CROP YIELDS

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KEY POINTS:

- **Variability in yield, both within and between seasons in all major production areas is characteristic of dryland production**
- **Conservative rotations, stubble management, minimum tillage, controlled traffic, fallow management, timely planting & improved varieties all contribute to improvements in long term average yields.**

DARLING DOWNS

Darling Downs crop statistics show significant variation in annual mean yield across the region since the dryland cotton industry began expanding in 1983. Land set aside in rotation for dryland cotton has increased nearly every year although failure of planting rain prevents this area being realised each year. A combination of good average price at planting, a full profile of moisture and timely planting rain would see a potential planted area of around 50,000 hectares.

The top yields on the Darling Downs come from the deep basaltic alluvial soils on the Central Downs, and the Pirrinuan / Jimbour area of the Northern Downs. However, most of the region is capable of producing 5-6 bales / ha if everything goes well. Long-term averages for the region show the Northern Downs with 3.25 bales / ha and the Central Downs with 4.00 bales / ha.

Dryland commercial yields range from a low of 0.5 bales / ha up to 9.75 bales / ha with the full range experienced across the area in some years. Low yields are generally associated with early planted crops grown on a marginal profile of soil moisture, experiencing hot dry conditions in late December / early January, or late planted crops suffering heavy heliothis damage and then an early frost. High yields are associated with timely mid-season rainfall, adequate late season heat, and low Heliothis pressure.

Data from 12 Dryland farms entered in the Darling Downs Cotton Growers Association (DDCGA) crop competition in the 1998 / 99 and 1999 / 00 seasons showed a yield range of 4.5–8.0 bales / ha with an average of 6.3 bales / ha. Mean variable cost was $1147 / ha and the mean Gross Margin $1815 / ha. These 2 seasons were very rewarding for most growers, combining above average yields with good bale price.

Estimating crop yield is improving with crop modelling. The Agricultural Production Systems Research Unit (APSRU) based at the Department of Primary Industries (DPI) in Toowoomba uses the CSIRO OZCOT Agricultural Production Simulator (APSIM) model. APSIM assists growers in choosing between various crop options and planting times available for summer crop planting.

CENTRAL QUEENSLAND

With the exception of 2000 / 01 season, dryland cotton production in Central Queensland has been severely limited with a series of dry years, with an average planting of 2000-3000 hectares only. Yields in most seasons have ranged from 2.5- 3.25 bales / ha although the 1999 / 00 season produced yields of up to 8 bales / ha. The combination of timely rain and an attractive bale price produced an 8000-10000 hectare planting in 2000 / 01, with an average yield of about 2.75 bales / ha.

MOREE DISTRICT

The majority of dryland cotton crops are grown in eastern areas around Croppa Creek, Pallamallawa, Terry Hie Hie and Gurley. The further west the crop, the less reliable the rainfall and crop yields.

District yields over the last five years have ranged from 0.5 bales / ha to 7.5 bales / ha. This variability in yield emphasises the potential risks and rewards of growing dryland cotton. The overall average for east Moree is in the range of 2.0 bales / ha to 3.0 bales / ha (0.8 to 1.2 bales / ha).

Practices which reduce the risk of crop failure include 3 in 1 rotations, stubble retention and minimum tillage controlled traffic fallow management.

A range of row configurations are used by growers across the district with high yielding crops produced from all row configurations. However, given the variability in crop yields, single or double skip is generally recommended. Skip row has the advantage of reducing both production costs and the risk of total crop failure and producing poor quality fibre (lint).

LOWER NAMOI VALLEY (Edgeroi/Bellata)

Dryland cotton yields in the Narrabri Shire have averaged about 2.8 bales / ha over the last 10 years, although average yields for the last 5 years exceed this figure. This may reflect the adoption of better growing technology.

Crop yields show large variation from year to year. Lint yields as low as 0.9 bales / ha and as high as 7.5 bales / ha have been obtained by growers in Narrabri Shire. This variation reflects timeliness of summer rainfall and crop agronomy. The risk of achieving lower than average yields can be minimised by timely planting and good fallow management.

UPPER NAMOI VALLEY (Gunnedah)

The boom in dryland cotton production occurred in the 1990-91 season, with the bulk of the expansion occurring in the Boggabri / Mullaley district. Genuine mixed cropping growers adopted dryland cotton with moderate success. During the next three years yields were highly dependent on the rainfall events, 1990–91, 92-93 and 93-94 seasons average yields were 3.5, 4.3 and 2.5 bales / ha respectively.

As with any short season area, temperature limitations define the production boundaries of that region. Consequently precise crop management is required to maximise both earliness and yield potential.

The principle row configuration used is solid plant. However, growers are investigating the option of sowing single skip cotton. The aim of single skip is to help reduce input costs, especially insecticide and biotechnology licensing fees. The negative component of single skip cotton that can extend the growing season required to produce an adequate yield.

Rainfall in the Upper Namoi is considered adequate for solid plant cotton, however the reliability and timeliness of these rainfall events is the critical factor. Like all summer cropping areas, a cotton crop requires well timed rainfall plus at least 90-100cm of stored subsoil moisture at planting. This combination has resulted in a long term average yield of 3.28 bales / ha (1.3 bales / ac) for the district.

A combination of conservation tillage practices and varietal improvements have led to a slight but continual improvement in long term yield average. Okra leaf cotton varieties have provided a major advancement for dryland cotton, as these varieties exhibit improved water use efficiency and better canopy penetration for insecticides. Unfortunately, in recent seasons, there has been an increase in trash discounts from merchants and based on current crop management practices many growers are changing back to conventional leaf varieties to avoid these grade discounts.

In conclusion, dryland cotton within the Upper Namoi has become both a main revenue source for growers and a viable rotation crop for the general mixed farming community.

SOUTH WEST QUEENSLAND

The area of dryland cotton has steadily increased in the South West broadacre farming lands of Waggamba, Tara and Murilla Shires over the last 4-5 years. Yields have averaged about 2.75 bales / ha, ranging from 1.0 - 4.5 bales / ha. Much of the cotton is planted into long fallowed no-tilled winter cereal stubble – a proven technique for maximising soil moisture storage. A depth of 90 cm of soil moisture at planting is important to maximise the probability of at least breaking even.

SUMMARY

A summary of potential dryland cotton yields for the major regions in Queensland and NSW is presented in **Table 6**.

Table 6: Dryland cotton yield potential (bales/ha).

Region	Long Fallow		Short Fallow	
	Average	Range	Average	Range
Darling Downs	3.6	2.0–8.0	2.25	0.4–3.0
Moree	2.5	1.0–5.0	n/a	n/a
Central QLD	2.5	1.75–7.0	1.5	0.4–2.5
Lower Namoi	3.0	0.9–6.5	n/a	n/a
Upper Namoi	3.0	2.0–6.8	2.0	1.0–4.0
Sth West QLD	2.75	1.75–4.0	n/a	n/a