Johannes Farm and Feedlot Diverts Clean Water

Teresa Pierson and Ron Wiederholt

Spring melt rarely fails to leave its mark on North Dakota's farms and ranches. It only takes once losing an overwhelmed muck boot to a mocking mud puddle to know that this time of year presents a special challenge in "water management." The Doyle and Patsy Johannes family, Underwood, N.D., is excited at the prospect of future springs with less mess and fresher runoff due to their farmstead's new clean water diversion.

The Johanneses joined the North Dakota Discovery Farms program to study the relationship between their feedlot and the nearby Missouri River watershed. Three gaging stations collect samples as water leaves the feedlot and runs downslope toward the watershed. The Johanneses have eagerly awaited data to quantify how much nitrogen and phosphorus is coming off the feedlot and to what extent natural vegetation lowers the amount of nutrients as runoff approaches the river. Now, they have answers.

Discovery Farms data shows that March is the only time a considerable amount of nutrients exit the feedlot. This doesn't surprise Doyle, knowing all too well the spring melt dilemma. Still, he says, "It is helpful to quantify the nutrients, and it is really good to see that there is a large reduction in nutrient load before runoff hits the river." Station three had a near 60 percent decrease in nitrogen load compared to station one.

Nevertheless, Doyle and Patsy wanted to reduce the nutrients leaving altogether and envisioned a diversion that would take water around the farmstead, rather than through it. "A lot of snow hangs up in the shelterbelt north of the place," Doyle says. "When it melts, the water heads straight for the feedlot. We thought a diversion would not only clean up the water, but also benefit the livestock."

The Johanneses presented the idea to Ron Wiederholt, North Dakota Discovery Farms program coordinator, who was in full support. "Doyle and Patsy saw an opportunity to better their operation and the environment, and they ran with it," he says. "This is exactly what we hope to see come out of the Discovery Farms program."

The North Dakota Stockmen's Association also offered their support, providing 60 percent cost share for the improvement. K_2S Engineering Inc., Jamestown, N.D., was hired to implement a berm and ditch system that will divert the clean snowmelt around the north and west sides of the farm. Doyle has since taken advantage of the berm by moving his feed bunks on top of it and sloping it back for the cattle, creating an even drier environment for feeding.

Water that eludes the feedlot as well as that which doesn't will continue to be monitored through the Discovery Farms program. Past results will be compared with new data to evaluate the effectiveness of the diversion and to further explore the relationship between agriculture and the environment. In this way, the Johanneses will continue to make research-based decisions and share their experiences with knowledge-hungry peers. Even spring melt doesn't stand a chance against these informed agriculturists.

For more information on the monitoring being done at the Johannes site, check out the article "Impacts of snowmelt on feedlot runoff nitrogen loading" on page 50 of the 2012 ND Beef Report at http://www.ag.ndsu.edu/cattledocs/research-reports/2012-beef-cattle-and-range-research-report/view.

A berm now serves as the barrier between Johanneses' feedlot and the shelterbelt that collects snow throughout the winter.

The clean water that is diverted from the shelterbelt north of Johannes Farm and Feedlot flows around the west side of the operation to a roadside ditch, where it passes through a culvert and into the first of three North Dakota Discovery Farm gaging stations.

The end of the diversion ditch is rocked to reduce erosion.