Birdsfoot Trefoil Grazing Study at

PINECROFT FARM

4.4 Acre Field Bruce BFT
Waterville, NY
Oneida County

- **Soil Type: Pittsfield**
- **Soil pH: 5.4**
- **Buffer pH: 5.6**
- **P: 2 lbs/acre:**
- **K: 99 lbs/acre**
- **Ca: 1411 lbs/acre**
- **Mg: 102 lbs/acre**
- **% OM: 3.2**

Soil Preparation and Planting

- **Originally orchard grass/ladino clover pasture**
- **Plowed up on May 6, 2014**
- **Limed at 2 T/acre July 18th, 2014**
- **Limed again at 2 T/acre Sept 24th, 2014**

- **Organic fertilizer – 250 lbs./acre of a 5-3-2 manure based OMRI (organic materials review institute) certified organic fertilizer was broadcast on the field in May 2015 a few days prior to planting**

Planted BFT at 18 lbs. per acre on May 24th, 2015

Planting with seed drill

Field after planting

Cultipacked immediately after planting. Half inch of rain on May 27th.

Management after planting

- Emerged May 30th
- On July 12th BFT was 7 to 8 inches tall, weeds coming on. Grazed with 45 ewes and 20 lambs for 2 days.
- On Aug 3rd BFT>12” and in flower. Weeds were lambsquarters and foxtail. Mowed to 7-8 inches because sheep had only concentrated on front of field.
- Grazed again on Aug 19th for 2 days. Foxtail still a problem but BFT keeping up with it. Farmer determined that would need to partition field in at least thirds for 2016 study to get lambs to graze evenly.
- Spring 2016 –Some weak spots as emerging. Farmer worried about winter kill because no snow in the ground during severe cold so frost seeded 25 lbs. more in upper part of field on March 17, 2016

Lamb Management

- Romney , Dorset and Dorset x Cheviot lambs born late April
- Group of 50 to 60 lambs weaned together around June 1st
- Trial "started" June 17th . However, the 12 Control lambs went out to pasture June 18th while the 12 BFT lambs were kept in barn until June 23rd .
- All lambs received ~1/3rd lb. of an 18% crude protein corn and soy mix (ranged from ¼ to ½ lb.) per head per day for most of the study.

Treatments/ Forage

- Birdsfoot Trefoil (BFT) treatment:
  - Twelve lambs (5 rams, 7 ewes) averaging 45 lbs. (35 to 66 lb.)
  - Lambs in barn on hay from June 17th until June 23rd then set stocked on the 4.4 acre BFT pasture from June 23rd through Aug 15th. The pasture was not subdivided as planned so there was no rotation and lambs had access to all 4 acres all the time. The pasture had been grazed (sheep) for 3 days Aug 19th, 2015. During the first 31 days of the study in order to give lambs access to a barn for shelter, the BFT lambs also had access 24/7 to a small pasture in an orchard that was probably heavily infected with worms due to very heavy sheep grazing in May 2016.
- Conventional Pasture (CP) treatment:
  - Twelve lambs (5 rams, 7 ewes) averaging 41 lbs. (29 to 53 lbs.)
  - Lambs went out on a 1 acre permanent pasture (timothy, reed canary, red clover, alfalfa) 24/7 on June 18th until July 18th . They were given access to the 1st half of it for 2 weeks and then the 2nd half was opened up. Given access to another 3.5 acres of permanent pasture from July 18th through Aug 15th. Both sections last grazed (sheep) in October 2015. Thus they did get more access to “clean” pastures than did the BFT group.

June 15th - Mowed BFT to control bad infestation of Canada thistles.

Photos taken on June 17th - BFT 4 to 6” high, some even lower.

Started grazing trial on June 23rd .

BFT lambs had 24/7 access to a pen in a barn for first 31 days by walking through a small orchard pasture. This pasture had been heavily grazed by sheep thru May. Forage in it was short and was easily a source of parasite infection. Last 4 weeks lambs were left in the BFT pasture 24/7.

BFT field had recovered from mowing and was flowering by July 4th when photo taken. Height on July 17th was ~ 8 - 10 “ .

BFT field on Aug 1st

Farmer mowed again Aug 12th to control the Canadian thistles. BFT height on Aug 15th ~ 5 ½ - 6 “

CP lambs had access 24/7 to a small pen with tarp in their first permanent pasture for shelter throughout the study.

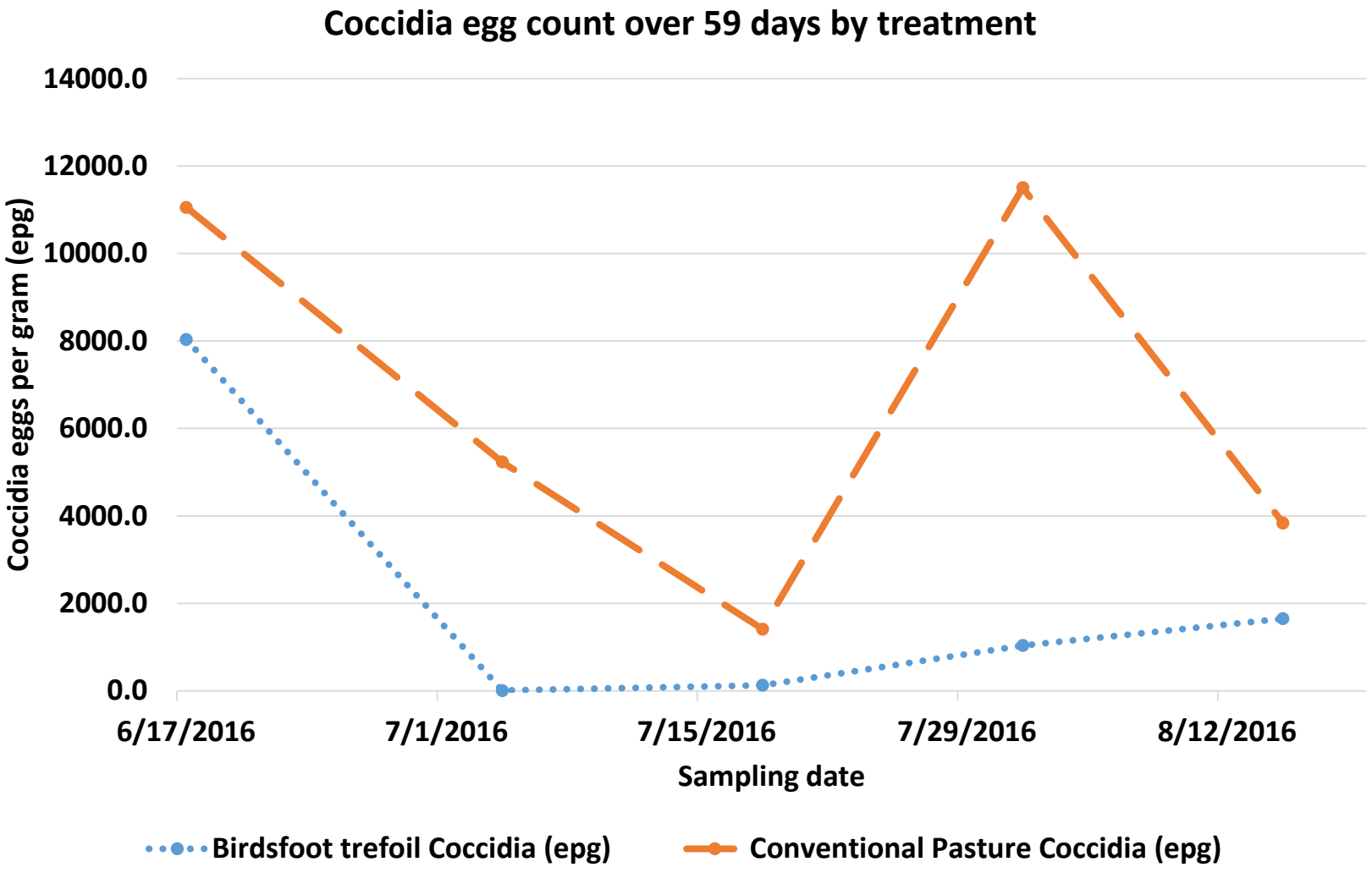
Photo of the permanent pasture of timothy, reed canary and red clover on July 4th. Forage ranged from ~2 to 4 ft. when entered pasture on June 18th . By July 18th mostly stalks (1 ½ ‘ high). One lamb dewormed on July 18th because of temporary swelling under jaw that we feared might be bottle jaw but fecal samples did not bear this out. Possibly bee sting?

Opened up
additional 3.5 acres
on July 18th
Alfalfa 2 ‘, Clover 1 ½ ‘,
Grasses 3’
Photo on Aug 1st

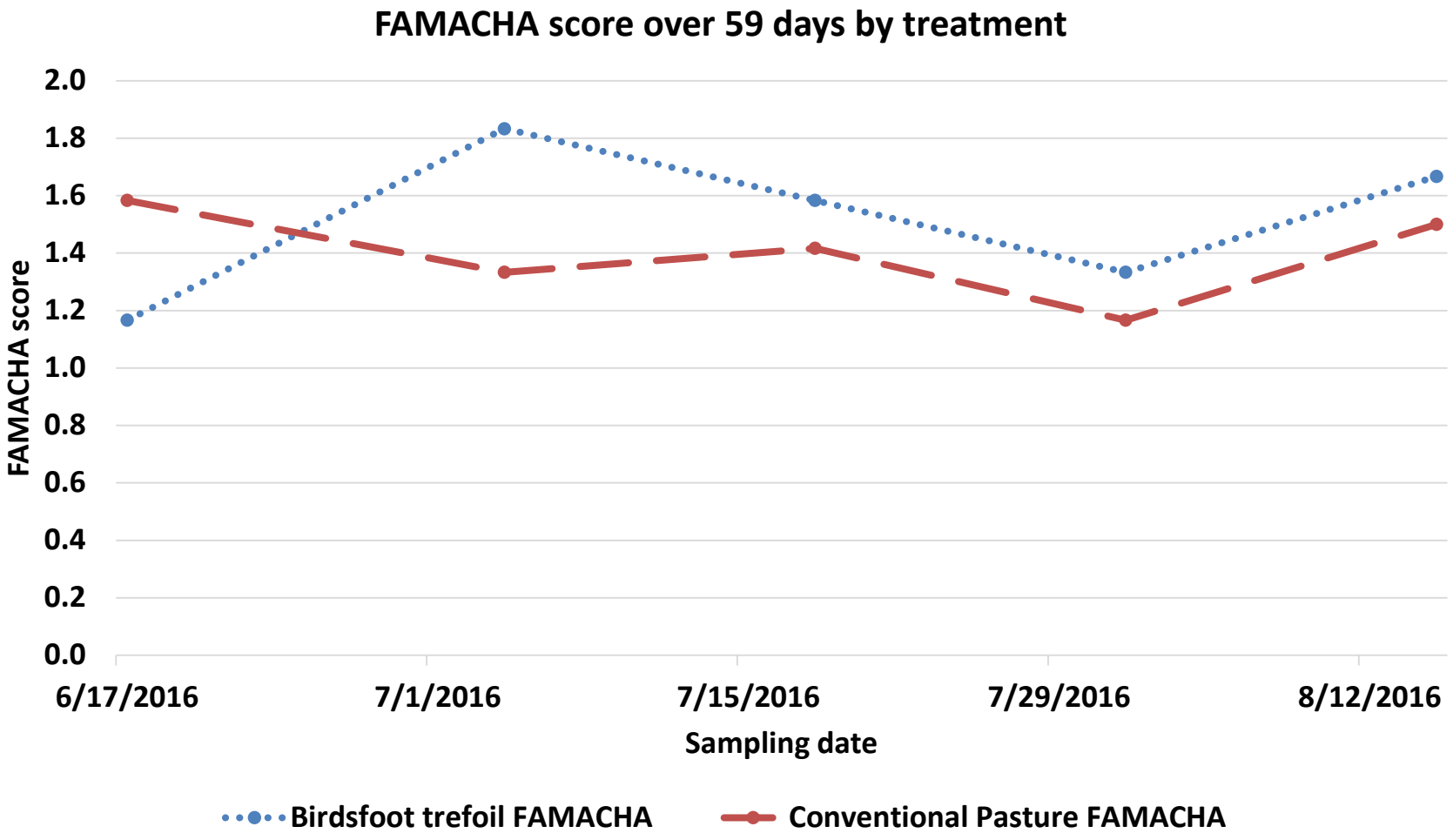
All lambs were FAMACHA scored and fecal sampled ~ every 2 weeks. Lambs weighed at beginning and end of the 59 day study.

Pastures were sampled every 2 weeks

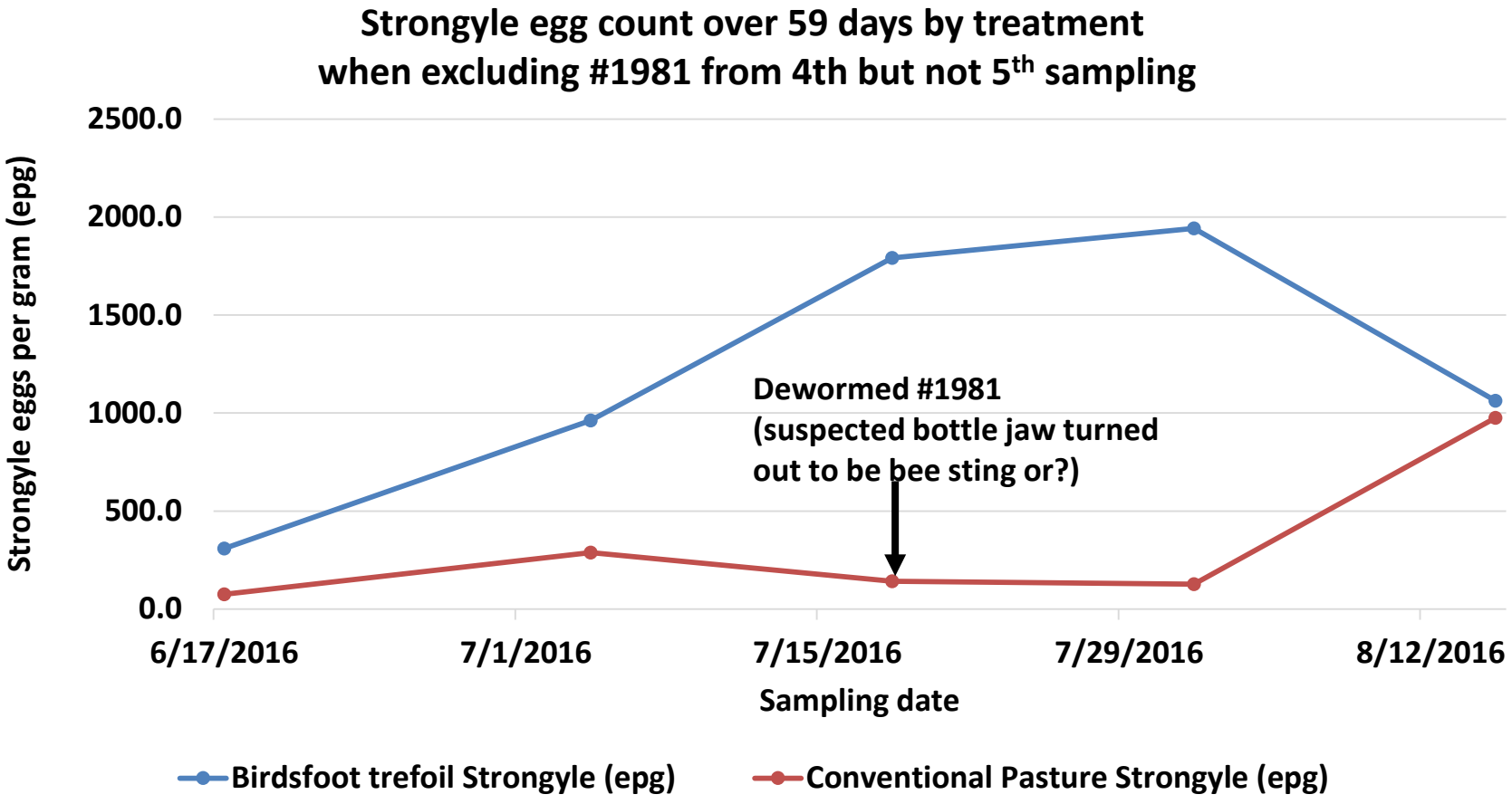
Lambs on BFT treatment received coccidiostat (Sulmet®) in water for 5 days from June 30th – July 4th. One lamb in control group also directly dosed with Sulmet® same 5 days



FAMACHA scores were low at first sampling in the BFT group but then rose sharply. FAMACHA scores were similar between BFT and Control groups from week 4 thru week 8. The BFT group had access to a heavily grazed, very short orchard pasture the first 4 weeks of study situated between their shelter in barn and the BFT pasture and probably had much more exposure to worms because of this access.

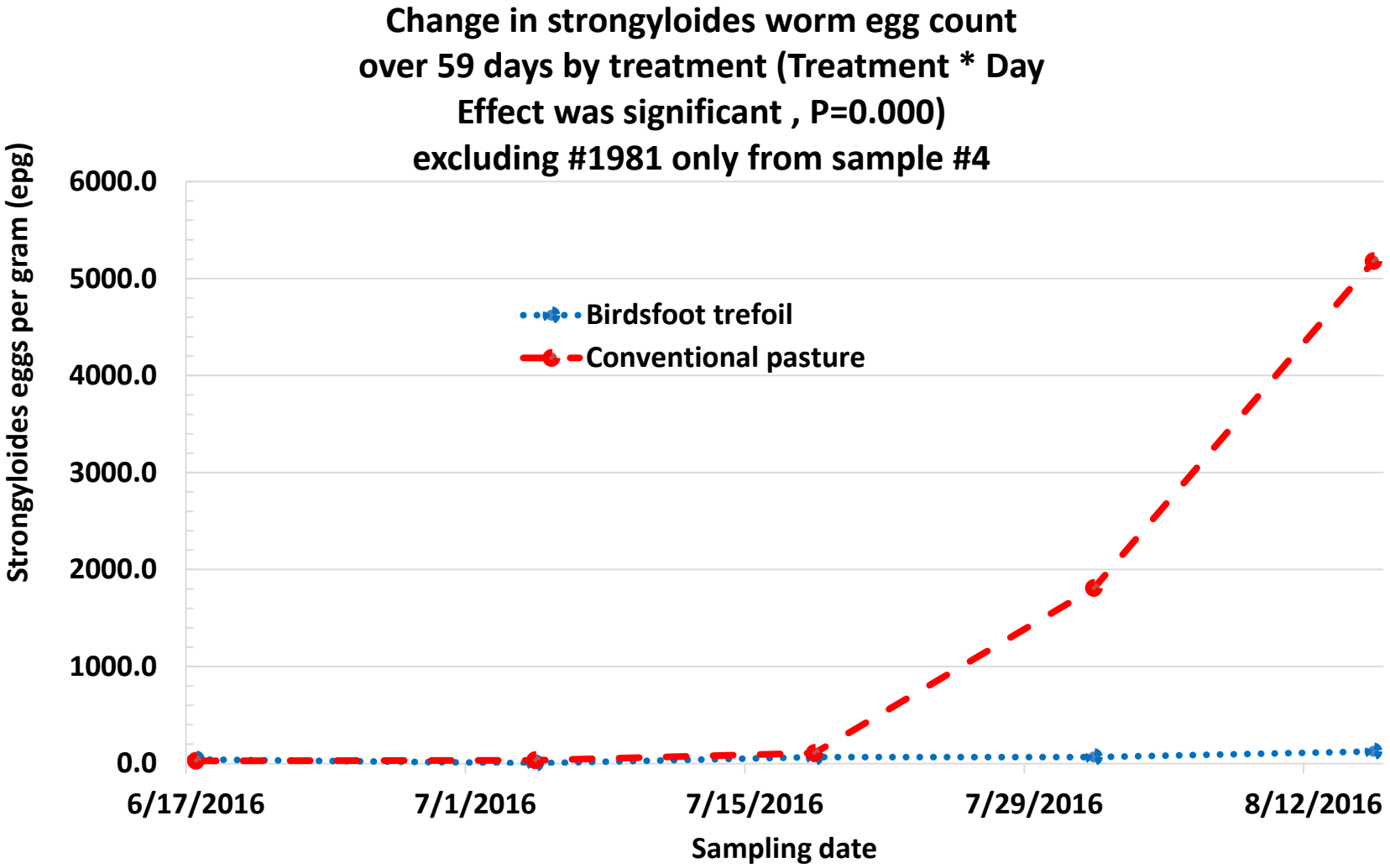


Fecal egg counts rose immediately in the BFT treatment (Treatment*Day was significant, P=0.000). However, the BFT group had more exposure to feces because of access to a heavily grazed orchard pasture for the first 4 wks. of the study when walking back and forth at their leisure between the barn and their BFT pasture and also because of set stocking and short height of the BFT.



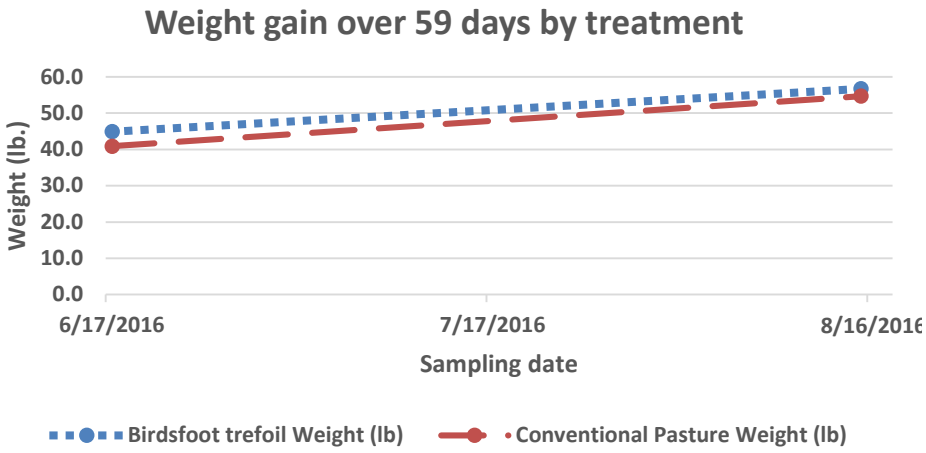
During the last weeks of the study, conventional pasture lambs did some back tracking onto regrowth in original field in preference to very mature forage in large field. This may be one explanation for why their strongyle count rose on Aug 15th

The increase in strongyloides in the CP treatment vs the BFT treatment was probably not an effect of BFT forage. Instead, the CP lambs slept in a small shelter kept in one location throughout the study. In contrast the BFT lambs slept in a barn during the 1st part of the study and then out in the BFT field the remainder of the study. Thus, BFT lambs were probably in less mud/feces with less exposure to strongyloides



BFT lambs rarely used the tarp shelter/pen put up in their BFT pasture for the last 4 weeks of the study unless being gathered for sampling. Instead they slept in the field. This probably contributed to less exposure to strongyloides because this worm can be spread by contaminated mud and feces getting into the hairline of the foot.

Weight Gain (lb.) by treatment during 59 d. grazing trial was not significant (P=0.208)



NOTE - Lambs in both groups received ~1/3rd lb. grain/head per day thru out study. However, the last week of study the BFT group received no grain – see explanation next slide.

*Note – For final weight, BFT Lambs were off pasture for 15 to 18 hr. prior to weighing (w/ access to hay) while CP lambs were on pasture until a couple of hours before weighing). Shrinkage was probably experienced by the BFT lambs but not by the CP lambs resulting in underestimation of BFT weight gains

	Birdsfoot Trefoil	Conventional Pasture
6/17/2016	44.9	40.9
8/15/2016	56.7*	54.7*
Gain (lb)	11.8	13.8
Days	59	59
Daily gain (lb)	0.20	0.23

Despite mowing, the BFT pasture was lush. The last week of the study the BFT lambs ate no grain because for 3 days they ignored the offered grain so the farmer stopped offering it during the final 4 days

Percentage of strongyle worms identified as barber pole worms

	6/16/2016		8/15/2016	
	% Barber Pole	Barber Pole eggs per gram	% Barber Pole	Barber Pole eggs per gram
BFT lambs	36.2%	109.6	88.4%	900.5
CP lambs	76.5%	54	92.1%	933.6
Total lambs	44.87%		90.38%	

Dry Matter Yield/Acre for Pastures and Percentage and Amount of Birdsfoot Trefoil in BFT Pasture

	BFT Pasture			Conventional Pasture
Date	DM Yield (lbs./acre)	BFT Yield (lbs./acre)	%BFT	DM Yield (lbs./acre)
6/17/2016	377	126	33.3%*	3364.4
7/4/2016	1447	1234	85.3%	3880.3
7/18/2016	1974	1548	78.4%	2669.1
8/1/2016	1447	1166	80.6%	4138.2

*Remainder of forage was fairly unpalatable Canada Thistle that the BFT lambs generally ignored.

BFT Production in 2017 in the 4 acre field