SUCCESSFUL DRIP IRRIGATING SUGARCANE ON LARGE ESTATES

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## Estate Disposition as at April 2011

<table>
<thead>
<tr>
<th>Irrigation Type</th>
<th>Simunye</th>
<th>%</th>
<th>Mhlume</th>
<th>%</th>
<th>RSSC Group</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drip</td>
<td>8466.4</td>
<td>70.5%</td>
<td>2182.1</td>
<td>22.7%</td>
<td>10648.5</td>
<td>49.3%</td>
</tr>
<tr>
<td>Furrow</td>
<td>1151.8</td>
<td>9.6%</td>
<td>6092.7</td>
<td>63.4%</td>
<td>7244.5</td>
<td>33.5%</td>
</tr>
<tr>
<td>Sprinkler</td>
<td>2038.3</td>
<td>17.0%</td>
<td>1063.4</td>
<td>11.1%</td>
<td>3101.7</td>
<td>14.3%</td>
</tr>
<tr>
<td>Center Pivot</td>
<td>357.9</td>
<td>3.0%</td>
<td>267.1</td>
<td>2.8%</td>
<td>625</td>
<td>2.9%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12014.4</td>
<td></td>
<td>9605.3</td>
<td></td>
<td>21619.7</td>
<td></td>
</tr>
</tbody>
</table>
Why change?

- Provide more even wetting pattern
- Improve water use efficiency (>10tc/Ml)
- Provide extra water for expansion
- Increase sucrose yield
- Reduce labour and night shift operations
- Improve power load factors
- Increase level of automation
- Reduce cost of cane
Change Options

1. Retain existing sprinkler and furrow systems
   - “without project” option

2. Upgrade existing sprinkler and furrow system
   - change from surface aluminium to buried HDPE laterals
   - change grid spacing from 18 x 20 m to 18 x 18 m
   - change manual hydrant valves to automatic diaphragm type

3. Convert to solid set system
   - solid set sprinklers
   - centre pivot
   - surface drip
   - subsurface drip [selected option]
In-field system:
Dual row planting at 1.8 m - 1.9 m c/c
Peak demand 7.7 mm/day
Drip emitters 1.6 l/hour @ 0.92 m
Drip tape 15.7 mm ID
Wall thickness 0.40 mm
Length 200-500 m
Flushing mains with ball valves

Cluster house:
Command 9 panels at 9-12 ha
Phases 3 x 8 hrs at peak
Filter Stations

- Arkal Spin Klin disc filters
- Star & Galaxy systems
- 140 mesh (100 micron)
- Back flush timers & Pressure differential switches
Cluster house - +/- 100 ha
Planting

- Pre-wet (apply 6 – 12 mm) to improve seed soil contact.
- Cane rows – 400 mm apart
- Plant furrows – installation machine
- Covering machine → ridges
- Lateral just below seed cane
- Ridge → 5-7.5 cm high
- Lateral depth → 10-15 cm
Covering and first irrigation
Typical Field after Planting
Change management

Challenges:
- How to maintain cane productivity?
- How to change “mind set” of operators?

Action Plan:
- Establish a specialist implementation team
- Set clear targets on yield, water savings and cost
- Establish formal design, supply & install contracts
- Involve field staff in whole project cycle
- Focus attention/time on design optimisation
- Redevelop in blocks not individual fields
- Draw in technical expertise of manufacturer
Key success factors

- Defined project targets underpinned by detailed analysis
- Adoption of cluster house operating principle and installation of drip under guidance
- Involvement of field staff throughout
- Partnership between RSSC project team, turnkey contractor at first while building internal capacity and drip equipment manufacturer
- Continuous monitoring and feedback
- Revisiting and modifying cultural practices based on research and support