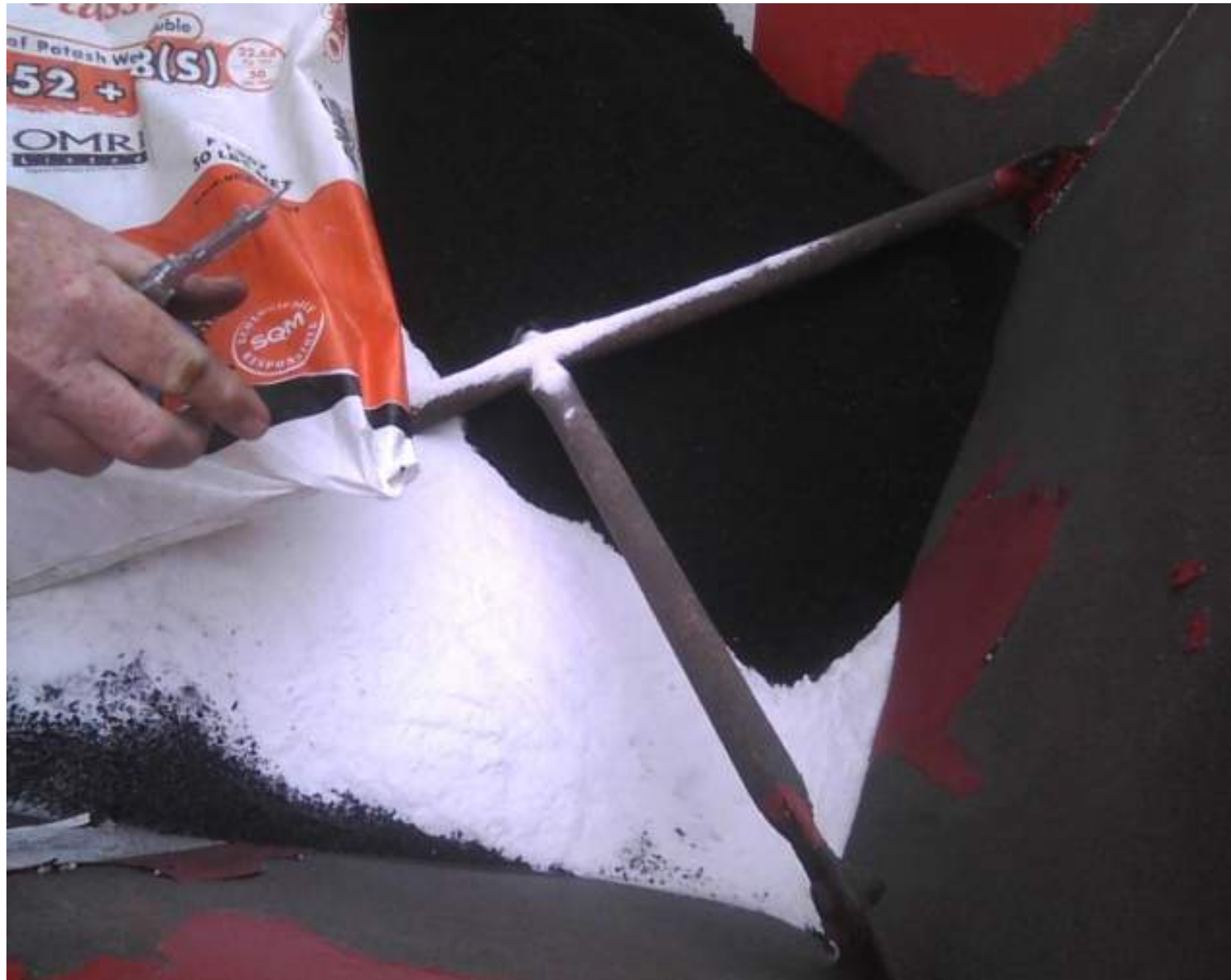
Fertilized on Oct 15th, 2014



Inorganic plots (1 & 2) got 0-0-60 and 11-52-0 (MAP),
followed by manure spreading on Oct 21, 2014



Organic plots (3 & 4) got bone char and sulfur of potash, followed by manure spreading on Oct 21st





**Frost seeded additional Birdsfoot Trefoil seed with broadcast seeder
in early Spring 2015**

Lambs pasture grazed with dams prior to weaning

- 40 Lambs in total – 3 diets fed after weaning
 - 16 on Birdsfoot Trefoil Pasture (BFT) after weaning
 - 16 on Conventional Pasture (CP) after weaning
 - 8 on 2nd cut Hay and Grain (HG)
 - All 3 groups got free choice minerals with no added copper (Wight & Patterson Sheep Mineral)

**16 lambs grazed on birdsfoot trefoil paddocks (43 to 58% BFT)
Half of these lambs received 1 gram of copper oxide wire
particles (COWP) 2 weeks prior to weaning. 8 lambs
designated "BFT", 8 lambs designated "BFT/COWP".**





**16 lambs grazed on conventional pastures
Half the lambs received 1 gram of COWP 2 weeks prior to weaning.
8 lambs designated “CP”, 8 lambs designated “CP/COWP”.**

8 lambs were tracked in a Control group fed 2nd cut hay (12% CP) and grain (16% CP). Each lamb received 1 gram COWP 2 weeks prior to weaning. This group designated as “HG”.







- **On June 8th, total BFT dry matter in biomass averaged about 27.5%.**

However, during the grazing trial (`July 25th to Sept 16th) the percentage of BFT in the biomass dry matter ranged from ~ 42.8% to 57.5%.



Both the BFT Pasture and Conventional Pasture had not been grazed yet that year and were pretty mature.



- Lambs were weighed
 - 2 weeks pre-weaning (start of the COWP study)
 - At weaning (start of the grazing trial)
 - 8 wks. post weaning (end of the grazing trial)

Lambs were FAMACHA scored every 2 wks.

- FAMACHA is a method of assessing anemia by comparing the color of the inside of the eyelid to a chart:

1. Excellent
2. Good
3. OK
4. Anemic
5. Very anemic

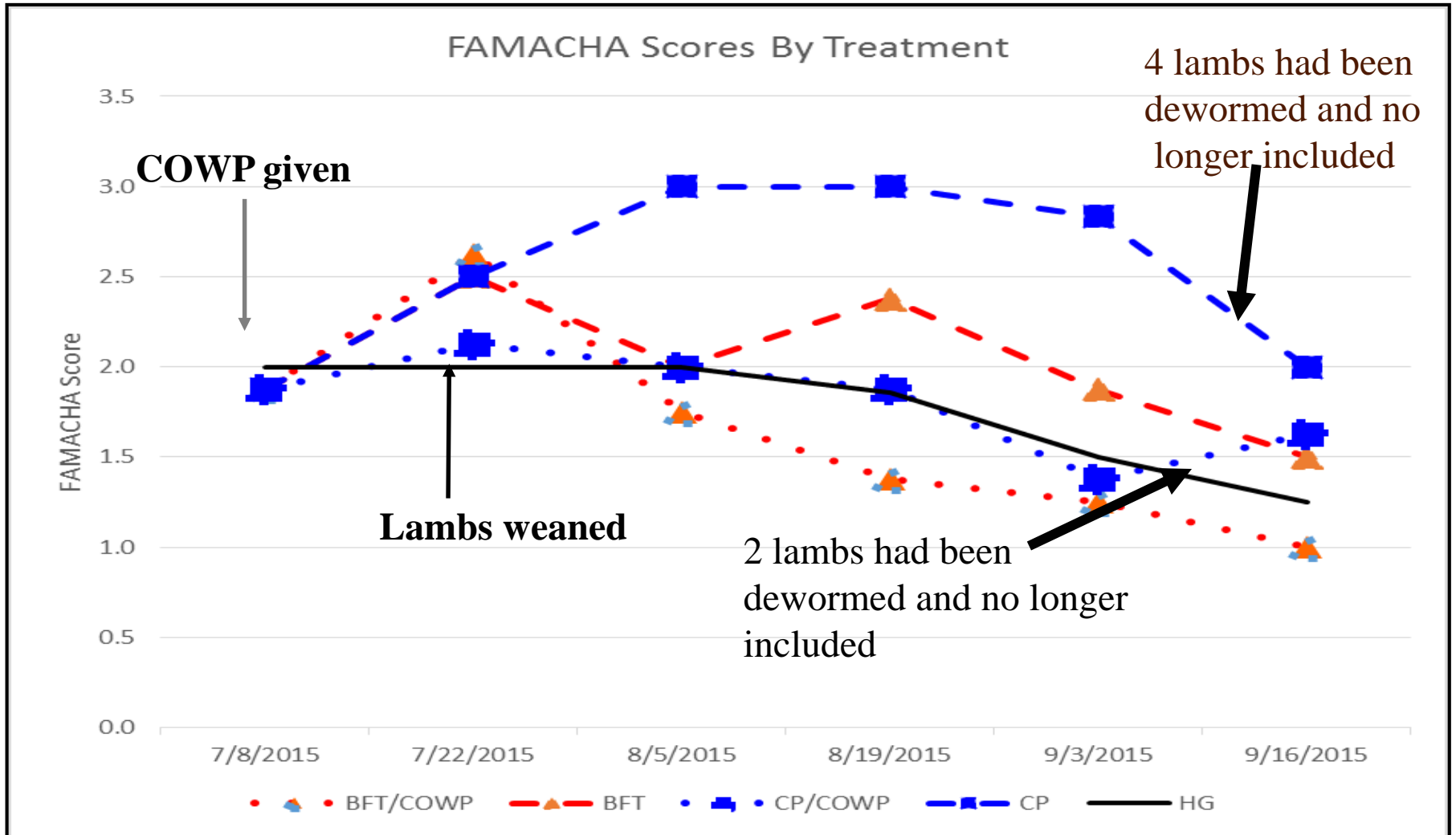




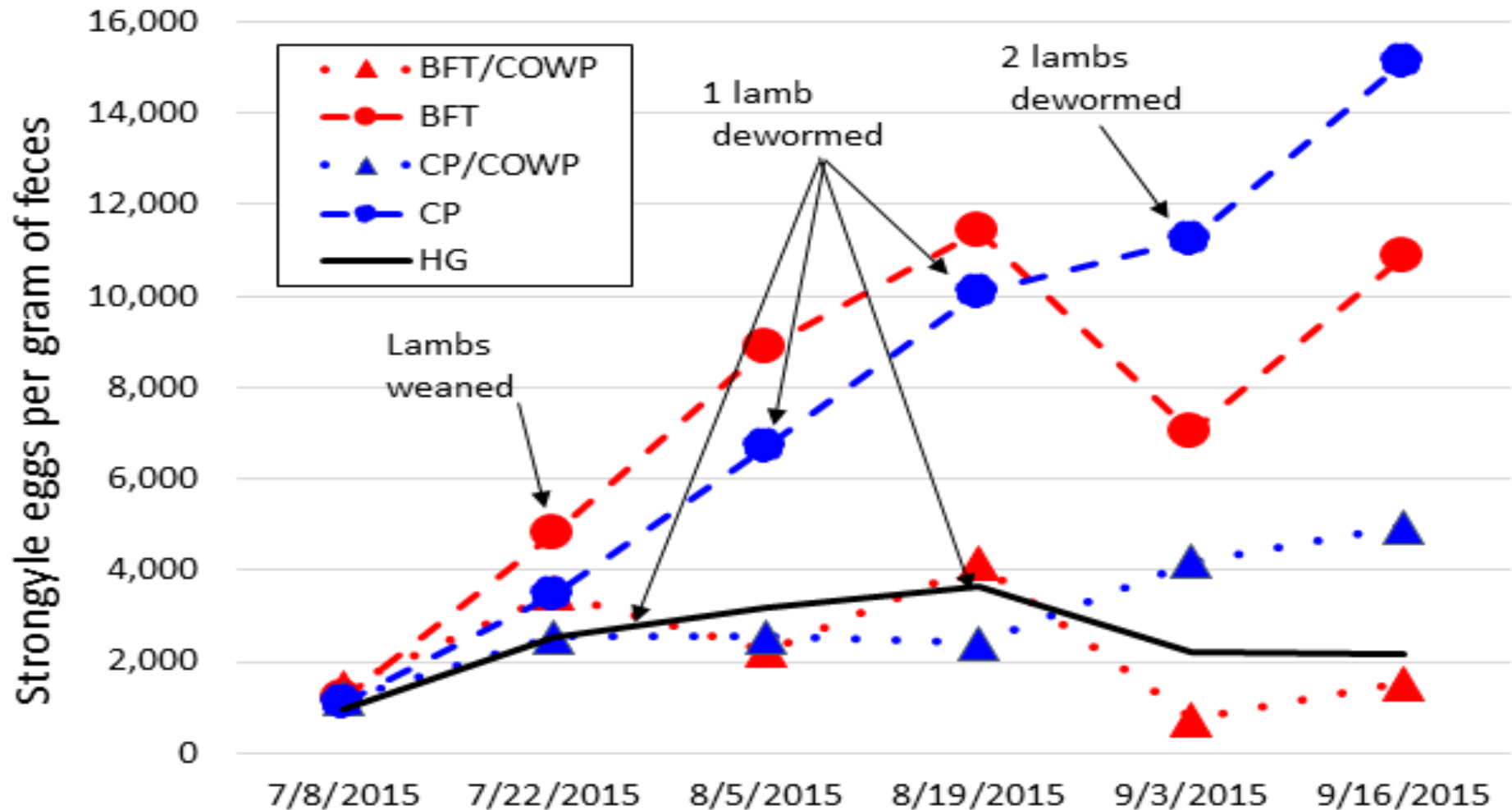
**Fecal samples were collected every 2 weeks.
Strongyle and Haemonchus (Barber pole worm, a subset of Strongyle)
eggs were counted in feces in the Bowman parasitology lab at Cornell**

During the grazing trial, the lambs on conventional pasture w/o COWP averaged the highest FAMACHA scores (lower is good). FAMACHA scores were included for all lambs unless they had to be dewormed in which case their FAMACHA scores in sampling periods following deworming were not included. The effects of Treatment ($P=0.006$) and Treatment*Day ($P=0.004$) on FAMACHA score were significant.

Figure1. FAMACHA Scores by Treatment



Treatments that got COWP appeared to have lower worm egg counts throughout the study. We were excited by the dip in worm egg counts for the two BFT groups at 6 wks. although it was temporary. Treatment*Day was statistically significant (P value < 0.001) for worm egg count (log). However, when we looked at forage separate from COWP, COWP * Day interaction was statistically significant (P value < 0.001) but Forage*Day interaction was not, nor was the contrast between BFT and CP.



The treatments on BFT gained weight similarly to the treatment on hay and grain (HG) while the treatments on conventional pastures (CP) appeared to grow slower. The treatment effect on post weaning average daily gain was statistically significant ($P < 0.001$)

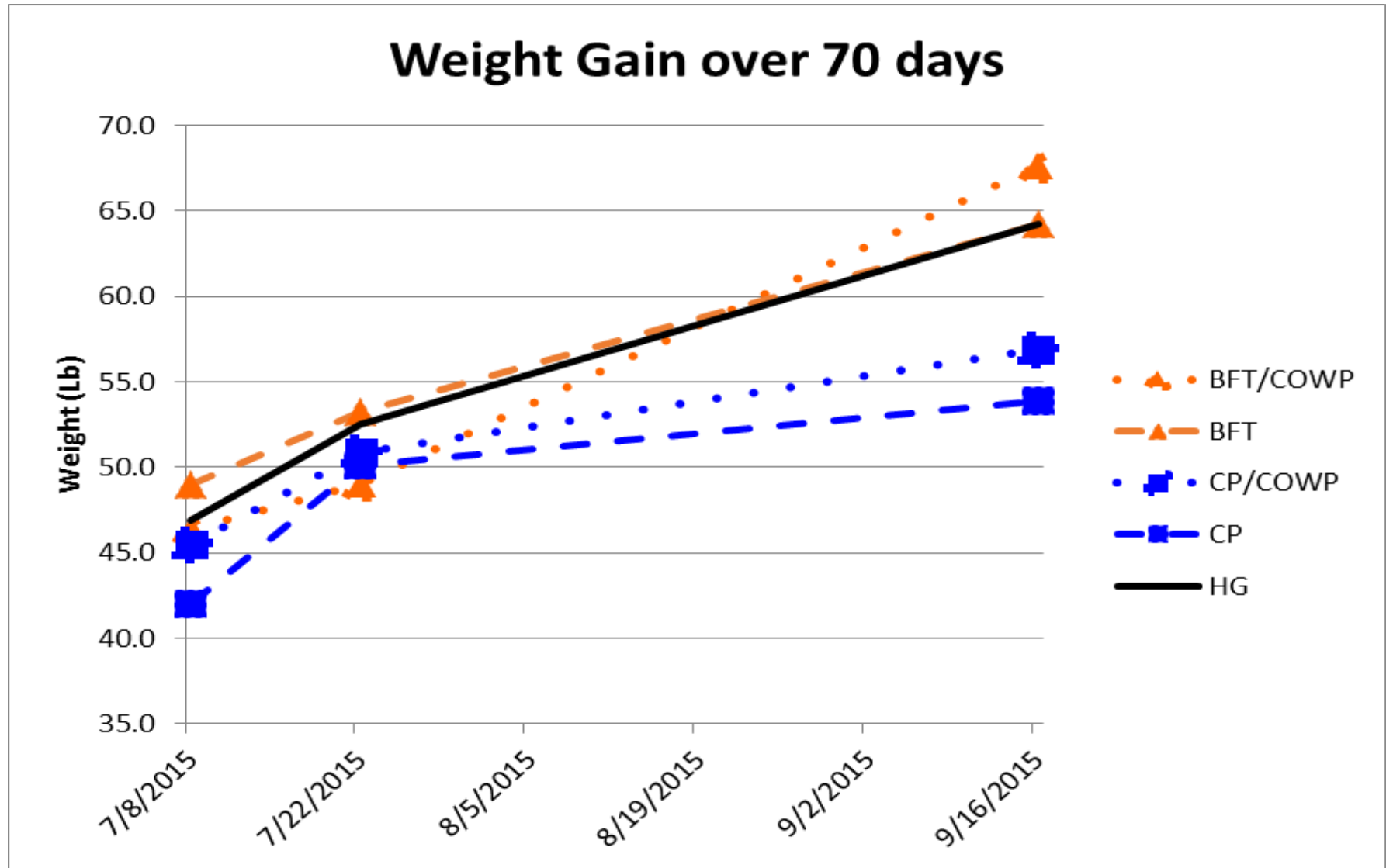


Table 1. Weight Gain by Treatment (P < 0.001 for post weaning gain) during 70 d. Grazing Trial

	Birdsfoot Trefoil + COWP	Birdsfoot Trefoil	Conventional Pasture + COWP	Conventional Pasture	Hay & Grain + COWP
Date	Weight (lbs.)				
7/08/2015	46.4	49.0	45.5	42.0	46.9
7/22/2015	49.0	53.3	50.9	50.1	52.5
9/16/2015	67.6	64.3	56.9	53.9	64.3
Gain (lbs.)	21.3	15.3	11.4	11.9	17.4
Days	70.0	70.0	70.0	70.0	70.0
Daily gain (lbs.)	0.304	0.218	0.163	0.170	0.248

Research sponsored by

- USDA Organic Research & Education Initiative
- Northeast Sustainable Agricultural Research & Education Program
- Federal Formula Funds
- Northern NY Agricultural Development Program
- With staff from Cornell Sheep & Goat Program, St. Lawrence County CCE, and Cornell's Dwight Bowman Parasitology Lab