



No-till Makes Double Cropping a Good Fit for Angel Rose Dairy

By Lisa Fields

"Soil should be covered 365 days a year," John Kemmeren stated. The philosophy of soil care at Angel Rose Dairy, owned by John, his wife Dianne, and their adult children Peter and Katy, brings a no-till based, systems approach to crop production. "We have a lot of highly erodible soils that need protection from soil loss to produce good crops," Kemmeren noted. "No-till accomplishes that, and cover or double crops help build organic matter."

In 2014 the Kemmerens participated in the Cornell Nutrient Management Spear Program's (NMSP) Double-Crop Nitrogen Rate Study. The goal of the 3-year project was to determine the conditions that result in an economic response to nitrogen (N) fertilizer in winter grains grown for forage in rotation with corn. On replicated plots at 62 farm sites across New York, five nitrogen rates of 0, 30, 60, 90 and 120 pounds of actual N per acre were applied at spring green-up.



Nitrogen rate trial at Angel Rose Farm, operated by John Kemmeren and his wife Dianne and children, showed nitrogen fertilizer was needed at green-up for optimal yield of cereal rye grown as forage.

At the Kemmerens' cereal rye plot, which had not received manure, the 120 pound per acre N rate achieved the best economic return with a dry matter yield of 2.41 tons per acre harvested at flag leaf (prior to seed head development) stage. Crude protein was significantly different between the two highest N rates there: at 15.9% with 120 lbs/acre of N compared to 13.3% at the 90 lbs/acre rate.

Professor Quirine Ketterings, director of the NMSP described the study's preliminary results. "The data show that in 40% of the fields an economic response was realized with additional N. In 33% of the fields there was no response to added N fertilizer. A response to N in the spring was much less likely when manure had been applied in the fall and the soil fertility status was optimal. Currently, we're examining the field history information to develop guidelines for when and how much nitrogen will give an economic benefit."

"I have always felt N is a good investment for the value it provides if the crop needs it," Kemmeren said. "Fine tuning crop inputs is important to the bottom line, so the nitrogen research in double cropped winter grains is really useful."

Each year, the Kemmerens grow 120 acres of corn for their 90 cow dairy and double crop 80 corn acres with cereal rye, harvesting 25% of it as pre-cut (prior to heading) rye straw. He added, "With no-till, avoiding compaction is paramount. Manure is fall applied to avoid wet spring conditions, a third of the corn crop is 1st year and we avoid growing corn for more than 3 years in a row." The rye straw is used for bedding for calves and in the tie-stall dairy barn, and as a profitable cash crop.

Kemmeren elaborated on no-till rye production, "Getting seed in the ground correctly to achieve good stands is absolutely essential. For the rye and other grasses and legumes we achieve this with our 10 foot Great Plains No-Till drill. It has adjustable depth coulters that clear a path for the seedbed, so the double-disk openers are setting the seed at

just the right depth. The press wheels have a raised band encircling each wheel that firms the seed into the soil where it needs to be.”

Kevin Ganoë, Central New York Extension Dairy Team Field Crops Specialist commented, “Two major reasons for John’s success are that he gets the seed in the ground successfully and views the farm as a whole system. He’s made no-till work well on some pretty challenging ground.”

On double-cropped fields Kemmeren plants 81-91 day maturity corn varieties that are usually ready for silage harvest in early September. Custom harvesters get the crop off in about two days so that cereal rye can be planted in mid-September, an ideal time for good fall growth. Where corn follows rye in the spring, Kemmeren lets the rye grow 2 foot or taller before burndown with herbicide, against conventional practices of early rye kill to limit growth. “I get better weed control and organic matter from the tall rye and our planter has no problem pushing the residue down to get a solid stand of corn. Early growth and yields are very good despite the heavy rye, so research on N breakdown with this practice would be really interesting to see.”

Some cereal rye acres are followed with annual brown midrib sudangrass (BMR) interseeded with red clover or a mix of clover and tall fescue or festulolium grass. Kemmeren said, “We take two cuttings of high quality BMR sudangrass baleage for the dairy herd. What remains is either a field of clover we can interseeded with grass after 1-2 years or rotate into corn, or a clover-grass hay field.”

Ganoë noted, “Flexible crop management such as John applies is part of the increased adoption of double-cropping. Farmers have gained awareness of soil health, so more acres across the region are covered in winter grains. I think it started with nutrient management plan requirements, and evolved into a realization that winter grain cover crops can make very good feed or straw. As double crops, they’ve become the third crop that fits into corn-hay rotations.”

“Quirine’s work with N in double crops is valuable for people to understand that you can get an N response in winter grains grown for forage,” Ganoë said. “Learning when this occurs and when a response to N is unlikely will help people get N management right.”

Although the research is still ongoing, its main messages have generated a lot of interest. Researchers have given talks about the study and farmers are also involved in outreach. After hearing Ketterings talk at an extension meeting, Kemmeren contacted her to see if she could share some of the summary slides with him. Ketterings explained, “John emailed me to say that he would be giving a presentation about their farm’s no-till practices at the National No-Tillage Conference in Indianapolis in January, 2016 and wanted to use some information from the double crop project. To get those requests from the farmers we work with is really great and rewarding. Farmer to farmer education is so much more meaningful and effective in getting other farmers to evaluate management options!”

At Angel Rose Dairy, double-cropping is part of caring for the soil that’s the root of the farm business. Kemmeren stated, “We have to keep the soil healthy to be able to farm successfully. I don’t want to see the Susquehanna River flowing brown with soil from my fields. When we get heavy rains, I don’t lose any sleep. I know the soil is safe from erosion.”

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To learn about the New York On-Farm Research Partnership and/or participate in trials, see: <http://nmssp.cals.cornell.edu/NYOnFarmResearchPartnership/index.html>. We welcome farmers and farm advisors to work join the program and help us set research priorities!



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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.