

**Supplementary Online Material to:**

**Exploring process-level genotypic and  
environmental effects on sugarcane yield  
using an international experimental dataset**

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## 1. Introduction

This document provides data supplementary to “Exploring process-level genotypic and environmental effects on sugarcane yield using an international experimental dataset” by Jones et al., 2019. The data presented include the following: a list of acronyms/symbols used in this document (1.1); shoot population thresholds for estimating date of primary shoot emergence (1.2); descriptions of the process followed to estimate date of 50% shoot emergence from shoot population data, and the modified Canesim canopy model used for estimating fractional interception of photosynthetically-active radiation (FiPAR, %) from observations to calculate seasonal radiation interception (1.3); shoot population (1.5) and FiPAR (1.6) observed data graphs; results of statistical analyses (1.7); phenotypic parameter correlation matrix (1.8); and tables of phenotypic parameters for all genotype and environment combinations (1.9).

## 1.1 List of acronyms and symbols

*Table A- 1. Symbols, their units and meanings.*

<b>Acronym</b>	<b>Units</b>	<b>Description</b>
ADM	t/ha	Above-ground dry biomass
ADM_OSG	t/ha	ADM at date of OSG
AS		APSIM-Sugar
CS		Canesim
DAP_EM50	D	Days from crop start to 50% primary shoot emergence
DC2		DSSAT-Canegro v4.5_C2.2
FiPAR	%	Fractional interception of PAR
FiPAR <sub>cs,d</sub>	%	Daily Canesim-simulated FiPAR
OSG		Onset of stalk growth (phenological event)
P		Plant crop
PAR	MJ/m <sup>2</sup>	Photosynthetically-active radiation
PFINAL	shoots/m <sup>2</sup>	Final POPN
PI	°Cd/leaf	Leaf phyllocron interval
POP_100	shoots/m <sup>2</sup>	100% primary shoot population
POPN	shoots/m <sup>2</sup>	Shoot population
PPEAK	shoots/m <sup>2</sup>	Peak POPN
PTQ	MJ/m <sup>2</sup> /°Cd	Photothermal quotient
RUE	g/MJ	Radiation use efficiency calculated as biomass produced over a given period, divided by intercepted photosynthetically actively radiation over the same period
RUEmax	g/MJ	Maximum observed RUE calculated over four biomass sampling periods
R1		First ratoon crop
SDM	t/ha	Stalk dry mass
SRAD	MJ/m <sup>2</sup>	Global solar radiation
STKPF	t/t	Stalk partitioning fraction
TAR	shoots/m <sup>2</sup> /°Cd	Tiller appearance rate per unit TT
T	°C	Mean daily air temperature
TMAX	°C	Maximum daily air temperature
TMIN	°C	Minimum daily air temperature
TT	°Cd	Thermal time
TT_EM50	°Cd	TT from crop start to 50% primary shoot emergence
TT_Fi50	°Cd	TT from TT_EM50 to 50% FiPAR
TT_OSG	°Cd	TT from DAP_EM50 to date of OSG
TT16	°Cd	TT calculated with DC2 cardinal temperatures for tillering
WSI		Water stress index

## 1.2 Shoot population thresholds for estimating emergence date

**Table A- 2.** Shoot population (shoots/m<sup>2</sup>) considered to represent 100% of primary shoots, by Experiment and Cultivar. Experiment names in italicized text were water-stressed. 'obs' indicates cases where time to 50% emergence was provided as an observation.

Experiment	Cultivar						
	N41	R570	CP88-1762	HoCP96-540	Q183	ZN7	NC0376
<i>La Mare, P</i>	obs	obs	obs		obs		obs
La Mare, R1	27.2	16.8	16.4		19.6		17.8
Pongola, P	6.0	3.7	5.0	4.5		4.6	
<i>Pongola, R1</i>	23.4	15.4	18.6	18		17.8	
Belle Glade, P	obs	obs	obs	Obs			obs
Belle Glade, R1	obs	obs	obs	Obs			obs
<i>Chiredzi, P</i>	obs	obs	obs	Obs	obs	obs	
Chiredzi, R1	11.0	14.0	9.0	12.0	10.0	10.0	

## 1.3 Additional canopy development methodology notes

### Inference of date of 50% shoot emergence from shoot population observations

In cases where date of 50% shoot emergence (DAP\_EM50, d) had not been recorded, this was inferred from shoot population (POPN, shoots/m<sup>2</sup>) observations. 100% primary shoot population (POP\_100, shoots/m<sup>2</sup>) was estimated for the Pongola and Chiredzi P crops as the POPN on the date that the POPN curve (plotted using linear interpolation against TT16) showed an inflection point corresponding with the start of secondary shoot production. DAP\_EM50 was the date at which POPN was approximately 50% of POP\_100. For R1 crops other than Belle Glade, POP\_100 was taken as the final stalk population of the previous crop. The DSSAT-Canegro v4.5\_C2.2 (DC2, Jones & Singels, 2018) model was calibrated interactively to fit simulated values to observed POPN, to permit inference of POPN values earlier in the cropping season than the first observations were taken. DAP\_EM50 was taken as the date when simulated POPN was nearest 50% of the POP\_100

## Modified Canesim canopy model

A modified Canesim canopy model was implemented to fit a continuous canopy curve to FiPAR observations. This model is described as follows:

$$FiPAR_{CS,d} = Flo_d \left( 1 - \left( WSI_d \frac{WSM}{100} \right) \right) \quad (A-1)$$

$$Flo_d = 100 \left( \frac{TTI_{k,d}}{0.5^k + TTI_{k,d}} \right) \quad (A-2)$$

$$TTI_{k,d} = \left( \frac{\max(0, (TT16_{cd} - TT\_EM50_{16}))}{TT\_Fi50} \right)^k \quad (A-3)$$

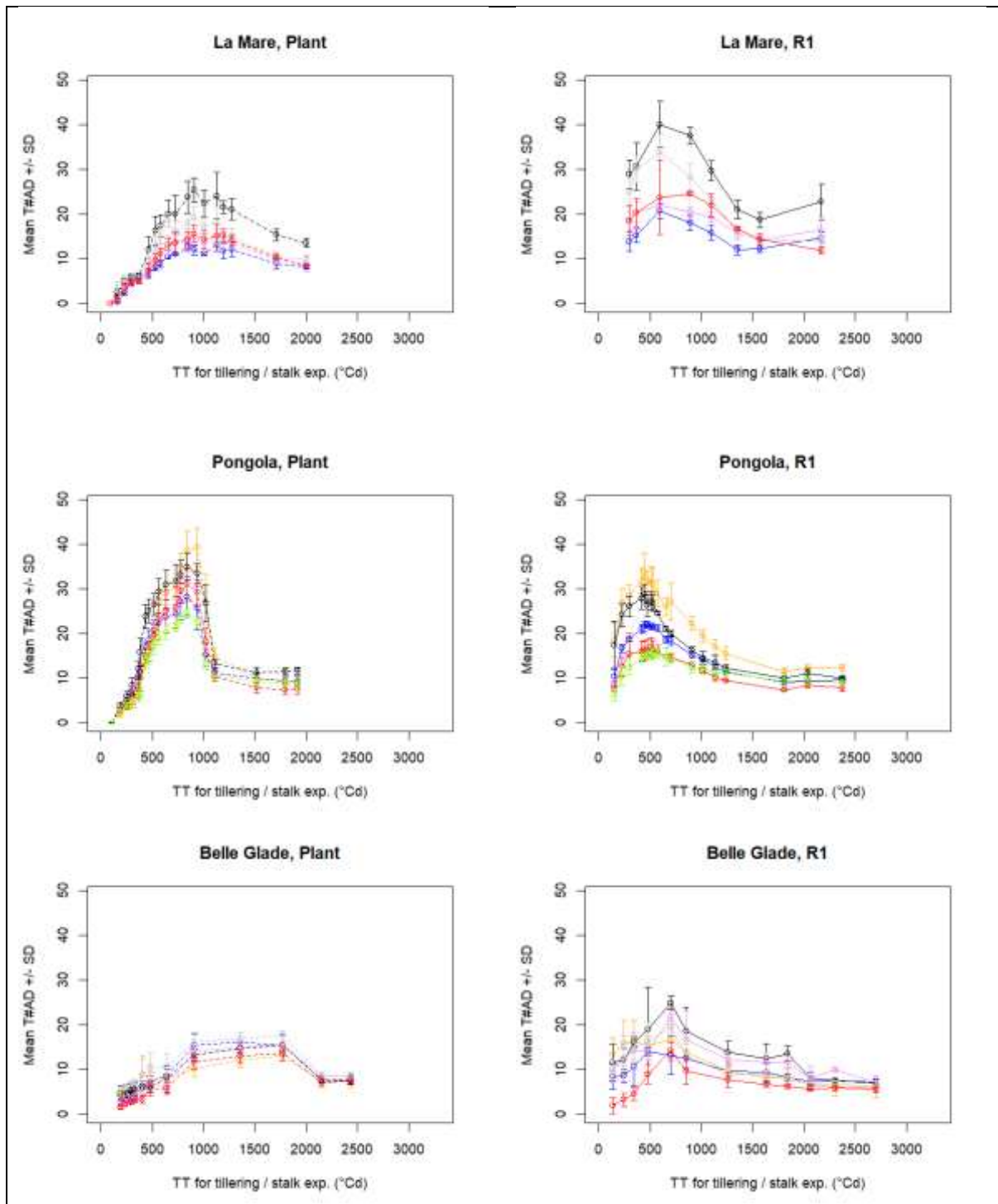
where, for day d,  $FiPAR_{CS,d}$  is predicted FiPAR,  $WSI_d$  is the 30-day rolling average WSI,  $Flo_d$  is unstressed FiPAR,  $TTI_{k,d}$  is a TT index, k is a constant (2.453),  $TT16_{c,d}$  is TT16 from crop start to day d, and  $TT\_EM50_{16}$  is  $TT\_EM50$  expressed in TT16.

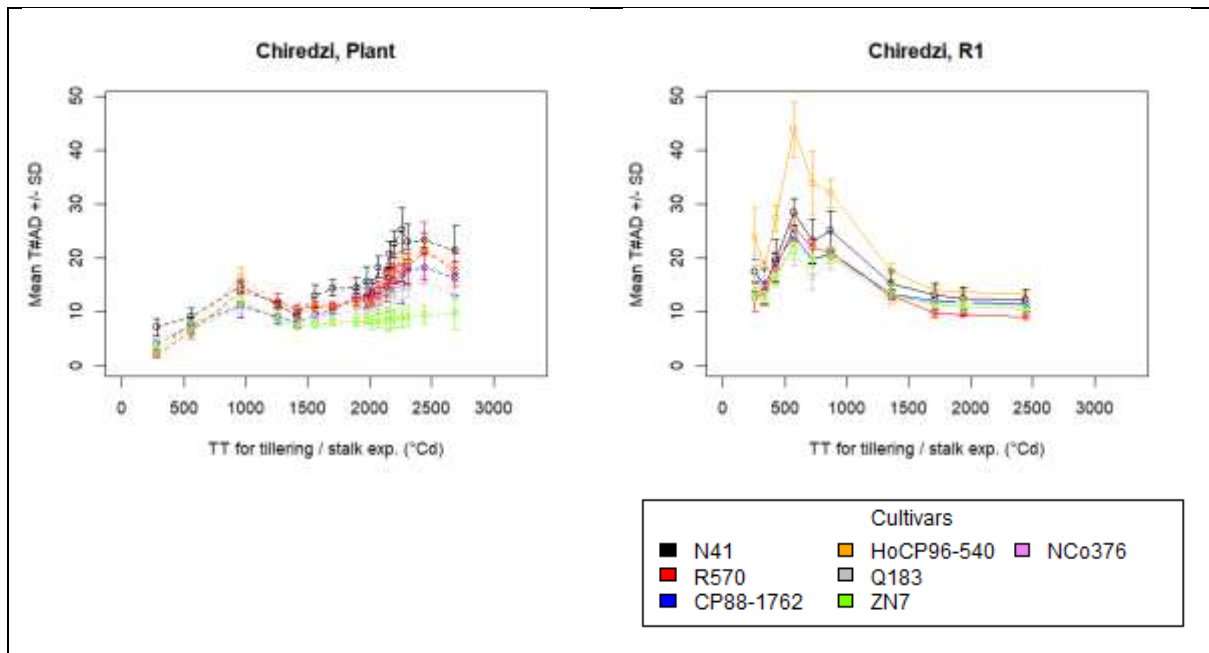
## 1.4 Climate summary per development stage

**Table A- 3.** Number of days, average daily mean (*T*), maximum (*TMAX*) and minimum (*TMIN*) temperature, sum of solar radiation (*SRAD*), average daily photothermal quotient (*PTQ*), and average daily water stress index (*WSI*) for growth phases as defined by the DSSAT-Canegro model standard parameters. *WSI* is low for germination because there is no transpiration before emergence.

Experiment	Days	T (°C)	TMAX (°C)	TMIN (°C)	SRAD (MJ/m <sup>2</sup> )	PTQ (MJ/°Cd)	WSI
<b>Germination</b>							
<i>La Mare, P</i>	24	26.4	30.1	22.8	489	1.23	0.00
La Mare, R1	10	27.5	31.3	23.7	247	1.41	0.00
Pongola, P	34	22.1	28.4	15.8	552	1.34	0.01
<i>Pongola, R1</i>	13	23.7	29.3	18.2	224	1.24	0.00
Belle Glade, P	50	18.2	23.7	12.6	563	21.11	0.00
Belle Glade, R1	31	16.0	22.4	9.6	493	17.90	0.00
<i>Chiredzi, P</i>	24	27.9	34.1	21.7	493	1.26	0.01
Chiredzi, R1	24	17.8	26.2	9.4	394	2.26	0.00
<b>Tillering</b>							
<i>La Mare, P</i>	66	25.8	29.5	22.0	1210	1.14	0.04
La Mare, R1	60	27.2	30.8	23.7	1207	1.14	0.09
Pongola, P	121	18.6	26.6	10.6	1688	1.78	0.04
<i>Pongola, R1</i>	109	19.6	26.7	12.6	1411	1.37	0.18
Belle Glade, P	93	21.2	27.4	15.0	1783	1.96	0.01
Belle Glade, R1	77	23.6	29.2	17.9	1598	1.57	0.06
<i>Chiredzi, P</i>	62	27.1	32.2	22.0	1130	1.09	0.02
Chiredzi, R1	96	20.8	28.9	12.7	1703	1.68	0.03
<b>Stalk growth</b>							
<i>La Mare, P</i>	271	24.4	28.0	20.8	5215	1.33	0.56
La Mare, R1	300	23.8	27.6	20.1	5866	1.41	0.04
Pongola, P	200	23.4	29.4	17.4	3891	1.46	0.15
<i>Pongola, R1</i>	228	24.2	30.7	17.6	4135	1.30	0.38
Belle Glade, P	224	24.6	29.9	19.3	4228	1.52	0.03
Belle Glade, R1	257	25.2	30.1	20.3	4365	1.93	0.08
<i>Chiredzi, P</i>	276	22.3	29.0	15.5	6854	2.30	0.24
Chiredzi, R1	243	25.9	32.3	19.5	5303	2.40	0.11
<b>Seasonal</b>							
<i>La Mare, P</i>	363	24.8	28.4	21.2	6914	1.29	0.42
La Mare, R1	372	24.5	28.2	20.8	7320	1.36	0.05
Pongola, P	357	21.7	28.4	14.9	6132	1.56	0.10
<i>Pongola, R1</i>	352	22.7	29.4	16.1	5770	1.32	0.30
Belle Glade, P	369	22.8	28.4	17.3	6573	4.28	0.02
Belle Glade, R1	367	24.0	29.2	18.9	6456	3.20	0.07
<i>Chiredzi, P</i>	364	23.5	29.9	17.1	8477	2.02	0.19
Chiredzi, R1	365	24.0	31.0	17.0	7401	2.19	0.08

## 1.5 Shoot population graphs

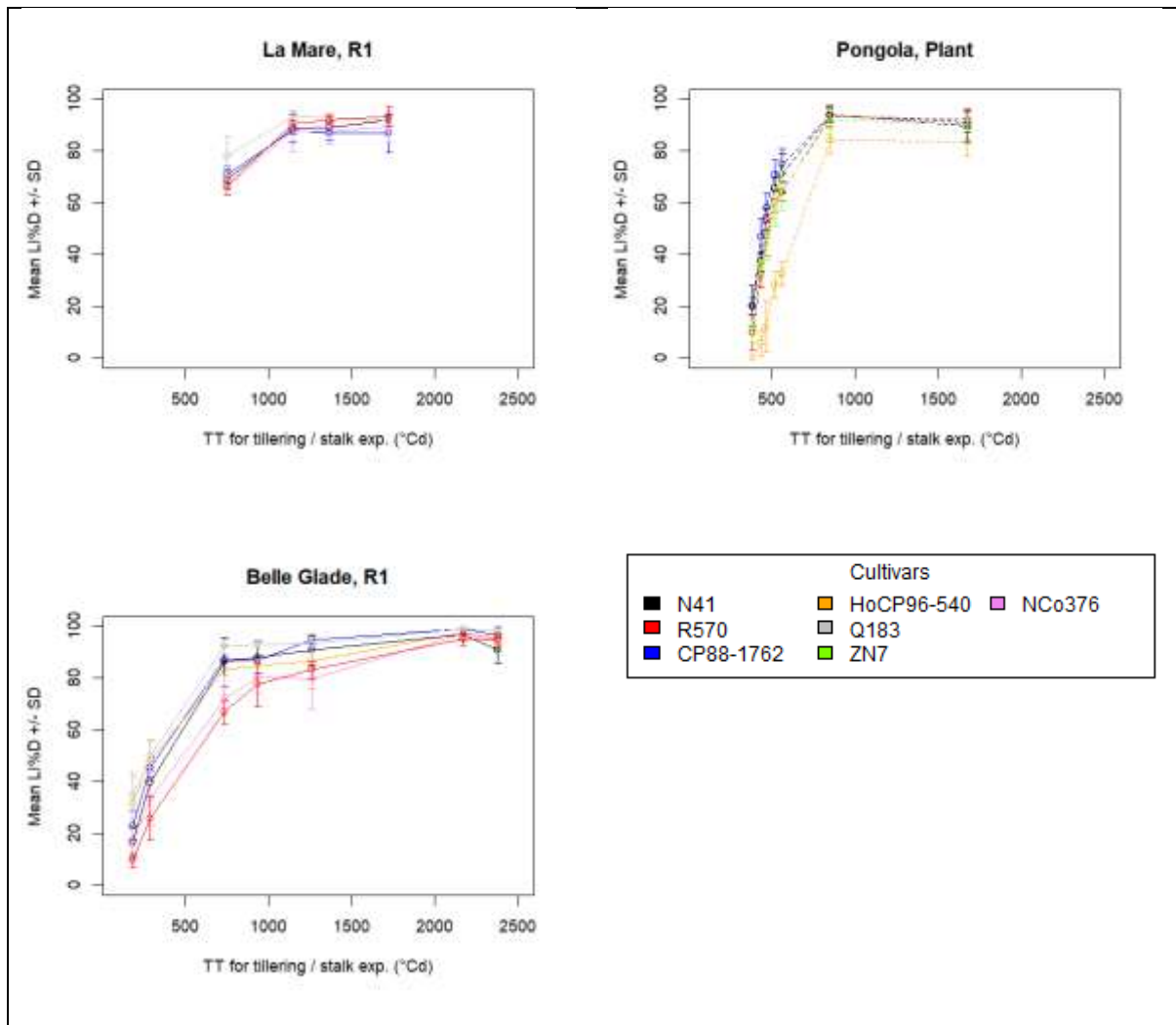




**Figure A- 1.** Shoot population for each cultivar per experiment, plotted against thermal time (TT16). Dashed lines are plant crops and solid lines are first ratoon crops.



## 1.6 FiPAR graphs



**Figure A- 2.** Fractional interception of photosynthetically-active radiation (FiPAR, %) for each cultivar per non-stressed experiment, plotted against thermal time (TT16). Dashed lines are plant crops and solid lines are first ratoon crops.

## 1.7 ANOVA results for final ADM and SDM

**Table A- 4.** Results of ANOVA on above-ground dry biomass (ADM, t/ha) and stalk dry mass (SDM, t/ha) at harvest for all Experiments and non-stressed Experiments. The 'Pr(>F)' column and asterisks in the rightmost column indicate statistical significance. Results are shown for common cultivars only.

Factor	Df	Sum Sq	Mean Sq	F value	Pr(>F)	Significance
<b>ADM (All Experiments)</b>						
Experiment	7	6814.0	973.5	16.55	0.000	***
Genotype	2	184.0	92.1	1.57	0.217	
Experiment x Genotype	14	2055.0	146.8	2.50	0.007	**
Residuals	65	3823.0	58.8			
<b>ADM (Non-stressed)</b>						
Experiment	4	4917.0	1229.2	20.86	0.000	***
Genotype	2	191.0	95.3	1.62	0.210	
Experiment x Genotype	8	1711.0	213.9	3.63	0.003	**
Residuals	44	2593.0	58.9			
<b>SDM (All Experiments)</b>						
Experiment	7	2510.7	358.7	7.38	0.000	***
Genotype	2	473.8	236.9	4.88	0.011	*
Experiment x Genotype	14	1864.0	133.1	2.74	0.003	**
Residuals	65	3158.8	48.6			
<b>SDM (Non-stressed)</b>						
Experiment	4	1531.0	382.8	10.89	0.000	***
Genotype	2	178.0	89.0	2.53	0.091	.
Experiment x Genotype	8	1100.0	137.6	3.91	0.001	**
Residuals	44	1547.0	35.2			

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

## 1.8 Phenotypic parameter value correlation matrix

*Table A- 5. Correlation matrix of phenotypic parameter values for common cultivars (N41, R570 and CP88-1762) and non-stressed experiments.*

	TT_EM50 P	TT_EM50 R1	PI	TAR	TT_Fi50	RUEmax	TT_OSG	ADM_OSG	STKPF	STKPF**	ADM	SDM	PFINAL	PPEAK
TT_EM50 P	1.00	-	1.00	0.76*	-0.83*	0.45	0.84*	-0.92*	-0.85*	-0.89*	-0.88*	0.75*	0.71*	-0.56*
TT_EM50 R1		1.00	1.00	0.38	0.42	-0.44	-0.12	-0.23	0.44	0.25	-0.41	-0.28	-0.55	-0.35
PI			1.00	0.20	-0.11	0.02	0.04	-0.32	0.14	0.13	-0.57*	-0.06	-0.03	-0.42
TAR				1.00	-0.36	0.01	0.67*	-0.69*	0.09	-0.06	-0.14	0.12	0.09	-0.20
TT_Fi50					1.00	-0.40	-0.60*	0.58*	0.50	0.42	0.61*	-0.39	-0.60*	0.33
RUEmax						1.00	-0.21	0.18	0.24	-0.50	-0.31	0.38	0.17	0.32
TT_OSG							1.00	-0.78*	-0.43	-0.12	-0.18	0.41	0.70*	-0.13
ADM_OSG								1.00	0.25	-0.06	0.39	0.04	-0.22	0.41
STKPF									1.00	0.12	0.43	0.11	-0.32	0.40
STKPF**										1.00	0.98*	-0.72*	-0.39	-0.50
ADM											1.00	-0.39	-0.33	0.33
SDM												1.00	0.80*	0.54
PFINAL													1.00	0.14
PPEAK														1.00

\*\*La Mare R1 excluded.

\*Significant at  $p < 0.05$

## 1.9 Phenotypic parameter values

**Table A- 6.** Thermal time from crop start to 50% emergence (TT\_EM50, °Cd), thermal time from TT\_EM50 to 50% canopy cover (TT\_Fi50, °Cd), and thermal time from TT\_EM50 to onset of stalk elongation (TT\_OSG, °Cd) by Experiment and Cultivar. 'Avg (cmn.)' is the average value for the three common cultivars (N41, R570 and CP88-1762); 'Avg' is the average of all cultivars.

Experiment	N41	R570	CP88-1762	HoCP96-540	Q183	ZN7	NCo376	Avg (cmn.)	Avg
<b>TT_EM50 (Plant crops)</b>									
<i>La Mare</i>	313	411	411		266		395	378	359
<i>Pongola</i>	330	292	330	385		317		317	331
<i>Belle Glade</i>	422	635	502	411	361		512	520	474
<i>Chiredzi</i>	707	626	591	410	591	401		641	554
Average	443	491	459	402	406	359	454	464	437
<b>TT_EM50 (ratoon crops)</b>									
<i>La Mare</i>	192	242	260		192		227	231	223
<i>Pongola</i>	203	224	216	192		348		214	237
<i>B. Glade</i> <sup>1</sup>	165	619	143	146	146		181	309	233
<i>Chiredzi</i>	440	628	420	516	402	440		496	474
Average	250	428	260	285	247	394	204	313	292
<b>TT_Fi50</b>									
<i>La Mare, P</i>	505	463	463		484		453	477	474
<i>La Mare, R1</i>	427	427	372		354		427	409	401
<i>Pongola, P</i>	297	348	286	402		327		310	332
<i>Pongola, R1</i>	392	436	415	494		444		414	436
<i>Belle Glade, P</i> <sup>2</sup>	498	428	312	482	388		528	413	439
<i>Belle Glade, R1</i>	303	245	277	258	234		373	275	282
<i>Chiredzi, P</i>	768	511	491		518	651		590	588
<i>Chiredzi, R1</i>									
All non-stressed	381	362	312	381	325	327	443	352	362
All stressed	555	470	456	494	501	548	453	494	497
All	456	408	374	409	396	474	445	413	418
<b>TT_OSG</b>									
<i>La Mare, P</i>	1179	1241	1081		1253		1177	1167	1186
<i>La Mare, R1</i>	1207	1219	886		989		937	1104	1048
<i>Pongola, P</i>	1406	1558	1287	1744		1533		1417	1506
<i>Pongola, R1</i>	1732	1823	2064	2061		1968		1873	1930
<i>Belle Glade, P</i>	810	624	789	765	815		694	741	750
<i>Belle Glade, R1</i>	577	455	442	766	609		682	491	589
<i>Chiredzi, P</i>	767	291	853		1125	1138		637	835
<i>Chiredzi, R1</i> <sup>3</sup>	822	771	806	834	773	893		800	816
All non-stressed	964	926	842	1027	797	1213	771	911	934
All stressed	1226	1118	1333	2061	1189	1553	1177	1226	1380
All	1063	998	1026	1204	927	1383	872	1029	1068

<sup>1</sup>Belle Glade values were observed. All others are estimated using DSSAT-Canegro simulations

<sup>2</sup>Low confidence in estimates

<sup>3</sup>Values determined using stalk height.

**Table A- 7.** Peak shoot population values (*PPEAK*, shoots/m<sup>2</sup>) and estimated final population (*PFINAL*, shoots/m<sup>2</sup>), for the three common cultivars across the different experiments.

Experiment	N41	R570	CP88-1762	Average	N41	R570	CP88-1762	Average
	PPEAK values				PFINAL values			
<i>La Mare, P</i>	25.4	15.6	13.1	18.0	14.0	8.0	8.0	10.0
<i>La Mare, R1</i>	40.1	24.6	20.7	28.5	22.0	12.0	15.0	16.3
<i>Pongola, P</i>	35.0	31.0	28.4	31.5	12.0	8.0	10.0	10.0
<i>Pongola, R1</i>	29.0	17.0	22.1	22.7	10.0	7.5	9.5	9.0
<i>Belle Glade, P</i>	15.4	13.7	16.1	15.1	7.5	7.5	7.5	7.5
<i>Belle Glade, R1</i>	25.0	14.2	14.1	17.8	8.0	6.5	8.0	7.5
<i>Chiredzi, P</i>	25.3	21.4	18.4	21.7	22.0	18.0	16.0	18.7
<i>Chiredzi, R1</i>	28.5	25.6	24.3	26.1	12.5	9.5	11.5	11.2
Average, non-stressed	28.8	21.8	20.7	23.8	12.4	8.7	10.4	10.5
Average, stressed	26.6	18.0	17.9	20.8	15.3	11.2	11.2	12.6
Average	28.0	20.4	19.7	22.7	13.5	9.6	10.7	11.3

**Table A- 8.** Tiller appearance rate per unit thermal time (*TAR*, shoots/°Cd) during the tillering phase (emergence to peak shoot population), by cultivar per experiment. 'Avg (cmn.)' is the average value for the three common cultivars (N41, R570 and CP88-1762); 'Avg' is the average of all cultivars.

Experiment	N41	R570	CP88-1762	HoCP96-540	Q183	ZN7	NCo376	Avg (cmn.)	Avg
	TAR								
<i>La Mare, P</i>	0.032	0.020	0.013		0.024		0.020	0.022	0.022
<i>La Mare, R1</i>	0.038	0.010	0.023		0.027		0.011	0.024	0.022
<i>Pongola, P</i>	0.052	0.046	0.042	0.056		0.037		0.047	0.047
<i>Pongola, R1</i>	0.034	0.021	0.032	0.044		0.024		0.029	0.031
<i>Belle Glade, P</i>	0.008	0.008	0.013	0.005	0.008		0.009	0.010	0.009
<i>Belle Glade, R1</i>	0.025	0.023	0.017	0.004	0.016		0.020	0.022	0.018
<i>Chiredzi, P</i>	0.007	0.006	0.006	0.005	0.004	0.014		0.006	0.007
<i>Chiredzi, R1</i>	0.040	0.043	0.025	0.072	0.014	0.031		0.036	0.038
All non-stressed	0.033	0.026	0.024	0.034	0.016	0.034	0.013	0.028	0.026
All stressed	0.024	0.016	0.017	0.025	0.014	0.019	0.020	0.019	0.019
All	0.030	0.022	0.021	0.031	0.016	0.027	0.015	0.024	0.023

**Table A- 9.** Leaf phyllocron interval (PI, °Cd) between subsequent leaf tip appearance, by cultivar, per experiment. 'Avg (cmn.)' is the average value for the three common cultivars (N41, R570 and CP88-1762); 'Avg' is the average of all cultivars.

Experiment	N41	R570	CP88-1762	HoCP96-540	Q183	ZN7	NCo376	Avg (cmn.)	Avg
	<b>PI</b>								
<i>La Mare, P</i>	147	140	115		124		127	134	131
<i>La Mare, R1</i>	139	155	122		126		134	139	135
<i>Pongola, P</i>	101	114	104	126		107		106	110
<i>Pongola, R1</i>	109	139	125	154		125		124	131
<i>Belle Glade, P</i>	139	144	117	147	132		152	133	139
<i>Belle Glade, R1</i>	152	171	168	193	136		163	164	164
<i>Chiredzi, P</i>									
<i>Chiredzi, R1</i>	139	176	134	203	171	136		150	160
All non-stressed	134	152	129	167	141	121	149	138	142
All stressed	128	139	120	154	124	125	127	129	131
All	132	148	126	165	138	123	144	135	140

**Table A- 10.** Final (at harvest) above-ground dry mass (ADM, t/ha) and stalk dry mass (SDM, t/ha), and average stalk partitioning fraction (STKPF, t/t), per experiment and cultivar. 'Avg (cmn.)' is the average value for the three common cultivars (N41, R570 and CP88-1762); 'Avg' is the average of all cultivars.

Experiment	N41	R570	CP88-1762	HoCP96-540	Q183	ZN7	NCo376	Avg (cmn.)	Avg
	<b>ADM</b>								
<i>La Mare, P</i>	45.6	51.6	57.3		59.7		49.7	51.5	52.8
La Mare, R1	68.3	71.2	56.4		54.0		61.3	65.3	62.2
Pongola, P	43.4	35.9	38.4	32.6		36.0		39.2	37.3
<i>Pongola, R1</i>	40.7	33.4	35.4	32.4		34.6		36.5	35.3
Belle Glade, P	41.9	52.3	62.4	34.5	47.8		42.8	52.2	47.0
Belle Glade, R1	34.7	46.6	48.1	34.1	40.3		45.0	43.1	41.5
<i>Chiredzi, P</i>	48.9	51.8	51.9	44.0	33.1	50.9		50.9	
Chiredzi, R1	45.8	45.7	50.0	55.4	43.7	49.2		47.2	48.3
All non-stressed	46.8	50.3	51.1	39.2	46.5	42.6	49.7	49.4	46.6
All stressed	45.0	45.6	48.2	38.2	46.4	42.8	49.7	46.3	45.1
All	46.2	48.5	50.0	38.8	46.5	42.7	49.7	48.2	46.1
	<b>SDM</b>								
<i>La Mare, P</i>	26.0	28.6	36.2		31.6		30.4	30.3	30.6
La Mare, R1	43.6	42.7	34.5		33.4		38.6	40.3	38.6
Pongola, P	32.9	26.3	28.8	23.7		26.7		29.3	27.7
<i>Pongola, R1</i>	31.9	22.9	27.9	20.6		27.7		27.6	26.2
Belle Glade, P	34.3	39.9	52.2	29.8	38.2		33.2	42.1	37.9
Belle Glade, R1	29.7	35.1	42.0	31.2	35.9		35.1	35.6	34.8
<i>Chiredzi, P</i>	16.3	31.0	37.9	30.4	33.7	34.6		28.4	30.7
Chiredzi, R1	29.8	28.8	33.7	39.3	27.5	32.4		30.8	31.9
All non-stressed	34.1	34.6	38.2	31.0	33.8	29.5	35.6	35.6	33.8
All stressed	24.7	27.5	34.0	25.5	32.7	31.2	30.4	28.7	29.4
All	30.6	31.9	36.6	29.2	33.4	30.3	34.3	33.0	32.3
	<b>STKPF</b>								
<i>La Mare, P</i>	0.62	0.63	0.68		0.58		0.69	0.64	0.64
La Mare, R1	0.71	0.66	0.64		0.68		0.66	0.67	0.67
Pongola, P	0.86	0.85	0.85	0.83		0.93		0.85	0.86
<i>Pongola, R1</i>	0.89	0.79	0.96	0.76		1.02		0.88	0.88
Belle Glade, P	0.81	0.76	0.84	0.86	0.81		0.75	0.80	0.80
Belle Glade, R1	0.86	0.77	0.86	0.94	0.92		0.80	0.83	0.86
<i>Chiredzi, P</i>	0.40	0.65	0.77	0.74	0.92	0.68		0.61	0.69
Chiredzi, R1	0.86	0.87	0.80	0.89	0.84	0.85		0.84	0.85
All non-stressed	0.82	0.78	0.80	0.88	0.81	0.89	0.74	0.80	0.82
All stressed	0.64	0.69	0.80	0.75	0.75	0.85	0.69	0.71	0.74
All	0.75	0.75	0.80	0.84	0.79	0.87	0.73	0.77	0.79
All non-stressed (excluding La Mare, R1)	0.85	0.81	0.84	0.88	0.86	0.89	0.78	0.83	0.84

**Table A- 11.** Average seasonal fractional interception of photosynthetically-active radiation (FiPARavg), and maximum sampling-period radiation use efficiency (g/MJ intercepted PAR), by Experiment and Cultivar. Experiment names in italicized text were water-stressed. 'Avg (cmn.)' is the average value for the three common cultivars (N41, R570 and CP88-1762); 'Avg' is the average of all cultivars.

Experiment	N41	R570	CP88-1762	HoCP96-540	Q183	ZN7	NCo376	Avg (cmn.)	Avg
	<b>FiPARavg</b>								
<i>La Mare, P</i>	0.76	0.76	0.76		0.78		0.77	0.76	0.77
La Mare, R1	0.79	0.81	0.77		0.82		0.78	0.79	0.79
Pongola, P	0.66	0.65	0.68	0.53 <sup>1</sup>		0.63		0.66	0.63
<i>Pongola, R1</i>	0.65	0.64	0.64	0.56 <sup>1</sup>		0.61		0.64	0.62
Belle Glade, P*	0.61	0.60	0.68	0.62	0.67		0.57	0.63	0.63
Belle Glade, R1	0.73	0.66	0.76	0.73	0.79		0.67	0.72	0.72
<i>Chiredzi, P</i>	0.69	0.73	0.77		0.76	0.72		0.73	0.73
Chiredzi, R1									
All non-stressed	0.70	0.68	0.72	0.63	0.76	0.63	0.67	0.70	0.68
All stressed	0.70	0.71	0.72	0.56	0.77	0.67	0.77	0.71	0.70
All	0.70	0.69	0.72	0.61	0.76	0.65	0.70	0.70	0.69
	<b>RUEmax</b>								
<i>La Mare, P</i>	2.60	2.97	2.73		3.23		3.60	2.77	3.03
La Mare, R1	3.11	3.17	3.18		2.57		2.69	3.15	2.94
Pongola, P	2.62	2.20	2.11	2.34		1.95		2.31	2.24
<i>Pongola, R1</i>	3.38	2.25	2.61	2.26		2.29		2.75	2.56
Belle Glade, P	2.60	3.43	3.82	2.56	2.81		3.32	3.28	3.09
Belle Glade, R1	3.35	3.48	4.28	1.70	2.57		3.20	3.70	3.10
<i>Chiredzi, P</i>	6.21	3.65	3.13		2.10	14.46		4.33	5.91
Chiredzi, R1									
All non-stressed	2.92	3.07	3.34	2.20	2.65	1.95	3.07	3.11	2.74
All stressed	4.06	2.95	2.83	2.26	2.67	8.38	3.60	3.28	3.82
All	3.41	3.02	3.12	2.21	2.66	6.23	3.20	3.18	3.26

<sup>1</sup>Low confidence in estimates

<sup>1</sup>HoCP96-540 was defoliated by rabbits at Pongola, leading to lower FiPAR% values than otherwise possible.