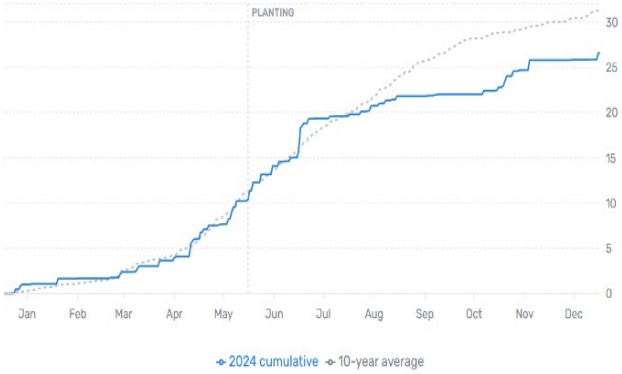
Long Term Add Grazed Cover Crop into Rotation - Year 2

Study ID: 1395159202402
County: Seward
Soil Type: Butler silt loam terrace 0-1% slopes, Lamo silty clay loam occasionally flooded, Muir silt loam 0-1% slopes and 1-3% slopes and rarely flooded, Hastings silty clay loam 3-7% slopes severely eroded
Planting Date: 5/30/24
Harvest Date: 9/30/24
Population: 140,000
Row Spacing (in): 30”
Variety: Connect™ CT2323E
Reps: 4
Previous Crop: Corn
Tillage: No-till
Herbicides: ***Pre:*** 5 oz/ac Verdict® + 12 oz/ac Outlook®
Post: 32 oz/ac Liberty® + 32 oz/ac Enlist One® + 1.3 pt/ac Dual II Magnum® applied 6/28/24. 32 oz/ac Enlist One® + 32 oz/ac glyphosate on 7/13/24.

Seed Treatment: None
Foliar Insecticides: None
Foliar Fungicides: None
Fertilizer: None
Irrigation: Pivot, Total: 8”
Rainfall (in):



Introduction: The goal of this study is to look at the impacts of adding a grazed sorghum sudan crop compared to the regular field crop over time. Yield, total economics of the crop vs. grazed crop over time (Table 3), and nutrient differences such as P and K will be tracked. An area grower was showing how strip grazing of a cover crop added into the field crop rotation led to better phosphorus (P) distribution in that area of the field and higher yields. This grower wanted to test this topic as a study to see if he could also see better P distribution and higher yields in the area where grazed sorghum sudan is added into the crop rotation.

In Year 1, cereal rye was harvested for small grain ryelage. Then, Mega Green sorghum sudan was planted May 20, 2023, at around 18 lb/ac in a large block with corn (Channel® 213-19 seeded at 32,000 seeds/ac on May 21, 2023) surrounding it. There are four reps in this study. The sorghum sudan was split into grazing areas and grazed with 66 heifers for 79 days. The sorghum sudan grazing began when it was around 30” tall.

Yield/Economics: Because this is a unique cropping systems study, the on-farm research team wasn’t sure how to compare the yield and economics of year one. The results are shared here. The corn was harvested on 11/1/23 and averaged 241 bu/ac. With a price of $4.50/bu, the total income after crop expenses was $653.46/ac. The sorghum sudan, at time of corn harvest, had resulted in 79 grazing days of 26.9 acres. The entire sorghum sudan area had not been grazed. The associated income from the grazing was estimated to be $241.01/ac at the time of corn harvest for comparison.

However, significant sorghum sudan biomass was left in the field. Due to the nature of the fence around the perimeter, the sheer growth rate and biomass of the sorghum sudan, and number of cattle available compared to the acres, the grower felt there were grazing opportunities beyond what was captured. The remainder of the area was grazed during the winter, including for calving, which provided additional value to the sorghum sudan. The grower didn’t attempt to measure how much additional grazing there was. For a quick value, he thought an additional $15/ac value might be in line. Adding $241.01 + $15 would result in a total value of $256.01/ac for the sorghum sudan area. The grower felt there is a large learning curve on grazing this way, and efficiency improvements could be made.

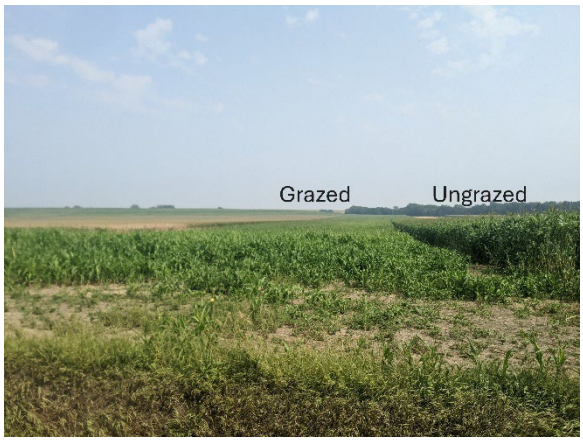
Prior to grazing the sorghum sudan in the winter of 2023-2024, biomass samples were collected in a 36” by 36” square to determine quality of both the previously grazed area and non-grazed area. Results are shown in Table 1.

Table 1. Quality of ungrazed sorghum sudan and grazed regrowth of sorghum sudan on 1/22/24. All results listed as dry matter basis.

Sorghum Sudan Sample	Crude Protein	Acid Detergent Fiber (ADF%)	Total Digestible Nutrients (TDN%)	Relative Feed Value (RFV)	Relative Feed Quality (RFQ)
Grazed regrowth	2.08	55.49	44.54	56	32
Ungrazed	6.48	37.50	55.32	87	96

Pictures: (Top Photo) September 7, 2023, showing the corn area (far left), grazed sorghum sudan area (middle) and ungrazed sorghum sudan area (right). The other corn area is not pictured and is to the right of the ungrazed sorghum sudan area. The goal was to graze the entire sorghum sudan area during the growing season, but the biomass was more than the cattle could eat during that time.

(Lower left photo) A recently grazed sorghum sudan area. (Lower right photo) The non-grazed area was nearly 5'7" on September 7, 2023.



In Year 2, soybeans were planted across the entire field area. There were no additional treatments added as the goal was to see if any differences existed between the sorghum sudan grazed area vs. the corn for grain area.

Table 2. Results 2024

	Average Stand Counts (plants/acre) Only 2 reps, no stats	Moisture (%)	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
Check (No Cover Crop)	108,750	8.8 A*	69 A	757 A
Grazed Cover Crop	113,750	8.7 A	70 A	774 A
P-Value:	--	0.4	0.6	0.6

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 13% moisture.
‡Marginal net return based on $11/bu soybeans.

Summary:

- There were no significant differences in moisture, yield, or marginal net return.
- No significant yield difference was found between the addition of grazed sorghum sudan grass to a corn/soybean rotation (70.4 bu/ac) against no cover crop (68.8 bu/ac).
- With this, the addition of a feed source in 2023 for grazing purposes did not mitigate yield in 2024.

Table 3. Two crop year economic analysis summary of this study, presented in $/ac.

	2023 Corn	2024 Soy	2025	3-year Total
Check (No Cover Crop)	$653.46	$757	N/A	*$1410.46*
Grazed Cover Crop	$256.01	$774	N/A	*$1030.01*