

The area outlined in blue delineates the monitored field. Red lines represent the location of subsurface drainage tiles. All surface and subsurface runoff in the blue area moves in the same direction and flows through a water monitoring station. The triangle indicates the location of the water monitoring station.

The soils in the field selected for monitoring are classified as Flom and Ves loams. The Flom loam is considered to be poorly drained while the Ves loam is considered to be well drained. Both soils have a high water holding capacity.

Soil samples, routinely collected from Meyer Dairy, are used to guide the application of fertilizer and manure. The most recent soil sample results (0 to 3 and 3 to 6 inches) from the monitored field are summarized in the table below.

Soil Sample Analysis of the Monitored Field		
Soil Property	Value (0-3)	Value (3-6)
pH	6.9	6.9
Organic Matter, %	5.7	5.5
Soil Test P (Bray), ppm	73	65
Soil Test K, ppm	300+	289

## EQUIPMENT INSTALLATION

Installation of the edge-of-field surface water and sub-surface drainage monitoring sites occurred in February 2011. The flume, wing-wall, berm and equipment needed for automatic, routine measurement of surface water runoff was installed along with sub-surface drainage monitoring equipment, including an agri-drain structure. Weather station equipment to record precipitation, temperature and other climatic variables was also installed. The surface water and sub-surface drainage monitoring sites at Meyer Dairy were fully operational in March of 2011. Surface water runoff and sub-surface drainage from the edge-of-field sites 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, chloride, total 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 Meyer Dairy 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 this type of agricultural operation. Work at Meyer Dairy 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](http://WWW.DISCOVERYFARMSMN.ORG)



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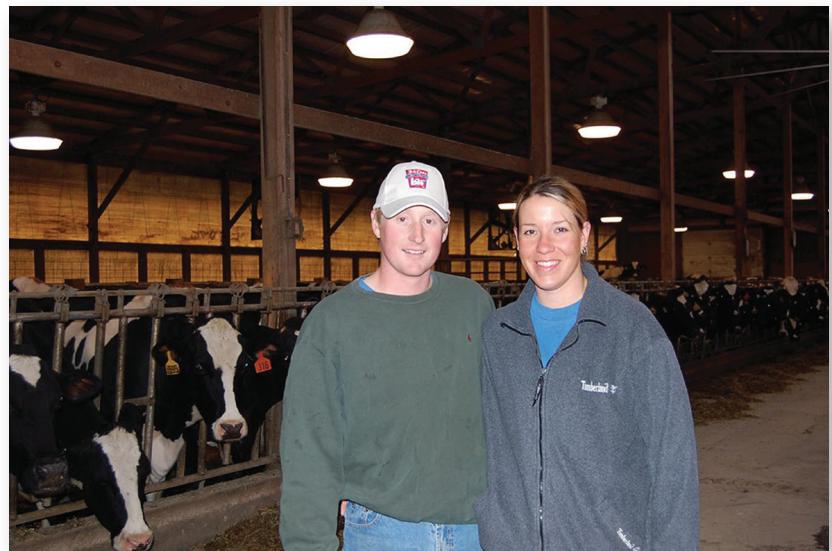
# MEYER DAIRY

## Farm, Site and Study Design



## OVERVIEW OF OPERATION

Meyer Dairy is a family dairy farm located just south of Sauk Centre, Minnesota in Stearns County (<http://meyerdairy.wordpress.com/>). It is owned and operated by Nick and Tara Meyer. Nick and Tara both work full time on the farm, overseeing all farming and financial aspects of the business. They have a son Tyler (born 2009) and a daughter Madeline (born 2011).

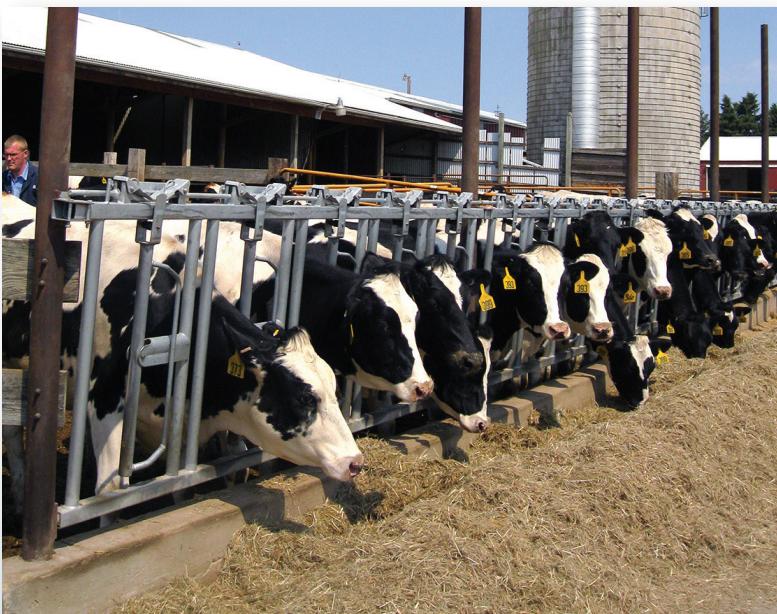


Meyer Dairy is very conscientious about conservation on their farm. "We are proud to be a part of the Discovery Farm program because, as farmers, we know environmental stewardship and farming go hand in hand," says Tara. The Meyers are quick to say that conservation is just part of how they think about the future generation and farming decisions at Meyer Dairy are made to ensure the farm remains economically sustainable and environmentally compatible far into the future.

Nick was raised on this farm. In 2003, Nick started leasing the 120 cows and equipment from his parents, Gerald and Joyce, and thus began the farm transfer process. The Meyers built a 143 stall freestall barn in the summer of 2003 and moved cows into the barn the following fall. A double-eight parlor was constructed and functional by 2004. The Meyers currently milk 175 cows twice a day and deliver their milk to the Land O' Lakes co-op, where it is made into cheese. All of the dairy youngstock are raised on-site.

The Meyer's own 360 acres which they utilize to grow feed for their dairy cattle. The typical cropping rotation at Meyer Dairy is four years of alfalfa followed by four years of corn. Crops are fed to cattle in the form of high moisture corn, corn silage and haylage. Additional feedstuffs are purchased as needed including corn, hay, straw, cornstalks and protein mix. Approximately 60% of their tillable acres are tile drained to ensure high crop productivity.

To protect their land and local water resources, Meyer Dairy works closely with the Stearns County Soil and Water Conservation District. The Stearns County SWCD wrote a comprehensive nutrient management plan for Meyer Dairy in 2003 and continues to work with the Meyers each year to adapt the plan to current conditions. Recognizing their exceptional conservation efforts, Stearns County SWCD awarded Meyer Dairy the 2009 Outstanding Conservationist Award.



## Manure Management

Meyer Dairy manages their manure to assure that adequate nutrients are applied for optimum crop production while also reducing the risk of nutrient loss to the environment. Their manure management system involves regular soil testing, manure testing and proper nitrogen crediting. Liquid manure from the manure storage basin is injected in the fall or spring to the cropped acres that will be planted to corn. Pen pack manure from the barn and calf area is surface applied where needed and incorporated into the soil profile within 24 hours. Injection and incorporation of manure helps to reduce nutrient losses to the atmosphere and surface waters.

## Location And Climate

Meyer Dairy is located in the north central hardwood forest region of Minnesota. The region is characterized by rolling plains with a mix of woodlands, row crops and pasture. The farm is located in the Upper Sauk River watershed, approximately 4 miles from the Sauk River. Area soils mostly consist of glacial till deposits. Mean daily temperatures are 15°F and 70°F for the winter and summer months, respectively. Average annual precipitation is about 27 inches, most of which occurs during the growing season. On average 23.5 inches are in the form of rain and 3.5 inches are in the form of snowfall.

## FARM AND SITE SELECTION

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

The site selected for monitoring provides an edge-of-field evaluation of fields with an alfalfa-corn rotation and manure application. The surface monitoring sites captures water from a 28 acre area and the sub-surface monitoring site drains approximately 24 acres. The purpose of this study design is to determine the quality of water leaving the agricultural field and how cropping and management decisions affect sediment and nutrient loss.

