The 2022 season at Hart; rainfall, temperature and soil analysis

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The Mid-North region had a dry start leading into the 2022 growing season, with a lack of rainfall across summer months until the season break arrived late May. This meant there was very little stored soil moisture (Figure 1 & 2) at seeding. Some sowing windows across the region were either pushed back, or late crop emergence was noted. The season break occurred on May 30 at Hart, with 26 mm of rainfall received (Table 1).

Seeding at the Hart field site commenced on April 22, with early sown winter wheat and vetch trials. Most of Hart's pulse and cereal program was sown by late May, however no significant rain had occurred during this time. All remaining trials were sown by June 17 directly into soil moisture. By this time, Hart had noted 88 mm growing season rainfall (GSR) with majority of this rainfall received between May 30 and June 11.

Starting soil nitrogen (N) at Hart was 74.2 kg/ha at depth (0-105 cm), after an oaten hay crop in 2021 (Table 2).

Trials at Hart began emerging on June 8. The site experienced drier conditions through July (15 mm), with rainfall becoming more consistent mid-late August. Crop growth was very slow during winter months due to cold conditions (Figure 3), also resulting in minimal water use (Figure 2). Monthly rainfall was well above average from September to November (Figure 1).

Hart received 519 mm of annual rainfall in 2022, placing it at a decile 10 rainfall year (average annual rainfall 400 mm). Growing season rainfall (April – October) of 355 mm was 55 mm above Hart's 100-year average growing season rainfall (300 mm), equivalent to a decile 8 season.

Daily minimum and maximum temperature data at Hart in 2022 is provided in Figure 3.

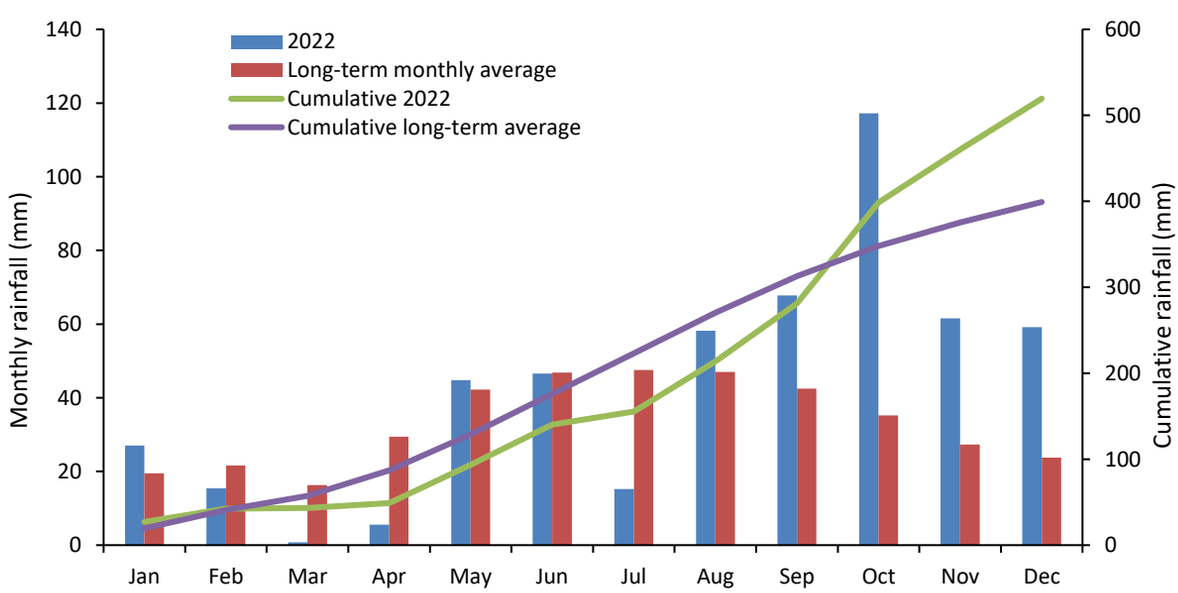

Figure 1. Hart rainfall graph for the 2022 season and long-term average. Lines are displayed to present cumulative rainfall for long-term average (purple) and 2022 (green).

Table 1. Hart rainfall chart for 2022 (Source: Mesonet)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0.2	0	0	0	1	0.2	6.2	0.2	0.2	28.4	0
2	0	0	0	0	0	0	0	0	0	0	1.8	0
3	0	0	0	0	0	0	0	4.6	0	0	1.6	0
4	0	0	0	0	0.4	3.4	0	0	0.2	5.8	0	0
5	0	0	0	0	0	0.4	0	0.8	0	11.8	0	0
6	5.2	0	0	0.8	0.8	11.8	0.2	0.4	0	0	0	0
7	3.6	0	0	0	0.8	11.4	0.4	3	0.2	4	0	0
8	0.6	0	0	0	0	0.2	2.6	0.4	25.4	0.2	0	0
9	0	1.6	0	0	0	0	1	0	12.2	0	0	0.2
10	0	0	0	0	0	0.4	0.2	0.2	6.2	0	1.4	0.2
11	0	0	0	0	0	4.6	0	5	0	0	0	0
12	0	0	0	0	0	0	1.8	6	0.4	0.2	9.8	0
13	0	0	0	0	0	0	0.8	5.4	0	16.6	3.6	0
14	0	0	0	0	0	0	0.2	3.4	3.6	3.8	3.6	0
15	0	0	0	0.8	0	0	0	3	1.8	0.2	0.2	0
16	0	0	0	0.2	0	4.6	0	1.4	4.4	0	0	0
17	0	7.2	0	0	0	0	2	0	3	0	0	0
18	0	0	0	0.8	0	0	1.6	0.8	0.6	3.4	0	0
19	0	0	0	0.4	0	0	0.2	6.6	0.2	0	4.6	0
20	0	0	0	0	0	2.2	0	0.4	0	0	2.4	0
21	0	1	0	1.4	0	1.4	0	2	3.6	0	1.8	4.2
22	1.2	0	0	0	0	0.6	0	0	0.2	0	0.4	28.8
23	12.2	0	0.8	0	0	0	0	6	0.2	23.4	0	0
24	4.2	0	0	0	0	0	0	0.2	1.6	11.4	0	0
25	0	0	0	0	1.2	1.8	3.6	0.6	0	4	0	0
26	0	0	0	0	4.4	0.2	0.2	0.2	1.8	0	0	0
27	0	0	0	0	0	1.4	0	0	0.6	0	2	18.8
28	0	5.4	0	0	0	0	0	0	1	0	0	7
29	0		0	0	0	0	0	0	0.2	0.6	0	0
30	0		0	1.2	26.2	1.2	0	1.4	0.2	0	0	0
31	0		0		11		0.2	0.2		31.6		0
Montly total	**27.0**	**15.4**	**0.8**	**5.6**	**44.8**	**46.6**	**15.2**	**58.2**	**67.8**	**117.2**	**61.6**	**59.2**
GSR rainfall				5.6	50.4	97.0	112.2	170.4	238.2	355.4		
Total rainfall	27.0	42.4	43.2	48.8	93.6	140.2	155.4	213.6	281.4	398.6	460.2	519.4

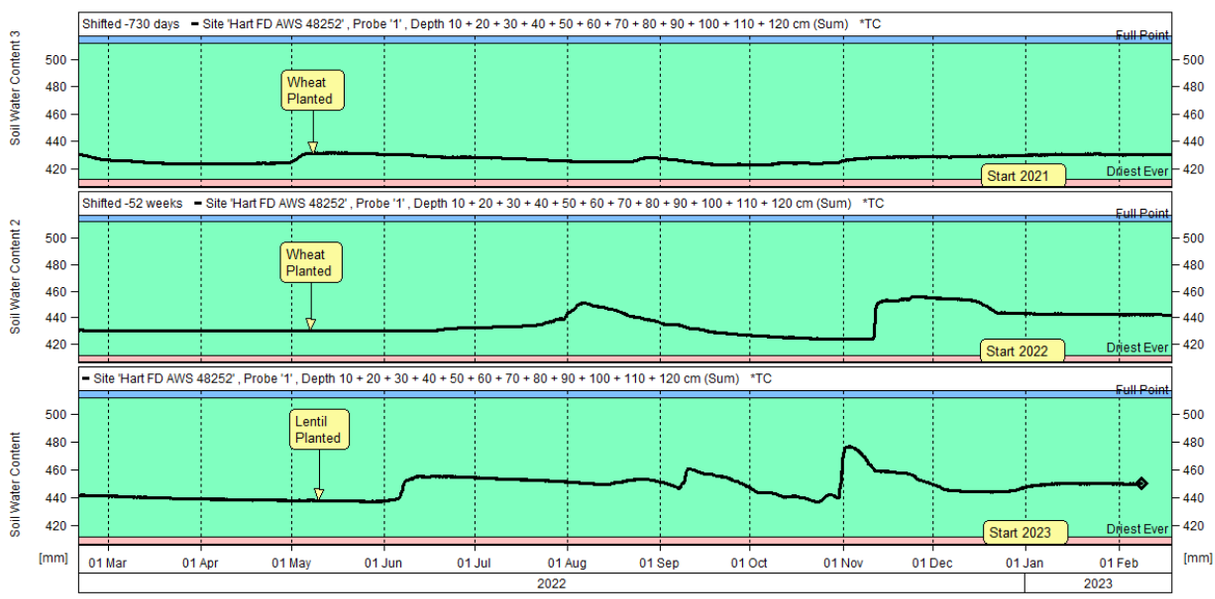

Figure 2. Soil moisture probe summed comparison (80cm) for 2020 (top), 2021 (middle) and 2022 (bottom) at the Hart field site.

Hart soil moisture data is free to view thanks to Agbyte and can be viewed here: *https://www.hartfieldsite.org.au/pages/live-weather/soil-moisture-probe.php*

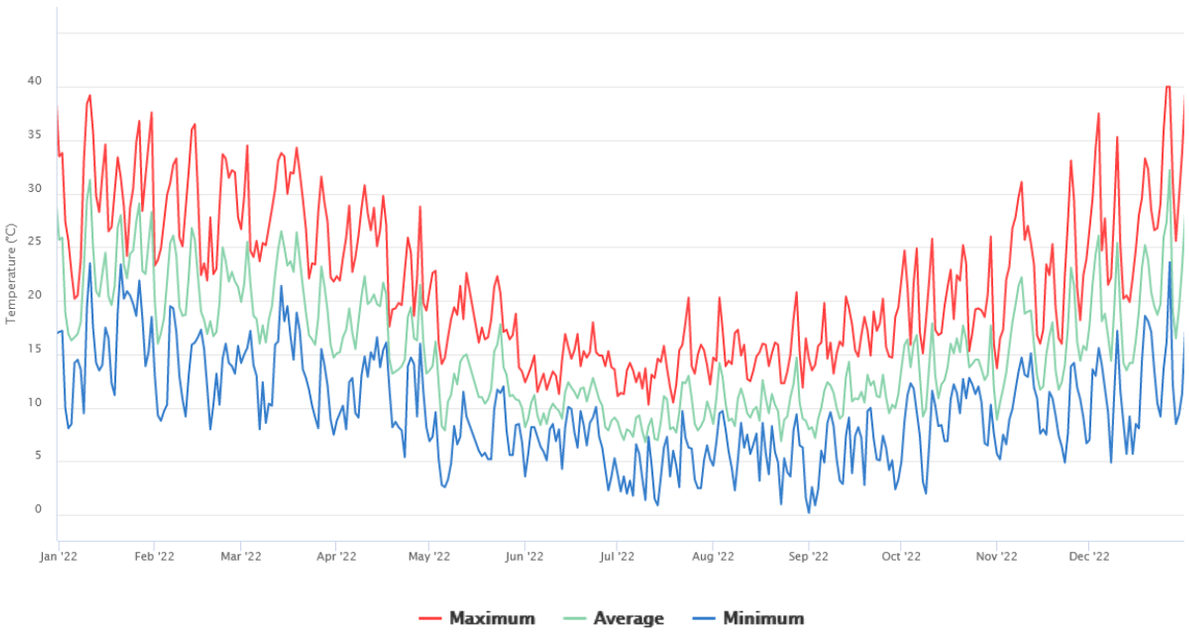

Figure 3. Daily minimum, average and maximum temperature (°C) from January 1 to December 31 at Hart in 2022. Temperature data sourced from Mid North Mesonet.

Table 2. Actual soil physical and chemical properties for the Hart field site, sampled March 31, 2022.

		Sampling Depth (cm)					
Soil property	**Units**	**0-15** (cm)	**15-35** (cm)	**35-55** (cm)	**55-75** (cm)	**75-105** (cm)	**Total profile** (0-90cm)
Texture		Loam	Loam	Loam	Loam	Loam	
Phosphorus Cowell	mg/kg	22	8	10	9	<5	
Potassium Colwell	mg/kg	273	146	145	129	133	
Available soil N	kg/ha	19.6	14.5	14.4	13.7	12	74.2
Sulphur	mg/kg	5.1	5.2	7.3	11	23	
Organic Carbon	%	1.00	0.60	0.59	0.48	0.25	
Conductivity	dS/m	0.15	0.13	0.15	0.27	0.47	
pH ($CaCl_2$)		7.8	7.8	7.9	8.1	8.6	