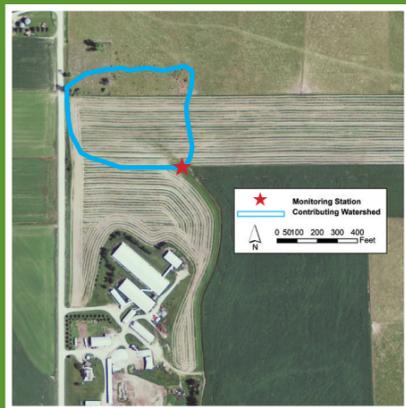


FARM AND SITE SELECTION

The initial farm visit occurred in the summer of 2010 with a tour of the fields to evaluate potential sites for surface water monitoring. This was the first Discovery Farm selected for this region because cropping practices, manure management and landscape at SFI are typical of the area and there was a field site capable of generating a robust dataset.

The site selected for monitoring provides edge-of-field evaluation of fields with an alfalfa-corn rotation and manure application. The purpose of this study design is to determine the quality of water coming off of the agricultural fields and how cropping and management decisions affect sediment and nutrient loss. The monitoring site was installed in a grassed waterway at the edge-of-field boundary. Surface water runoff from approximately 6 acres flows through the monitoring site. The monitored field has an average slope of 6.7%.



The area outlined in blue delineates the monitored field. All surface runoff in this area moves in the same direction and flows through a water monitoring station. The star indicates the location of the water monitoring station.

Soil in the monitored field is classified as a well-drained Mt. Carroll-Hersey silt loam. Soil samples (0 to 6 inches) were collected from the field in June of 2010. The results of the analysis of these samples are summarized in table below. The values for P and K are classified as very high and high respectively. The very high P test is attributed to the normally high P values for these soils combined with the manure application history.

Soil Sample Analysis of the Monitored Field	
Soil Property	Value
pH	7.2
Organic Matter, %	3.9
Soil Test P (Bray), ppm	80
Soil Test K, ppm	141

EQUIPMENT INSTALLATION

The installation of the edge-of-field surface water monitoring site occurred in September 2010. The flume, wing-wall, berm and equipment needed for automatic, routine measurement of surface water runoff was installed. Weather station equipment to record precipitation, temperature and other climatic variables was also installed at this time. The surface water monitoring site at SFI was fully operational in September of 2010. Surface water runoff from the edge-of-field site will be monitored year round for the 5 to 7 year duration of this project.



Collected samples are analyzed for sediment, total phosphorus, phosphate phosphorus, total kjeldahl nitrogen, ammonia and nitrate nitrogen. 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 SFI is designed to provide information to better understand how farm management practices can impact the potential for sediment and nutrient loss to surface waters. Throughout the 5 to 7 year duration of this project, this site will provide information on surface water flow and nutrient and sediment loss in these types of landscapes. Work at SFI will help to identify some of the strengths and challenges of similar farming systems and landscapes.

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SCHAFFER FARMS, INC. Farm, Site and Study Design



OVERVIEW OF OPERATION

Schafer Farms, Inc. (SFI), established in 1886, is a beef cow-calf and swine farrow-to-wean livestock operation located near Goodhue, Minnesota (www.schaferfarm.com). It is owned and operated by Lowell and Pat Schafer and their two sons and daughter-in-laws; Brandon and Monica and Brian and Heather. Lowell, Pat, Brian and Heather manage the beef operation and crop production, while Brandon and Monica oversee the swine enterprise and manure management.

The Schafer family's interest in environmental quality was one of the major factors behind the selection of SFI as a Minnesota Discovery Farm. As the 6th generation to farm the land, Brandon and Brian appreciate the stewardship ethic of their forefathers and are working to insure that SFI will be a sustainable operation for the 7th generation.



Everything at SFI revolves around livestock. The swine component consists of a 1600 sow farrow to wean operation, producing 36,000 pigs per year. Hogs are mostly crossbred York x Landrace sows with a small nucleus of purebred York and Landrace sows used as the Grandparent. Most of the weaned pigs are marketed on a weaned-pig contract to a pork producer in a neighboring county. Some of the weaned pigs are retained as replacement gilts on the home site or fed to market weight on finishing sites owned and operated by SFI.

The cattle component of SFI is a herd of brood cows of Gelbvieh and Gelbvieh/Angus composite. Cattle are kept on pasture during the growing season and overwintered on corn stalks. The breeding program at SFI is focused on selecting for balanced traits and striving to produce cattle that

will work in all phases of production. Calves showing exceptional genetic merit, performance, structure and soundness are placed into bull and heifer development programs. SFI hosts annual bull and heifer sales offering 50-60 yearling bulls and 100-150 heifers.



Since livestock is the economic base for SFI, a large portion of the farm is utilized for forage production. There is approximately 160 acres of pasture and 190 acres of crops. The typical crop rotation at SFI consists of three years of alfalfa followed by two years of corn. Alfalfa is harvested as haylage for the cattle. The majority of the corn acreage is harvested as silage with the remainder utilized as grain for the swine ration.

To ensure protection of their land and local water resources, SFI works closely with the Goodhue Soil and Water Conservation District staff. A portion of their land is in pasture which provides year round vegetative cover. Appropriate soil conservation practices are used on the cultivated acres at SFI. For example, a rye cover crop is planted in the fall on the corn silage acres and grazed or harvested the following spring prior to planting. Use of cover crops and other conservation practices helps to keep soil movement to a minimum in the rolling hills at SFI.

Manure Management

Liquid manure from the swine barns is injected using a drag-line system in fall and/or spring prior to a corn crop and in the summer to the pasture acres. Nutrient analysis of the manure and routine soil sampling are key components to the manure management system at SFI. The manure management system assures that adequate nutrients are applied for optimum crop production while also reducing the risk of nutrient loss to the environment.



SFI produces more manure than can be effectively utilized on their farm. To effectively manage this situation, SFI trades excess manure to other farmers in the immediate neighborhood for corn stalks used in their cattle operation.

Best management practices to control odors from the livestock operations are utilized at SFI. Trees and shrubs are planted around the barn exhaust fans and other key areas. These trees help disperse any dust or odor as barns are being ventilated. The drag-line system used to inject manure also helps to control odors during application.

Location And Climate

SFI is located in the southeastern non-glaciated region of Minnesota. The region is characterized by broad, rolling ridges and narrow valleys cut by one of the region's numerous rivers and streams. The farm is located in the upper portion of the Wells Creek watershed, approximately 12 miles from Lake Pepin and the Mississippi River. Area soils mostly consist of deep loess deposits overlying limestone bedrock. A large percentage of this region is farmed due to the productive agricultural soils. Mean daily temperatures are 17°F and 69°F for the winter and summer months, respectively. Average annual precipitation is about 30 inches, most of which occurs during the growing season. On average 27 inches are in the form of rain and 3 inches are in the form of snowfall.

