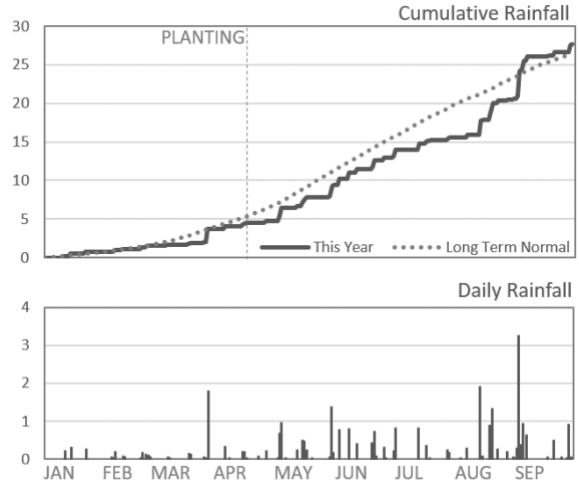
Corn Following Winter Terminated and Winter Hardy Cover Crops

Study ID: 0656127201802
County: Nemaha
Soil Type: Judson silt loam 0-2% slope; Judson silt loam 2-6% slopes
Planting Date: 4/17/18
Harvest Date: 9/14/18
Row Spacing (in): 30
Hybrid: Pioneer® 0363AM
Reps: 7
Previous Crop: Wheat
Tillage: No-Till
Herbicides: ***Pre:*** 3 qt/ac FulTime® NXT, 16 oz/ac 6# 2,4-D, and 16 oz/ac Buccaneer 5 Extra® on 4/4/18 ***Post:*** 3 oz/ac Bellum™, 32 oz/ac Buccaneer 5 Extra®, and 3.2 oz/ac N-Tense™ on 6/4/18
Seed Treatment: PONCHO®/VOTiVO®
Foliar Insecticides: 3.84 oz/ac Lambda-Cy 1EC aerial applied on 7/7/18; 3.84 oz/ac Lambda-Cy 1 EC aerial applied on 7/26/18
Foliar Fungicides: 6 oz/ac AzoxyProp Xtra on 6/4/18; 10.5 oz/ac AzoxyProp Xtra aerial applied on 7/7/18; 10.5 oz/ac AzoxyProp Xtra aerial applied on 7/26/18

Fertilizer: 150 lb/ac N as 32% UAN on 4/4/18; 1 gal/ac NResponse™ on 6/4/18; 82.8 lb/ac N as Urea on 6/11/18; 1 gal/ac Kugler KQ-KRN™ (28% N) aerial applied on 7/7/18;1 gal/ac Kugler KS2075 (20% N, 7.5% P, 5% S) aerial applied on 7/26/18
Irrigation: None
Rainfall (in) as measured at field:



Introduction: This study is being conducted on a soil health demonstration farm as part of the Nebraska USDA/Natural Resources Conservation Service's (NRCS) Soil Health Initiative, and involves the farmer, the Nebraska On-Farm Research Network, and the USDA/NRCS. This is the second year of this study. The two treatments, the use of winter terminated cover crops and the use of winter hardy cover crops, will be used in this five-year study (2016-2021). The cover crops were drilled August 1, 2017. The winter terminated treatment was a mix of 30 lb/ac oats, 1.5 lb/ac canola/rapeseed, and 1 lb/ac turnip. The winter hardy treatment consisted of 30 lb/ac cereal rye, 1.5 lb/ac canola/rapeseed, and 1 lb/ac turnip. This study did not have a no cover crop control. For uniformity, both cover crop mixes were sprayed with herbicide to terminate the cover crops on April 4, 2018. Baseline soil health measures (one per treatment) were collected on 10/19/16 (Table 1).

Table 1. Baseline soil quality measurements for winter terminated and winter hardy treatments from 2016.

	Average Steady State Infiltration (in/hr)	Bulk Density (g/cm^3)	Total Pore Space (%)	Water Holding Capacity if all pores filled (inch H_2O/ft)	Solvita at 24 hr	Estimated Solvita Microbial Activity Rating	Average Soil Health Indicator Score
Sample Site 3 (Winter Terminated)	1.30	1.22	53.8	6.5	2.0	Low	2.44
Sample Site 4 (Winter Hardy)	1.12	1.32	50.2	6.0	2.0	Low	2.59

Table 2. 2018 corn stand counts, test weight, moisture, yield, and net return for winter hardy and winter terminated cover crop treatments.

	Stand Count (plants/ac)	Test Weight (lb/bu)	Moisture (%)	Corn Yield† (bu/ac)	Marginal Net Return‡ ($/ac)
Winter Terminated	29,710 A*	56 A	20.7 A	243 A	759.43 A
Winter Hardy	29,515 A	56 A	20.9 A	240 A	748.71 A
P-Value	0.677	0.226	0.516	0.281	0.283

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 15.5% moisture for corn.
‡Marginal net return based on $3.23/bu corn, $12.48/ac winter terminated cover crop seed mix, $12.45/ac winter hardy cover crop seed mix, and $14.40/ac drilling cost.

Summary:

- In 2018, there were no differences in corn yield, moisture, test weight, harvest stand counts, or net return between the winter terminated or winter hardy cover crop treatment.

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