

NARROW ROW COTTON

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This article will refer to narrow row cotton only as that currently being grown in 75 cm rows (30"). The older system of high density stripper cotton will not be discussed.

Over the last few years there has been considerable interest generated by USA reports of large yield increases through growing cotton in 75 cm rows. Both red and green commercial pickers are available for harvesting that row spacing. Californian research results show yield increases as much as 19% over 100 cm rows, *even with their current commercial varieties* (El-Zik et al 1982). By using compact short-season cultivars they claim further advantages (Kerby 1991).

Transplanting technology directly from California to Australia is not always advisable as our cotton growing environment differs considerably from theirs in a number of key areas - climate, soils, pests, diseases and varieties.

The great theoretical advantage of narrow rows is to reduce early season competition between plants, giving potential earliness and yield advantages. This is achieved by maintaining the same sowing rate while decreasing row space. All results of high density and narrow row experiments show clearly that plant competition at the squaring and flowering phases reduce fruit retention and boll size, particularly of early bolls.

The theoretical yield and maturity advantages of narrow rows depend on good retention of lower fruit. Important factors are:

1. Plant density. Competition effects on yield components are important. The extra advantage of Pix under narrow rows in California, can be explained by its reduction of competition effects in their climate. Under Australian conditions, bacterial blight, boll rots and insect control will present greater problems under narrow rows.
2. Insect control. Lower pest thresholds will be needed in stage I and hence narrow row systems are more reliant on pesticides. This may involve political and biological risks which should be considered by the cotton industry. If narrow rows can achieve earliness however, there are potential savings on stage III insecticides.

3. Weather. Cloudy weather can cause shedding of fruit, particularly under high plant density. Note that California rarely experiences cloudy weather in summer. We have had outstanding success with okra leaf cultivars in Australia, due in part to blight resistance, some pest resistance and better canopy architecture under humid conditions.
4. Irrigation. With earlier ground cover under narrow rows, the first irrigation may be required earlier. Bed sizes are smaller with narrow rows, potentially increasing waterlogging problems.

Recent local research

Our recent experiments have not shown any significant yield advantage of 75 cm rows over the normal spacing in the Namoi Valley (Table 1). This result has been evident at both high and low yield levels. The poor result in 1990/91 could be attributed to problems at establishment - a common factor with 75 cm rows on clay soils.

Table 1. Yield results for replicated comparisons between 75 and 100 cm rows.

(a) Small scale experiments at Research Station (kg lint/ha).

Row space	NARS 1989/90	NARS 1990/91	NARS 1991/92
75 cm	1764	1476	2390
100 cm	1731	1535	2607

(b) Large scale experiments Auscott Narrabri (kg lint/ha - Data from D Anthony)

Row space	Auscott 1989/90	Auscott 1990/91
75 cm	1484	1109
100 cm	1463	1463

In the 1991/92 experiment at the Research Station, all eighteen varieties in the experiment responded to narrow rows in the same manner. That data set included the Californian line that they find well adapted to narrow rows (Kerby 1991); under Australian conditions that line has poor yield. The conclusion is that the best variety for your district is also the one you should grow in narrow rows.

Summary and conclusions

1. Increased yield with 75 cm rows compared with 100 cm rows has been recorded in the San Joaquin Valley in California. However California and Australia differ in climate, soils, pests, diseases and varieties.
2. Namoi Valley experiments in the past two seasons have not shown a yield advantage for 75 cm rows over 100 cm rows. Narrow rows may require more stringent early season pest control and it will be liable in some seasons to greater risk from boll rots.
3. In Australia, 75 cm rows might be ideal where the season is short (and arid) and on soils where full ground cover is not normally obtained with wide rows. To date there has been a lack of experimentation at those locations in the south and east where narrow rows could be beneficial.
4. Narrow row production may require new equipment (inter-row rigs and planters). Cultivation equipment and bed configuration for narrow rows also require research/development for Australian soils and conditions.
5. Variety is not an issue at present. All of our varieties have the same response to narrow rows.

References

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