Hart Beat

Hart Field Site Group Inc.
www.hartfieldsite.org.au

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Grain Yield and Soil Nitrogen in 2010

So far, grain yield predictions made by *Yield Prophet®* have been very stable at each of the sites.

The predicted yields are greater than those calculated using the French and Schultz model, except at Hart, so need to be treated with caution. However, Figure 1 shows that in seasons with an average (50%) finish, grain yield potential is very good. It is slightly better compared to last season, 2009 (Figure 2).

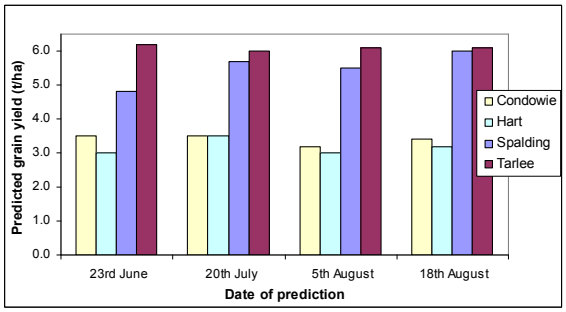


Figure 1: Yield Prophet® predictions of grain yield from the 23rd June to the 18th August at each site. In 2010 the yields predicted are for average rainfall and temperature conditions for the remainder of the season.

Canola agronomy plots at Hart 1st Aug 2010

A water use efficiency site 15th Aug 2010

The Tarlee Water Use Efficiency site has shifted to the MNHRZ this year. We would like to particularly thank Mick Faulkner and Jeff Braun for their collaboration.

MID NORTH
HIGH RAINFALL ZONE

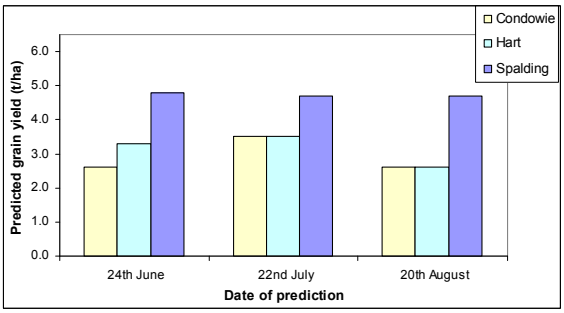


Figure 2: Yield Prophet® predictions of grain yield from the 24th June to the 20th August at each site in 2009.

The recent run of cold and wet weather has reduced the amount of soil nitrogen available to the crops (Figure 3). Hence, some crops are showing some yellowing and slow growth, otherwise called the 'winter blues' or 'wet feet'. A few warm days will help to green things up again!

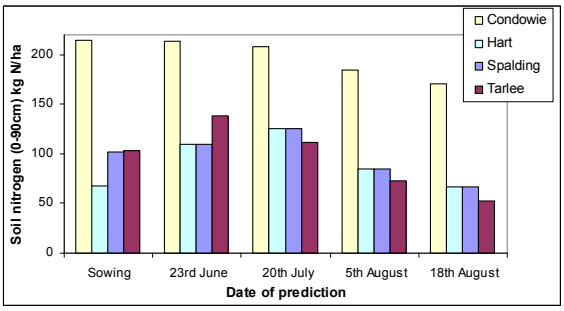


Figure 3: Yield Prophet® predictions of available soil nitrogen (0-90cm) from sowing to the 18th August at each site.

SPAA

Precision Ag Crop Walk

Wednesday 1st Sept 2010

10:30am – 11:30am
At Kenton Angel's farm – Kybunga

RSVP: Sam Trengove 0428 262 057

Further details and directions
www.hartfieldsite.org.au

Hart Site information as of 18th August 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: 266mm
GSR to date: 191mm (22mm since last report)
GSR decile: 5.0
Maximum temp since sowing: 26.7ºC
Minimum temp since sowing: -1.4ºC
Average temp accumulation per day: 10.1ºC
Current predicted soil N status: 55kg/ha
Current predicted PAW: 46mm
Current push probe depth: 60cm

Grain & hay yield predictions

Yield prophet estimate: (Date of report 18/08/2010)

These estimates are based on a 50% probability

Yield t/ha	Sown 14th May (see graph)	Change from last report	Sown 5th May	Change from last report
Grain	3.2	+0.2	3.0	+0.2
Hay	6.5	+0.5	3.4	+0.1

French & Schultz grain yield estimate:
100% WUE: 3.5t/ha, 80% WUE: 2.8t/ha
This model assumes that there is 110mm of evaporation and decile 5 (92mm) rainfall for the remainder of the growing season.

Pre-sowing soil nitrogen and water

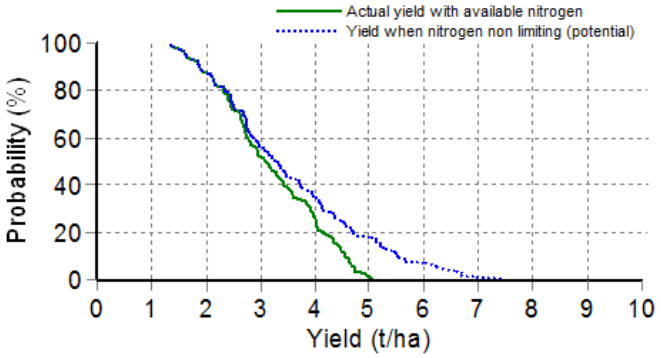
(measured 15th March)
Soil N prior to sowing (0-90cm): 68kg/ha
Plant available water at sowing (0-90cm): 0mm

Crop growth

Variety: Gladius
Sowing date: 14th May
Nitrogen fertiliser: 51kgN/ha
Targeted plant density: 150 plants per square metre
Current growth stage: Tip of flag leaf (GS37)
Predicted date of head (GS55): 22nd September

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 18th August 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: 207mm
GSR to date: 168mm (17mm since last report)
GSR decile: 5.0
Maximum temp since sowing: 27.7ºC
Minimum temp since sowing: -0.8ºC
Average temp accumulation per day: 11.5ºC
Current predicted soil N status: 171kg/ha
Current predicted PAW: 23mm
Current push probe depth: 20cm

Grain & hay yield predictions

Yield prophet estimate: (Date of report 18/08/2010)

These estimates are based on a 50% probability

Yield t/ha	Sown 29th April (see graph)	Change from last report	Sown 15th May	Change from last report
Grain	3.4	+0.2	2.6	+0.1
Hay	5.7	+0.2	5.5	+0.2

French & Schultz grain yield estimate:
100% WUE: 2.6t/ha, 80% WUE: 2.1t/ha
This model assumes that there is 110mm of evaporation and decile 5 (73mm) rainfall for the remainder of the growing season.

Pre-sowing soil nitrogen and water

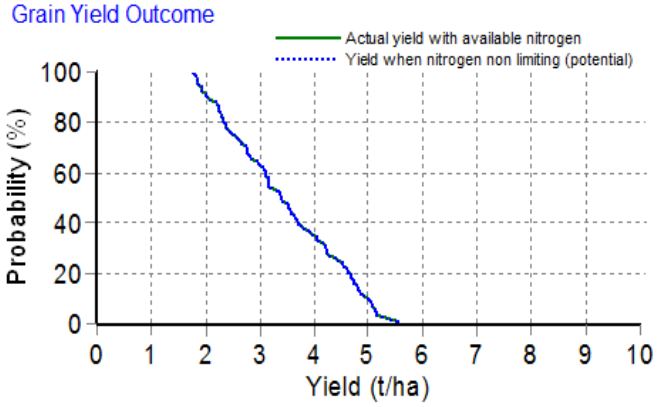
(measured 15th March)
Soil N prior to sowing (0-90cm): 215kg/ha
Plant available water at sowing (0-90cm): 0mm

Crop growth

Variety: Gladius
Sowing date: 29th April
Nitrogen fertiliser: 6kgN/ha
Plant density: 120 plants per square metre
Current growth stage: Awn emergence (GS49)
Predicted date of flowering (GS65): 5th September

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 18th August 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: 277mm
GSR to date: 237mm (39mm since last report)
GSR decile: 7.0
Maximum temp since sowing: 25.5ºC
Minimum temp since sowing: -4.1ºC
Average temp accumulation per day: 9.2ºC
Current predicted soil N status: 67kg/ha
Current predicted PAW: 101mm
Current push probe depth: 70cm

Grain & hay yield predictions

Yield prophet estimate: (Date of report 18/08/2010)

These estimates are based on a 50% probability

Yield t/ha	Sown 6th May (see graph)	Change from last report	Sown 15th May	Change from last report
Grain	6.0	+0.5	5.7	+0.7
Hay	8.3	+0.3	8.3	+0.3

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 (103mm) rainfall for the remainder of the growing season.

Pre-sowing soil nitrogen and water

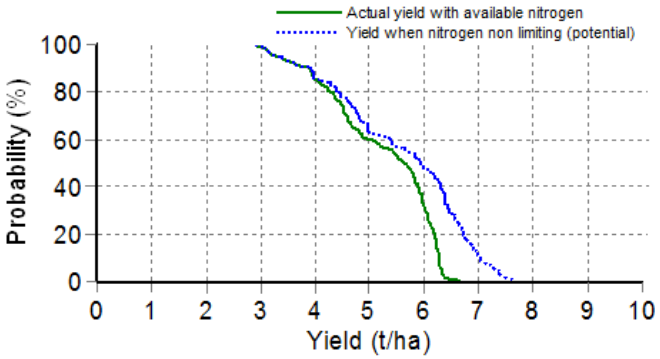
(measured 15th March)
Soil N prior to sowing (0-90cm): 102kg/ha
Plant available water at sowing (0-90cm): 0mm

Crop growth

Variety: Gladius
Sowing date: 6th May
Nitrogen fertiliser: 42kgN/ha
Targeted plant density: 150 plants per square metre
Current growth stage: Tip of flag leaf (GS37)
Predicted date of head (GS55): 12th September

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 18th August 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: 266mm
GSR to date: 234mm (24mm since last report)
GSR decile: 4.0
Maximum temp since sowing: 27.8ºC
Minimum temp since sowing: -0.2ºC
Average temp accumulation per day: 11.2ºC
Current predicted soil N status: 53kg/ha
Current predicted PAW: 103mm
Current push probe depth: 60cm

Grain & hay yield predictions

Yield prophet estimate: (Date of report 18/08/2010)

These estimates are based on a 50% probability

Yield t/ha	Sown 13th May (see graph)	Change from last report	Sown 5th May	Change from last report
Grain	6.1	0.0	5.9	-0.1
Hay	7.8	-0.2	7.4	-0.1

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 (120mm) rainfall for the remainder of the growing season.

Pre-sowing soil nitrogen and water

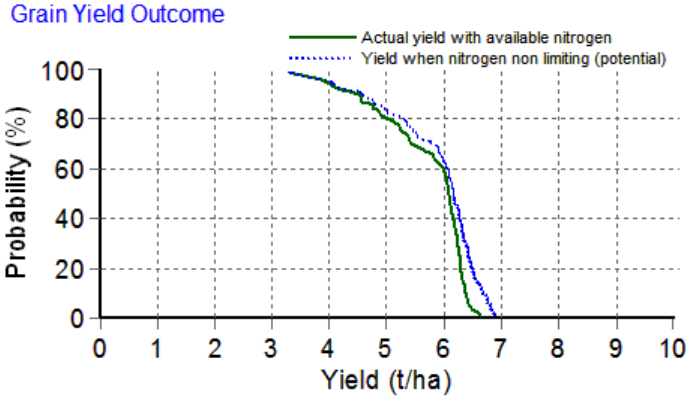
(measured 13th April)
Soil N prior to sowing (0-90cm): 103kg/ha
Plant available water at sowing (0-90cm): 35mm

Crop growth

Variety: Correll
Sowing date: 13th May
Nitrogen fertiliser: 50kgN/ha
Targeted plant density: 150 plants per square metre
Current growth stage: Tip of flag leaf (GS37)
Predicted date of head (GS55): 10th September

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

Probing for soil moisture

During the growing season methods for measuring soil moisture can be used to estimate crop grain or hay yield potential. This might be useful for adjusting crop nitrogen rates or not applying any. Measuring the soil moisture tells us more than just rainfall because it takes into account water lost through evaporation and plant water use that has already occurred.

One method is a metal push probe. It is a simple, cheap and portable tool for estimating depth and quantity of plant available soil water. Hence, it can be used to quickly test the different soil types of a paddock, repeatedly if required. It is essentially a metre of 10mm steel rod with a T handle and a larger diameter point (14mm), to aid removing the rod in moist soils (see picture).

The depth reached by the probe with reasonable force is a good indicator of available soil moisture, in most soil types. The crop available water depends on the soil type i.e light or heavy texture, change in soil type with depth and constraints to crop growth i.e salt or boron (Table 1). Knowledge about crop available water is essential for the values to be useful.

With a couple seasons of experience and knowledge about their soil, growers gain a very good 'feel' for the amount of water likely to be available, and how quickly it disappears.

Making a probe

Cut a piece of 10mm steel rod at 1 meter (or longer if you live on the Liverpool plains) and use a welder to create a 14mm 'bulb' at one end and grind smooth. The handle is a 30cm piece of 30mm pipe or similar. *It is important that the handle is secured firmly to the rod as if it breaks off when you are pushing down on it, you risk getting stabbed in the chest.* Drill a 10mm hole through the side of the handle so the rod passes through at 90 degrees and weld securely in place.

Soil Type	mm water/ cm push probe
Sandy loam	0.7
Sandy clay loam	1.0
Red brown earth	1.2
Clay loam	1.5
Heavy clay	1.8

Table 1: Some rules of thumb for plant available moisture (mm) to 70cm depth for a range of soil types.

Rainfall and soil water characteristics for the WUE sites

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

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