

LOXTON, South Australia

Low Rainfall Zone, South Australian Mallee

GPS 34°25'48.46"S, 141°27'56.49"E

Seasonal Snapshot

Growth and production of pulse crops at the Loxton pulse validation site in 2018 was restricted by a late break, low soil moisture availability and frost. Just 107 mm of rainfall was received during the growing season (April – October) which is 40 percent less than the long-term average (**Figure 1**). There was also a delayed start to the season with just 14 mm rainfall received from January – April. The first significant rainfall event occurred over the 8-9th June with 14 mm falling over these two days. Dry conditions and delayed seeding resulted in significant erosion at the site on the deep sands which severely impacted crop establishment and growth on the sandy soil types at the site (**Figure 3**).

Pulse crops were subject to terminal drought with just 12 mm of rainfall recorded throughout September and October. Frost events were also frequent at the site with 13 days with a minimum temperature of below 0°C recorded in September (**Figure 2**). Frosts on the 28th and 29th of September appeared to have had a detrimental effect on lentils and field peas. Biotic stresses did not impact pulse crops at the site in 2018 as pressure from the major pulse crop diseases was negligible.

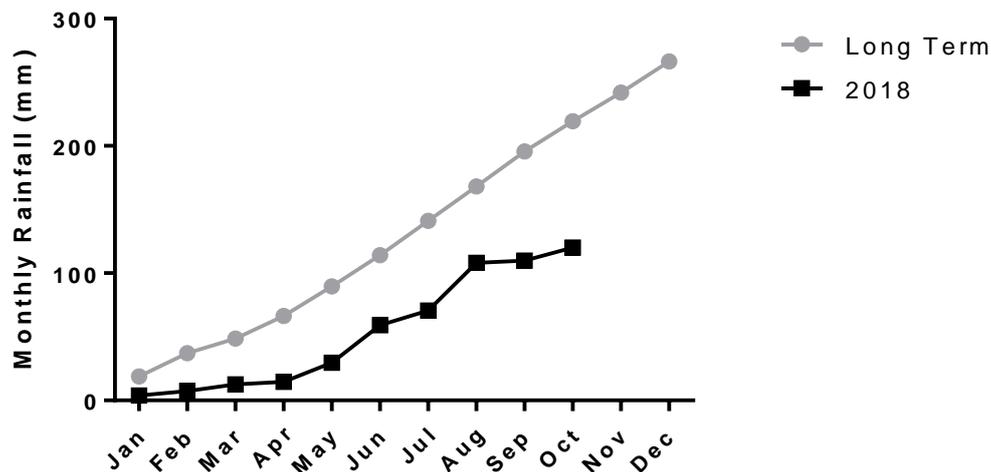


Figure 1. Cumulative rainfall in 2018 compared to the long-term average at the Loxton pulse validation site.

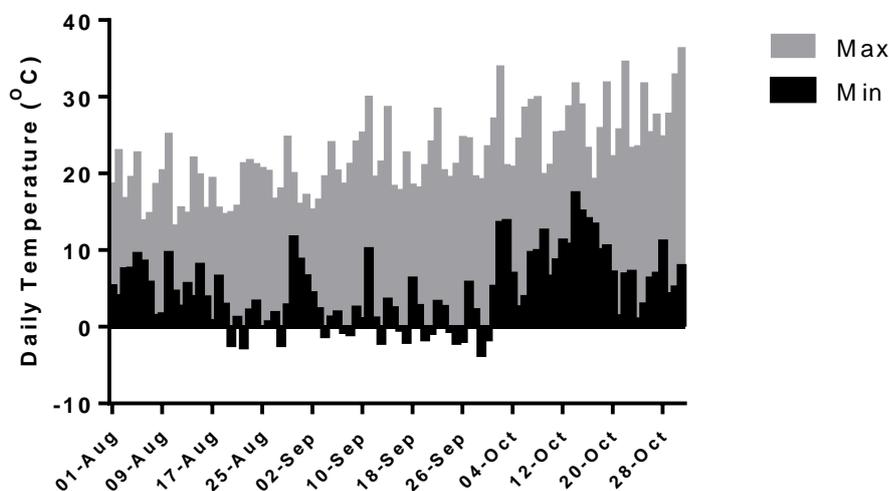


Figure 2. Daily minimum and maximum temperature measured between August and October at the Loxton pulse validation site in 2018.



Figure 3. Erosion which occurred post sowing on the sandy soil types at the Loxton pulse validation site in 2018.

Soil Characterisation

The 2018 Loxton pulse validation was located in the South Australian Mallee approximately 5 km south of Loxton. Trials at the site were located on three key soil types which were broadly identified as the flat (lower slope/swale of dune), midslope and sand dune. Key soil properties for each of the soils are described in **Table 1**, **Table 2** and **Table 3**.

Table 1. Soil properties for the flat site at the Loxton pulse validation site in 2018.

Depth (cm)	NO ₃ -N (mg/kg)	NH ₄ -N (mg/kg)	P (mg/kg)	K (mg/kg)	S (mg/kg)	OC (%)	EC (dS/m)	pH (CaCl ₂)	pH (H ₂ O)
0-10	15	1.1	23	270	8.8	0.46	0.16	7.2	7.7
10-40	2.6	≤1			8.3		0.4	8.5	9.8
40-70	4.9	≤1			7.9		0.12	8.0	8.7
70-100	2.6	≤1			15		0.58	9.1	9.9

Table 2. Soil properties on the mid-slope site at the Loxton pulse validation site in 2018.

Depth (cm)	NO ₃ -N (mg/kg)	NH ₄ -N (mg/kg)	P (mg/kg)	K (mg/kg)	S (mg/kg)	OC (%)	EC (dS/m)	pH (CaCl ₂)	pH (H ₂ O)
0-10	6.2	1.9	24	140	7.7	0.33	0.11	7.3	8.0
10-40	2	3.7			4.5		0.068	7.8	8.6
40-70	2.5	≤1			7.5		0.24	8.5	9.6
70-100	2.5	≤1			9		0.44	8.6	9.9

Table 3. Soil properties for the sand dune site at the Loxton pulse validation site in 2018.

Depth (cm)	NO ₃ -N (mg/kg)	NH ₃ -N (mg/kg)	P (mg/kg)	K (mg/kg)	S (mg/kg)	OC (%)	EC (dS/m)	pH (CaCl ₂)	pH (H ₂ O)
0-10	8.5	1.7	35	98	5.8	0.34	0.042	6.09	7.1
10-40	3.1	≤1			4.7		0.049	7.42	8.1
40-70	1.2	≤1			4.3		0.059	8.25	8.95
70-100	≤1	≤1			3.2		0.059	8.34	9.08