PROFIT POTENTIAL USING SPLIT PIVOT IRRIGATION STRATEGIES IN COTTON PRODUCTION

Bob Glodt
and
Layton Schur
Discussion Topics

➢ Split pivot irrigation strategies with 200 gallon per minute irrigation potential.

➢ Parameters and production guidelines for using split pivot irrigation strategies.

➢ Variable cost breakdown and profit potential when irrigating using a split pivot production strategy.

➢ 2017 grower examples of using split pivot irrigation strategies.
COTTON MANAGEMENT
GUIDELINES FOR SPLIT
PIVOT IRRIGATION
STRATEGIES
DEFINING THE PARAMETERS

➢ WATER DELIVERY MUST BE APPLIED IN ACCORDANCE TO CROP DEMAND.

➢ IRRIGATION MUST BE APPLIED STRATEGICALLY.

➢ WE MUST UNDERSTAND THE RELATIONSHIP BETWEEN YIELD POTENTIAL AND WATER.
PRE-WATER AS CLOSE TO PLANTING AS POSSIBLE TO A DEPTH OF 18-24”
COTTON WATER DEMAND
AT 100% OF PET

Inches Per Day

Days After Planting

emergence
first square
first bloom
first open boll
maturity
PRE-FLOWER IRRIGATION STRATEGY

Maintain Adequate Moisture in Root Zone

Inches Per Day

Days After Planting

- emergence
- first square
- first bloom
- first open boll
- maturity
FLOWER TO 1\textsuperscript{ST} OPEN BOLL
IRRIGATION STRATEGY

<table>
<thead>
<tr>
<th>Days After Planting</th>
<th>Inches Per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>emergence</td>
<td>0.05</td>
</tr>
<tr>
<td>first square</td>
<td>0.10</td>
</tr>
<tr>
<td>first bloom</td>
<td>0.20</td>
</tr>
<tr>
<td>first open boll</td>
<td>0.30</td>
</tr>
<tr>
<td>maturity</td>
<td>0.00</td>
</tr>
</tbody>
</table>

IRRIGATE @ % OF PET

FILL PROFILE
**Irrigation Capacity During Peak Water Demand in Relationship to Potential Evapotranspiration for Cotton**

<table>
<thead>
<tr>
<th>% PET</th>
<th>@100% PET Inches/Day</th>
<th>@100% PET Inches/Wk</th>
<th>Inches/Week @ % of PET</th>
</tr>
</thead>
<tbody>
<tr>
<td>90%</td>
<td>0.32”</td>
<td>2.24”</td>
<td>2.02”</td>
</tr>
<tr>
<td>60%</td>
<td>0.32”</td>
<td>2.24”</td>
<td>1.34”</td>
</tr>
<tr>
<td>30%</td>
<td>0.32”</td>
<td>2.24”</td>
<td>0.67”</td>
</tr>
</tbody>
</table>
PUSH WATER DEEP INTO THE SOIL PROFILE – LEPA
# REVIEW OF IRRIGATION STRATEGY

<table>
<thead>
<tr>
<th>Irrigation</th>
<th>Pre-Water</th>
<th>Pre-Bloom</th>
<th>One Irrigation Prior to PET Irrigations</th>
<th>PET Irrigations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfed</td>
<td>Irrigate top 18-24”</td>
<td>Keep water in root zone</td>
<td>Apply 1-2” of water or capacity</td>
<td>No Irrigations, Rainfed only</td>
</tr>
<tr>
<td>30%</td>
<td>Irrigate top 18-24”</td>
<td>Keep water in root zone</td>
<td>Apply 1-2” of water or capacity</td>
<td>Irrigate at 30% PET</td>
</tr>
<tr>
<td>60%</td>
<td>Irrigate top 18-24”</td>
<td>Keep water in root zone</td>
<td>Apply 1-2” of water or capacity</td>
<td>Irrigate at 60% PET</td>
</tr>
</tbody>
</table>
QUESTIONS SO FAR?
UNDERSTANDING THE RELATIONSHIP BETWEEN YIELD POTENTIAL AND WATER
# Average Yields per Irrigation Regimen – Agri-Search Data

<table>
<thead>
<tr>
<th>Year</th>
<th>Site</th>
<th># Var.</th>
<th>Pounds Lint per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>RF</td>
</tr>
<tr>
<td>2012</td>
<td>OLT</td>
<td>7</td>
<td>327</td>
</tr>
<tr>
<td>2013</td>
<td>EDM</td>
<td>8</td>
<td>598</td>
</tr>
<tr>
<td>2014</td>
<td>EDM</td>
<td>12</td>
<td>786</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AVG.</td>
</tr>
</tbody>
</table>
PET / FALLOW SCENARIOS
200 Gallon Per Minute Pivot

65 Ac
55 Ac

60% PET
Fallow

111 Ac

9 Ac

30% PET
Fallow
GROSS $ PER ACRE @ (0.65/lb)
PET/FALLOW SCENARIOS

$44,337.80

60% PET

$46,296.25

FALLOW

-1958.45

$64,447.38

30% PET

$64,718.55

FALLOW

-$271.17
60% PET - RAINFED AND 30% PET - RAINFED SCENARIOS

- 60% PET
  - Rainfed: 65 Ac
  - Rainfed: 55 Ac

- 30% PET
  - Rainfed: 9 Ac
  - Rainfed: 111 Ac
GROSS $/ACRE - 60% PET - RAINFED AND 30% PET - RAINFED SCENARIOS @ (0.65/lb)

$70,378.75

$24,082.50

$46,296.25

$68,053.05

$3,334.50

$64,718.55

60% PET  RAINFED

30% PET  RAINFED
GROSS $/ACRE - 60% PET - RAINFED SCENARIO

$70,378.75

$24,082.50
$46,296.25

60% PET
RAINFED
GROSS $/ACRE - 60% PET - RAINFED BUMPED UP ONE IRRIGATION REGIMEN

$70,378.75

$24,082.50

$46,296.25

$90,844.00

$37,898.25

$52,945.75
GROSS $/ACRE - 30% PET - RAINFOED SCENARIO

$68,053.05

$64,718.55

$3,334.50

30% PET

RAINFOED
30% PET - RAINFOED BUMPED UP ONE IRRIGATION REGIMEN

$68,053.05

$64,718.55

$3,334.50

$98,681.70

$93,434.25

$5,247.45

30% PET  RAINFED

60% PET  30% PET
GROSS VALUES PER 120 ACRES

$0  $10,000  $20,000  $30,000  $40,000  $50,000  $60,000  $70,000  $80,000  $90,000  $100,000

60% - FAL  30% - FAL  60% - RF  30% - RF  90% - 30%  60% - 30%
Production Costs Per Acre

- Plowing
- Fertilizer
- Seed
- Irrigation
- Chemicals
- Har/Gin

<table>
<thead>
<tr>
<th></th>
<th>60% PET</th>
<th>30% PET</th>
<th>Rainfed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Costs Per Acre</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- $0
- $20
- $40
- $60
- $80
- $100
- $120
Production Costs, Gross Value, and Potential Profit By Irrigation Regimen (Per Acre)
### HOW MUCH WATER DOES IT TAKE TO JUMP UP ONE PET REGIMEN?

<table>
<thead>
<tr>
<th>% PET</th>
<th>2012 IRR.*</th>
<th>2013 IRR.*</th>
<th>2014 IRR.*</th>
<th>AVG.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAINTFED</td>
<td>1.4”</td>
<td>2.8”</td>
<td>2.0”</td>
<td>2.1”</td>
</tr>
<tr>
<td>30% PET</td>
<td>2.7”</td>
<td>3.3”</td>
<td>3.3”</td>
<td>3.1”</td>
</tr>
<tr>
<td>60% PET</td>
<td>5.5”</td>
<td>6.6”</td>
<td>6.5”</td>
<td>6.2”</td>
</tr>
<tr>
<td>90% PET</td>
<td>8.2”</td>
<td>9.9”</td>
<td>9.8”</td>
<td>9.3”</td>
</tr>
<tr>
<td>Rain</td>
<td>1.4”</td>
<td>2.8”</td>
<td>2.0”</td>
<td>2.1”</td>
</tr>
</tbody>
</table>

*POST FLOWER RAIN AND IRRIGATION
WHAT IS THE PROBABILITY OF ACHIEVING YIELD GOALS? (21 YEARS)

- < 2.1" : 24%
- 2.1" + : 76%
- 5.2" + : 48%
- 8.3" + : 1%
THE END
GROWER PERSPECTIVE
2017 SPLIT PIVOT IRRIGATION STRATEGIES IN COTTON PRODUCTION

Layton Schur
2017 CLEMENTS WEST – LOCKNEY, TX
30% - Rainfed

80 Ac

40 Ac

30% PET

Rainfed
## Clements West - Water Management

<table>
<thead>
<tr>
<th>Growth Stage</th>
<th>30% PET</th>
<th>Rainfed</th>
<th>Rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-plant</td>
<td>0.75”</td>
<td>0.75”</td>
<td>6.0”</td>
</tr>
<tr>
<td>Pre Flower</td>
<td>2.0”</td>
<td>0”</td>
<td>4.75”</td>
</tr>
<tr>
<td>Post Flower</td>
<td>2.0”</td>
<td>0”</td>
<td>6.1”</td>
</tr>
</tbody>
</table>
## 2017 Clements – Lockney, TX
### Production Costs/Acre

<table>
<thead>
<tr>
<th>Input</th>
<th>Rainfed</th>
<th>30% PET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertilizer</td>
<td>$27.75</td>
<td>$27.75</td>
</tr>
<tr>
<td>Seed</td>
<td>$61.36</td>
<td>$88.63</td>
</tr>
<tr>
<td>Plowing</td>
<td>$37.00</td>
<td>$37.00</td>
</tr>
<tr>
<td>Chemicals</td>
<td>$112.82</td>
<td>$124.73</td>
</tr>
<tr>
<td>Irrigation</td>
<td>$11.25</td>
<td>$71.25</td>
</tr>
<tr>
<td>Harvest</td>
<td>$37.80</td>
<td>$99.60</td>
</tr>
<tr>
<td>Ginning</td>
<td>$9.58</td>
<td>$24.90</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$294.56</strong></td>
<td><strong>$473.86</strong></td>
</tr>
</tbody>
</table>
Yield – Clements Farm

Lbs. Lint/Ac

30% PET

Rainfed

30% PET
Rainfed

0 200 400 600 800 1000 1200 1400
Profit and Loss Profile – Clements Farm

Gross $  Cost  Profit

-5,000  0  5,000  10,000  15,000  20,000  25,000  30,000  35,000  40,000  45,000  50,000  55,000

30% PET  RAINFED  WHOLE PIVOT
WHY WAS THE RAINFED PORTION OF THE PIVOT NOT PROFITABLE?
The TAWC website was very important to know how much water should be applied and when.

Always use the most productive ground for allocation of water.

Less inputs can be used in the rainfed portion of the pivot as compared to the 30 or 60% PET portions.
THANK YOU FOR YOUR ATTENTION!