

Row configurations

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There are a range of different configurations being used by growers across the cotton industry in semi-irrigated situations. These include single skip, 1.5m & 2m (60 & 80 inch), double skip, super single and some non-uniform configurations. The positive and negative features of each configuration including the relative

water use efficiencies depend on the individual situation. What works best in one farming system may not in another due to differences in soil type, environment, cropping history, available equipment, water availability and other factors.

Growers deciding:

- Whether they would benefit from using skip row configurations; and,
- Which skip row configuration they would use... should consider the following points:

The advantages and disadvantages of each configuration

Extensive research has shown that while skip row cotton does limit yield potential (Figure 2), the combination of reduced fibre length discounts and variable cost savings in growing skip row cotton often lead to a better risk/return proposition.

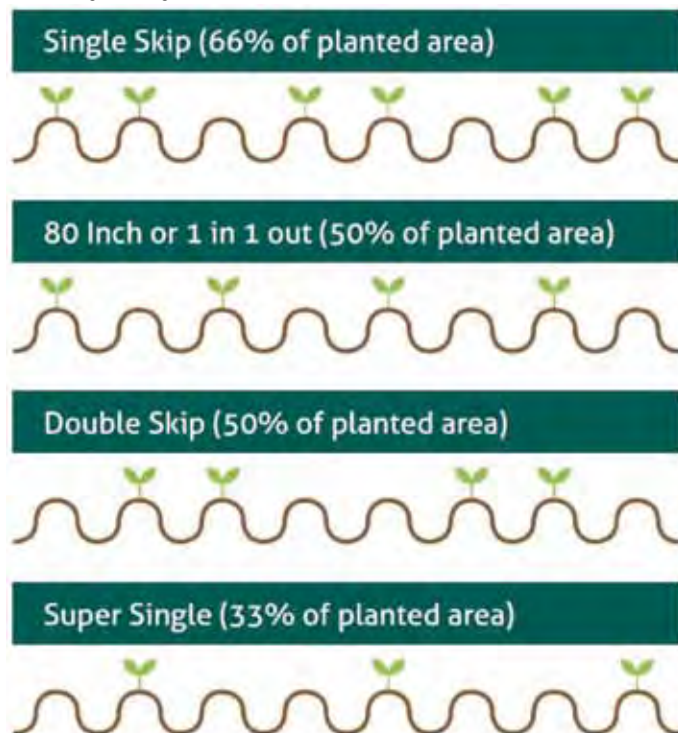
To use this graph, growers need to consider their yield potential, based on all the factors discussed later in this chapter.

BE AWARE OF

- Different row configurations are being used by growers across the cotton industry in semi-irrigated situations – what works best in one farming system may not in another.
- Savings in variable costs of inputs are likely with wider row configurations.
- Wider row spacing configurations can be used to manage risk in dryland and semi-irrigated situations but will limit yield potential.
- Careful research is essential to assess the benefits of reduced costs and improved fibre quality when using different row configurations in water limited situations.

FIGURE 1.

Row configuration guide (Source: CSD Getting the most out of skip row irrigated cotton)

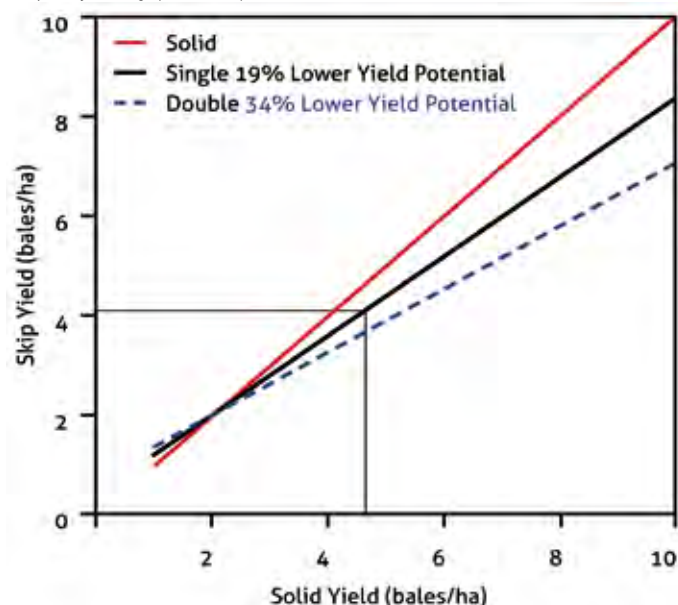


Single skip has the highest upside yield potential of these configurations averaging 19% decline from solid plant. It will however also use its moisture profile the quickest. Having a plant row 50cm one side and a one metre skip row to the other, this configuration will enjoy some benefits of mild early stress to limit vegetative growth. It is best suited to situations on heavier soil types with high Plant Available Water Capacity (PAWC) and more irrigation water availability.

While **one-in-one-out (or 2m or 80 inch)** cotton has not

FIGURE 2.

Comparison of average solid and skip row yields in dryland systems across several seasons and regions. Collated by Hearn (1999) and including some semi-irrigated treatments. Compiled by M. Bange (CSIRO 2006)



been included in these comparisons, grower experience and some trial work has shown its yield potential to be slightly higher than double skip but possibly more prone to fibre quality discounts because it does not have the advantage of mild early stress. A more uniform growth habit in 80 inch cotton can reduce lodging and allow better spray penetration and defoliation processes when compared to double skip.

Other advantages perceived by some double skip growers compared to 80 inch are:

- Gaps in stand are better compensated for.
- Growth management is easier due to mild early stress which can help limit vegetative growth.
- Double skip is easier for cultivation, especially if the 2m/80 inch row is in the middle of a 2m bed.
- Watering up – 2m/80 inch is more difficult to sub (ie, watering the sub-soil) to the centre of the bed.

Double skip has an average yield potential about 39% less than solid plant. Having a plant row 50cm one side and a 1.5m skip row to the other, this configuration provides the benefits of mild early stress to limit vegetative growth. Plants can be prone to lodging, especially vegetative branch fruit which takes advantage of the extra light available in the skip area. It is best suited to drier profiles and hotter environments.

Some growers have tried **super single** (one-in-two-out) in semi-irrigated situations. The widely spaced plant rows 2 metres apart means the yield potential and potential upside in a good season is severely limited. However, may be an option with a full soil moisture profile at planting and minimal irrigation water resources. This configuration allows growers to minimise growing costs as well as limit the likelihood of fibre quality discounts.

Non-uniform configurations have been tried in some circumstances but can lead to variability in maturity, and subsequent difficulties in management.

Skip row configurations function by increasing the volume of soil that plants have to explore, providing a bigger reservoir of available moisture and allowing the plants to hold on for longer during dry periods.

Skip row cotton provides an 'in between' option for increasing the area of cotton which can be grown, allowing some upside in production if conditions improve and far less downside in potential fibre quality discounts if the season deteriorates.

In some cases, inherent growing characteristics such as soil type and location may mean there is minimal advantage in adopting skip row practices (see Dryland Cotton chapter).

Row configuration effects on cotton gross margin

The vigorous tap root of the cotton plant allows for wider exploration of the soil profile for moisture and nutrients, particularly when compared with fibrous root type crops. This characteristic has led to the use of wide row configurations that increase the total amount of soil moisture available to the plants. This extends the time

before in-crop rainfall is required and therefore makes the crop less reliant on in-crop rainfall particularly in the first 2–3 months of its life. Narrower row configurations such as single skip are more popular in higher rainfall eastern areas while the wider row configurations such as super single are used in the lower rainfall western areas.

The wide row spacings provide greater surety in yield and maintenance of base grade fibre quality. There is a strong relationship between row configuration and fibre quality, especially for fibre length. In row configuration trials, fibre quality improved with wider row configurations. Therefore the row configuration chosen in combination with the seasonal conditions experienced will have an influence on the likelihood of quality discounts being incurred on delivery of the cotton.

Savings in variable costs of inputs such as planting seed, insecticides, defoliant and the picking operation are likely with wider row configurations. Taking this into account, a lower yielding wider row configuration crop can at times give a better gross margin than a higher yielding crop on a closer configuration. In many ways growing skip row cotton really emphasises that gross margin is not just a function of the yield produced, but very much a combination of yield and costs associated with the row configuration chosen.

Row configuration effects on variable costs

Cotton has a couple of big ticket items which make up the majority of the growing costs, these being picking and technology licence fees.

In wide row configurations, efficiencies in picking can be made through not trafficking every pass, with some contractors charging on a green hectare basis.

The technology licence fee of genetically engineered cottons can either be based on a green hectare rate or on an end point royalty scheme where the licence fee paid is related to the yield achieved. This not only works as a risk management tool but also in wider planting row configurations where the green hectare rate and yield potential is lower, it is also a cost management tool because the grower pays less.

Further information:

'Getting the most out of skip row irrigated cotton' – www.csd.net.au