

Nebraska Report-Midwest Cover Crop Council 2017

The first Annual Nebraska Cover Crop Conference was held on February 25, 2016, the day after the 2016 MCCC Annual Meeting concluded. This conference focused on cover crops in corn/soybean cropping systems. The NRCS State Soil Scientist addressed the erosion issues in soybean stubble on sloping fields. Cover crop industry representatives discussed benefits of cover crops in cropping systems. The conference concluded with a panel of farmers discussing how they were successfully using cover crops in their corn/soybean cropping systems.

The conference attracted 208 attendees from 33 Nebraska counties and 3 states, Nebraska, Iowa and Kansas. The producers that attended the conference managed or influenced 157,658 acres, or about 1% of Nebraska's row crop acres. Total acres managed or influenced by the advisors that attended the conference was 1.4 million or 10% of Nebraska's row crop acres.

Results of a survey conducted following the conference indicate an estimated value of knowledge gained or anticipated practice changes of \$10.96 per acre or an estimated value of the program at \$17.4 million. For other Extension programs in 2016, the estimated value is \$3 million, from 210 participants attending five Cover Crop and Livestock Integration Field Days. Surveys indicated 100% of survey respondents were likely to make changes based on the information presented. At the 2016 Husker Harvest Days, Specialists and Educators assisted 125 producers with plans to plant cover crops and/or use annual forages for grazing.

In November of 2016, fifty-one Extension, Natural Resources Conservation Service (NRCS), and USDA Meat Animal Research Center (MARC) employees attended the first integrated Cover Crop In-Service developed via questions employees received in the field. Published research was compiled and provided for reference; interactive presentations and field tours showcased current research at USDA-MARC and South Central Ag Lab (SCAL) near Clay Center. Selected quotes include, "When producers approach me with an interest in planting cover crops, I now know what series of questions to ask in order to help them achieve their goal" and "The tour provided me an opportunity to see the different cover crop treatments...This was my first opportunity for an up close visual of this system."

In 2017 Extension programs in Nebraska provided education on the benefits and challenges of cover crops in Nebraska cropping systems at Private Pesticide Application Trainings for 560 farmers in 2017. Cover crop research results were presented to over 700 crop advisors and farmers at crop production clinics across Nebraska in 2017. Twenty-five producers participated in Beef Extension Meeting with a farmer panel of area cattle producers that are using cover crops successfully.

The second annual cover crop conference was held on February 14th 2017 at the ENREC (formerly ARDC). The conference continued to focus on the use of cover crops in corn/soybean cropping systems. There were presentations on terminating cover crops, planting green management, cover crop influence on corn and soybean nutrient management and cover crops and early maturing corn and soybean hybrids and varieties. There was a panel of farmers using cover crops in their Corn/SB rotation and an agribusiness panel discussing cover crop custom

seeding opportunities. The 2017 Conference attracted 248 attendees from Nebraska, Iowa and Kansas.

An update of the research initiated in 2014 to evaluate cover crops that was jointly funded by the Nebraska Corn Board and the Soybean Commodity Boards was reported. An overview indicated a focus on agronomic aspects of cover crops primarily corn and soybean systems, with ongoing research in three areas with some early findings included.

The first project is “Cover Crop Use in Corn-Soybean Systems”. This project is being conducted to determine the feasibility of winter cover cropping in corn-soybean rotations (cover crop performance and effects of crop yields). The details of the study include: Cover crop species x planting time x rotational phase, early planting time (broadcast into corn and soybeans when corn is at half-milk) and a late planting time (drilled after harvest). The cover crop species and seeding rates include: Rye 60 lbs/a, Radish 7 lbs/a, Pea+Vetch 25+10 lbs/a, Rye+Radish+Pea+vetch 30+3+10+4 lbs/a, and a 7-species mix of rye+radish+pea+vetch+oats+clover+collards 20+2+8+3+15+3+1 lbs/a. There are 4 locations across the state, 3 cropping systems, 2 seeding dates and 5 cover crop treatments plus a control. They are evaluating, soil moisture, herbicide systems, soil health & management, soil fertility and the economics of these systems. Results of this study indicate: Rye most productive. Radish winterkilled. Legumes produced less than 400 lb/a at any location. Mixes were 93 to 99% rye.

Early planting often produced twice the amount of biomass than the late planting. Cover crops before soybeans were terminated 2 weeks later at most locations. Their biomass was double that of the cover crops terminated before corn! (higher values in the ranges are from soybean plots). Reductions (but no increases) in corn and soybean yields that followed rye cover crops versus a control were found at some site-years. HAL was the most productive location in terms of cover crops (up to 4,500 lb/a) and that could have impacted corn yields there. So far, only HAL and SCAL data analyzed for 2016. Lower yields after rye were found at HAL, but rye did not impact cover crops negatively compared to the control at the other stations. Possible explanations: Water use of cover crops, N tie up, allelopathy???

A second study evaluated corn yields vs cover crop biomass. The objective of this study was to assess the effects of planting date, plant population and corn maturity on corn yield and cover crop biomass. Study details include: two locations, two-year time frame, biomass importance in cover crops, factors assessed for cover crop biomass impact were biomass, corn yield and planting date and harvest maturity.

The third area of research was inter-seeding cover crops into corn. The objective of this research was to determine if inter-seeding cover crops into corn would establish productive cover crops and the potential impact on corn yield. Study details include two locations, two-year timeframe, five planting dates, three species and a three species mix (rye, radish, & hairy vetch), impact on corn assessed, planting dates impact on cover crop and biomass and irrigated vs. dryland.

Take aways from this research include: Cover crops can have many benefits, All systems are different, What works in one place may not work in another, Consider the short and long term impacts of cover crops and Lots of questions remain/research to be conducted. In the fall of

2015, a SARE Research and Education Grant (\$200,000) comparing grazing of Cover Crops, ungrazed cover crops and no cover crops was awarded to the University of Nebraska. Researchers evaluated subsequent crop yields and impact on soil physical and biological properties in 2016 at the four on-farm research fields and three experiment station research sites across Nebraska.

Nebraska NRCS has initiated several soil health demonstration farms across Nebraska. Nebraska Extension will cooperate with NRCS on these research & demonstration sites, conduct research and collect data from on-farm cover crop research sites and schedule joint field days and tours of cover crop demonstration sites.

The Nebraska Grazing Land Coalition has also initiated Cover Crop Demonstration Sites across Nebraska. There are several sites across the state where farmers and ranchers are incorporating cover crops into their operation at research and demonstration sites. Extension will cooperate in collection of data at demonstration sites and cooperate in scheduling field days and tours of these sites across the state.

One of the most important activities in Nebraska is the Development of Cover Crop Selection Tool. NCR SARE is providing funding to help develop a Cover Crop Selection Tool for Nebraska. We have held one face-to-face meeting and two Zoom meetings with Dean Baas facilitating and Extension faculty, UNL Researchers, NRCS and the ag industry participating. We plan to meet via Zoom and complete the process this year.