



Table Rock Farm Reaps Many Benefits Through On-Farm Research Partnership

By Lisa Fields

Table Rock Farm in Castile, Wyoming County started their on-farm research partnership with Cornell's Nutrient Management Spear Program (NMSP) in 2006 when senior farm partner Willard DeGolyer posed a question about the corn crop's nitrogen needs. He explained, "When I noticed my neighbor's corn coming up out of the ground a darker green color than ours I wondered if we might benefit from adding more N fertilizer to our corn. I spoke with Bill Cox (Professor of Crop Science) and he said we needed a measured comparison of the yields to know the answer." Cox connected DeGolyer with NMSP's leader, Associate Professor Dr Quirine Ketterings, and their successful working relationship began.

At Table Rock, the starter N rate routinely used was 30 pounds per acre. For the study, 3 nitrogen rates were used in 2nd year corn: 0, 30 and 60 pounds per acre in the band at corn planting time. DeGolyer stated, "There was no yield difference between the 3 rates. We found that the manure we were applying supplied sufficient N in that growing season. The results were the same in 1st to 4th year corn fields in 2007, convincing us to cut out starter fertilizer." That had a significant economic impact as the farm typically grows 570 acres of silage corn to feed their 1,050 cow herd.

Beyond changing a specific management practice, DeGolyer commented on deeper impacts of research participation. "For us, much of the excitement of farming is looking forward to the next year in anticipation of improvement. We're always asking ourselves how we can we do a better job. We've been doing research for enough years now that it's part of the farm's culture. During our team discussions, we pose our questions in the context of research projects to get the answers we're seeking." Table Rock's approach to crop management and the team structure of the farm are recipes for successful collaboration.

Meghan Hauser, DeGolyer's daughter and farm partner elaborated. "The Cornell Team

and our crop team work around the shop break room table together, determining what went right and wrong with the previous year's plots, discussing the study findings and selecting new topics to explore. As a result of this process, both teams end up sharper and with a clearer picture of what we need to know and to learn to be successful farmers in the future."

DeGolyer added, "The farm employees look forward to these meetings. We're all equally invested in having the kind of communication you need to make this work. Having a crop team that increases their knowledge and awareness of current research by being directly involved is a big benefit to any employer."



Figure 1: From left to right: Quirine Ketterings (NMSP), Bill Verbeten (Cornell Cooperative Extension), Karl Czymmek (PRODAIRY and NMSP), Derek Zerkowski and Greg Godwin (NMSP) and Willard DeGolyer. Meghan Hauser took the photo at lunch after the 2013 farm meeting.

Table Rock's objectives and goals are clear, which is key for the research to work well for both the farm and the NMSP team. DeGolyer stated, "We look to achieve long term benefits here of improved soil health, increased yields and a better economic bottom line."

In addition to the starter N study, Table Rock has participated in manure incorporation method and manure rate studies. DeGolyer commented on the projects. "In 2008 we saw

a 4 ton per acre greater yield in fields where manure was injected compared to fields where we used the Aerway to surface incorporate manure. The nitrogen testing tools, the pre-sidedress soil N test (PSNT) taken when the corn was 6-10" tall, and the corn stalk N test (CSNT) performed at the end of the growing season showed sufficient N for the crop in both manure treatments. The yield difference was real but it wasn't driven by nitrogen, so understanding why requires more examination. Meanwhile, the crop performance let us know we're on the right track." The manure rate study in 2010-2012 compared the farm's standard practice of applying 9,000 gallons to 12,000 and 15,000 gallons per acre to determine if higher rates would impact yield. Three years of data showed no benefit to increasing the rate.

Ketterings described NMSP's work with Table Rock as an example of "Adaptive Nutrient Management". "Adaptive nutrient management is a process that's highly effective in improving individual field and whole farm nutrient use efficiency. At the onset, the process involves characterizing a current approach and comparing that to a management alternative or two. At Table Rock in 2006, the farm conducted the replicated trials to decide on starter nitrogen fertilizer use, and then took action when the results convinced them they could meet corn nitrogen needs with manure only. We used the farm's whole farm mass nutrient balance to evaluate the impact of management changes on nutrient use. The NMB went from 161 lbs of N, 28 lbs of P and 65 lbs of K per acre remaining on the farm in 2005 to values at or below 100 lbs N, 13 lbs P and 40 lbs K per acre these past three years despite including drought years. These are impressive numbers from an environmental perspective, and there's a definite positive economic impact for the farm."

The benefits of the work at Table Rock went beyond benefits to the farm itself. Ketterings stated, "The work done at Table

Rock enabled us to obtain the funding to expand the work to many other farms. The idea is to implement trials statewide so that most NY farms can see data from a region they can relate to. That's the best way for outreach to achieve success in implementing change."

To illustrate the benefits, following the starter nitrogen work at Table Rock, 21 on-farm trials were conducted statewide, comparing 0 and 30 lbs nitrogen per acre in the starter band. Ketterings added, "The results of the statewide project also showed that manure could replace the need for starter nitrogen, consistent with the findings at Table Rock, but now applicable across a variety of soil types and growing conditions."

When asked about the challenges involved with on-farm research, DeGolyer replied, "Over the years the program's team has learned how to work with our unpredictable schedule where timely harvest must be the number one priority and weather dictates when that happens. Although harvesting plots may take a little longer, it hasn't hurt our forage quality or harvest efficiency. The benefits greatly outweigh any minor inconvenience. We're lucky to have the talent that we do at Cornell. The staff are there to work with you and have a great deal to offer."

Years of projects that were key to successful crop management changes has etched a philosophy at Table Rock. DeGolyer summed it up: "We live by the motto of measured results versus drive-by observations."

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To learn about the New York On-Farm Research Partnership and/or participate in trials, see: <http://nmisp.cals.cornell.edu/NYOnFarmResearchPartnership/index.html>. We welcome farmers and farm advisors to work join the program and help us set research priorities!



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The **Nutrient Management Spear Program** (NMSP) 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 NMSP projects and extension/teaching activities, visit the program website (<http://nmisp.cals.cornell.edu>) or contact Quirine Ketterings at qmk2@cornell.edu or (607) 255-3061.