



Crop Advisor's Collaboration with NMSP Promotes Double-Cropping in Northern NY

By Lisa Fields

Early in 2013, Professor Dr Quirine Ketterings, leader of the Nutrient Management Spear Program (NMSP) in Cornell University's Department of Animal Science initiated the Double Crop Nitrogen (N) Rate field study. She put out a call for participants around the state to host on-farm plots to examine the nitrogen response of winter grains grown for forage in a double-crop system.

Eric Bever, Certified Nutrient Management Planner with Champlain Valley Agronomics welcomed the opportunity as an ideal fit. He explained, "Several of our northern NY clients became interested in harvesting winter rye as forage after learning of successes with it from our clients further south. It's been a popular and successful cover crop, and tight forage supplies inspired harvesting it for feed prior to planting corn. This move to double cropping meant a change in management. The N Rate Study gave us the chance to get a tighter handle on the N needs of winter grain grown as forage in a replicated study. Having NMSP set this up and manage it enabled us and the host farmer to be directly involved with the research process."

The study was set up on 44 farms across New York in 33 winter triticale, 8 cereal rye and 3 winter wheat fields. The nitrogen was applied in four replicated plots each, with treatments of 0, 30, 60, 90 and 120 pounds of actual N per acre, stabilized with agrotain to prevent volatilization.

Ketterings said, "In order to generate a crop response curve from the data we had to have the zero N control, a low rate of N and two higher rates that were above what we would expect to need for optimum yield. The crop response curve enabled us to derive the amount of N we really needed that year and the yield achieved at the optimum N rate."

Shona Ort, NMSP technician described the field work. "We applied the N at spring dormancy break (green-up) and harvested the plots in the spring prior to flag leaf emergence. We measured yields, tested samples for forage

quality, collected soil samples and got field history information."

The direct involvement between the farmer and research process appealed to Brian Siple of BCS Dairy in Peru, NY who collaborated with Bever as a host site for the study. Siple has a 220 cow dairy with about 400 acres of crops. He said, "I was growing the winter rye anyway, and I wanted to see what N rate was best."



Cereal rye seeded after corn silage harvest at BCS Dairy in Peru, NY yielded 1.75 tons of dry matter per acre where 88 lbs N/acre was applied at green-up.

After fall 2012 corn silage harvest, Siple planted 77 acres of winter cereal rye as his first venture into double-cropping. Bever commented, "Most of our clients are in need of forage beyond what their acreage can provide from their traditional crops. Erratic weather and our short growing season this far north are major factors. The convention has been to

think of yields on a per crop basis, but with double cropping the viewpoint changes to forage yields per field. You're increasing yields without added acreage and the winter cover provides substantial soil health benefits. As a nutrient management planner, I like to promote that. It's a tremendous help to hold nutrients in place, greatly reduce erosion and build a healthier, more productive soil over time. Of course, all those qualities help achieve better forage yields, too."

Bever explained the choice of winter rye over the winter triticale grown on most of the N Rate Study farms. "Winter triticale is not reliably winter-hardy in Northern NY, and it grows more slowly in the spring. Winter rye has excellent survival here. It can establish with a bit later fall planting date than the triticale can, and is ready for forage harvest along with perennial grasses in the spring. Managing field operations is critical to successful double-cropping as the corn won't be planted until the latter part of May. We generally recommend silage corn hybrids with 85-90 day maturity."

Siple had a positive experience with his first year of double-cropping and planted 150 acres of cereal rye following corn silage harvest in 2013. Along with many other dairy producers, Siple's primary motivation for double-cropping was as an emergency feed. He said, "Without the rye I would have run out of feed so it definitely filled a need. I got the rye cut a bit later than planned and used it as heifer feed for that reason. They grew quite well with it in their ration. Next spring, I hope to get it cut earlier and use it for dairy forage. Between the forage gain and the soil benefits I intend to double crop winter rye on some of my acreage every year as part of the corn rotation."

Siple's N Rate Study plot showed an economic response to 88 pounds of N per acre with a yield of 1.75 dry matter tons per acre assuming 50 cents per pound of N fertilizer and forage value of \$250 per ton. Crude protein (CP) increased from 15% CP without N

application to 19-20% CP with N application rates of 80-90 lbs N/acre.

Bever noted, "Brian used a light manure rate on the study field. Our general recommendation was 46 pounds of actual N per acre as stabilized urea. The study results had an impact, as he'll apply more N this spring where the fertility and history are similar. On his farm, the data generated from the study plots shows he'll get an economic return from doing that."

Ketterings elaborated, "Analysis of field data from the statewide study shows that 30% of the sites did not have a yield response to the N fertilizer additions, while 44% showed a yield response to N additions of from 75 to 100 pounds per acre. We are analyzing soils and crop management practices at the sites to examine correlations to the N responses. Those data will help us develop N fertilization guidelines for double-cropped winter grains."

"The research NMSP does, involving farmers and advisors from across the state in replicated studies, has widespread benefits," Bever stated. He summarized, "There's no substitute for seeing this work done on your own farm or client's farm, and the data generated gets shared so that all producers and advisors across NY are seeing on-farm data. It's much more convincing than quoting a theory to someone from a book, or data that's only from research farms with few commercial farm sites. I highly recommend to any farmer to get involved with NMSP's on-farm studies if they have the opportunity."

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To learn about the statewide cover crop and/or double crop projects, see the NY On-Farm Research Partnership: <http://nmisp.cals.cornell.edu/NYOnFarmResearchPartnership/index.html>. Specifics for the double crop nitrogen rate studies planned for 2014 can be found at: <http://nmisp.cals.cornell.edu/NYOnFarmResearchPartnership/DoubleCrops.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://nmisp.cals.cornell.edu>) or contact Quirine Ketterings at qmk2@cornell.edu or (607) 255-3061.