“NEW & IMPROVED”
BROWN MID-RIB SORGHUM-SUDANGRASS MEASURES UP AS A CORN SILAGE REPLACEMENT

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Paul Cerosaletti - Delaware County
Pete Barney - St. Lawrence County
Dr. Quirine Ketterings - Cornell University
WHY BMR SS: Improved Crop Production

- Tolerant (Yield & Quality) of later planting date (June 1 to July 30)
  - No need to wait for mature grain

![Yield by Planting Date (wet year)](chart.png)
WHY BMR SS: *Consistent Yield on Droughty Soils*

1 inch water = .84 tons Corn silage; 1.76 tons BMR SS silage

BMR Sorghum Sudan
11.5 tons @ 35% DM

Corn Silage
5.75 tons @ 35% DM
WHY BMR SS: Can wait for proper soil conditions instead of mudding in the crop.
WHY BMR SS: Protection of the Environment

½ the soil erosion of conventional corn

Corn

BMR-Sorghum-Sudan

Bare Ground 1 month later

Complete ground cover in 2 – 3 weeks
WHY BMR SS: *Consistent Yield Through Flexible Harvest Options*

BMR SS on river flat harvested 3 days **before** Hurricane Isabel hit – no need to wait for grain fill!
BMR SS: Can plant after 1\textsuperscript{st} (& 2\textsuperscript{nd}) cut grass harvest

- **Crop 1: Grass Hay**
  - 100 lbs N per acre @ green up
  - Cut 6/9
  - 2.5 t/ac DM (7.0 @ 35% DM)
  - Could have taken 2\textsuperscript{nd} cut!!

**Crop 2: BMR SS**
- Planted July 10
- Cut 9/8 Baleage
- 2.2 t/ac DM (6.2 @ 35% DM)
Double Crop Opportunity in Northern Climates – Less than ideal drained soil

September - May
Forage Triticale

June - September
BMR Sorghum-Sudan
BMR SS Double Cropping with winter triticale

Winter Triticale no till seeded (with conventional drill) into BMR SS stubble;
BMR SS planted 6/28/03
BMR SS harvested 8/17/03
Winter Triticale planted 8/25/03
BMR SS: Environmental Benefits - Double Cropped with winter triticale

Because of winter triticale cover - No Soil Erosion!
2003 season (milk 2000 v. 7.54)
Triticale/BMR at Valatie Site

Lbs N/A

Lbs Milk/A

21.8 ton Corn Silage At Valatie site

- triticale
- 2nd cut BMR
- 1st cut BMR

2003 season (milk 2000 v. 7.54)
Triticale/BMR at Valatie Site

Lbs N/A

Lbs Milk/A

21.8 ton Corn Silage At Valatie site

- triticale
- 2nd cut BMR
- 1st cut BMR
BMR SS: As A Nurse Crop seeding year

As a Nurse Crop with Red Clover/Orchardgrass
BMR SS: Crop Production

- Doesn’t require special equipment
  - No corn planter or corn head
  - Planted with hay equipment
  - Harvested with hay equipment

- Harvestable as:
  - Chopped silage
  - Baleage
  - Grazed

Small & large farm friendly
Few Pest Problems

• Deer hide in it – eat alfalfa
• Rootworms are killed by it
• Armyworm will occasionally eat it
Why NOT BMR Sorghum-Sudan

- Late planting means 85% of sunlight available (unless double crop)
- It does poorly in cool temperatures
  - Planted too early
    Cool summers
There is NO Perfect Crop

Management can Make or Break the Profitability of Any Crop
Buying the wrong seed:
Not all BMR’s are the same
Ask your seed dealer for BMR-6!

<table>
<thead>
<tr>
<th></th>
<th>Forage Sorghum</th>
<th>Corn Silage</th>
<th>Cytoplasm 6</th>
<th>Cytoplasm 18</th>
<th>Non BMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>4% FCM lb./day</td>
<td>73.3</td>
<td>74.1</td>
<td>68.6</td>
<td>64.0</td>
<td></td>
</tr>
</tbody>
</table>

Grant et al 2003
For a Good Crop
Use Good Planting Techniques

- Soil **MUST BE WARM** >60F (cool conditions – annual grass – destroys crop
- Broadcast and disk/roll = failure
- Cultipacker seeder = failure
- Drill ½ - 1 inch deep
- Band fertilizer on poorer soils
BMR SS: Can Min Till or No-till

Need to drill 1 inch deep in no-till
Critical to Use Enough Seed

100 lb /a

40 lb /a
Weeds fill in empty spots
Enough Seed = Less Weeds
Like Corn: Short on N = Short on Yield
High Return on N Applied
Like any grass - Needs to be fed each cut

- Single 150 lb N application
- Split 75/75 lb N application
BMR Sorghum-Sudan Thrives on Pre-Plant Manure
Needed N except manure was!
Effect of Traffic Timing on Alfalfa Yield, Arlington, WI
2002

Total Yield (t/a)

No Traffic

2 DAY

5 DAY

9% Yield Loss
Mowed BMR
5 Days later spread 8,000 gal manure
RESULT: 85% of the field was dead

Be Cautious with Topdress Manure
Harvest
Storage
Feeding
BMR Sorghum-Sudan
Rapid Growth Gets Away on You
Went From 34” to 54” in one week!
Rapid Growth Gets Away on You
Went From 34” to 54”
in one week!

Great Grazing

Too High...
a Waste for Grazing

08 25 2003
Taller crop equals more water/acre
Predicted Water Removed for 35% DM
Milk Energy From BMR SS by Height

![Graph showing milk energy from BMR SS by harvest height in inches. The graph plots milk yield in pounds against harvest height in inches. There are two lines on the graph, one for ME Corn Silage (78.4) and another for ME BMR. The data points vary slightly around the lines, indicating the energy yield at different heights.](Image)
Milk from Protein by BMR SS Height

Lbs milk

harvest height inches

MP BMR

MP Corn Silage 57
Harvest Management is Key to Preserving Quality

• Set blade at 5 - 6 inch (37% more yield from faster regrowth + leaves rocks in the field).
Use a **Roller Conditioner**

Flail conditioners – Not as good
Ranges from minimal broken stems to Cole slaw like silage

Intermesh rollers shred stems for faster drying
Impact of Intermesh Roll Conditioning
Mowed at 8am; sampled 5.5 hours later

Prince Not
Prince Cond
Dream Not
Dream Cond
## Impact on Milk/Ton

<table>
<thead>
<tr>
<th></th>
<th>BMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrow Fresh</td>
<td>3364.4a</td>
</tr>
<tr>
<td>Wide Fresh</td>
<td>3030.9b</td>
</tr>
<tr>
<td>Narrow Ferment</td>
<td>2725.4A</td>
</tr>
<tr>
<td>Wide Ferment</td>
<td>3021.3A</td>
</tr>
<tr>
<td>Ibs Milk/ton</td>
<td>295.9</td>
</tr>
<tr>
<td>$/ton</td>
<td>$38.47</td>
</tr>
</tbody>
</table>

@2.5 Ton DM/cut x $38.47 = $96/cut x 2 cuts = $192/A
Harvest Management is Key to Preserving Quality

- Set blade at 5 = 6 inch (37% more yield from faster regrowth + leaves rocks in the field.
- Wide swath for rapid drying – like hay
- **Merge/rotary rake when correct moisture**
Harvest Management is Key to Preserving Quality

- Set blade at 5 = 6 inch (37% more yield from faster regrowth + leaves rocks in the field.
- Wide swath for rapid drying – like hay
- Merge/rotary rake when correct moisture
- **Chop @ 68 – 70% moisture**
- **Chop at ¾-1 inch length – longer for bagger and upright silos**
• If chopped too fine, lose effective fiber

Regular vs BMR
**BMR SS: Forage Analysis**

- Invitro digestibility analysis for best energy estimate

<table>
<thead>
<tr>
<th>Cutting Height</th>
<th>34”</th>
<th>46”</th>
<th>59”</th>
<th>69”</th>
</tr>
</thead>
<tbody>
<tr>
<td>In vitro adj. NeL, Mcal/lb</td>
<td>0.74</td>
<td>0.72</td>
<td>0.71</td>
<td>0.66</td>
</tr>
<tr>
<td>NIR NeL, Mcal/lb</td>
<td>0.62</td>
<td>0.61</td>
<td>0.60</td>
<td>0.61</td>
</tr>
</tbody>
</table>
Maximize BMR type forage in the diet

<table>
<thead>
<tr>
<th></th>
<th>Normal Corn Silage 50% forage diet</th>
<th>BMR Corn Silage 50% forage diet</th>
<th>BMR Corn Silage 65% forage diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk, lbs/day 3.5% FCM</td>
<td>74.6</td>
<td>73.3</td>
<td>79.2</td>
</tr>
</tbody>
</table>

US Dairy Forage Research Center
BMR SS: Quality

• Crude Protein: 15 – 16%

• NDF Digestibility:
  • Typical Range – 70-85% of NDF
  • Regular corn silage - 45-55% of NDF
  • Affected by weather
    – 2002 – lots of sun, higher NDFD
    – 2003 – lots of rain – increased lignin – lower NDFD
BMR SS: In the ration

• Balancing diets with BMR SS:
  • If replacing corn silage –
    – Should be able to reduce protein supplementation
    – will need to supplement with starch sources
  » Goal: NFC content of diet - 34-38% of DM

NFC = Non Fiber Carbohydrate
Feeding Trial

- DMI was 3 pounds above predicted levels
- Needed to add 2 lbs of corn meal to balance
- Removed 2 lbs of soy (which costs 2x as much)
- Milk production was the same as corn silage
- BMR Sorghum Sudan = high quality corn silage
3.5 % Fat Corrected Milk

Grant et al 2006
% Fat

Grant et al 2006
They found

- BMR-SS > body weight gain  similar BCS
- Efficiency  (solids corrected milk/DMI) was 28% greater for BMR-SS over Corn Silage.
- Rumen pH greatest @ 45% BMR 2nd at 35% BMR; lowest at 35% & 45% CS
- Conclude: BMR-SS an effective alternative to corn silage @ 35% or 45% of diet

Grant et al 2006
BMR SS: Why Not?

Commitment

• Farmer has to be committed to working with new crop, learning

• Nutritionist has to be committed to analyzing for fiber digestibility and accounting for higher forage protein
There is NO Perfect Crop

Management can Make or Break the Profitability of Any Crop
BMR Sorghum-Sudan: The Un-Corn

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