

1.6 Acre Field Bruce BFT Germantown, NY Colombia County

- **Soil Type: Raynham**
- **Soil pH: 6.0**
- **Buffer pH: 6.0**
- **P: 4 lbs/acre**
- **K: 249 lbs/acre**
- **Ca: 2,706 lbs/acre**
- **Mg: 351 lbs/acre**
- **% OM: 3.9**



Soil Preparation and Planting

- **Pasture limed in 2013**
- **Fall 2014 - Pasture mowed close and plowed next day**
- **6 days later on Aug 6th, 2014 disked and planted Bruce BFT at 12 lb. per acre**
- **400 lb. bone char per acre (65 lb. P²O⁵) banded in at planting**

1 in. rain on the day before planting, emerged ~Aug 15, 2014
then drought – Velvet leaf may have provided shade





Was mowed to control velvet leaf on Oct 2nd after rains finally came.



Frost seeded additional BFT in March 2015.

Lamb Management

- Grass fed flock
- Flock was originally FinnDorsets. Had been bred to Icelandic rams for the last few generations. This lamb crop was sired by one Dorset ram and one Icelandic cross ram.
- Used only ram lambs for the study. Lambs were born late April/early May.
- Ram lambs weaned on July 29th.
- Grazing trial started July 30th.

Treatments

- Nine ram lambs on Birdsfoot Trefoil Treatment. Birdsfoot trefoil group got about 3000 sq. ft. of BFT pasture every 3 days (~108 sq.ft. per lamb per day). Birdsfoot trefoil had been mowed high once or twice during the spring to control weeds and try to keep it from getting too mature.
- Ten ram lambs tracked on Conventional Pasture Treatment. Entire Conventional Pasture Group consisted of 30 ram lambs and one mature ram. Control group got about 8320 sq. ft. of conventional pasture every 2.5 days (~111 sq. ft. per lamb). Conventional pasture had been harvested for hay in the spring.

Both groups got free choice minerals (Heinhold sheep minerals and livestock kelp).





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(Heinhold sheep minerals and livestock kelp).**



On July 13, 2015 two wks. before study

Field biomass averaged about 65% BFT. Mugwort was the 2nd most common plant in the pasture with regard to biomass. Queen Anne's Lace was also prominent. Biomass yield in dry matter per acre was ~ 2900 lb./acre and BFT yield was about 1900 lbs. of dry matter per acre.





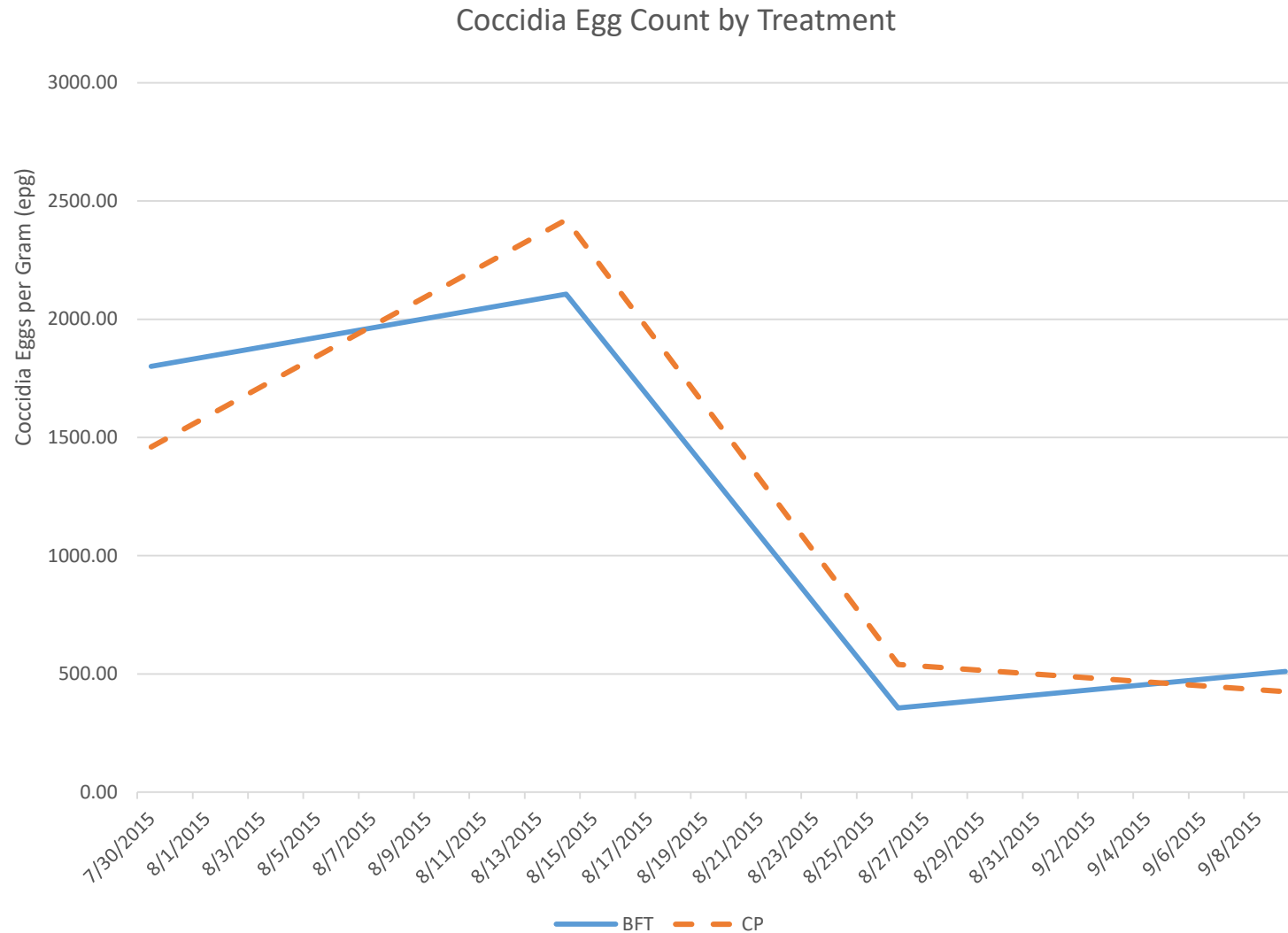




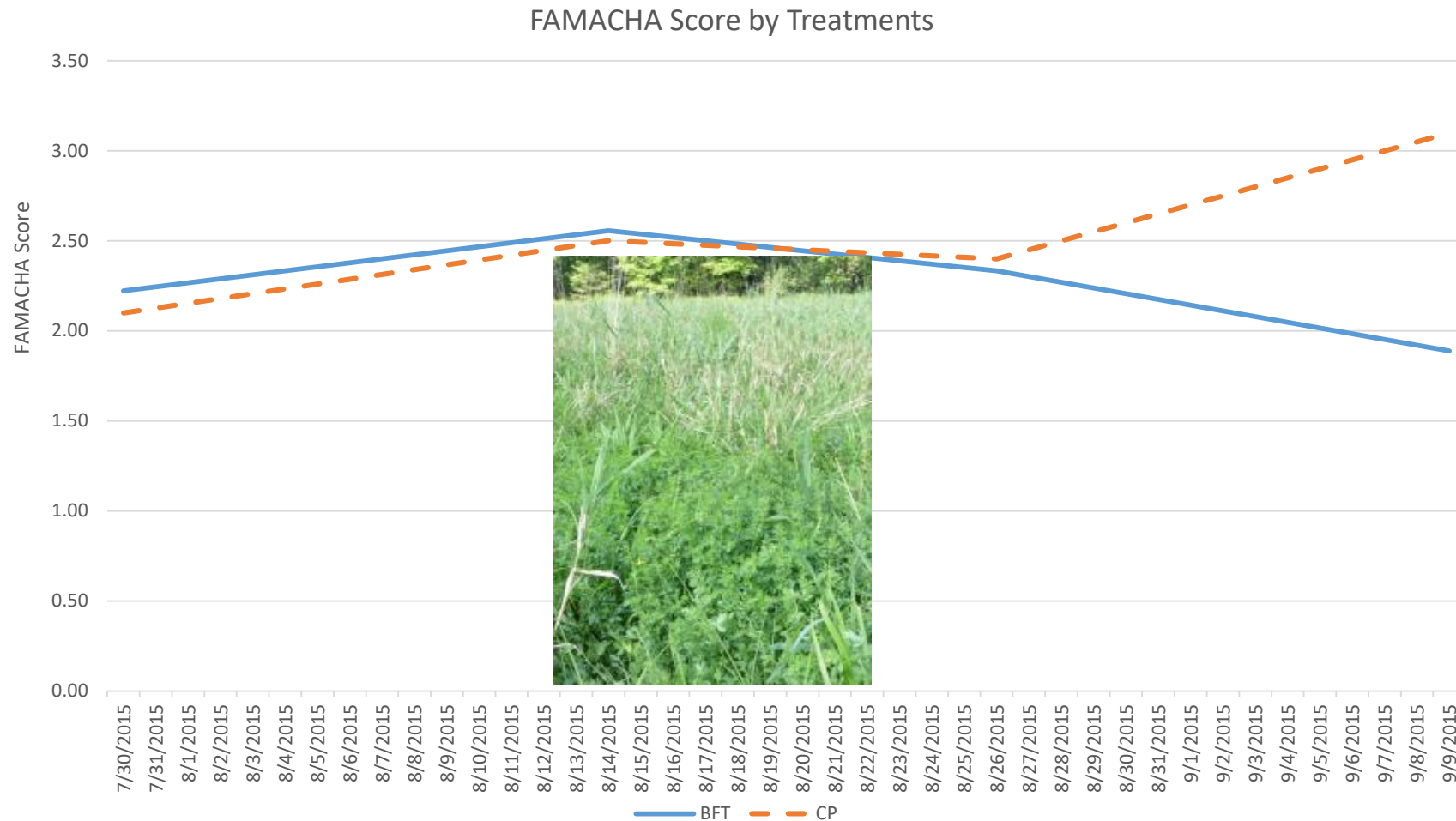
Cansvoort Group
Sample
8/14/15
Birdsfoot
Trefoil
Pasture

CONTENTS
DATE

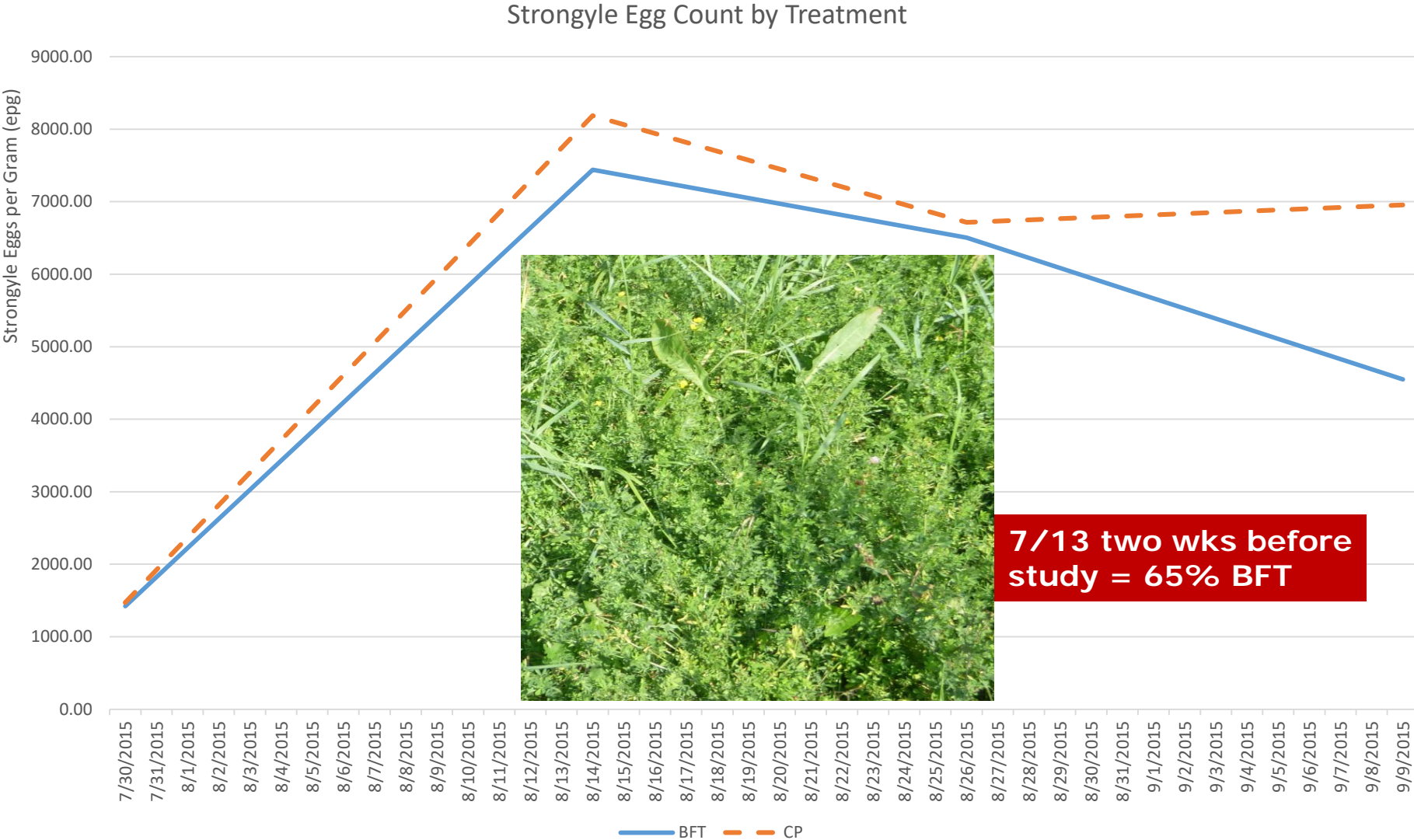
Lambs had just been weaned - coccidia egg counts rose next 2 weeks and then dropped sharply by Week 4



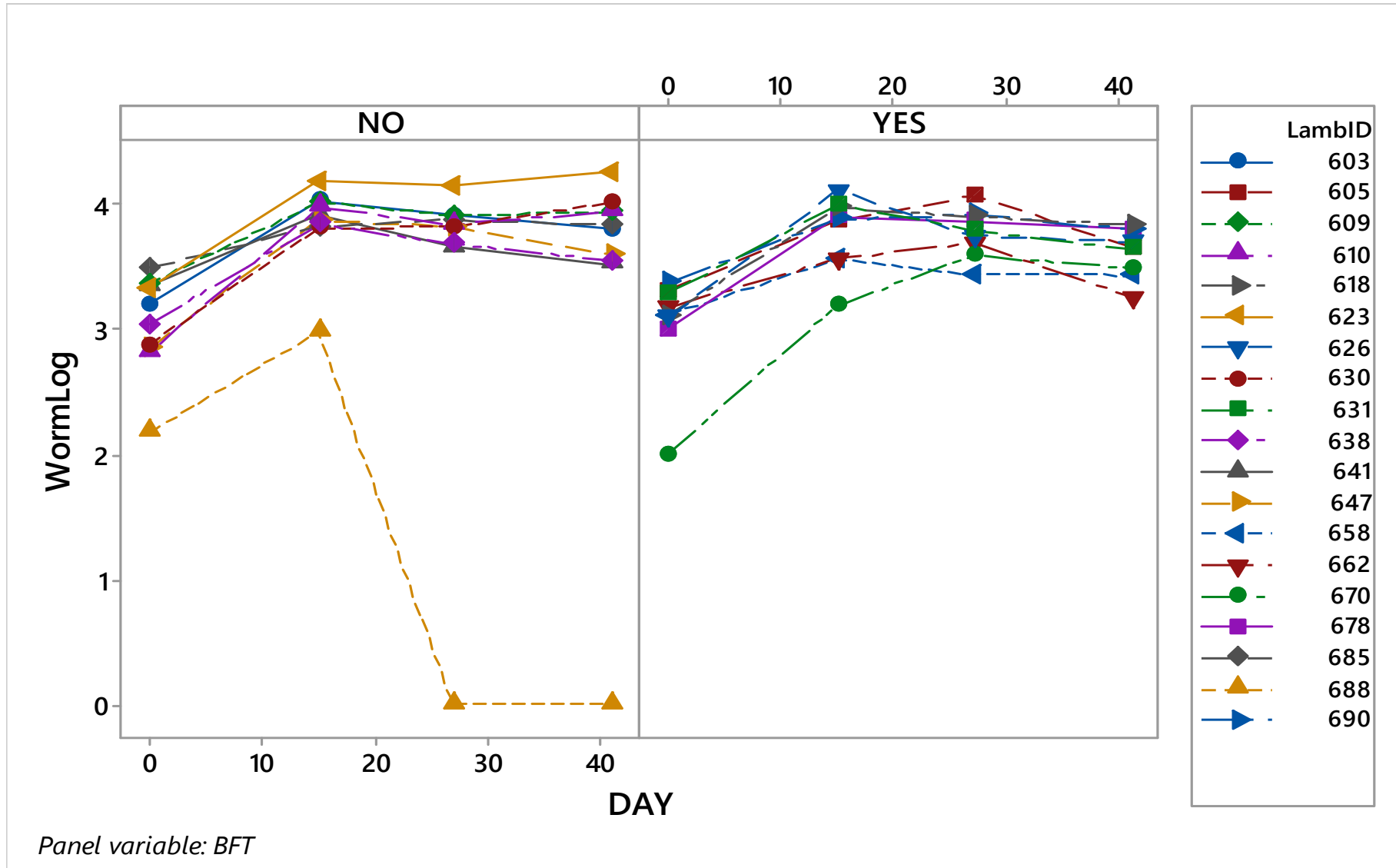
FAMACHA scores were similar for both groups till Week 6 when the BFT group averaged better FAMACHA scores by one whole point. Forage*Day effect was significant (P=0.001) for FAMACHA score. 4 lambs from the conventional pasture (CP) group had to be dewormed at study's end based on FAMACHA and health status compared to 0 in the BFT group.



Fecal egg counts for both groups rose sharply after weaning but were similar until Week 6 when the average egg count for the BFT group was less. However Forage*Day effect was not significant (P=0.91) for LOG10 eggs per gram. Spot checks during the study indicated that most of the strongyle worms were barber pole worms

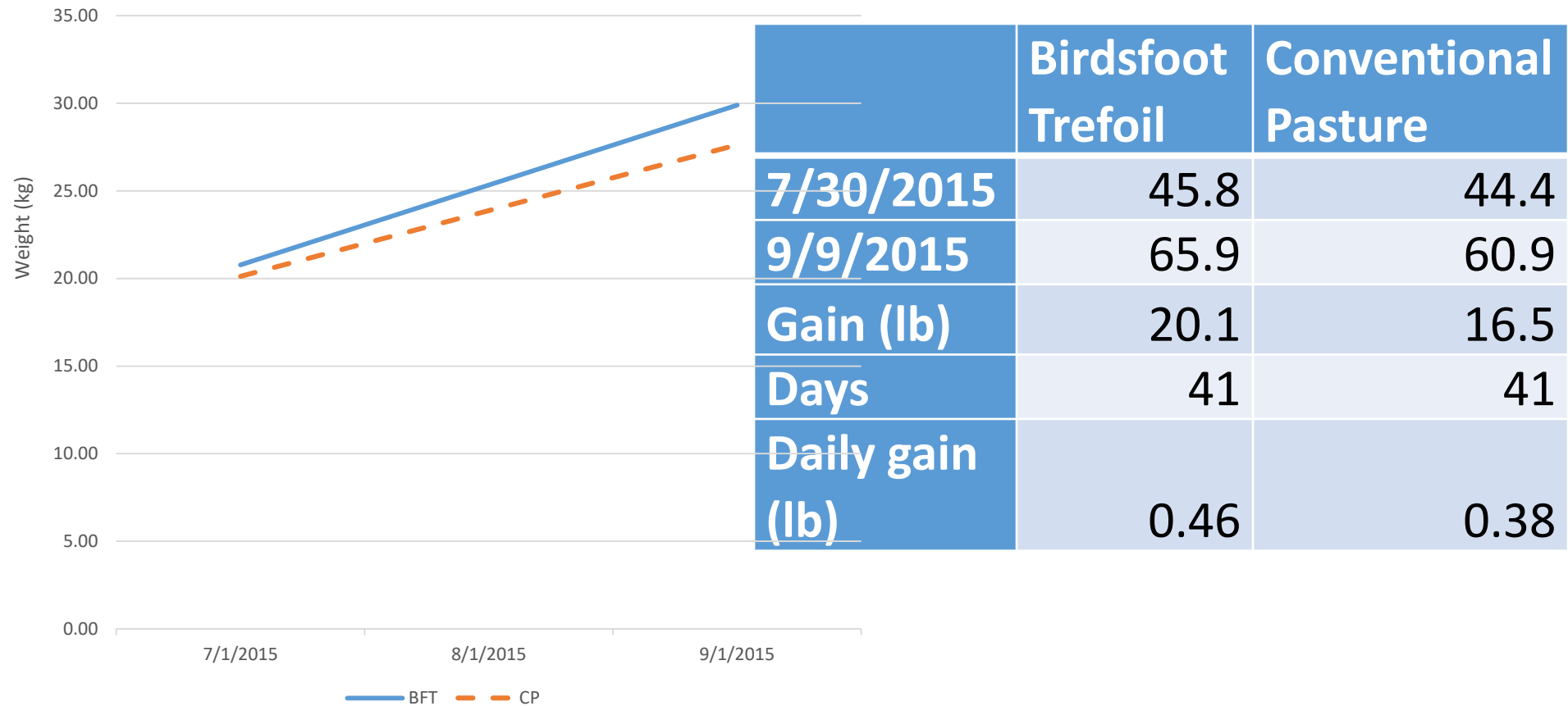


LOG10 strongyle worm eggs per gram for individual lambs over time. One CP ram lamb, #688, was quite an outlier and might have developed his own immune response.



Weight Gain (lb.) by Treatment during 41 d. Grazing Trial

Weight Change (kg) over 41 Day Grazing Trial
 Although average growth slightly better for lambs grazing BFT, it was not statistically significant (P=0.208)



A year later, almost half the BFT field is pure mugwort



A student project was also done at the same farm comparing response of the birdsfoot trefoil pasture and the conventional pasture to simulated grazing

Exudate Responses to Complete and Partial Defoliation in Orchardgrass and Birdsfoot trefoil

2016 Bard College MAT Biology

Pauline Kufner

Simultaneous Diel Research at Gansvoort Farm Summer 2015

Investigated plant carbon exudate response to herbivory to better understand soil carbon cycling in grazing systems.

Methods:

- Measured in-situ soil CO₂ respiration
- Assumes respiration is correlated with exudate supply

Treatments:

- 1) All above-ground biomass removed
- 2) Partial removal of biomass X
- 3) Orchard grass
- 4) BFT

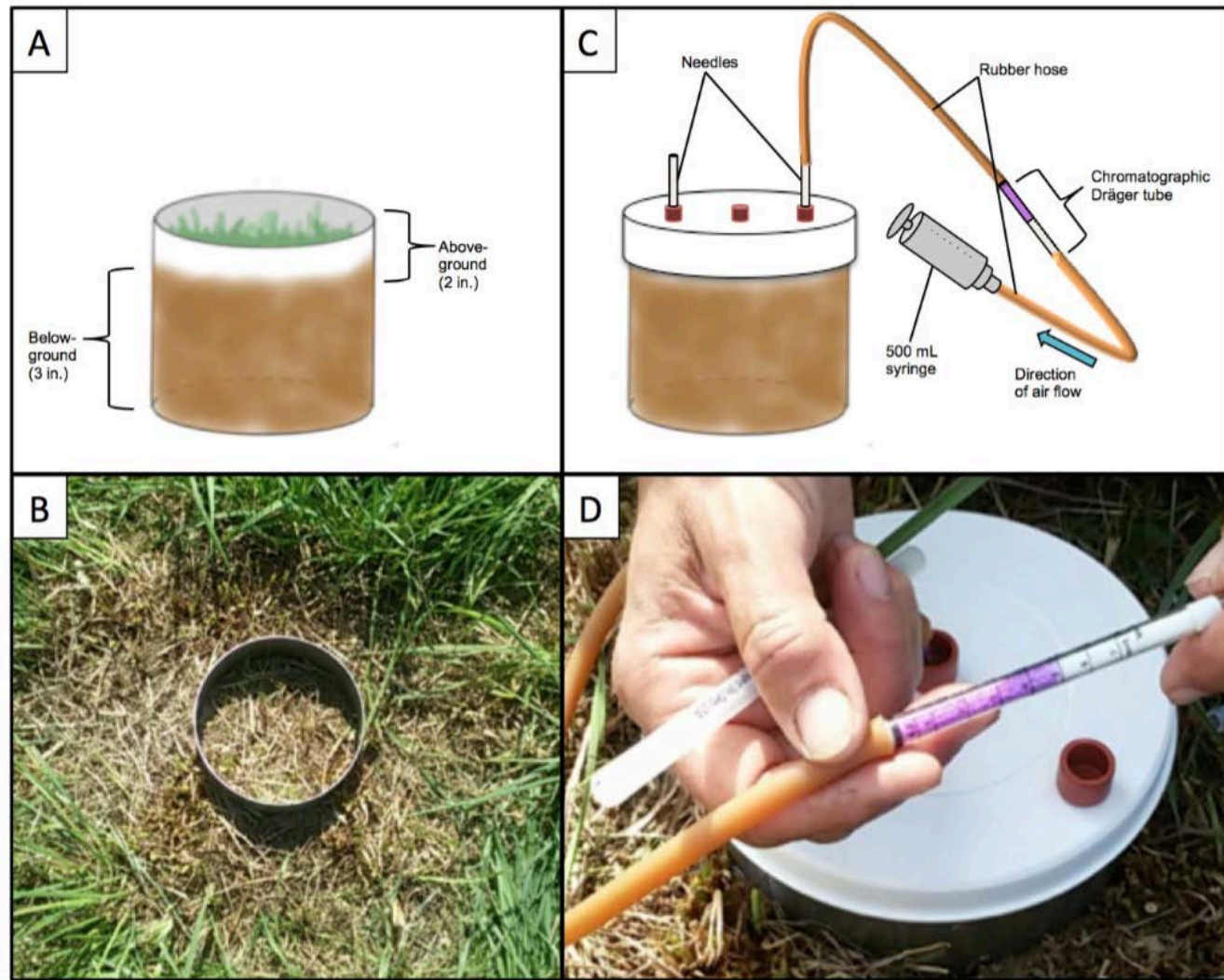


Figure 1: Soil respiration measurement by the Dräger method. A) illustrating the proportions of the metal cylinder that were submerged below the soil or above ground, B) a perimeter of approximately 6 inches surrounding the cylinder was completely defoliated for clipped treatments to ensure consistent results from surrounding roots, C) a diagram of the flow of air from the soil below ground through a needle, rubber hose, and Dräger tube due to negative air pressure created by a syringe, D) the crystal violet color zone of the Dräger tube indicating percent CO₂ in the air passing through the tube.

Results: Soil respiration (exudate response) clearly higher under partial defoliation compared to complete defoliation. No difference in response between plant type.

Table 3: Mean soil respiration ($\text{gCO}_2 \text{ m}^{-2}\text{h}^{-1}$) averaged across three samples and five sampling periods from each of the four different plant-treatment combinations ($n=15$).

		Plant-type	
		Grass	BFT
Treatment	Partial	2.54 ^a	2.82 ^a
	Complete	1.71 ^b	1.56 ^b

Differing superscripts (a, b) indicate a statistically significant difference ($P < 0.05$). Values of the same superscripts are not significantly different.

Remaining thoughts on the part of the farmer

- How much BFT would be necessary to have a significant impact on animal health?
- If pure stands and extended time periods necessary (6 weeks?), how would that fit into an intensive rotational grazing system?

