



SUNY Morrisville Farm Manager Integrates Field Research with Crop Program

By Lisa Fields

On a sunny September day, SUNY Morrisville's Farm manager Shawn Bossard planted winter triticale as he talked about a recent field study on the farm. He noted several reasons why he participated in the Cornell Nutrient Management Spear Program's (NMSP) Manure Rate Study in 2013. "I thought it would benefit the farm to learn whether the manure rates we use can affect corn silage yields. Having field research here is good educational exposure for the students. It's also good public relations with the local and statewide ag community."

During his former career in the Cornell Cooperative Extension system, Bossard developed a strong working relationship with the NMSP's leader, Dr. Quirine Ketterings. She described the field study, "We examined two aspects of manure management as separate study components. One was to determine if the method used to apply manure, either by tillage or direct injection, affected corn yields. The second component examined whether yields were impacted by manure application rate. We also examined forage quality and took soil samples to evaluate the effect of manure rates on soil fertility. The NY Farm Viability Institute funded the project as part of our New York On-Farm Research Partnership. We were able to work with four farms and were really pleased to include Shawn and SUNY Morrisville in the project."

In 2012 Bossard began the transition from purchased forages to producing their own, along with much of the grain fed to the cows. This change in crop management brought significant changes in manure management. In 2013, of the 1028 crop acres that fed the 265 cows, 160 heifers and 80 calves, 850 were rented from nearby landowners.

Bossard explained, "The farm has a methane digester and 4.2 million gallons of liquid manure to manage. Dry manure with bedding is produced from the maternity and sick pens and calf barn. We're actually short on manure for our crop needs, but we're not in a

position to manage it all on the farm so we export some. We give most of the dry manure to a composting business in Syracuse as we lack storage for it and have limited labor for daily spreading. Early in spring, when the liquid manure storage is getting full, a local vegetable farmer takes quite a bit. The arrangement works well, as he comes in before we're able to spread on corn ground."

The farm recently acquired a 5,000 gallon tank spreader with an injection system. It features a flow meter wired into field monitor mapping software to track just how much is being spread where. "We typically aim to inject 8,000 gallons per acre in the spring and add another 10,000 in the fall on the ground that really needs the nutrients," Bossard said.

For the Manure Rate Study, three rates were used, 8, 10 and 12 thousand gallons injected per acre in the spring after the NMSP crew flagged and soil sampled the plots.



SUNY Morrisville's Farm manager Shawn Bossard participated in the NYFVI funded project to evaluate manure management options for corn.

The 2013 growing season brought excessive rainfall and cool soil conditions that affected the results. Ketterings commented, "The corn silage yields averaged 15.3 tons per acre at 35% dry matter. There was no yield difference among the three different manure

rates, consistent with several other study sites. The soil at this site showed low nitrogen status in all three tests we performed; pre-plant soil test, pre side-dress nitrate test and the corn stalk nitrate test taken at silage harvest time.”

Bossard added, “The weather made it impractical to side-dress N. Herbicide application had left deep ruts that slowed down harvest equipment, adding two days to chopping time. That compaction and continual wet, cool weather compromised root growth.”

“When field conditions are as wet as they were in 2013, it is difficult to identify if low yields are resulting from crops not getting enough oxygen due to saturated soils, or if a nutrient like nitrogen might be limiting yield,” Ketterings explained. She stated, “This points to the importance of doing similar trials in multiple locations and for multiple years.”

Despite the disappointing 2013 growing season, the field study yielded an unanticipated benefit for Bossard. He explained, “The study results inspired me to examine the factory pre-sets on the tank spreader. I found a mis-calibration, so it was applying manure as if the spreader was 15 feet wide, when the reality was 13.5 feet. This definitely needed attention as we were applying more than we thought. If it weren’t for the study I may not have checked into the equipment. Field research always gets you thinking and sometimes you learn something unexpected.”

As Bossard looks to the future, he sees major changes coming along for crop management. “After a few not very productive corn years, I initiated a more diverse mix of crops to meet feed needs,” he said. “We really need to build our soil health, and with winter grains harvested for spring forage we achieve soil protection during the winter and add to our feed resource, too. I planted 150 acres in winter triticale and 320 acres of cereal rye after corn harvest this fall. The rye is mostly for cover, with some as straw followed with silage corn. We hope to harvest the triticale for forage and follow it with dwarf gene Brown

Midrib sorghum. We’ll plant it after haylage harvest which avoids the time and labor conflicts we have with planting corn. As it’s planted with a grain drill in seven inch rows and doesn’t need herbicide, we’ll save soil and dollars, too. In time, diversifying crops will give us healthier soil and better yields.”

Feeding the soil will change significantly, too. Bossard said, “It’s quite likely that in 3-5 years a major digester will be built here to incorporate food waste along with manure. The liquid portion will go back into the system to fuel campus electricity, and the nutrients and dry portion will be composted. This means a shift to surface spreading dry and stabilized manure with low odor or run-off risk. There’s a new technology, the Subsurfer[®] developed for injection of dry chicken manure. It’s a bed-type spreader with augurs that move the manure into injection tubes, so it’s something to explore when we get to that point.”

Despite the challenges of managing an educational, institutional farm in the face of major changes, Bossard is excited about the future. He commented, “With everything going on here, there’s ample opportunity to be involved in field research studies with Quirine and her crew. It keeps us connected with famers, educators and advisors across the state, and gives us data that applies right here at home. It’s great for the farm as a business and for the students to learn real-world lessons that relate to their careers. We’re really pleased to participate in this kind of research.”

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To learn about the statewide manure management projects, see the NY On-Farm Research Partnership: <http://nmsp.cals.cornell.edu/NYOnFarmResearchPartnership/index.html>. For specifics for the manure project, see: <http://nmsp.cals.cornell.edu/NYOnFarmResearchPartnership/ManureRateMethod.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.