



Brown Midrib Sorghum Sudangrass, Part I

Successfully Growing a High Energy Grass for Dairy Cows

Brown Midrib Sorghum Sudangrass (BMR SxS) is a low lignin, highly digestible, warm-season, annual grass. It is harvested as a forage crop and could be a useful addition to dairy farm cropping systems, both for milk production and protection of the environment. Potential benefits of BMR SxS include:

1. High quality forage, which when properly built into higher forage rations, promotes healthy rumens and reduces nitrogen and phosphorus imports via purchased feeds.
2. Potentially comparable yields to corn silage, especially on less productive corn grounds and/or where corn planting is delayed due to wet, spring soil conditions.
3. Reduced soil erosion due to increased soil cover throughout the year.
4. Flexible planting date (June 1 - July 1) is compatible with other spring field work.
5. Low requirement for pesticides (usually none) due to high seeding rates and low insect/disease pressure.
6. A 2-cut system allows manure applications during the summer when chances for runoff and leaching are reduced.
7. Yield and quality do not depend on grain fill, so the crop is less susceptible to July-August drought conditions than corn silage.
8. Double-cropping with winter rye/triticale.
9. Compatible with rotational grazing, because BMR SxS provides grazeable forage during the July-August "summer slump" and can serve as rotation crop to re-establish perennial forage species in pastures while not losing grazeable acres.
10. Compatible with existing hay equipment.

Planting Date: The seeds do not perform well in cold soils. Soil temperature must be over 60°F for rapid emergence and growth (often about June 1st). BMR SxS planted as late as July 15th can still produce one cutting.

Seeding Rate and Depth: Drilling 65-70 lbs/acre of seed will give 2.5–3 tons more yield than lower seeding rates and shade the ground

to control weeds. Seeds should be planted SHALLOW, ½-¾ inch deep. Deeper placement has resulted in failed seedings. Drills set for shallow planting are ideal. Broadcast, "air-truck", and cultipacker seeders are less reliable than drills, but can work as long as good seed-soil contact can be achieved without burying the seed. A roller with corrugations of less than 2 inches is best, while 3-4 inch corrugations will bury the seed too deeply. Rolling with teeth down or light disk incorporation has also resulted in stand failures. Premixing fertilizer with seed, even for a short time, could be toxic and has resulted in significant stand loss.

Growth: Seedlings should emerge within one week given warm soils and adequate moisture. Dry conditions after planting may delay emergence 10-14 days and/or result in uneven germination. Under warm, moist conditions, BMR SxS could grow up to 3-4 inches per day; growth rates will decline when nights become cool or during dry periods.

Weed Control: Under proper growing conditions, BMR SxS will out-compete weeds and not need herbicide. A stale seedbed system (tilling the field 10 days before planting, letting small weeds emerge, and then harrowing before planting) will kill most weeds. Minor weed infestations are corrected by harvesting. If annual grasses establish, they can lead to stand failure. Broadleaf weeds can be controlled by herbicide, but consult the herbicide label before application.

Fertilizer: Under optimal management, yields in research trials across New York State have ranged from 9 to 18 tons/acre (35% dry matter), depending on weather conditions. Apply phosphorus and potassium similar to corn silage (based on soil test levels). For nitrogen (N), BMR SxS should be fertilized more like an intensively managed perennial grass than a corn crop. If no manure is applied, broadcast 110-130 lbs N/acre at

planting and topdress the same amount soon after each cutting for higher yield and protein content. For sites that follow sod plow-down or recent manure application, N application rates should not exceed 35-55 lbs N/acre per cut for optimum return to fertilizer investment and reduced N losses to the environment. Manure should be applied within 2 days after cutting to minimize damage to re-growth.

Stand Height at Harvest: With sufficient N, harvesting BMR SxS at a height of 36-48 inches will yield energy levels similar to corn silage and crude protein (CP) levels of 15-20%. Delaying harvest until the crop is taller will result in lower CP content, but more yield per acre per cutting. Fiber digestibility declines as the plant matures but is still highly digestible at taller heights relative to most other common forage crops. Delaying harvest until the crop is taller may jeopardize a second cutting in crops planted after June 15th in cooler areas. If the crop is light yellow, indicative of N deficiency, harvest at 30 inches and correct the yield limitations with proper N fertilization. If grazing or green chopping any BMR SxS, wait until plants reach a minimum of 24 inches in height to avoid prussic acid poisoning. Do not graze horses on BMR SxS, as it can cause cystitis syndrome. Green plants that are frosted should be completely dried before grazing or ensiled several weeks before feeding. If BMR SxS is properly fermented, prussic acid from any harvest is not a problem.

Harvest Management: A major key to attaining high quality BMR SxS is rapidly drying the crop in the field. As height increases, energy holds at modest levels and protein drops, but moisture removal becomes much more of a challenge (Figure 1).

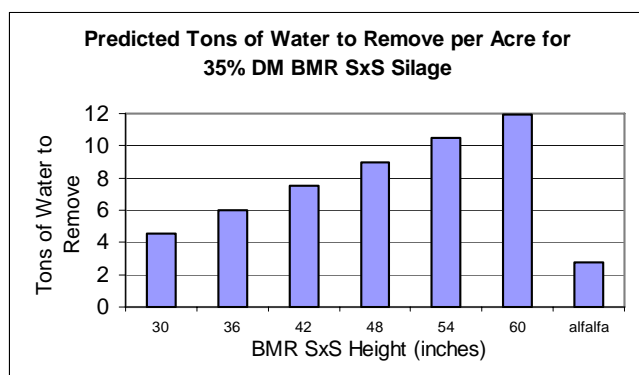


Figure 1: Water per acre to remove in the field at different BMR SxS heights versus alfalfa.

Wet silage will result in lower energy feed, improper fermentation, decreased dry matter intake, and less potential milk production. To avoid this, consider the following:


1. Set the mower height at 5-6 inches so as not to stunt re-growth.
2. Harvest at stand height of 36-48 inches to keep moisture removal manageable.
3. Mow into a FULL WIDTH SWATH (like hay) to rapidly remove moisture.
4. Windrow with a merger or properly adjusted rotary rake (to avoid stones).

Most of the plant water is in the stem. Intermeshing conditioning rolls fully crush the stems for rapid drying. Flail conditioners are difficult to set to break open the stems without shredding the crop. BMR SxS needs to be watched closely, as the crop can dry deceptively fast in good conditions. Set the chopper length at ¾-1 inch for bunk silos and tumble mixers. Up-rights, baggers, and auger mixers need a slightly longer cut to maintain effective fiber. BMR SxS can be successfully made into round bale silage (baleage). BMR SxS can also be grazed (subject to the grazing restrictions discussed earlier). Strip grazing using portable fencing works well. BMR SxS will be more completely grazed when less than 48 inches tall. It will often take roughly 40 days of re-growth for the next harvest. Weather conditions can greatly influence the rate of re-growth, so monitoring harvest height is critical to managing the water in this high yielding crop.

Additional Resources:

- o Rensselaer County Cornell Cooperative Extension site: <http://www.cce.cornell.edu/rensselaer/agriculture>.
- o Nutrient Management Spear Program site: <http://nmsp.css.cornell.edu/projects/bmr.asp>.

For more information



Cornell University
Cooperative Extension

Nutrient Management Spear Program
<http://nmsp.css.cornell.edu>

Tom Kilcer, Greg Albrecht, Paul Cerosaletti, Pete Barney,
Quirine Ketterings, Jerry Cherney

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