

Midwest Cover Crop Council

Nebraska Report 2020

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Extension Products:

- Nebraska Cover Crop Selector Tool was released.
- Cover Crop Recipes Following Corn and Following Soybeans Were Developed and Published in 2019.

Extension Programs:

- As part of Nebraska Extension's Crop Diagnostic Clinic Series, A Soil Health Clinic evaluated how cover crops can be used to improve soil health with 31 ag professionals participating.
- As a part of the Soybean Management Field Days, cover crop research was initiated at these sites to monitor impact of cover crops on crop yields and soil health with the cooperating farmers.
- Several Extension and NRCS sponsored local field days and cover crop workshops was conducted across the state as well.
- As part of the Nebraska On-Farm Research Network, Seventeen On-farm Research Projects were conducted across Nebraska to evaluate different issues of cover crops in cropping systems. Of these 17 On-farm Research Projects, 6 of the studies involve NRCS Demonstration Farms.
- These projects include research that evaluates the impact of grazing cover crops on subsequent crop yields, impact of cover crops to improve soil health and water quality, cover crop seeding rates, evaluating the impact of inter-seeding cover crops on subsequent crop yields, corn & soybean maturity studies and economics.

Nebraska Extension and NRCS Partnership on Research

- The NRCS Soil Health Initiative is a collaboration with University of Nebraska researchers and extension as well as 17 farmer collaborators across Nebraska. Farmers are conducting strip trials of various cover crops, crop rotations and/or management techniques. Experiments were established in both 2016 and 2017 and soil measurements have been taken annually by NRCS field staff and University of Nebraska Extension. NRCS' Environmental Quality Incentive Program (EQIP) is funding these demonstration projects, and the funding is for five years per demonstration site.
- As part of participating in the farm and ranch demonstration initiative, producers will host field days to share with their neighbors what they have been learning and experiencing on their farms during their five-year demonstration period. The University of Nebraska team is beginning to collect additional crop

and soil measurements in 2019 to support the project and its understanding of economic and agronomic impacts of cover crops, crop rotations, and other management changes such as grazing.



- Results from an example of an NRCS Soil Health Site are listed below. This site located in southeast Nebraska is evaluating a three-year rotation of Corn-Soybeans-Wheat with a cover crop planted following wheat and corn. A winter hardy cover crop of cereal rye with brassicas is being compared to a winter-terminated cover crop of oats and brassicas to determine if these different cover crop treatments will have an effect on subsequent crop yields. In 2019 soybean yields following the winter hardy cover crop yielded similar and had a similar marginal net return than soybeans following the winter terminated cover crop (Table 1.) Also in 2019 similar results were reported when corn following winter hardy cover crops yielded similar and had a similar marginal net return than corn following the winter terminated cover crop (Table 2.) These sites are located on the bottomland soils of this project. In both years the site on the upland soils of the project that was soybeans in 2017 and corn in 2018, had significant lower yields and significantly lower marginal net returns for soybeans and corn following the winter-hardy cover crops compared to the winter-terminated cover crops, respectively (see 2019 report). Spring cover crop (cereal rye) biomass was measured on 9 fields across southeastern Nebraska in 2019 (Table 3.)

Table 1. 2019 Soybean Yields bu/ac

Treatment	Yield	Marg. Net Return \$/ac
Winter Hardy CC	86 A	670.35 A
Winter Terminated CC	84 A	652.21 A

Table 2. 2019 Corn Yields (bu/ac)

Treatments	Yield	Marg. Net Return \$/ac
Winter Hardy CC	214 A	792.55 A
Winter Term. CC	217 A	805.04 A

Table 3. 2019 Cover Crop Dry Matter Tons/ac (lbs/ac)

Treatment (Rye)	Yield	C	N
Spring Yld Apr.11–May 17	tons(lbs)	lbs/ac	
Low	.37 (740)	307	23
High	2.34 (4680)	2004	108
Ave. (9 fields)	1.22 (2440)	1046	67

Nebraska Extension, NCR SARE and other organizations partner on Cover Crop/Soil Health Conferences

- In January 2019 Dwayne Beck presented a program on no-till/cover crops and soil health in east central Nebraska with 83 participants.
- On February 14th 2019 the Nebraska Cover Crop Conference hosted 213 participants as David Montgomery, Jay Fuhrer, Ray Ward on several producers discussed Soil Health & Cover Crops.
- On March 5th 2019 the SE Nebraska Soil Health Conference hosted 116 participants as Ray Ward and Keith Thompson a Kansas farmer, discussed Soil Health in Beatrice, NE.
- The Central Nebraska Cover Crop Conference was held on February 28th, 2019. Twenty-five people attended the program. Discussion focused on grazing cover crops, seeding methods, innovative methods to incorporate cover, and more.

Research: Cover Crop Research at University of Nebraska Rogers Memorial Farm

- Corn Stover Removal and Cover Crop Effects on Soil Carbon in Continuous Corn Production
Humberto Blanco (Agronomy and Horticulture) and Paul Jasa (Started Fall 2013)
- Carbon Cocktail vs Legume Cocktail vs Diverse Cocktail in Corn/Soybean/Wheat Rotation
Paul Jasa (Started Fall 2013)
- Cereal Rye/Winter Pea Cover Crop in No-till and Tilled Corn/Soybean Rotation
Paul Jasa (Fall 2007 to present)
- Carbon Cover Crop vs Legume Cover Crop in Corn/Soybean/Wheat Rotation
Paul Jasa (Fall 2005 to present)
- Cover Crop Biomass Production in Wheat/Corn/Soybean Rotation (Started Summer 2017)
Humberto Blanco and Sabrina Ruis (both Agronomy and Horticulture)

Implementation of cover crops in no-till corn and soybean systems in Nebraska

- Project developed in cooperation with NE Corn and Soybean Boards.
- State-specific recommendations on which cover crop species, planting times work best in standard NE no-till corn-soybean systems
- Six cover crops, planted at two times
 - Early planted cover crops (broadcast into corn and soybean in mid-September)
 - Late-planted cover crops (drilled after harvest)

Cereal rye, vetch, Winter pea, radish

Cover Crop Biomass Production Fall (following wheat) 2019

• Treatment	Tons/Ac	C/N Ratio
Nitrogen Fixing Mix	2.02	35.31
Early Grazed Mix	3.62	52.24
Late Grazed Mix	2.34	39.76
Compaction Fighter	2.64	48.00
High Carbon Mix	3.58	38.74

Take Home Message & Future Plans

- Cover crops improved soil health, reduced nitrate loss and supported pollinators in Nebraska agroecosystems
- Cover crops reduced erosion and stabilized soils under flooding conditions in Nebraska in 2019
- Greater resilience and stability of Nebraska cropping systems
- More benefits may be possible if we change current rotations/management
- Explore cropping systems that allow for greater cover crop growth
- Combine soil health goals with other ecosystem services
- Learn from successful cover crop farmers!