Subsurface Drip Irrigation

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Subsurface drip system

Chillicothe

2008
Each series cell is approximately 0.2 acres
Each series cell has 16, 40-in rows by 150 ft
Each Field row between plots is 30 ft wide

B = Box to house flow meters, solenoids, valves
Research Areas

1) Cropping Systems under drip
2) Conservation tillage under drip
3) Forage production under drip
4) Soil compaction mitigation strategies in dual-use wheat (AerWay)
5) Canola variety trials
6) Wheat fertility studies at Chillicothe
7) Buck Creek watershed project
Cropping Systems Under Drip

(Total grant $150K; Vernon share, $18K)
Funded by Texas Cropping Systems Program

- 8 Treatments
- Single, double, triple crop
- 1 Irrigation treatment (75% ET replacement)
- Crops: cotton, wheat, canola, sesame
- Systems:
  --continuous cotton, wheat, canola, sesame
  --double crop cotton/wheat; cotton/canola
  --triple crop cotton-wheat-sesame; cotton-canola-sesame
- Yield, quality, economics, nutrient status, soil parameters
Conservation tillage under drip
(Total grant $19.5K; Vernon share, $19.5K)
Texas State Support Committee of Cotton Inc.

- 4 tillage sys: conv-till bed, reduced-till flat, no-till, no-till & cover crop
- 5 irrigation treatments: 0, 33, 66, 100, 133% ET replacement
- Yield and quality data taken
- Soil moisture profiles monitored
- Seedling emergence data
- Soil biological activity monitored
- Nutrient profiles monitored
Forage Study Under Drip
(no grant funding)

- 6 Forages: Old World Bluestem (B Dahl), Brown midrib sorghum (Dairy Master), Bermudagrass (Tifton 85), Eastern gammagrass (?), Alfalfa (2 lines)
- Establish in 2007
- 4 Irrigation treatments: 0, 33, 66, 100 % ET replacement
- Clip as appropriate
- Quality analyses
Forage plots under SDI

19 September 2007
## Seasonal Forage Production, 2007

<table>
<thead>
<tr>
<th>Forage</th>
<th>0</th>
<th>33</th>
<th>66</th>
<th>100</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Gamma (1)</td>
<td>6290</td>
<td>10900</td>
<td>7280</td>
<td>8390</td>
<td>8210</td>
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<tr>
<td>Tifton 85 (2)</td>
<td>5030</td>
<td>4390</td>
<td>4550</td>
<td>4390</td>
<td>4590</td>
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<tr>
<td>BMR (2)</td>
<td>5960</td>
<td>7610</td>
<td>6050</td>
<td>7260</td>
<td>6720</td>
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<tr>
<td>WW B-Dahl (3)</td>
<td>8460</td>
<td>9410</td>
<td>6870</td>
<td>8060</td>
<td>8200</td>
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</tbody>
</table>

Irrigation Treatment (%ET)
Sesame

July 9, 2008

July 24, 2008
Black Sorghum

July 24, 2008
Canola Variety Trials
(USDA, Kansas State University)

- Yield determination
- Oil quality and quantity