WIDER ROW SPACING AND DRIP IRRIGATION IN SUGARCANE – DIFFERENT SPACING, CROP BEHAVIOUR, YIELDS AND RECOMMENDATIONS

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MAJOR COMPONENTS OF CROP PRODUCTION

- SUNLIGHT
- AIR
- WATER
- MACRO & MICRO NUTRIENTS
• SUNLIGHT & WATER ARE ABUNDANT
• DRIP IRRIGATION FACILITATES MOISTURE AND NUTRIENTS
• SPACING DECIDES AVAILABILITY OF SUNLIGHT – BOTH DURATION PER DAY/SEASON & INTENSITY
# WATER CONSUMPTION FOR CANE PRODUCTION

<table>
<thead>
<tr>
<th></th>
<th>Conventional Crop</th>
<th>Drip crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of irrigations</td>
<td>30</td>
<td>270</td>
</tr>
<tr>
<td>Quantity irrigated per ha</td>
<td>5000000</td>
<td>62500</td>
</tr>
<tr>
<td>Total quantity irrigated (litres)</td>
<td>150000000</td>
<td>16875000</td>
</tr>
<tr>
<td>Yield of cane (ha)</td>
<td>112.5</td>
<td>137.5</td>
</tr>
<tr>
<td>Water required to produce one T of cane</td>
<td>1,33,000</td>
<td>1,22,700</td>
</tr>
</tbody>
</table>
WHAT IS THE SPACING FOR SUGARCANE?

30cm?
45 cm ?
60 cm?
80 cm ?
120 cm ?
150 cm ?
180 cm ?
240cm?
FEATURES OF SUGARCANE AS ROW CROP

• Cane is adaptable to all situations

***Being a grass and like a grass

even 12,000 stubbles per ha spread uniformly is giving good yield of 120 t
WHY ARE WE PRACTICING REDUCED SPACING?

• Its just because our cultivation is not mechanised
• We used country ploughs for ridging
• We have changed over to tractor drawn ridgers for quite some years only
POINTS TO BE CONSIDERED WHILE PLANNING FOR WIDER SPACING

- Physical and physiological factors affecting tillering ability
- Salinity, alkalinity, water logging during tillering phase
- Fertilizer availability, finance position of the farmer
- Factors that may tend to delay cultivation activities
Spacing has to be decided to suit the convenience of the machinery planned – farm machinery available with the farmer, for taking up inter-cultural operations.
<table>
<thead>
<tr>
<th>Row spacing</th>
<th>Where it can be used?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single row with 120 cm spacing</td>
<td>Where interculture is to be done with power tiller</td>
</tr>
<tr>
<td>Single row with 150 cm spacing</td>
<td>Where interculture is to be done with mini tractor</td>
</tr>
<tr>
<td>Single row with 180 cm spacing</td>
<td>Where interculture is to be done with narrow tractors</td>
</tr>
<tr>
<td>Single row with 240 cm spacing</td>
<td>Where interculture is to be done with conventional tractors</td>
</tr>
<tr>
<td>Double row/ double paired row under 1.2 m x 0.75m</td>
<td>Where manual harvesting is planned and interculture is to be done with mini tractor</td>
</tr>
</tbody>
</table>
WIDER ROW FOR DRIP AND CHOICE OF PLANTING METHOD

- Single row versus double row planting
- Spacing between the paired row
- Spacing in double paired row system
<table>
<thead>
<tr>
<th>Lateral spacing (cm)</th>
<th>Planting method</th>
<th>Length of furrow in m (per ha.)</th>
<th>Seed rate (nos. per m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>135</td>
<td>Paired row</td>
<td>7400</td>
<td>10</td>
</tr>
<tr>
<td>155</td>
<td>Paired row</td>
<td>6450</td>
<td>11</td>
</tr>
<tr>
<td>195</td>
<td>Double paired row</td>
<td>5125</td>
<td>13</td>
</tr>
<tr>
<td>240</td>
<td>Double paired row</td>
<td>4165</td>
<td>15.6</td>
</tr>
<tr>
<td>Diameter of pits (cm)</td>
<td>Spacing (cm)</td>
<td>No. of pits</td>
<td>No. of plants to be maintained per pit</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------</td>
<td>-------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>90</td>
<td>150 x 120</td>
<td>5500</td>
<td>4</td>
</tr>
<tr>
<td>90</td>
<td>150 x 180</td>
<td>3625</td>
<td>6</td>
</tr>
<tr>
<td>90</td>
<td>150 x 150</td>
<td>4375</td>
<td>5</td>
</tr>
<tr>
<td>75</td>
<td>120 x 120</td>
<td>6800</td>
<td>3</td>
</tr>
</tbody>
</table>
CHOICE OF VARIETIES FOR WIDER ROW DRIP IRRIGATION

- Variety resistant to Red rot ..etc are to be selected
- Variety has to be profuse tillering

- Available varieties are
  - Co 86032
  - Co V 92102
  - Co A 90081
  - Co A 92081
CHALLENGES IN WIDER ROW PLANTING UNDER DRIP IRRIGATION:

1. Time taken for planting after installation is more. Advance planning is required.

2. Drip system care and maintenance is very vital. If left uncared, will report yield reduction.

3. The capital cost is high.

4. Since the roots do not go deep inside the soil, the crop quickly lodges.

5. Surface drip irrigation does not permit high earthing up

6. Power failure and transformer failure are greater issues in adoption of drip irrigation in India.
ADVANTAGES OF PIT-DRIP IRRIGATION

• Pit system of planting can provide the best yield. SSI can favour even higher yields.
• Pit system of planting under drip irrigation can be the choicest method for small farmer.
• Diesel engines can be perfectly used in pit system of planting.
• Cane can be harvested with in 10 months in tropics.
ADVANTAGES OF WIDER ROW SPACING UNDER DRIP IRRIGATION:

• Sub-surface drip irrigation is the ultimate solution for total mechanisation right from planting till harvest.
• The longevity of the drip system increases.
• This is very ideal for continuous ratooning.
• The drip system can be operated after harvest of cane and therefore the ratoon establishes very well.
• Sub-surface drip irrigation is the best system for water savings, labour savings and fertilizer efficiency.
Farm Mechanization
TRASH SHREDDER
1.95 M SPACING / DOUBLE PAIRED ROW
Mrs. & Mr. Krishnamoorthy

Spacing - 5.0 Ft. Sub-Surface Drip (Previous 3.0 Ft.)
Average Yield - 66 Mt./Ac.  (Previous 46 Mt./Ac.)
Extent - 7.00 Ac.

CONVERSION OF NARROW ROW TO WIDER ROW

Harvested by machine
Mr. Subramaniam, Devakottai, Sivagangai

Spacing - 6.0 Ft. (Previous - 4.0 Ft.)
Average cane yield – 70 Mt./ac (Previous 53 Mt./Ac.)
Extent – 6.25 Ac.
Thank you
Field Preparation

195 cm
PAI RED ROW – SURFACE DRIIP

195 cm

75 cm

BACK
AT 2 MONTHS AFTER PLANTING

195 cm

120 cm

75 cm
KURUNGULAM

150cm

BACK