Important decisions

- Single cut (silage) or multi cut (generally hay)
- Hybrid selection
- Harvest management
- Planting date
- Soil fertility
- Water supply
- Weed management
- Seeding rate
Forage hybrid decisions

Silage
- Headed: BMR, SP3902 BD
  - Conventional: SP3903 BD
  - Headless: NK300, SS304, HIKANE II, SS405, SS506
- Headless: BMR, SP1615
  - Conventional: SP6205 BD
  - Headless: Sordan 79, SDH1741 BMR, SP4555

Sorghum x Sudan
- Headed: BMR, SDH1741 BMR
  - Conventional: Sordan 79, SDH2942 BMR, SP4105
- Headless: Sordan Headless

Sudangrass
- Headed: Trudan 8
  - Conventional: Trudan Headless
- Headless: BMR, Millex BMR

Millet
- Conventional: Millex 32
- BMR: BMR, Millex BMR

Hay/Grazing
- Headed: BMR, SP3902 BD
  - Conventional: SP3903 BD
  - Headless: NK300, SS304, HIKANE II, SS405, SS506
- Headless: BMR, SP1615
  - Conventional: SP6205 BD
  - Headless: Sordan 79, SDH1741 BMR, SP4555
Hay/Grazing cont.

- **Sudangrass**
  - Headed
  - Headless
    - Trudan 8
    - Trudan Headless

- **Millet**
  - Conventional
    - Millex 32
  - BMR
    - Millex BMR
What is BMR?

• A mutation that causes the mid rib of the leaves to turn brown. It also reduces lignification and increases digestibility.
Silage harvest management

- Headed hybrids need to be harvested at milk to soft dough stage
  - Allows for the best forage quality
  - Highest utilization of grain
  - Generally lodging will be reduced
- Headless hybrids can be harvested at any time
  - Generally will have higher moisture content therefore will require swathing before chopping
  - Quality does not change
  - Lodging may increase as hybrids get taller
Have choppers ready
Have choppers running?
Hay harvest management

• Headed hybrids will begin to lose quality as they mature
  • Cell walls thicken and lignin increases
  • Highest protein is generally at boot stage and will decrease as it matures
# What happens to quality

Mean of four sorghum cultivars harvested at different maturity stages

<table>
<thead>
<tr>
<th>Grow Stage</th>
<th>Crude Protein %</th>
<th>Lignin %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heading</td>
<td>8.34</td>
<td>4.14</td>
</tr>
<tr>
<td>Milk</td>
<td>7.85</td>
<td>4.60</td>
</tr>
<tr>
<td>Dough</td>
<td>7.69</td>
<td>4.70</td>
</tr>
<tr>
<td>Physiological maturity</td>
<td>6.35</td>
<td>5.16</td>
</tr>
</tbody>
</table>

• As crop matures yields increase

Mean of four sorghum cultivars harvested at different maturity stages

<table>
<thead>
<tr>
<th>Grow Stage</th>
<th>Yield tons/ac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heading</td>
<td>4.5</td>
</tr>
<tr>
<td>Milk</td>
<td>7.3</td>
</tr>
<tr>
<td>Dough</td>
<td>9.4</td>
</tr>
<tr>
<td>Physiological maturity</td>
<td>13.4</td>
</tr>
</tbody>
</table>

Highest quality
Highest quality + good quality?
<table>
<thead>
<tr>
<th>Forage</th>
<th>Cutting management</th>
<th>Days from planting to first harvest</th>
<th>Estimated DM yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>hay, haylage, green-chop silage</td>
<td></td>
</tr>
<tr>
<td>Sudangrass and hybrid sudangrass</td>
<td>cut 2-3 times</td>
<td>2.5 feet tall</td>
<td>3-6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>~ 45 days from planting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>~ 25 days regrowth</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>cut at dough stage</td>
<td>80-90 days</td>
</tr>
<tr>
<td>Sorghum-sudan</td>
<td>cut 2-3 times</td>
<td>3 feet tall</td>
<td>4-7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>~ 30 days regrowth</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>cut at dough stage</td>
<td>80-100 days</td>
</tr>
</tbody>
</table>
## Grazing management

<table>
<thead>
<tr>
<th>Forage</th>
<th>Days from planting to first grazing</th>
<th>Stocking rate and rotation</th>
<th>Days rest to allow regrowth</th>
<th>Rotational grazing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sudangrass and hybrid sudangrass</td>
<td>18 inch height about 35 days</td>
<td>4-5 AU/A graze to 6-8 inches grazed in 7-10 days</td>
<td>18 inch height about 21 days</td>
<td>130-150</td>
</tr>
<tr>
<td>Sorghum-sudan hybrid</td>
<td>24-30 inch height about 40 days</td>
<td>5-6 AU/A graze to 6-8 inches grazed in 7-10 days</td>
<td>24-30 inch height about 25 days</td>
<td>160-180</td>
</tr>
</tbody>
</table>
Planting Date

• Wide window depending upon use and need
• Minimum of 60°F but 65°F or higher is preferred
  • If planting at 60°F make sure forecast for next week is for warm temperatures
Fertilizer recommendations

• Nitrogen
  • 6 – 8 lbs. per ton of wet yield
    • Example: 20 wet tons harvested X 6 = 120 lbs. N

• Phosphorous
  • Low soil test: 50 lbs. P$_2$O$_5$
  • Medium soil test: 30 lbs. P$_2$O$_5$
  • High soil test: sufficient

• Potassium
  • Soil test medium or lower 80 to 100 lbs. K$_2$O
Nitrate management

• Generally occurs during times of drought stress
  • Plant continues to uptake N and not able to metabolize due to water stress
  • Do not graze or bale when under drought stress
  • After rainfall or irrigation allow time for nitrates to metabolize before grazing or haying
  • Research has shown that ensiling will reduce nitrates by 40 – 50%
Prussic Acid/HCN

• Sudangrass and sorghum plants contain the cyanogenetic glucoside *dhurrin* (or *durrin*).

• An enzyme called *emulsin*, breaks down *dhurrin* to release prussic acid or hydrocyanic acid (HCN).

• If plants are damaged, as by freezing, chewing, or trampling, then *emulsin* can more easily free larger quantities of the poison; thus the hazard.

• HCN is lost if the stem is broken (crimping/ensiling)
Prussic Acid/HCN

- Species: Millet < Sudangrass < Sorg-Sudan < forage sorghum.
- Plant part: Leaves are higher than stems, upper leaves are higher than lower leaves
- Tillers: Higher than main plants
- Maturity: Higher yields result in lower HCN
- Fertilizer: Do not over apply N and amend P and K deficiencies
- Frost: Frost concentrates HCN, delay harvest or grazing few days for HCN to dissipate
- Drought: Lower yields increase HCN concentration
Water supply

• Biggest key is to harvest (silage/hay) after rainfall/irrigation to reduce nitrates

• Forage sorghum silage yields have been similar to those of corn while using 30 percent less irrigation water

• Sorghums will yield 1.75 to 2.5 tons of biomass per one inch of irrigation water

• Sorghum silage yield increased approximately 0.75 ton/acre (at 65 percent moisture) for every inch of watered used by the crop
Weed management

• Forage sorghum/sorghum-sudan Concep treated seed allow for the use of chloracetamide (metolachlor) + atrazine
  • Dimethenamid and Acetochlor labels do not have forage sorghum on labels
  • Sudangrass cannot be Concep treated, so only broadleaf control

• Broadleaf control
  • Atrazine for (forage sorghum, SXS, sudangrass)
  • Sharpen (forage sorghum, SXS, sudangrass, and pearl millet)
Double crop weed control

• Burn down options
  • Glyphosate (22 to 32oz)+ sharpen (2 oz)
  • Glyphosate (22 to 32 oz) + Atrazine (1 to 1.5 lbs.)
  • 2,4-D or Banvel wait 1 – 3 days/oz to plant
# Seeding rate

<table>
<thead>
<tr>
<th></th>
<th>Adequate Moisture</th>
<th>Limited Moisture</th>
<th>Planting Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forage Sorghum</td>
<td>100,000 seed/acre</td>
<td>60,000 seed/acre</td>
<td>Row Crop Planter</td>
</tr>
<tr>
<td>Sorghum X Sudangrass</td>
<td>20-25 lbs/acre</td>
<td>20 lbs/acre</td>
<td>Drilled</td>
</tr>
<tr>
<td>Sudangrass X Sudangrass</td>
<td>15 lbs/acre</td>
<td>10 lbs/acre</td>
<td>Drilled</td>
</tr>
</tbody>
</table>

- Lower rates for dryland
- Higher rates for narrow rows (accounting for grain drill system)
- Seeding depth of 1 to 1.5 inches
Plant Population and Silage Yield

- Seeding Rate Recs
  - Seldom do yields increase when yields are above 90,000 plants/acre
  - Seeding systems and seed quality will dictate seeding rates.
  - Planters > Drills for stand establishment
  - Wide rows likely better in drier environments.
- Lodging decreased as plant population increased
- Contrary to conventional wisdom, it appeared that finer stems had a lower wind profile than wide, rigid stems.
For more information please visit:
www.sorghumpartners.com

Call to speak to a sorghum expert:
1-855-SORGHUM