

**PROJECT NUMBER** : TK 208/21

**PROJECT TITLE** : Evaluation of planting date on production of cotton cultivars in SA

**REPORT YEAR** : 2014/2015

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## **INTRODUCTION**

Obtaining a vigorous and optimal stand is the first step for profitable cotton production. The use of appropriate cultivars and agronomic practices in suitable environmental factors is a prerequisite for such success. Environmental factors such as soil temperature determines the time of planting cotton.

In South Africa, the window for sowing cotton is very narrow and has a major influence on the yield and fibre qualities. Finding the most suitable cultivar for a particular planting date can help to widen the window period for sowing and ultimately optimize the total yield and quality of fibre.

The results of the 2014/15 evaluation of cultivars that are most suitable for a particular planting date are presented in this report.

## **OBJECTIVE**

The objective of the trial is to determine which cultivar is most suitable for a particular planting date. The effect on plant growth, yield, fibre qualities and the degree of whiteness (colour values) of the different cotton cultivars was determined at various planting dates.

## **LOCALITY**

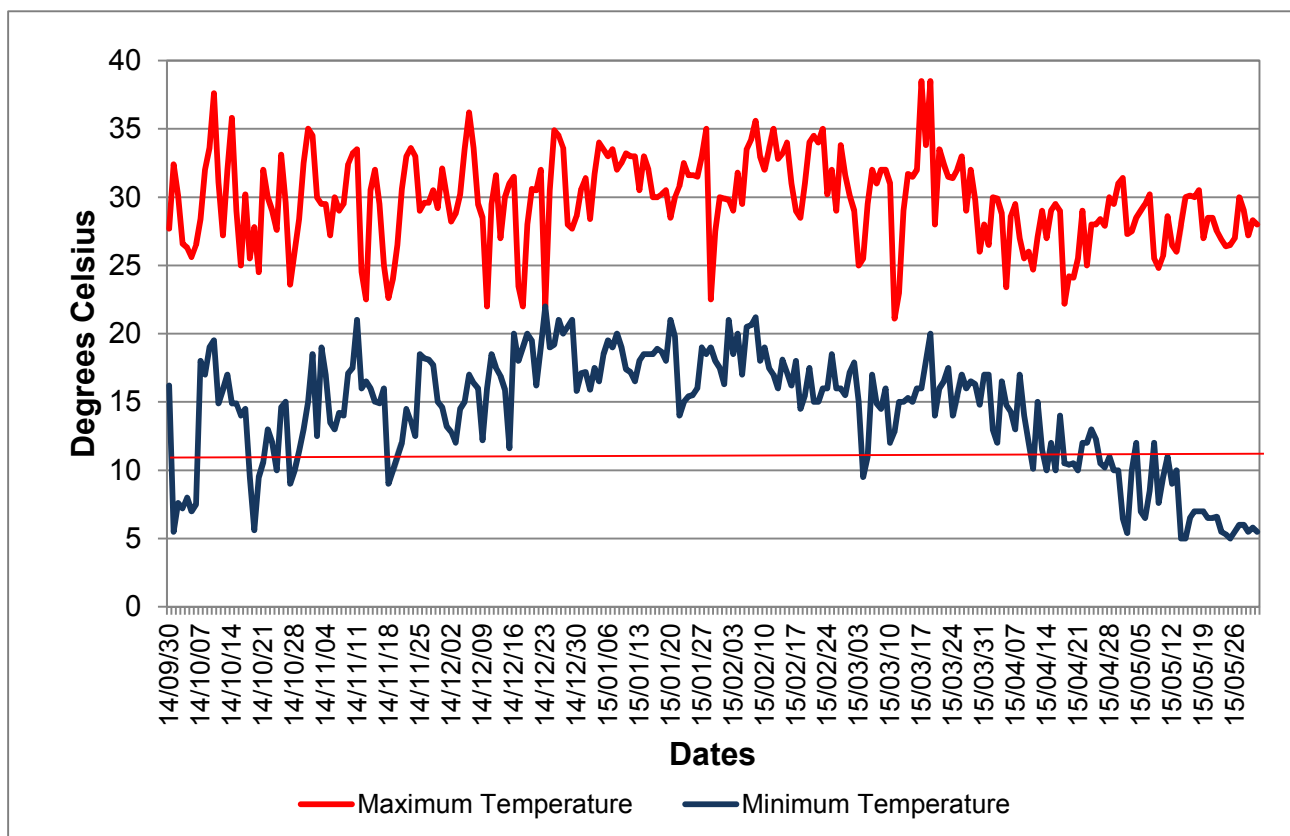
Groblersdal: ARC-Loskop Research Farm

The locality presents one of the 8 different climatic zones experienced for cotton production in South Africa.

## GENERAL PRODUCTION CONDITIONS

### Maximum and Minimum temperatures

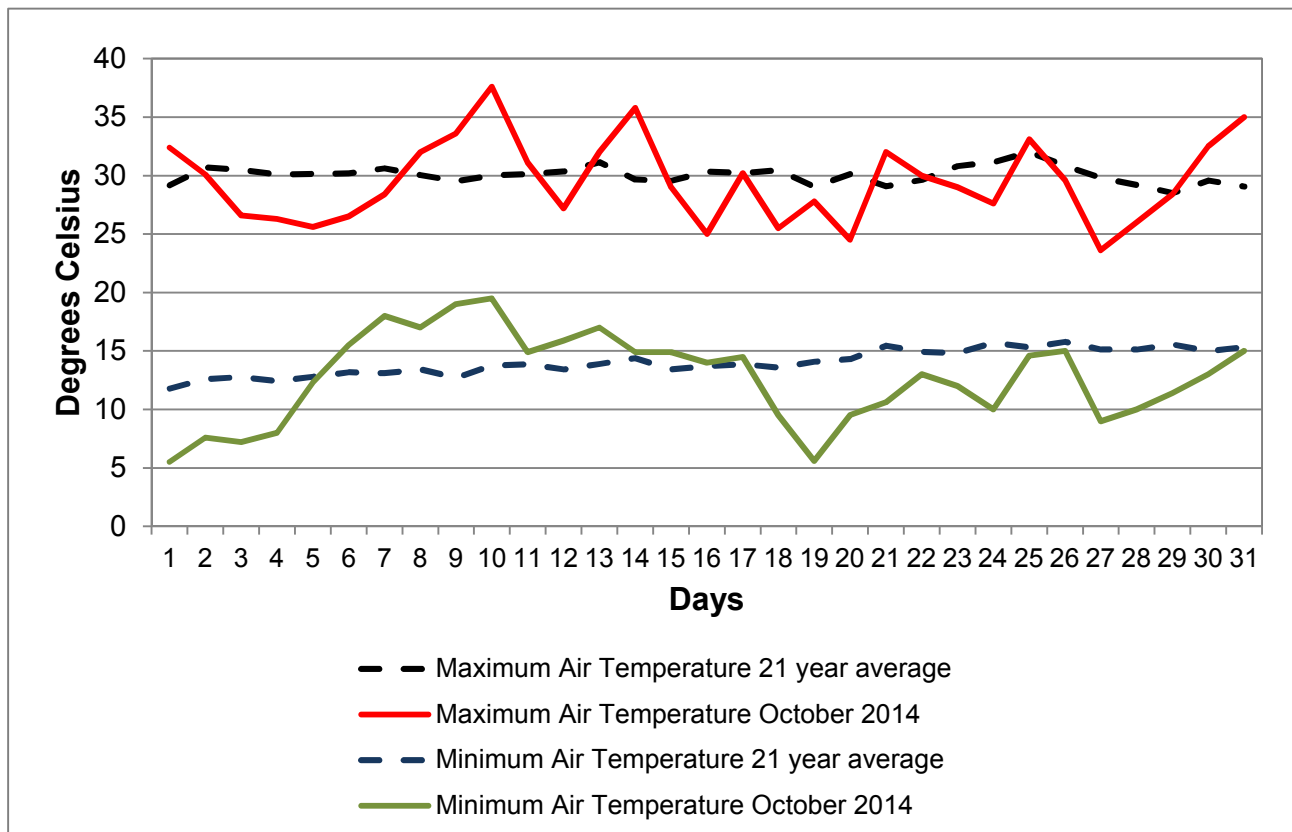
Cultivar adaptation and successful production are influenced by climatic conditions, especially temperatures during specific phases of the growing season. During the planting- and the early growing season for the planting date trial (October 2014 to January 2015) weather conditions fluctuated with wet weather and moderate to hot temperatures but from February 2015 to end of March 2015 weather conditions were extremely hot and dry. Warm to moderate temperatures in April 2015 and May 2015 could have benefitted the November 2014 plantings.



**Figure 1.** Minimum and maximum air temperatures (°C) at Groblersdal 2014/15

## October 2014 Air temperatures

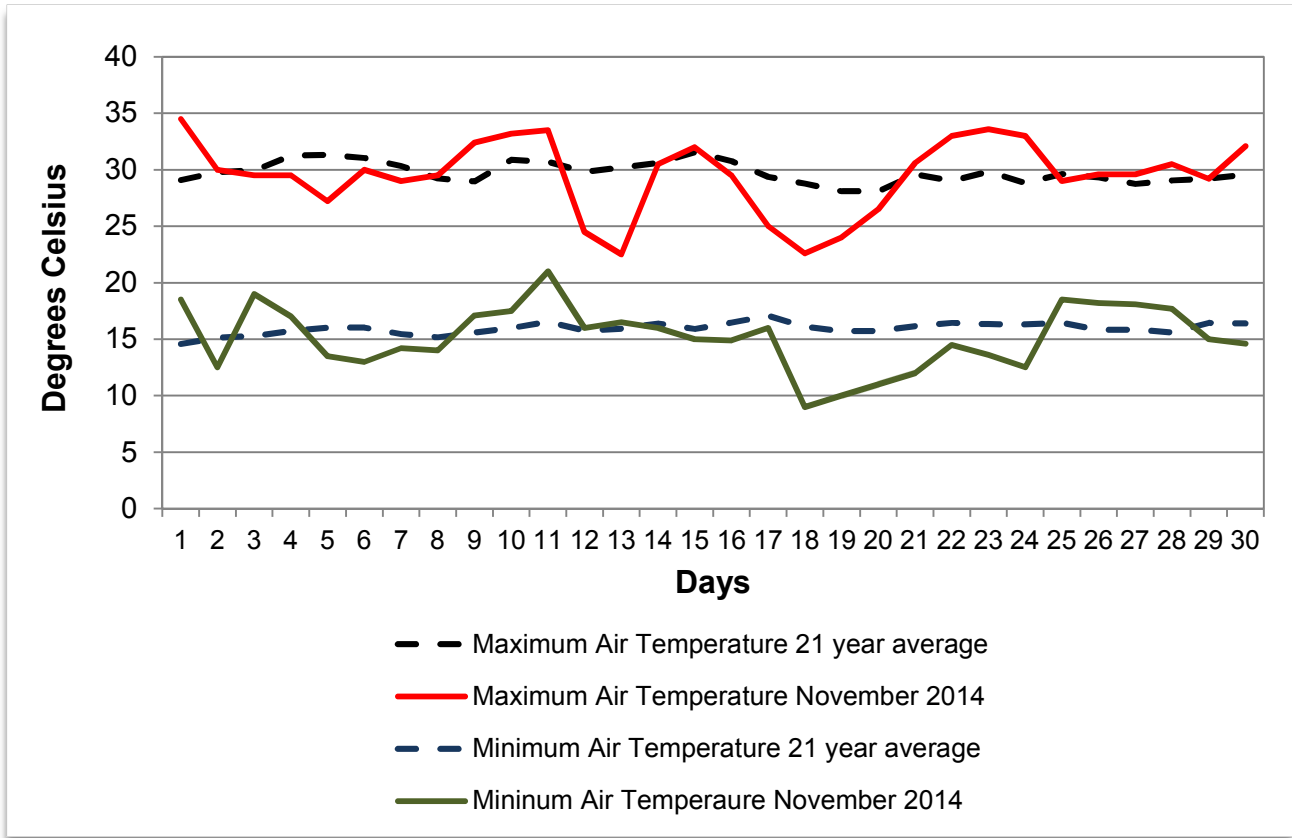
The minimum and maximum temperature data collected from the weather station at ARC-Loskop Research farm indicate that the maximum and minimum temperatures for October were lower than the long-term values. The maximum temperatures varied through-out the month and the minimum temperatures were above the long term average in the first part of October but drop below the long term values in the second part of October.



**Figure 2.** October 2014 Air temperatures (°C)

## November 2014 Air temperatures

The minimum and maximum temperature data collected at the weather station for November 2014 indicated a variation in temperatures. Cold weather was experienced on the 17<sup>th</sup> of November 2014 when minimum temperatures drop below 15°C for eight days before return to normal minimum temperatures on the 25 November 2015.



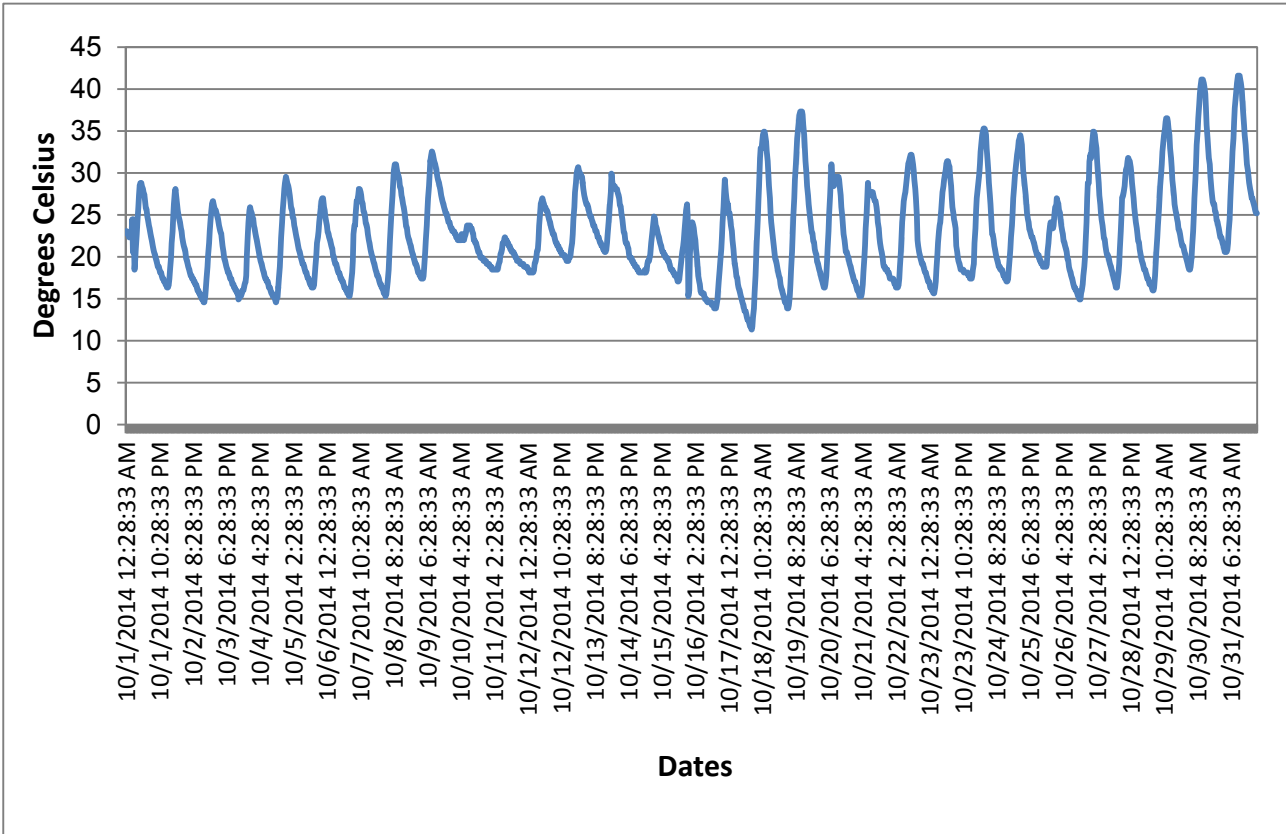
**Figure 3.** November 2014 Air temperatures (°C)

**Soil temperature**

A soil temperature meter was installed 30 September 2014 to record soil temperatures during sowing season of the eight planting dates. A figure for the soil temperature is given in Figures 3 and 4 below.

**October 2014 Soil temperatures**

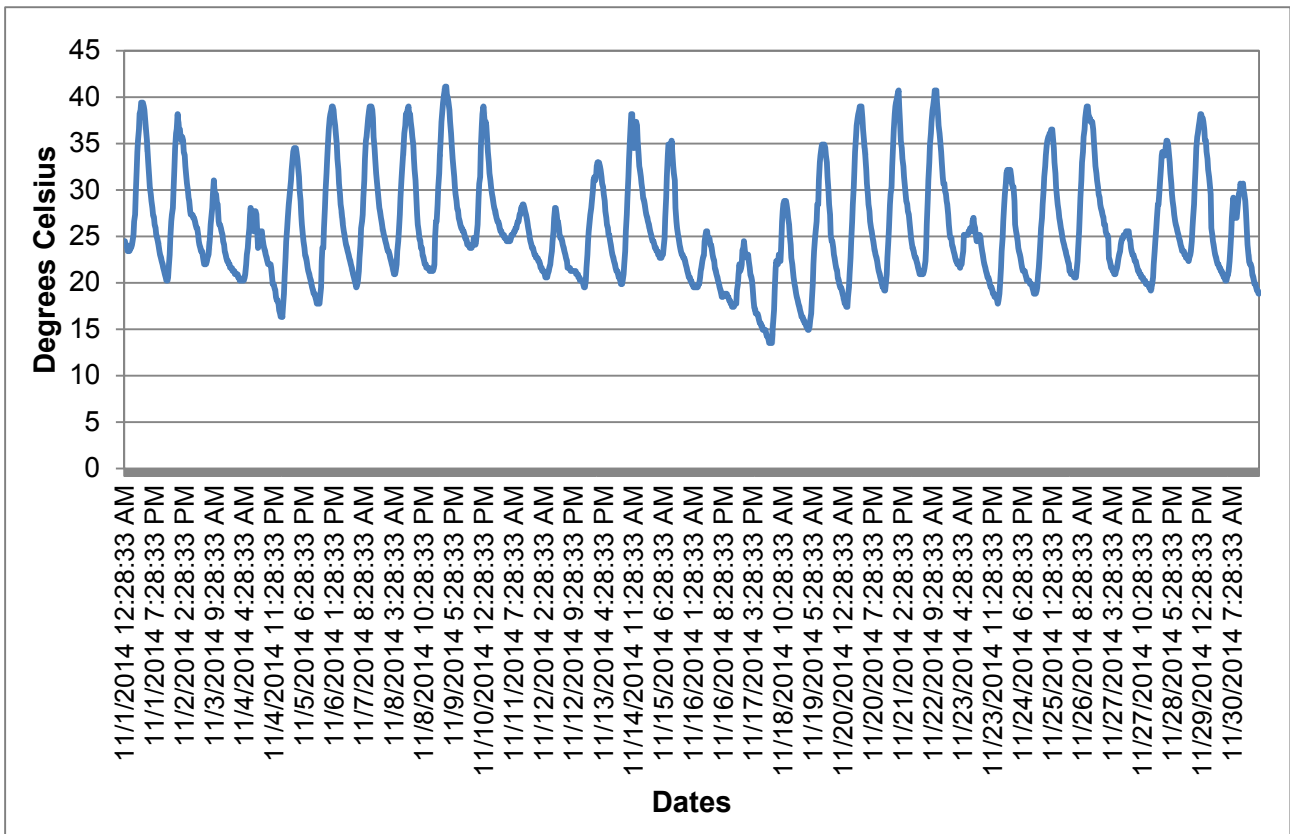
High seed quality and warm air temperature are not enough for optimum seed germination and emergence if the soil is cold. Cotton should not be planted before the top 30 mm of soil has not maintained a temperature of 16 to 18°C or higher. Soil temperatures were above 15°C from 01 October 2014.



**Figure 4.** October 2014 Soil temperatures (°C)

**November 2014 Soil temperatures**

Soil temperatures for November 2014 were normal for sowing of cotton, even when a cold front passed over the country from 17 to 24 November 2014.

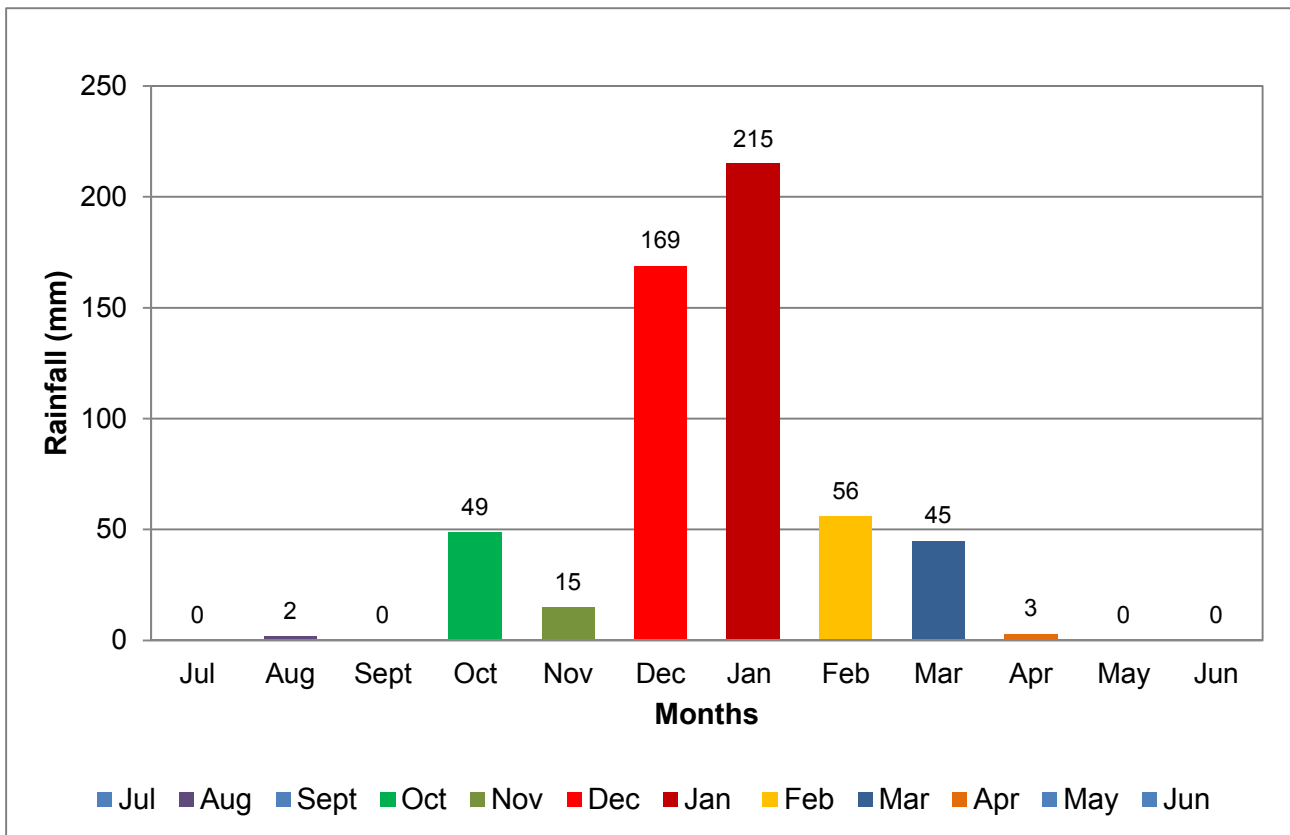


**Figure 5.** November 2014 Soil temperatures (°C)

**Rainfall (mm)**

A total of 554 mm rain was recorded during the growing season of the Plant Date Trials. Figure 5 indicates the rainfall for the 2014/15 cotton growing season with the highest rainfall for December 2014 (169 mm) and January 2015 (215 mm). Very dry and hot conditions were experienced during February, March, April and May. A hailstorm and rain (25 mm) just after planting on 17 October 2014 resulted in eroded soil, wash away of cotton seeds and damage to cotton seedlings.

Monthly rain fall measured at ARC-Loskop Research Farm, Groblersdal.



**Figure 6.** Rainfall (mm)

## PLANTING DATES

A field trial was conducted at ARC-Loskop Research Farm, Groblersdal, by planting different cotton cultivars over a period of eight weeks to determine which cultivar is most suitable for a particular planting date. These planting dates were:

1. 07 October 2014 (PD 1)
2. 14 October 2014 (PD 2)
3. 21 October 2014 (PD 3)
4. 28 October 2014 (PD 4)
5. 04 November 2014 (PD 5)
6. 11 November 2014 (PD 6)
7. 18 November 2014 (PD 7)
8. 25 November 2014 (PD 8)

## **CULTIVARS**

Cotton cultivars planted under irrigation consisted of 6 entries namely:

1. Delta12BRF (standard)
2. 13P3001B2R2
3. DP1240B2RF
4. CandiaB2RF
5. 13P3005B2R2
6. DP210BRF (standard)

## **EXPERIMENTAL PROCEDURE**

The trial was conducted under irrigation conditions, following practices that are commonly used in commercial cotton production systems. The effect on planting time on plant growth, yield, fibre qualities and the degree of whiteness (colour values) of the different cotton cultivars was determined.

Each planting date trial was planted in a randomized block design with four replicates, and plots consisted of 2 rows of 5m lengths, at an inter-row spacing of 90cm and intra-row spacing of 15cm.

All cultural practices, including fertilizer regimes, pest control and irrigation were treated the same. Target total fertilizer was 180 kg N/ha, 35 kg P/ha and 85 kg K/ha. Weed and insect control was applied as necessary.

Plant establishments and any yield limiting factors were noted throughout.

Sub-samples of the harvested seed cotton were ginned for turnout data. Lint samples were sent to Cotton SA for HVI fibre quality analysis.

### **The use of a plant growth regulator, Mepiquat chloride (Pix)**

Environmental conditions in January 2015, (rain of 210 mm, hot condition, optimum fertilizer) indicated the necessity the use of Mepiquat chloride (Pix). Two application of 250 ml/ha each were applied with a knapsack on each planting date trial at 1<sup>st</sup> white flower and then 3 weeks later.



## **Germination %**

Soil temperatures indicated that the soils warmed up from the beginning of October. Other environmental conditions played a part in plant stand. From the compared analysis Planting Date 2 resulted in very low average germination percentage of 1.7 %, and as the soil warmed, more seedlings emerge from the soil, and the average germination percentage at 14 days was low at 82.2%. A hail storm and heavy rain on 17 October 2014 resulted in lower germination % in Planting Dates 1 and 2 due to damage to the seedlings, eroded soil and wash away of seeds just after plant.

After 30 days of plant, the last three November planting dates showed significant better plant stands than the October planting dates.

**Table 1.** Germination percentage 7 days after planting

Cultivar	Planting dates								Average Germination % - 7 Days after planting	Ranking	
	PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14			
1	<b>Delta 12 BRF</b>	52.9	4.3	38.9	79.3	71.8	95.7	89.3	81.4	64.2	2
2	<b>13P3001B2R2</b>	43.6	0.0	32.5	76.4	68.6	89.6	88.6	82.9	60.3	4
3	<b>DP 1240 B2RF</b>	37.5	2.9	29.3	84.3	68.2	93.9	85.4	82.9	60.5	3
4	<b>Candia B2RF</b>	21.1	1.4	35.4	79.6	72.9	92.1	83.6	78.2	58.0	6
5	<b>13P3005B2R2</b>	34.3	1.1	33.6	78.9	72.1	94.3	85.7	77.9	59.7	5
6	<b>DP210BRF</b>	45.0	0.7	47.5	87.5	75.0	95.4	93.9	86.4	66.4	1
<b>Average</b>		39.0	1.7	36.2	81.0	71.4	93.5	87.7	81.6		
<b>Ranking</b>		6	8	7	4	5	1	2	3		
<b>CV %</b>		2.24									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		6.09									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		2.261									

**Table 2.** Germination percentage 14 days after planting

Cultivar		Planting dates								Average Germination % - 14 Days after planting	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	77.1	86.1	86.1	85.4	79.6	98.2	100.0	91.4	88.0	2
2	13P3001B2R2	72.5	85.7	78.2	86.4	85.7	99.6	98.6	92.9	87.5	4
3	DP 1240 B2RF	76.4	74.3	81.4	91.1	80.7	97.5	98.6	94.6	86.8	5
4	Candia B2RF	79.6	82.1	91.4	89.3	83.2	97.9	98.9	96.1	89.8	1
5	13P3005B2R2	75.0	86.4	82.1	83.9	82.5	98.2	96.8	94.6	87.5	4
6	DP210BRF	79.3	78.6	83.6	91.4	81.1	97.1	97.9	92.5	87.7	3
<b>Average</b>		76.7	82.2	83.8	87.9	82.1	98.1	98.5	93.7		
<b>Ranking</b>		8	6	5	4	7	2	1	3		
<b>CV %</b>		1.04									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		4.475									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		10.96									

**Table 3.** Plant stand percentage 30 days after planting

Cultivar	Planting dates								Average Germination % - One Month after planting	Ranking	
	PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14			
1	Delta 12 BRF	76.1	87.5	82.5	85.4	75.4	96.8	100.0	91.4	86.9	3
2	13P3001B2R2	71.1	88.9	78.9	88.9	80.0	98.2	98.6	92.9	87.2	4
3	DP 1240 B2RF	75.0	76.4	84.3	89.3	80.4	96.8	98.6	94.6	86.9	3
4	Candia B2RF	82.5	82.9	93.2	91.1	82.1	96.8	98.9	96.1	90.4	1
5	13P3005B2R2	73.9	87.5	81.1	90.0	82.9	97.9	96.8	94.6	88.1	2
6	DP210BRF	71.8	79.6	84.6	89.6	78.2	94.3	97.9	92.5	86.1	5
<b>Average</b>		75.1	83.8	84.1	89.0	79.8	96.8	98.5	93.7		
<b>Ranking</b>		8	6	5	4	7	2	1	3		
<b>CV %</b>		1.05									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		4.13									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		10.135									

## **Final Plant Mapping data**

Final Plant mapping data were made to assist in explaining the influence of the cultivar adaptation and climatic conditions, especially temperatures during specific phases of the growing season.

For every Planting Date trial five plants per cultivar in each replication were evaluated.

The Final Plant Mapping data included the following:

- a. Plant height
- b. Number of vegetative nodes
- c. Number of fruit branches
- d. Height-to-node ratio
- e. Bolls/plant
- f. Boll Retention at 95 % zone

## **Degree-days (base 15.6°C)**

The growth of the cotton plant is temperature dependent and growth ceases when the average daily temperature falls below the critical development threshold level of 15.5°C. As the temperature rise above the critical threshold, the growth rate of the cotton plant increase to an optimal level. The relationship between growth and temperature is used to predict the timing of various development stages of the cotton plant.

To calculate degree-days the following formula was used:

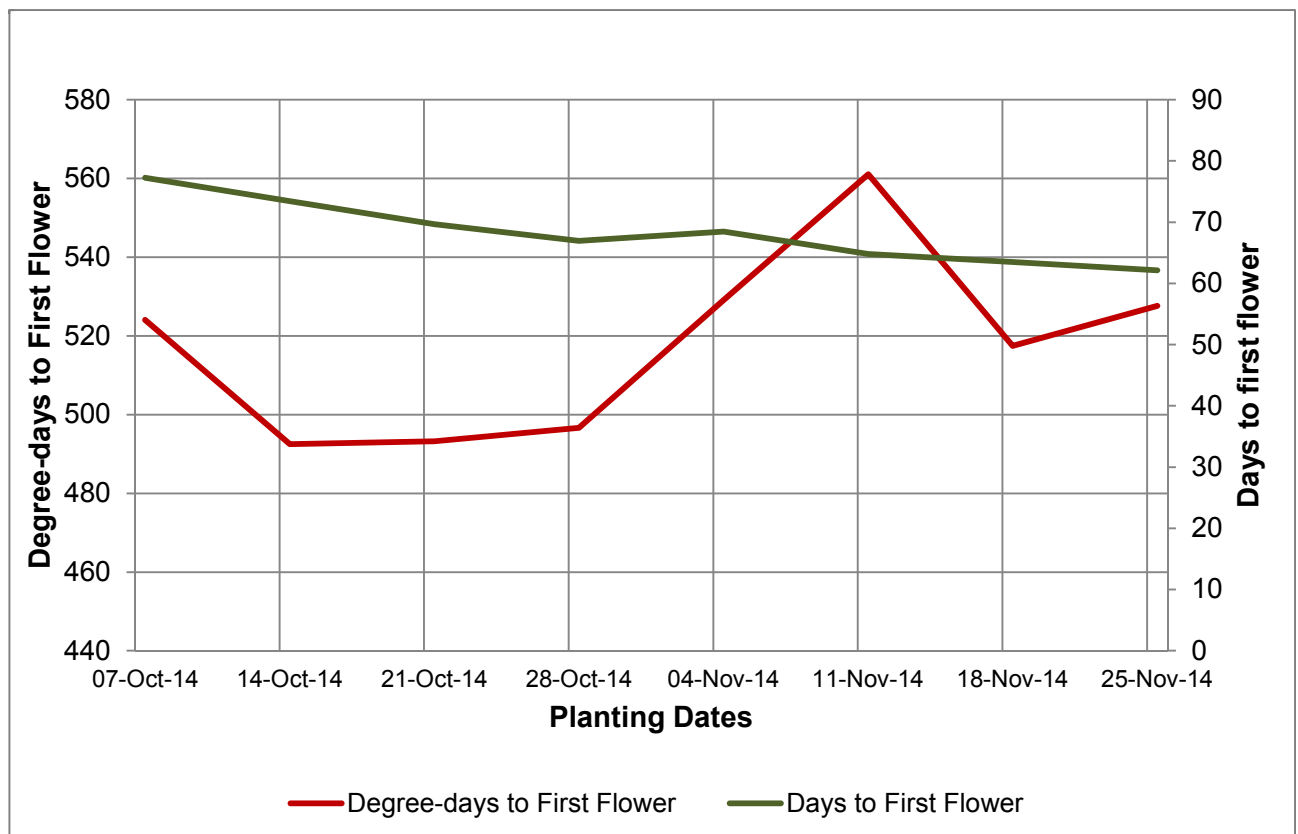
*([Daily Maximum temperature + Daily Minimum temperature] ÷ 2) – Development threshold (15.6°C).*

Figure 7 indicated that when cold weather conditions were experienced in the period 17 to 24 November 2014, Planting Date 6 planted at 18 November 2014 needed significant more Degree-days before the plants start flowering. Planting Date 2, 3, and 4 needed significantly less Degree-days before flowering.

## Days to First flower

Days to First flower was calculated to indicate how many days elapsed from planting to first flower. Figure 7 showed significantly that at the beginning of the plant period, 7 October 2014, 77 days were needed for Planting Date 1 to flower, and gradually decreased till Planting Date 8 planted at 25 November 2014 needed 62 days to flower.

Table 4 and 5 indicated that 13P3001B2R2 and Delta 12 BRF flower significant earlier than the other cultivars.



**Figure 7.** Effect of temperature on flowering

**Table 4.** Days to First Flower

Cultivar		Planting dates								Average Days from Plant to First Flower	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	77.3	73.3	68.5	66.3	67.3	64.0	63.8	61.0	67.7	2
2	13P3001B2R2	76.0	71.8	68.5	64.5	67.0	64.0	63.0	60.3	66.9	1
3	DP 1240 B2RF	79.0	75.0	71.0	69.8	70.5	64.0	63.8	62.8	69.5	6
4	Candia B2RF	77.5	73.5	70.5	67.8	68.0	66.8	63.5	63.8	68.9	5
5	13P3005B2R2	76.8	74.3	70.0	67.3	68.5	64.8	64.0	62.3	68.5	4
6	DP210BRF	77.0	72.8	69.5	66.3	69.5	65.3	63.0	62.8	68.3	3
<b>Average</b>		77.3	73.4	69.7	67.0	68.5	64.8	63.5	62.1		
<b>Ranking</b>		8	7	6	4	5	3	2	1		
<b>CV %</b>		2.17									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.8478									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.7342									

**Table 5.** Degree-day to first flower

Cultivar		Planting dates								Average Day Degrees to First Flower	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	525.1	490.4	483.1	492.4	518.3	552.4	516.6	517.7	512.0	2
2	13P3001B2R2	513.9	474.1	483.2	473.4	514.8	553.7	511.9	512.9	504.7	1
3	DP 1240 B2RF	532.9	485.8	503.7	523.6	547.6	554.2	524.4	534.5	525.8	6
4	Candia B2RF	527.2	499.9	498.8	506.0	526.2	576.0	520.4	542.1	524.6	5
5	13P3005B2R2	521.1	503.9	495.6	497.0	528.2	561.4	519.5	527.7	519.3	3
6	DP210BRF	524.0	500.8	495.0	487.5	539.6	568.6	512.0	530.8	519.8	4
<b>Average</b>		524.0	492.5	493.2	496.6	529.1	561.1	517.5	527.6		
<b>Ranking</b>		5	1	2	3	7	8	4	6		
<b>CV %</b>		0.192									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		7.286									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		5.846									

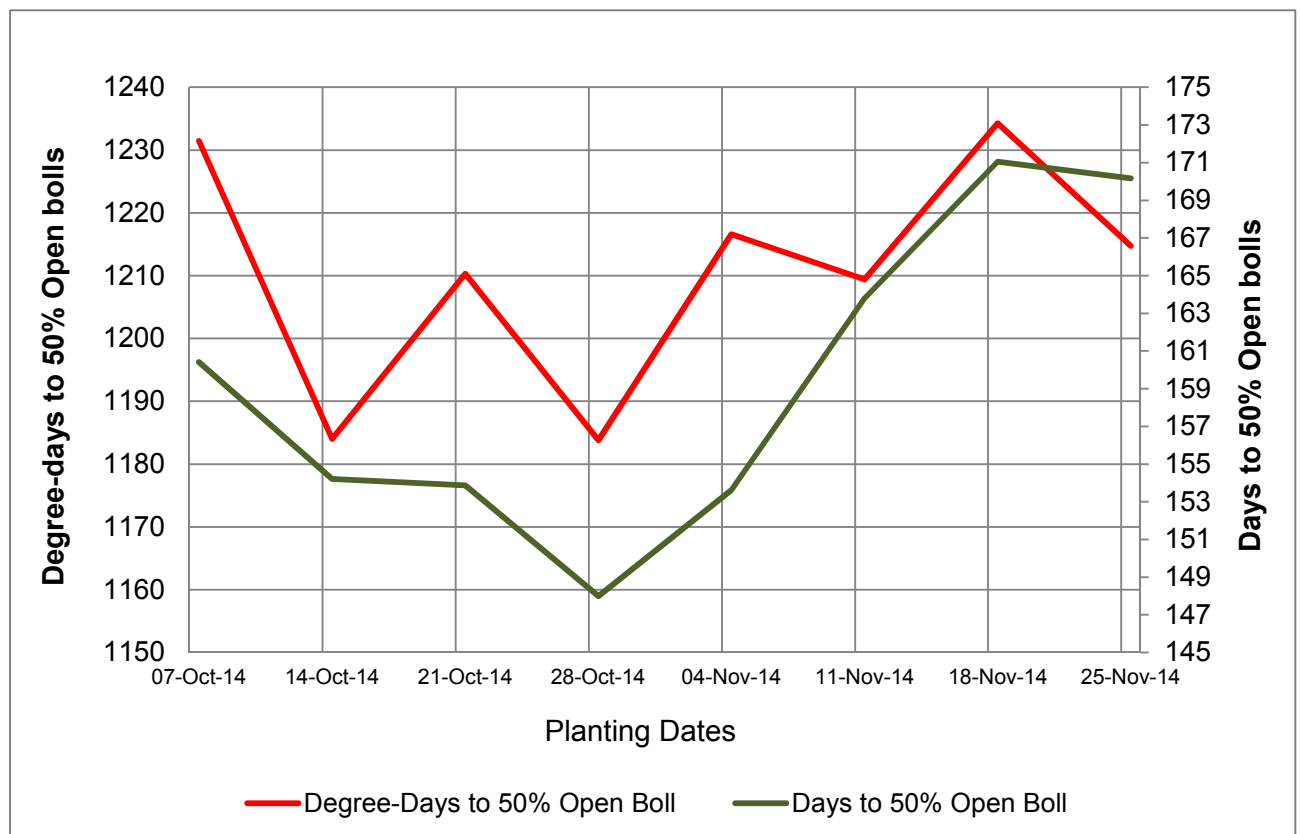


## Days to 50 % Open boll

Days to 50 % open boll was calculated to indicate how many days elapsed from planting to 50 % open bolls. Figure 8 showed significantly that, early plant and late plantings took significant longer to reach 50 % open boll. Planting date 1 needed 160 days, Planting Date 7 needed 171 day and Planting Date 8 needed 170.2 day to reach 50 % open boll.

Planting Date 7 and 1 significantly needed 1234.3 and 1231.4 degree-days respectively to reach 50 % open boll, while Planting Date 4 was significant early and needed 1183 degree-days to reach 50 % open boll.

The cultivar13P3001B2R2 needed significantly less time (155 days or 1183.3 degree-days) to reach 50% open boll.



**Figure 8.** Time to 50 % Open Bolls

**Table 6.** Days to 50 % Open bolls

Cultivar	Planting dates								Average Days from Plant to 50 % Boll Burst	Ranking	
	PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14			
1	<b>Delta 12 BRF</b>	158.3	154.3	153.5	148.5	155.5	162.0	172.5	169.3	159.2	3
2	<b>13P3001B2R2</b>	160.0	150.0	148.0	144.8	151.8	158.3	167.3	165.3	155.7	1
3	<b>DP 1240 B2RF</b>	167.5	156.8	156.0	150.0	157.8	167.5	174.3	172.5	162.8	6
4	<b>Candia B2RF</b>	158.0	156.3	155.8	148.5	152.0	167.5	168.0	174.5	160.1	4
5	<b>13P3005B2R2</b>	156.8	151.8	154.0	146.3	152.3	162.5	172.8	167.0	157.9	2
6	<b>DP210BRF</b>	162.0	156.3	156.0	150.0	152.5	165.0	171.5	172.5	160.7	5
<b>Average</b>		160.4	154.2	153.9	148.0	153.6	163.8	171.0	170.2		
<b>Ranking</b>		5	4	3	1	2	6	8	7		
<b>CV %</b>		2.465									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		2.2433									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		1.9428									

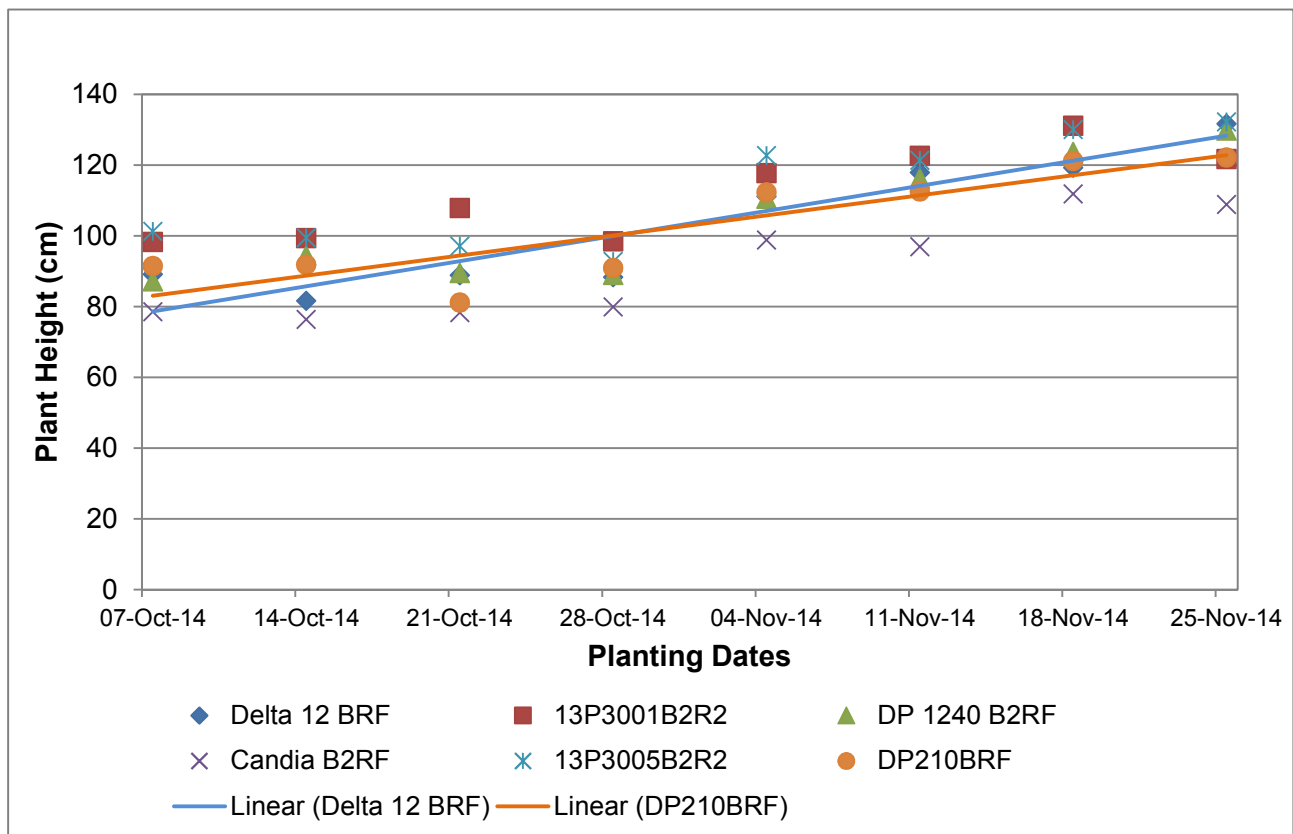
**Table 7.** Degree-days to 50 % Open bolls

Cultivar		Planting dates								Average Day Degrees to 5% Boll burst (HU)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	1223.8	1185.5	1207.9	1189.3	1225.1	1204.6	1237.4	1212.7	1210.8	3
2	13P3001B2R2	1180.6	1152.1	1157.3	1157.2	1207.5	1189.1	1224.4	1203.0	1183.9	1
3	DP 1240 B2RF	1300.7	1205.6	1228.6	1198.6	1235.7	1222.0	1242.7	1220.5	1231.8	6
4	Candia B2RF	1222.2	1200.5	1226.8	1189.5	1209.3	1223.4	1227.4	1224.7	1215.5	4
5	13P3005B2R2	1205.4	1159.5	1212.3	1170.8	1209.4	1204.0	1238.7	1207.4	1200.9	2
6	DP210BRF	1256.1	1200.9	1228.8	1197.5	1212.5	1213.2	1235.0	1220.0	1220.5	5
<b>Average</b>		1231.5	1184.0	1210.3	1183.8	1216.6	1209.4	1234.3	1214.7		
<b>Ranking</b>		7	2	4	1	6	3	8	5		
<b>CV %</b>		2.11									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		14.653									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		12.69									

## Plant height at Final Plant Mapping

Figure 9 indicated that the November plantings resulted in significant taller plants. This results may be related to the fact that later plantings develop during warmer weather, resulting in faster vegetative growth, but with less total development time.

The cultivars 13P3005B2R2 and Delta12BRF resulted in significant taller plants at the 8<sup>th</sup> Planting Date with heights of 132.2cm and 131.7cm respectively. The cultivar Candia B2RF resulted in significant shorter plants over all the planting dates with an average plant height of 91.2 cm (Table 6). The shorter plants of Candia B2RF could be cultivar related and due to the sensitivity of the cultivar to the applications of Mepiquat chloride (Pix).



**Figure 9.** Plant Height at Final Plant Mapping

**Table 8.** Plant height at Final Plant Mapping (cm)

Cultivar		Planting dates								Average Plant height (cm)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	89.1	81.7	88.9	88.3	111.1	117.9	119.3	131.7	103.5	3
2	13P3001B2R2	98.3	99.4	107.9	98.5	117.8	122.7	131.1	121.7	112.2	6
3	DP 1240 B2RF	87.1	94.4	89.5	89.0	110.5	116.3	123.7	129.8	105.0	4
4	Candia B2RF	78.6	76.4	78.3	80.0	98.8	96.9	111.9	108.9	91.2	1
5	13P3005B2R2	101.3	99.5	97.1	92.8	122.7	121.4	130.0	132.2	112.1	5
6	DP210BRF	91.5	91.9	81.1	91.0	112.3	112.6	121.1	122.1	103.0	2
<b>Average</b>		91.0	90.5	90.5	89.9	112.2	114.6	122.9	124.4		
<b>Ranking</b>		2	3	3	1	4	5	7	6		
<b>CV %</b>		6.82									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.576									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		3.5384									

### **Number of vegetative nodes**

The number of vegetative nodes produced before the first fruiting branches are formed depends on the variety and the environment. There was no significant differences between cultivars (Table 9).

Candia B2RF resulted in significantly more average vegetative node. Planting Date 4 significantly had the highest number of vegetative nodes.

**Table 9.** Number of vegetative nodes

	Cultivar	Planting dates								Average Number of Vegetative nodes above cotyledons (count)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	4.35	4.20	4.45	4.70	5.20	4.45	4.10	4.55	4.50	4
2	13P3001B2R2	4.40	4.45	4.35	4.80	5.00	4.50	4.65	4.50	4.58	3
3	DP 1240 B2RF	4.50	4.45	4.60	4.90	4.90	4.75	4.30	5.15	4.69	2
4	Candia B2RF	4.60	4.50	5.00	5.90	4.85	5.25	4.55	5.55	5.02	1
5	13P3005B2R2	4.15	4.70	4.15	4.70	4.70	4.70	4.35	4.30	4.47	6
6	DP210BRF	4.60	4.30	4.45	4.80	4.40	4.50	4.05	4.85	4.49	5
<b>Average</b>		4.43	4.43	4.50	4.97	4.84	4.69	4.33	4.82		
<b>Ranking</b>		6	6	5	1	2	4	7	3		
<b>CV %</b>		7.56									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.1996									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.4988									

## **Fruit Branches**

The number of fruit branches increased significantly in the November plantings (Table 10). This may be related to the fact that later plantings develop during warmer weather, resulting in faster vegetative growth.

The cultivar, CandiaB2RF, resulted in significant lower fruiting branches over all the planting dates. CandiaB2RF sensitivity to Mepiquat chloride could be the cause for the lower number of fruit branches.



**Table 10.** Number of fruit branches

Cultivar		Planting dates								Average Number of fruit branches (count)
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14	
1	Delta 12 BRF	17	15	16	15	17	18	19	20	17
2	13P3001B2R2	16	14	16	14	17	17	20	17	16
3	DP 1240 B2RF	17	17	16	15	17	18	19	18	17
4	Candia B2RF	15	13	14	13	17	15	18	16	15
5	13P3005B2R2	17	16	15	14	17	17	19	19	17
6	DP210BRF	17	15	15	14	18	18	19	18	17
<b>Average</b>		16	15	15	14	17	17	19	18	
<b>CV %</b>		5.832								
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.5493								
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.1729								

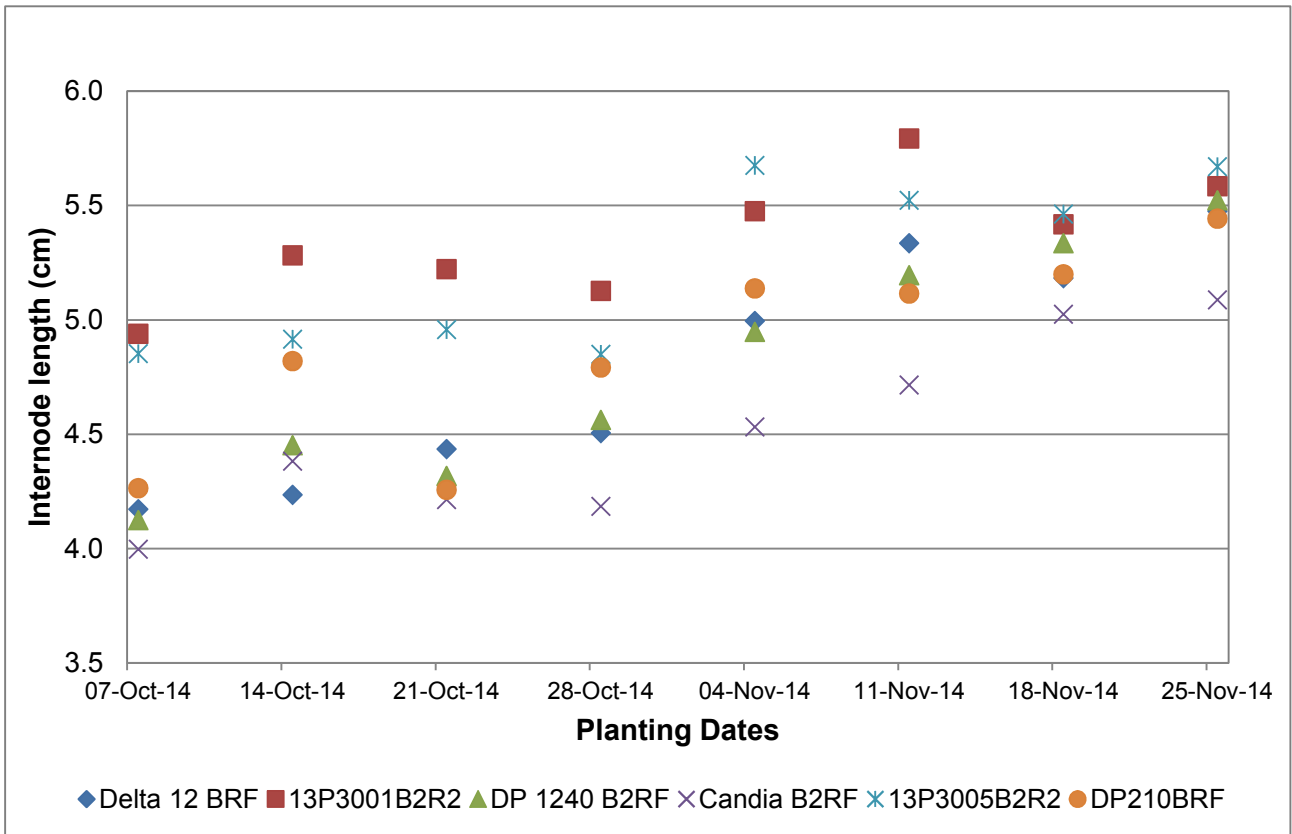
### **Height-to-node ratio (HNR) of cotton cultivars planted at different planting dates.**

The height-to-node ratio is a simple determination of the plant's vigor or growth potential. It reflects the degree of stress that plants experience throughout the season. This is the numeric equivalent to the average distance between nodes and is called internode length. The formula used:

*Height-to-node ratio = Plant height (cm) ÷ total number of nodes on main stem (vegetative nodes and fruit branch nodes)*

Hot and dry weather conditions experienced from February 2015 to middle March 2014 clearly showed the stress the plants experienced in the October plantings which were at peak growth and had significantly shorter internode length (cm). Cooler temperature from middle March and April benefitted the November 2014 plantings. Plants were growing more vigorously and the internode lengths (cm) were significant longer.

Cultivar 13P3001B2R2 and 13P3005B2R2 had the longest significant internode lengths of 5.38 cm and 5.23 cm respectively. The two cultivars is both strong growers and improved management of the cultivar is needed. CandiaB2RF had the shortest significantly internode length of 4.52 cm and careful use of Mepiquat chloride is needed.



**Figure 10.** Height-to-node ratio of cotton cultivars planted at different dates

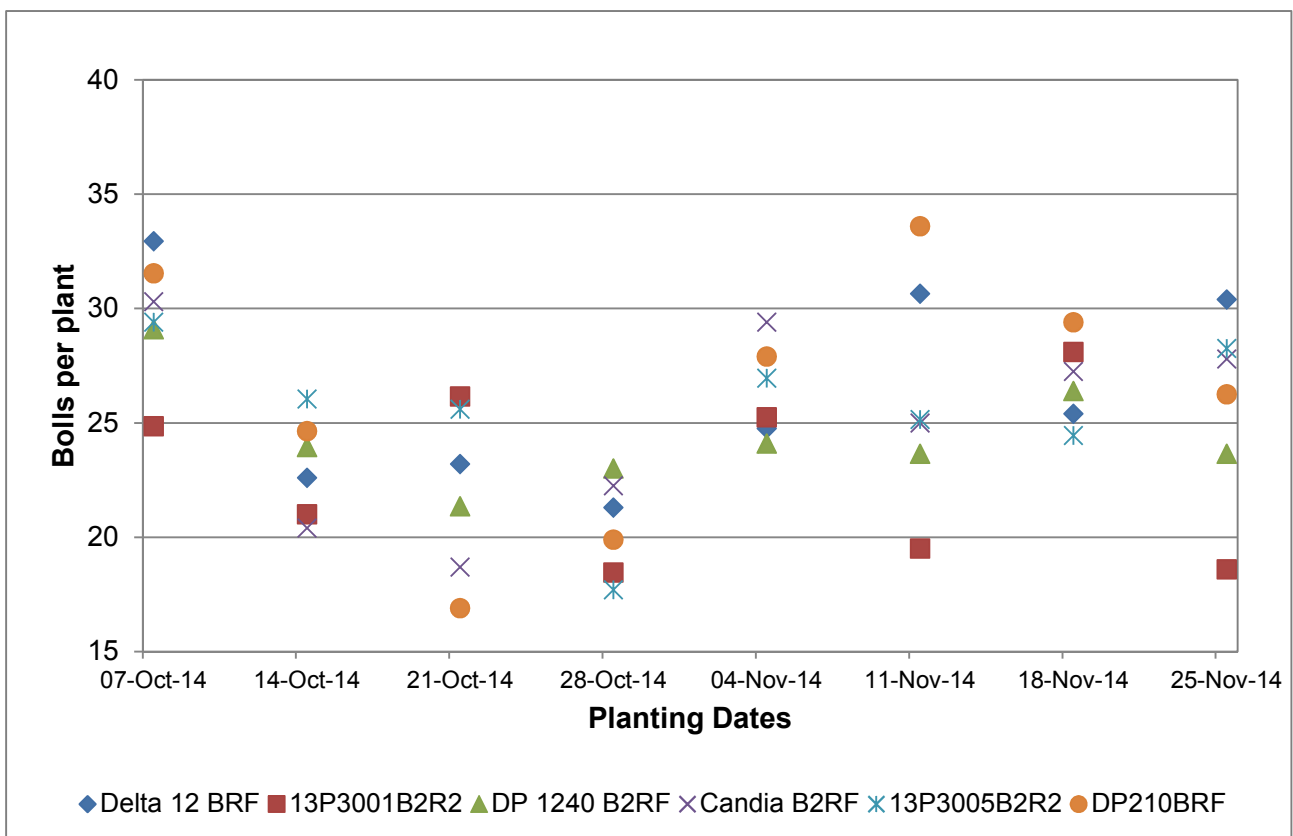
**Table 11.** Height-to-node ratio of cultivars planted at different dates

Cultivar		Planting dates								Average HNR (Calculated)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	4.17	4.24	4.43	4.50	5.00	5.34	5.18	5.48	4.79	5
2	13P3001B2R2	4.94	5.28	5.22	5.13	5.48	5.79	5.42	5.58	5.36	1
3	DP 1240 B2RF	4.13	4.45	4.32	4.56	4.95	5.20	5.34	5.52	4.81	4
4	Candia B2RF	4.00	4.38	4.22	4.19	4.53	4.72	5.03	5.09	4.52	6
5	13P3005B2R2	4.85	4.91	4.96	4.85	5.67	5.52	5.46	5.67	5.24	2
6	DP210BRF	4.27	4.82	4.26	4.79	5.14	5.12	5.20	5.44	4.88	3
<b>Average</b>		4.39	4.68	4.57	4.67	5.13	5.28	5.27	5.46		
<b>Ranking</b>		8	5	7	6	4	2	3	1		
<b>CV %</b>		6.705									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.1894									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.164									

## Bolls per plant

Stress to plants reduced early leaf area, resulting in a smaller and older leaf area during boll set. Thus, the stress that occurred due to environmental conditions and the application of Mepiquat chloride in Planting Dates 2, 3 and 4 could have reach cut-out sooner and have a smaller boll load than non-stressed Planting dates 1, 5 and 7.

Cultivar DP210BRF had the highest bolls per plant at 11 November 2014 planting with 33 bolls per plant. Cultivars DP210BRF and Delta12BRF had the highest significant average number of bolls per plant, 26.4 and 26.2 respectively.



**Figure 11.** Number of Bolls per Plant

**Table 12.** Number of boll per plant

Cultivar		Planting dates								Average Day Bolls per plant (count)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	33.0	22.6	23.2	21.3	24.8	30.6	25.4	30.4	26.4	1
2	13P3001B2R2	24.8	21.0	26.1	18.5	25.3	19.5	28.1	18.6	22.7	6
3	DP 1240 B2RF	29.1	23.9	21.3	23.0	24.1	23.6	26.4	23.7	24.4	5
4	Candia B2RF	30.3	20.4	18.7	22.2	29.4	25.0	27.3	27.8	25.1	4
5	13P3005B2R2	29.4	26.1	25.6	17.7	26.9	25.2	24.4	28.3	25.4	3
6	DP210BRF	31.5	24.7	16.9	19.9	27.9	33.6	29.4	26.3	26.3	2
<b>Average</b>		29.7	23.1	22.0	20.4	26.4	26.3	26.8	25.8		
<b>Ranking</b>		1	6	7	8	3	4	2	5		
<b>CV %</b>		19.35									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		2.762									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		2.392									

### Boll retention 95% zone

Cut-out occurs when the boll load consumes all the carbohydrates produced by the leaves. This is affected by both the early boll load and the quantity of leaf area to sustain the boll load. Final plant mapping data was used to determine when cut-out occurred. Plants were considered to be cut-out when 95 percent of the harvested bolls at the first position-1 have already been set.

Planting Date 3 at 21 October 2014 significantly retained more bolls at the 95 percent zone of 83.0 %. The cultivar DP210BRF retained the highest number of bolls at the 95 percent zone of 83.288 %. The cultivar 13P3001B2R2 retained the lowest significant number of bolls at the 95% zone of 71 % at the late planting date of 25 November 2014.

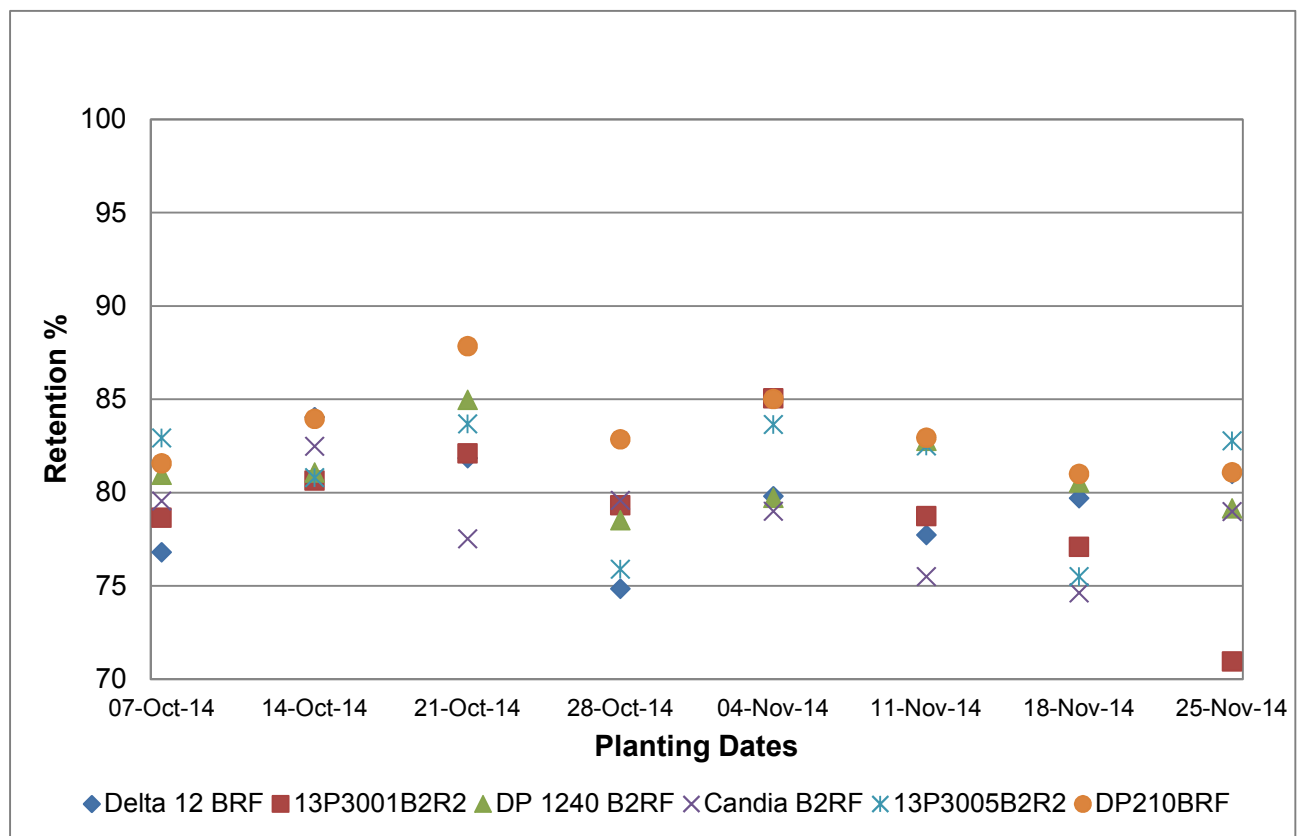


Figure 12. Boll retention 95 % zone

**Table 13.** Boll retention 95 % zone

Cultivar	Planting dates								Average retention 95 % bolls (calculated)	Ranking	
	PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14			
1	<b>Delta 12 BRF</b>	76.8	84.0	81.9	74.8	79.8	77.7	79.7	81.0	79.5	3
2	<b>13P3001B2R2</b>	78.6	80.6	82.1	79.3	85.1	78.8	77.1	71.0	79.1	4
3	<b>DP 1240 B2RF</b>	80.9	81.1	85.0	78.5	79.7	82.8	80.5	79.1	81.0	2
4	<b>Candia B2RF</b>	79.5	82.5	77.5	79.6	79.0	75.5	74.6	79.0	78.4	5
5	<b>13P3005B2R2</b>	82.9	80.8	83.7	75.9	83.6	82.5	75.5	82.8	81.0	2
6	<b>DP210BRF</b>	81.6	83.9	87.9	82.8	85.0	83.0	81.0	81.1	83.3	1
<b>Average</b>		80.1	82.2	83.0	78.5	82.0	80.0	78.1	79.0		
<b>Ranking</b>		4	2	1	7	3	5	8	6		
<b>CV %</b>		6.84									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		3.142									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		2.721									



## **Yield kg/ha**

Very high temperatures in February and early March 2015 may have cause stress to plants when they were between early square and peak flower and could have reduced yields significantly in the October plantings. Planting Date 4 had the lowest significant yield of 5193 kg/ha (Table 14).

The warm to moderate weather from middle March to end of May 2015 benefited the November 2014 plantings. Very high significant yields of 7141.3 kg/ha, 6752.5 kg/ha and 6419 kg/ha were obtained for the Planting dates 7, 5 and 6 respectively. Cultivar 13P3005B2R2 and 13P3001B2R2 had the highest significant yields of 6966.9 kg/ha and 6370.8 kg/ha respectively.

**Table 14.** Yield kg/ha

Cultivar		Planting dates								Average yield (kg/ha)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	<b>Delta 12 BRF</b>	5267.2	5770.7	5958.3	4639.9	6567.2	5964.9	6685.3	5753.7	5825.9	5
2	<b>13P3001B2R2</b>	6436.4	6625.0	6090.4	5754.8	5535.4	6800.3	7187.2	6537.0	6370.8	2
3	<b>DP 1240 B2RF</b>	6054.2	5602.9	6205.3	4971.5	6689.1	6284.1	7113.2	6249.0	6146.2	4
4	<b>Candia B2RF</b>	5512.3	4902.5	5468.4	5012.7	7165.9	5985.8	7290.2	5822.2	5895.0	6
5	<b>13P3005B2R2</b>	7447.8	6725.2	7256.1	5318.2	7656.1	7210.7	7601.5	6519.4	6966.9	1
6	<b>DP210BRF</b>	6419.8	6163.4	6277.0	5483.0	6901.1	6272.5	6970.3	5447.7	6241.9	3
<b>Average</b>		6189.6	5965.0	6209.3	5196.7	6752.5	6419.7	7141.3	6054.9		
<b>Ranking</b>		5	7	4	8	2	3	1	6		
<b>CV %</b>		0.016									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		486.62									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		313.59									

## **Fibre %**

Fibre percentages were not influenced by the planting dates. Fibre percentages were also cultivar related. The cultivars 13P3001B2R2, Candia B2RF and 13P3005B2R2 had the highest significant fibre% of 44.1 and 43.9 % respectively.

**Table 15.** Fibre %

Cultivar		Planting dates								Average Fibre %	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	39.4	39.8	39.3	40.9	38.2	38.6	39.1	37.9	39.2	5
2	13P3001B2R2	44.5	43.8	44.1	43.6	43.9	44.1	44.6	43.8	44.1	1
3	DP 1240 B2RF	41.8	40.9	40.0	41.7	39.4	40.8	40.7	39.2	40.6	3
4	Candia B2RF	45.1	44.4	43.3	44.3	42.7	44.0	43.8	43.2	43.9	2
5	13P3005B2R2	45.7	44.1	44.9	43.5	42.4	44.2	43.5	43.1	43.9	2
6	DP210BRF	40.7	42.1	41.2	39.8	39.8	40.5	40.6	39.5	40.5	4
<b>Average</b>		42.9	42.5	42.2	42.3	41.1	42.0	42.1	41.1		
<b>Ranking</b>		1	2	4	3	7	6	5	7		
<b>CV%</b>		1.894									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		1.9799									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.3939									

## **Boll size (g)**

Boll sizes for the November Planting Dates 5, 7 and 8 were significantly larger with a boll size of 6.33 g, 6.14 g and 6.11 g respectively. Planting Date 1 was also significantly larger with a boll size of 6.10 g compare to the boll sizes of Planting Dates 2, 3, 4 and 6. The cultivar DP210BRF average boll size of 6.3g over planting dates was significantly more than the other cultivars.

The smaller boll sizes of Planting Dates 2, 3 and 4 may be a directed result of the high temperatures in February and early March 2015 which caused stress to plants when plants were between early square and peak flower.

**Table 16.** Boll size (g)

Cultivar		Planting dates								Average Boll size (g)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	5.7	5.6	5.7	6.0	5.8	5.6	6.1	6.0	5.82	5
2	13P3001B2R2	6.6	6.2	5.9	6.1	6.3	6.0	6.6	6.5	6.27	2
3	DP 1240 B2RF	6.3	6.3	6.0	6.0	6.2	6.1	6.5	5.9	6.18	3
4	Candia B2RF	5.9	5.6	5.5	5.4	5.6	5.4	6.0	5.9	5.66	6
5	13P3005B2R2	5.8	5.9	5.8	6.0	6.2	5.9	6.3	6.2	6.02	4
6	DP210BRF	6.3	6.3	6.3	6.2	6.4	6.1	6.4	6.3	6.30	1
<b>Average</b>		6.1	6.0	5.9	5.9	6.1	5.9	6.3	6.1		
<b>Ranking</b>		2	3	4	4	2	4	1	2		
<b>CV %</b>		4.48									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.1549									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.1342									

## **Fibre length (mm)**

Fibre length is largely controlled by variety, although weather and management can also influence the final fibre length. Water stress and extremely high or low temperatures during the elongation phase will result in shorter fibres.

The October planting resulted in significantly shorter fibres due to weather conditions during the elongation phase. The November planting dates produced significantly longer fibres.

The cultivar, DP210BRF resulted in the longest average fibre length of average 31.4 mm followed by CandiaB2RF and 13P3001 with a fibre length of 31.0 mm. From the combined analysis for planting dates over planting dates, Planting Date 8 resulted in two cultivars, 13P3001B2RF and CandiaB2RF, with significantly higher fibre lengths of 32.3 mm and 32.3 mm respectively.

**Table 17.** Fibre length (mm)

Cultivar		Planting dates								Average Length (mm)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	29.5	29.0	29.6	29.6	30.5	28.9	30.3	31.0	29.8	5
2	13P3001B2R2	30.3	30.9	30.3	30.9	30.0	31.3	31.6	32.3	31.0	2
3	DP 1240 B2RF	30.7	30.4	29.1	29.8	30.5	31.2	31.6	32.2	30.7	3
4	Candia B2RF	30.7	30.6	30.8	30.5	30.9	30.8	31.2	32.3	31.0	2
5	13P3005B2R2	30.0	29.8	30.3	29.6	30.3	30.4	31.2	32.0	30.4	4
6	DP210BRF	31.0	30.8	31.0	30.8	32.1	31.5	32.1	31.9	31.4	1
<b>Average</b>		30.4	30.2	30.2	30.2	30.7	30.7	31.3	31.9		
<b>Ranking</b>		4	5	5	5	3	3	2	1		
<b>CV %</b>		2.488									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.4365									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.378									



## **Uniformity index**

Uniformity index is minimally affected by cotton variety. Field weathering and ginning have a more dramatic effect on uniformity.

The uniformity index values between 83 and 85 indicated a high degree of uniformity. All the Cultivars over planting dates resulted in the index values between 83 and 85.

**Table 18.** Uniformity index

Cultivar		Planting dates								Average Uniformity	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	82.8	83.5	83.1	82.6	84.3	84.2	83.4	82.7	83.3	5
2	13P3001B2R2	83.5	84.4	83.9	84.6	85.1	84.9	86.1	85.2	84.7	2
3	DP 1240 B2RF	84.1	85.2	84.6	84.3	84.9	85.0	85.5	86.0	84.9	1
4	Candia B2RF	83.2	84.7	84.2	83.8	84.8	83.9	83.1	85.0	84.1	4
5	13P3005B2R2	83.6	83.6	84.7	83.7	85.1	84.2	84.4	86.1	84.4	3
6	DP210BRF	83.3	83.9	83.6	82.7	84.0	83.6	83.5	82.6	83.4	3
<b>Average</b>		83.4	84.2	84.0	83.6	84.7	84.3	84.3	84.6		
<b>Ranking</b>		3	5	6	7	1	8	4	2		
<b>CV %</b>		1.394									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.6702									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.5805									

### **Fibre strength (g/tex)**

Variety is by far the most dominant factor in fibre strength. Environment has a small effect on fibre strength.

The cultivar Delta1240B2RF gave significantly the strongest fibres of 33.5 g/tex. From the combined analysis for planting dates over cultivars, Delta1240B2RF resulted in significantly stronger fibres of 37.0 g/tex at Planting Date 7 and 8. Planting date 8 resulted in the strongest fibres of 35.0 g/tex.

**Table 19.** Fibre strength (g/tex)

Cultivar		Planting dates								Average Fibre Strength (g/tex)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	28.5	28.9	28.9	29.2	30.8	29.2	31.8	31.8	29.9	6
2	13P3001B2R2	30.6	30.2	30.6	30.2	31.3	31.2	34.5	35.9	31.8	2
3	DP 1240 B2RF	31.6	33.0	32.0	33.0	32.3	32.2	37.0	37.0	33.5	1
4	Candia B2RF	28.4	29.2	29.7	30.9	30.0	30.0	31.7	35.6	30.7	4
5	13P3005B2R2	30.5	30.7	29.9	31.4	30.0	31.1	33.2	36.3	31.6	3
7	DP210BRF	29.2	29.1	29.1	29.9	30.8	30.4	32.5	33.4	30.5	5
<b>Average</b>		29.8	30.2	30.0	30.8	30.9	30.7	33.5	35.0		
<b>Ranking</b>		8	6	7	4	3	5	2	1		
<b>CV %</b>		4.785									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.8573									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.7425									

## **Elongation**

There was again a clear difference between the October and November planting. The October plantings had significantly higher fibre elongation of  $\geq 8$ , while the November plantings had significantly lower fibre elongations of  $< 8$ .

The cultivar DP1240B2RF and 13P3001B2R2 resulted in the highest significant fibre elongations of 8.1 and 8.0 respectively.

**Table 20.** Elongation

Cultivar		Planting dates								Average fibre elongation	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	7.7	8.0	7.7	8.0	6.9	7.1	7.2	7.1	7.5	4
2	13P3001B2R2	8.9	8.8	8.7	8.5	7.4	7.1	7.7	7.1	8.0	2
3	DP 1240 B2RF	8.5	8.7	8.7	8.5	7.7	7.7	7.5	7.2	8.1	1
4	Candia B2RF	7.5	7.5	7.2	7.6	6.6	6.7	6.9	6.5	7.1	6
5	13P3005B2R2	8.1	8.1	8.1	8.0	7.6	6.8	7.4	7.2	7.7	3
7	DP210BRF	7.8	7.6	7.5	7.7	6.6	6.9	7.0	6.9	7.2	5
<b>Average</b>		8.1	8.1	8.0	8.0	7.1	7.1	7.3	7.0		
<b>Ranking</b>		1	1	2	2	4	4	3	5		
<b>CV %</b>		6.245									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.271									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.2347									

### **Micronaire (µgrams)**

Planting cotton too early, resulted in very thick fibres with micronaires above 4.5µgram. Planting Date 1, 2 and 3 resulted in average micronaires of 4.6 µgram, 4.5 µgram and 4.5 µgram respectively. The cultivar Candia B2RF had the best micronaire average over the planting dates with a micronaire of 3.7µgram. Candia B2RF resulted in good micronaires over all the planting dates.

The November plantings resulted in significantly lower micronaire than the October plantings.

**Table 21.** Micronaire ( $\mu$ grams)

Cultivar		Planting dates								Average Micronaire ( $\mu$ g)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	4.6	4.6	4.7	4.5	4.1	4.3	3.6	3.3	4.2	3
2	13P3001B2R2	4.7	4.5	4.7	4.5	4.6	4.1	4.1	4.0	4.4	4
3	DP 1240 B2RF	4.9	5.0	5.0	4.8	4.8	4.3	4.3	4.0	4.6	5
4	Candia B2RF	3.9	4.0	3.6	3.7	3.8	3.6	3.3	3.4	3.7	1
5	13P3005B2R2	4.8	5.1	4.8	4.5	4.4	4.4	4.2	4.1	4.6	5
6	DP210BRF	4.3	4.2	4.3	4.3	3.8	3.6	3.6	3.2	3.9	2
<b>Average</b>		4.5	4.6	4.5	4.4	4.2	4.1	3.9	3.7		
<b>Ranking</b>		6	7	6	5	4	3	2	1		
<b>CV %</b>		7.307									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.1769									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.1532									



**Yellowness (+b < 9) and Degree of reflectance (RD ≥75).**

Each planting date trial was hand pick when ready and cotton fibres were not exposed too long to field weathering. Thus, the degree of Reflection ( $Rd \geq 75$ ) and yellowness (+b < 9) are in the respective norms.

**Table 22.** Yellowness (+b < 9)

Cultivar		Planting dates								Average Yellowness (+b < 9)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	7.2	7.2	7.4	7.3	7.3	7.8	7.0	6.8	7.2	1
2	13P3001B2R2	7.6	7.4	7.2	7.0	7.4	7.7	7.5	6.6	7.3	2
3	DP 1240 B2RF	8.0	8.4	8.6	8.2	8.0	8.3	7.5	6.8	8.0	4
4	Candia B2RF	7.4	7.0	7.2	7.1	8.1	7.7	7.1	7.1	7.3	2
5	13P3005B2R2	7.6	7.9	8.0	7.6	7.8	7.6	6.8	7.2	7.6	3
6	DP210BRF	7.3	7.3	7.3	7.3	7.8	7.9	6.6	7.2	7.3	2
<b>Average</b>		7.5	7.5	7.6	7.4	7.7	7.8	7.1	7.0		
<b>Ranking</b>		4	4	5	3	6	7	2	1		
<b>CV %</b>		5.752									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.2453									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.2124									

**Table 23.** Degree of reflectance (RD  $\geq$ 75)

Cultivar		Planting dates								Average Degree of reflectance (RD $\geq$ 75)	Ranking
		PD 1 07/10/14	PD 2 14/10/14	PD 3 21/10/14	PD 4 28/10/14	PD 5 04/11/14	PD 6 11/11/14	PD 7 18/11/14	PD 8 25/11/14		
1	Delta 12 BRF	80.5	81.1	79.9	79.9	80.7	81.3	82.5	83.5	81.2	3
2	13P3001B2R2	80.6	81.1	80.8	80.0	80.9	81.4	81.3	83.9	81.2	3
3	DP 1240 B2RF	78.1	78.4	77.8	77.8	80.0	80.3	82.1	82.8	79.7	5
4	Candia B2RF	81.1	82.2	81.7	80.7	80.3	81.1	82.6	82.8	81.6	1
5	13P3005B2R2	79.7	79.6	79.5	78.7	81.0	80.9	83.5	82.2	80.6	4
6	DP210BRF	80.8	81.5	80.8	80.0	80.7	80.9	83.9	82.1	81.3	2
<b>Average</b>		80.1	80.6	80.1	79.5	80.6	81.0	82.7	82.9		
<b>Ranking</b>		2	3	2	1	3	4	5	6		
<b>CV %</b>		1.2663									
<b>LSD<sub>t</sub>(0.05)(PD x Cult)</b>		0.5857									
<b>LSD<sub>t</sub>(0.05)(Cult x PD)</b>		0.5073									

## **CONCLUSION**

Clear differences were recorded between the October and November plantings. Environmental conditions throughout the cotton growing season had influenced the growing rate of the different cultivars. It is very difficult to find a particular cultivar early in the cotton growing because environmental conditions such as hail and heavy rains had an influence on cultivar performance. The use of Mepiquat chloride on CandiaB2RF had a disadvantage on the cultivar's performance.

The new cultivars, 13P3001B2R2 and 13P3005B2R2, were recommended for shorter growing season and high yields, respectively.

## **PROPOSED RESEARCH FOR 2015/16**

This trial was a second cotton season trial and a third season for this trial is needed because environmental conditions are unpredicted and not controllable. Also growth parameters have only been measured during one season. To do a test for cultivar stability a third year trial is needed. The trial will be planted at Groblersdal: ARC-Loskop Research Farm.