

# Crop Soil News



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

Advanced Ag Systems  
Research, Education, Consulting

## BMR Male Sterile Forage Sorghum: a Breakthrough Energy Crop

On-going field research data is giving increasing proof to the advantages of BMR male sterile forage sorghum as a replacement for corn silage. Multiple replicated trials with proper nutrient-enhancing delayed harvest, were conducted in several states. The data found the crop has the ability to produce at less cost, nearly the same milk as corn silage but with **better components**. Conventional dairy farms are finding that it is 90% cheaper for the seed to grow sorghum than corn silage and that is before we factor in all the fungicide sprays we have to put on corn but not sorghum. Corn stops growing at 85F, while sorghum grows to 105F – you get more growth out of the season. Deer hide in it and come out to eat the neighbors' corn. Its natural prussic acid wipes out corn rootworms so corn can be planted the next year after without damage. It is direct harvested with one cut and with no grain you don't have to expend extra cost and fuel for processing.

Sorghum can play a **critical role** in increasing the **profitability of organic farms**. Farmers have this image that to be a real farmer they need to grow corn silage. Organic corn needs to be regularly cultivated to control weeds, especially in its smaller stages. This comes at the same time and nice weather that haylage needs to be harvested to support a profitable high-forage diet. Thus, the corn is cultivated, the haylage is late, and so it costs more to produce organic milk, severely **handicapping profitability**. Properly planted BMR male sterile sorghum (not a GMO-derived crop) planted correctly, can outgrow the weeds and does not need to be cultivated. It can support the same milk production and is planted after timely harvest of highly digestible haylage.



Without fertile seed head, all **the nutrition is stored in the forage**. The 8 week post heading harvest date allows enhanced nutrition to build in the crop so it supports nearly the same milk as corn silage. Without seed there is no need to buy and operate kernel processors.



Drilled narrow rows **yield 18% higher** than wide 30 inch rows. Population/acre spacing in the row is critical to get large size stalks that stand well, have high nutrition relative to the lignin filled rind, and yield that optimizes the crop. Over planting produces a lodged crop that has poor digestibility. Our research this year will find the optimum combination.

As with any crop, there are key steps to be taken for successfully selecting, planting, growing, harvesting, and preserving this high digestible fiber forage. The first key to growing BMR male sterile forage sorghum is to get the right length of season for your location. We found to **maximize the digestible nutrients** to corn silage levels it is **critical to have 8 weeks of growth after head emergence, before you harvest**. This is the same as normally chopping corn silage 8 weeks after tasseling. This means 8 growable weeks. One farm planted late and yes, got the 8 weeks after heading; but the last two weeks were too cold for sorghum to grow. Thus, variety selection is critical. There are limited varieties because we have only recently had the breakthrough harvest that give us the **male sterile enhanced nutrients** critical for dairy. Sorghum breeders are rapidly developing varieties for a wider range of climate zones. North of the Mason-Dixon line (south edge of Pennsylvania) there is only one variety that I know of that is less than 55 days to heading that fits that climate zone. South of that line, several companies have varieties that fit. Unfortunately, one that had nice genetics had quality control issues and it all had seed set – ruining the digestibility. Another had a good male sterile, but the parent genetics caused it to send out heads from each of the leaf axils which converted the highly digestible nutrients into lateral shoots with lots of lignin and very low digestibility. **Buyer beware**. There are good longer season male sterile varieties, but you must look and ask questions.

The crop does well with immediately incorporated manure with high organic matter. The organic matter will supply nitrogen late into the season to maintain high (11-12% CP) crude protein. For perspective, a 25 ton silage crop at 35% DM will remove 336 pounds of nitrogen (plus critical 40 pounds of sulfur) to support a 12% crude protein level. Short it and the protein drops. The flip side is that you can correct lower protein by adding urea in the TMR.

The front end of the season is **critical** for successful stand establishment. **The soil temperature needs to be above 60, approaching 65, with warmer weather forecast for the next two weeks**. Some farms tried to push it in the cooler weather last spring and regretted the results, especially for organic farms where weeds out-competed the crop. The advantage is that the warm weather comes after the first cutting haylage is already in storage. If you push the season it is critical not to use organic and use treated seed that allows herbicide application. Sorghum needs warm soils.

An **absolute essential step** that we are conducting replicated research on in multiple states, is the **population planted and the row width used**. This is a major deciding factor between success and failure. There are tremendous erroneous recommendations out there. The old farmer's tale is to plant it at 15-20 pounds of seed/acre which at the average pounds of seed/acre results in 225,000 seeds/acre or less than 1 inch between plants on a 30-inch row. The story is that it increases the yield, and the smaller stems are more digestible. **NOT TRUE. BS, Bad Science**. In the early 1980's there was considerable replicated research on high-population corn planting (40-50,000/acre). The result was a crop that fell over before harvest like overplanted sorghum does. The smaller stems had a huge increase in percent rind (outside rim of the stem with high lignin). This significantly decreased the digestibility of the forage. The same with sorghum. What we have found is that as we increased the spacing in the row, the sorghum stalks got as big as corn stalks at the same population, and the lodging issues decreased or disappeared. Yield and digestible fiber were still maintained. Our hypothesis is



This organic farm rushed the season and planted into cool soils. It delayed the growth of the sorghum and enhanced the growth of the weeds. Farms that waited for warm weather had excellent crops with no weed pressure.



A common problem is planting too high a population. Here a great crop was turned into a lodged mess.

that at 7.5 inch row spacing, 120,000 seeds/acre is the maximum (note: we do NOT use pounds of seed/acre but **seed count/acre** just like corn). This results in plants that are 7 inches apart in a row that is 7.5 inches wide. This is nearly equidistant spacing to maximize yield, quality, and standability while shading the ground to prevent weed growth. If you use a 15-inch spacing corn planter with sorghum plates you still need that minimum 7 inches in the row to prevent thin lodging stalks, and that is achieved at 60,000 seeds/acre. With GPS you can plant a 15 inch row and double back splitting the rows to get very accurately planted 7.5 inch. We do not suggest you plant sorghum in 30-inch rows as in my replicated trials it **yielded 18% less than the narrow 7.5 inch drilled rows**. If you insist on using this spacing, we are suggesting the same 30 – 34,000 seeds/acre as corn to keep the crop standing and have stalks that maximize digestible content. In my research, I have had an intense storm (hurricane) hit after the plants headed out. Because it was planted at the correct population, in two weeks it was ¾ back to standing upright. At harvest, it was nearly all upright. This will not happen at too high a population. It goes down and stays down.

We suggest planting depth at 1 – 1.25 inches (similar to corn) into warm soils. The warmer the soil the faster it emerges. Once up it can grow at a tremendous pace. Mine doubled in height each week. When it was 14 inches tall, I measured it growing 3 inches a day over the next week.

BMR male sterile forage sorghum is not a magic crop. It has huge potential in **profitable dairy rations**. As with any crop, key management principles need to be followed.



At this height sorghum grows at a tremendous rate. In my research I measure it increasing 3 inches in height every day for a week.

Sincerely,

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Hand  
to Better  
Agriculture**

