

Optimised Irrigation Row Configuration

In 2014-2015 and 2015-2016 Optimised Irrigation Row Configuration Trials were planted at Keytah and Auscott Watervale in the Gwydir Valley.

The trials investigated water-use efficiency and relative yield potential of four different row configurations under siphon irrigation. This information will help growers determine the most appropriate row configuration for their operation.

The trial was planted at two locations;

- In 2014-2015 and 2015-2016 at Auscott, which utilises a standard 40inch (1m) system where cotton is planted on 1m beds and
- In 2014-2015 at Keytah, which utilises the narrow 30inch (0.75m) system where cotton is planted on 1.5m beds.

The trial involved the comparison of 30inch, 40inch, 60inch and 80inch configurations. Each row configuration was watered as required with the aim to maximise the yield of each treatment.

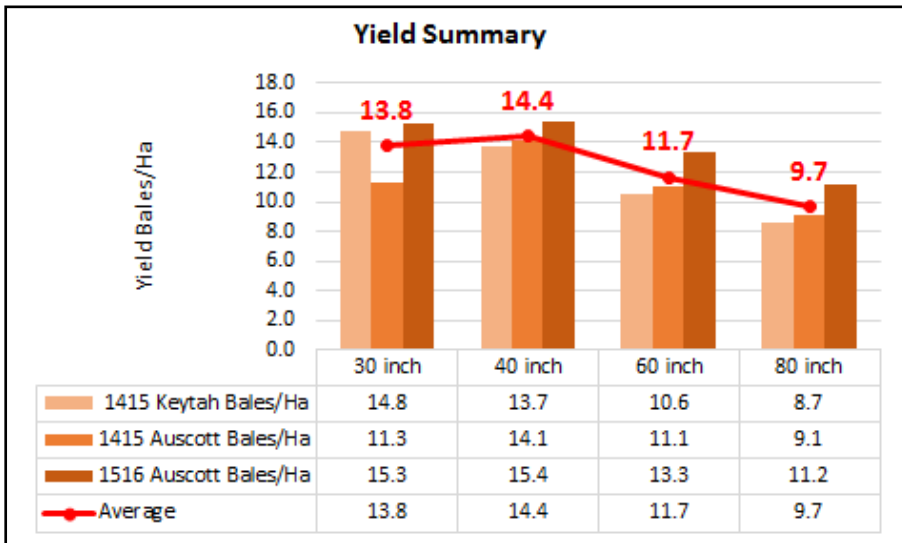
The trials were made possible through funding from the CRDC.

Key Results

- Good bed structure is critical. Beds should be developed well in advance of planting.
- 30inch and 40inch produced good yield and water use efficiency.
- The 60inch yielded an average 19% less than 40inch.
- The water use efficiency of the 60inch relative to 40inch was 97 percent.
- The 80inch yielded an average of 33 percent less than 40inch.
- The water use efficiency of the 80inch relative to 40inch was 88 percent.
- Narrow row spacings are best suited to full irrigation.
- Wider row spacings are more suited to limited water.



Yield Comparisons

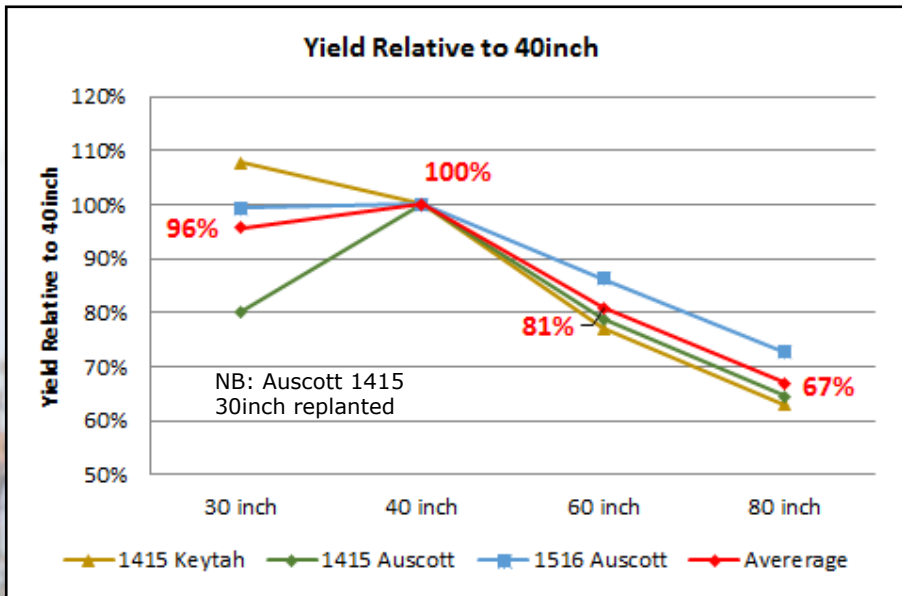


The highest yield achieved for 30inch was 14.8 bales/Ha at Keytah in 2014-2015 with an average of 13.8bales/Ha. Importantly the 30 inch at Auscott in 2014-2015 was replanted, which did impact on yield.

The highest yield for 40inch was 15.4 bales/Ha at Auscott in 2015-2016. The average 40inch yield was 14.4bales/Ha.

For the 60inch, the highest yield was 13.3bales/Ha at Auscott in 2015-2016. The average 60inch yield was 11.7bales/Ha.

In the 80inch plots, the highest yield was 11.2bales/Ha at Auscott in 2015-2016. While the average was 9.7bales/Ha.



Discussion of Results

The trials in 2014-2015 confirmed that to achieve maximum yield potential, field preparation and bed structure are very important regardless of whether 1m or 1.5m beds are used. This is especially important for the solid plant 30 or 40inch configurations. Where bed structure is not ideal it can impact on establishment, potentially reducing yield and water use efficiency.

Availability of irrigation water is a critical factor growers have to manage. When availability is not limited a solid plant of 30 or 40inch both have the potential to produce robust yields with good water use efficiency.

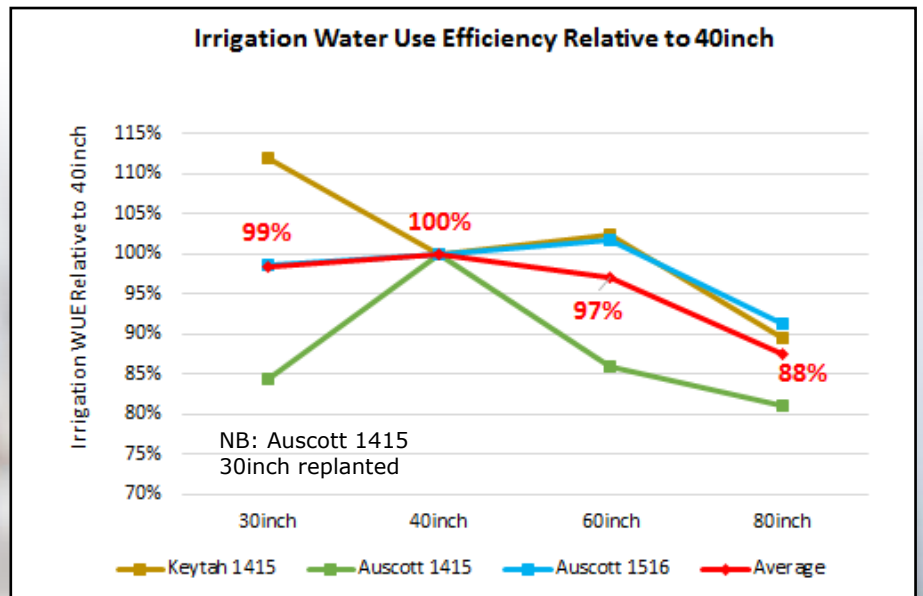
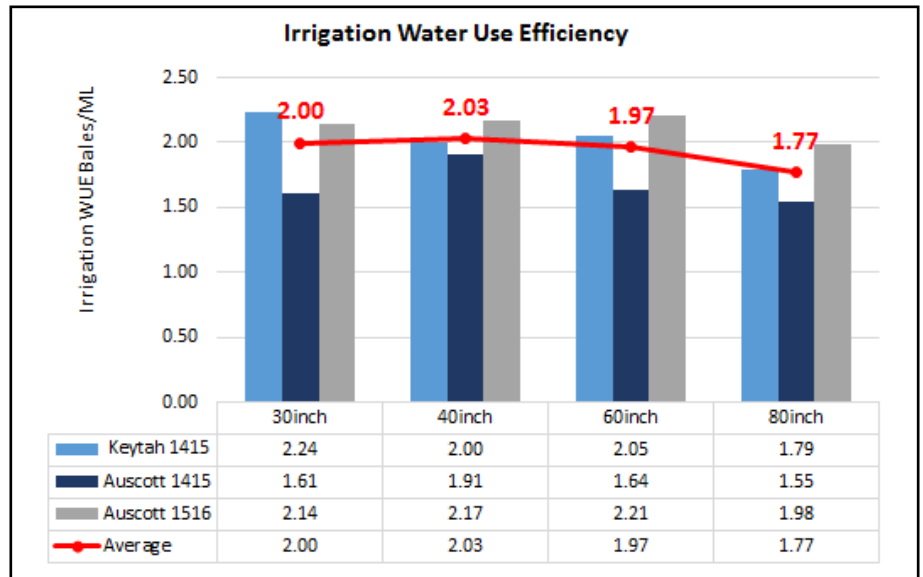
In situations where irrigation water is limited and a solid plant may not be appropriate, growers can now make more well informed decisions on what configuration to plant.

Water Use Efficiency Comparisons

When compared relative to the industry standard 40inch, the data shows that the 30inch yielded on average four percent less than the 40inch, using one percent less water. It is important to remember that the 30inch at Auscott in 2014-2015 was replanted, which impacted the yield.

In the 60inch plots where there is 33 percent less green hectares than 40inch, the data shows that on average it yielded 19 percent less than the 40inch and had a water use efficiency that was 3 percent less than the 40inch.

The findings for the 80inch, which has 50 percent less green hectares than the 40inch; were an average yield reduction of 33 percent, and a water use efficiency that was 12 percent less than the 40inch.



The 60inch configuration however has performed well. There is approximately a 19 percent yield cost, but the water use efficiency is very good. These results make 60inch a viable alternative to the solid row configurations.

The final decision as to which row configuration is most appropriate will depend on crop rotation and the farm operations.

In situations where broad acre cropping is carried out in conjunction with cotton production a move to 30 or 60inch may be beneficial as they allow for the three metre wheel spacing commonly found in broad acre cropping.

Optimised Irrigation Row Configuration Summary

Variable	Keytah	Auscott Watervale	Auscott Watervale
Year	2014-2015	2014-2015	2015-2016
Standard farm row spacing	30inch on 1.5m beds	40inch on 1m beds	40inch on 1m beds
Soil type	vertisol	vertisol	vertisol
Soil variation from EM survey	<9%	<5%	<5%
Planting date	27 th October 2014	9 th November 2014	18 th October 2015
Watered-up	30 and 40inch: 28 th October 60 and 80inch: 29 th October	40inch: 11 th November 80inch: 12 th November 30inch: 13 th November 60inch: 14 th November	20inch 21 st October 40inch 22 nd October 60inch 20 th October 80inch 21 st October
re-plant		60inch: 21 st November 30inch: 27 th November	
30inch irrigation	6.62ML/Ha	6.99ML/Ha	6.62ML/Ha
40inch irrigation	7.37ML/Ha	7.38ML/Ha	6.86ML/Ha
60inch irrigation	5.17ML/Ha	6.75ML/Ha	5.17ML/Ha
80inch irrigation	5.53ML/Ha	5.88ML/Ha	4.83ML/Ha
Rainfall	254mm Oct - April	266mm Dec - May	242mm Oct - Feb
Picking	18 th and 19 th May 2015	1 st to 3 rd June 2015	4 th and 5 th April 2016



Gwydir Valley
Cotton Grower's Association Inc.



AUSCOTT LIMITED

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