The 2019 season at Hart

The Mid-North had a dry start to seeding and Hart was no exception. With well below average summer rainfall (Figure 1) this also meant there was limited stored moisture available (Figure 2) going into the season.

Trial seeding commenced on the March 18, well before our traditional sowing window and the final trials were sown June 5. Trial plots sown prior to the beginning of May were irrigated to achieve germination and establishment.

The majority of Hart's research program was sown in mid-May. The site received less than average rainfall during April, with 8 mm. A total of 41 mm was captured throughout May which improved seed bed moisture and reduced moisture stress in early sown trials.

June was the only month where Hart received above average monthly rainfall of 56 mm (Figure 1). This was followed by well below average rainfall for July, August, September and October. By the end of October Hart's growing season rainfall was 162 mm. Annual rainfall for the year was 189 mm (Table 1) placing Hart at a decile 1 for both growing season and annual rainfall in 2019.

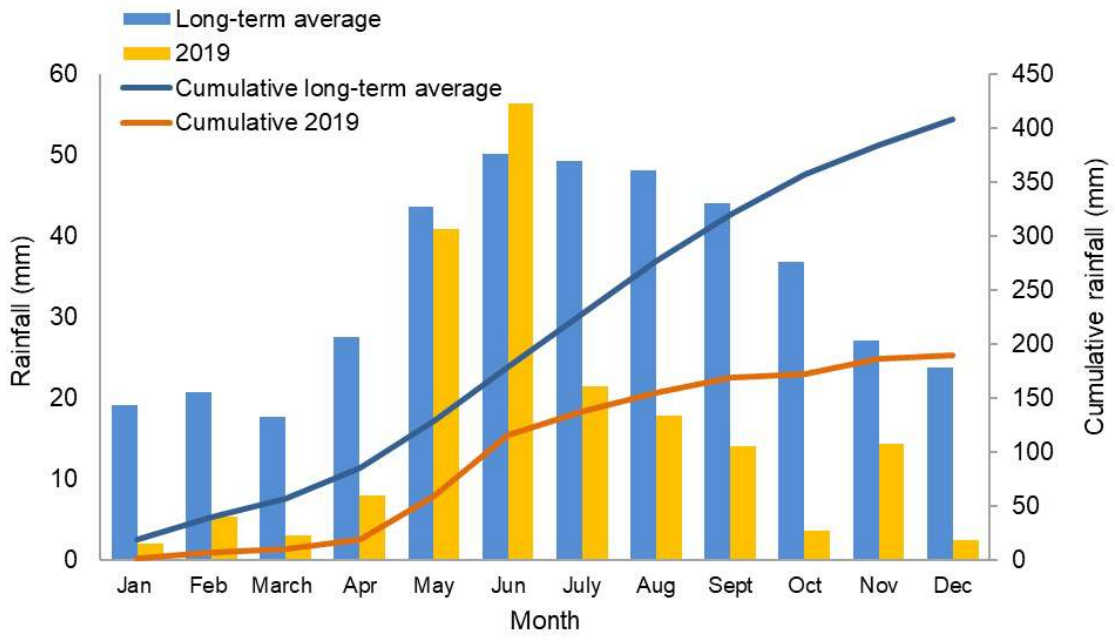

Figure 1. Hart rainfall graph for the 2019 season to date and long-term average. The cumulative rainfall is presented as lines for long term average (blue) and 2019 (orange).

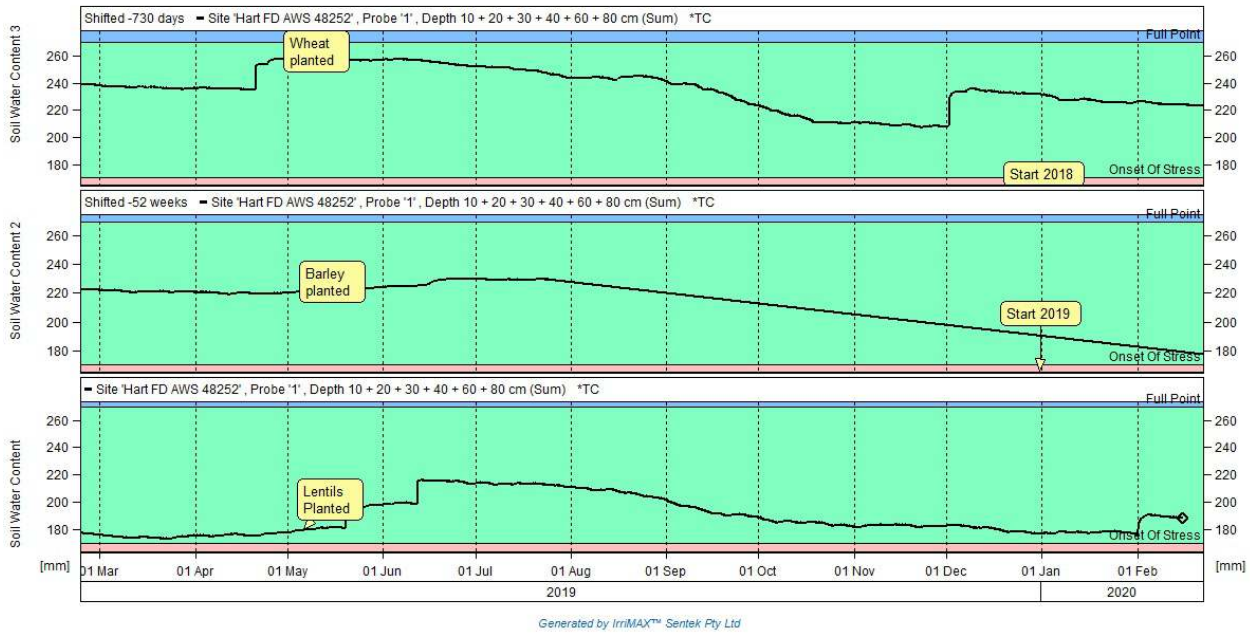

Figure 2. Hart Field-Site soil moisture probe summed comparison for 2017 (top), 2018 (middle) and 2019 (bottom). Hart data is free to view via AgByte: http://www.hartfieldsite.org.au/pages/live-weather/soil-moisture-probe.php

Table 1. Hart rainfall chart 2019 (AgByte weather station)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	3.2	0	0	0	0	0	3.8	2.4
2	0	0	0	0	1	1	0	0	0	0	2.6	0
3	0	0	0	0	1.4	1	0	0	0	0	2	0
4	0	0.4	0	0	0	0	0	0	0	0	0.8	0
5	0	0	2.8	0	0	0	0	0	0	0	0	0
6	0	2.2	0	0	0	0	4	0	2.6	0	0	0
7	0	0	0	0	0.6	0	1.2	3.6	0.2	1.8	0	0
8	0	0	0	0	0	0	0	5.4	0	0.8	2	0
9	0	1	0	0.8	13.4	0	0.2	3.2	0	0	0	0
10	0	0	0	0	1.8	0.4	3.0	0.4	0	0	0	0
11	0	0	0	0	0.8	0	1.8	0.2	0	0	0	0
12	0	1.8	0	0	0	41	4.2	0.2	0	0	0	0
13	0	0	0	0	0	0.2	0	0	0	0.2	0	0
14	0	0	0	0	0	0.6	1.0	0	0	0	0	0
15	0	0	0	0	0	0	1.0	0	0.6	0	0	0
16	0	0	0	0	0	0	0.4	0	0	0.2	0	0
17	0	0	0	0	0	0	0.6	0.2	0	0	0	0
18	0	0	0	0	0	1	0	3.2	0	0	0	0
19	0	0	0	0	9	0	0	0.4	0	0	0	0
20	0	0	0	0	0	0	0	0.8	9	0	0	0
21	0	0	0	2.2	0	0	0	0	0.8	0	0	0
22	0	0	0	0	0	0	0	0	0.6	0	0	0
23	0	0	0.2	0	0	0	1.0	0	0.2	0	0	0
24	0	0	0	0	0	0	1.6	0	0	0	0	0
25	0	0	0	0	4.8	0	0.2	0	0	0	0	0
26	2	0	0	0	0.4	0	0.6	0	0	0.6	0	0
27	0	0	0	0	1.2	0	0.2	0	0	0	0	0
28	0	0	0	0	0.6	0	0	0	0	0	0	0
29	0		0	0	1.6	11.0	0.2	0.2	0	0	2.8	0
30	0		0	5	0.8	0.2	0.2	0	0	0	0.4	0
31	0		0		0.2		0	0		0		0
Montly total	**2.0**	**5.4**	**3.0**	**8.0**	**40.8**	**56.4**	**21.4**	**17.8**	**14.0**	**3.6**	**14.4**	**2.4**
GSR rainfall				8.0	48.8	105.2	126.6	144.4	158.4	162.0		
Total rainfall	2.0	7.4	10.4	18.4	59.2	115.6	137.0	154.8	168.8	172.4	186.8	189.2

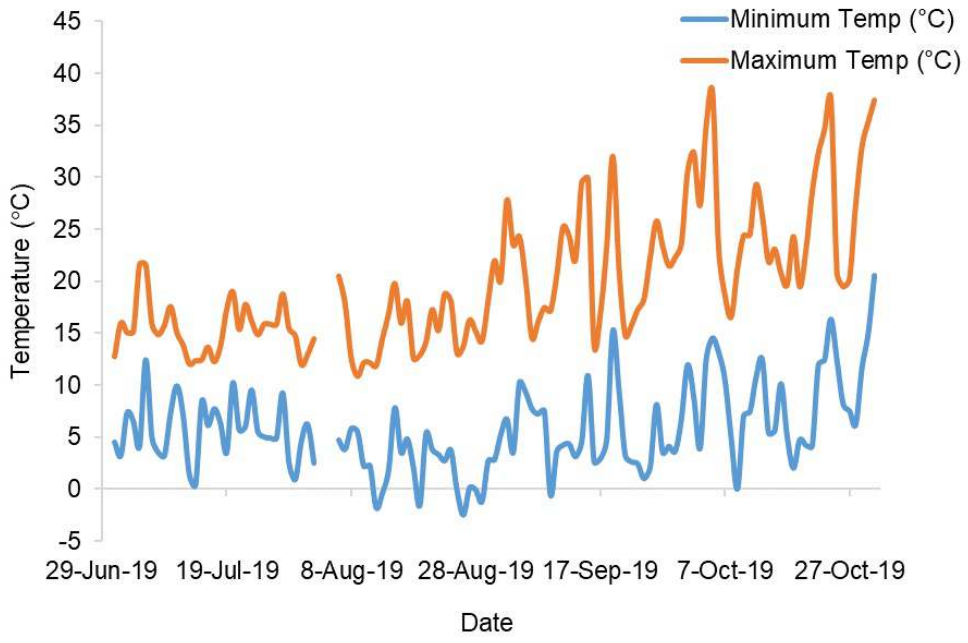

Figure 3. Hart daily maximum and minimum air temperature from July 1 to October 31, 2019. Source: AgByte weather station.

Table 2. General soil physical and chemical properties for the Hart field site. Sampled on May 24, 2019.

		Sampling depth (cm)					
Soil property	**Units**	**0-15**	**15-35**	**35-55**	**55-75**	**75-105**	**Total profile**
Texture							Loam - clay loam
Gravel	%	0	0	0	0	0	
Phosphorus Colwell	mg/kg	34	11	6	4	3	
Potassium Colwell	mg/kg	443	275	257	263	271	
Available soil nitrogen	kg/ha						26
Sulphur	mg/kg	5	3	5	17	53	
Organic carbon	%	1.6	0.9	0.5	0.4	0.2	
Conductivity	dS/m	0.13	0.12	0.20	0.26	0.54	
pH ($CaCl_2$)		7.8	7.7	7.9	8.1	8.2	