

HART BEAT

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flexi/coil



HART BEAT

Yield Prophet® simulations for 8 sites across the mid-north of SA

The Yield Prophet® simulations featured are not a crystal ball, but provide a realistic prediction of the available soil water and nitrogen status of your crop



HART EVENTS

HART FIELD DAY – September 17, 2019

Spring Twilight Walk – October 15, 2019

IN THIS ISSUE

Definitions

Site information

Hart Beat site reports

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

www.hartfieldsite.org.au

Definitions

Hart Beat definitions

Each site has 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.

Drained upper limit (DUL) – is the amount of water that a saturated soil holds after it has drained.

Crop lower limit (CLL) – is the amount of water remaining in the soil after crop senescence.

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.

Bulk density (BD) – is a measure of the weight of dry soil per unit volume of soil.

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 probability curves - display two different nitrogen scenarios for each site. 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.

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.

Yield Prophet® has been very accurate throughout Australia, over the past 5 seasons. At the Hart field site the **Yield Prophet®** prediction on the 15th September, using an average finish, has been only 16% above the final grain yield, averaged over the past 4 years, making wheat growth models such as APSIM highly valuable.

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 and nitrogen processes in the paddock, and crop growth. **Yield Prophet®** calculates the amount of water and nitrogen available to the crop and the water and nitrogen demand of the crop.

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 www.hartfieldsite.org.au

Site information

Rainfall and soil water characteristics for all sites

Site	Average annual rainfall (mm)	Soil type	Plant Available Water Capacity (mm)	Soil Profile Depth (cm)	Plant Available Water at 15 March (mm)	Pre-sowing soil nitrogen (kg/ha)
Hart	400	Sandy clay loam	206	150	0	67
Spalding	430	Red brown earth	143	150	0	63
Condowie	350	Sandy loam	115	150	0	65
Kybunga	428	Clay loam	262	120	0	64
Farrell Flat	474	Light clay loam	172	120	0	71
Pinery	374	Silty clay loam	112	150	0	70
Eudunda	445	Gravelly loam	96	100	0	63
Tarlee	474	Sandy loam	113	150	0	67

2019 site locations



SANDY CLAY LOAM

Crop growth

Variety: Scepter wheat **Sowing date:** 1st May **Nitrogen fertiliser:** 30 kg N/ha at seeding + 20 kg N/ha on 18th July
Emergence date: 19th May

The season so far

Annual rain to date: 137 mm
GSR to date: 126 mm (33 mm since last report) **GSR decile:** 2
Current predicted PAW: 40 mm (19 % full) **PAWC:** 206 mm

Grain yield predictions (Yield Prophet)

Yield prophet estimate: (Date of report 29/07/2019)

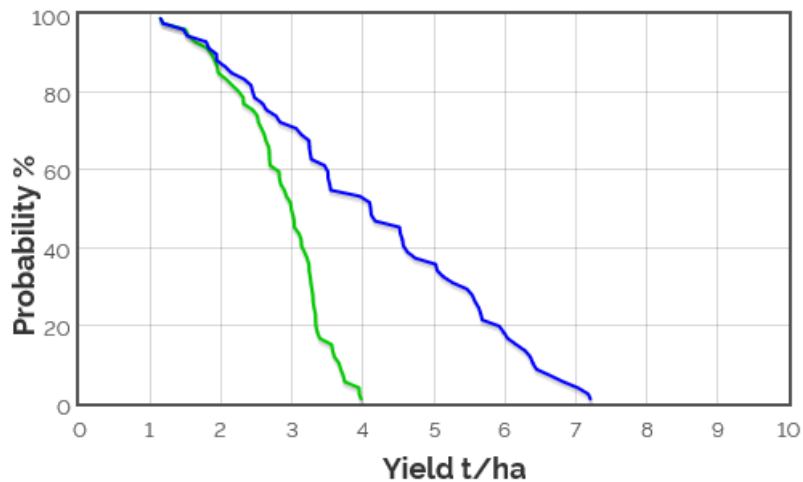
These estimates are based on a 50% probability

Yield t/ha	Sown 1 st May (see graph)	Change since last report	Sown 20 th May	Change since last report
Grain	3.6	-0.3	3.4	-0.5

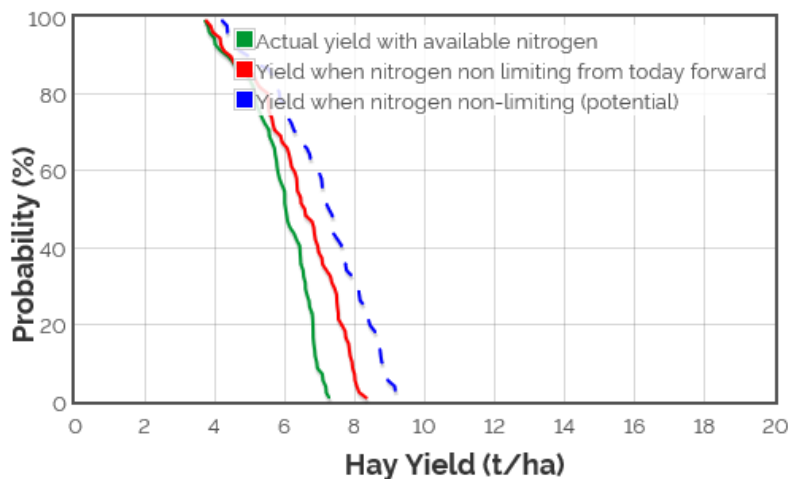
French & Schultz grain yield estimate:

100% WUE:	2.9 t/ha
80% WUE:	2.3 t/ha

This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (124 mm) for the rest of the season.



The graphs above and below 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.



SPALDING

RED BROWN EARTH

Crop growth

Variety: Scepter wheat Sowing date: 1st May Nitrogen fertiliser: 30 kg N/ha at seeding +
Emergence date: 13th May 40 kg N/ha on 18th July

The season so far

Annual rain to date: 185 mm
GSR to date: 163 mm (52 mm since last report)
Current predicted PAW: 66 mm (46 % full)

GSR decile: 5
PAWC: 143 mm

Grain yield predictions (Yield Prophet)

Yield prophet estimate: (Date of report 29/07/2019)

These estimates are based on a 50% probability

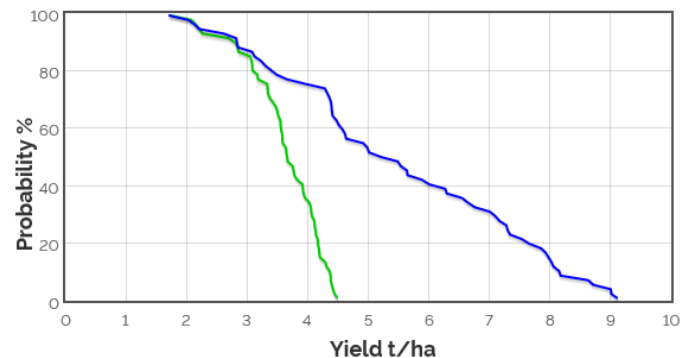
Yield t/ha	Sown 1 st May (see graph)	Change since last report	Sown 20 th May	Change since last report
Grain	4.4	-0.1	3.9	-0.2

French & Schultz grain yield estimate:

100% WUE:	3.8 t/ha
80% WUE:	3.0 t/ha

This model assumes that there is 7 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (131 mm) for the rest of the season.

Grain yield outcome graph



This graph shows 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.

CONDOWIE

SANDY LOAM

Crop growth

Variety: Scepter wheat Sowing date: 1st May Nitrogen fertiliser: 30 kg N/ha at seeding +
Emergence date: 19th May 20 kg N/ha on 18th July

The season so far

Annual rain to date: 142 mm
GSR to date: 136 mm (46 mm since last report)
Current predicted PAW: 30 mm (26 % full)

GSR decile: 5
PAWC: 115 mm

Grain yield predictions (Yield Prophet)

Yield prophet estimate: (Date of report 29/07/2019)

These estimates are based on a 50% probability

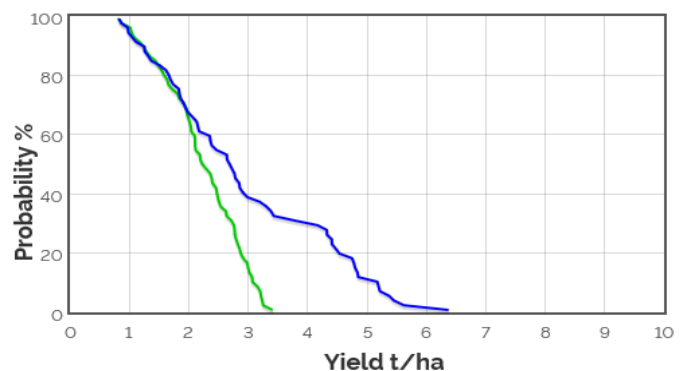
Yield t/ha	Sown 1 st May (see graph)	Change since last report	Sown 20 th May	Change since last report
Grain	2.5	-0.1	2.3	-0.2

French & Schultz grain yield estimate:

100% WUE:	2.6 t/ha
80% WUE:	2.1 t/ha

This model assumes that there is 2 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (101 mm) for the rest of the season.

Grain yield outcome graph



This graph shows 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.

CLAY LOAM

Crop growth

Variety: Scepter wheat Sowing date: 1st May Nitrogen fertiliser: 30 kg N/ha at seeding + 40 kg N/ha on 18th July
 Emergence date: 20th May

The season so far

Annual rain to date: 194 mm
 GSR to date: 184 mm (44 mm since last report)
 Current predicted PAW: 56 mm (21 % full)

GSR decile: 5
 PAWC: 262 mm

Grain yield predictions (Yield Prophet)

Yield prophet estimate: (Date of report 29/07/2019)

These estimates are based on a 50% probability

Yield t/ha	Sown 1 st May (see graph)	Change since last report	Sown 20 th May	Change since last report
Grain	3.9	-0.6	3.6	-0.5

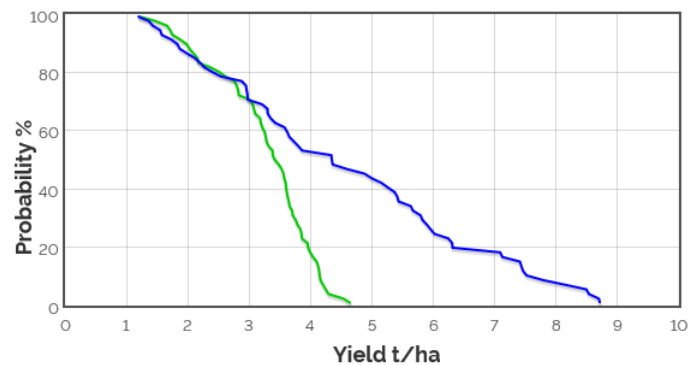
French & Schultz grain yield estimate:

100% WUE: 4.7 t/ha

80% WUE: 3.8 t/ha

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

Grain yield outcome graph



This graph shows 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.

FARRELL FLAT

Crop growth

Variety: Scepter wheat Sowing date: 1st May Nitrogen fertiliser: 30 kg N/ha at seeding + 40 kg N/ha on 18th July
 Emergence date: 14th May

The season so far

Annual rain to date: 177 mm
 GSR to date: 167 mm (51 mm since last report)
 Current predicted PAW: 56 mm (33% full)

GSR decile: 4
 PAWC: 172 mm

Grain yield predictions (Yield Prophet)

Yield prophet estimate: (Date of report 29/07/2019)

These estimates are based on a 50% probability

Yield t/ha	Sown 1 st May (see graph)	Change since last report	Sown 20 th May	Change since last report
Grain	4.7	-0.6	4.3	-0.4

French & Schultz grain yield estimate:

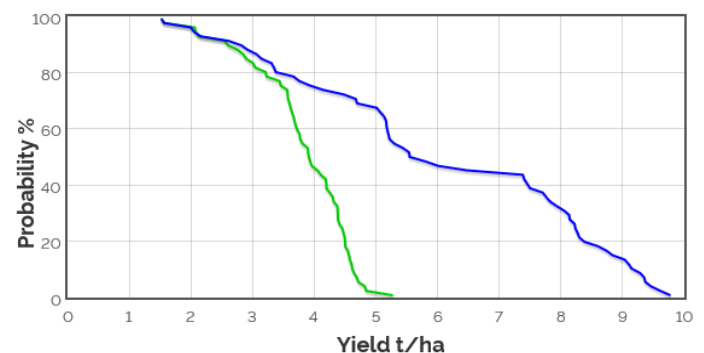
100% WUE: 4.3 t/ha

80% WUE: 3.5 t/ha

This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (157 mm) for the rest of the season.

LIGHT CLAY LOAM

Grain yield outcome graph



This graph shows 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.

SILTY CLAY LOAM

Crop growth

Variety: Scepter wheat Sowing date: 1st May Nitrogen fertiliser: 30 kg N/ha at seeding + 20 kg N/ha on 18th July
 Emergence date: 18th May

The season so far

Annual rain to date: 145 mm
 GSR to date: 136 mm (41 mm since last report)
 Current predicted PAW: 41 mm (37 % full)

GSR decile: 2
 PAWC: 112 mm

Grain yield predictions (Yield Prophet)

Yield prophet estimate: (Date of report 29/07/2019)

These estimates are based on a 50% probability

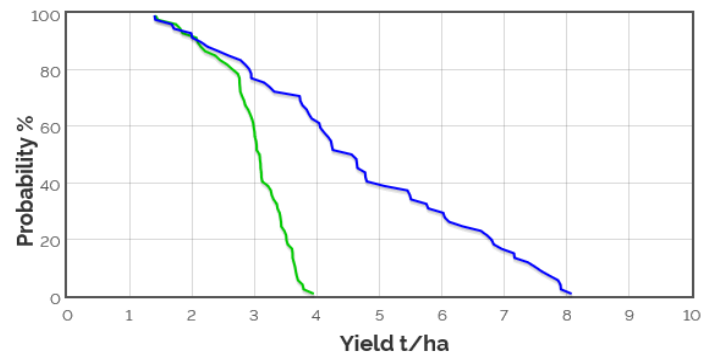
Yield t/ha	Sown 1 st May (see graph)	Change since last report	Sown 20 th May	Change since last report
Grain	3.9	-0.5	3.6	-0.6

French & Schultz grain yield estimate:

100% WUE:	3.1 t/ha
80% WUE:	2.5 t/ha

This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (126 mm) for the rest of the season.

Grain yield outcome graph



This graph shows 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.

GRAVELLY LOAM

Crop growth

Variety: Scepter wheat Sowing date: 1st May Nitrogen fertiliser: 30 kg N/ha at seeding + 20 kg N/ha on 18th July
 Emergence date: 15th May

The season so far

Annual rain to date: 132 mm
 GSR to date: 118 mm (39 mm since last report)
 Current predicted PAW: 9 mm (9 % full)

GSR decile: 1
 PAWC: 96 mm

Grain yield predictions (Yield Prophet)

Yield prophet estimate: (Date of report 29/07/2019)

These estimates are based on a 50% probability

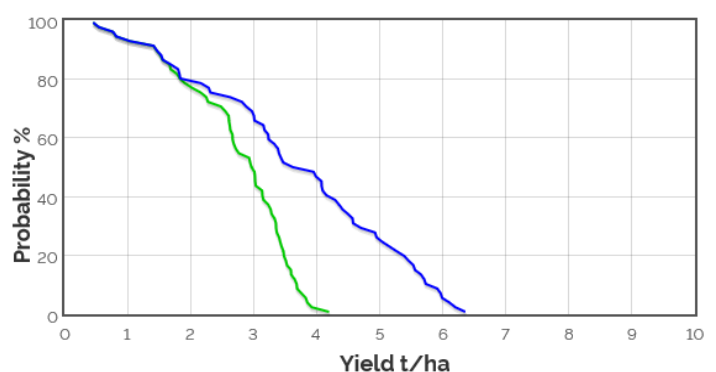
Yield t/ha	Sown 1 st May (see graph)	Change since last report	Sown 20 th May	Change since last report
Grain	3.3	-0.7	3.1	-0.8

French & Schultz grain yield estimate:

100% WUE:	3.2 t/ha
80% WUE:	2.5 t/ha

This model assumes that there is 4 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (147 mm) for the rest of the season.

Grain yield outcome graph



This graph shows 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.

Crop growth

Variety: Scepter wheat Sowing date: 1st May Nitrogen fertiliser: 30 kg N/ha at seeding + 20 kg N/ha on 18th July
 Emergence date: 14th May

The season so far

Annual rain to date: 157 mm
 GSR to date: 148 mm (41 mm since last report)
 Current predicted PAW: 44 mm (39% full)

GSR decile: 2
 PAWC: 113 mm

Grain yield predictions (Yield Prophet)

Yield prophet estimate: (Date of report 29/07/2019)

These estimates are based on a 50% probability

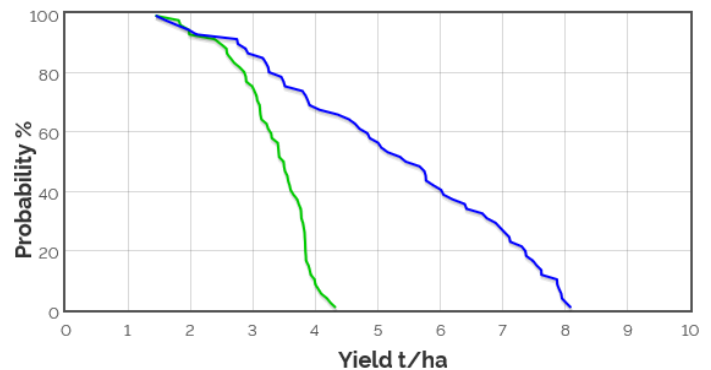
Yield t/ha	Sown 1 st May (see graph)	Change since last report	Sown 20 th May	Change since last report
Grain	4.5	0.0	4.0	-0.5

French & Schultz grain yield estimate:

100% WUE:	3.9 t/ha
80% WUE:	3.2 t/ha

This model assumes that there is 3 mm stored moisture, 110 mm of evaporation and Decile 5 rainfall (156 mm) for the rest of the season.

Grain yield outcome graph



This graph shows 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.

Winter Walk 2019

