



## Research leads to lower nitrogen rates on corn

Mike Kiechle, a Philadelphia, N.Y., dairy producer, didn't hesitate to participate in a research project on precision nitrogen (N) management on corn when Mike Hunter, Jefferson County Extension educator, asked him. "The project sounded interesting and allowed me to be on the front line," Kiechle said. "It was a win-win situation: The project didn't cost anything and ended up saving me money."

Hunter was equally eager to work with Cornell University researchers and graduate student Joe Lawrence on the N management research. "With the rising costs of nitrogen fertilizer and the importance of sound nutrient management practices on farms today, we need research projects such as this one to provide answers that help us make better decisions on the farm," said Hunter. "I benefited by learning more about field crop production, and farmers got an answer to their big question: 'Will it work on my farm?'"

In cooperation with Cornell Cooperative Extension field crops Extension staff and the private sector, the research included 16 trials on farms and at research stations in 2005 and 2006 to determine N needs for first-year corn following grass/legume sods, explained Karl Czymmek, Senior Extension Associate with Cornell's PRO-DAIRY program and a key collaborator on the project.

"With this project, we focus on determining under what situations extra N would be good to add and when we can save money by reducing fertilizer applications without impacting yield and quality," said Quirine Ketterings, leader of the Nutrient Management Spear Program (NMSP) and an Associate Professor in the Department of Crop and Soil Sciences. "This is the best way to minimize the potential negative environmental and economic impacts of excess N fertilizer use."

That's critical, given the number of acres of corn grown for silage in New York State – some 520,000 in 2005 – and the increasing cost of N, which is currently 40 cents per pound. Helping farmers cut their N use improves their bottom line and prevents losses into the environment.

"We set out to test if we needed starter and sidedress N for corn silage and looked at not just dry matter yields but also silage quality," said Lawrence, who worked on the research as part of his Master's thesis in Cornell's Department of Crop and Soil Sciences.

### Real world research

Prior to the N research trial on his dairy, Kiechle applied 50 pounds of N in the starter on first-year corn out of sod. When he learned from the first year of research that corn did not respond to additional N beyond a small starter, Kiechle cut N to no more than 30 pounds in the starter and eliminated sidedress N.



Mike Kiechle, dairy producer who milks 110 cows in Philadelphia, N.Y. (right), talks with Mike Hunter, field crop extension educator with Cornell Cooperative Extension of Jefferson County (middle), and Kevin Dietzel, of the Nutrient Management Spear Program (left), during a break at harvest of the nitrogen trial at Kiechle's.

The research on the N needs of first-year corn "pointed out I was oversupplying N," said

Kiechle, who milks 110 cows, grows 80 acres of corn, 40 acres of oats, green-chopped, and 70 to 80 acres of alfalfa-grass mix. "I wasn't giving manure enough credit." Kiechle daily spreads, reaching as many acres as possible.

Cutting N in the starter had several positive results. Kiechle saw a difference in the appearance of his corn and the quality of silage. He saw increased energy levels in corn silage but minimally lower crude protein. Best of all, yields did not suffer: Kiechle harvested 20 tons of corn silage in 2006, which he admits isn't "too shabby on clay. I'm happy with 18 tons and excited with 20."

"Thanks to the work of Cornell Cooperative Extension educators, PRO-DAIRY staff and industry, and the participation of producers like Mike Kiechle, we demonstrated that producers can save a significant amount of money by applying just a small starter N application and not sidedressing or using broadcast N fertilizer for first-year corn," Ketterings said.

### Joint effort

Everyone involved in this research agrees on this point: The research is a model for collaboration and for generating truly valuable information for researchers, educators and farmers.

"Working with Extension offices and producers around the state, in conjunction with research farm trials, is vital," Lawrence said. "Without the on-farm component, it would be very difficult to get a large enough dataset together, and we would not be as effective in getting our message out."

Hunter agrees: "The combination of farmers, Extension and Cornell working together on research projects is extremely valuable in the sense that we form a team that is focused on finding the answers to questions and learning together. Farmers are an extremely important part of the research

because they bring another element of credibility into the equation."

Hunter disseminates information on the research through Extension newsletters and when working one-on-one with farmers. Also, the project report will be presented at the 11<sup>th</sup> Annual North Country Crop Congresses, be attended by approximately 175 farmers and agri-service people.

Another collaborator in the N in corn research is the Northern New York Agricultural Development Program (NNYADP), which funded a portion of the research in the North Country. NNYADP co-chair Jon Greenwood, a dairy farmer himself, emphasizes the importance of supporting this research: "The Northern New York Agricultural Development Program considers precision nitrogen management for corn research a good way to marry science and practicality with the goal of developing efficient, cost-effective production practices that are environmentally-friendly and can be used by farmers throughout the region."

"It takes the dedication of a large group of people to conduct these research projects," Ketterings said. "We are fortunate in New York to have Cornell Cooperative Extension field crops educators willing to work together and to work with us to get questions answered through on-farm research. These educators have the relationships with producers that allow us as a team to be responsive to producers' concerns. Such collaboration benefits farm productivity and the environment."

*By Eleanor Jacobs*



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The **Nitrogen for Corn Project** was initiated to evaluate the need for starter and side-dress N for corn following plow-down of grass or legume sods. Cornell University's Nutrient Management Spear Program (NMSPP) faculty and staff, PRO-DAIRY staff and Cornell Cooperative Extension educators worked together to conduct 16 first year corn trials and 12 second year corn trials on-farm and on Cornell research stations in 2005 and 2006. The project was funded with grants from the New York Farm Viability Institute (extension-industry grant), the Northern New York Agricultural Development Program (NNYADP, for NNY sites in the project), and federal formula funds (feed quality component). The results of the first year corn trials show us that (1) no additional N beyond a small (30 lbs N/acre) starter is needed for optimum yield and quality of first year corn, independent of sod composition or turnover time – fall vs. spring, and (2) we can skip the PSNT for first year corn. As for second year corn sites, five of the twelve sites showed a significant yield increase, with the average optimum economic N rate ranging from 90 to 110 pounds of N per acre, plus the 30 pounds N per acre as banded fertilizer. The other seven sites did not show a yield response upon side-dress N addition. This included a field that yielded 30 tons per acre in the second year following spring plow-down of a 20% alfalfa sod and no manure or side-dress N. We are currently evaluating 6 management tools that might help identify fields that don't need the additional N.