The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://droughtmonitor.unl.edu

Released Thursday, March 7, 2013

Matthew Rosencrans, NOAA/NWS/NCEP/Climate Prediction Center
The Good
The Bad
The Ugly
Desperation!
Overloaded With Corn
That’s A Lot of Cows!

- 425,000 Milking Cows
- 170 Dairies
- 9.6 Billion lbs. of Milk
- 2,000 Head / Dairy
- 45 tons DM / Day
Silage Acres in NM

(Source: NASS-NM)
## How Much Water Do You Have?

<table>
<thead>
<tr>
<th>Plant Type</th>
<th>GPM/Acre</th>
<th>Inches/Week</th>
<th>Inch/Day</th>
<th>Inches per 100 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunflowers</td>
<td>2.0</td>
<td>0.75</td>
<td>0.11</td>
<td>10.6</td>
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<tr>
<td></td>
<td>2.5</td>
<td>0.93</td>
<td>0.13</td>
<td>13.3</td>
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<tr>
<td></td>
<td>3.0</td>
<td>1.10</td>
<td>0.16</td>
<td>15.9</td>
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<tr>
<td></td>
<td>3.5</td>
<td>1.30</td>
<td>0.18</td>
<td>18.6</td>
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<tr>
<td></td>
<td>4.0</td>
<td>1.50</td>
<td>0.21</td>
<td>21.2</td>
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<td>4.5</td>
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<td>0.24</td>
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<td></td>
<td>5.0</td>
<td>1.85</td>
<td>0.27</td>
<td>26.5</td>
</tr>
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<td>2.00</td>
<td>0.29</td>
<td>29.2</td>
</tr>
<tr>
<td></td>
<td>6.0</td>
<td>2.25</td>
<td>0.32</td>
<td>31.8</td>
</tr>
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<td></td>
<td>6.5</td>
<td>2.41</td>
<td>0.34</td>
<td>34.4</td>
</tr>
<tr>
<td></td>
<td>7.0</td>
<td>2.60</td>
<td>0.37</td>
<td>37.1</td>
</tr>
</tbody>
</table>

Source: Leon New, TAMU AgriLife.
Corn Crop Water Use

Source: B. Bean, TAMU AgriLife Extension; Water use at Halfway, TX.

- 2011
- 13 YR AVG

Graph showing water use in inches from May to September with lines representing 6 GPM/Ac and 5 GPM/Ac.
What If We Stay Dry?

U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period
Valid for March 7 - May 31, 2013
Released March 7, 2013

KEY:
- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

Describes large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events.

"Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.
Sorghum Forages

Why Consider Them?

• Advantages
  – Later planted
    • More time to fill profile
    • Improved odds of rain
  – Higher yields with limited water (in hot months)
  – Drought tolerant
  – Low seed cost
  – Multiple harvest options

• Disadvantages
  – Lower nutritive value
  – Lodging
  – Harder to dry
  – Few herbicide options
Sorghum Forages

Why Consider Them?
## Consistent Performers

### Forage Sorghum

<table>
<thead>
<tr>
<th>Seed Company</th>
<th>Varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern CO Seed</td>
<td>HP 95 BMR</td>
</tr>
<tr>
<td>Forage First</td>
<td>FS-5</td>
</tr>
<tr>
<td>Pioneer</td>
<td>849F</td>
</tr>
<tr>
<td>Richardson Seed</td>
<td>Pacesetter BMR ; Sweeter-N-Honey BMR</td>
</tr>
<tr>
<td>Scott Seed</td>
<td>S.S. Silage</td>
</tr>
<tr>
<td>Sorghum Partners</td>
<td>SS405 ; NK 300</td>
</tr>
</tbody>
</table>
Crop Water Use
Forage Sorghum

- What's Your Goal?
  - Silage

- Can We Get 30 Tons (10 Tons of DM) of Silage?

- How Much Water Do You Have?
  - 15 to 25 inches per season

- Water Use
  - Literature: 2.4 inches / ton DM
  - Research (NMSU/TAMU): 2.5 to 3.5 inches / ton DM
Limited Irrigation Studies at Clovis  
2005-2010

- **Declining Well Capacity**
  - 425 GPM on 120 ac
  - 1.3 inches per week
  - 15-18 inches over 100 days

1 = Corn  
‘DKC69-71 (RR2/YGCB)’  
‘Pioneer 31G71’

2 = Forage Sorghum, Conventional  
‘FS-5’

3 = Forage Sorghum, Brown Midrib  
‘DairyMaster BMR’  
‘Leafy 108 Brachytic Dwarf’
Dry Matter Yield
Clovis, NM – Long-term Trend

DM Yield, Ton ac⁻¹

- Corn
- C-FS
- BMR-FS

2005-2006
2007-2008
2009-2010

0.0
2.0
4.0
6.0
8.0
10.0
12.0
Much speculation

~ 15,000 seeds/lb

- 75 to 150,000 seeds/ac
Seeding Rate Effect
2007-2008 – Clovis, NM

Total Water = 32”

Yield, ton/acre

- **Low**
- **Med**
- **High**

**Corn**
- Low: 25,000
- Med: 30,000
- High: 33,000

**C-FS**
- Low: 95,000
- Med: 115,000
- High: 125,000

**BMR-FS**
- Low: 95,000
- Med: 115,000
- High: 125,000
## Seeding Rate Effect

**2009-2010 – Clovis, NM**

Total Water = 25”

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Med</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn Conv. FS Dwarf BMR</td>
<td>17,500</td>
<td>21,500</td>
<td>25,000</td>
</tr>
<tr>
<td>DM Yield (ton/acre)</td>
<td>63,000</td>
<td>76,500</td>
<td>90,000</td>
</tr>
</tbody>
</table>

- **Com**
  - Low: b
  - Med: ab
  - High: a

- **Conv. FS**
  - Low: a
  - Med: a
  - High: a

- **Dwarf BMR**
  - Low: a
  - Med: a
  - High: a
Seeding Rate Effect on Yield

Bushland, TX

Yield, Ton/Ac

[Bar chart showing the effect of seeding rate on yield for NutriChoice II, BMR 100, and DairyMaster at different nutrient levels (60,000, 90,000, 120,000).]
Corn & Forage Sorghum Silage

Fertility

• Yield goal dependent

• Full irrigated (N)
  – 200 to 300 lbs of N/ac
  – 8 to 10 lbs/ton of yield goal

• Other fertility (check soil test)
  – 40-60 lbs Phosphorus
  – 30-45 lbs Sulfur
  – 5-10 lb Zinc

• Save with sorghum

Nutrient/ton
N: 8-10 lbs
P₂O₅: 3-4 lbs
K₂O: 12-15 lbs
Corn vs. Sorghum – 2011
Clovis Variety Trials

• Corn
  – Irrigation: 26.3
  – Rainfall: 3.7
  – Total Water: 30.0
  – Fertilizer: 250 lb N
  – Yield:
    • DM: 6.9 Tons
    • Wet: 23.3 Tons
    • Range: 18.3-28.6 Tons

• Forage Sorghum
  – Irrigation: 25.2
  – Rainfall: 4.0
  – Total Water: 29.2
  – Fertilizer: 220 lb N
  – Yield:
    • DM: 6.7 Tons
    • Wet: 22.7 Tons
    • Range: 17.0-32.2 Tons
# Nutrient Removal

**ASC – Clovis**

<table>
<thead>
<tr>
<th></th>
<th>Wet</th>
<th>Dry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>P₂O₅</td>
</tr>
<tr>
<td>Corn</td>
<td>10.0</td>
<td>3.8</td>
</tr>
<tr>
<td>Forage Sorghum</td>
<td>8.8</td>
<td>3.4</td>
</tr>
<tr>
<td>Wheat/Triticale</td>
<td>14.8</td>
<td>5.1</td>
</tr>
</tbody>
</table>
Nitrogen Use Efficiency Research

Clovis ASC
Nutritional Suitability

• Must Compete with Corn
• High Energy
• Equal or Better Milk Production
  – 50-60 lb/day
• Consistent Product
• Comparable or Lower Cost
The Enemy
BMR and Non-BMR Forage Sorghum
Silage Yield vs. % IVTD,
Bushland, TX Variety Trials – 3 Years

(Yellow lines represent averages for corn silage grown in the trials)

(Bean and McCollum, 2006)
NDF vs. NDF-Digestibility
Clovis, NM Variety Trials – 3 years

<table>
<thead>
<tr>
<th></th>
<th>NDF</th>
<th>NDFD-48</th>
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</thead>
<tbody>
<tr>
<td>Corn (91)</td>
<td>46.3</td>
<td>58.4</td>
</tr>
<tr>
<td>C-FS (41)</td>
<td>56.0</td>
<td>66.7</td>
</tr>
<tr>
<td>BMR-FS (20)</td>
<td>56.1</td>
<td>69.4</td>
</tr>
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</table>
Milk per Ton
Clovis, NM Variety Trials – 3 years

<table>
<thead>
<tr>
<th>Variety</th>
<th>Milk Prod.</th>
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<tbody>
<tr>
<td>Corn (91)</td>
<td>2721</td>
</tr>
<tr>
<td>C-FS (41)</td>
<td>2722</td>
</tr>
<tr>
<td>BMR-FS (20)</td>
<td>2795</td>
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</table>
## Feeding Trials

<table>
<thead>
<tr>
<th></th>
<th>Conventional FS</th>
<th>BMR-6 FS</th>
<th>BMR-18 FS</th>
<th>Corn</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DMI, Lbs/d</strong></td>
<td>51</td>
<td>55</td>
<td>51</td>
<td>53</td>
</tr>
<tr>
<td><strong>Milk, Lbs/d</strong></td>
<td>68</td>
<td>75</td>
<td>71</td>
<td>74</td>
</tr>
<tr>
<td><strong>Fat %</strong></td>
<td>3.57</td>
<td>3.89</td>
<td>3.77</td>
<td>3.88</td>
</tr>
<tr>
<td><strong>4% FCM, Lbs/d</strong></td>
<td>64</td>
<td>74</td>
<td>69</td>
<td>73</td>
</tr>
<tr>
<td><strong>BW, Lbs</strong></td>
<td>1,399</td>
<td>1,406</td>
<td>1,410</td>
<td>1,408</td>
</tr>
</tbody>
</table>

(Oliver et al., 2004)
Conventional vs. BMR – Yield
Clovis, NM Variety Trials – 4 years

<table>
<thead>
<tr>
<th></th>
<th>Dry Yield</th>
<th>Wet Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-FS (46)</td>
<td>8.2</td>
<td>25.4</td>
</tr>
<tr>
<td>BMR-FS (23)</td>
<td>6.8</td>
<td>22.0</td>
</tr>
</tbody>
</table>
Harvesting Sorghum Forages

• **Ensiling**
  – One or two harvests
  – Stage of maturity
    • Mid-dough
    • 25% grain
  – Minimal drying required
    • 60-70% moisture

• **Green chop**
  – 18 inch minimum
  – Grazing precautions
Harvest Challenges

- Reducing Lignin
- Top-heavy Plant in a Windblown World
Brachytic Dwarf Sorghum

Clovis, NM
Silage Yield
2009-2010 – Clovis, NM

Yield (ton/ac)

- Corn
- Conv. FS
- Dwarf BMR

Dry Matter
- a
- b

Wet Yield
- a
- b
- c
Insurance Coverage

2013 Sorghum Silage Expansion

Counties labeled with 2013 T-yields.
Herbicide Options
Herbicide Options

• Forage Sorghums
  – Pre-emergence
    • Atrazine
    • Dual (Concep)*
    • Bicep/Cinch (Concep)*
  – Post-emergence
    • Atrazine
    • 2,4-D
    • Aim EW
    • Basagran
    • Buctril (Bromoxynil)
    • Clarity (Dicamba)**
    • Starane

* Some forage type sorghums may not take seed treatment very well.
** Check label for specifics about sorghums used for forage.
Sharpen Herbicide Study
Forage Sorghums

- **Sharpen (Saflufenacil)**
  - BASF; Broadleaf weeds
  - Contact herbicide; some residual pre-emerge
  - Good on horseweed
  - Labeled in *grain sorghum* only*
  - Good burndown option; mode of action
    - Alternative to glyphosate
    - Little plant back restriction

- **Verdict**
  - Sharpen + Outlook (dimethenamid)
  - Stronger pre-emergence activity
Sharpen Herbicide Study
Clovis ASC – 2012

• Test Plots
  – Late application at planting (May 30)
  – Evaluate crop damage
  – Evaluate yield effects
    • Forage: Conventional and BMR
    • Grain sorghum: Standard variety

• Rates
  – Sharpen only
    • 1, 2, 4 oz/ac
  – Verdict
    • 20 oz/ac (4 oz Sharpen + 16 oz Outlook)
Small Plot Results at Clovis
Crop Injury (15 days Post)
Small Plot Results at Clovis

Crop Injury (30 days Post)

Stunting Injury, %

- Grain
- Conventional-FS
- BMR-FS

Legend:
- 0 - Control
- 1 oz Sharpen
- 2 oz Sharpen
- 4 oz Sharpen
- 20 oz Verdict

Note: Values with different letters (a, b, c) are significantly different.
Small Plot Results at Clovis
Yields – Grain Sorghum

LSD = NS
## Small Plot Results at Clovis

### Yield – Forage Sorghum

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Conventional</th>
<th>BMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - Control</td>
<td>7.8</td>
<td>7.5</td>
</tr>
<tr>
<td>1 oz Sharpen</td>
<td>7.8</td>
<td>7.0</td>
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<tr>
<td>2 oz Sharpen</td>
<td>7.7</td>
<td>7.4</td>
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<tr>
<td>4 oz Sharpen</td>
<td>7.7</td>
<td>7.4</td>
</tr>
<tr>
<td>20 oz Verdict</td>
<td>7.0</td>
<td>6.6</td>
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LSD = NS
Sharpen Test Plots at Clovis
General Damage – 15 days Post

Control

Verdict (20 oz)
Sharpen Test Plots at Clovis
General Damage – 15 days Post

Control

Verdict (20 oz)
Test Plots at Clovis
BMR Forage Sorghum – 30 days Post

Control

Verdict (20 oz)
Test Plots at Clovis
Conventional Forage Sorghum – 30 days Post

Control  Sharpen (4 oz)
Test Plots at Clovis

Conventional Forage Sorghum – 30 days Post

Control

Sharpen (1 oz)
Test Plots at Clovis – 2010

7 Days Post Final Treatment

Atrazine (pre) + Accent + Resolve (post)

Sharpen (pre) + Accent + Resolve (post)
## Pre-Emergence Weed Control - 2009

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate</th>
<th>Cost</th>
<th>% Pigweed Control</th>
<th>% VtLf Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rate</td>
<td>Cost</td>
<td>23-Jun 12 DAT</td>
<td>8-Jul 27 DAT</td>
</tr>
<tr>
<td>Untreated</td>
<td>Prod./Ac</td>
<td>$/Ac</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Atrazine</td>
<td>0.75 qt</td>
<td>2.25</td>
<td>100</td>
<td>53</td>
</tr>
<tr>
<td>Atrazine</td>
<td>1 qt</td>
<td>3.00</td>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td>Atrazine</td>
<td>1.25 qt</td>
<td>3.35</td>
<td>100</td>
<td>76</td>
</tr>
<tr>
<td>MiloPro</td>
<td>0.75 qt</td>
<td>6.35</td>
<td>100</td>
<td>66</td>
</tr>
<tr>
<td>MiloPro</td>
<td>1 qt</td>
<td>8.50</td>
<td>100</td>
<td>73</td>
</tr>
<tr>
<td>MiloPro</td>
<td>1.25 qt</td>
<td>10.65</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>Sharpen</td>
<td>2.5 oz</td>
<td>??</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Sharpen</td>
<td>3.75 oz</td>
<td>??</td>
<td>100</td>
<td>98</td>
</tr>
<tr>
<td>Sharpen</td>
<td>5 oz</td>
<td>??</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Lumax</td>
<td>2.5 qt</td>
<td>31.22</td>
<td>100</td>
<td>100</td>
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<tr>
<td>Bicep II Mg</td>
<td>1.6 qt</td>
<td>17.80</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Bicep II Mg</td>
<td>2.1 qt</td>
<td>23.36</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>LSD (P=0.05)</td>
<td></td>
<td></td>
<td>0</td>
<td>16.32</td>
</tr>
</tbody>
</table>

Source: B.Bean, TAMU AgriLife Extension.
## Pre-plant Burndown
### Applied April 2010

<table>
<thead>
<tr>
<th>Herbicide(s)</th>
<th>Rate (oz/acre)</th>
<th>Horsewd(a)</th>
<th>Kochia(b)</th>
<th>R. thistle(b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundup Pmax (RU)</td>
<td>22 oz</td>
<td>70</td>
<td>99</td>
<td>100</td>
</tr>
<tr>
<td>RU</td>
<td>32 oz</td>
<td>75</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Sharpen + RU</td>
<td>1 oz + 22 oz</td>
<td>90</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Sharpen + RU + 2, 4-D</td>
<td>1 oz + 22 oz + 32 oz</td>
<td>97</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2, 4-D</td>
<td>32 oz</td>
<td>63</td>
<td>99</td>
<td>100</td>
</tr>
<tr>
<td>RU + 2, 4-D</td>
<td>22 oz + 32 oz</td>
<td>70</td>
<td>99</td>
<td>100</td>
</tr>
<tr>
<td>RU + 2, 4-D + Clarity</td>
<td>22 oz + 32 oz + 2 oz</td>
<td>87</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Valor</td>
<td>2 oz</td>
<td>60</td>
<td>97</td>
<td>98</td>
</tr>
<tr>
<td>Valor + 2, 4-D</td>
<td>2 oz + 32 oz</td>
<td>83</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Valor + RU</td>
<td>2 oz + 22 oz</td>
<td>60</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>First Shot &amp; RU</td>
<td>0.75 oz + 22 oz</td>
<td>73</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

(a)- 1-4" rosette  
(b)- 1-2" tall

Source: B.Bean, TAMU AgriLife Extension.
Other Sorghum Herbicides

Post-emergence

- Huskie
  - Bromoxynil + pyrasulfotole
  - Fast burndown and long control
  - Excellent broadleaf herbicide
    - Larger weeds (up to 9”)
  - Good on pigweed
  - Some crop injury (i.e., leaf burn)
  - “Grain sorghum (to include grain and forage)”
    - Not necessarily ‘forage sorghums’
Sorghum Herbicide Program
You Have Options

• Start Clean
  – Burndown (short or no residual)
    • Roundup (or other glyphosate)
    • Sharpen or Verdict (Hope to get Forage Sorghum label)

• Pre-emergence
  – S-metolachlor* - Atrazine
    • Dual Mag, Bicep (Lite), Cinch ATZ (Lite)
    • Concep Treated Seed; Incorporated

• Post-emergence
  – Atrazine; 2,4-D; Dicamba**; Aim EW, Basagran, Starane
  – Huskie** or Buctril

* Some forage type sorghums may not take seed treatment very well.
** Check label for specifics about sorghums used for forage.
Resources

http://forages.nmsu.edu
Late-planted Summer Forages
Photoperiod Sensitive Sorghum

• Forage sorghum or SxS
• Remain vegetative
  – Day length < 12 hrs, 20 min
  – About Sep 20th
• Very high yielding
• Hard to dry
• Quality for silage is questionable
Yields of Sorghum Forages at Varying Planting Dates – Tucumcari, NM

Yields of Late Planted Summer Annual Forages – Bushland, TX

Source: Bean et al., Evaluation of Late-planted Summer Forages for Dryland Hay Prod. – Preliminary Report. TAMU.
**BMR and Non-BMR Forage Sorghums**

Corn yield and nutritional comparison to sorghum/sudangrass harvested 67 days after planting.

<table>
<thead>
<tr>
<th>Type</th>
<th>Yield, DM Ton/acre</th>
<th>Moisture</th>
<th>% C. Protein</th>
<th>% NDF</th>
<th>% IVTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMR Sorghum</td>
<td>2.9</td>
<td>78</td>
<td>12.8</td>
<td>54.7</td>
<td>84</td>
</tr>
<tr>
<td>NonBMR Sorghum</td>
<td>3.5</td>
<td>76</td>
<td>12.1</td>
<td>55.8</td>
<td>82</td>
</tr>
<tr>
<td>Corn</td>
<td>2.8</td>
<td>81</td>
<td>14.4</td>
<td>55.8</td>
<td>83</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Type</th>
<th>Yield (Dry Tons)</th>
<th>Yield (Wet Tons)</th>
<th>Crude Protein</th>
<th>TDN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Sorghum</td>
<td>2.7</td>
<td>8.7</td>
<td>10.2</td>
<td>64.9</td>
</tr>
<tr>
<td>BMR Sorghum</td>
<td>2.2</td>
<td>7.1</td>
<td>10.5</td>
<td>65.8</td>
</tr>
</tbody>
</table>

Irrigation = 1.4” ; Rainfall = 6.1”
Planted – June 13 ; Harvested – Sept. 15
Sorghum Forages – Things to Consider (Hay)

• General considerations
  – Did you have a winter crop?
  – What’s your input level?
  – BMR vs. Non-BMR

• Water requirement
  – 1 inch = 0.33 tons/ac of forage
  – Rain distribution? Deep moisture?

• How many cuttings to take?
  – Rapid growth; 45-60 days
  – Tonnage vs. quality
  – Class of livestock

<table>
<thead>
<tr>
<th>Input/Yield Level</th>
<th>Seeding Rate (lb/ac)</th>
<th>Nitrogen (lb/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>10-15</td>
<td>75-100</td>
</tr>
<tr>
<td>Med-High</td>
<td>15-20</td>
<td>150-200</td>
</tr>
</tbody>
</table>

~25 lbs. N per ton
Questions?

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