



Grazing Specialist Teams Up with NMSP for Double Crop Study at Schumacher Dairy-Ops

By Lisa Fields

Jonathan Barter, Grazing Specialist for the Steuben County Soil and Water Conservation District (SWCD) has been enthused about the double crop concept for many years. He explained, "Before I came to New York in 2007, I ran a fertilizer business in Pennsylvania where winter rye was widely used as both cover and spring forage in rotation with corn. That crop combination is challenging to manage here due to our shorter growing season. In 2011, I heard Tom Kilcer of Advanced Agricultural Systems speak about double-cropping with winter triticale before either short season corn or alternative summer annuals. I found his talk compelling and wanted to see the concept applied locally. Connecting with the Double Crop N Rate Study this year gave me that opportunity."



Jonathan Barter (right) and Tim Parker (left) on the trial harvest day at Schumacher Dairy-Ops in Ontario County. The winter triticale field averaged 2.75 tons of dry matter per acre.

Dr. Quirine Ketterings, Professor of Nutrient Management in Agricultural Ecosystems, leads the Nutrient Management Spear Program (NMSP) in Cornell University's Department of Animal Science. She explained the on-farm Double-Crop N Rate Study that connected Barter with the NMSP. "Double-cropping has generated a lot of interest among farmers and crop advisors. It was important to look at the N needs of the system under a wide variety of soils and management practices. By collaborating with crop consultants, Extension and other agency staff like Jonathan, we had 44 study sites in double-cropped winter grains across the state."

Ketterings explained the trial setup, "We used five N rates; 0, 30, 60, 90 and 120 pounds N per acre applied as urea treated with Agrotain® in four replications at each site. The N was applied at spring dormancy break (green-up) and the plots were harvested in mid-May, prior to flag leaf stage.

The design of the trials and consistency in implementation were very important. We needed to include a zero N control and a low N rate, as well as two high N rates, above what we expected to need for optimum yield, to generate a crop response curve. With this curve, we could derive the amount of N we really needed that year, and the yield achieved at the optimum N rate."

In Barter's region, the Schumacher family's Schumacher Dairy-Ops LLC in Ontario County hosted the N Rate Study plots. Double cropping wasn't new for this 1200 cow dairy, but the study coincided with a firm commitment to the practice.

John Schumacher said, "Soil protection is a priority for us. Nutrient retention is very important because we daily spread manure, and manure nutrients are the basis of our soil fertility program. We crop 4,000 acres and rely on a lot of rented ground. The winter cover gives us a lot more places to apply manure without run-off risk. Over the years we've used oats as fall cover or winter grains as green

manure, so harvesting winter grains as spring forage made sense as a next step. In 2012 we double-cropped about 430 acres with a fall planting of either winter rye or triticale. Double cropping has the economic benefit of a lot more forage from the same acreage, but you do that while building up the soil and holding the nutrients in place. The winter triticale gets planted on the better, silt loam soils after the corn comes off. Winter rye goes on the clay loam fields that have some slope, as triticale will frost-heave on those soils, and there's too much crop loss. Both grow well, but the triticale is easier to manage for feed quality as it has slower spring growth than rye, which can mature quite fast. Our harvest timing and the weather conditions determine whether we get heifer or dairy forage from our double-cropped grains. In either case, the inventory we gain is well worth it."

The Double Crop N Rate Study site at Schumacher's didn't show a response in yield to N fertilizer addition at green-up. Schumacher said, "That field got a medium manure rate of 8,000 gallons per acre incorporated before planting the winter triticale. The yields were quite good at 2.75 tons per acre of dry matter in the study plots."

Participating in the on-farm research was a positive experience for Schumacher. He noted, "We got some good response from having the plots here. People asked questions and we told them how we manage double-cropping and what the benefits are. A few local crop farmers who contract with dairies have taken up this system."

Questions remain as to when N fertilizer is or is not likely to provide an economic response in double-cropped winter grains. Ketterings said, "Analysis of field data from the Double Crop N Rate Study shows that 30% of the sites did not respond to the N fertilizer additions in terms of total dry matter yield, while 44% responded with greater yield to N additions of 75-100 pounds per acre. We are analyzing soils and crop management practices at the sites to examine correlations to the N

responses. Those data can help us with the development of N guidelines for double-cropped winter grains."

Barter was impressed enough by what he saw to pursue an expansion of double-cropping in 2014 through a grant administered by Finger Lakes Region Resource Conservation and Development. He explained, "Through the New York State Environmental Protection Fund I obtained funding to establish 1200 acres of winter triticale as a double-crop. With that level of local acreage, the message gets out quickly. We're aiming for both the visual and supportive data to show people this can work."

Double-cropping is not without challenges. Barter noted, "The major issue is timing. Fall corn harvest has to be completed in time to get the winter grain established before hard frost occurs. In the spring, the forage harvest of the winter grain often conflicts with other field work. Reduced tillage could ease this time constraint, but there are barriers to adoption for those farms that prefer to incorporate manure and till the dense root mass of winter triticale. Although reduced tillage benefits soil health and erosion control, the fall and winter cover in a double-crop system with tillage achieves those goals too."

In summary, Schumacher said, "Our outlook on double-cropping is that we're in it for the long haul; it's a business and stewardship decision."

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