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Hart Beat

Hart Field Site Group Inc.
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Can we use Yield Prophet to make early in crop decisions?

The *Yield Prophet*® (YP) wheat growth model has been very accurate throughout Australia over the past 6 years. At Hart the YP prediction on the 10th September, using an average finish, has been only 20% above the final grain yield, making it highly valuable (Figure 1).

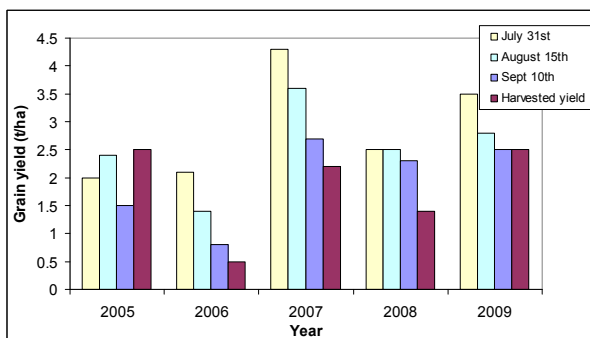


Figure 1: The predicted and harvested grain yield for wheat from 2005 to 2009 on July 31st, August 15th or September 10th, using an average finish, at Hart.

While earlier predictions in July and August have been less accurate they still give a useful indication of yield potential. For instance, in 2005, 2006 and 2008 YP was predicting low final yields from late July (Figure 1). Generally over the past 5 years estimated yields have been at their highest in July or August.

YP can give an accurate prediction of grain or hay yield potential early enough in the season to influence crop input decisions (see back page to run YP on your farm).



WINTER WALK

Featured Trials:

- Disease control in pulse crops
- Pre-emergent ryegrass control
- Controlling weeds along fence lines
- Estimating grain yield using Yield Prophet and moisture probes
- New broadleaf herbicides
- Pulse varieties

Tuesday 27 July 2010

At the Hart Field Day Site
[located on the Blyth to Brinkworth road]

9 am – 12 noon

For further details, visit our brand new website:

www.hartfieldsite.org.au

Enquiries:

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Attendance is FREE

Soil 2 Grain Workshop

"Keeping crops greener for longer"

Maitland Golf Club
Monday 2nd August
9:00am – 1:00pm
(Breakfast at 8:00am)
\$20 / head

Speakers include:
Nick Poole, Mick Faulkner & Peter Hooper
For further detail visit:

www.hartfieldsite.org.au

Dates for 2010

HART FIELD DAY
Tuesday 21st September
Gates open 9:00am

Spring Twilight Walk
Thursday 21st October
5:00pm – at the site

Hart

Site information as of 20th July 2010

Soil type: Sandy clay loam
PAWC: 201mm
Average annual rainfall: 400mm
Average GSR (Apr to Oct): 305mm

The season so far

Annual rain to date: 229mm
GSR to date: 154mm (33mm since last report)
GSR decile: 5
Maximum temp since sowing: 26.7°C
Minimum temp since sowing: -1.4°C
Average temp accumulation per day: 10.5°C
Current predicted soil N status: 116kg/ha
Current predicted PAW: 49mm

Grain & hay yield predictions

Yield prophet estimate: (Date of report 20/07/2010)

These estimates are based on a 50% probability

Yield t/ha	Sown 14 th May (see graph)	Change from last report	Sown 5 th May	Change from last report
Grain	3.5	+0.5	2.8	-0.1
Hay	6.5	+0.5	3.3	-2.2

French & Schultz grain yield estimate:

100% WUE: 3.7t/ha, 80% WUE: 2.9t/ha
This model assumes that there is 110mm of evaporation and decile 5 (139mm) rainfall for the remainder of the growing season.

Pre-sowing soil nitrogen and water

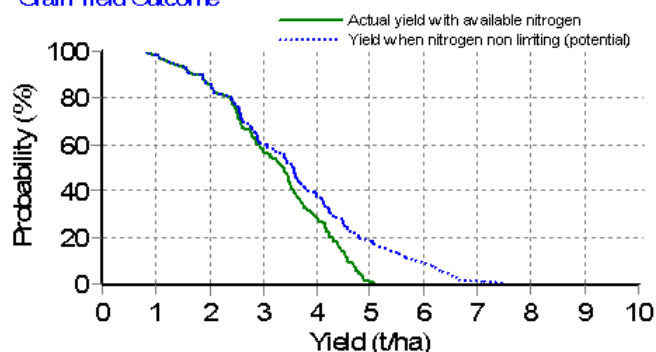
(measured 15th March)
Soil N prior to sowing (0-90cm): 68kg/ha
Plant available water at sowing (0-90cm): 0mm

Crop growth

Variety: Gladius
Sowing date: 14th May
Nitrogen fertiliser at sowing: 51kgN/ha
Targeted plant density: 150 plants per square metre
Current growth stage: Stem elongation (GS30)
Predicted date of full flag leaf (GS39): 15th August

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.

Grain Yield Outcome



Condowie

Site information as of 20th July 2010

Soil type: Sandy loam
PAWC: 127mm
Average annual rainfall: 349mm
Average GSR (Apr to Oct): 252mm

The season so far

Annual rain to date: 177mm
GSR to date: 138mm (31mm since last report)
GSR decile: 6
Maximum temp since sowing: 27.7°C
Minimum temp since sowing: -0.4°C
Average temp accumulation per day: 11.6°C
Current predicted soil N status: 208kg/ha
Current predicted PAW: 31mm

Grain & hay yield predictions

Yield prophet estimate: (Date of report 20/07/2010)

These estimates are based on a 50% probability

Yield t/ha	Sown 29 th April (see graph)	Change from last report	Sown 15 th May	Change from last report
Grain	3.5	0.0	3.0	+0.2
Hay	5.8	+0.3	5.8	+0.3

French & Schultz grain yield estimate:

100% WUE: 2.7t/ha, 80% WUE: 2.1t/ha
This model assumes that there is 110mm of evaporation and decile 5 (105mm) rainfall for the remainder of the growing season.

Pre-sowing soil nitrogen and water

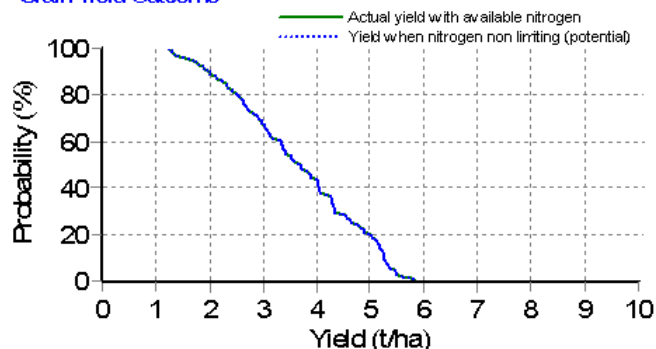
(measured 15th March)
Soil N prior to sowing (0-90cm): 215kg/ha
Plant available water at sowing (0-90cm): 0mm

Crop growth

Variety: Gladius
Sowing date: 29th April
Nitrogen fertiliser at sowing: 6kgN/ha
Targeted plant density: 120 plants per square metre
Current growth stage: 2nd node (GS32)
Predicted date of full flag leaf (GS39): 2nd August

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.

Grain Yield Outcome



Spalding

Site information as of 20th July 2010

Soil type: Red brown earth
 PAWC: 150mm
 Average annual rainfall: 434mm
 Average GSR (Apr to Oct): 322mm

The season so far

Annual rain to date: 219mm
 GSR to date: 180mm (36mm since last report)
 GSR decile: 6.5
 Maximum temp since sowing: 25.5°C
 Minimum temp since sowing: -4.1°C
 Average temp accumulation per day: 9.2°C
 Current predicted soil N status: 126kg/ha
 Current predicted PAW: 81mm

Grain & hay yield predictions

Yield prophet estimate: (Date of report 20/07/2010)

These estimates are based on a 50% probability

Yield t/ha	Sown 6 th May (see graph)	Change from last report	Sown 15 th May	Change from last report
Grain	5.7	+0.9	5.4	+0.6
Hay	8.0	+0.5	8.5	+0.2

French & Schultz grain yield estimate:

100% WUE: 4.6t/ha, 80% WUE: 3.7t/ha
 This model assumes that there is 110mm of evaporation and decile 5 (159mm) rainfall for the remainder of the growing season.

Pre-sowing soil nitrogen and water

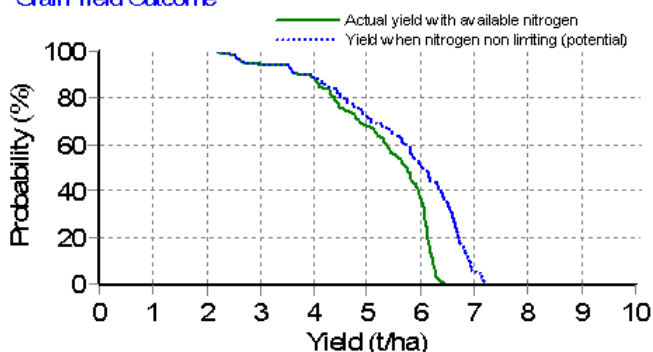
(measured 15th March)
 Soil N prior to sowing (0-90cm): 102kg/ha
 Plant available water at sowing (0-90cm): 0mm

Crop growth

Variety: Gladius
 Sowing date: 6th May
 Nitrogen fertiliser at sowing: 42kgN/ha
 Targeted plant density: 150 plants per square metre
 Current growth stage: 1st node (GS31)
 Predicted date of full flag leaf (GS39): 20th August

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.

Grain Yield Outcome



Tarlee

Site information as of 20th July 2010

Soil type: Clay loam over clay on rock
 PAWC: 122mm
 Average annual rainfall: 469mm
 Average GSR (Apr to Oct): 350mm

The season so far

Annual rain to date: 209mm
 GSR to date: 178mm (25mm since last report)
 GSR decile: 4
 Maximum temp since sowing: 27.8°C
 Minimum temp since sowing: 1.4°C
 Average temp accumulation per day: 11.4°C
 Current predicted soil N status: 112kg/ha
 Current predicted PAW: 83mm

Grain & hay yield predictions

Yield prophet estimate: (Date of report 20/07/2010)

These estimates are based on a 50% probability

Yield t/ha	Sown 13 th May (see graph)	Change from last report	Sown 5 th May	Change from last report
Grain	6.0	0.0	6.0	0.0
Hay	8.0	0.0	7.5	0.0

French & Schultz grain yield estimate:

100% WUE: 4.9t/ha, 80% WUE: 3.9t/ha
 This model assumes that there is 110mm of evaporation and decile 5 (175mm) rainfall for the remainder of the growing season.

Pre-sowing soil nitrogen and water

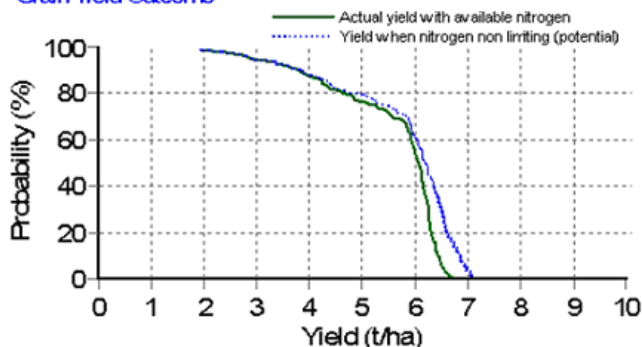
(measured 13th April)
 Soil N prior to sowing (0-90cm): 103kg/ha
 Plant available water at sowing (0-90cm): 35mm

Crop growth

Variety: Correll
 Sowing date: 13th May
 Nitrogen fertiliser at sowing: 0kgN/ha
 Targeted plant density: 150 plants per square metre
 Current growth stage: 5 leaf / 3 tillers (GS15/23)
 Predicted date of full flag leaf (GS39): 20th August

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.

Grain Yield Outcome



Hart Beat

WUE site locations



How to use Yield Prophet®

To run *Yield Prophet*® (YP) on your own farm the model requires information from:

- a soil test (increments down to 120cm) for moisture and nitrogen sampled prior to planting
- a soil classification (see below)
- historic and current climate data from the nearest met weather station
- rainfall data for the paddock
- crop and fertiliser details

The soil classification is very important and will influence the accuracy of YP. It includes values of plant available water capacity and soil chemistry. The most accurate method is to measure and test the paddock using a trained technician, or selecting the closest matching soil from a national database.

This can be accessed through the APSRU website and also viewed in Google Earth, the link for which is,

<http://www.apsim.info/Wiki/APSsoil.ashx>

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.

Day degrees – the accumulation of temperature units, or warmth. It is the main environmental property that controls plant development.

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.

The **French & Schultz** formula estimates the rainfall limited grain yield based on the growing season rainfall (GSR). It assumes evaporation of 110mm, it does not include stored water at sowing and a maximum grain yield potential of 20 kg/mm/ha.

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

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.

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*®

Site	Average annual rainfall (mm)	Soil type	Drained upper limit (mm to 150cm)	Crop lower limit (mm to 150cm)	Plant Available Water Capacity (mm)
Condowie	350	Sandy loam	376	249	127
Hart	400	Sandy clay loam	683	482	201
Spalding	430	Red brown earth	469	319	150
Tarlee	470	Clay loam over clay on rock	511	348	163

Hart field site contact information

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