



New Field Crops Specialist Dives into Collaborative Double-Cropping Research with NMSP

By Lisa Fields

Bill Verbeten started his Extension Field Crops Specialist position with the Northwest New York Dairy, Livestock and Field Crops Team of Cornell Cooperative Extension in October of 2012. He noted, "I was fortunate to become part of an established team with a good reputation."

Eager to get involved in relevant field research, Verbeten quickly connected with the Nutrient Management Spear Program's (NMSP) "Double Crop Nitrogen Rate" study. Directed by Associate Professor Dr. Quirine Ketterings in the Department of Animal Science at Cornell University, the project compares yield and quality response of winter grains harvested as forage to five rates of spring-applied nitrogen (N) fertilizer.



Bill Verbeten of the Northwest New York Dairy, Livestock and Field Crops Team of Cornell Cooperative Extension, coordinated on-farm nitrogen rate trials for winter cereals grown for forage at 15 farm fields in western New York.

Shona Ort, NMSP technician and coordinator for the project, described the project in detail, "This was a continuation of my B.S. Honors thesis research on carbon and nitrogen pools and yields of cover and double crops in New York. That project provided lots of data on crop biomass, carbon and nitrogen plant and soil dynamics under various farming practices. The Double Crop Nitrogen Rate study was a next step toward developing

nitrogen fertilization guidelines based on achieving the yield of best economic return in this crop system. We set up plots on 33 triticale, 8 cereal rye, and 3 winter wheat fields across New York, mostly in rotation with corn silage. We applied urea treated with Agrotain® to reduce the risk of ammonia volatilization. The five rates were 0, 30, 60, 90 and 120 pounds of nitrogen per acre which we applied in early spring. All trials were harvested in May at or close to flag leaf stage."

Verbeten spoke of his involvement. "I hadn't previously worked with winter grain forage or double cropping, but I had fifteen farms participate as project sites this year. Some of the interest was due to the need for emergency forage when conditions reduced hay crop yields as happened in 2012. We also had participants who've double cropped some acres for many years and wondered about the value of extra nitrogen."

Ketterings added, "It was great to see so many farmers voluntarily participate in the study and to have Bill and others take the lead on coordinating the trials in their regions. Because we had five N rates in four replications at each location, we could determine the optimum economic rate of N for each field. Farmers received an individual field report, but we'd like to develop N guidelines for farms across the entire state. Our dataset now includes optimum N rates for all 44 trials. Sixteen did not show a yield response to added N, for one, 30 pounds of N per acre was the optimum rate, while for the remaining sites the optimum rate ranged from about 70 to 120 pounds of N per acre. We are now analyzing the soil samples and field histories, as well as quality analysis of forage samples to determine under what conditions N addition does pay off and if extra N is needed, how much to apply."

Verbeten commented, "Getting the nitrogen rate right is essential to managing double crops well, and this study will provide data driven recommendations. Farmers won't adopt a new practice if the yields aren't there.

Additionally the management of post-harvest tillage prior to corn silage, optimal triticale planting and harvest timing, and selection of corn varieties that mature by early to mid-September are necessary. As with any other crop, the management has to be on target to achieve success."

Verbeten spoke of NMSP's teamwork. "They really made things smooth for me. They helped set up and harvest the plots on a timely basis. It was a very positive experience and I plan to routinely participate in their research initiatives. Quirine and her team are headed in the right direction in serving farmers in New York and my region."

Verbeten's project outreach included a Google map. He explained, "I posted each on-farm trial on the [web](#). You click on the farm name in the sidebar or location on the map and dated field photos come up. It's easy to use and people can compare crop appearance between the different N fertilizer rates, planting dates, seeding rates and tillage on each farm. In the high visibility locations we got a lot of informal outreach from neighbor curiosity, which generated a lot of interest."

One such site was the Stein's 815 cow dairy farm in LeRoy. Dale Stein commented, "With the plots here, several farmers stopped by to learn more about what we do. We started double cropping fifteen years ago to fill in the summer feed gap until fall grain and corn silage harvest. We grow 700 acres of corn silage each year and typically have 120 (160 acres in 2013) planted to winter triticale. We plant it by September 30th and harvest no later than May 15th."

The years of double-cropping experience taught Stein to be prepared to make changes. He explained "The corn must be ready for harvest to have this system work. That time window is the limitation on double crop acreage. The tillage for both crops is also critical because of triticale's large root mass. For planting triticale we use a vibra-shank or similar tool that loosens the soil without turning it, then air-seed and cultimulch to

cover the seedbed. We're moving to a one-pass tool to improve efficiency of triticale root break-up prior to planting corn. We apply about 6,000 gallons per acre of liquid manure at triticale planting and topdress N at spring green-up. Triticale's a high sugar feed, about 10-12% if there's enough sun during spring growth. Cloud cover has a major impact on the sugar levels we achieve. We generally get a milk response of 2 pounds per cow per day when we start feeding it in May, but this year it was 3 pounds. Our 2013 yield averaged over 9 tons as-fed [20% DM] per acre. There was no yield response in the nitrogen study plots and I didn't expect one, but protein increased from the typical 14-16% to 17%. That raises the crop's feed value significantly."

Verbeten summarized his thoughts about double-cropping. "Beyond growing triticale as an emergency forage, adoption of the double crop system will probably out-yield the traditional corn silage and haylage rotation without double crops. It's a risk management tool as haylage acres can be cut back to some degree. It also adds another dimension of fiber digestibility characteristics, shifting the whole farm's forage and feeding system. The winter cover allows better utilization of fall applied manure, and along with the increased forage supply could help some farms increase their herd size without scrambling for additional acreage. With the yogurt industry's quest for more New York State milk, double cropping could be part of a significant economic impact for dairy farms in the years to come."

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