

ARC-IIC

NATIONAL COTTON CULTIVAR TRIALS

20010/11

LNR-IIG

NASIONALE KATOEN KULTIVAR PROEWE

2010/11

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South African National Cotton Cultivar Trials, 2011

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Abstract

Each year the Agricultural Research Council-Institute for Industrial Crops (ARC-IIC) conducts cultivar trials across South Africa to evaluate the performance of different cotton varieties. These tests provide unbiased data on the performance of the cotton cultivars in the different cotton producing areas. During the 2010/2011 a total of nine trials were conducted. Trials were planted at Douglas (Northern Cape), Loskop (Mpumalanga), Makhathini (KwaZulu-Natal), Marydale (Northern Cape), Mactaggerscamp (Northern Cape), Rustenburg (North-West), Vaalharts (Northern Cape), Upington (Northern Cape) and Weipe (Limpopo). The Department of Agriculture and Land Reform: Northern Cape planted the trials at Douglas, Marydale, Mactaggerscamp and Upington. Heavy floods during mid January 2011 resulted in the flooding of the Orange river and the Upington trial was lost due to the drowning of the cotton. A hailstorm at Douglas damaged the national cotton cultivar trial and it was written off. Six to eight cultivars were tested at each test site. At Loskop, Candia BG resulted in the highest fibre yields of 1986 kg ha⁻¹. At Makhathini, Candia resulted in the highest fibre yield of 1259 kg ha⁻¹. DP 210 BRF resulted in the highest fibre yield (2656 kg ha⁻¹) at Marydale. At Mactaggerscamp, Rustenburg and Vaalharts, NuOPAL resulted in the highest fibre yields of 1902 kg ha⁻¹, 1081 kg ha⁻¹ and 2512 kg ha⁻¹ respectively. NuOPAL also resulted in the highest fibre yield of 1792 kg ha⁻¹ at Weipe.

Introduction

The national cotton cultivar trials provide many segments of the cotton industry with unbiased data on yield, fiber quality and agronomic performance of commercially available varieties. Several seed companies enter the varieties they feel has the best chance of producing high yields of good quality fiber. The results of these trials are the closest possible to obtaining “on-farm” experience with a particular variety.

Materials and Methods

Localities and varieties. Trials were planted at seven localities in 2011 (Table 1). Trials were also planted at Douglas and Upington, but the trials were lost due to hail and floods. Six to eight varieties were planted at each site (Table 2). Varieties included in the 2011 trials were submitted to the Institute for Industrial Crops by Monsanto SA, Bayer, and two varieties from the ARC-Institute for Industrial Crops (ARC-IIC).

Experimental design and trial protocols. Most of the trials were planted at ARC - Experimental substations (Table 1). Four trials were planted at cotton producers, namely at, Douglas, Marydale, Mactaggerscamp and Weipe. All cultural practices, including planting date, fertilizer regimes, pest control, irrigation and harvest date were decided on by the technicians and the farmers. Insect control regimes were followed for conventional varieties in all the trials. Weather data is given in the Appendix.

The test plots of 4 by 9 m in size, was replicated and randomized using proper field-plot techniques. Two rows per plot were harvested and the seed cotton from each plot was weighed in the field. Sub-samples of the harvested seed cotton were ginned for turnout and lint yield was calculated from the seed cotton and turnout data. Lint from the samples was sent to Cotton SA for HIV fiber quality analysis.

Acknowledgements

The valuable cooperation, land and resources provided by the following cooperators are greatly appreciated: Annette Swanepoel, (Department of Agriculture and Land Reform: Northern Cape) Kobus Lategan (Department of Agriculture and Land Reform: Northern Cape), Andries Kühn (Mactaggerscamp farmer), Johan Maree (Marydale farmer), Jacques Willemse (Weipe farmer), Coleen Fourie (Loskop substation), Jurie Steyn (Makhathini substation) Piet Maja (Rustenburg substation) and Johan van Schalkwyk (Vaalharts substation). The support and cooperation provided by the participating seed companies – Bayer, Monsanto SA and ARC-IIC for their varieties, is gratefully acknowledged.

Table 1. Trial localities and cooperators

Province	Locality	Irrigation or Dryland	Co-operators
Northern Cape	Douglas	Irrigation	Kobus Lategan (Researcher) / Tiaan Milke (Producer)
Mpumalanga	Loskop	Irrigation	C Fourie (Researcher)
KwaZulu-Natal	Makhathini	Dryland	J Steyn (Researcher)
North-West	Rustenburg	Irrigation	P Maja (Researcher)
Northern Cape	Vaalharts	Irrigation	J van Schalkwyk (Researcher)
Northern Cape	Marydale	Irrigation	Kobus Lategan (Researcher) / J Maree (Producer)
Northern Cape	Mactaggertscamp	Irrigation	Kobus Lategan (Researcher) / A Kühn (Producer)
Northern Cape	Upington	Irrigation	A Swanepoel and K Lategan (Eiland Research Station)
Limpopo	Weipe	Irrigation	J Willemse (Producer)

Table 2. Entries used in the different trials at the different localities.

Loskop	Makhathini (Dryland)	Rustenburg	Douglas Marydale Mactaggerscamp Vaalharts Upington	Weipe
DeltaOPAL	DeltaOPAL	DeltaOPAL	DeltaOPAL	DeltaOPAL
NuOPAL	NuOPAL	NuOPAL	NuOPAL	NuOPAL
DeltaOPAL RR	DeltaOPAL RR	DeltaOPAL RR	DeltaOPAL RR	DeltaOPAL RR
DP210 BRF	DP210 BRF	DP210 BRF	DP210 BRF	DP210 BRF
Delta 12 BRF	Delta 12 BRF	Delta 12 BRF	Delta 12 BRF	Delta 12 BRF
Candia	PM 3225 B2RF	Delta 18 RF	Gariiep VERTOL1	Delta 18 RF
Candia BG	Candia	DP 485	Gariiep VERTOL2	A5
	Candia BG			

Origin of cultivars:

Monsanto SA varieties were the following: DeltaOPAL, NuOPAL, DeltaOPAL RR, DP 210 BRF, Delta 12 BRF, Delta 18 RF, PM 3225 B2RF, and DP 485

Bayer submitted the Australian cultivars – Candia and Candia BG

ARC-IIC – Gariiep VERTOL1, Gariiep VERTOL2 and A5

RESULTS AND DISCUSSION

LOSKOP IRRIGATION

Yield parameters

Although the cultivars did not differ significantly regarding seed cotton yield, the cultivar, NuOPAL produced the highest seed cotton yield of 4566 kg ha⁻¹ followed by Candia BG with 4530 kg ha⁻¹ (Table 4). Some cultivars differed significantly regarding fibre percentages. The cultivar, Candia BG produced the highest fibre percentage of 44.0 %, followed by Candia with 43.4 %. Cultivars differed significantly regarding fibre yield. The cultivar, Candia BG produced the highest fibre yield of 1986 kg ha⁻¹ followed by NuOPAL with 1919 kg ha⁻¹.

Quality parameters

Significant differences existed at the fibre length and fibre strength measurements. The cultivar, DP 210 BRF produced the longest fibre of 32.8 mm, followed by Candia BG with 31.5 mm. The cultivar, NuOPAL produced the strongest fibre of 34.4 g tex⁻¹ followed by DeltaOPAL with 33.7 g tex⁻¹. All micronaire values were within the acceptable range of 3.5 to 4.9.

Table 3. Soil sample analysis (0 – 3 0cm), Loskop, 2010/2011

	Loskop
Ph	6.55
Resistance (ohms)	575
mg/kg	
N	6
P	37
K	363
Ca	1400
Mg	620
Na	50
S Value	13.272
Ca %	52.7
Mg %	38.6
K %	7.0
Na %	1.6

GENERAL APPEARANCE AND CULTIVATION PRACTICES



Coleen Fourie

A devastating hailstorm on the 14th of November damaged the trail. Replanting was done on 16 November 2010. Very wet conditions set in straight after planting and continued until the end of January 2011. This was followed by very hot conditions. Five irrigations were applied during February to March 2011.

CROP SUMMARY

Planted	21/10/2011
No. of Heliothis sprays	6
Total insect sprays	10
Harvest: 1st pick	3/5/2011
Harvest: 2nd pick	1/6/2011
Rainfall	501.1
Nitrogen (kg ha⁻¹)	140
Phosphorus (kg ha⁻¹)	30
Potassium (kg ha⁻¹)	60
Pix (l/ha)	0.4

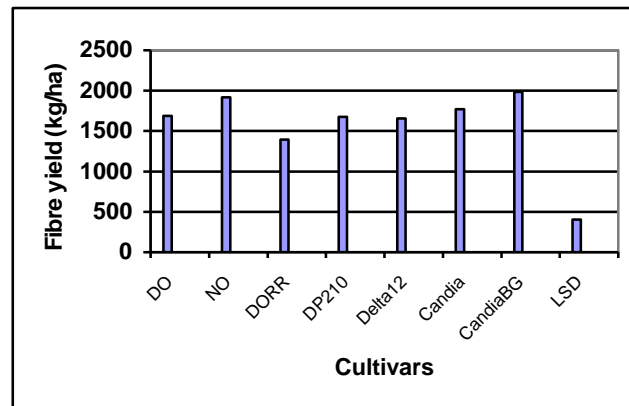


Table 4. Yield and fibre characteristics of the cotton cultivar trial planted under irrigation at Loskop, 2010/2011

Variety	Delta OPAL	Nu OPAL	Delta Opal RR	DP 210 BRF	Delta 12 BRF	Candia	Candia BG
Yield (kg ha ⁻¹)	3973	4566	3343	4145	4258	4093	4530
Pick 1 %	77.0	64.2	68.1	71.4	61.2	55.4	74.0
Fibre%	42.5	42.2	41.8	40.6	39.2	43.4	44.0
Fibre yield	1688	1919	1396	1675	1656	1772	1986
Length (mm)	29.6	31.1	29.5	32.8	30.6	30.8	31.5
Uniformity	85.8	86.2	85.6	84.5	85.4	86.3	85.9
Strength (g tex ⁻¹)	33.7	34.4	32.9	30.6	29.9	33.0	31.5
Rd	76.1	76.5	76.0	78.1	78.9	78.5	79.3
Plus b	8.3	8.0	8.1	7.3	7.4	7.8	7.4
Micronaire	4.1	4.0	4.2	3.8	4.1	4.1	3.9
Maturity	90.4	91.0	91.9	86.3	88.9	90.5	86.8
Color grade	41-3	41-1	31-2	31-2	31-1	31-2	31-2
Parameter	LSD Tukey (P ≤ 0.05)		CV%				
Yield (kg ha ⁻¹)	NS		6.5				
Pick 1 %	NS		21.1				
Fibre %	3.5		4.1				
Fibre yield (kg ha ⁻¹)	405.8		2.6				
Length (mm)	2.2		1.9				
Uniformity	NS		0.8				
Strength (g tex ⁻¹)	2.4		1.9				
Rd	NS		0.6				
Plus b	0.8		2.0				
Micronaire	NS		1.7				
Maturity	0.03		0.6				

MAKHATHINI DRYLAND

Yield parameters

Although Candia produced the highest seed cotton yield (2887 kg ha⁻¹) it did not differ significantly from the rest of the cultivars but the fibre percentage was significantly higher (Table 6). The cultivar, DeltaOPAL had the second highest yield of 2862 kg ha⁻¹. The cultivar, Candia produced the highest fibre percentage of 43.6 %, followed by Candia BG with 43.2%. This cultivar, also produced the highest fibre yield of 1259 kg ha⁻¹, followed by DeltaOPAL with 1173 kg ha⁻¹.

Quality parameters

All the fibre quality parameters measured showed significant differences, except for uniformity and micronaire (Table 6). The cultivar, Candia BG produced the longest fibre of 29.9 mm. The cultivar, DeltaOPAL produced the strongest fibre of 34.1 g tex⁻¹ followed by PM 3225 B2RF with 33.8 g tex⁻¹. All micronaire values were within the acceptable range of 3.5 to 4.9.

Table 5. Soil sample analysis (0 – 30cm), Makhathini, 2010/2011

	Makhathini
Ph	5.98
Resistance (ohms)	1400
mg/kg	
N	4
P	34
K	338
Ca	453
Mg	133
Na	28
S Value	4.353
Ca %	52.0
Mg %	25.3
K %	19.9
Na %	2.8

GENERAL APPEARANCE AND CULTIVATION PRACTICES



Jurie Steyn

Rainfall was abnormally high for Makhathini, so the cotton never really experienced moisture stress until middle February 2011. The very wet conditions could have induced lower levels of Nitrogen. Red bollworm was a serious problem at Makhathini for the last two seasons and spraying was mainly directed at red bollworm and aphids.

CROP SUMMARY

Planted	3/11/2011
No. of Heliothis sprays	4
Total insect sprays	6
Harvest: 1st pick	16/03/2011
Harvest: 2nd pick	30/03/2011
Harvest: 3rd pick	05/05/2011
Rainfall	767.9
Nitrogen (kg ha⁻¹)	0
Phosphorus (kg ha⁻¹)	0
Potassium (kg ha⁻¹)	0

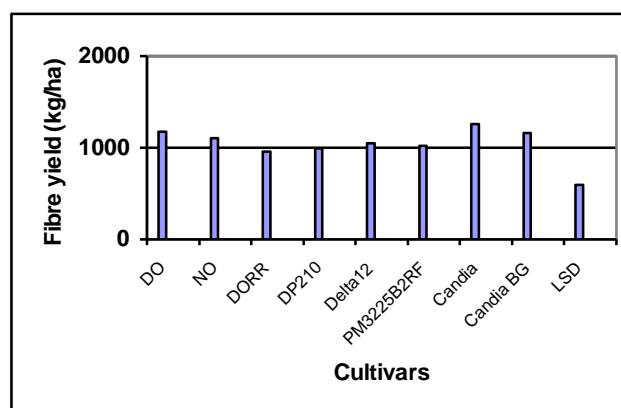


Table 6. Yield and fibre characteristics of the cotton cultivar trial planted under dryland conditions at Makhathini, 2010/2011

Variety	Delta OPAL	Nu OPAL	Delta Opal RR	DP 210 BRF	Delta 12 BRF	PM3225 B2RF	Candia	Candia BG
Yield (kg ha ⁻¹).	2862	2787	2495	2433	2682	2462	2887	2674
Pick 1 %	60.2	74.3	69.5	76.1	73.7	80.9	49.4	72.7
Fibre%	40.8	39.5	38.2	40.7	39.2	41.5	43.6	43.2
Fibre yield	1173	1105	956	990	1048	1023	1259	1159
Length (mm)	28.2	28.6	28.4	29.6	28.5	28.2	28.8	29.9
Uniformity	84.0	85.0	84.8	85.4	84.8	85.0	85.2	84.5
Strength (g tex ⁻¹)	34.1	33.3	33.7	32.1	30.4	33.8	33.1	30.9
Rd	79.0	79.3	78.6	80.4	80.6	77.3	79.5	81.9
Plus b	8.7	8.6	8.6	8.1	8.2	8.8	8.8	7.9
Micronaire	4.1	3.8	3.9	4.0	4.1	3.8	4.1	3.5
Maturity	89.7	88.4	88.3	87.5	88.0	89.6	88.8	84.6
Color grade	21-1	31-3	21-2	21-2	31-1	21-4	21-4	21-1
Parameter	LSD Tukey (P ≤ 0.05)		CV					
Yield (kg ha ⁻¹)	NS		9.9					
Pick 1 %	NS		7.6					
Fibre %	3.6		0.7					
Fibre yield (kg ha ⁻¹)	NS		9.9					
Length (mm)	1.3		0.7					
Uniformity	NS		0.3					
Strength (g tex ⁻¹)	3.0		1.5					
Rd	2.0		0.7					
Plus b	0.5		1.7					
Micronaire	0.98		4.3					
Maturity	NS		1.6					

MARYDALE IRRIGATION

Yield parameters

Cultivars differed significantly regarding seed cotton and fibre yield. The cultivar, DP 210 BRF produced the highest seed cotton yield of 6188 kg ha⁻¹ followed by NuOPAL with 6118 kg ha⁻¹ (Table 8). The cultivar, Gariep VERTOL1 produced the highest fibre percentage of 46.0 %, followed by DeltaOPAL with 45.0 %. The cultivar, DP 210 BRF produced the highest fibre yield of 2656 kg ha⁻¹ followed by NuOPAL with 2654 kg ha⁻¹.

Quality parameters

No significant differences existed regarding the measured fibre qualities. The cultivar, DP 210 BRF produced the longest fibre of 30.5 mm, followed by NuOPAL with 30.0 mm (Table 8). NuOPAL produced the strongest fibre of 31.8 g tex⁻¹. All micronaire values were within the acceptable range of 3.5 to 4.9.

Table 7. Soil sample analysis (0 – 30cm), Marydale, 2010/2011

Marydale	
Ph	6.37
Resistance (ohms)	
mg/kg	
N	
P	29
K	118
Ca	547
Mg	116
Na	30
Zn	5.8
Cu	0.8
Mn	15.7
Fe	12.7

Marydale: plant counts per plot

76 plant per plot = 100 % plant count

Cultivar	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Mean
DeltaOPAL	52	43	65	69	70	59.8
NuOPAL	68	37	44	65	67	56.2
DeltaOPAL RR	79	52	41	68	77	55.4
DP 210 BRF	70	53	64	57	73	63.6
Delta 12 BRF	62	62	41	71	51	57.4
Gariep VT1	35	60	49	47	41	46.4
Gariep VT2	61	46	43	39	51	48.0

GENERAL APPEARANCE AND CULTIVATION PRACTICES



Johan Maree

The trial was planted on the 20th of October 2010, by Mr Kobus Lategan from the Department of Agriculture and Land Reform: Northern Cape. Spraying for insects included, Endosulfan (three sprayings), Etaphon and Ginstar. A mean seed cotton yield of 5137 kg ha⁻¹ was obtained.

CROP SUMMARY

Planted	20/10/2011
Harvesting date	11/05/2011
Rainfall	452.8
Nitrogen (kg ha⁻¹)	240
Phosphorus (kg ha⁻¹)	36
Potassium (kg ha⁻¹)	24
Pix	Yes

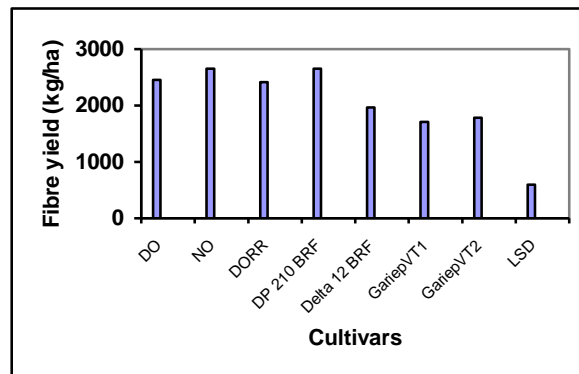


Table 8. Yield and fibre characteristics of the cotton cultivar trial planted under irrigation at Marydale, 2010/2011.

Variety	Delta OPAL	Nu OPAL	Delta Opal RR	DP 210 BRF	Delta 12 BRF	Gariep VT1	Gariep VT2
Yield (kg ha ⁻¹)	5459	6118	5640	6188	4761	3717	4076
Fibre %	45.0	43.5	42.8	42.8	41.3	46.0	43.8
Fibre yield	2455	2654	2415	2656	1964	1708	1783
Length (mm)	29.1	30.0	28.7	30.5	29.0	29.1	28.6
Uniformity	82.5	83.3	84.1	81.8	82.5	84.6	83.9
Strength(g tex ⁻¹)	31.5	31.8	31.1	30.4	29.2	29.3	29.8
Rd	77.9	77.9	77.9	77.7	77.7	77.7	77.6
Plus b	7.7	7.7	7.6	7.6	7.6	7.6	7.5
Micronaire	4.7	4.3	4.4	3.9	4.4	4.1	3.9
Maturity	92.0	90.3	93.8	86.5	89.3	89.8	89.2
Color grade							
Parameter	LSD Tukey (P≤0.05)	CV (%)					
Yield (kg ha ⁻¹)	1355	7.3					
Fibre %	NS	2.1					
Fibre yield (kg ha ⁻¹)	594.1	9.0					
Length (mm)	NS	0.8					
Uniformity	NS	0.7					
Strength (g tex ⁻¹)	NS	1.4					
Rd	NS	0.2					
Plus b	0.09	0.7					
Micronaire	NS	4.0					
Maturity	NS	1.1					

MACTAGGERSCAMP IRRIGATION

Yield parameters

Cultivars differed significantly regarding seed cotton yield, fibre percentage and fibre yield. The cultivar, NuOPAL produced the highest seed cotton yield of 4345 kg ha⁻¹ followed by DP 210 BRF with 3895 kg ha⁻¹ (Table 10). DP 210 BRF produced the highest fibre percentage of 45.3 %. The cultivar, NuOPAL produced the highest fibre yield of 1902 kg ha⁻¹ followed by DP210 BRF with 1761 kg ha⁻¹.

Quality parameters

Although no significant differences existed regarding fibre length, the cultivar DP 210 BRF produced the longest fibre of 30.4 mm (Table 10). Fibre strength differed significantly. The cultivar, DeltaOPAL produced the strongest fibre of 32.9 g tex⁻¹. All micronaire values were acceptable except for the cultivar, DeltaOPAL with a high micronaire value of 5.1.

Table 9. Soil sample analysis (0 – 30cm), Mactaggerscamp, 2010/2011

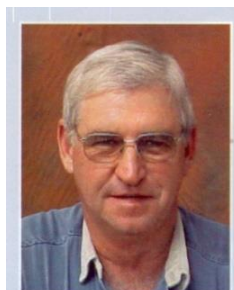
Mactaggerscamp	
Ph	6.8
Resistance (ohms)	650
mg/kg	
N	
P	59
K	140
Na	0.35
Cu	4.59
Zn	2.1
Mn	165.1
B	0.32
Fe	73.17

Mctaggerscamp: plant count per plot

76 plant per plot = 100 % plant count

Cultivar	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Mean
DeltaOPAL	66	61	59	59	69	62.8
NuOPAL	58	58	53	69	68	61.2
DeltaOPAL RR	61	64	63	64	64	63.2
DP 210 BRF	56	67	69	65	64	64.2
Delta 12 BRF	60	67	59	63	66	63.0
Gariép VT1	34	34	36	46	32	36.4
Gariép VT2	34	23	35	46	31	33.8

GENERAL APPEARANCE AND CULTIVATION PRACTICES



Andries Kühn

The trial was planted on the 26th of October 2010 by Mr Kobus Lategan from the Department of Agriculture and Land Reform: Northern Cape. A mean seed cotton yield of 3489 kg ha⁻¹ was obtained. Insect sprayings included, MSMA, Endosulfan (three sprayings) and Selecron (two sprayings).

CROP SUMMARY	
Planted	26/10/2010
Harvesting date	10/05/2011
Rainfall	271.7
Nitrogen (kg ha ⁻¹)	66
Phosphorus (kg ha ⁻¹)	21
Potassium (kg ha ⁻¹)	53
Sulphur	16.2

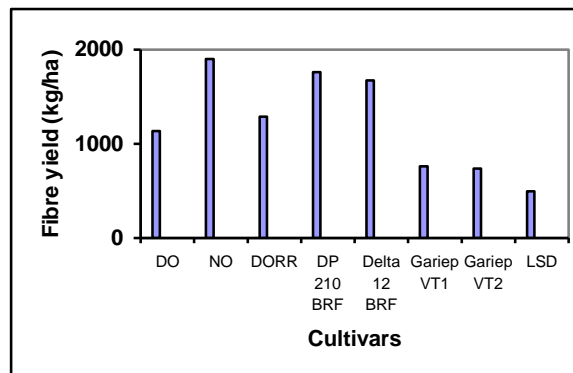


Table 10. Yield and fibre characteristics of the cotton cultivar trial planted under irrigation at Mactaggerscamp, 2010/2011.

Variety	Delta OPAL	Nu OPAL	Delta Opal RR	DP 210 BRF	Delta 12 BRF	Gariep VT1	Gariep VT2
Yield (kg ha ⁻¹)	2596	4345	3090	3895	3888	1812	1699
Fibre %	43.8	43.8	41.8	45.3	43.0	42.0	43.3
Fibre yield	1137	1902	1289	1761	1672	762	738
Length (mm)	28.4	28.5	28.8	30.4	28.9	28.5	28.1
Uniformity	82.5	82.8	82.7	81.6	81.7	83.8	83.7
Strength (g tex ⁻¹)	32.9	32.6	32.6	30.7	30.5	30.7	32.0
Rd	69.9	69.2	69.3	69.2	69.3	69.4	69.9
Plus b	8.3	8.0	8.0	8.0	8.0	8.0	8.2
Micronaire	5.1	4.6	4.7	4.2	4.6	4.0	4.8
Maturity	92.5	90.5	91.0	87.6	89.3	86.8	90.8
Color grade							
Parameter	LSD Tukey (P≤0.05)	CV (%)					
Yield (kg ha ⁻¹)	1086	8.4					
Fibre %	0.02	1.6					
Fibre yield (kg ha ⁻¹)	497.4	8.1					
Length (mm)	NS	1.5					
Uniformity	NS	1.2					
Strength (g tex ⁻¹)	1.83	1.6					
Rd	NS	1.9					
Plus b	NS	3.1					
Micronaire	0.49	5.0					
Maturity	0.03	1.1					

RUSTENBURG IRRIGATION

Yield parameters

Cultivars did not differ significantly regarding seed cotton yield, fibre percentage or fibre yield (Table 12). The cultivar, NuOPAL produced the highest seed cotton yield of 2471 kg ha⁻¹, with DeltaOPAL the second highest with 2400 kg ha⁻¹. NuOPAL also produced the highest fibre yield of 1081 kg ha⁻¹ followed by DeltaOPAL with 1005 kg ha⁻¹. The highest fibre percentage of 43.8 was obtained with the cultivar, NuOPAL. Some cultivars differed significantly regarding pick 1 percentage. The cultivar, NuOPAL produced the highest pick 1 percentage of 55.0 %.

Quality parameters

None of the measured fibre qualities, except fibre strength, showed any significant differences (Table 12). The cultivars DP 210 BRF and Delta18 RF, both produced the longest fibre of 29.5 mm. DeltaOPAL produced the strongest fibre of 34.1 g tex⁻¹, followed by DeltaOPAL RR with 33.9 g tex⁻¹. All of the cultivars resulted in acceptable micronaire values of between 3.5 and 4.9.

Table 11. Soil sample analysis (0 – 30cm), Rustenburg, 2010/2011

	Rustenburg
Ph	7.57
Resistance (ohms)	345
mg/kg	
N	4
P	27
K	173
Ca	4320
Mg	2530
Na	63
S Value	43.227
Ca %	50.0
Mg %	48.4
K %	1.0
Na %	0.6

GENERAL APPEARANCE AND CULTIVATION PRACTICES



Piet Maja

The National Cotton Cultivar trial at Rustenburg experienced hail on the 29th of January 2011. An estimated 20 to 30 percent damage occurred. The trial resulted in a mean seed cotton yield of 2212 kg ha⁻¹. A lot of rain and cloudy weather was experienced during the season.

CROP SUMMARY

Planted	1 Nov 2011
No. of Heliothis sprays	4
Harvest: 1st pick	12/04/2011
Harvest: 2nd pick	25/05/2011
Rainfall	727.2
Nitrogen (kg ha⁻¹)	150
Phosphorus (kg ha⁻¹)	30
Potassium (kg ha⁻¹)	80

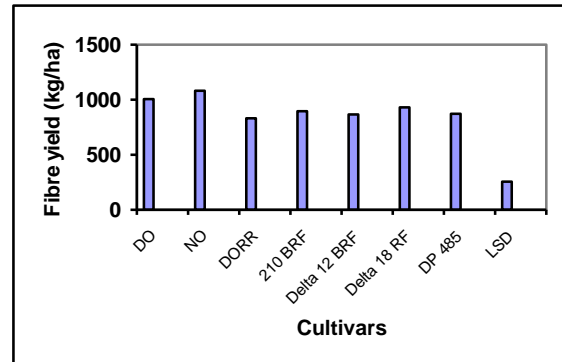


Table 12. Yield and fibre characteristics of the cotton cultivar trial planted under irrigation at Rustenburg, 2010/2011

Variety	Delta OPAL	Nu OPAL	Delta Opal RR	DP 210 BRF	Delta 12 BRF	Delta 18 RF	DP 485
Yield (kg ha ⁻¹)	2400	2471	1993	2147	2214	2216	2045
Pick 1 %	45.5	55.0	31.8	42.8	55.5	31.2	13.5
Fibre %	42.0	43.8	41.8	41.8	39.3	41.8	43.0
Fibre yield	1005	1081	834	898	865	932	874
Length (mm)	28.8	29.2	29.3	29.5	29.1	29.5	29.3
Uniformity	84.0	83.7	84.4	82.1	83.0	83.1	83.8
Strength (g tex ⁻¹)	34.1	32.6	33.9	29.5	30.7	31.0	30.9
Rd	76.4	76.3	76.5	74.7	74.7	75.9	75.7
Plus b	7.1	6.7	7.1	6.5	6.7	6.9	7.2
Micronaire	4.1	4.2	4.2	4.2	4.3	4.3	4.2
Maturity	90.4	90.1	88.9	89.1	89.6	88.3	87.6
Color grade							
Parameter	LSD Tukey (P<0.05)		CV (%)				
Yield (kg ha ⁻¹)	NS		7.6				
Pick 1 %	19.9		14.6				
Fibre %	NS		1.3				
Fibre yield (kg ha ⁻¹)	NS (257.7)		7.9				
Length (mm)	NS		0.9				
Uniformity	NS		0.4				
Strength (g tex ⁻¹)	3.4		1.3				
Rd	NS		1.4				
Plus b	NS		2.4				
Micronaire	NS		3.1				
Maturity	NS		0.7				

VAALHARTS IRRIGATION

Yield parameters

Cultivars differed significantly regarding all of the yield parameters, except for the fibre percentage (Table 14). The cultivar, NuOPAL gave the highest yield of 5868 kg ha⁻¹, followed by Delta 12 BRF with 5482 kg ha⁻¹. The cultivar, DP 210 BRF, produced the highest pick 1 percentage of 99.0 %. The cultivar, DP 210 BRF produced the highest fibre percentage of 43.0 %, followed by NuOPAL with 42.8%. NuOPAL produced the highest fibre yield of 2512 kg ha⁻¹ followed by DP 210 BRF with 2258 kg ha⁻¹.

Quality parameters

Although the fibre lengths did not differ significantly, DP 210 BRF produced the longest fibre of 30.1 mm (Table 14). DeltaOPAL RR produced the strongest fibre of 32.3 g tex⁻¹. Miconaire values were within the acceptable range.

Table 13. Soil sample analysis (0 – 30cm), Vaalharts, 2010/2011

	Vaalharts
Ph	6.88
Resistance (ohms)	1530
Mg/kg	
N	5
P	66
K	58
Ca	320
Mg	115
Na	15
S Value	2.764
Ca %	57.9
Mg %	34.4
K %	5.4
Na %	2.4

GENERAL APPEARANCE AND CULTIVATION PRACTICES



Johan van Schalkwyk

Poor germination was observed with Gariiep VERTOL1 and Gariiep VERTOL2, (less than 2%). DP210 BRF and Delta 12 BRF (60 – 80%). The plots were replanted on 8 November 2010. Gariiep VERTOL 2 was replanted with Delta 18 RF, as no more seed was available. A lot of rain was recorded from December through to April. In January there were less than 12 cloudless days. Two installments of 80 kg/ha N were worked into the soil with an additional installment of 80 kg/ha N when the plants started to turn yellow after all the rain.

CROP SUMMARY

Planted	22/10/2011
Total insect sprays	4
Harvest: 1st pick	4/5/2011
Harvest: 2nd pick	20/5/2011
Rainfall	91.5
Nitrogen (kg ha⁻¹)	324
Phosphorus (kg ha⁻¹)	40
Potassium (kg ha⁻¹)	84

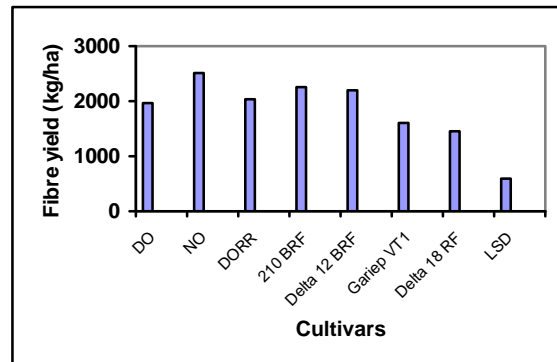


Table 14. Yield and fibre characteristics of the cotton cultivar trial planted under irrigation at Vaalharts, 2010/2011.

Variety	Delta OPAL	Nu OPAL	Delta Opal RR	DP 210 BRF	Delta 12 BRF	Gariep VT1	Delta 18 RF
Yield (kg ha ⁻¹)	4638	5868	4995	5241	5482	3920	3554
Pick 1 %	94.5	98.0	94.3	99.0	97.0	93.8	93.3
Fibre %	42.3	42.8	40.8	43.0	40.3	40.8	40.8
Fibre yield	1960	2512	2039	2258	2195	1603	1448
Length (mm)	29.4	28.5	29.5	30.1	29.1	28.3	29.6
Uniformity	83.2	81.5	84.4	81.0	81.6	85.0	82.5
Strength (g tex ⁻¹)	31.4	31.2	32.3	28.7	30.3	29.7	30.0
Rd	74.2	74.2	74.2	74.3	74.2	74.2	74.3
Plus b	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Micronaire	4.2	4.0	4.1	3.9	3.6	3.6	3.6
Maturity	89.0	89.0	89.5	85.2	85.8	87.5	84.5
Color grade							
Parameter	LSD Tukey (P≤0.05)	CV (%)					
Yield (kg ha ⁻¹)	1390	9.3					
Pick 1 %	3.5	1.1					
Fibre %	NS	1.1					
Fibre yield (kg ha ⁻¹)	587.6	9.9					
Length (mm)	NS	0.6					
Uniformity	2.4	0.8					
Strength (g tex ⁻¹)	NS	1.1					
Rd	NS	1.7					
Plus b	NS	9.5					
Micronaire	NS	4.8					
Maturity	NS	1.4					

WEIPE IRRIGATION

Yield parameters

Cultivars only differed significantly with regards to fibre percentage and fibre yield (Table 16). The cultivar, NuOPAL produced the highest seed cotton yield of 4230 kg ha⁻¹ followed by Delta12 BRF with 4210 kg ha⁻¹. The cultivar, DeltaOPAL produced the highest fibre percentage of 43.0 %, followed by NuOPAL with 42.3 %. The cultivar, NuOPAL produced the highest fibre yield of 1792 kg ha⁻¹ followed by Delta 12 BRF with 1686 kg ha⁻¹.

Quality parameters

Although no significant differences regarding fibre qualities were obtained, DP 210 BRF produced the longest fibre of 30.1 mm (Table 16). The cultivar A5, produced the strongest fibre (32.2 g tex⁻¹), followed by Delta 12 BRF and DeltaOPAL RR both with 32.0 g tex⁻¹. DeltaOPAL RR, Delta 12 BRF and A5 gave unacceptably low micronaire values of 3.3 to 3.4.

Table 15. Soil sample analysis (0 – 30cm), Weipe, 2010/2011

	Weipe
Ph	7.92
Resistance (ohms)	340
mg/kg	
N	6
P	89
K	620
Ca	4140
Mg	635
Na	115
S Value	28.038
Ca %	73.8
Mg %	18.7
K %	5.7
Na %	1.8

GENERAL APPEARANCE AND CULTIVATION PRACTICES



Piet Maja / Jacques Willemse

The trial emerged well after the planting in October 2010. No problems occurred during the growing season. A mean seed cotton yield of 3908 kg ha⁻¹ was obtained. No insecticides were applied to the trial.

CROP SUMMARY

Planted	21/10/2010
Harvest: 1st pick	30/5/2011
Rainfall	363.6
Nitrogen (kg ha⁻¹)	100
Phosphorus (kg ha⁻¹)	20
Potassium (kg ha⁻¹)	20

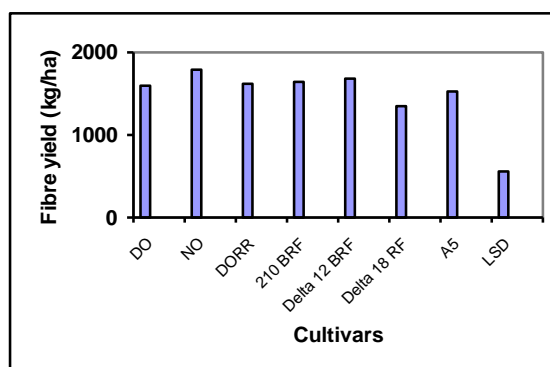


Table 16. Yield and fibre characteristics of the cotton cultivar trial planted under irrigation at Weipe,
2010/2011

Variety	Delta OPAL	Nu OPAL	Delta Opal RR	DP 210 BRF	Delta 12 BRF	Delta 18 RF	A5
Yield (kg ha ⁻¹)	3760	4230	3938	4073	4210	3433	3711
Fibre %	43.0	42.3	41.0	40.3	40.0	39.3	41.0
Fibre yield	1598	1792	1619	1646	1686	1347	1528
Length (mm)	28.9	29.6	28.7	30.1	29.6	29.2	29.5
Uniformity	82.3	82.0	82.7	82.0	82.0	82.0	82.7
Strength (g tex ⁻¹)	31.2	31.0	32.0	30.0	32.0	30.0	32.2
Rd	78.6	78.0	77.7	78.0	77.7	77.7	77.0
Plus b	6.5	6.5	6.8	6.2	5.6	6.5	6.5
Micronaire	3.7	3.5	3.3	3.5	3.4	3.5	3.3
Maturity	77.2	76.4	79.1	75.7	75.3	77.4	79.8
Color grade	41-2	41-1	41-1	41-2	41-2	51-1	31-2
Parameter	LSD Tukey (P≤0.05)		CV %				
Yield (kg ha ⁻¹)	NS		24.7				
Fibre %	2.3		0.7				
Fibre yield (kg ha ⁻¹)	554.5		24.0				
Length (mm)	NS		0.3				
Uniformity	NS		0.4				
Strength (g tex ⁻¹)	NS		1.7				
Rd	NS		0.6				
Plus b	NS		1.1				
Micronaire	NS		2.5				
Maturity	NS		0.8				

Appendix 1.

Table 17. Weather data. Loskop, 2010/2011 season.

Year	Month	Tx	Tn	Rain	Rs	ETO	HU
2010	October	32.7	14.9	49.3	22.7	5.3	427.1
2010	November	30.1	17.0	86.1	21.1	4.4	308.9
2010	December	30.3	16.9	163.1	24.3	4.9	405.9
2011	January	30.8	18.6	115.1	24.6	5.0	424.2
2011	February	31.8	16.9	58.4	25.4	5.2	383.4
2011	March	32.2	15.9	26.4	22.4	4.7	411.15
2011	April	29.4	13.7	2.8	17.1	3.5	136.4
							2497.1

Tx = Maximum temperature, Tn = Minimum temperature, Rs = Radiation, ETO = Evapotranspiration, HU = Heat Units

Table 18. Weather data. Makhathini, 2010/2011 season.

Year	Month	Tx	Tn	Rain	Rs	ETO	HU
2010	October	28.1	17.6	138.9	14.1	3.1	368.3
2010	November	30.2	19.2	141.5	18.2	3.9	408.4
2010	December	30.1	20.5	137.2	17.6	3.7	446.3
2011	January	29.9	21.2	166.1	19.3	4.0	459.6
2011	February	31.5	20.6	50.3	21.1	4.4	419.0
2011	March	33.7	21.4	99.6	19.4	4.2	506.5
2011	April	28.8	17.7	28.2	13.6	2.8	369.1
2011	May	28.6	15.1	6.1	11.1	2.3	335.2
							3312.4

Tx = Maximum temperature, Tn = Minimum temperature, Rs = Radiation, ETO = Evapotranspiration, HU = Heat Units

Table 19. Weather data. Marydale (Prieska), 2010/2011 season.

Year	Month	Tx	Tn	Rain	Rs	ETO	HU
2010	October	29.7	8.7	1.2	24.7	5.4	309.8
2010	November	32.9	12.1	13.0	29.3	6.7	391.1
2010	December	34.1	15.8	79.6	25.1	6.4	479.0
2011	January	32.6	18.8	114.4	24.8	5.5	471.6
2011	February	32.1	17.5	136.1	22.4	4.7	381.9
2011	March	31.6	15.2	53.6	18.6	4.1	393.3
2011	April	26.2	9.1	28	16.7	3.2	235.9
2011	May	24.2	5.8	26.9	12.4	2.4	152.8
							2815.4

Tx = Maximum temperature, Tn = Minimum temperature, Rs = Radiation, ETO = Evapotranspiration, HU = Heat Units

Table 20. Weather data. Mctaggerscamp (Upington), 2010/2011 season.

Year	Month	Tx	Tn	Rain	Rs	ETO	HU
2010	October	29.9	9.4	0.51	24.8	5.2	331.9
2010	November	32.4	13.7	81.0	28.9	6.4	402.9
2010	December	34.5	15.7	60.2	30.1	6.7	484.8
2011	January	34.7	20.4	71.9	27.6	6.1	540.5
2011	February	35.0	20.6	56.1	24.5	5.3	526.5
2011	March	35.3	19.4	2.03	20.3	4.5	562.2
							2848.8

Tx = Maximum temperature, Tn = Minimum temperature, Rs = Radiation, ETO = Evapotranspiration, HU = Heat Units

Table 21. Weather data. Rustenburg, 2010/2011 season.

Year	Month	Tx	Tn	Rain	Rs	ETO	HU
2010	October	32.4	15.9	7.6	22.0	5.0	441.6
2010	November	30.7	17.2	51.1	22.0	4.8	405.2
2010	December	30.3	17.8	160.0	22.6	4.9	421.4
2011	January	28.3	18.6	218.2	21.2	4.3	396.6
2011	February	29.8	17.9	29.2	21.8	4.5	374.5
2011	March	30.0	17.2	163.6	19.3	4.0	404.5
2011	April	24.5	13.9	90.9	14.0	2.7	259.0
2011	May	23.3	8.6	6.6	14.5	2.6	181.9
							2884.7

Tx = Maximum temperature, Tn = Minimum temperature, Rs = Radiation, ETO = Evapotranspiration, HU = Heat Units

Table 22. Weather data. Vaalharts, 2010/2011 season.

Year	Month	Tx	Tn	Rain	Rs	ETO	HU
2010	October	32.1	10.9	4.8	22.3	5.1	361.8
2010	November	33.6	14.1	3.3	24.8	5.8	406.2
2010	December	33.9	16.2	4.6	26.1	6.0	442.2
2011	January	31.4	17.9	8.6	21.1	4.5	416.6
2011	February	32.0	17.0	6.6	22.2	4.7	358.8
2011	March	32.1	15.6	15.0	18.9	4.1	385.7
2011	April	25.8	9.9	25.7	14.9	2.8	221.1
2011	May	24.0	6.3	22.9	13.1	2.9	150.8
							2743.1

Tx = Maximum temperature, Tn = Minimum temperature, Rs = Radiation, ETO = Evapotranspiration, HU = Heat Units

Table 23. Weather data. Weipe, 2010/2011 season.

Year	Month	Tx	Tn	Rain	Rs	ETO	HU
2010	October	33.7	17.7	0.76	21.5	5.3	486.4
2010	November	34.0	20.5	40.4	21.7	5.2	501.5
2010	December	34.0	21.4	111.3	23.6	5.4	522.5
2011	January	30.9	22.0	142	21.3	4.6	493.11
2011	February	35.0	20.4	12.5	21.2	4.9	404.5
2011	March	30.0	17.0	56.4	16.5	3.7	397.1
2011	April	28.9	10.1	0.25	16.0	3.2	284.21
							3089.3

Tx = Maximum temperature, Tn = Minimum31.7 temperature, Rs = Radiation, ETO = Evapotranspiration, HU = Heat Units