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# Crop Soil News

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"It is the crops that feed the cows that make the milk which creates the money."

## Bmr Sorghum Research: What we know so far.

Interest in BMR sorghum as a potential companion to or replacement of corn silage in high forage diets continues to grow. We are working to develop the steps for a greater chance of success with this crop at both Cornell with Dr. Ketterings, and the Valatie research farm. A key advance was the **recent BMR brachytic dwarf sorghum feeding trial** that found the **same milk producing ability as corn silage**. Read it for yourself:

<http://www.caes.uga.edu/departments/ads/documents/Feedingvalueofbrachyticforagesorghumcompared.pdf>



We planted a block of 85 – 89 day brachytic dwarf sorghum (Alta AF7102) with a Great Plains drill on 7 inch row spacing at 6.3 lbs. of seed/acre (113,000 seeds/acre). We still don't know the optimum plant/acre/row spacing for northern conditions. We changed our planting depth from 1.25 inch to .75 inch and the stand emerged much faster than last year. We are still not satisfied with the uniformity of the seed spacing – but that is future work. Due to a huge (1000 plots) winter forage research project, it did not get planted until June 10, (2 weeks later than it could have been planted). This delayed soft dough harvest 2 weeks later in September. The Concept treated seed allowed us to use atrazine and metolachlor for nearly complete weed control. The season was excellent for corn production with neighboring farmers getting record high yields. It was cool with very few hot days. At the Valatie farm we had good growing conditions until early August when the water turned off and there was only two .30 inch rainfall events for 3 weeks of August and the first half of September. The sorghum just kept growing.

The first study was determining the optimum length of cut. A stand was harvested September 5 at early milk stage with a Claas chopper and processor. A special thanks to Brian Chittenden of Dutch Hollow farms for taking time to help us with this project. With perfect standability and the low lignin BMR gene, the chopper flew through the field with no problems. Cutting height was as low as the machine could go. As it was early milk (19.59% DM), yield was 16.23 ton/A of 35% dry matter material (see nitrogen trial below for full season yield). With homolactic bacteria it fermented perfectly.

We started at the setting for corn silage of 11 mm (.43 inch) cut length. We then stepped up to 17 mm (.67 inch), and finally 21 mm (.83 inch) with no change in the proces-

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sor. The objective was to determine what length of cut is and optimum balance between effective fiber, digestion, and speed of harvest. Unfortunately, we were not able to adjust the processor accurately this time around and plan to look at that next year. Screening and comments were by Russ Saville, a very experienced nutritionist with Cargill who managed to squeeze this in his very hectic schedule (thank you Russ).

**Results:**

The **11 mm** gave very little if any effective fiber on the top of the Penn State Screens. If long haylage or hay was fed this may be ok. It took more power to chop it this fine. The **17 mm** increased the effective fiber on the top screen and reduced the very fine material in the bottom screen. The **21 mm** increased the top screen and decreased the middle and bottom screens. It also reduced the power needed. Russ preferred the 21 mm cut.

	Penn State Rec	21 mm (.83 inch)	17 mm (.67 inch)	11 mm (.43 inch)
Top screen	2-4%	7%	3%	1%
Middle screen	40-50%	75%	77%	71%
Bottom screen	40-50%	18%	20%	27%

**THE REST OF THE STORY**

There are critical points that will not show in the above screening. Note the 21 mm cut on right in the picture. Most of the material on the **top screen** are **pieces of leaf** that were almost an inch square. This provides a very effective rumen mat but is **still highly digested** because of its BMR properties. Thus you can have your cake (effective fiber for a rumen mat) and eat it too (high digestion so more of the forage can be directly utilized for milk production).

The second issue is that the longer cut, in addition to reducing power consumption, will preserve more of the energy. This crop is high in sugars. The more cuts the more of the sugar is exposed for bacteria to use for fermentation or, on feed out, use to spoil the forage (also more leachate from the silo). A longer length of cut leaves more of the sugar in complete plant cells that are broken down quickly over time by rumen bacteria, steadily releasing energy and protein into the rumen.

Finally note the picture at the right. The chopper had a processor that acted as a “de-barking” unit. It removed the outer rind of the stem leaving the soft spongy material completely exposed to bacterial digestion in the cow.

Our nitrogen trial indicates we have more work to do. The Cornell sites had a nice yield curve by nitrogen rate. At Valatie for the third year, because of our deep rooting, building soil organic matter, and the fine, extensive sorghum roots, we did not have any yield increase above 50 lbs. of N/a with a **yield of 24.29 tons of 35% dry matter silage** (30% moisture at harvest Sept 22 - was away so harvest was delayed).



Sincerely,

*Thomas F. Kilcer*

Thomas Kilcer,  
Certified Crop Advisor

172 Sunnyside Rd  
Kinderhook, NY  
12106

Tel: 518-421-2132

[tfk1@cornell.edu](mailto:tfk1@cornell.edu)

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