



Information Sheet

3. DRAINAGE

3.1 **Ridging**

Poor growth, low yields and the need for frequent crop re-establishment are features of cane grown on shallow soils such as those of the Longlands, Westleigh, Kroonstad, Valsrivier, Katspruit and Swartland forms. These soils have sandy, permeable topsoil layers overlying relatively impermeable subsoils. Root distribution in such soils is generally poor, and rainfall efficiency is limited by low plant available water capacity and surface crusting. There is a high compaction hazard that leads to waterlogged fields and increased run-off during storms. These soils are vulnerable to the development of saline/sodic conditions and have a high erodibility status.

Where to ridge

Ridging should be considered mainly in flat or low lying areas, where:

- the water table is within 0.6 m of the soil surface
- an impervious layer is found within 0.6 m of the soil surface
- soils have a very low infiltration rate and water will dam on the surface for several days after rain or irrigation.

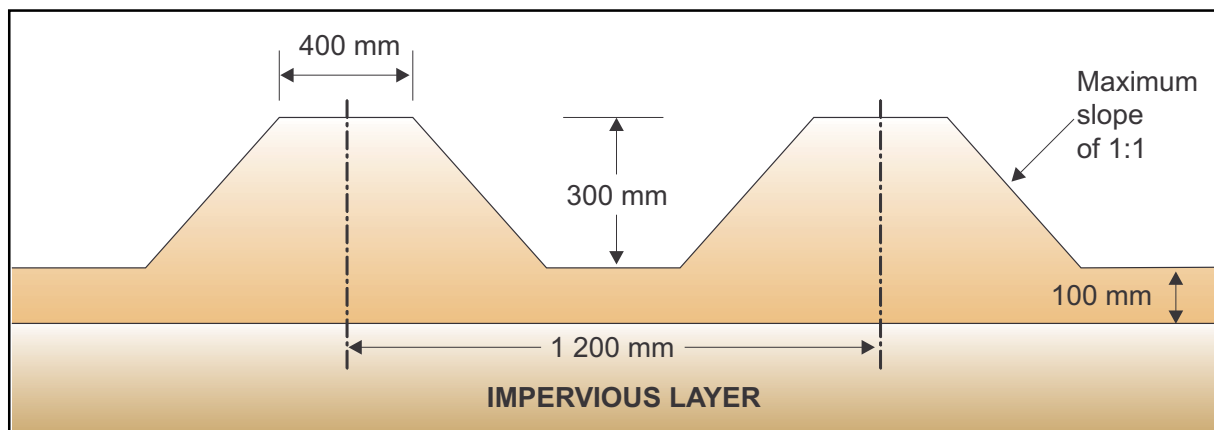
Timing

- Ridging can be implemented before planting or after harvesting.
- Ridging of ratoon fields should be implemented within three weeks after harvest.

Ridge construction

Ridges must be as high as possible and a disc or mouldboard ridger should be used to construct ridges with dimensions as in the diagram.

- The crown width should be about 400 mm but not less than 325 mm to ensure that applied fertiliser remains on the row.
- Care should be taken when drawing the planting furrow on the ridge to avoid breaking the structure down and to ensure the depth of planting furrows.
- The height of the ridge, measured from the bottom of the interrow, should be 300 mm or more, but not less than 150 mm.
- To ensure stable ridges, the maximum ridge slope of 1:1 should not be exceeded.



Factors limiting ridge height

- Row spacing should increase with decreasing soil depth and should not be less than 1.2 m in order to maintain a ridge height greater than 150 mm. If the ridge height is less than 150 mm, yield responses are unlikely.
- Minimum soil depth to the impervious layer in the interrow before ridging must exceed 250 mm.
- The ground-free height of equipment to be used on ridged fields will limit maximum height of ridges.

Notes

- Ridges must be drawn to a gradient of 1:150 to prevent waterlogging in the interrow and to minimise soil erosion. A steeper gradient will result in serious soil erosion.
- The stability of ridges on soils with a sandy loam topsoil will be improved if compacted during construction. Setting wheel spacing of tractor to run between the interrow and row is one way of obtaining this goal.
- Ridges of about 150 mm high will probably have to be redrawn after harvest.



Ridge construction.

Advantages of ridges

- Soil compaction is confined to the interrow.
- Creates more room for roots.
- Creates a favourable water environment for roots.
- Controls disposal of excess surface water.
- Enhances control of soil erosion.
- Improves efficiency of mechanical harvesting.

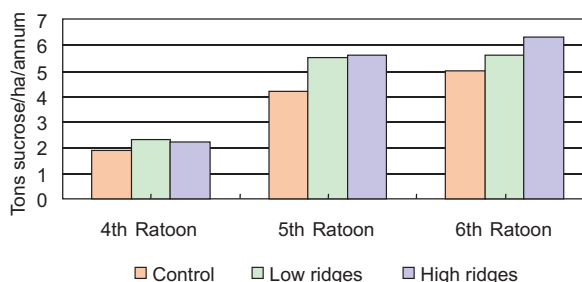
Disadvantages of ridges

- It is not possible to travel across the rows at harvest.
- Only slewing boom loaders can be used.
- Wheels of equipment must be set to run in the interrow.
- Could take up to two crops before beneficial yields are obtained.

Response to ridging

A yield response to ridging is most likely in ratoon cane where rainfall is above the long term mean, as shown by the following trial results:

- The cumulative response obtained over seven crops in a trial at Mtunzini on a Longlands form soil was 7,9 tons sucrose per hectare for an input cost equivalent to about half a ton of sucrose.
- The cumulative response obtained over three crops near Eston on a Kroonstad form soil was three tons sucrose per hectare.



Sucrose yields from three crops from a ridging trial conducted near Eston. The low ridges had a height of 150 mm and that of the higher ridges was 250 mm.

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