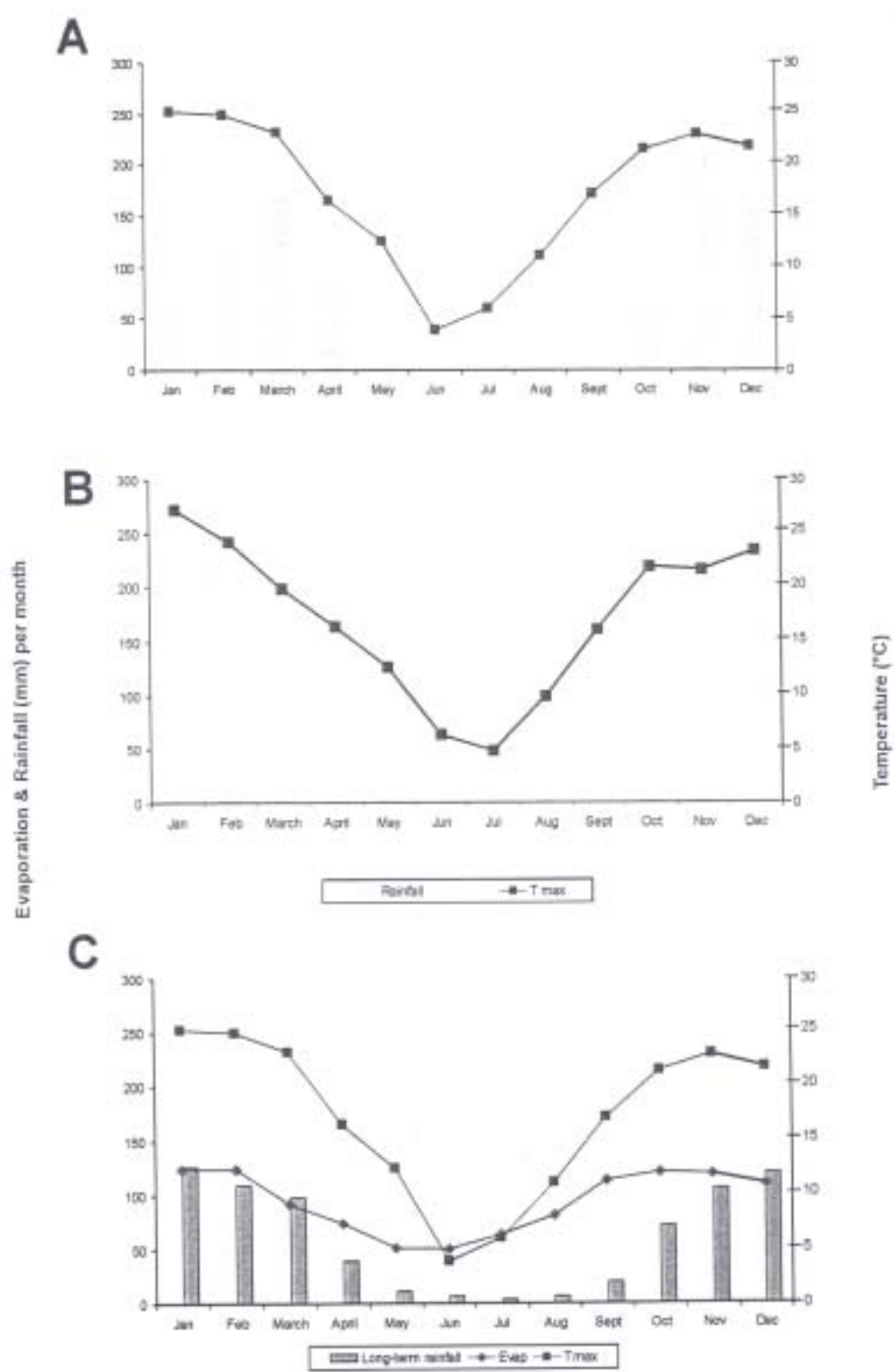


**APPENDIX**

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<b>FIGURE 9.A1</b>	Monthly meteorological data for 1995 (A), 1996 (B) and Long-term 1974 - 1996 (C) for Hatfield Experimental Farm, University of Pretoria (25° 45' S; 28° 16' E; altitude 1372 masl) showing mean max and min temperatures, evaporation and rainfall.
<b>TABLE 9.A2</b>	Grain yield, spike number, spikelets per spike, grains per spike, grain number, grain mass and grain nitrogen content of three South African spring wheat cultivars at six soil fertility regimes.
<b>TABLE 9.A3</b>	Grain yield and components of yield performance of four South African wheat cultivars at three soil fertility regimes
<b>TABLE 9.A4</b>	Effect of cultivar and soil fertility on biomass yield, harvest index and crop height at six soil fertility regimes at maturity.
<b>TABLE 9.A5</b>	Biomass yield, harvest index and final crop height of four South African wheat cultivars at three soil fertility regimes.
<b>TABLE 9.A6</b>	Interaction between cultivar and soil fertility on grain number per ear of first and second tillers (T <sub>1</sub> and T <sub>2</sub> ) of four South African wheat cultivars.
<b>TABLE 9.A7</b>	Interaction between cultivar and soil fertility on grain protein content of four South African wheat cultivars with respect to first and second tillers (T <sub>1</sub> and T <sub>2</sub> ).
<b>TABLE 9.A8</b>	Interaction between cultivar and soil fertility on grain protein content by floret position of four South African wheat cultivars.
<b>TABLE 9.A9.</b>	Comparison of effect of cultivar and soil fertility on nitrogen harvest index and grain protein content (%) of four South African wheat cultivars in 1995 and 1996.
<b>TABLE 9.A10</b>	Effect of soil fertility status on bread-making quality characteristics of two South African wheat cultivars.



**FIGURE 9.A1** Monthly meteorological data for 1995 (A), 1996 (B) and Long-term 1974-1996 (C) for Hatfield Experimental Farm (25°45'S; 28°16'E; altitude 1372 masl) showing mean max temperatures, evaporation and rainfall.

**Table 9.A2 Grain yield, spike number, spikelets per spike, grains per spike, grain number, grain mass and grain nitrogen content of three South African spring wheat cultivars at six soil fertility regimes.**

Treatment		Grain yield (kg ha <sup>-1</sup> )	Spikes (m <sup>-2</sup> )	Spikelets per spike	Grains per spike	Grain number (m <sup>-2</sup> )	1000 grain mass (g)	Grain N content (%)
<b>Cultivar<sup>(1)</sup></b>	<b>SST 86</b>	3373	339	17.1	27.4	10 042	35.2	2.42
	<b>Inia</b>	3742	403	16.9	23.5	10 462	35.9	2.38
	<b>Kariega</b>	4066	426	17.9	27.6	12 827	34.1	2.38
	<b>LSD<sub>T</sub></b>							
	<b>P ≤ 0.05</b>	466	62.1	1.2	4.1	1 302	1.5	0.08
<b>Fertility</b>	<b>NPKM</b>	6163	511	19.6	38.0	19 266	33.9	2.78
	<b>NPK</b>	5590	477	19.2	35.2	16 629	35.1	2.58
	<b>PK</b>	4896	394	18.9	31.8	12 424	39.5	2.16
	<b>NP</b>	3332	475	17.6	24.8	11 903	27.8	2.31
	<b>NK</b>	1300	260	14.7	13.7	3 523	36.6	2.39
	<b>O</b>	1081	219	13.0	13.6	2 918	37.4	2.13
	<b>LSD<sub>T</sub></b> <b>P ≤ 0.05</b>	1480	168	1.9	11.9	3 880	3.9	0.30
<b>CV %</b>	18.3	21.5	9.7	21.7	16.6	5.8	5.4	

Significant at the 0.05 level.

- (1) Data exclude the cultivar Carina which had missing values

**TABLE 9.A3 Grain yield and components of yield performance of four South African wheat cultivars at three soil fertility regimes**

Treatment		Grain yield	Spikes	Spikelets per	Grains	Grain	1000 grain	Grain N content
		(kg ha <sup>-1</sup> )	(m <sup>-2</sup> )	spike	per spike	number	mass	(%)
						(m <sup>-2</sup> )	(g)	
<b>Cultivar</b>	<b>SST 86</b>	3903	349	16.9	29.3	11650	36.2	2.47
	<b>Inia</b>	4484	403	16.7	27.6	12342	36.9	2.53
	<b>Kariega</b>	4447	454	18.2	29.9	14821	33.4	2.49
	<b>Carina<sup>1</sup></b>	6343	508	20.1	42.8	23956	27.4	3.58
	<b>LSD<sub>T</sub></b>							
	<b>P ≤ 0.05</b>	1031	100	2.0	10.5	3587	2.1	0.98
<b>Fertility</b>	<b>NPKM</b>	6801	546	20.2	41.3	23269	31.8	3.00
	<b>NPK</b>	6253	496	19.5	40.2	19838	33.3	2.84
	<b>‘O’ Control</b>	1330	244	14.2	15.7	3970	35.4	2.46
	<b>LSD<sub>T</sub></b>							
	<b>P ≤ 0.05</b>	1392	149	1.9	9.2	2474	1.5	0.11
<b>CV %</b>		20.0	22.6	9.4	26.9	17.9	4.9	26.5

Significant at the 0.05 level.

<sup>(1)</sup> Yield data for Carina was obtained for the treatments NPKM, NPK and ‘O’ only.

**TABLE 9.A4 Effect of cultivar and soil fertility on biomass yield, harvest index and crop height at six soil fertility regimes at maturity**

Treatment		Biomass (t ha <sup>-1</sup> )	Harvest index	Crop height (mm)
<b>Cultivar</b>	<b>SST 86</b>	8.3	0.33	674
	<b>Inia</b>	9.9	0.29	903
	<b>Kariega</b>	11.1	0.32	855
	<b>LSD<sub>T</sub></b>			
	<b>P ≤ 0.05</b>	1.1	0.03	63.9
<b>Fertility</b> <sup>(1)</sup>	<b>NPKM</b>	15.5	0.37	950
	<b>NPK</b>	13.8	0.36	919
	<b>PK</b>	12.0	0.37	886
	<b>NP</b>	9.1	0.32	736
	<b>NK</b>	4.2	0.26	692
	<b>'O' Control</b>	3.9	0.22	682
	<b>LSD<sub>T</sub></b>			
<b>P ≤ 0.05</b>	3.3	0.11	75.6	
<b>CV %</b>	16.3	9.9	6.1	

Significant at the 0.05 level.

<sup>(1)</sup> Fertility data excludes Carina.

**TABLE 9.A5 Biomass yield, harvest index and final crop height of four South African wheat cultivars at three soil fertility regimes**

Treatment		Biomass (t ha <sup>-1</sup> )	Harvest index	Crop height (mm)
<b>Cultivar<sup>(1)</sup></b>	<b>SST 86</b>	9.4	0.33	709
	<b>Inia</b>	11.4	0.29	943
	<b>Kariega</b>	12.3	0.32	900
	<b>Carina</b>	15.0	0.36	1018
	<b>LSD<sub>T</sub></b>			
	<b>P ≤ 0.05</b>	1.5	0.01	64.0
<b>Fertility</b>	<b>NPKM</b>	15.5	0.37	950
	<b>NPK</b>	13.8	0.35	919
	<b>'O' Control</b>	4.3	0.25	729
	<b>LSD<sub>T</sub></b>			
	<b>P ≤ 0.05</b>	1.6	0.04	516
<b>CV %</b>		11.1	15.4	5.2

Significant at the 0.05 level

<sup>(1)</sup> Cultivar data based on treatments NPKM, NPK and '0' only.

**TABLE 9.A6 Interaction between cultivar and soil fertility on grain number per ear of first and second tillers (T<sub>1</sub> and T<sub>2</sub>) of four South African wheat cultivars****(a) First tiller (T<sub>1</sub>)**

Treatment		GRAINS PER EAR			
		CULTIVAR			
		SST 86	Inia	Kariega	Carina
Fertility	NPKM	30.8a	17.4a	34.4a	25.3a
	NPK	32.6a	33.3b	28.9a	38.8a
	LSD <sub>T</sub> P ≤ 0.05			14.5	
CV (%)				12.9	

**(b) Second tiller (T<sub>2</sub>)**

Treatment		GRAINS PER EAR			
		CULTIVAR			
		SST 86	Inia	Kariega	Carina
Fertility	NPKM	22.6a	3.4a	17.4a	13.9a
	NPK	14.4a	15.6b	16.4a	18.8a
	LSD <sub>T</sub> P ≤ 0.05			12.9	
CV (%)				22.4	

Significant at the P ≤ 0.05 level.

**TABLE 9.A7 Interaction between cultivar and soil fertility on grain protein content of four South African wheat cultivars with respect to first and second tillers (T<sub>1</sub> and T<sub>2</sub>)****(c) First tiller (T<sub>1</sub>)**

Treatment		GRAIN PROTEIN CONTENT (%)			
		CULTIVAR			
		SST 86	Inia	Kariega	Carina
Fertility	NPKM	15.5a	14.3a	14.5a	14.5a
	NPK	15.0a	15.1a	16.7b	15.4a
	LSD <sub>T</sub> P ≤ 0.05			2.2	
CV (%)				6.9	

**(d) Second tiller (T<sub>2</sub>)**

Treatment		GRAIN PROTEIN CONTENT (%)			
		CULTIVAR			
		SST 86	Inia	Kariega	Carina
Fertility	NPKM	14.1a	14.1a	15.4a	14.6a
	NPK	17.6b	15.1a	16.9b	15.4a
	LSD <sub>T</sub> P ≤ 0.05			1.49	
CV (%)				3.9	

Significant at the P ≤ 0.05 level.



**TABLE 9.A8 Interaction between cultivar and soil fertility on grain protein content by floret position of four South African wheat cultivars**

Treatment		GRAIN PROTEIN CONTENT (%)			
		CULTIVAR			
		SST 86	Inia	Kariega	Carina
Fertility	NPKM	14.5a	13.7a	12.9a	15.4b
	NPK	13.9a	14.5b	15.7b	14.3a
LSD <sub>T</sub>				0.69	
P ≤ 0.05					
CV (%)				5.3	

Significant at the P ≤ 0.05 level.

**TABLE 9.A9 Comparison of effect of cultivar and soil fertility on nitrogen harvest index and grain protein content (%) of four South African wheat cultivars between 1995 and 1996.**

Treatment		1995 <sup>1</sup>		1996 <sup>2</sup>	
		NHI	GPC (%)	NHI	GPC (%)
Cultivar	SST 86	0.77a	12.0a	0.73a	13.7a
	Inia	0.78a	11.5a	0.85b	13.5a
	Kariega	0.79a	11.6a	0.79a	13.5a
	Carina	0.81b	13.1b		14.4b
Fertility	NPKM	0.73a	13.8d		
	NPK	0.78a	13.3d	0.78a	12.5c
	PK	0.83b	9.7a	0.83b	9.4a
	NP	0.76a	10.9b	0.76a	10.0b
	NK	0.75a	11.9c	0.75a	11.4b
	'O' Control	0.84b	10.4b		
Mean		0.78	11.7	0.78	10.8
CV %		5.3	5.7	4.9	6.6

Means within the columns followed by the same letter are not significantly different according to Fischer's test (P ≤ 0.05).

<sup>1</sup> Fertility data excludes Carina.

<sup>2</sup> Cultivar data based on treatments NPK, PK, NP and NK only.

**TABLE 9.A10** Effect of soil fertility status on bread-making quality characteristics of two South African wheat cultivars

Treatment		Loaf volume <sup>2</sup> (cm <sup>3</sup> )	Mixograph peak water absorption (%)	Mixograph peak time (min)	Dough characteristics
NPK <sup>3</sup>	Inia	950	63.4	3.4	Normal
	Kariega	1025	63.2	3.6	Normal
	Mean	988c*	63.3b	3.5a	
PK	Inia	880	63.0	3.8	Normal
	Kariega	880	59.4	3.7	Normal
	Mean	880a	61.2a	3.8b	
NP	Inia	920	61.7	3.5	Normal
	Kariega	1040	62.7	3.7	Normal
	Mean	980c	62.2ab	3.6ab	
NK	Inia	890	61.8	4.0	Normal
	Kariega	980	63.4b	3.6	Normal
<b>Mean</b>		935b	62.6b	3.8b	
<b>CV %</b>		1.3	1.5	3.5	

\* Significant at the  $P \leq 0.05$  level.