

# The 2020 season at Hart; rainfall, temperature and soil analysis

Rebekah Allen and Brianna Guidera; Hart Field-Site Group

The Mid-North had a promising start to the season receiving above average summer rainfall (Figure 1). This meant there was an increase in stored soil moisture available leading into the growing season (Figure 2).

Seeding at Hart commenced on April 20, utilising an optimal sowing window for early sown wheats. The majority of Hart's trial program was sown early to mid-May, with the final plots sown on May 29.

The site received above average rainfall during April, with 60 mm. Although there was an optimistic start to the seeding program, well below average rainfall of 19 mm was received for May (Table 1) affecting early crop establishment in some trials. Rainfall received on site for both June and July was well under average, with a combined total of 38.4 mm. Temperatures were also mild during winter months (Figure 3). These dry conditions resulted in many trials progressing quickly from early vegetative stages to reproductive phases.

August rainfall relieved crops from both moisture and nitrogen stress with a total of 67.5 mm rainfall (Figure 4). Above average rainfall was received in September and October, bringing Hart's growing season rainfall to a decile 7 with 336 mm.

Annual rainfall received was 503 mm, placing Hart at a decile 9 for the year. This was significantly higher when compared to 2019 when an annual rainfall of 189.2 mm (decile 1) was recorded.

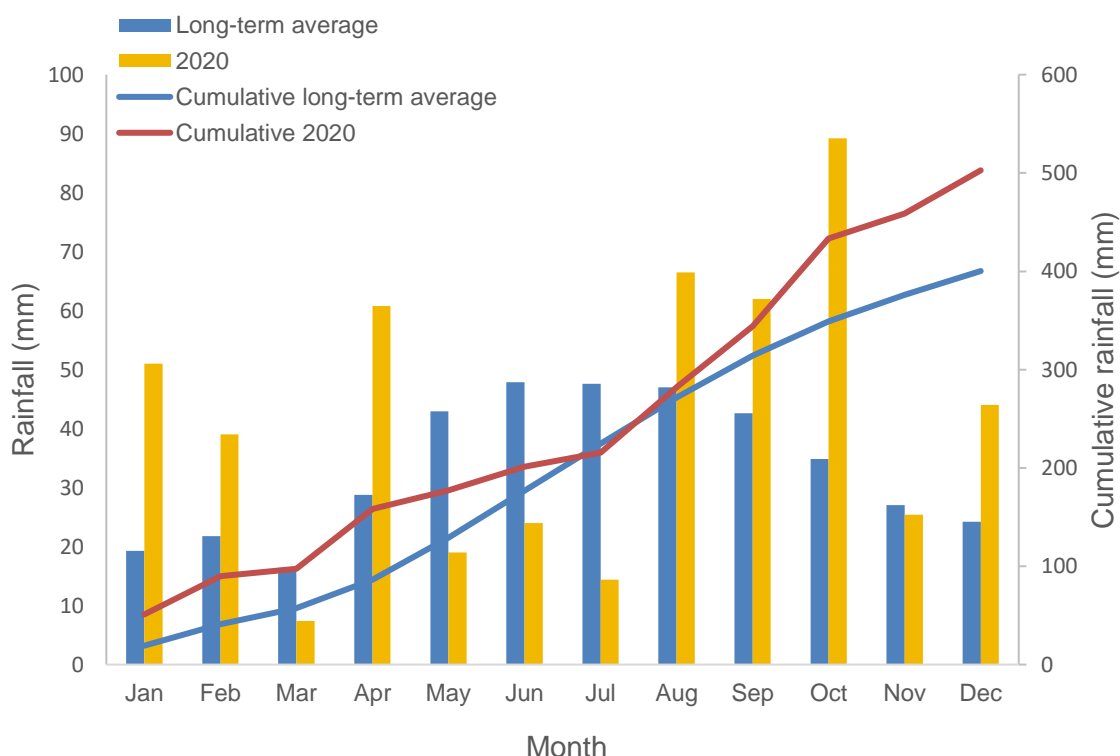


Figure 1. Hart rainfall graph for the 2020 season and long-term average. Lines are displayed to present cumulative rainfall for long-term average (blue) and 2020 (red).

Table 1. Hart rainfall chart 2020 (AgByte weather station and Mesonet).

|                     | January     | February    | March      | April       | May         | June        | July        | August      | September   | October     | November    | December    |
|---------------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1                   | 0           | 38          | 1.4        | 0           | 1.6         | 1.6         | 0           | 0           | 0           | 0           | 0           | 8.6         |
| 2                   | 0           | 0           | 0          | 0           | 5.4         | 0.4         | 0           | 0           | 0           | 0           | 0           | 0.2         |
| 3                   | 0           | 0           | 0.2        | 10.4        | 0           | 0.8         | 2.2         | 0           | 0           | 0           | 0           | 0           |
| 4                   | 0           | 0           | 0          | 4           | 0           | 0           | 2.6         | 0           | 0           | 0           | 0           | 0           |
| 5                   | 5.8         | 0           | 0          | 2.8         | 0           | 0           | 0.4         | 0           | 0           | 19.4        | 3.4         | 4           |
| 6                   | 0           | 0           | 0          | 0           | 0           | 0           | 0.4         | 0           | 0           | 0           | 0           | 16          |
| 7                   | 0           | 0           | 0          | 0           | 0           | 0           | 0           | 0           | 0           | 8.8         | 0           | 2.2         |
| 8                   | 0           | 0           | 0          | 0           | 0.2         | 0           | 0           | 0           | 0.2         | 11.8        | 0           | 0.6         |
| 9                   | 0           | 0           | 0          | 0.8         | 1           | 0           | 0           | 0           | 0.4         | 0.2         | 0           | 0           |
| 10                  | 1.4         | 0           | 0          | 0           | 3.8         | 0           | 2.8         | 0           | 0           | 0           | 0           | 0           |
| 11                  | 0           | 0           | 0          | 0           | 0.2         | 0           | 4           | 0           | 0           | 0           | 12          | 0           |
| 12                  | 0           | 0           | 0          | 0           | 0           | 0           | 0.2         | 23          | 1.9         | 0           | 0           | 0           |
| 13                  | 0           | 0           | 0          | 0           | 0           | 4.6         | 0.4         | 5           | 3.3         | 0           | 0.4         | 0           |
| 14                  | 0           | 0.8         | 0          | 0           | 0           | 0           | 0.4         | 11.5        | 0           | 0           | 0           | 0           |
| 15                  | 0           | 0.2         | 0          | 0           | 0           | 0           | 0           | 0           | 0.1         | 0           | 0           | 0           |
| 16                  | 0           | 0           | 0          | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 6.2         |
| 17                  | 0           | 0           | 0          | 0           | 0           | 0           | 0           | 10.8        | 0           | 4.8         | 0           | 0           |
| 18                  | 0           | 0           | 0          | 4           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 19                  | 1.6         | 0           | 0          | 0           | 0           | 0           | 0           | 0           | 3.8         | 0           | 0           | 0           |
| 20                  | 2.6         | 0           | 0          | 0           | 1.4         | 3.6         | 0           | 0           | 1.3         | 0           | 0           | 0           |
| 21                  | 0           | 0           | 0          | 0           | 0.2         | 11.6        | 0           | 0           | 0.6         | 0           | 0           | 5.4         |
| 22                  | 0           | 0           | 0          | 0           | 1.2         | 0.5         | 0           | 0           | 1           | 0           | 0           | 0.8         |
| 23                  | 0.2         | 0           | 0          | 7.6         | 3.6         | 0.6         | 0           | 0           | 8           | 8           | 9.2         | 0           |
| 24                  | 0           | 0           | 5.4        | 0           | 0           | 0           | 0.2         | 16          | 1.3         | 13.4        | 0           | 0           |
| 25                  | 0           | 0           | 0          | 8.4         | 0           | 0.3         | 0           | 0           | 9.2         | 0           | 0           | 0           |
| 26                  | 0           | 0           | 0          | 6           | 0           | 0           | 0           | 0           | 0.6         | 0           | 0           | 0           |
| 27                  | 0           | 0           | 0          | 0           | 0           | 0           | 0.8         | 0           | 0           | 0.4         | 0           | 0           |
| 28                  | 0           | 0           | 0          | 0           | 0           | 0           | 0           | 0.2         | 0           | 0           | 0           | 0           |
| 29                  | 0           | 0           | 0.4        | 7.4         | 0           | 0           | 0           | 0           | 17          | 0           | 0.4         | 0           |
| 30                  | 0           | 0           | 0          | 9.4         | 0.4         | 0           | 0           | 0           | 13.3        | 21.8        | 0           | 0           |
| 31                  | 39.4        | 0           | 0          | 0           | 0           | 0           | 0           | 0           | 0           | 0.6         | 0           | 0           |
| <b>Montly total</b> | <b>51.0</b> | <b>39.0</b> | <b>7.4</b> | <b>60.8</b> | <b>19.0</b> | <b>24.0</b> | <b>14.4</b> | <b>66.5</b> | <b>62.0</b> | <b>89.2</b> | <b>25.4</b> | <b>44.0</b> |
| GSR rainfall        |             |             |            | 60.8        | 79.8        | 103.8       | 118.2       | 184.7       | 246.7       | 335.9       |             |             |
| Total rainfall      | 51.0        | 90.0        | 97.4       | 158.2       | 177.2       | 201.2       | 215.6       | 282.1       | 344.1       | 433.3       | 458.7       | 502.7       |

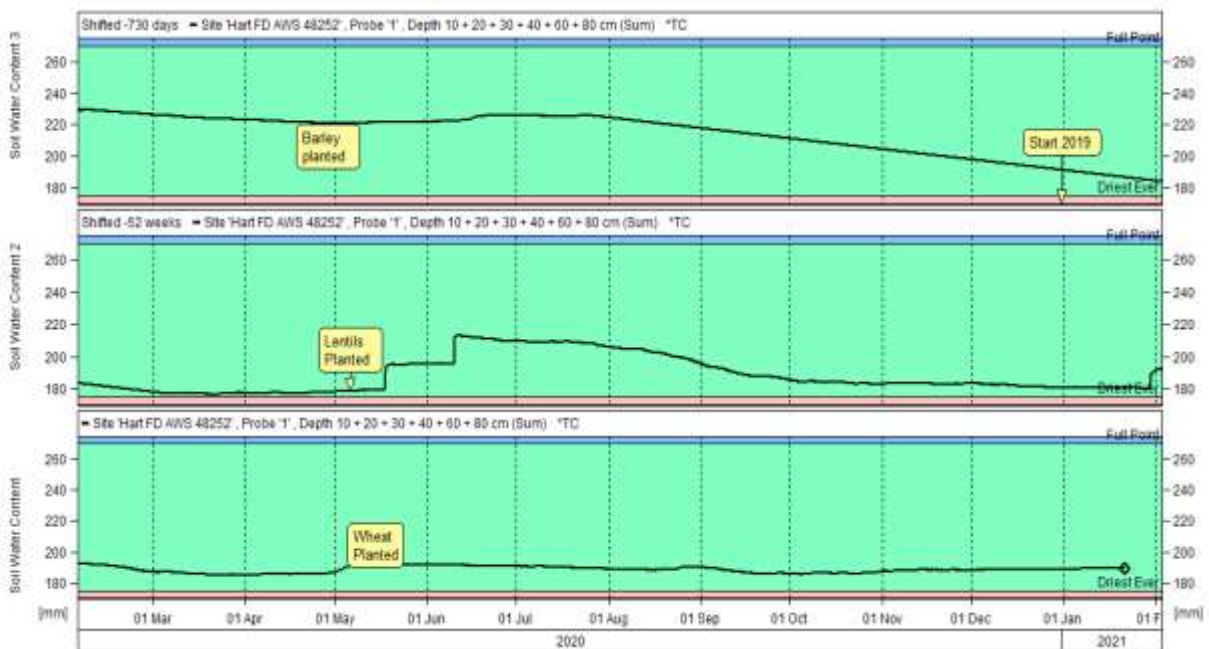


Figure 2. Soil moisture probe summed comparison (80cm) for 2018 (top), 2019 (middle) and 2020 (bottom) at the Hart Field-Site.

Hart soil moisture data is free to view courtesy of [Agbyte](http://www.hartfieldsite.org.au/pages/live-weather/soil-moisture-probe.php):

<http://www.hartfieldsite.org.au/pages/live-weather/soil-moisture-probe.php>

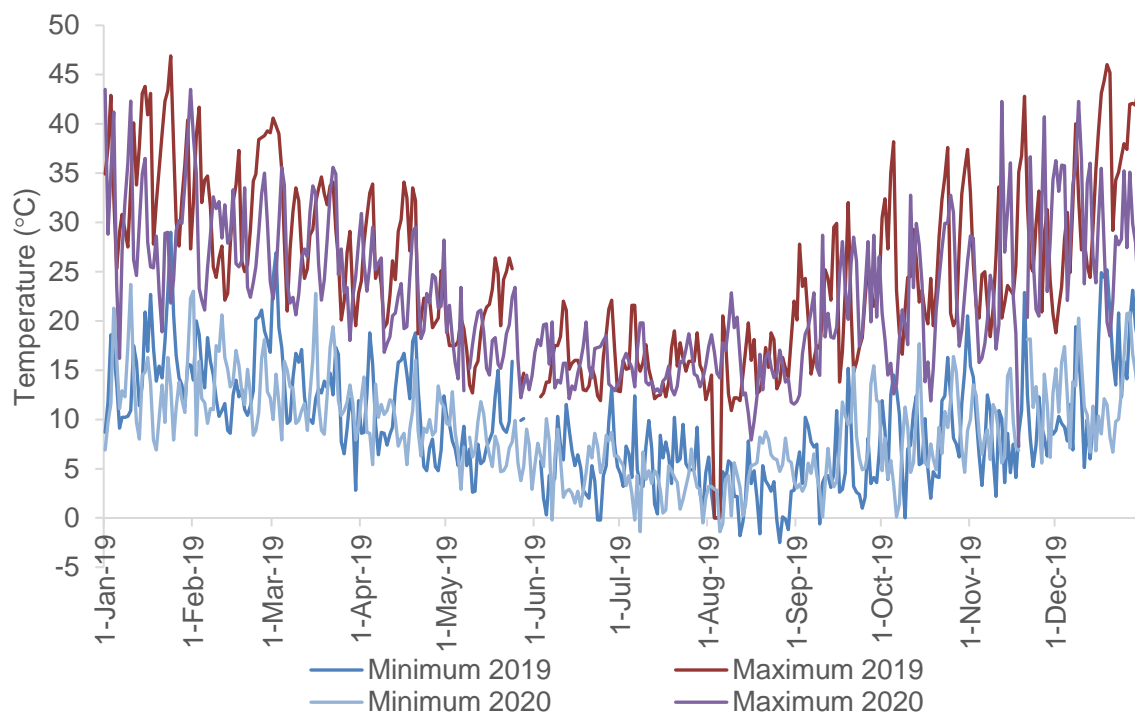


Figure 3. Daily minimum and maximum daily temperature (°C) from January 1 to December 30 at Hart in 2019 and 2020.

Table 2. Actual soil physical and chemical properties for the Hart field site, sampled April 24, 2020. Note: Soil profile depth at Hart is 75-105 cm; however, below properties are to 30 cm only.

| Soil property           | Units | Sampling depth (cm) |           |           | Total profile (0-60cm) |
|-------------------------|-------|---------------------|-----------|-----------|------------------------|
|                         |       | 0-10cm              | 10-20cm   | 20-30cm   |                        |
| Texture                 |       | Loam                | Clay loam | Clay loam | Loam - clay loam       |
| Gravel                  | %     | 0                   | 0         | 0         |                        |
| Phosphorus Colwell      | mg/kg | 31                  | 11        | 8         |                        |
| Potassium Colwell       | mg/kg | 605                 | 322       | 230       |                        |
| Available soil N        | kg/ha |                     |           |           | 53                     |
| Sulphur                 | mg/kg | 10                  | 8.4       | 9.7       |                        |
| Organic carbon          | %     | 1.8                 | 1.1       | 0.9       |                        |
| Conductivity            | dS/m  | 0.21                | 0.19      | 0.23      |                        |
| pH (CaCl <sup>2</sup> ) |       | 7.6                 | 7.8       | 7.2       |                        |