

'Walk away' cotton shows promise

■ By Stewart Brotherton¹, Graham Volck² and Oliver Volk²

THE aim of 'walk away' cotton is to establish the crop in September using limited available allocation, in order to develop a good root system and reach cut out as quickly as possible; and then to commence regular irrigation in either January or February when an increase in allocation is highly probable (Figure 1). The indeterminate nature of the cotton plant provides the mechanism for the success of this system.

This has been a common practice in the Dawson Callide Valley for many years. In more recent trials, Moree has shown increased yields with reduced water use when compared to conventionally sown cotton.

In 2019, Graham Volck and son Oliver looked to grow 'walk away' cotton on their farm 'Clearview' as a means of maintaining cotton production in a year of low initial water allocation.

Results from the season at 'Clearview' were encouraging, with

the farm averaging a yield of 12.25 bales per hectare from a total applied water of five megalitres per hectare. This represented a 15 per cent increase in yield and a 30 per cent reduction in water use when compared to the five-year average. The majority of the cotton was strict middling (92 per cent) with the remainder base grade.

The growth and development of the crop was monitored throughout the season, as summarised in the following graphs.

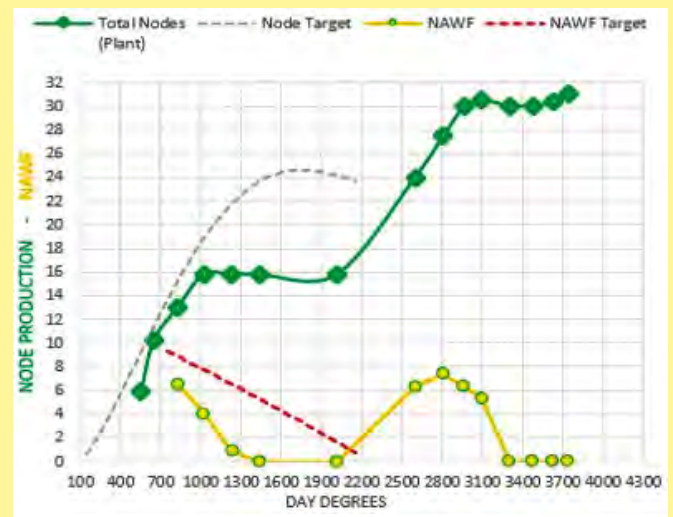
Growth and recovery of the cotton crop happened rapidly following the first in-crop irrigation in February (Figure 3). The photos illustrate the rapid recovery of the crop following the first

FIGURE 1: Mean amount of inflow for Nogoa River at Craigmore (28 years of data)



Source: Jeff Kavanagh, 2020.

FIGURE 2: Clearview crop – node number and NAWF



Source: Stewart Brotherton, Cotton Seed Distributors, 2020.

FIGURE 3: Photo comparison



Crop in early January



Crop in February

Source: Graham Volck, 2020.

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irrigation in February. The plant had been completely shut down at permanent wilting point for one month prior to this recovery.

Any bolls set prior to January did not contribute to yield. All harvestable fruit came from main stem nodes 13 and above and multiple vegetative branches.

To determine how repeatable these results are, we examined

TABLE 1: Key agronomic information

Variety	Sicot 746B3F
Planting date	September 10 2019
Planting rate	12.5 seeds/m
Established plant stand	11.3 plants/m
Nitrogen applied	280 kg/N/ha
First in-crop rain	January 18 2020
First irrigation	February 12 2020
Number of irrigations	5
RR plant shield applications	2
Mirid sprays	2
Heliiothis sprays	1
Pix applied	2.5 L/ha
Total number of nodes	31
Plant height	118 cm
First defoliation date	May 26 2020
Picking date	June 22 2020
Final boll count	149.3 bolls/m
Boll weight average	1.82 g
Average yield	12.25 b/ha
Turnout	39.6 per cent

this season's weather conditions and compared them with the 10-year average BOM records (Table 2). We also made comparisons to a more conventional system of planting in August and picking in January.

Key Points:

- Day degrees (DD1532) are similar between the two growing periods, on average varying by 12 per cent (Table 2).
- Rainfall totals are very similar. But early sown crops receive the majority of rain during boll opening and picking, whereas

FIGURE 4: 'Clearview' crop – boll number and plant height



Source: Stewart Brotherton, Cotton Seed Distributors, 2020.

TABLE 2: Comparison of key climatic growth parameters for conventionally early sown cotton planted mid-August and defoliated mid-January vs 'walk away' cotton restarted on 18 January, 2020 and defoliated end of May

Conventional crop – Date range: Aug 10–Jan 17											
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	10 year mean
Base 12	2270.7	2181.4	2106.7	2042.5	2088.7	2039.6	2153.5	1945.6	1908.7	1772.2	2051
DD1532	1413.9	1387.9	1355.9	1303.5	1353.9	1294	1369.5	1173	1179.8	1157.6	1298.9
Cold shock days ($\leq 11^{\circ}\text{C}$)	26	22	17	18	16	21	23	31	35	11	22
Days above 36°C	66	44	27	31	21	27	31	33	13	1	29.4
Nights above 25°C	4	4	3	4	0	3	4	1	0	0	2.3
Days above 40°C	13	7	4	4	2	2	6	2	0	0	4
Total rainfall (mm)	84.8	147	288	177	262.6	385	182.6	109.6	224.4	637	227.4
Total radiation (MJ/m ²)	3775.4	3590.6	3630.3	3374.8	3729.1	3707.8	3918.1	3844.2	3613	2898.5	3246.9
Average temp (°C)	25.9	25.2	24.9	24.5	24.8	24.5	25.2	23.7	23.4	22.8	24.5
'Walk away' crop – Date range: Jan 18–May 31											
	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	10 year mean
Base 12	1777.5	1846.6	1811.5	1821.9	1931.7	1769	1726.4	1576.9	1551.4	1537.7	1735.10
DD1532	1206.8	1219.5	1204	1202.9	1336.8	1156.2	1165.6	1033.1	1017.3	994.5	1153.7
Cold shock days ($\leq 11^{\circ}\text{C}$)	11	7	7	2	4	12	4	6	17	18	8.8
Days above 36°C	12	29	23	35	19	19	13	9	4	3	17.2
Nights above 25°C	7	7	3	4	4	2	0	0	0	1	2.8
Days above 40°C	0	9	7	3	1	1	0	1	0	0	2.2
Total rainfall (mm)	270	207	252.6	297.6	282	104.8	180.2	270.8	484.2	384.2	224.9
Total radiation (MJ/m ²)	2338.9	2341.3	2424.6	2474.9	2563	2717.6	2559.8	2433.5	2457.7	2451.9	2230.6
Average temp (°C)	25.1	25.7	25.4	25.6	26.4	25.1	24.8	23.7	23.4	23.2	24.8

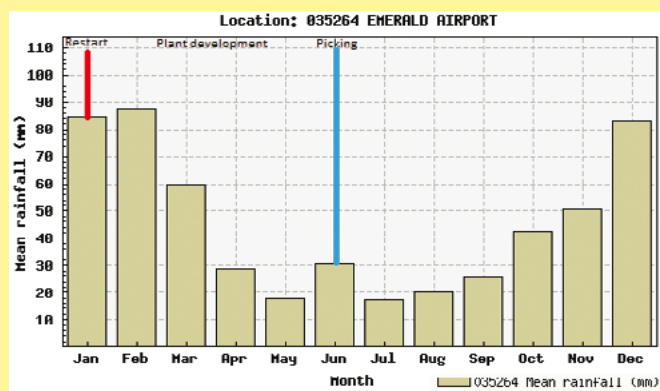
Location: Emerald Airport; Latitude: -23.5694; Longitude: 148.1756.

Source: Stewart Brotherton, Cotton Seed Distributors, 2020.

the reverse occurs for 'walk away' cotton (Figure 5). For 'walk away' cotton, January–February rainfall is beneficial to growth, rather than detrimental to yield.

- The August to January growing period experiences significantly more hot days and cold shock days. These hot days occur during flowering and boll maturation. The reverse occurs in the later growing period with cooler conditions at these times.
- Radiation is on average 30 per cent lower for the January to May period (Table 2).
- Radiation and DD1532 for 'walk away' cotton in the 2019–20 season was five per cent higher than average.

FIGURE 5: Growth stages of 'walk away' cotton relative to 30-year average rainfall



Source: BOM, 2020.

- On average, 'walk away' cotton receives only 24 per cent of the rainfall at boll opening and picking that conventional cotton receives (Table 3).

CSD has committed to monitoring a further 50 hectare trial of 'walk away' cotton this season as we aim to gather a minimum of three years of data across a range of conditions. Bayer will also be involved in this season's trial in order to monitor Bollgard efficacy.

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TABLE 3: Rainfall risk comparison during boll opening and picking for conventional and 'walk away' cotton

Rainfall measurements (mm)		
Year	December 1–January 31	May 1–June 30
2020		27
2019	124.8	20.4
2018	27.2	31.2
2017	98.8	22.8
2016	133.4	110.8
2015	229.6	12.6
2014	246.8	16.2
2013	65.2	40
2012	103.6	97.2
2011	255.8	46.4
2010	325	0
10 year mean	135.4	32.7

Source: BOM, 2020.



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