

INTENSIVE BALE GRAZING

Background:

Winter Bale grazing has been shown to be an effective, rapid method to improve soil quality and pasture growth. It also has been determined that a more concentrated form of bale grazing might be the most effective means of ensuring that improvement. This demonstration was conducted to determine whether the soil microbial population also had a similar rapid improvement.

In the winter of 2023-24, intensive bale grazing was conducted on some problematic pasture in the Westlock area. 40 cow-calf pairs bale grazed a 4 acre paddock from the beginning of November, 2023, to the third week of March, 2024. Roughly 200 large round bales were grazed in this area for that period. Bales were generally placed 30 feet apart. In May, sampling was conducted to see if there was a rapid change in the physical and microbial population of the soil, compared to a neighboring ungrazed area. The following differences were noted, and while not replicated over several sampling sites but rather taken over the area as a whole, are nonetheless interesting, and when taken as an entirety could be indicative of rapid, beneficial changes to the pasture soil.

Results:

Potential Physical Changes:

Characteristic	Grazed area	Ungrazed area
Organic Matter	7.20%	6.10%
Phosphorous (Bray analysis)	51	31
Potassium	435 ppm	238 ppm
Nitrogen	150 ppm	61 ppm
Sulphur	10 ppm	9 ppm
pH	5.7	5.8

Most all the standard physical characteristics and nutrients appear to favor the bale grazed area, with the application of those nutrients in cattle waste products and organic matter from the bales themselves. This generally looks like a rapid, positive means to improve degraded pasture, but for most producers, it can only improve a small area at a time. If the pH from these samples were a solid, replicated number that we could rely on however, it would be a cautionary indicator of a downside of bale grazing, that all the uric acid applied to a small area might drop the pH to a number low enough to have a negative impact on legumes such as alfalfa (pH 5.5).

Potential Microbial Changes

Characteristic	Grazed Area	Ungrazed Area
Total bacteria	11732	7420
Active Carbon	1060	1009
CO2 Respiration	108 ppm	108 ppm
General Fungi -soil	2389	1390
Pseudomonas	2543	40
General bacteria	2044	2063
Anaerobes -soil	299	269
Actinomycetes	2424	1893
Total gram negatives	5258	2241
Rhizobium – soik	567	123
Gram positives – soil	2007	1223
Biological Quality Rating	5	5
Total microbial activity - soil	14536	9420
Trichoderma - soil	113	341
Nitrogen Fixers - soil	2148	2078

Conclusions:

These microbial results seem to indicate a jump in bacteria, fungi, and total microbial activity with recent, intensive bale grazing. Pastures are therefore more likely healthy and will take advantage of the extra nutrients, and indeed will produce more with enhanced soil rhizobium fixing even more nitrogen. This also seems to be clear in the various microbial populations and ratios, as shown in the following two tables. This agrees with data previously determined in our demonstrations and others, and has been shown to last a number of years. Producers need to consider this method of improving soil and find a way to maximize this means of efficiently using this method of winter feeding.

Economics:

When used carefully, bale grazing can producer an economic return. This method of enhancing soil is generally free, especially the nitrogen content from urine, commonly a lost product when expelled on a feedlot or wintering area. Other nutrients are also added to the soil. This and other results indicate bale crazing can be an efficient means of maximizing waste products to use all of them.



INTENSIVE BALE GRAZING CONT'D

Ungrazed Paddock



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Report Number: C24344-10013
Account Number: 03091

To: GATEWAY RESEARCH ORG.
BOX 5865
WESTLOCK, AB T7P 2P6

For: Ungrazed Paddock

Attn: SANDEEP NAIN
780-349-2012

Reported Date: 2024-12-16
Printed Date: 2025-03-26

VitTellus Bio Soil Health Report

Vitellius Bio Soil Health Report																			Page: 1 / 2	
Sample ID	Lab Number	Pseudomonas Population	Nitrogen Fixers	Rhizobium Related	Gram Positive	Actinomycetes	General Bacteria	General Fungi	Trichoderma	Anaerobe	Total-Gram negatives	Total-Bacteria	Total microbial activity	Gram-:	Gram+:	Actinomycetes	Fungi: Bacteria	Fungi: Trichoderma	Aerobe:	
98016	40	2078	123	1223	1893	2063	1390	340	269	2241	7420	9420	1.39	0.65	0.23	4.08	7			
H																				
G																				
M																				
L																				
VL																				

VL=Very Low, L=Low, M=Medium, G=Good, H=High

Sample ID	Lab Number	Soil Health Index Pseudomonas	Soil Health Index Total Gram negatives	Soil Health Index Gram Positive	Soil Health Index Gram+: Gram-	Soil Health Index Fungi: Bacteria	pH Total Gram negatives	pH Fungi: Bacteria	OM Fungi: Bacteria	PERP Pseudomonas	CEC Total Gram negatives	CEC Total microbial activity	CEC Total Fungi	KMg Total Gram negatives	Rhizobium Related	Overall biological index	Overall microbial sustainability index
98016	0	0	51	1	1	0	0	0	0	1	1	17	43	0	34	35	53
H																	
G																	
M																	
L																	
VL																	

The results of this report relate to the sample submitted and analyzed. All results are released based on acceptable QC data.
No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Beth Wood, Agronomist

A&L Canada Laboratories Inc. is accredited by the Standards Council of Canada for specific tests as listed on www.scc.ca and by the Canadian Association for Laboratory Accreditation as listed on www.caia.ca

Grazed Paddock



A & L Canada Laboratories Inc.

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Telephone: (519) 457-2575 Fax: (519) 457-2664

For: Bale Grazed Paddock

Report Number: C24344-10013
Account Number:

To: GATEWAY RESEARCH ORG.
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WESTLOCK, AB T7P 2P6

Reported Date:2024-12-16

VitTellus Bio Soil Health Report

Vit i elius Bio Soil Health Report																			Page: 2 / 2	
Sample ID	Lab Number	Pseudomonas Population	Nitrogen Fixers	Rhizobium Related	Gram Positive	Actinomycetes	General Bacteria	General Fungi	Trichoderma	Anaerobe	Total-Gram negatives	Total-Bacteria	Total microbial activity	Gram+: Gram-	Gram+: Actinomycetes	Bacteria r	Fungi: Trichoderma	Aerobe: Anaerobe		
98017		2543	2148	567	2007	2424	2044	2389	116	299	5258	11732	14536	0.84	0.83	0.21	20.56	6		
VL=Very Low, L=Low, M=Medium, G=Good, H=High																				
Sample ID	Lab Number	Soil Health Index Pseudomonas	Soil Health Index Total Gram negatives	Soil Health Index Gram Positive	Soil Health Index Gram+: Gram-	Soil Health Index Fungi: Bacteria	pH Total Gram negatives	pH Fungi: Bacteria	OM Fungi: Bacteria	PERP Pseudomonas	CEC Total Gram negatives	CEC Total microbial activity	CEC Total Fungi	Kg Total Gram negatives	B Rhizobium Related	Overall biological index	Overall microbial sustainability index			
98017		78	72	35	79	79	41	41	69	19	41	26	46	53	55	59				
VL=Very Low, L=Low, M=Medium, G=Good, H=High																				

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