Hungry for Forage

- 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)
Ogallala Aquifer

Clovis, NM
Where Did the Rain Go?

Precipitation for NMSU Agric. Sci. Center at Clovis.
Corn Crop Water Use

Daily Water Usage in Corn
Six Year Average (2005-2010) versus 2011 at Bushland, TX
Source: TX-High Plains ET Network

The Perfect Storm – 2011
Desperation!
Desperation !
Overloaded With Corn
Outlook is Grim

U.S. Drought Monitor

November 29, 2011
Valid 7 a.m. EST

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

Intensity:
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:
- Delineates dominant impacts
- S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months (e.g. hydrology, ecology)

http://droughtmonitor.unl.edu/

Released Thursday, December 1, 2011
Author: David Miskus, NOAA/NWS/NCEP/CPC
What About Sorghum?

- Water-use Efficient
- High Yielding
- Cheaper Seed Cost
- Nutritionally Inferior
- Highly Variable
- Limited Experience
Comparing BMR and Non-BMR Forage Sorghums

- **Brown Midrib**
  - Lower Lignin
  - Higher Digestibility
  - Lower Yielding
  - Increased Lodging
  - Higher Moisture at Harvest

- **Conventional**
  - Higher Lignin
  - Lower Digestibility
  - Higher Yields
  - Faster Dry Down
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
## Water Use Efficiency

**Bushland, TX – 2007 – Adequate Capacity**

<table>
<thead>
<tr>
<th>Species</th>
<th>ETc (mm)</th>
<th>ETc (in)</th>
<th>Dry Matter (kg/m²)</th>
<th>Water Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forage Sorghum</td>
<td>489</td>
<td>19.3</td>
<td>1.7</td>
<td>3.47</td>
</tr>
<tr>
<td>Corn</td>
<td>671</td>
<td>26.4</td>
<td>2.4</td>
<td>3.64</td>
</tr>
</tbody>
</table>

- Similar Production per Unit of Water
- F. Sorghum Used Less Water (27% lower ET)
- Corn Had Greater Yield Potential

(Howell et al., 2008)
Limited Irrigation Studies at Clovis
2005-2010

- Declining Well Capacity
  - 425 GPM on 120 ac
  - 1.3 inches per week
  - 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
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>
NDF vs. NDF-Digestibility
Clovis, NM Variety Trials – 3 years

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

Milk, Lbs/ton

- Corn (91) 2721
- C-FS (41) 2722
- BMR-FS (20) 2795
# 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>DMI, Lbs/d</td>
<td>51</td>
<td>55</td>
<td>51</td>
<td>53</td>
</tr>
<tr>
<td>Milk, Lbs/d</td>
<td>68</td>
<td>75</td>
<td>71</td>
<td>74</td>
</tr>
<tr>
<td>Fat %</td>
<td>3.57</td>
<td>3.89</td>
<td>3.77</td>
<td>3.88</td>
</tr>
<tr>
<td>4% FCM, Lbs/d</td>
<td>64</td>
<td>74</td>
<td>69</td>
<td>73</td>
</tr>
<tr>
<td>BW, Lbs</td>
<td>1,399</td>
<td>1,406</td>
<td>1,410</td>
<td>1,408</td>
</tr>
</tbody>
</table>

(Oliver et al., 2004)
Harvesting Sorghum Forages

- **Silage**
  - Stage of maturity
    - Mid-dough
    - 25% grain
  - Much variability
  - Whole plant moisture
    - 60-70% moisture
Harvest Challenges

• Reducing Lignin
• Top-heavy Plant in a Windblown World
Herbicide Options

• Forage Sorghums
  – Pre-emergence
    • Atrazine
    • Dual (Concep)*
    • Bicep/Cinch (Concep)*
  – Post-emergence
    • Atrazine
    • 2,4-D
    • Aim
    • Clarity (Dicamba)**
    • Buctril (Bromoxynil)
    • Huskie (Supp. Label)

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

**Advantages**
- Later planted
  - Avoid early season water use
  - More time to fill profile
  - Improved odds of rain
- Higher yields with limited water
- Drought tolerant
- Lower seed cost
- More harvest options

**Disadvantages**
- Lower yields with good water
- Lower nutritive value?
- Lodging
- Inconsistent harvest H₂O
- Few herbicide options
Questions?

Mark Marsalis
W: (575) 985-2292
C: (575) 799-6448
marsalis@nmsu.edu

http://forages.nmsu.edu