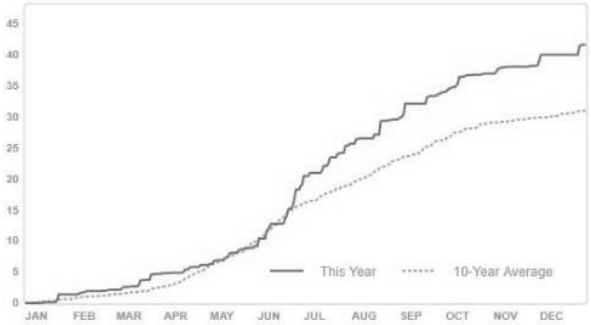
Evaluating the Impact of Monoculture Rye Cover Crop versus Multispecies Cover Crop on Subsequent Wheat Crop Yield and Soil Quality Indicators

Study ID: 0732167201801
County: Stanton
Soil Type: Nora-Crofton complex 6-11% slopes; Nora silty clay loam 11-17% slopes; Moody silty clay loam 2-6% slopes; Nora silty clay loam 6-11% slopes; Alcester silty clay loam 2-6% slopes
Planting Date: 10/24/17
Harvest Date: 7/16/18 and 7/21/18
Population: 1,000,000 seeds/ac
Row Spacing (in): 7.5
Variety: Redfield
Reps: 5
Previous Crop: Soybean
Tillage: No-Till
Herbicides: ***Pre:*** None ***Post:*** None
Seed Treatment: Cruiser®

Foliar Insecticides/Fungicides: None
Fertilizer: Spring topdress on 3/30/18; 300 lb/ac Ammonium Nitrate (102 lb N/ac), 40 lb/ac Potash, 40 lb/ac Ammonium Sulfate (8 lb N/ac, 10 lb S/ac)
Note: Field was hailed on 6/23/18
Irrigation: None
Rainfall (in):



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 study compares two treatments, a monoculture rye cover crop versus a cover crop mix. Soil health indicators, soil tests, and yield data are evaluated each year.

Cover crops were drilled in October 2016. The monoculture cover crop was 50 lb/ac rye. The cover crop mix consisted of 35 lb/ac Elbon Rye, 0.5 lb/ac Bayou Kale, 0.5 lb/ac Impact forage collards, 0.5 lb/ac Trophy rape, 0.5 lb/ac purple top turnip, 0.5 lb/ac African cabbage, 3.5 lb/ac hairy vetch, 30 lb/ac Austrian winter pea, and 2 lb/ac winter lentil. Cover crops were terminated on May 14, 2017 and soybeans were planted on May 25, 2017 and harvested on September 29, 2017. Wheat was planted in October 2017. Wheat yield was obtained for each treatment using yield monitor data with a 15' buffer applied to the treatments.

Results:

Soil Health Soil Test (Mar. 2017 – 2 samples, 1 in each treatment):

	Total Bacteria	Bacteria Gram (+)	Bacteria Gram (-)	Total Fungi	Arbuscular Mycorrhizal	Saprophytes	Protozoa	Undifferentiated
	Biomass, PLFA ng/g							
Rye	1596.8	993.3	603.5	221.2	85.4	135.8	10.6	902.3
Mix	1651.6	904.8	746.7	379.8	78.5	301.3	24	1808.8

	Soil pH	Buffer pH	OM %	CO_2-C	Total Nitrogen	Organic Nitrogen	Total Organic Carbon	Nitrate	Ammonium	Organic C:N	Soil Health Score
				ppm							
Rye	6.1	6.7	4.3	118.0	29.7	19.5	186	7.3	1.4	9.5	16.22
Mix	7.2		4.2	128.0	22.0	15.1	159	5.2	1.3	10.5	15.27

	Moisture (%)	Wheat Yield† (bu/ac)
Cover Crop - Rye	14.2 A*	35 A
Cover Crop - Mix	14.6 A	33 A
P-Value	0.591	0.366

†Yield values are from cleaned yield monitor data. Bushels per acre corrected to 13.5% moisture.
*Values with the same letter are not significantly different at a 90% confidence level.

Summary: There was no difference in wheat yield or moisture for the monoculture versus cover crop mix. The field was hailed on June 23, 2018.

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