



## Extension educator carries Starter P message

**Tom Kilcer** is a link in the education chain that informs farmers about the Starter P Project. The Cornell Cooperative Extension educator and agronomist carries the key message from the statewide phosphorus (P) project to farmers in Rensselaer, Albany, Schenectady and Columbia counties.

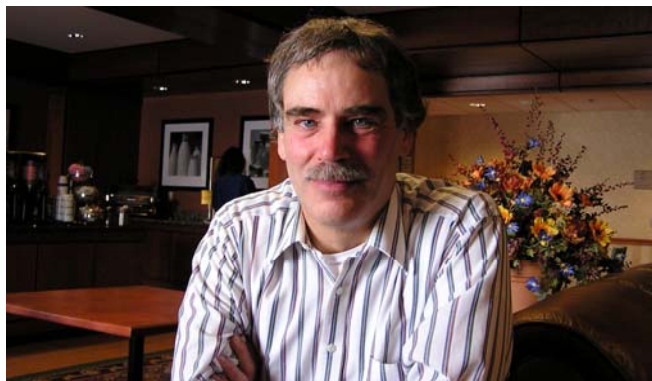
The project's message is this: on fields that soil test high in soil P, farmers can expect no yield penalty with P starter levels below 25 pounds P<sub>2</sub>O<sub>5</sub> per acre and for very high P fields, no additional P fertilizer is needed at all. When manure is applied to fields testing high or very high, farmers can also eliminate P from starter with no yield penalty. There also was no loss of quality when P applications were lowered or eliminated.

The Starter P Project was a joint effort of Cornell University's Nutrient Management Spear Program (NMSP), PRO-DAIRY and Cornell Cooperative Extension educators. Together they conducted 65 on-farm and 13 research station trials between 2001 and 2003 for the Starter P Project.

"It is our mission to do applied research that addresses producer and industry questions about environmental management of farms," said Quirine Ketterings, NMSP leader and a faculty member in the Department of Crop and Soil Sciences. "We aim to extend the knowledge we gain through our research and have an impact. We want to work with the industry to achieve implementation of practices that increase farm profitability and protect environmental quality."

The Starter P Project was a model for how to accomplish all those goals, Kilcer said. "The project was both research- and farm-based. It involved farmers backed by researchers at Cornell, so that we had quality research results and rapid output of those results."

"Farmers are understandably skeptical about small plot results from research farms," said Karl Czymmek, a PRO-DAIRY specialist and a driving force in the starter P research. "They want to see results from real farms where it is often harder to control things."



Tom Kilcer, field crops extension educator of Rensselaer County Cornell Cooperative Extension.

### Changed behavior

Kilcer told farmers, "if soils test very high, the research says you don't need any additional phosphorus. Let's try growing it without phosphorus." Six to 10 farmers took him up on the idea and tested the need for starter P. Yield results and corn quality from their experiments convinced these farmers that they could safely reduce or eliminate P in the starter, Kilcer said. "Farmers who have tried it (lowering P use) have stayed with it almost consistently across the board."

On-farm test plots and farmer experience lent credibility to the results of the Starter P Project. Farmers listen to farmers. "The main marketing (of the Starter P Project) that we did was farmer examples," Kilcer said. "People who went without P in the starter band have been very favorable in their communication with other farmers."

Dave Hewitt, a Petersburg, N.Y., dairy farmer, sets an example for how effective cutting P can be. Even before the Starter P project confirmed that additional phosphorus wasn't needed in some situations, Hewitt grew 20 acres of corn with no P or potassium (K), applying straight urea. He didn't see any drop in tonnage or quality. Then Hewitt set up test plots for three fertilizer applications: full rate, half rate and no fertilizer. "The one with no additional fertilizer did as well as the corn with a full rate," Hewitt said.

At one time, Hewitt applied 350 pounds of triple-19 as starter; now he applies 65 pounds of straight urea through the corn planter. His yields: 20 tons of corn silage per acre. Economics played a role in Hewitt's decision to change his fertilizer program. "I realized we had been spending money we didn't need to," Hewitt said about his decision to feed his crops, not his soil – 80% of his fields test high in P.

As a result of the Starter P Project, two things happened, not just at Hewitt's farm but on others as well, Kilcer said. "One is that farmers have backed off on P, in some cases dramatically so. And secondly, we've increased the amount of nitrogen in the band."

Mark and Neil Stanton, Coeymans Hollow, are a case in point. They apply 30 pounds of nitrogen (N) in the band as corn starter. That's it. Strict rotations – two years corn and four years hay – and wise use of manure allow the Stantons to spend \$10 less per tillable acre on crop inputs compared to the average for dairies participating in the Cornell Dairy Farm Business Summary. The Stantons spend \$60 per acre vs. \$70 for the average of dairies in the summary.

"The thing is farmers have P there and adding more won't make a difference," Kilcer said. "With P costing 28 cents per pound, why spend money on what doesn't give a return?" Prior to their current program of N in the band, the Stantons applied 10-34-8, sometimes going to 10-34-10 or 12. By soil testing every year, the Stantons know what fields need manure. "That's why

we don't have to use P," Mark Stanton says. About 5 to 10% of the Stantons' fields test very high for P; the rest are moderate to high. The Stantons have regularly worked with Kilcer, benefiting from his advice on forage production. So it wasn't a leap for the brothers to drop P from their starter when Kilcer told them they didn't need it. "With no phosphorus we couldn't see any difference in yield," Mark says.

Scott Swartz is another farmer who took to heart Kilcer's message on starter for his corn. Years ago he applied 400 pounds of 6-24-24. Following Kilcer's recommendation, Swartz switched to 60 pounds of urea as starter. By soil testing his whole farm every year, he closely monitors P and K levels. Fields that test low for both receive manure to raise the levels. Swartz also changed his rotation to a more intensive two years of corn and four of hay. "I'll save a ton of money on chemicals and fertilizer with this rotation," Swartz says.

Many farmers improve their efficiency by switching from a fertilizer with phosphorus to applying urea in the band, Kilcer said. "They can plant all day and not stop." (Please note that due to the potential for seedling injury, Cornell guidelines suggest that no more than 65 pounds of urea be used in the fertilizer band. See Section 2.11.3 in the Cornell Guide for Integrated Field Crop Management for more details.)

#### Message methods

In addition to farmer-to-farmer communication on the results of lowering or eliminating P in the starter, Kilcer used other methods to inform farmers. He wrote Extension newsletter articles about farmers' experiences with no P. "For example, I'd say (about farmers) last year fertilizer cost them only this much, that you could plant all day long (with straight urea), and corn was as good or better than they ever had," Kilcer explained. "That's what made the program work."

Along with the Extension newsletter, Kilcer mailed out a research postcard prepared by Ketterings' team. "We used those Starter P postcards," Kilcer said. "They were really effective, putting a quick summary out to the people. We put them right in the newsletters with subjects supporting that whole concept."

#### Added benefits

Research data answered many questions farmers had. "We were able to address concerns about how no or lower Starter P would work in certain conditions," Kilcer said. "They questioned whether low P was going to work in all circumstances and weather conditions. The research substantially increased farmers' receptivity to Cornell starter P fertilizer guides." The project also "increased credibility with the agricultural audience,"

said Kilcer, who found that his message drew the attention of crop consultants, Natural Resources Conservation Service (NRCS) staff and fertilizer dealers. "We were seen as a source of reliable, unbiased, cutting-edge information."

The Starter P Project provided Kilcer and other Extension educators with the opportunity to work closer with Cornell researchers. A better working relationship resulted, Kilcer said. "It was a two-way street rather than a one-way. I can't stress enough that it was an excellent model for cooperation. It was cooperation among equals."

The way Ketterings and others organized the Starter P Project serves as a model for further collaborative work between Extension staff in the field and the college, said Kilcer. "It's wise use of limited resources to generate multiple data points."

"Key to our collaboration was standardized protocols and sufficient support for local offices," Ketterings said. "Not all offices had the equipment to determine yields or tools to determine moisture contents, for example. The Northeast SARE funding allowed us to buy scales and chippers needed to do the harvest and collect sub-samples for silage quality determination." Cornell University researchers, county Cornell Cooperative Extension educators and farmers teamed up to accomplish a common goal – to identify P needs for optimum corn production, said Ketterings.

"Because of this network approach, the project became a success," she said. "We were able to generate a database with a large number of trials covering a great variety of soil types and growing seasons, and that allowed us to determine and demonstrate that we could reduce starter P use to 0-25 pounds  $P_2O_5$  per acre on high P soils and eliminate it altogether for very high P soils without a penalty in yield or silage quality. "It would have taken at least a decade for a single researcher to do just the trials, let alone the Extension programming, that we managed to do in three years as a group," Ketterings added.

"Quirine uses the educational model to its best," Kilcer said. "She works with Extension, and they put trials on farms and farmers tell other farmers and farmers learn from farmers. She then generates a really large data base very quickly."

By Eleanor Jacobs



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The **New York Starter Phosphorus Project** was initiated to evaluate and demonstrate the value of P starter application on soils testing high or very high in soil P. Cornell University's Nutrient Management Spear Program (NMSPP) faculty and staff, PRO-DAIRY staff and Cornell Cooperative Extension educators worked together to conduct 65 on-farm and 13 research station trials between 2001 and 2003. The project was funded by a NESARE research and education grant (LNE02-173) and contributions from New York State Natural Resources Conservation Service, Agway, Carovail, Pioneer Hi-Bred International Inc., AgriCulver Seeds and the Northern New York Agricultural Development Program. Based on the results of these three years, we conclude that on sites that test *high* in P and have no manure applications planned for the season, no yield penalty is expected when P starter levels are *reduced* below 25 lbs  $P_2O_5$  per acre. On sites that test *very high* in P or when manure is applied to high testing sites, there is a low probability of a starter P response, and P could be *eliminated* from the starter without a yield or silage quality penalty. For more information, visit: <http://nmspp.css.cornell.edu/projects/starterp.asp> or contact Quirine Ketterings at [gmk2@cornell.edu](mailto:gmk2@cornell.edu) or (607) 255-3061.