APPENDICES

Meteorological Data

Peechelba East, Victoria

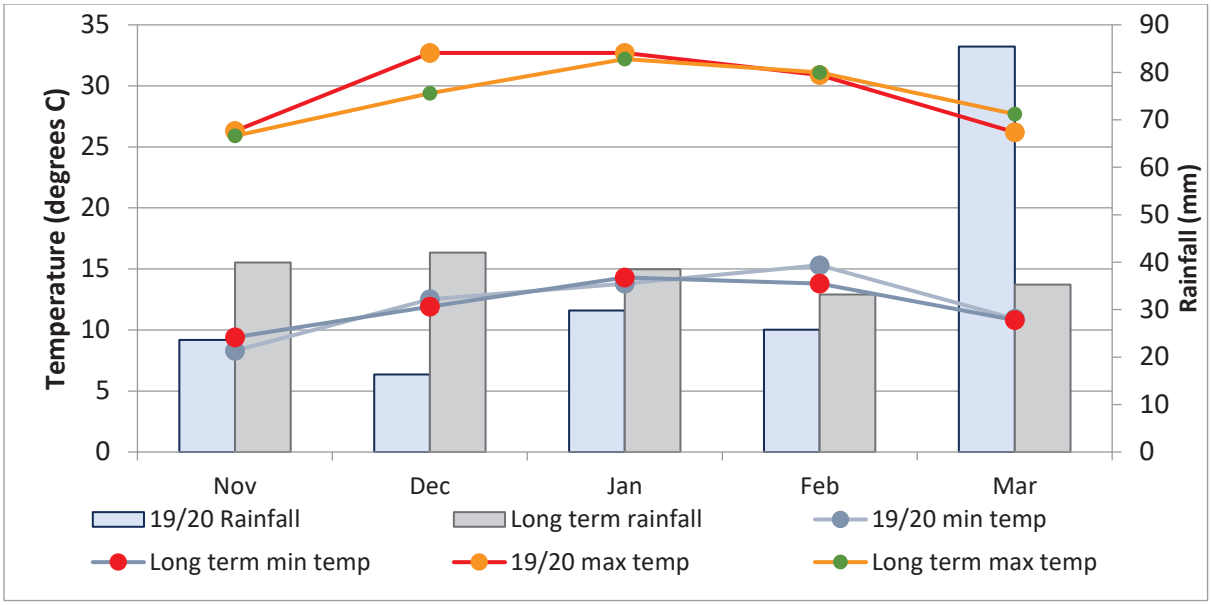

Figure 1. 2019/2020 growing season rainfall and long-term rainfall (1930-2020) (recorded at Peechelba East), 2019/2020 min and max temperatures and long-term min and max temperatures recorded at Wangaratta (1987-2020) for the growing season (November-March).

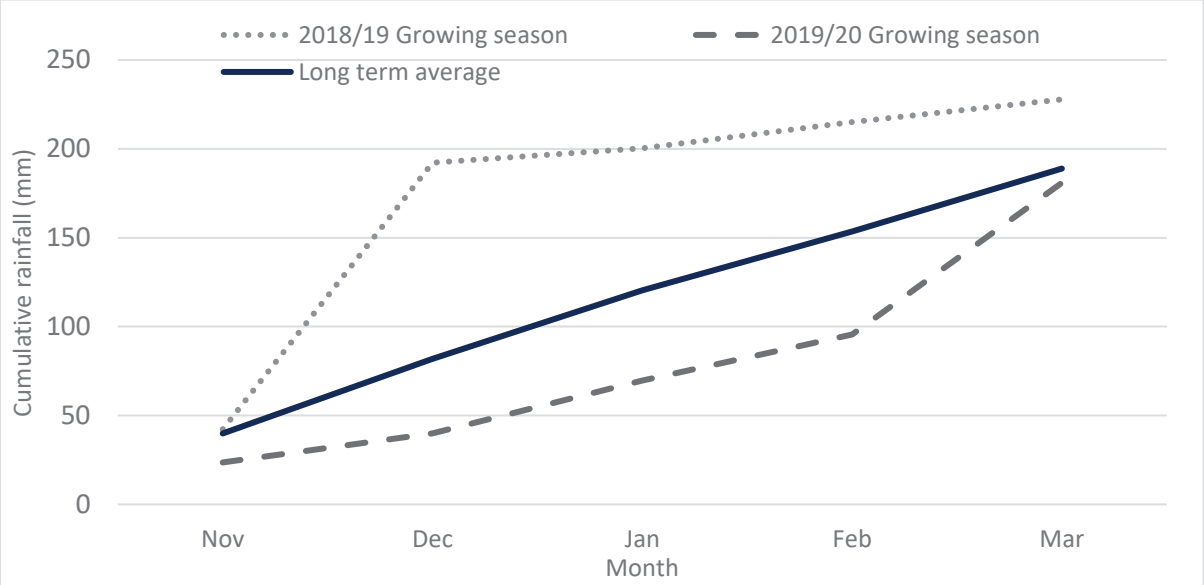

Figure 2. Cumulative growing season rainfall for 2018/2019, 2019/2020 and the long-term average for the growing season (November-March).

Hopefield, NSW

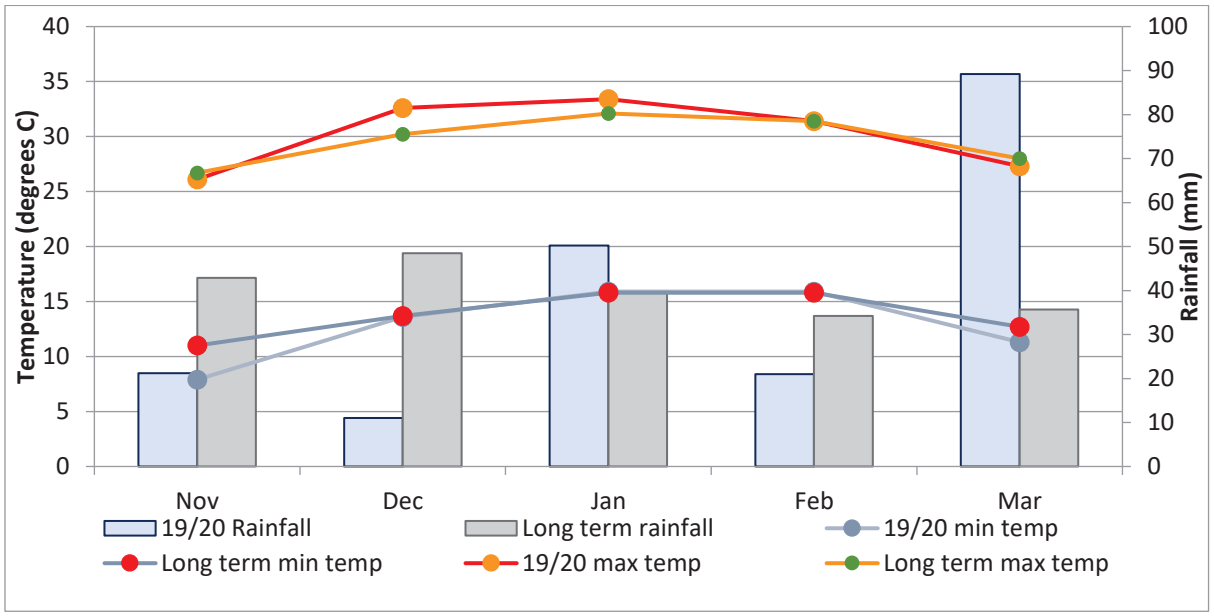

Figure 3. 2019/2020 growing season rainfall and long-term rainfall (1929-2020) (recorded at Hopefield, NSW), 2019/2020 min and max temperatures and long-term min and max temperatures recorded at Corowa, NSW (1890-2020) for the growing season (November-March).

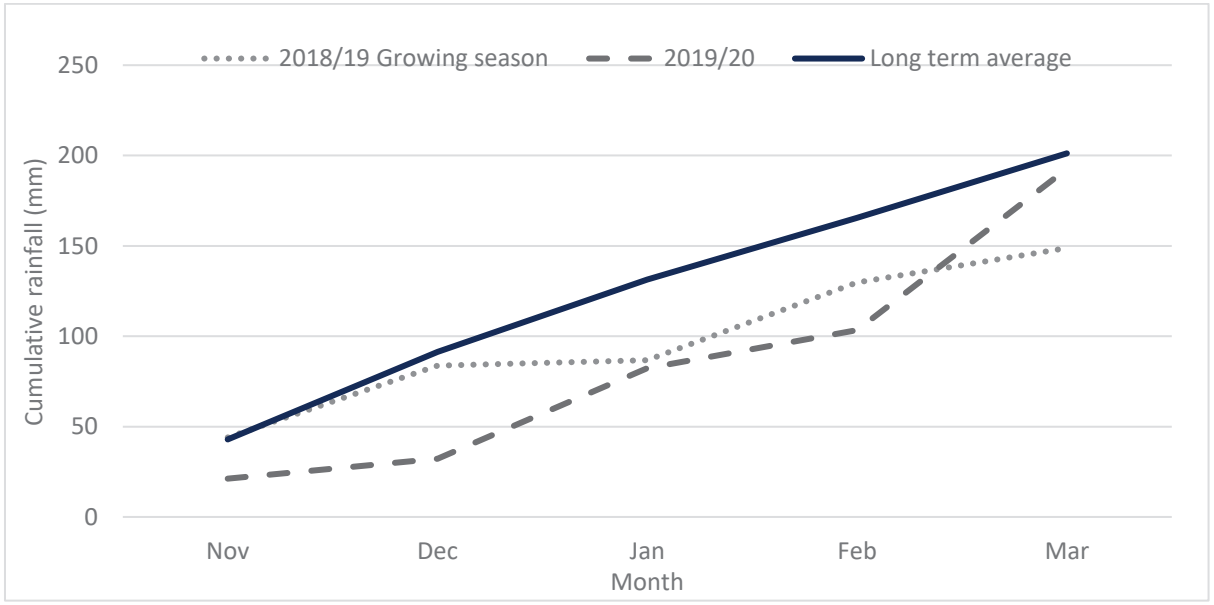

Figure 4. Cumulative growing season rainfall for 2018/2019, 2019/2020 and the long-term average for the growing season (November-March).

Boort, Victoria

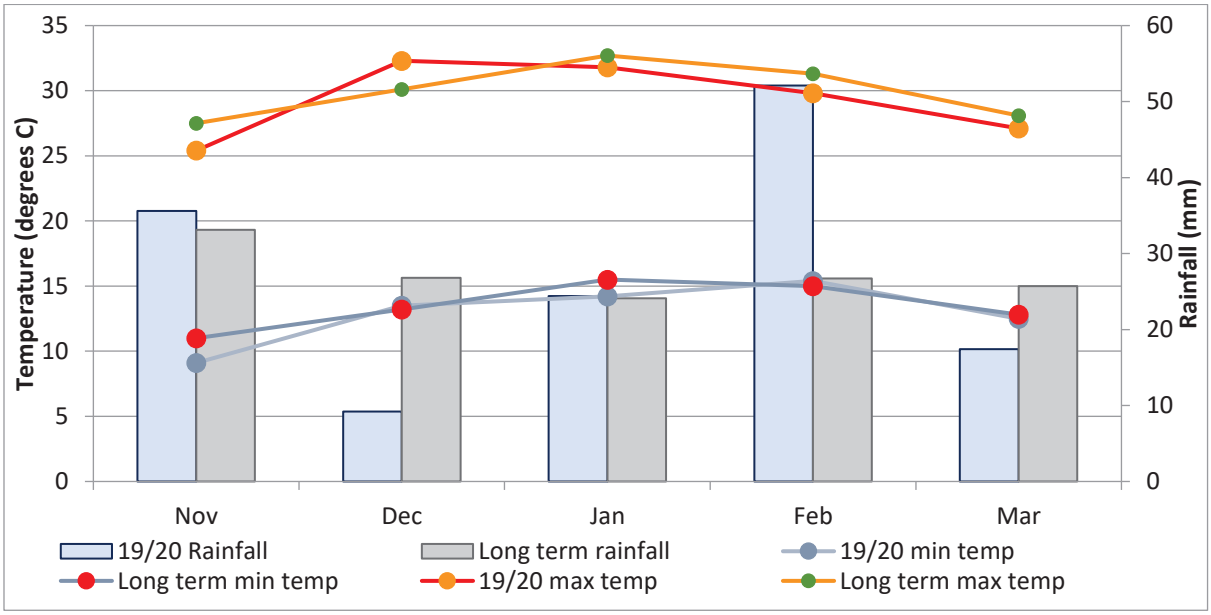

Figure 5. 2019/2020 growing season rainfall and long-term rainfall (1881-2020) (recorded at Boort, VIC), 2019/2020 min and max temperatures and long-term min and max temperatures recorded at Charlton (2004-2020) for the growing season (November-March).

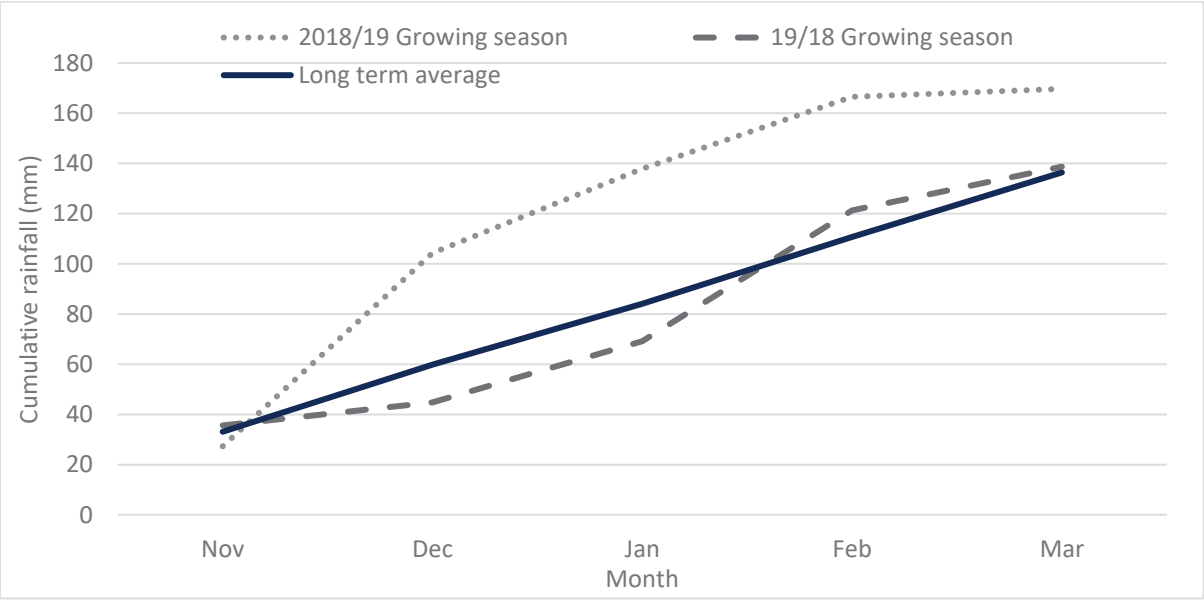

Figure 6. Cumulative growing season rainfall for 2018/2019, 2019/2020 and the long-term average for the growing season (November-March).

Kerang, Victoria

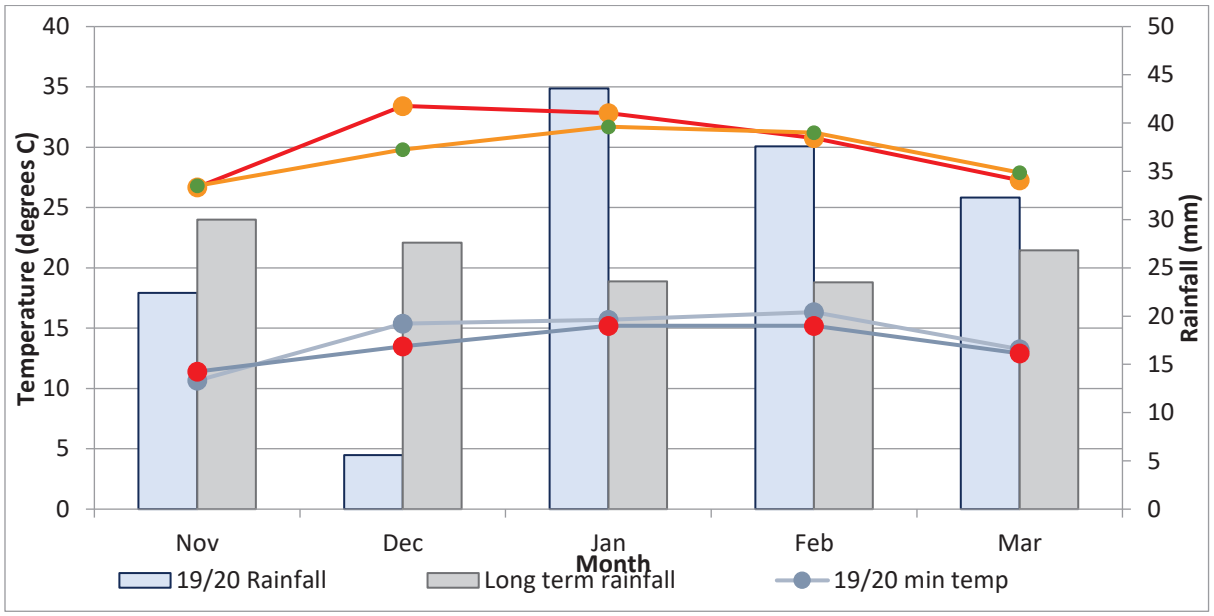

Figure 7. 2019/2020 growing season rainfall and long-term rainfall (1881-2020) (recorded at Kerang, VIC), 2019/2020 min and max temperatures and long-term min and max temperatures recorded at Kerang (1910-2020) for the growing season (November-March).

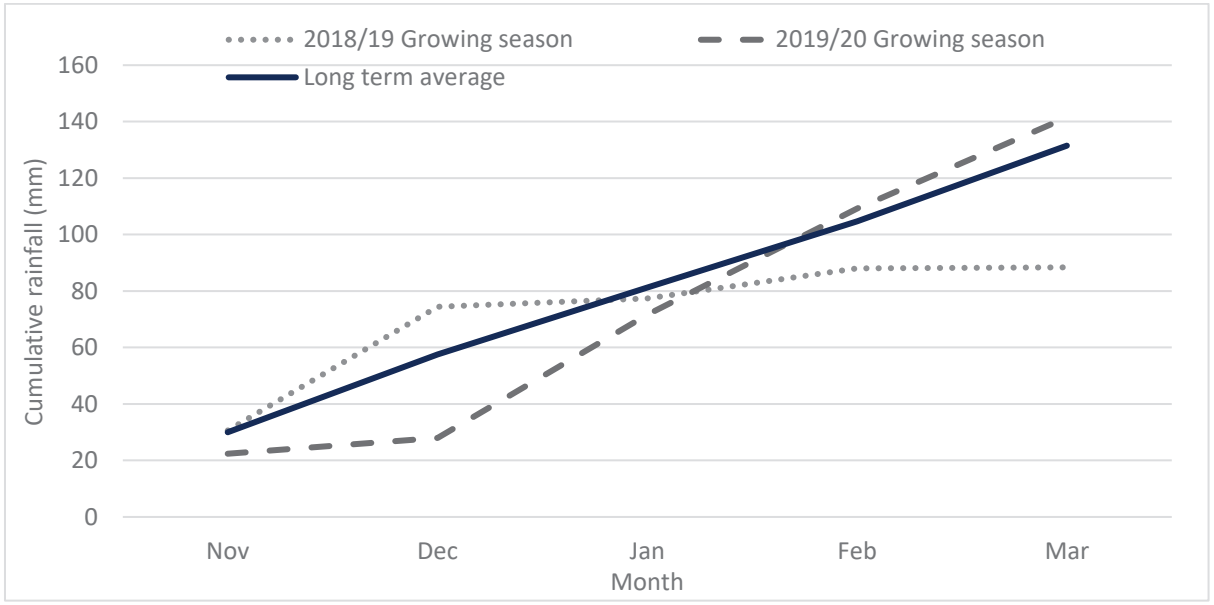

Figure 8. Cumulative growing season rainfall for 2018/2019, 2019/2020 and the long-term average for the growing season (November-March).

Yenda, NSW

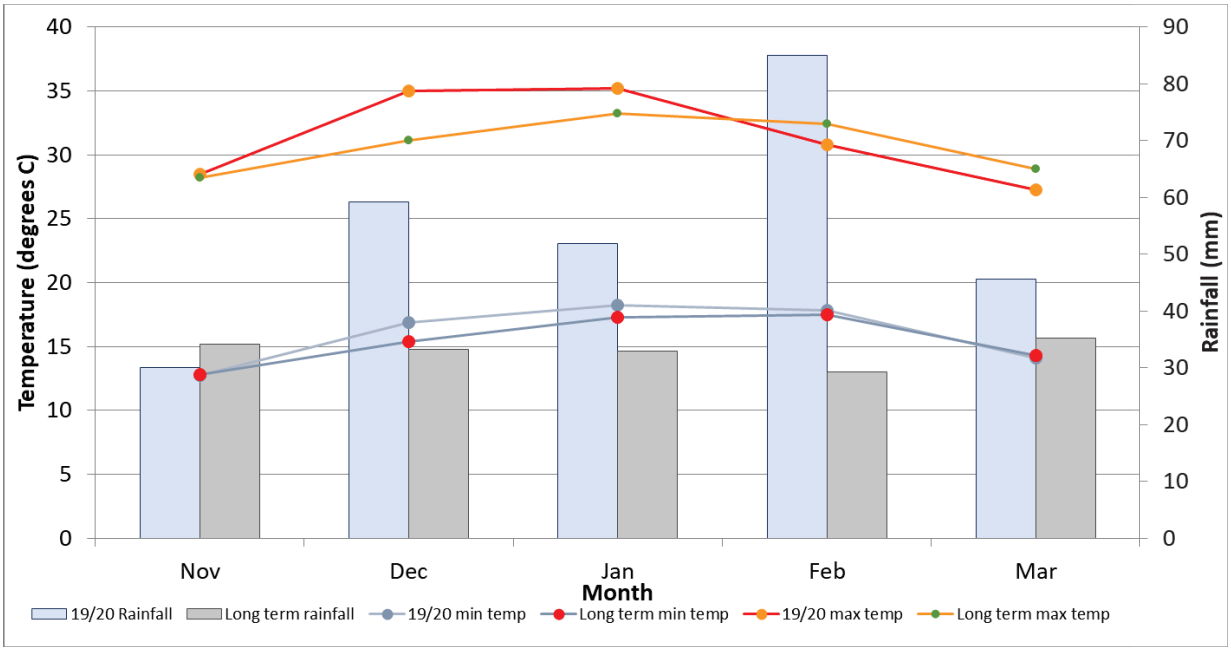

Figure 9. 2019/2020 growing season rainfall and long-term rainfall (1925-2020) (recorded at Yenda, NSW), 2019/2020 min and max temperatures and long-term min and max temperatures recorded at Griffith (1958-2020) for the growing season (November-March).

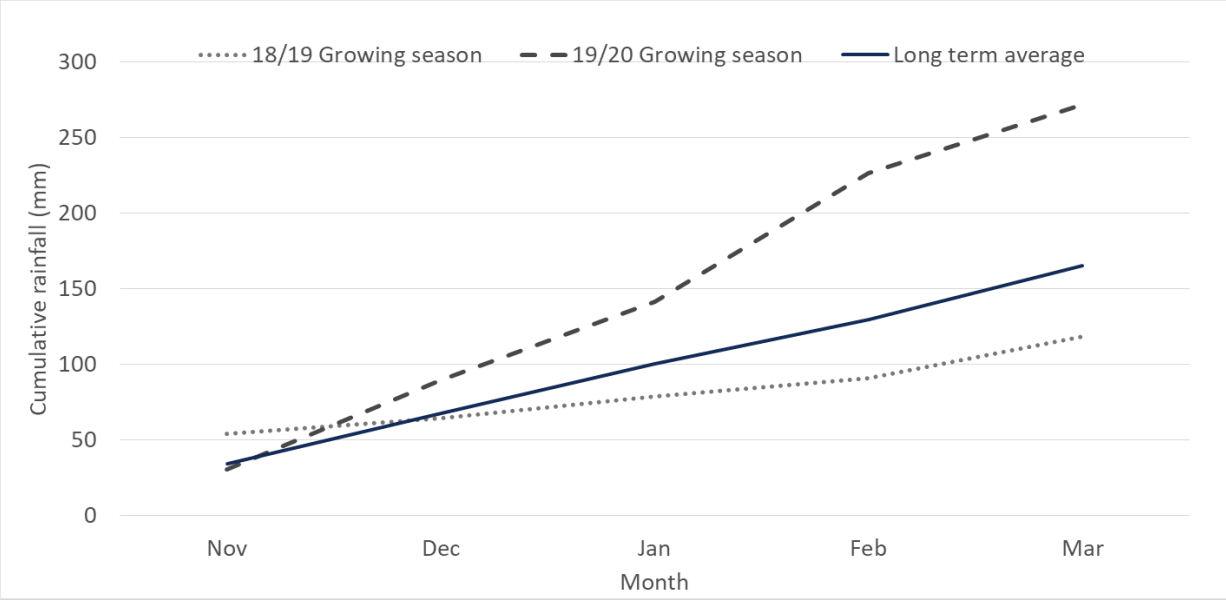

Figure 10. Cumulative growing season rainfall for 2018/2019, 2019/2020 and the long-term average for the growing season (November-March).

Site Details

Peechelba East, Victoria

Paddock and Irrigation records

GPS Location	-36.169247, 146.271604	**Irrigation Type**	Overhead pivot
Sown	13-Nov-19	**Frequency and Rate**	Daily 7 or 14mm
Hybrid	Pioneer 1756	**First Applied**	15-Nov-19
Harvested	31-May-20	**Last Application**	25-Mar-20
Soil Type	Red loam over clay	**Total Water applied**	6.08 ML/ha
Previous Crop	Oaten hay		

Crop Nutrition

Date	Product	Rate	Placement	Crop Stage
11-Nov-19	Urea	400 kg/ha	Spread	Pre-Plant
11-Nov-19	Gypsum	2.2 t/ha	Spread	Pre-Plant
11-Nov-19	Potash	300 kg/ha	Spread	Pre-Plant
13-Nov-19	1% Zinc	250 kg/ha	With Seed	Pre-Plant
13-Nov-19	Cotton Starter	30 L/ha	With Seed	Pre-Plant
10-Dec-19	Urea	100 kg/ha	Fertigation	V6
26-Dec-19	Urea	130 kg/ha	Fertigation	V10
26-Dec-19	Molybdenum Mix	250 ml/ha	Fertigation	V10
11-Jan-20	SL Tec TE8	4 L/ha	Foliar Spray	V14
14-Jan-20	Urea	110 kg/ha	Fertigation	V16
15-Jan-20	Urea	110 kg/ha	Fertigation	V16

Crop Protection

Date	Product	Rate	Placement	Crop Stage
14-Nov-19	Dual Gold	2 L/ha	Foliar Spray	Post sow - Pre-Emergence
14-Nov-19	Atrazine	2.5 L/ha	Foliar Spray	Post sow – Pre-Emergence
14-Nov-19	Lorsban	0.8 L/ha	Foliar Spray	Post sow – Pre-Emergence
14-Nov-19	Glyphosate	2 L/ha	Foliar Spray	Post sow - Pre Emergence
11-Jan-20	Abamectin	1 L/ha	Foliar Spray	V14
11-Jan-20	Trojan		Foliar Spray	V14
13-Jan-20	Gemstar	500 ml/ha	Foliar Spray	V15

Hopefield, NSW

Paddock and Irrigation

GPS Location	-35.944516, 146.478170	**Irrigation Type**	Overhead pivot
Sown	2-Dec-19	**Frequency and Rate**	Daily -10mm
Hybrid	Pioneer 1756	**First Applied**	2-Dec-19
Harvested	27-May-20	**Last Application**	28-Mar-20
Soil Type	Red loam over clay	**Total Water applied**	6.88 ML/ha
Previous Crop	Wheaten Hay		

Crop Nutrition

Date	Product	Rate	Placement	Crop Stage
15-Nov-19	Gypsum	2.5 t/ha	Broadcast	Pre-Sow
2-Dec-19	MAP	230 kg/ha	Beneath seed	Pre-Plant
2-Dec-19	Urea	200 kg/ha	Beneath seed	Pre-Plant
2-Dec-19	Corn Popup	30 L/ha	With seed	Planting
2-Dec-19	UAN	230 L/ha	Surface Spray	Planting
5-Jan-20	Urea	600 kg/ha	Broadcast	6 Leaf

Crop Protection

Date	Product	Rate	Placement	Crop Stage
25-Nov-19	Sakura	118 g/ha	Surface Spray	Pre-Plant
25-Nov-19	Atrazine	2.5 kg/ha	Surface Spray	Pre-Plant
25-Nov-19	Dual	1.85 L/ha	Surface Spray	Pre-Plant
25-Nov-19	Lorsban	0.8 L/ha	Surface Spray	Pre-Plant
25-Feb-20	Abermectin	1 L/ha	Aerial Foliar Spray	Tasselling

Kerang, Victoria

Paddock and Irrigation

GPS Location	-35.706588 143.812190	**Irrigation Type**	Border check
Sown	30-Oct-2019	**Frequency and Rate**	7 days 0.7Ml/ha
Hybrid	Pioneer 1756	**First Applied**	4-Nov-2019
Harvested	21-April-20	**Last Application**	26-Feb-20
Soil Type	SM grey clay	**Total Water applied**	9.8 ML/ha
Previous Crop	Grass pasture		

Crop Nutrition

Date	Product	Rate	Placement	Crop Stage
16-Oct-19	Superfect	650 kg/ha	Spread	Pre-Plant
16-Oct-19	Gypsum	2.5 t/ha	Spread	Pre-Plant
30-Oct-19	Urea	325 kg/ha	Pre-drilled	Pre-Plant
17-Dec-19	Urea	325 kg/ha	Spread	V8

Crop Protection

Date	Product	Rate	Placement	Crop Stage
19-Nov-19	Atrazine	1.1 kg/ha	Foliar Spray	V2
7-Dec-19	Starane	0.6 l/ha	Foliar Spray	V6
14-Feb-20	Astound Duo	0.4 l/ha	Foliar Spray	Post silking

Yenda, NSW

Paddock and Irrigation

GPS Location	-34.323874, 146.316022	**Irrigation Type**	Beds in bays
Sown	1-Oct-19	**Frequency and Rate**	7 days, 0.6 ML/ha
Hybrid	Pioneer 1756	**First Applied**	1-Oct-19
Harvested	1-April-20	**Last Application**	18-Feb-20
Soil Type	Red Brown Earth	**Total Water applied**	9.1 ML/ha
Previous Crop	Cotton 2018/19, winter fallow		

Crop Nutrition

Date	Product	Rate	Placement	Crop Stage
15-Sept-19	GranulocZ	350 kg/ha	Drilled	Pre-Plant
15-Sept-19	Urea	325 kg/ha	Drilled	Pre-Plant
23-Nov-19	Urea	115 kg/ha	Water run	V4
6-Dec-19	Urea	115 kg/ha	Water run	V6
16-Dec-19	Urea	115 kg/ha	Water run	V8

Crop Protection

Date	Product	Rate	Placement	Crop Stage
2-Nov-19	Atrazine	2.0 L/ha	Foliar Spray	V3

Soil Test Reports

Peechelba East, Victoria (0 – 30cm)

Analyte	Units	Result	Optimal Range	Status
pH (H_2O)	(pH)	6.599	6 - 7	Slightly Acidic
pH ($CaCl_2$)	(pH)	5.716	5.4 - 6.5	Slightly Acidic
EC*	dS/m	0.067	0 - 0.15	Satisfactory
Lime requirement	t/ha			
ESI	units	0.011	value >0.05	Low
Total Carbon*	%	1		
Total Nitrogen	%	0.113		
Carbon: Nitrogen Ratio	(ratio)	8.92		
Organic Matter	%	1.5	3.25 - 5.2	Very Low
M3 PSR	(ratio)	0.17	0.06 - 0.23	Satisfactory
Mehlich Phosphorus	ppm	123.45	40 - 90	Very High
Potassium	ppm	114.85	195 - 320	Low
Sulphur	ppm	11.77	12 - 45	Low
Calcium	ppm	713.31	1300 - 2200	Low
Magnesium	ppm	196.71	165 - 330	Satisfactory
Sodium	ppm	88.13	16 - 63	Very High
Chloride	ppm	16.7	0 - 200	Satisfactory
Zinc	ppm	7.07	1.6 - 8	Satisfactory
Copper	ppm	2.02	2.5 - 10	Low
Boron	ppm	0.52	1.7 - 4	Very Low
Manganese	ppm	164.11	18 - 70	Very High
Iron	ppm	92.41	30 - 200	Satisfactory
CECe	meq/100g	7.1		
Calcium	meq/100g	3.6 (50.7%CEC)	6.5 - 11.0	Low
Potassium	meq/100g	0.3 (4.2%CEC)	0.5 - 0.8	Low
Magnesium	meq/100g	1.6 (22.5%CEC)	1.4 - 2.7	Satisfactory
Sodium	meq/100g	0.4 (5.6%CEC)	0.1 - 0.3	High
Base Saturation	%	83	80 - 87	Satisfactory
Exchangeable Acidity	meq/100g	1.2 (17.0%CEC)	13 - 20 %CEC	Satisfactory
Aluminium Saturation	%			
Ca:Mg Ratio	(ratio)	2.25	3 - 5	Low
K:Mg Ratio	(ratio)	0.187	0.3 - 0.5	Low

Kerang & Yenda

Site		Yenda Fungicide	Yenda KUE	Kerang KUE	Kerang R SpxPop	Kerang NUE	Kerang Fungicide
Depth	cm	0-10	0-10	0-10	0-10	0-10	0-10
Colour		DKBR	DKBR	DKGR	DKGR	DKGR	DKGR
Gravel	%	0	0	0	0	0	0
Texture		3.0	3.0	2.5	2.5	2.5	2.5
Ammomiun N	mg/kg	6	5	4	4	3	4
Nitrate N	mg/kg	44	49	2	1	4	1
Phosphorus Colwell	mg/kg	42	46	98	108	78	82
Potassium Colwell	mg/kg	634	577	675	725	813	705
Sulfur	mg/kg	38.6	49.9	21.8	19.4	16.1	10.4
Organic Carbon	%	1.10	.98	1.19	1.66	1.38	1.20
Conductivity	dS/m	0.230	.252	0.284	0.192	0.220	0.228
pH ($CaCl_2$)		6.2	5.8	6.9	7.0	7.5	7.5
pH (water)		6.7	6.5	7.8	7.9	8.3	8.4
DTPA Copper	mg/kg	2.23	2.17	1.93	1.85	1.89	1.83
DTPA Iron	mg/kg	77.10	83.30	31.30	30.50	26.80	29.90
DTPA Manganese	mg/kg	23.70	26.33	17.01	15.41	11.32	9.36
DTPA Zinc	mg/kg	1.76	1.79	1.20	1.42	0.93	1.13
Exch Aluminium	meq/100g	0.050	0.050	0.060	0.060	0.060	0.050
Exch Calcium	meq/100g	14.80	11.13	16.62	16.79	15.75	17.75
Exch Magnesium	meq/100g	9.21	7.21	8.87	8.08	8.28	8.83
Exch Potassium	meq/100g	2.03	1.47	2.10	2.06	2.21	2.04
Exch Sodium	meq/100g	0.71	0.65	1.43	1.11	1.41	1.31
Nitrate 0-30 cm	mg/kg	28	32	3	2	3	2
Ammonium 0-30 cm	mg/kg	6	7	4	5	5	4
Nitrate 30-60 cm	mg/kg	21	19	1	1	1	1
Ammonium 30-60 cm	mg/kg	6	6	3	4	3	3
Nitrate 60-90 cm	mg/kg	13	32	1	1	1	1
Ammonium 60-90 cm	mg/kg	6	6	4	3	3	3

Site Photos

Boort, Victoria – 19 December 2019

Yenda, NSW - 23 November 2019

Kerang, Victoria – 23 December 2019

Hopefield, NSW – 24 January 2020

Peechelba East, Victoria -17 December 2019