

Grazed versus Non-grazed Cover Crop

Study ID: 0719107201801

County: Knox

Soil Type: Trent silt loam 0-2% slope; Nora silt loam 2-6% slopes; Moody loam 0-2% slope; Moody loam 2-6% slopes; Paka loam 11-20% slopes; Alcester silty clay loam 2-6% slopes

Planting Date: 11/4/17

Harvest Date: 7/24/18

Population: 2 bu/ac

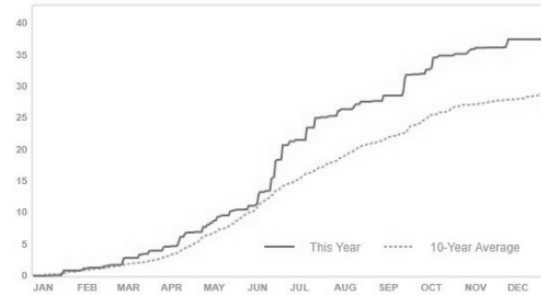
Reps: 10

Previous Crop: Field Peas

Tillage: No-Till

Irrigation: None

Rainfall (in):



Introduction: This study is being conducted on a soil health demonstration farm as part of the Nebraska USDA/Natural Resource Conservation Service's (NRCS) Soil Health Initiative, and involves the farmer, the Nebraska On-Farm Research Network, and the USDA/NRCS. Two treatments are being evaluated in this five-year study: grazed cover crop/forage and non-grazed cover crop. The field was divided into plots approximately 2 acres in size that were assigned as grazed or non-grazed. These plots will be maintained throughout the project.

On October 15, 2016, following corn harvest, cover crops were planted and the grazed treatments had 100 head of cows grazing for 1 week in April 2017. Field peas were then planted on April 20, 2017 and harvested on July 26, 2017. Cover crops were again planted July 30, 2017 and 180 head of cows grazed from October 20, 2017 through October 28, 2017 in the grazed treatments. Dry forage production was 9,380 lb/ac.

2016 Cover Crop Mix (10/15/16):

Species	Rate (lb/ac)
Austrian Winter Pea	10
Hairy Vetch	5.5
Cereal Rye	13.6
Siberian Kale	0.5
Trophy Rape seed	0.5
Impact Forage Collard	0.5
Purple Top Turnip	0.5
African Cabbage	0.5
Barley	10.2
Triticale	15.2
TOTAL	57

2017 Cover Crop Mix (planted 7/30/17):

Species	Rate (lb/ac)
Cowpea	2.0
Sudan-Sorghum hybrid	7.0
Pearl Millet	3.0
Spring Oats	4.0
Annual Ryegrass	4.0
Sunflower	3.0
Safflower	1.5
Buckwheat	3.0
Sunn Hemp	1.0
Winter Lentil	1.5
Forage Collards	1.0
Chickling Vetch	2.0
TOTAL	33.0

Winter wheat was planted on November 4, 2017, at a rate of 2 bu/ac. Wheat was harvested July 27, 2018. Winter wheat yield was evaluated for grazed versus non-grazed cover crop treatments. A 30' buffer was applied to the treatments to adjust for GPS drift when laying out fences and recording yield data.

Soil Quality Measures 2016 (Baseline):

	Bulk Density (g/cm ³)	NRCS Soil Health Assessment Worksheet Field Indicator Score
Cover Crop—Non-grazed	1.23	2.45
Cover Crop—Grazed	1.21	2.48

Soil Quality Measures 2018:

	Bulk Density (g/cm ³)	NRCS Soil Health Assessment Worksheet Field Indicator Score
Cover Crop—Non-grazed	0.98	2.80
Cover Crop—Grazed	0.96	2.75

Soil Health Test: Soil health samples from 2016, 2017, and 2018. Two samples were collected each year, one in each treatment.

Treatment	Solvita		Total					Inorganic		Organic	Soil Health Score
	OM %	CO2 Burst (ppm)	Total Nitrogen (ppm)	Organic Nitrogen (ppm)	Organic Carbon (ppm)	Nitrate (ppm)	Ammonium (ppm)	Nitrogen (ppm)	Organic C : N	Nitrogen Release (ppm)	
2016 Non-grazed	3.0	90.2	23.7	15.2	185	7.8	0.5	8.3	12.2	15.2	10.8
2016 Grazed	2.9	41.5	22.5	14.5	178	7.3	1.2	8.5	12.3	9.5	6.6
2017 Non-grazed	3.7	24.0	29.6	14.5	142	13.6	0.4	14.0	9.8	9.9	6.7
2017 Grazed	3.7	41.0	27.8	13.3	137	12.6	0.6	13.2	10.3	13.3	8.2
2018 Non-grazed	3.5	60.0	12.8	9.3	130	3.0	2.1	5.1	13.9	9.3	9.5
2018 Grazed	3.4	81.8	12.5	9.0	117	2.5	2.6	5.1	13.0	9.0	11.4

2018 Wheat Yield:

	Yield† (bu/acre)
Cover Crop—Non-grazed	46 A*
Cover Crop—Grazed	47 A
P-Value	0.220

*Values with same letters are not significantly different at 90% confidence level.

†Yield values are from cleaned yield monitor data.

Summary: There was no wheat yield difference for the grazed versus non-grazed treatment. Soil quality parameters will continue to be monitored.