RIDGE AND FURROW IRRIGATION
WHAT IT IS?

Check basins are rectangular or square small plots surrounded by levees or checks.
WHEN It USED?

- Crops roots which required submergence in water for periods longer than 24 hours.
- i.e. Potatoes, beet, carrots, rice, citrus, banana, clover, tobacco.
- The flatter the land surface, the easier it is to construct basins.
- It is also possible to construct basins on sloping land, even when the slope is quite steep.
CHECK BASIN IRRIGATION DESIGN ASPECTS

 предлагаем включить в проект проверку следующих аспектов:

- BASIN LAYOUT
  - Basin layout not only refers to the shape and size of the basins but also to the shape and size of the bunds.

- What is the shape of the basin: Square, rectangular or irregular?

- How high should be the bund be: 10, 50 or 100 cm?

- What is the shape of bund?
FURROW IRRIGATION
WHAT IT IS?

- Furrows are small, parallel channels made to carry water in order to irrigate the crop.
- The crop is usually grown on the ridges between the furrows.
FURROW IRRIGATION

DESIGN ASPECTS

➢ FURROW LAYOUT

♦ FURROW LENGTH
  ( CLAY: 300 TO 400 m
       SAND: 60 to 300 m )
1) SLOPE
2) SOIL TYPE
3) STREAM SIZE
4) IRRIGATION DEPTH
5) FIELD LENGTH
## FURROW IRRIGATION

### FURROW LENGTH

<table>
<thead>
<tr>
<th>Furrow slope (%)</th>
<th>Maximum stream size (l/s) per furrow</th>
<th>Clay</th>
<th>Loam</th>
<th>Sand</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>50</td>
<td>75</td>
<td>50</td>
</tr>
<tr>
<td>0.0</td>
<td>3.0</td>
<td>100</td>
<td>150</td>
<td>60</td>
</tr>
<tr>
<td>0.1</td>
<td>3.0</td>
<td>120</td>
<td>170</td>
<td>90</td>
</tr>
<tr>
<td>0.2</td>
<td>2.5</td>
<td>130</td>
<td>180</td>
<td>110</td>
</tr>
<tr>
<td>0.3</td>
<td>2.0</td>
<td>150</td>
<td>200</td>
<td>130</td>
</tr>
<tr>
<td>0.5</td>
<td>1.2</td>
<td>150</td>
<td>200</td>
<td>130</td>
</tr>
</tbody>
</table>

PRACTICAL VALUES OF MAXIMUM FURROW LENGTHS (m) DEPENDING ON SLOPE, SOIL TYPE, STREAM SIZE AND NET IRRIGATION DEPTH.

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### Recommended Maximum Length of Furrows for Different Slopes, Depths of Irrigation and Soil

<table>
<thead>
<tr>
<th>Furrow slope (%)</th>
<th>Furrow length (m)</th>
<th>Soil type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clay</td>
<td>Loam</td>
</tr>
<tr>
<td></td>
<td>7.5*</td>
<td>10*</td>
</tr>
<tr>
<td>0.05</td>
<td>300</td>
<td>270</td>
</tr>
<tr>
<td>0.10</td>
<td>350</td>
<td>330</td>
</tr>
<tr>
<td>0.20</td>
<td>370</td>
<td>370</td>
</tr>
<tr>
<td>0.30</td>
<td>390</td>
<td>400</td>
</tr>
<tr>
<td>0.50</td>
<td>380</td>
<td>370</td>
</tr>
<tr>
<td>1.00</td>
<td>270</td>
<td>300</td>
</tr>
</tbody>
</table>

*Depth of irrigation, cm

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FURROW IRRIGATION

DESIGN ASPECTS

♠ FURROW SHAPE

- Shape is either
  - U-shaped,
  - V-shaped,
  - Parabolic shaped or
  - Trapezoidal shaped

A deep, narrow furrow on a sandy soil

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FURROW IRRIGATION

DESIGN ASPECTS

♦ FURROW SHAPE

➢ LATERAL INFILTRATION IS HIGH

A wide, shallow furrow on a clay soil
FURROW IRRIGATION

DESIGN ASPECTS

♠ FURROW SIZE

- For low permeability of soils, wide and shallow furrow is preferred.
- For highly permeable soils, narrow and deep furrows are provided.
- Furrows of 75mm to 125 mm depth are provided for ROW crops.
FURROW IRRIGATION

DESIGN ASPECTS

- FURROW LAYOUT

- ♠ FURROW SPACING
  1) SOIL TYPE
    - SANDY (30-60 cm, 30 cm for coarse and 60 cm for sand)
    - CLAY (75-150 cm)
    - Normally 1 m-2 m is provided
FURROW CONSTRUCTION

Ridger plough: (a) wooden body, animal-drawn

Ridger plough: (b) iron type, animal-drawn
FURROW IRRIGATION

- FURROW CONSTRUCTION

Ridger plough: (c) hand-drawn version
FURROW IRRIGATION

➢ WETTING PATTERNS

Different wetting patterns in furrows, depending on the soil type (A - SAND)

Different wetting patterns in furrows, depending on the soil type (B - LOAM)

Different wetting patterns in furrows, depending on the soil type (C - CLAY)
FURROW IRRIGATION

PLANTING TECHNIQUES

Winter and early spring crops: seeds planted on the sunny side of the ridge

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MAINTENANCE OF furrows

- Water should be reach the d/s end of all furrows is regularly checked.

- There should be no dry places or spots where water stays ponding.

- Overtopping of ridges should not occur.

- Field channels and drains should be kept free from weeds.