



Facts On Friday

Compiled by the CSD Extension and Development Team

Happy Plant = High Yields:

The aim of every grower is to maximise the yield potential of each field on the property. To do this growers are trying to produce healthy, actively growing plants, or alternately trying to reduce the incidence and severity of stresses on the plant. The longer the plant is growing healthy, leads to increases in efficiencies of water use and nutrient conversion, which in turn leads to increased yield.

A healthy and actively growing crop must have access to water and nutrients when it needs it from the soil that is adequately aerated. The crop also needs access to sufficient heat and sunlight, and is not constrained by diseases or pests. Any one of these could be the limiting factor to a crop producing high yields.

As we move into the middle third of the season, the aim is to capitalise on good growing conditions at present. Early season conditions were not conducive to active growth, therefore, there is a lot of ground to make up. Ensuring that the crop has minimal setbacks from now on is crucial in ensuring crops rebound and yield well.

Critically, the period from flowering to cut out is when up to 90% of the crop yield is set. So ensuring that the plant/crop grows actively and healthy through this period is paramount. Depending on the regions' season length, a major aim throughout this period would be to extend the flowering period for as long as possible. Crops approaching cut-out too rapidly are stressed (cannot support the fruit load).

Nodes Above White Flower:

Analysis conducted by the CSD Team of more than 300 high yielding crops over the past 6 seasons has shown that an increase in boll number was the key changeable driver for improving cotton yield and this was achieved primarily from crops growing well and flowering for longer.

For this to occur, the plants need to be strong enough to produce and hold new flowers whilst having enough resources to fill existing bolls throughout the plant. High yielding crops did not grow excessively tall or long season - most were between 21-24 nodes - the difference is that they held onto later bolls at the top of the plant and in the outer positions.

Ideally, in non-limiting, fully irrigated crops, aim for above 8 NAWF at first flower or 750 Day Degrees and try to maintain it at this level for an extended period. Having a high NAWF indicates that the plant is actively growing and will continue to retain fruit on the upper and outer fruiting branches.

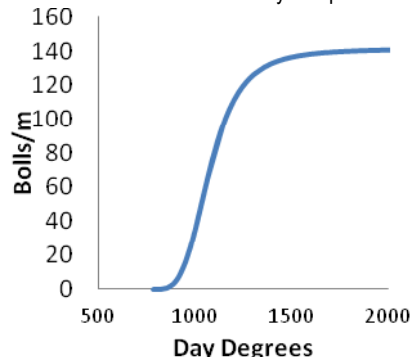
Boll Load:

Fruit counts done through the season can be misleading and do not correlate well to yield, mainly due to final boll weight and spatial variability. However, they can offer a good indicator of how the crop is progressing. Analysis of the segmented picking by CSD has suggested

most crops yielding 5 bale/ac and more had pickable fruit counts around 150+ boll/m.

Note from Figure 2, there is a rapid increase in the number of bolls from flowering through to 1500 DD (cut-out). This rapid accumulation emphasises how critical crop management is during the flowering to cut-out phase of growth as well as the benefits of prolonging cut-out for as long as possible. The time period post cut-out is used mainly to fill existing bolls with minimal further accumulation in number. In conventional or non Bollgard II® crops the incline in the curve is not as steep.

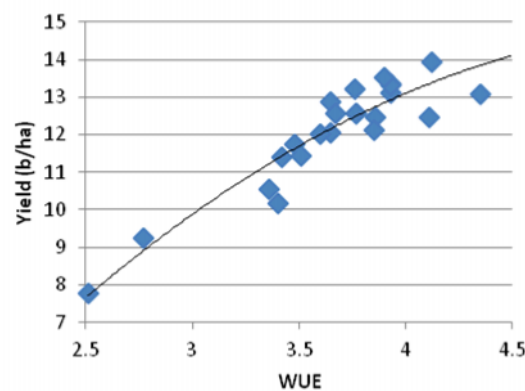
Figure 2: Average boll accumulation in Sicot 71/70/74 BR/BRF variety trial plots.



Boosting Efficiency:

To demonstrate the boost in crop efficiency, the CSD team measured the total evapotranspiration of 24 Sicot 71BRF crops over the past three seasons and derived water use efficiency (WUE) figure kg lint per mm passed through the crop, which was then compared to the actual yield of the crop (Figure 3).

Figure 3: Comparing total crop water use efficiency (WUE) with yield (b/ha)



This analysis showed that for every extra bale/ha in yield, the WUE of those crops improved by approximately 0.12 bales/ML.

Key Fundamentals:

- **Monitor Heavily** – In addition to the usual moisture, nutrient and insect scouting schedule regular checks for
 - Crop Growth, especially NAWF and Vegetative Growth Rate.
 - Boll Numbers/Retention to determine fruit load.
- **Use Sound Agronomic Principles** – Apply water, nutrients, insecticides and other inputs on time and efficiently as possible. Do not let the crop's limiting factor be something which management has control over.

FURTHER INFORMATION:

- **Managing for High Yields - The Australian Cotton Grower – Oct/Nov 2010**

Contacting the CSD Extension and Development Team

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Sicot, Sicala, Siokra and Sipima cotton varieties are a result of a research program conducted by CSIRO.

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