# HART BEAT

Yield Prophet® simulations for 8 sites across the Mid-North of SA

Definitions | Site information

Hart | Spalding | Condowie
Kybunga | Farrell Flat | Pinery
Eudunda | Tarlee

Plus...

Seasonal tips
Winter Walk details

HART
SA's premier cropping field site

ROCKY RIVER AG

CASE IH AGRICULTURE
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ISSUE 51
June 22, 2020

# DEFINITIONS

HART BEAT

## HART BEAT definitions

All sites have been characterised for plant available water capacity (PAWC) and bulk density to determine how much of the measured water and nitrogen is available to the crop during the season.

**Plant available water capacity (PAWC)** – is the difference between the drained upper limit of the soil and the lower extraction limit of a crop over the depth of rooting. It is the maximum water available to a crop from a particular soil type.

**Plant available water (PAW)** – is the amount of water contained in the soil at a given time minus the crop lower limit.

**Growing season rainfall (GSR)** – is rainfall for the period between and including April to October.

**Decile** – is a measure of seasonal rainfall on a scale of 1 to 9. In a decile 7 year, 70% of previous years were dryer, in a decile 3 year 30% of previous years were dryer.

***Yield Prophet®*** is an internet-based service which uses the APSIM wheat prediction model.

The model relies on accurate soil, crop, historical climate data and up to date local weather information to predict plant growth rates and final hay or grain yields. These are critical measurements specific to the site being analysed and may not fit closely to individual situations. Instead the predictions will give a realistic guide to seasonal prospects based on a site with similar rainfall and / or soil type.

Using climate data for the current season, *Yield Prophet®* simulates the soil water, nitrogen processes and crop growth in the paddock. *Yield Prophet®* calculates the amount of water and nitrogen available to the crop as well as the water and nitrogen demand of the crop.

The **French & Schultz** formula estimates the rainfall limited grain yield based on the growing season rainfall (GSR). It assumes evaporation of 110mm, includes stored water at sowing (30% of Jan to Mar rainfall) and a maximum grain yield potential of 20 kg/mm/ha.

Yield Potential = GSR (Apr-Oct) – Evaporation (110mm) * 20 kg/mm/ha.



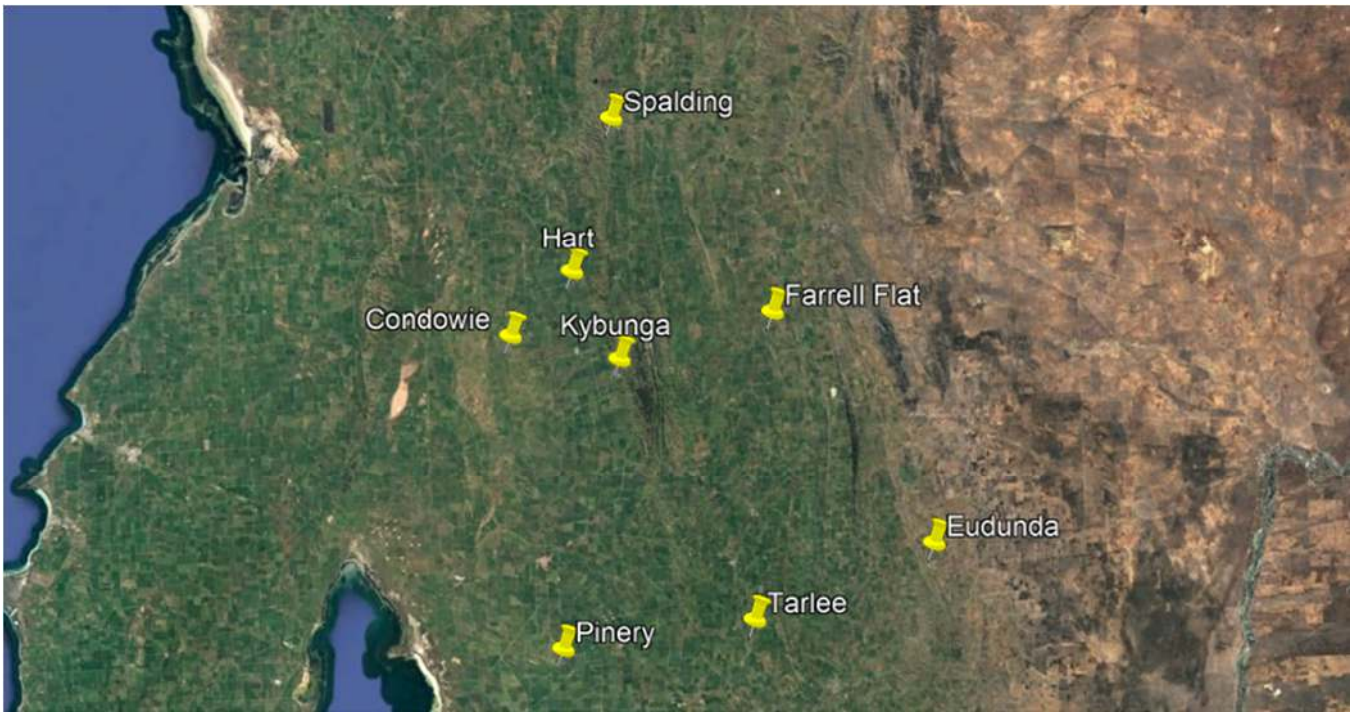
# SITE INFORMATION

HART BEAT

## Rainfall and soil water characteristics for all sites

| Site | Average annual rainfall (mm) | Soil type | PAWC (mm) | Soil sampling date | Profile depth (cm) | Pre-sowing nitrogen (kg/ha) |
|---|---|---|---|---|---|---|
| Hart | 400 | Sandy clay loam | 206 | May 7, 2020 | 150 | 63 |
| Spalding | 430 | Red brown earth | 143 | April 24, 2020 | 150 | 69 |
| Condowie | 350 | Sandy loam | 115 | April 24, 2020 | 150 | 67 |
| Kybunga | 428 | Clay loam | 262 | May 7, 2020 | 120 | 70 |
| Farrell Flat | 474 | Light clay loam | 172 | April 24, 2020 | 120 | 64 |
| Pinery | 374 | Silty clay loam | 79 | May 7, 2020 | 150 | 60 |
| Eudunda | 445 | Gravelly loam | 96 | April 24, 2020 | 100 | 68 |
| Tarlee | 474 | Sandy loam | 113 | May 8, 2020 | 150 | 61 |

## 2020 site locations



# SEASONAL TIPS

# HART BEAT

## MANAGING BROADLEAF WEEDS IN CEREALS

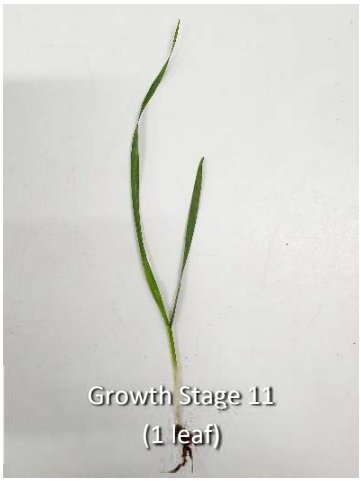
You may be starting to think about early post emergent weed control and this first edition of Hart Beat is a good time to provide a reminder about herbicide use, particularly for this season.

**Seasonal issues so far…** To date, we have seen supply shortages of traditionally used broadleaf weed control products such as MCPA and LVE MCPA, meaning that application for earlier weed control may become more challenging.

**Alternative options** 2,4-D is likely to be considered as a potential alternative but applying this too early can be detrimental to yield. 2,4-D should not be used prior to Growth Stage 15 (5 leaf stage) and if applied at this stage rates should be kept low.

## DETERMINING CEREAL GROWTH STAGES

Accurately identifying cereal growth stages prior to herbicide application is important; see below for a guide and consider the growth stage of your crop to ensure the timing of your application is not detrimental.









Location:

# HART

HART BEAT


## HART

Soil type: Sandy clay loam

**Date of report:** June 22, 2020

### Crop growth

| | |
|---|---|
| Variety: | Scepter wheat |
| Sowing date: | May 1, 2020 |
| Emergence: | May 11, 2020 |
| Nitrogen fertiliser: | 30 kg N/ha @ seeding |

### The season so far

| | |
|---|---|
| Annual rainfall to date: | 199.8 mm |
| GSR to date: | 102.4 mm |
| GSR Decile: | 5 |
| Current predicted PAW: | 66 mm (32%) |
| PAWC: | 206 mm |

## Yield Prophet® predictions

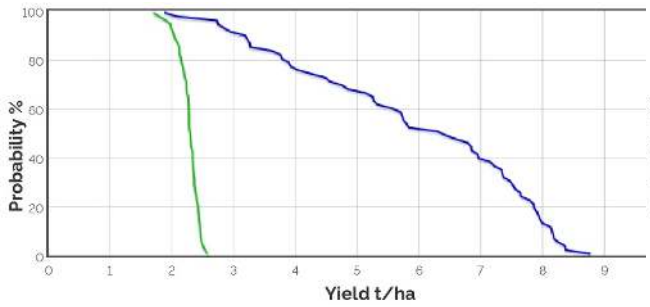
(*based on a 50% probability)*

Wheat sown May 1: **2.3 t/ha**

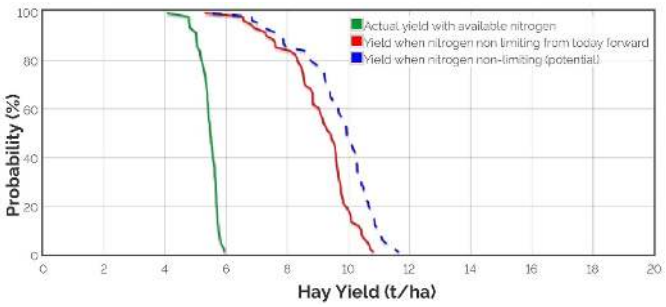
*also see graphs below*

Wheat sown May 20: **2.3 t/ha**

### Grain yield outcome graph




### Hay yield outcome graph




*These graphs show the chance of reaching the corresponding yield given weather, soil conditions, agronomic inputs to date and historical climate data (100yrs) to simulate remainder of the season.*

*Yield probability curves (left graph) - display two different nitrogen scenarios. The green line displays the actual grain yield with the current soil available nitrogen. The blue line represents the grain yield potential with unlimited nitrogen (yield potential). A small difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. Conversely, a large difference between these two lines indicates additional N fertiliser is required for the crop to reach its yield potential.*

## French & Schultz predictions

*This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (213 mm) for the remainder of the growing season.*

100% WUE **4.7 t/ha**

80% WUE **3.7 t/ha**

Location:

# SPALDING

HART BEAT


## SPALDING

Soil type: Red brown earth

**Date of report:** June 22, 2020

### Crop growth

| | |
|---|---|
| Variety: | Scepter wheat |
| Sowing date: | May 1, 2020 |
| Emergence: | May 12, 2020 |
| Nitrogen fertiliser: | 40 kg N/ha @ seeding |

### The season so far

| | |
|---|---|
| Annual rainfall to date: | 213 mm |
| GSR to date: | 133 mm |
| GSR Decile: | 7 |
| Current predicted PAW: | 45 mm (31%) |
| PAWC: | 143 mm |

## Yield Prophet® predictions

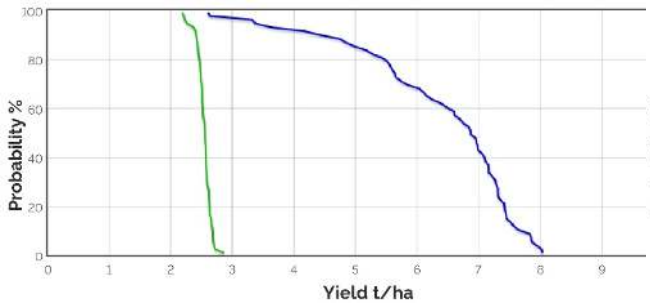
(*based on a 50% probability)*

Wheat sown May 1: **3.1 t/ha**

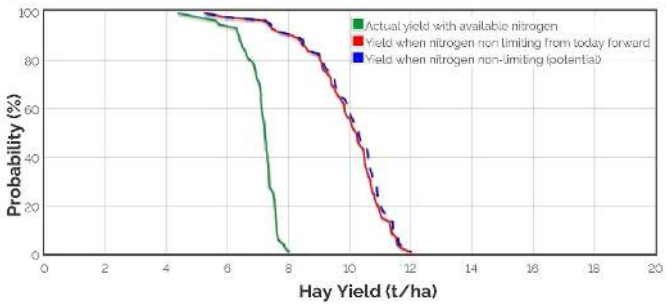
*also see graphs below*

Wheat sown May 20: **3.1 t/ha**

### Grain yield outcome graph




### Hay yield outcome graph




*These graphs show the chance of reaching the corresponding yield given weather, soil conditions and agronomic inputs to date, and historical climate data (100yrs) to simulate remainder of the season.*

*Yield probability curves (left graph) - display two different nitrogen scenarios. The green line displays the actual grain yield with the current soil available nitrogen. The blue line represents the grain yield potential with unlimited nitrogen (yield potential). A small difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. Conversely, a large difference between these two lines indicates additional N fertiliser is required for the crop to reach its yield potential.*

## French & Schultz predictions

*This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (218 mm) for the remainder of the growing season.*

100% WUE **5.3 t/ha**

80% WUE **4.2 t/ha**

Location:

# CONDOWIE

HART BEAT


## CONDOWIE

Soil type: Sandy loam

**Date of report:** June 22, 2020

### Crop growth

| | |
|---|---|
| Variety: | Scepter wheat |
| Sowing date: | May 1, 2020 |
| Emergence: | May 11, 2020 |
| Nitrogen fertiliser: | 30 kg N/ha @ seeding |

### The season so far

| | |
|---|---|
| Annual rainfall to date: | 131.4 mm |
| GSR to date: | 78 mm |
| GSR Decile: | 5 |
| Current predicted PAW: | 4 mm (3.5%) |
| PAWC: | 115 mm |

## Yield Prophet® predictions

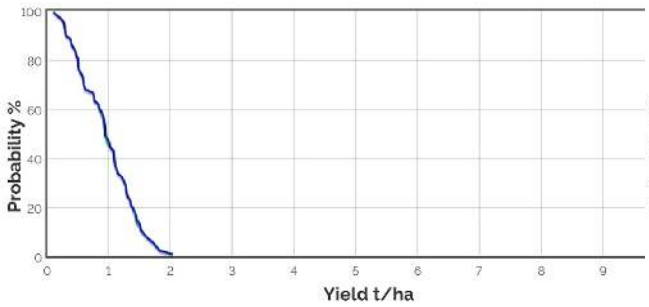
(*based on a 50% probability)*

Wheat sown May 1: **0.9 t/ha**

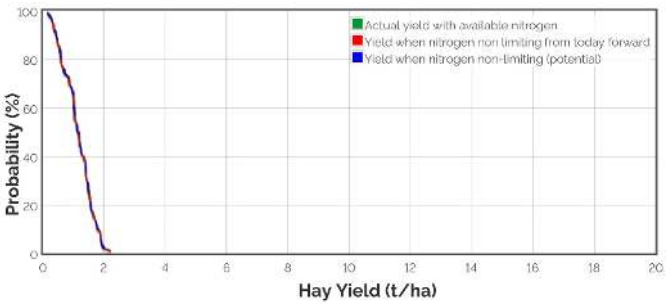
*also see graphs below*

Wheat sown May 20: **1.20 t/ha**

### Grain yield outcome graph




### Hay yield outcome graph




*These graphs show the chance of reaching the corresponding yield given weather, soil conditions and agronomic inputs to date, and historical climate data (100yrs) to simulate remainder of the season.*

*Yield probability curves (left graph) - display two different nitrogen scenarios. The green line displays the actual grain yield with the current soil available nitrogen. The blue line represents the grain yield potential with unlimited nitrogen (yield potential). A small difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. Conversely, a large difference between these two lines indicates additional N fertiliser is required for the crop to reach its yield potential.*

## French & Schultz predictions

*This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (158 mm) for the remainder of the growing season.*

100% WUE **2.9 t/ha**

80% WUE **2.4 t/ha**

Location:

# KYBUNGA

HART BEAT


## KYBUNGA

Soil type: Clay loam

**Date of report:** June 22, 2020

### Crop growth

| | |
|---|---|
| Variety: | Scepter wheat |
| Sowing date: | May 1, 2020 |
| Emergence: | May 12, 2020 |
| Nitrogen fertiliser: | 30 kg N/ha @ seeding |

### The season so far

| | |
|---|---|
| Annual rainfall to date: | 211 mm |
| GSR to date: | 145 mm |
| GSR Decile: | 6 |
| Current predicted PAW: | 73 mm (28%) |
| PAWC: | 262 mm |

## Yield Prophet® predictions

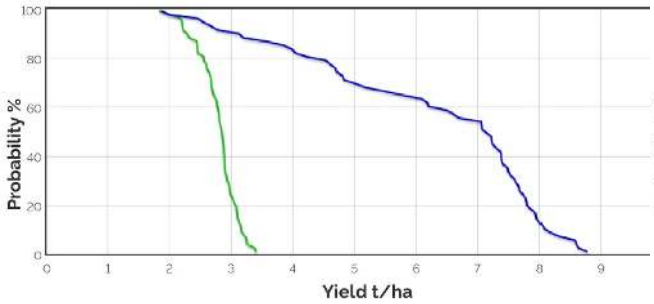
(*based on a 50% probability)*

Wheat sown May 1: **2.8 t/ha**

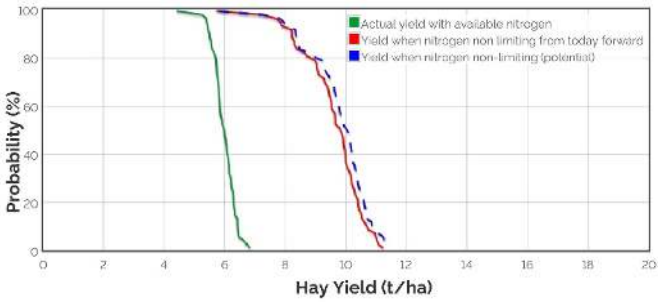
*also see graphs below*

Wheat sown May 20: **2.9 t/ha**

### Grain yield outcome graph




### Hay yield outcome graph




*These graphs show the chance of reaching the corresponding yield given weather, soil conditions and agronomic inputs to date, and historical climate data (100yrs) to simulate remainder of the season.*

*Yield probability curves (left graph) - display two different nitrogen scenarios. The green line displays the actual grain yield with the current soil available nitrogen. The blue line represents the grain yield potential with unlimited nitrogen (yield potential). A small difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. Conversely, a large difference between these two lines indicates additional N fertiliser is required for the crop to reach its yield potential.*

## French & Schultz predictions

*This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (242 mm) for the remainder of the growing season.*

100% WUE **5.9 t/ha**

80% WUE **4.7 t/ha**

Location:

# FARRELL FLAT

HART BEAT


## FARRELL FLAT

Soil type: Light clay loam

**Date of report:** June 22, 2020

### Crop growth

| | |
|---|---|
| Variety: | Scepter wheat |
| Sowing date: | May 1, 2020 |
| Emergence: | May 13, 2020 |
| Nitrogen fertiliser: | 30 kg N/ha @ seeding |

### The season so far

| | |
|---|---|
| Annual rainfall to date: | 197 mm |
| GSR to date: | 125 mm |
| GSR Decile: | 6 |
| Current predicted PAW: | 29 mm (17%) |
| PAWC: | 172 mm |

## Yield Prophet® predictions

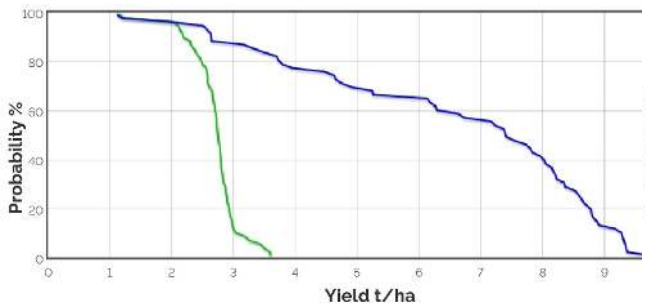
(*based on a 50% probability)*

Wheat sown May 1: **2.7 t/ha**

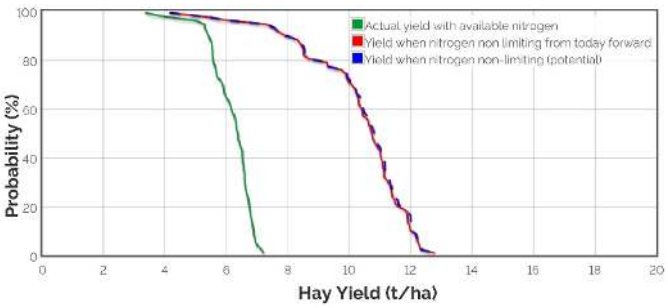
*also see graphs below*

Wheat sown May 20: **2.8 t/ha**

### Grain yield outcome graph




### Hay yield outcome graph

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## French & Schultz predictions

*This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (252 mm) for the remainder of the growing season.*

100% WUE **5.7 t/ha**

80% WUE **4.6 t/ha**

Location:

# PINERY

HART BEAT


## PINERY

Soil type: Silty clay loam

**Date of report:** June 22, 2020

### Crop growth

| | |
|---|---|
| Variety: | Scepter wheat |
| Sowing date: | May 1, 2020 |
| Emergence: | May 11, 2020 |
| Nitrogen fertiliser: | 40 kg N/ha @ seeding |

### The season so far

| | |
|---|---|
| Annual rainfall to date: | 200.4 mm |
| GSR to date: | 156.6 mm |
| GSR Decile: | 7 |
| Current predicted PAW: | 65 mm (82%) |
| PAWC: | 79 mm |

## Yield Prophet® predictions

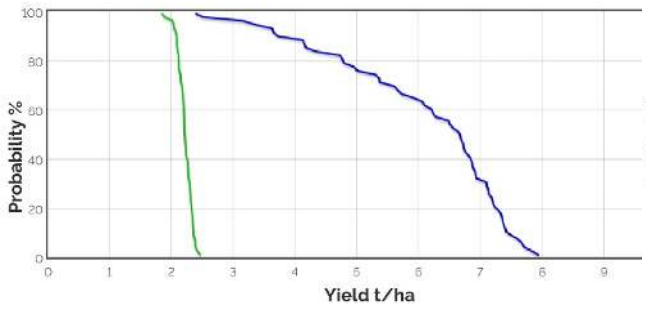
(*based on a 50% probability)*

Wheat sown May 1: **2.2 t/ha**

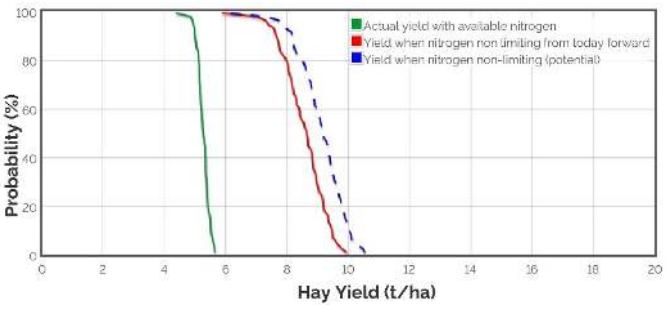
*also see graphs below*

Wheat sown May 20: **2.2 t/ha**

### Grain yield outcome graph




### Hay yield outcome graph

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*Yield probability curves (left graph) - display two different nitrogen scenarios. The green line displays the actual grain yield with the current soil available nitrogen. The blue line represents the grain yield potential with unlimited nitrogen (yield potential). A small difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. Conversely, a large difference between these two lines indicates additional N fertiliser is required for the crop to reach its yield potential.*

## French & Schultz predictions

*This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (210 mm) for the remainder of the growing season.*

100% WUE **5.4 t/ha**

80% WUE **4.3 t/ha**

Location:

# EUDUNDA

HART BEAT


## EUDUNDA

Soil type: Gravelly loam

**Date of report:** June 22, 2020

### Crop growth

| | |
|---|---|
| Variety: | Scepter wheat |
| Sowing date: | May 1, 2020 |
| Emergence: | May 12, 2020 |
| Nitrogen fertiliser: | 30 kg N/ha @ seeding + |

### The season so far

| | |
|---|---|
| Annual rainfall to date: | 154 mm |
| GSR to date: | 111 mm |
| GSR Decile: | 6 |
| Current predicted PAW: | 21 mm (22%) |
| PAWC: | 96 mm |

## Yield Prophet® predictions

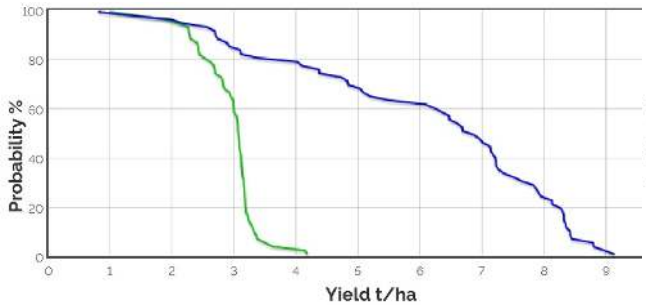
(*based on a 50% probability)*

Wheat sown May 1: **3.1 t/ha**

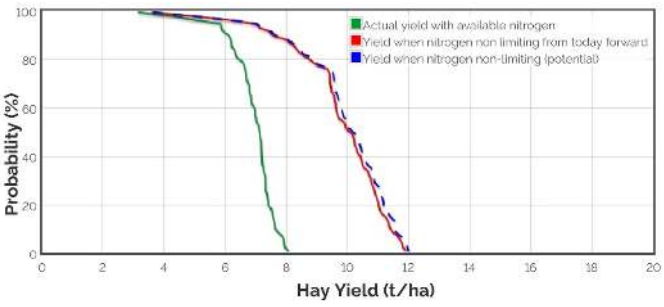
*also see graphs below*

Wheat sown May 20: **3.0 t/ha**

### Grain yield outcome graph




### Hay yield outcome graph

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## French & Schultz predictions

*This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (226 mm) for the remainder of the growing season.*

100% WUE **4.7 t/ha**

80% WUE **3.8 t/ha**

Location:

# TARLEE

HART BEAT


## TARLEE

Soil type: Sandy loam

**Date of report:** June 22, 2020

### Crop growth

| | |
|---|---|
| Variety: | Scepter wheat |
| Sowing date: | May 1, 2020 |
| Emergence: | May 11, 2020 |
| Nitrogen fertiliser: | 30 kg N/ha @ seeding |

### The season so far

| | |
|---|---|
| Annual rainfall to date: | 190 mm |
| GSR to date: | 156 mm |
| GSR Decile: | 7 |
| Current predicted PAW: | 101 mm (89%) |
| PAWC: | 113 mm |

## Yield Prophet® predictions

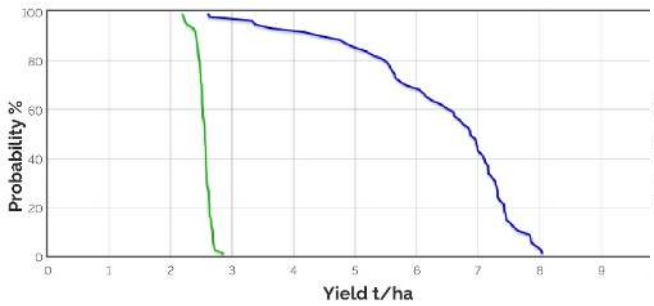
(*based on a 50% probability)*

Wheat sown May 1: **2.6 t/ha**

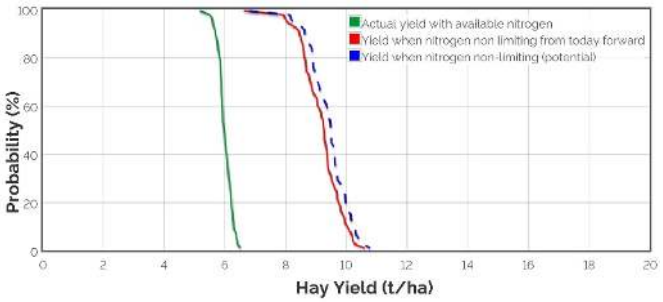
*also see graphs below*

Wheat sown May 20: **2.6. t/ha**

### Grain yield outcome graph




### Hay yield outcome graph

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## French & Schultz predictions

*This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (199 mm) for the remainder of the growing season.*

MID NORTH
HIGH RAINFALL ZONE

100% WUE **6.8 t/ha**

80% WUE **5.5 t/ha**

# More from Hart

HART BEAT

## Hart Winter Walk

### Tuesday, July 21


**COVID-Safe practices will apply**

**Registration essential as numbers will be limited**
*More details to come…*

**Enquiries:**
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0427 423 154 | admin@hartfieldsite.org.au

## Contact us

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