



Western New York Farm Reaps Benefits of On-Farm Manure Incorporation Study

By Sara Zglobicki

When asked why he chose to participate in a recent reduced-tillage manure incorporation study, Willard DeGolyer commented that given past research experience, taking part in this study “just made sense.” DeGolyer alternates between 3 years of corn and 3 years of alfalfa-grass hay mix while tending 1050 milking and dry cows and 850 youngstock cows at Table Rock Farm in Castile, NY. DeGolyer’s family shares in the work. His uncle, Calvin DeGolyer, still has some stock in the farm, and his daughter Meghan Hauser is his partner as well as the fourth generation on the farm.

Table Rock is one of ten sites collaborating with the Cornell Nutrient Management Spear Program (NMSP) of the Department of Animal Science on a 2-year manure incorporation study. Funding from the New York Farm Viability Institute (NYFVI) and Northern New York Agriculture Development Program (NNYADP) made the on-farm trials possible. The research compares corn yield, forage quality and soil characteristics in plots where manure is surface applied and (1) not incorporated, (2) shallowly incorporated with an aerator (Aerway) or (3) incorporated with a chisel plow or injected. Table Rock Farm is the only site where manure is injected into the soil instead of chisel-incorporated.

At Table Rock Farm, most of the manure is injected as a general practice. “Injection helps

us make the best use of nitrogen for crops, with the side benefit of reducing odors and reducing the risk of losing nutrients off the fields with heavy rains,” DeGolyer explains.

Karl Czymmek, senior extension associate with PRODAIRY and key collaborator in the project, identified the three goals of the study. “First of all, discussion in the popular press led to an increased awareness among farmers that reducing tillage improves soil quality and reduces negative environmental impacts. Lower equipment costs, fewer trips across the field, and reduced labor were economic motivators. Finally, mixing manure with the soil provides odor control while capturing ammonia-N which could increase yield, reduce the need for fertilizer, or do both.”

History of On Farm Research

Early on, Willard and the Table Rock Farm cropping team put to use past work with Dr. Bill Cox, Professor of Crop Management and Dr. Jerry Cherney, Professor of Forage Quality and Management, at Cornell University’s Department of Crop and Soil Sciences, which showed benefits of growing corn in 15-inch rows, noting that “narrow rows increased our yields.”

In 2006, the cropping team posed a new question, “We thought our corn might be short on nitrogen, because we noticed our neighbor’s



The cropping team of Table Rock Farm, a 1050 cow dairy farm in Western New York. From left to right: Richard Sanford, Ryan Domes, Doug Luce, Jeffrey Jordan, and Ed James.

corn, growing faster and greener with more N earlier in the season." Cox insisted that they needed to compare N application rates and measure the yield to be able to conclude if there was a difference at the end of the season and connected the farm team with Quirine Ketterings, leader of the Cornell Nutrient Management Spear Program. Their teams worked to establish a side-by-side comparison of different amounts of N starter fertilizer on corn. The results demonstrated two years in a row that he did not need any starter N fertilizer to maintain optimum yield at regularly manured fields. As a result, the cropping team decided to stop using starter fertilizer on the farm. DeGolyer observes that "not using starter fertilizer reduced a major cost while helping the nutrient balance on the farm." While time is a valuable resource at Table Rock Farm, participation in these projects has paid off and the team eagerly continued the collaboration knowing the results may provide a way to test injection methodology and maybe save money.

Benefits of On-Farm Research

Table Rock Farm's cropping team has a long history of asking the questions necessary to improve techniques and yields. With a cumulative 72 years of experience among the four primary members of the team, there is a level of comfort in knowing the land, knowing what has worked on the farm, and realizing what needs to be questioned and improved. To that end, the team has embraced the opportunity to work with Cornell on research projects.

In addition to directly seeking answers to farmers' questions, another benefit of on-farm research is rapid sharing of results with surrounding farms. As DeGolyer notes, "I'm in a progressive area. Farmers watch their neighbors very closely, and information goes back and forth very easily in different areas of the state."

DeGolyer values the unbiased research that provides quality, useful information to farmers

and is supported by extension and university personnel. He comments that such personnel "are unsung heroes in what they are doing for agriculture in the Northeast. These quality people spark my interest and that of my employees. This drives us to look forward to the next cropping year, and that is what it's all about."

Anne Place, graduate student with the NMSPP working on the manure application study as part of her thesis, adds such collaborations go both ways. Anne commented that, "Farmer participation in projects like this one helps us find out what farmers are interested in. They help us direct where the research program should be going so that we can conduct useful studies and provide reliable and applicable information to the farmers."

2008 and 2009 Trial Results

At Table Rock Farm, there was an unexpected 4 ton yield advantage of manure injection over Aerway incorporation in both 2008 and 2009. However, the yield increase did not seem to be a result of N conservation with the injection method; the presidedress nitrate test (PSNT) and the late season corn stalk nitrate tests (CSNT) indicated sufficient N, also for the Aerway plots.

"The results at Table Rock Farm show us we need to do more work on injection technology. If we get similar yield differences in others parts of the state and under different growing conditions, the technology will quickly pay for itself. At this stage, it is unclear what exactly caused the yield increase as it does not appear to be a nitrogen effect. So, additional work is needed." Ketterings concludes.

"What we've learned has given us new confidence in what we are doing and has showed us our on-farm practice is working well," DeGolyer concludes.

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The **Nutrient Management Spear Program (NMSPP)** is an applied research, teaching and extension program for field crop fertilizer and manure management on dairy and livestock farms. It is a collaboration among faculty, staff and students in the Department of Animal Science, Cornell Cooperative Extension, and PRO-DAIRY. Our vision is to assess current knowledge, identify research and educational needs, facilitate new research, technology and knowledge transfer, and aid in the on-farm implementation of strategies for field crop nutrient management including timely application of organic and inorganic nutrient sources to improve farm profitability while protecting the environment. An integrated network approach is used to address research, extension and teaching priorities in nutrient management in New York State. For more information on NMSPP projects and extension/teaching activities, visit the program website (<http://nmsp.cals.cornell.edu>) or contact Quirine Ketterings at qmk2@cornell.edu or (607) 255-3061.