NORTH DAKOTA– Whole System Approach to Crop & Livestock Integration in Northern Great Plains

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In the fall of 2018, an NDSU research team was awarded an NCR-SARE grant to holistically study crop and livestock integration to determine the value of cover crops and cover crops plus livestock to a cash-cropping system and a drylot management system (as separate or combined enterprises). The project will measure changes to soil health metrics as a result of cover crops with or without grazing. It will also compare animal performance between cover crop grazing and drylot with weaned calves.

Cover crops emerging in corn.

Planting cover crops into corn on July 1.

Today crop and livestock enterprises are more segregated than ever. With better data, more agreements can be achieved between crop and livestock farmers so both may gain. For the crop farmer interested in cover crops, livestock represent a short-term return on investment. For the livestock producer, cover crop grazing can reduce strain on winter feed stores and time in the feedlot.

Historically, many barriers have existed, including lack of interest. With cover crop acres increasing, farmer experience and research efforts have increased accessibility, visibility, and acceptability of cover crops, even in scenarios that traditionally hadn't supported them, such as row crops. A project goal was to compare forage production in a typical spring-wheat-to-fall-cover-crop setup vs. mid-season cover crop planting into corn, with fall grazing targeted for both. Utilizing corn acres for grazing could be a boon due to corn's popularity in the eastern and central parts of ND. However, in late seasons like 2019, the attractiveness or ability to graze following corn harvest can be limited, let alone the biomass production potential.

When the project was conceived, compaction was not a part of it. Later, we recognized that fears of animal compaction were frequently discussed among farmers. It is now one of the focal points of the soil health changes. This is being measured through traditional means (i.e., soil penetrometer), but also through precision ag data generated by equipment pulling the drill. We will be using tractor fuel efficiency, elevation, and slippage to serve as a proxy for changes to soil compaction following grazing and help to better account for the high spatial variability of hoof traffic.

A key to the success of our project is farmer involvement. It is one thing to demonstrate concepts through research, and another to logistically manage a concept on-farm. Three farmer cooperators will be grazing rye following corn harvest. Rye will be aerially spread mid-season, as that is the most available method to plant into standing corn. Farmers will report experiences with the practice and note challenges throughout the process.

This year has proved difficult for much of the Midwest. The delayed planting, cool summer, and water-logged fall have changed the expectations for production this year. Even though 2019 is anomalous compared to recent years, our experiences this year will be representative of possible outcomes for anyone utilizing this system.