



Whole Farm Analysis Project: Understanding Impact of Nutrient Management Decisions on Small Dairies

By Sara Zglobicki

In Lewis County, less than 30 miles from Lake Ontario, Marc Laribee owns and manages about 200 cows at Grace-Way Dairy Farm in Lowville, NY. A '94 graduate from Cornell University, Laribee worked on a dairy for two years before coming to his current farm. Managing nutrients on his farm has been at the forefront of Laribee's thoughts through the years.

"In school we were talking about the idea of sustainability and balancing nutrients, and I'd taken some classes along the way on these topics. It's always on my mind. Manure management is important to me; I don't want to buy a lot of fertilizer. The idea of balancing the nutrients on my whole farm is a logical step," Laribee commented.

It's no surprise that Laribee participates in the Cornell Whole Farm Mass Nutrient Balance project (MNB project) that helps farmers take this logical step. The MNB project is an effort of Cornell Nutrient Management Spear Program (NMSP), led by Quirine Ketterings, associate professor in the Department of Animal Science.

"We work with eighty to one hundred New York dairy farmers like Marc Laribee on annual assessment of whole farm nutrient balances," Ketterings says. "In collaboration with our colleagues in herd nutrition, agricultural consultants, Cornell Cooperative Extension educators and Soil and Water District personnel, we try to monitor farm nutrient balances over time."

"A mass nutrient balance is assessed on an annual basis by taking the difference between the amount of nitrogen, phosphorus, and potassium imported through purchased products and the amount exported off the farm via milk, meat, crops, manure and/or compost and dividing this by the total crop acreage," Caroline Rasmussen, research support specialist with the NMSP, and coordinator of the statewide MNB project explains.

The collected data include the amount of feed, fertilizer and bedding purchased off-farm,

crop yields, forage and manure analysis results.

As Laribee summarized, "The Mass Nutrient Balance is a management tool that gives us a good idea of where we stand in terms of nutrient management. It lets me know what nutrients are coming in and what ends up staying on the farm. For any farm to be sustainable in the long term it needs a reasonable balance for nutrients. If you have more [nutrients] going out than coming in, your yields may be low. If the opposite is true [you have a large on-farm excess], you may have water quality problems."

Through participating in the MNB project, Laribee has recognized that with his land acreage, he was able to keep nutrients balanced despite more than doubling his herd size. "There were 80 cows when I came here, and now there are about 200. We still have the same land base and things are still balanced. But we know that in the future, if I add more cows, I'll need to add more land."



Mark Laribee is one of many New York dairy farmers working with Cornell researchers to better manage the nutrient going into and out of their farms.

The Mass Nutrient Balance project also helps farmers looking to cut production costs in a tough economy. Peg Cook, a crop consultant who works with Laribee to compile his crop

data notes, "The Mass Nutrient Balance project helps farmers identify where they can maximize on-farm resources while minimizing costs. For example with the Mass Nutrient Balance report farmers can see that maybe less nitrogen fertilizer is needed for their corn. Some farmers have even come to me saying that they don't want to use any fertilizer, but only manure, so that they can better use the nitrogen in the manure."

As Cook continued, "The Mass Nutrient Balance report also helps me fine tune my manure application recommendations. Last year more farmers were incorporating their manure closer to planting time. They definitely saw an improvement in yields. Several farmers have come to me saying that I've helped them save \$6-10 thousand on their fertilizer bill."

Record Keeping: Key to Nutrient Management

The key to the Mass Nutrient Balance project and nutrient management in general is a set of good records. Laribee has kept record-keeping as simple as possible but still gets the job done. "You need to do it every day. We try to keep a booklet in the manure spreading tractor to record when and where manure gets spread. We do the best we can. In the tractor by the bunk and silo we keep a notecard and pen so we can record what we are unloading."

As Laribee expressed, "If you don't measure, you can't manage it because you're always guessing." He continued, "It all starts with data recording. You don't really have anywhere to go without at least one year's worth of data. But, once you can pull together one year's worth of data, you can ask 'where can we go from here to do a better job?'"

Joe Lawrence, field crops educator of Cornell Cooperative Extension (CCE) of Lewis County compiled data from Laribee's farm and other farms in Lewis County. He commented that "it's a good opportunity to create a database for the farms where they can track changes. If they change the feed they are feeding or how they fertilize their crops, it will

show in the Mass Nutrient Balance from one year to the next."

The Next Logical Step

The Nutrient Management Spear Program has started a new follow-up project with farmers like Laribee that have been using the Mass Nutrient Balance reports to inform their management decisions.

"This new project, sponsored by the Northeast Sustainable Agriculture Research and Education program [NESARE], calls on management teams of farmers, CCE educators, Soil and Water Conservation District technicians, and other farm consultants like Cook to combine the Mass Nutrient Balance report with other farm information to target management opportunities and inform on-farm decision making," says Patty Ristow, extension associate with the NMSP and coordinator of the new NESARE project. "The goal of this new project is to develop a short list of indicators that will help NY state farmers confidently answer the question: "What can I do on my farm to reduce my inputs while maintaining or increasing my production?"

Laribee's farm is one of four case study farms in the new project and Laribee, Lawrence, and Cook are all excited to be participating in this new project. It builds on the Mass Nutrient Balance report with additional tools to help farmers confidently identify where they can make the most profitable and environmentally sound management changes.

(This article appeared in Country Folks Small Farms Quarterly issue of April 6, 2009).

To learn about and participate in the statewide whole farm nutrient mass balance project, check out the NMB website of the Cornell Nutrient Management Spear Program: <http://nmsp.cals.cornell.edu/projects/massbalance.html>.



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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://nmsp.cals.cornell.edu>) or contact Quirine Ketterings at qmk2@cornell.edu or (607) 255-3061.