



NMSP Field Study Explores Viability of Brachytic Dwarf Brown Midrib Forage Sorghum for Northern NY Dairy Farms

By Lisa Fields

Brachytic dwarf brown midrib forage sorghum, a potential corn silage alternative, has performed well in central and western NY research farm field trials. Researchers and farmers asked the question: can this high energy, heat loving, drought-tolerant crop also perform well in Northern NY? Impact of extreme weather on the corn silage crop has piqued interest in growing alternative energy feeds.

"Corn silage is an important mainstay of dairy cattle diets, and in response to extreme weather fluctuations, many farmers have switched to shorter season corn so they can double-crop with winter rye. The winter cover has a lot of soil and nutrient management benefits and helps stretch forage supplies in the spring, but this double-crop rotation isn't practiced on a lot of acres," noted Mike Hunter, Field Crops Specialist with the Northern NY Regional Agricultural Team. In the interest of increasing this practice, he took the opportunity to explore an additional double-cropping option in 2016.

Hunter and his colleague Dr. Kitty O'Neil participated with three farms in the Cornell Nutrient Management Spear Program's (NMSP) field study entitled 'Nitrogen and Harvest Timing for Brachytic Dwarf Brown Midrib Forage sorghum in Double Crop Rotations'.

Dr. Quirine Ketterings, leader of the NMSP, initiated the two-year study to determine the crop's nitrogen (N) fertility needs and ideal harvest timing for optimal quality and yield. She explained, "The brown midrib 6 gene combined with the dwarf gene make forage sorghum a potential option that yields well and is resistant to lodging. It has performed well in trials in Central NY and it was time to examine its yield, feed quality potential, and nitrogen needs in the North Country."

Hunter worked with a plot hosted by Elmer Dart in Jefferson County, planted June 6 and harvested October 7, 2016. Sorghum was planted at 8 pounds per acre in 30 inch rows using an adapter plate on a corn planter to

accommodate the sorghum seed. Five N rates (zero N as a control, 50, 100, 150 and 200 pounds actual N per acre) were used with each treatment replicated four times. Harvest took place when the plots that had received 100 lbs N per acre had reached soft dough (stage 7).



Brachytic dwarf brown midrib forage sorghum, a potential corn silage alternative, is being evaluated for use as forage crop on dairy farms in Northern NY.

"Elmer's farm is in one of the areas that was hit the worst by droughty weather in 2016," Hunter said. "His corn silage yielded about 10 tons to the acre wet yield, while the forage sorghum plot gave us 15 tons per acre. We were really impressed by the growth we saw and the yields drew interest from other farmers to learn more about the crop as well."

In addition to strong performance in dry conditions, the forage sorghum plot did not show an N response, indicating it can grow well where manure has routinely been applied.

Hunter explained, "This crop needs warm soil to germinate, which means that the nutrients from soil organic matter are going to be available, ready to help it grow. Elmer's plot had been in corn silage for 3 years before the

forage sorghum. The organic matter was high, 4.8%, and nutrients were all in the high range. Along with a respectable yield, the feed quality was very good in Elmer's plot at 41% neutral detergent fiber (NDF), 0.70 net energy of lactation (NEL) and 10% crude protein."

Sarah Lyons, graduate student with NMSP commented, "The harvest timing impacts on quality and yield varied somewhat between earlier trials in Central NY and last year's trials in Northern NY. We plan to continue to investigate this aspect of management, because earlier harvest would be ideal for double-cropping rotations. After planting in early June for the 2016 trials in Northern NY, we harvested at soft dough stage on September 27 and 30, and October 7. These dates are after the ideal planting window for winter cereals grown as double crops, especially with the early frost that can occur in the northern parts of the state."

Lyons described research plans for the study's second year in 2017. "This year we are going to have five N rate trials to add to our database, including 3 in Northern NY. Because of the large interest in how the sorghum variety compares to corn silage directly, we are implementing three trials to directly compare the two crops for both yield and quality under similar growing conditions. Results from both trials this year should help us to better understand how forage sorghum can be managed in NY conditions for optimum performance."

"Forage sorghum definitely brings some challenges we need to work through," Hunter commented. "This crop will fit best on fertile ground and that usually means a manure history that includes weeds. Pre-plant weed control with herbicides is limited to acetochlor, metolachlor, and atrazine. Post-emergent herbicides include several options that control broadleaf weeds but atrazine is the only option for post-emergent control of grasses. Those who will harvest it with conventional choppers and must plant in 30 inch rows for that reason could be facing a major weed infestation. Cultivation may be an option, but there's a concern it may damage the sorghum's roots."



Weed control with herbicides is limited to the pre-plant incorporated or pre-emergent materials acetochlor, metolachlor, and atrazine. Weed control is not a major issue if sorghum is planted at 7-8 inch rows (left) but can be a major challenge when planted at 30 inch row spacing (right).

Hunter set his sights on 2017 field trials. "It will be great to see the sorghum comparison to short season corn in the side-by-side trial. That gives a direct visual as well as a better comparison from a research viewpoint. We need more experience with sorghum and another year will give us further information. I'm cautiously optimistic about the crop's potential here," he said. "We need to try things, but they have to be practical for farm equipment and labor as well as our growing season and weather conditions. Forage sorghum's fit as a double-crop is definitely appealing. If it performs well, double-cropping could expand and that's promising news for North Country farms."

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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 activities 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.