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





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.

Disclaimer: Yield Prophet® information is used entirely at your own risk. You will accept all risks and responsibility for losses, damages, costs and other consequences of using Yield Prophet® information and reports. To the maximum extent permitted by law, APSRU and BCG excludes all responsibility and liability to any person arising directly or indirectly from using the information generated by Yield Prophet®.

Important Notice: Yield Prophet[®] does not generate recommendations or advice, it is only a guide and must be combined with local paddock and district knowledge. APSIM does not take into account weed competition, pest/disease pressure, pesticide / herbicide damage, farmer error, or extreme events (such as extreme weather, flood and fire). For more information about APSIM or Yield Prophet[®] please visit or www.yieldprophet.com.au.

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 | bunga 428 Cla | | 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: | ART | HART BEAT |
|---|--|--|
| G511 G512 G513 G514 emergence 2nd leaf 3rd leaf 4th leaf 1st tiller early tillering m | GS15 Sth leaf Sth leaf Late tillering GS16 Sth leaf Late tillering GS16 Sth leaf Late tillering Sth leaf Sth leaf Late tillering Sth leaf Sth leaf Late tillering Sth leaf Sth leaf St | GS39 GS45 GS55 GS55 GS55 GS55 GS55 GS55 GS55 |
| HART Soil type: Sand | dy clay loam | eport: June 22, 2020 |
| Sowing date: May | pter wheat Annual rair (1, 2020 GSR to date (11, 2020 GSR Decile | afall to date: 199.8 mm e: 102.4 mm |

Yield Prophet® predictions

Current predicted PAW:

PAWC:

66 mm (32%)

206 mm

30 kg N/ha @ seeding

Nitrogen fertiliser:

(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



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 |
|----------|----------|
| | |

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80% WUE

3.7 t/ha

Location: HART **SPALDING** BEAT G512 GS13 GS14 GS16 G\$30 GS31 G532 G537 GS39 G545 G\$55 GS6 G\$75 4th leaf 6th leaf 3rd leaf 2nd leal end of 1st node 2nd node flag leaf flag leaf mid bootine mid emergence min mid Ist tille late tillering billering early tillering fully head dough emerged emergen fill **SPALDING** Date of report: June 22, 2020 Soil type: Red brown earth

GS11

Crop growth

Sowing date:

Emergence:

Variety:

Scepter wheat May 1, 2020 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 Actual yield with available nitrogen ield when nitrogen non limiting from today forwar eld when nitroo en non-limiting (potential) 8 20 8 60 Probability Probability 14 Hay Yield (t/ha) Yield t/ha

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



Variety:

Crop growth

Sowing date:

Emergence:

Scepter wheat May 1, 2020 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



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 |

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Grain yield outcome graph

Location: HART **KYBUNGA** BEAT **GS15** G\$30 GS45 GS12 GS31 GS32 GS37 G539 G\$55 GS6 3rd leal 4th le 5th leaf end o 1st nod flag lea mid booting 2nd lea flag lea 1st tiller early tillering mid tillering tillering fully head late tiller Real dough emerged emergenc fill **KYBUNGA**

Soil type:

GS11

Crop growth Variety: Sowing date: Emergence: Nitrogen fertiliser: Scepter wheat

Clay loam

May 1, 2020 May 12, 2020 30 kg N/ha @ seeding **Date of report:** June 22, 2020

The season so far

| nm |
|---------|
| nm |
| |
| m (28%) |
| nm |
| |

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



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

FARRELL FLAT

GS16

6th leaf

late tillering

G\$30

end of

tillering

GS31

1st node

G532

2nd not



FARRELL FLAT

3rd le

1st tiller

G514

4th lea

early tillering

Soil type:

Variety:

Crop growth

Sowing date:

Emergence:

Nitrogen fertiliser:

G512

2nd leat

GS11

Light clay loam

and till oring

Scepter wheat May 1, 2020 May 13, 2020 30 kg N/ha @ seeding

Date of report: June 22, 2020

The season so far

GS37

flag leaf

| 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

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 (252 mm) for the remainder of the growing season.

| 100% WUE | 5.7 t/ha |
|----------|----------|
|----------|----------|

80% WUE 4.6 t/ha



| Location: PINERY | | | | | | | | H/ BI | AR EA | | | | | |
|---------------------|---------------------------|---------------------------------|-------------------------------------|-----------------------------------|------------------------------------|-----------------------------|------------------|------------------|-------------------|----------------------------|---------------------|---------------------|----------------------------|----------------------|
| G511 emergence | GS12 2nd leaf | GS13 GS14 leaf 1st tiller | GS14 4th leaf early tillering | GS15 Sth leaf mid tillering | GS16 6th leaf late tillering | cs30 end of tillering | GS31 Ist node | GS32 Znd node | C537 flag leaf | C539 flag léaf fully | GS45 mid booting | GS55 mid head | - GS65 mid flowering | GS75 mid dough |
| | PINEF Soil type | | Si | lty clay lo | am | | | Date | e of rep | emerged | ne 22, 20 | emergence | | fill |

Scepter wheat May 1, 2020 May 11, 2020 40 kg N/ha @ seeding

Crop growth

Sowing date:

Emergence:

Nitrogen fertiliser:

Variety:

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 Hay yield when nitrogen Yield when nitrogen non-limiting (potential) Yield when nitrogen non-limiting (potential) Yield t/ha

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 (210 mm) for the remainder of the growing season.

100% WUE **5.4 t/ha**

80% WUE 4.3 t/ha

HART Location: EUDUNDA BEAT









GS16

6th leaf











CS6

EUDUNDA

GS13

Soil type:

Gravelly loam

Crop growth

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

Date of report: June 22, 2020

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 Actual yield with available nitrog eld when nitrogen non limiting from today fo Vield when nitrogen non-limiting (potential 8 (%) 2 Probability obability Hay Yield (t/ha) Yield t/ha

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 (226 mm) for the remainder of the growing season.

> 100% WUE 4.7 t/ha

3.8 t/ha 80% WUE



| Location: | | | | | | | HART | | | | | | | |
|-----------|----------|------------------------|-----------------------------|---------------------------|----------------------------|------------------|----------|----------|-----------|-------------------------------|-------------|--------------------------|------------------|----------------------|
| TARLEE | | | | | | BEAT | | | | | | | | |
| G511 | G512 | G513 | GS14 | GS15 | GS16 | G530 | GS31 | G532 | G537 | G 539 | G545 | GS55 | G565 | G575 |
| emergence | 2nd leaf | 3rd leaf 1st tiller | 4th leaf earty tillering | 5th leaf mid tillering | 6th leaf late tillering | end of tillering | 1st node | 2nd node | flag leaf | flag leaf fully emerged | mid booting | mid head emergence | mid flowering | mid dough fill |

Soil type:

Sandy loam

Crop growth

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

Date of report: June 22, 2020

| 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 Hay yield when nitrogen non-limiting from today forward of today fo

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 (199 mm) for the remainder of the growing season.



100% WUE 6.8 t/ha

80% WUE 5.5 t/ha





9am – 12pm at the Hart Field Site

Full program available soon: www.hartfieldsite.org.au

COVID-Safe practices will apply

Registration essential as numbers will be limited More details to come... Enquiries: Sandy Kimber, Executive Officer 0427 423 154 | admin@hartfieldsite.org.au

Contact us

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