TEXAS A&M UNIVERSITY
Soil & Crop Sciences

TEXAS A&M AGRILIFE EXTENSION

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Texas A&M—AgriLife Agronomic Monday Memo

What are Brown Mid-Rib Forages among Sorghums?

Lower forage lignin and improved feed value highlight BMR potential.

In my new Extension career (1999) an early opportunity was learning about and explaining the advent of brown mid-rib (BMR) sorghum/sudans to farmers. Even today in Texas county Extension programs many hay farmers remain unfamiliar with BMR, which is non-GMO.

The key trait of BMR in **appearance** is… a brown mid-rib (also tan) in the leaves (Fig. 1, at right). There can also be brownish cast on the stalk (left side of pic). The key trait of BMR in **function** is reduced forage lignin. Lignin is an indigestible structural component that helps plants stand up. Cattle are ruminants. They can get feed value and energy from cellulose and hemicellulose. But not lignin (termites can!).

Research since 2001 shows BMR sorghums have reduced lignin by 20-33% and sometimes over 40%. This increases digestibility and feed value as more nutrients, protein, etc. *generally* in a BMR forage are available to the animal. Total digestible nutrients (%TDN) in BMRs is generally somewhat higher than non-BMR sorghum/ sudans. Forage yields on average may be slightly lower, but in contrast the market value of BMR hybrids as grazing forage and hay should be higher per ton.

Due to higher potential feed value, some Texas dairies and beef cattle feedlots, who would prefer corn silage, will specify BMR forage sorghum. Forage sorghum in general has somewhat lower feed value than corn, but BMR forage sorghums approach corn feed value. Coupled with substantially less water requirement, BMR forage sorghums may be a better option where irrigation + rainfall is limiting.

Grazing Livestock Generally Prefer BMR Sorghums vs. Non-BMR

In several instances Texas A&M AgriLife Extension has observed grazing preference for BMR

hybrids when traditional hybrids were drilled in the same field (Fig. 2). I saw this in my first ever Extension demonstration in Scurry County in 1999. I helped CEAs plant five sorghum/sudan hybrids including two BMRs in a Fluvanna, TX hayfield. Agents called me five days after the cattle were turned in. The cows had found something they liked. In time they were eating stalks of the BMR hybrids when there was still leafy material available in the non-BMR hybrids.

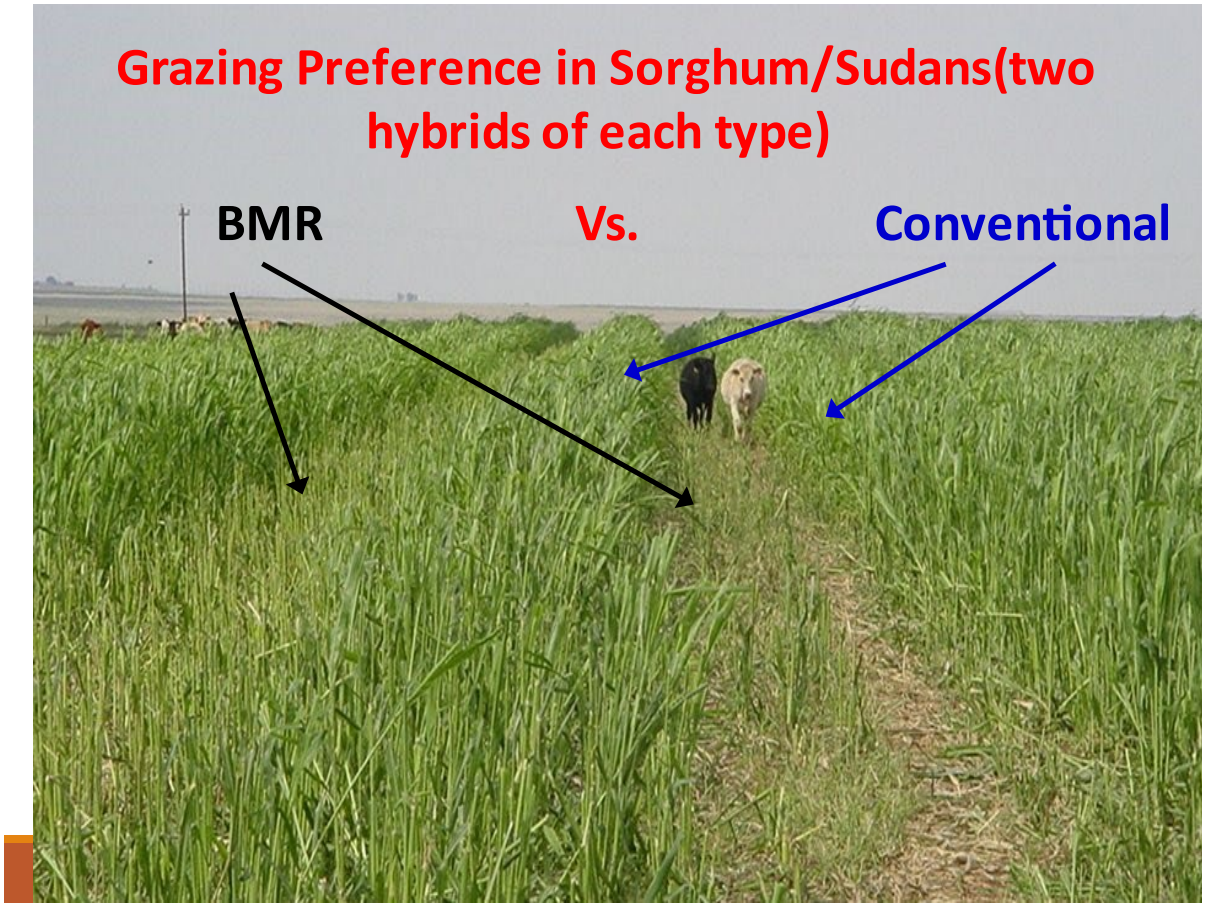

Fig. 2. Livestock grazing preference of two BMR sorghum/sudan hybrids vs. conventional sorghum/sudans, Deaf Smith Co., Texas (photo courtesy Richardson Seeds, Vega, TX).

Opportunities for Sorghum/Sudan Farmers—A Comparison for Your Farm

If a forage grower has not tried a BMR haygrazer, especially in a grazing setting, I encourage them to buy one or two bags of different BMRs from two companies. Drill them and keep track of the location vs. your preferred non-BMR. Animal preference does not ensure improved animal performance, but a grazing preference seems convincing. Research at Texas A&M at Bushland in the 2000s showed animal grazing performance on BMR vs. an isogenic line (the exact same hybrid but without the BMR gene) resulted in higher average daily gain of 0.32 lb./day (12%) higher on BMR over two years.

BMR Sorghums do not Excuse Poor Forage Management

How you manage your sorghum/sudan (or any forage) for yield and quality is still probably more

important than which hybrid including BMR you plant. Forage quality declines with time. What quality of forage do you need? If you are selling hay would an informed buyer pay more for BMR haygrazer at the same stage of growth as a non-BMR hybrid? This is a good time to test forage quality. BMR can be worth more. But any well-managed sorghum/sudan can produce good quality forage. The same good management for BMR can achieve even better results.

What about seed costs for BMR?

Yes, BMR seed will cost more. Texas seed companies in general sell BMR about $10-15/bag more than improved conventional BMR sorghums. (And the cheaper old haygrazers might be $10-15 less than improved haygrazers.) Modest seed rates should mitigate some of this cost differential. The higher value use of BMR (stockers vs. cows; dairies vs. beef cattle) will further diminish the cost differential.

Are there other forages that offer BMR?

Yes. BMR is a trait of the grass family (*Gramineae*). It has been successfully introduced into corn and hybrid pearl millet. The BMR trait has no effect on grain production. BMR corn hybrids are used (and specified for contracting in some cases) for corn silage. The ensiling process might diminish the advantage of BMR somewhat as non-BMR forages undergo breakdown and fermentation (which doesn't affect lignin much). Also, at least one U.S. company (Coffey Seed, Plainview, TX) has bred the BMR trait into hybrid pearl millet. Similar increases in forage quality are expected from BMR corn and BMR millet as in BMR sorghums.

Is there such a thing as a 'White Mid-Rib' forage?

Several years ago, a Texas forage seed company advertised 'white mid-rib' sorghum/sudans. As if this was unique and no one else had it. This relied on would-be forage growers thinking there was something special about white mid-rib. No, this was a sales gimmick. The company didn't have at the time a BMR forage for sale. They were losing sales. White mid-rib, if you can call it that, is the traditional sorghum/sudan, forage sorghum, etc. we have had for decades. There is no distinct advantage, it is the normal stuff. Advertising white mid-rib was disingenuous misleading to the seed buyer.

This weekly agronomic Memo for Texas A&M AgriLife Extension county agents is compiled by Dr. Calvin Trostle, Professor & Extension Agronomist, Lubbock, (806) 777-0247 (mobile), ctrostle@ag.tamu.edu TAM-AAMM tips will be collected at http:// (to be determined)