

Soils in the monitored field are Elmvale and Augsburg. These soils are classified as very fine sandy loams, and dominate large acreages in the southern part of the Red River Valley. In general, soils in this region have glacial lake deposited parent material referred to as lacustrine parent material. Lacustrine material is well sorted and fine-textured, having finer silts and clays. Soils formed from lacustrine parent material are poorly to very poorly drained. Therefore, the addition of tile to the farming enterprise was a high priority. Available water holding capacity varies, but averages about 1.5 inches per foot.



Results of the most recent soil samples collected from the field are summarized in the table below.

SOIL PROPERTY	VALUE
pH	8.0
Organic Matter %	4.2
Soil Test Phosphorus (Olsen), ppm	23
Soil Test Potassium, ppm	112
Zinc Test, ppm	0.9

These values are representative of farm enterprises in the area where producers are focused on producing profitable crops. The high pH is a consequence of the parent material, which is strongly calcareous. Values for phosphorus, potassium and zinc are in the medium range defined by University of Minnesota standards and additions of these nutrients will be needed in a fertilizer program for growing corn and soybeans.

EQUIPMENT INSTALLATION

Tile lines from the entire field drain to the southwest corner where the water is then pumped to the surface and exits the landscape by road ditches. When water is flowing through the tile lines, equipment installed at the pump station automatically collects water samples. Frequency of sampling is dependent on flow volume. Other instruments at the site continuously record precipitation, temperature and other climatic variables. The site was fully operational in the fall of 2012 and monitoring will continue for the duration of the project (5-7 years).

Collected samples are analyzed for total suspended solids, total phosphorus, phosphate phosphorus, total kjeldahl nitrogen, ammonia, nitrate nitrogen and chloride. By combining a measure of water flow and sediment and nutrient concentrations, it will be possible to calculate total nutrient and sediment movement.

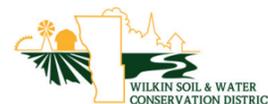
CONCLUSION

The Discovery Farms Minnesota project at the Nordick Farm is designed to provide information to better understand how farm management practices can impact sediment and nutrient movement through tile lines in the southern Red River Valley. Throughout the 5 to 7 year duration of this project, the site will provide information on sub-surface water quality and nutrient loss in these types of agricultural systems. Gathering this information from the Nordick Farm will help to identify some of the strengths and challenges of similar farming systems and landscapes.

FOR MORE INFORMATION, PLEASE CONTACT

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www.discoveryfarmsmn.org



NORDICK FARM Farm, Site and Study Design



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OVERVIEW OF OPERATION

Located in west-central Minnesota, the Nordick Farm is a family enterprise growing corn and soybeans in the southern Red River Valley. Jared Nordick, his wife Kelsey and their four children farm with Jared's dad, Jerry. Jared attended the North Dakota State College of Science at Wahpeton majoring in Farm Management and Agricultural Mechanics and returned to the family farm upon graduation. Jared is responsible for the day-to-day operations of the farm.

The farm is based out of central Wilkin County, which borders North Dakota. Water that leaves the Nordick Farm flows into Whiskey Creek, a tributary of the Red River. Once the water reaches the Red River, it flows north into Canada. Sediment, nitrogen and phosphorus movement on this flat agricultural landscape present a serious concern.



Jared is interested in learning how the Nordick Farm is affecting sediment, nitrogen and phosphorus movement. He believes it is important to document this movement and to adjust farm management practices to achieve the best possible outcome. Jared believes that participation in the Discovery Farms program will be a valuable learning experience for him as well as his neighbors.

CROPPING SYSTEM

The Nordick Farm utilizes a corn-soybean rotation. When corn is grown, a hybrid with a relative maturity of 90 days is planted during the first part of May at a seeding rate of 35,000 plants per acre. Fertilizer is broadcast in the spring and incorporated before planting with additional fertilizer applied near the seed during planting. A herbicide combination of Roundup, Volly, ATZ and Callisto is used on corn acres. Time of harvest is weather dependent and occurs when grain moisture content is appropriate. Corn residue is chopped at harvest with an attachment that fits on the combine eliminating an additional stalk shredding operation. Fall tillage following corn is achieved with the use of a soil preparation tool manufactured by Sunflower. A field cultivator is used in spring to prepare the seedbed.



When soybeans are grown, a variety in the 0.6 maturity group is planted during the last part of May in 30-inch rows at a rate of 200,000 seeds per acre. Soybeans planted are usually a variety that is tolerant to Iron Deficiency Chlorosis. Fertilizer is not applied during the years when soybeans are grown. Roundup is used on the soybean crop.

LOCATION AND CLIMATE

Wilkin County is part of the Red River Valley which formed from Glacial Lake Agassiz. Glacial activity in the region resulted in the poorly drained, silty and clayey soils that are present today. Wilkin County is located in the flattest and driest region of Minnesota. The region is primarily used for growing grain with little livestock activity.

The average annual precipitation is 25.2 inches. Nearly 75% of the annual precipitation falls between April and September. Average annual snowfall is 34 inches. During the growing season, the average temperature is 68° F with an average daily high of 81° F. The average temperature during the winter months is 10° F with an average daily low of -1° F.

FARM AND SITE SELECTION

The initial farm visit occurred during the early spring of 2012. The field most suitable for monitoring (160 acres) has been recently pattern tilled with a spacing of 80 feet and a depth of 3 feet. This site was selected to be a Discovery Farm because the cropping system and landscape are typical of other farms in the region and the monitoring site is capable of producing a robust and reliable data set.

Water that is drained from the monitored field flows to a sump pump located in the southwest corner of the field. All water is then pumped into an adjacent road ditch. The monitored field is almost level (1.1% average slope) which creates very little surface runoff. Because of the flat topography, surface runoff is not monitored and only water that flows through the sump pump is sampled.

