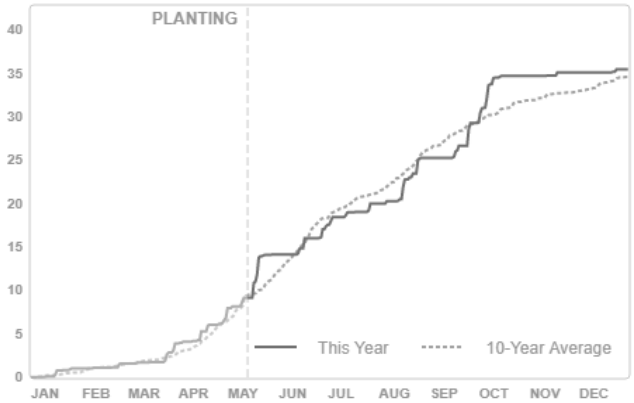
Corn Planted After Spring-grazed or Non-grazed Rye Cover Crop

Study ID: 078155201705
County: Saunders
Soil Type: Yutan silty clay loam 2-6% slopes, eroded; Pohocco-Pahuk complex 6-11% slopes, eroded; Filbert silt loam 0-1% slope; Tomek silt loam 0-2% slopes
Planting Date: 5/13/17
Harvest Date: 10/23/17
Population: 33,048
Row Spacing (in): 30
Hybrid: Pioneer 0801AMXT
Reps: 3
Previous Crop: Wheat
Tillage: No-Till
Herbicides: 37 oz/ac Roundup PowerMax®, 33.1 oz/ac AMS, 2.6 oz/ac Laudis®, 11.2 oz/ac Atrazine 4L, and 18.5 oz/ac MSO
Foliar Insecticides: 2.5 oz/ac Baythroid® XL and 9.2 oz/ac Capture® LFR®
Foliar Fungicides: 2.7 oz/ac Trivapro®

Fertilizer: 40 lb/ac 11-52-0, 15.6 gal/ac 32% UAN, 3.8 gal/ac 10-18-4, 0.3 gal/ac Zinc chelate, 1 gal/ac CoRoN®-Ag, 0.2 gal/ac Nutrisphere-N®, 0.2 gal/ac Boron, 0.4 gal/ac Magnesium, 0.3 gal/ac Pro-Manganese® 5
Irrigation: Pivot, Total: 2.4-3.4"
Rainfall (in):



Introduction: This study tested the effects of grazed and un-grazed rye cover crop on corn yield, as well as the addition of an ionophore supplement (monensin at 1,600 g/ton) on the weight gain of calves. The study consisted of four treatments: grazed rye cover crop with ionophore supplement, grazed rye cover crop without ionophore supplement, un-grazed rye cover crop, and a check with no cover crop. The field had wheat, then a sorghum-sudan hay prior to planting rye. Elbon cereal rye cover crop was planted on 10/28/16 at a rate of 70 lb/acre. Dry soil conditions in late fall and early spring reduced rye growth. Rye was not irrigated at any point. 700 lb steers were stocked at a rate of 0.95 hd/acre on 4/3/17 and were pulled on 4/29/17. Paddock 1 was pulled earlier due to overgrazing and was not included in the analysis. Rye cover crop was terminated at planting with glyphosate herbicide.

Results:

	----------Corn----------			-------Cover Crop----------		---------Cattle-------	
	Yield† (bu/ac)	**Early Season Stand Count (plants/ac)**	**Harvest Stand Count (plants/ac)**	**Ground Cover at Corn Planting (%)**	**Biomass at Planting (ton/ac DM)**	**Average Daily Gain (lb/d)**	**Cattle Weight Gain (lb/ac)**
Check	211 A*	33,926 A	37,778 A	87.2 AB	0.31 B	N/A	N/A
Cover Crop - Rye	204 A	33,852 A	35,222 A	91.6 A	0.40 C	N/A	N/A
Cover Crop - Grazed	190 A	31,852 B	31,111 A	81.6 B	0.23 A	2.9 A	60 A
Cover Crop - Grazed w/ Ionophore Supplement	203 A	33,519 A	34,222 A	81.7 B	0.25 A	3.6 A	68 A
P-Value	0.636	0.034	0.274	0.04	<0.01	0.152	0.23

*Values with the same letter are not significantly different at a 90% confidence level.
† Bushels per acre corrected to 15% moisture.

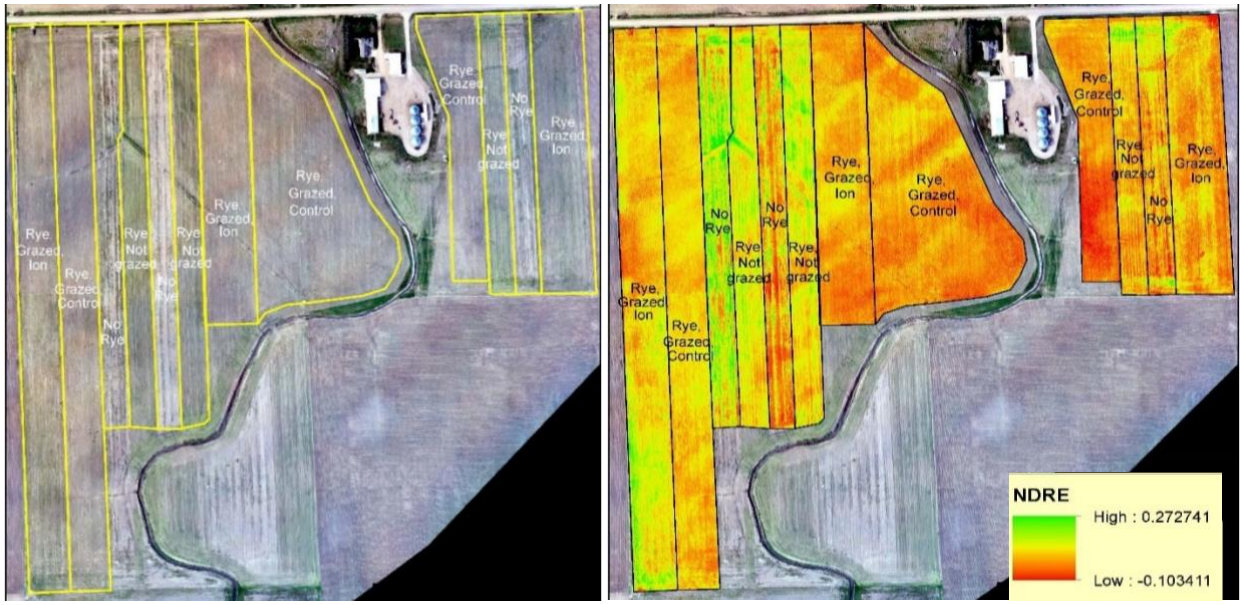


Figure 1. True color (RGB) imagery (left) and normalized difference red edge index (NDRE) imagery (right) of the field area on April 27, 2017.

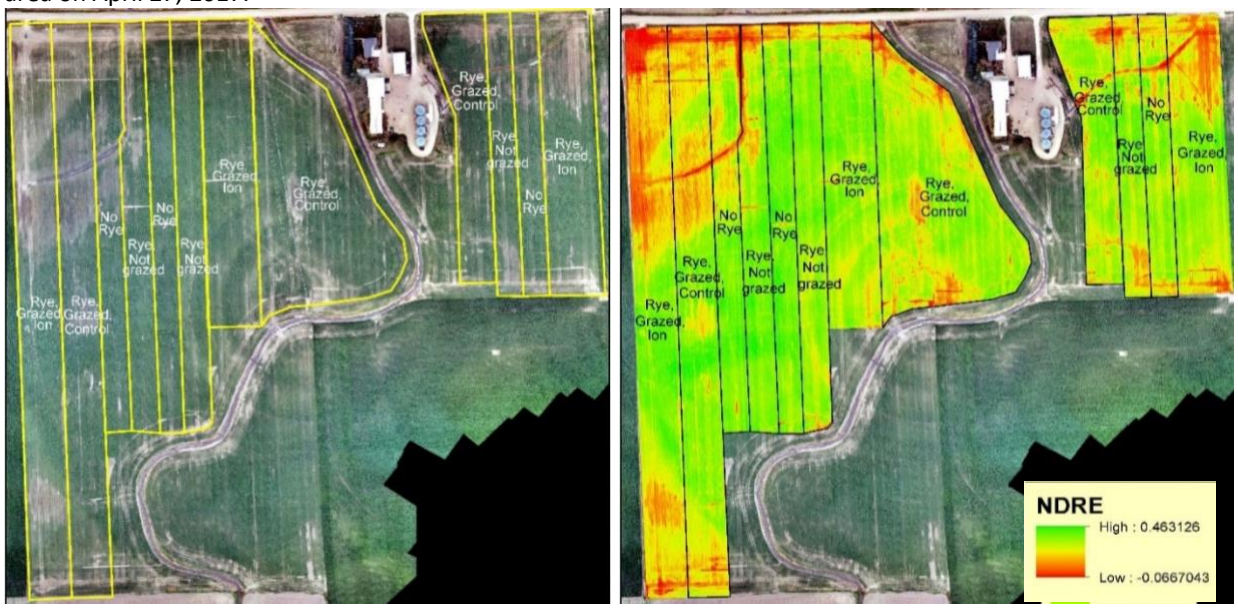


Figure 2. True color (RGB) imagery (left) and normalized difference red edge index (NDRE) imagery (right) of the field area on June 30, 2017.

Summary: No significant difference was observed between grazing treatments for average daily gain or total gain. Significant differences were observed in the amount of ground cover at planting with the grazed treatments having less cover than the rye cover crop or the control. No significant difference was observed in corn yield among treatments. Differences among treatments are evident in aerial imagery from April 27, 2017 *(Figure 1)* but less apparent on June 30, 2017 *(Figure 2).* Planting and grazing the rye with 700 lb steers resulted in returns above cost of establishment ($34.60 seed and seeding plus $19.80/ac fertilizer and application) and cattle care costs ($0.07/hd/d mineral, $0.10/hd/d yardage, $2.64/hd transportation and fencing at $4.40/ac) of $28.75/ac or $27.31/hd when calves were valued at $140/cwt.

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