

Row Spacing Vs Plant Population

Research by Rose Roche (CSIRO Plant Industry, Narrabri)

Cotton has been exhibiting its ability to adapt to different plant populations and row spacings in research conducted over the last six seasons.

This research aimed to determine whether yield or maturity of cotton could be optimised through changing row spacing or plant population.

Previous experiments comparing 'Ultra-narrow row' (UNR) and conventionally spaced cotton in Hillston, Breeza and Narrabri have found no significant differences in yield, maturity or fibre quality using existing production practices. This is due to cotton's indeterminate growth that enables it to compensate in response to plant population and allows it to be grown at a wide variety of plant populations. However, numerically higher yield and boll numbers in UNR systems suggest that there is some potential and new management options may optimise this system. It was found that node production rates slow very early in growth of UNR which indicates competition for resources very early in growth (before 1st square). Lowering the plant population may reduce the competition between individual plants and increase yield or reduce time to crop maturity. Recent experiments in 05/06 & 06/07 evaluated plant population in the UNR system.

In 05/06 plant populations of 12 plants/m² and 24 plants/m² were compared across three row spacings, 1m, 38 cm and 25 cm, as well as 36 plants/m² for 25 cm. In 06/07 the experiment was repeated, with the addition of 18 plants/m² for 38 cm rows. The 18 plants/m² was set out as 12 plants per linear row in outside rows but only 6 on the inside rows, where the plants are usually smaller and yield less.

Row spacing	Pop (plants/m ²)	Lint yield (bales/ha) 05/06	Lint yield (bales/ha) 06/07	Mean of both years
1 m	12	12.0	9.9	10.9
	24	11.3	10.2	10.8
38 cm	12	13.8	10.4	12.1
	24	12.0	11.2	11.6
	18		11.4	
25 cm	12	12.8	10.4	11.6
	24	12.5	10.8	11.7
	36	11.9	11.4	11.7

In both years, there was no statistical difference between row spacings and in 06/07 no difference in yield between different populations. There was a significant effect of population in 05/06 only; 12 plants/m² yielded the highest in all three row spacings.

Gin turn-out was higher in UNR spacings probably due to smaller seed size & number in the smaller bolls in the UNR spacings. There were no differences in maturity.

Across the two years, row spacing and plant population had very little effect on yield and no effect on maturity, the trend to higher yields in narrow row spacings continued in these experiments but was not statistically significant.

In these experiments and other recent experiments comparing different plant populations, cotton has had little response to plant population, except where establishment has been poor or lower plant population has led to excessive vegetative growth delaying maturity (excessive vegetative growth has been associated with yield loss in other studies). Seeding rates that ensure good, even establishment, without being too low (< 6-4 plants/m²) are recommended.

The more vigorous plant growth that occurs in Central Qld cotton may influence optimum plant density and row spacing, so local research is required to develop precise recommendations. The CQ Farming Systems Trial at the Ag College will this year look at plant populations in a November planting.

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INSECT RESISTANCE MANAGEMENT STRATEGY

The 2007/08 IRMS is now available. It can be downloaded from the Cotton CRC website www.cotton.crc.org.au or by contacting me.

DAWSON TIMS AMENDMENT

The TIMS (Transgenic and Insecticide Management Strategies) Troubleshooting Committee of ACGRA have approved the use of Tracer in Chickpeas until the 30th September for cotton growers in the Dawson/Callide region for the 2007/08 season, based on membership of the Dawson Valley Cotton Growers Association

CENTRAL HIGHLANDS TIMS AMENDMENT

The TIMS Troubleshooting Committee of ACGRA have approved Steward™ and Tracer® use in Chickpeas until the 30th September for cotton growers in the Central Highlands region for the 2007/08 season, based on membership of the Central Highlands Cotton Growers Association.