HART
SA's premier cropping field site

Hart Beat

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

15th August 2012 Issue 19

HART - *Celebrating 30 years in 2012*

Phosphorus fertilisers

The Hart Field Trial Site has conducted a long term phosphorus trial from 2007 continuing through to this season. The aim of the trial has been to investigate the impact of conventional phosphorus fertilisers, at varying rates, and alternative sources of phosphorus on the grain yield and quality of wheat, as well as examining the effect on soil phosphorus levels over time.

Results

In 2011 the grain yield ranged between 2.5 t/ha (nil phosphorus) to 3.0 t/ha (15 kg P/ha). All applications of phosphorus were higher yielding compared to nil phosphorus. This was statistically significant at the 95% level.

After 5 years of receiving no phosphorus this is the first significant response to the addition of phosphorus, increasing further with fertiliser rate.

Protein levels, whilst not significantly different, did decline with increases in grain yield in this treatment.

The treatment of biosolids (5t/ha) or chicken litter (3t/ha) alone were lower yielding as were the foliar treatments. However, the addition of 6 kg P/ha with the biosolids or chicken litter was able to improve grain yield significantly. There are significant differences between grain protein levels but this would appear to be more as a relationship to yield rather than in response to phosphorus treatments.

There were no significant differences in grain test weight or screenings which are attributable to treatments.

Soil phosphorus measurements in Autumn 2011 showed that 10 kg P/ha applied since 2007 had maintained soil phosphorus levels. Soil phosphorus level has significantly declined with the addition of 0 or 5 kg P/ha/yr, while 15 kg P/ha has increased soil phosphorus levels.

Key Findings

- All treatments receiving 5 or 10 kg P/ha for the past 3 seasons were significantly higher yielding compared to no phosphorus fertiliser.
- Annual applications of 10kg P/ha had maintained soil phosphorus levels whilst rates of 0 or 5 kg P/ha had led to declining soil phosphorous levels.
- Alternative phosphorus sources such as biosolids, chicken litter or biochar, produced significantly lower yields compared to phosphorus fertilisers.

See back page for related tables and page 16 of the 2011 Hart Trial Results book for the full article.

NEWSFLASH – as we go to print it's great to be able to report that much of the Mid-North cropping zone has experienced valuable rainfall (10-20mm). Please keep this in mind when interpreting Yield Prophet figures.

HART FIELD DAY

Tuesday 18th September 2012

Gates open 9am
Official welcome 10am
First session 10:30am
Last session ends 3:30pm
Bar open from 4pm

Further details coming soon:
www.hartfieldsite.org.au

Hart

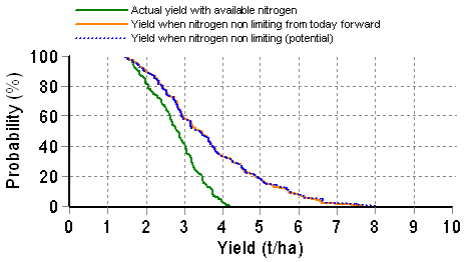
The season so far

Annual rain to date: 193mm (10mm since last report)
GSR to date: 114mm
GSR decile: 3.2
Current predicted PAW: 72mm

Crop growth

Variety: Gladius **Sowing date:** 30th May
Nitrogen fertiliser: 44kgN/ha

Grain Yield Outcome



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.

Site information as of 15th Aug 2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 15/8/2012)
These estimates are based on a 50% probability

Yield t/ha	Sown 30th May (see graph)	Change from last report	Sown 10th June	Change from last report
Grain	3.0	-0.6	2.8	-0.5

French & Schultz grain yield estimate:
100% WUE: 2.5t/ha, 80% WUE: 2.0t/ha
This model assumes that there is 26mm of stored moisture, 110mm of evaporation and decile 5 (94mm) rainfall for the remainder of the season.

Condowie

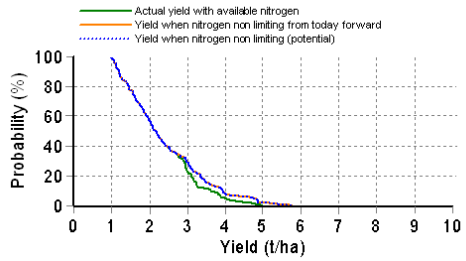
The season so far

Annual rain to date: 210mm (14mm since last report)
GSR to date: 124mm
GSR decile: 3.0
Current predicted PAW: 20mm

Crop growth

Variety: Gladius **Sowing date:** 18th May
Nitrogen fertiliser: 42kgN/ha

Grain Yield Outcome



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.

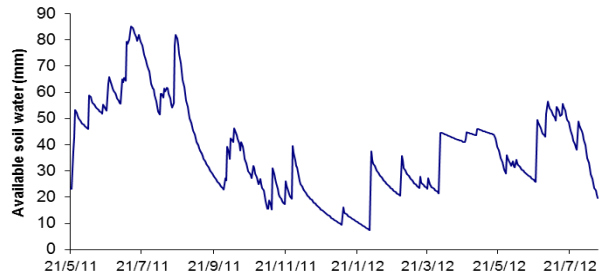
Site information as of 15th Aug 2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 15/8/2012)
These estimates are based on a 50% probability

Yield t/ha	Sown 18th May (see graph)	Change from last report	Sown 5th June	Change from last report
Grain	2.2	-0.4	1.7	-0.5

French & Schultz grain yield estimate:
100% WUE: 2.0t/ha, 80% WUE: 1.6t/ha
This model assumes that there is 7mm stored moisture, 110mm of evaporation and decile 5 (80mm) rainfall for the remainder of the season.



Kybunga

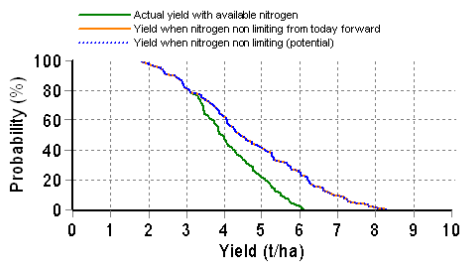
The season so far

Annual rain to date: 259mm (33mm since last report)
GSR to date: 172mm
GSR decile: 3.5
Current predicted PAW: 70mm

Crop growth

Variety: Gladius **Sowing date:** 17th May
Nitrogen fertiliser: 30kgN/ha

Grain Yield Outcome



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.

Site information as of 15/8/2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 15/8/2012)
These estimates are based on a 50% probability

Yield t/ha	Sown 17th May (see graph)	Change from last report	Sown 5th June	Change from last report
Grain	4.2	0.0	3.5	-0.2

French & Schultz grain yield estimate:
100% WUE: 4.3t/ha, 80% WUE: 3.5t/ha
This model assumes that there is 14mm stored moisture, 110mm of evaporation and decile 5 (140mm) rainfall for the remainder of the season.

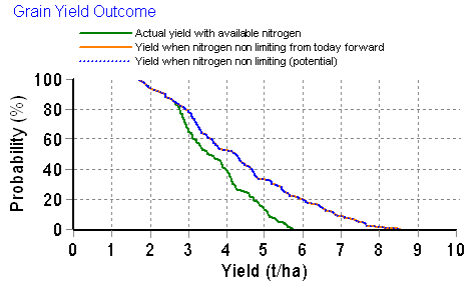
Spalding

The season so far

Annual rain to date: 223mm (14mm since last report)
GSR to date: 122mm
GSR decile: 1.0
Current predicted PAW: 56mm

Crop growth

Variety: Gladius **Sowing date:** 18th May
Nitrogen fertiliser: 44kgN/ha



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.

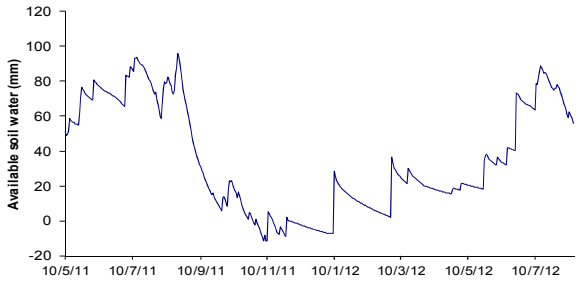
Site information as of 15th Aug 2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 15/8/2012)
These estimates are based on a 50% probability

Yield t/ha	Sown 18th May (see graph)	Change from last report	Sown 5th June	Change from last report
Grain	3.7	-0.8	3.3	-0.6

French & Schultz grain yield estimate:
100% WUE: 2.9t/ha, 80% WUE: 2.3t/ha
This model assumes that there is 22mm stored moisture, 110mm of evaporation and decile 5 (110mm) rainfall for the remainder of the season.



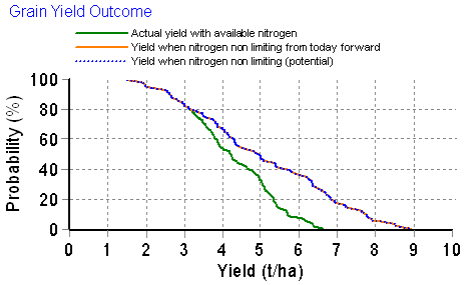
Farrell Flat

The season so far

Annual rain to date: 216mm (24mm since last report)
GSR to date: 142mm
GSR decile: 1.2
Current predicted PAW: 67mm

Crop growth

Variety: Scout **Sowing date:** 15th May
Nitrogen fertiliser: 30kgN/ha



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.

Site information as of 15th Aug 2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 15/8/2012)
These estimates are based on a 50% probability

Yield t/ha	Sown 15th May (see graph)	Change from last report	Sown 5th June	Change from last report
Grain	4.6	-0.7	3.9	-0.4

French & Schultz grain yield estimate:
100% WUE: 3.4t/ha, 80% WUE: 2.7/ha
This model assumes that there is 15mm stored moisture, 110mm of evaporation and decile 5 (124mm) rainfall for the remainder of the season.

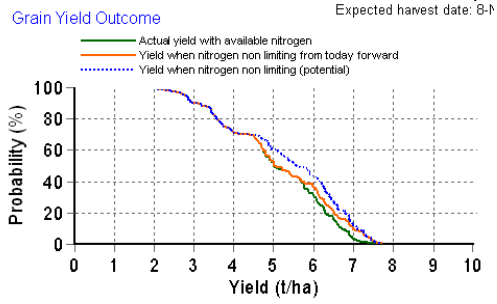
Tarlee

The season so far

Annual rain to date: 268mm (33mm since last report)
GSR to date: 184mm
GSR decile: 2.5
Current predicted PAW: 68mm

Crop growth

Variety: Scout **Sowing date:** 12th May
Nitrogen fertiliser: 50kgN/ha



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.

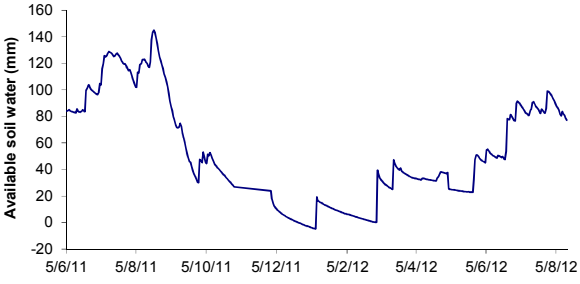
Site information as of 15th Aug 2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 15/8/2012)
These estimates are based on a 50% probability

Yield t/ha	Sown 12th May (see graph)	Change from last report	Sown 5th June	Change from last report
Grain	5.5	-0.3	5.2	-0.1

French & Schultz grain yield estimate:
100% WUE: 4.6t/ha, 80% WUE: 3.7/ha
This model assumes that there is 25mm stored moisture, 110mm of evaporation and decile 5 (132mm) rainfall for the remainder of the season.



Hart Beat

Table 2. Trial 1.Grain yield (t/ha), protein (%), test weight (kg/hL), retention (%) and screenings (%) at Hart in 2011.

Treatment	Grain yield (t/ha)	Protein (%)	Test weight (kg/hL)	Screenings (%)
Nil	2.5	11.8	76.4	1.1
5kg/ha P	2.7	11.5	78.4	0.8
10kg/ha P	2.9	11.3	78.2	1.1
15kg/ha P	3.0	11.2	78.0	0.8
LSD (0.05)	0.3	ns	ns	ns

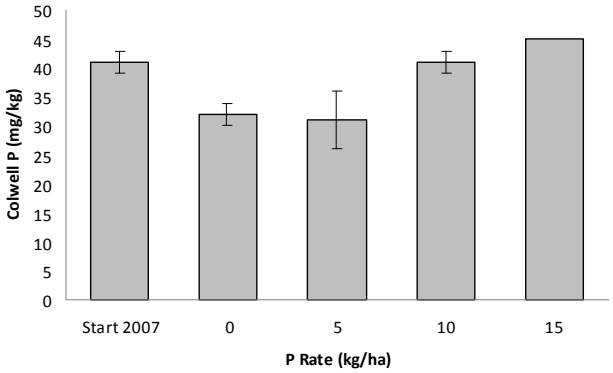


Figure 1. Soil Colwell phosphorus (0-10cm) levels measured in the Autumn of 2007 and then in 2011 for phosphorus rates between 0 and 15 kg/ha/yr at the Hart field site.

Table 3. Trial 2. Grain yield (t/ha), protein (%), test weight (kg/hL), and screenings (%) at Hart in 2011.

Treatment	Grain yield (t/ha)	Protein (%)	Test weight (kg/hL)	Screenings (%)
Nil	2.2	12.4	80.3	0.4
5t/ha Biosolids	2.5	12.2	79.5	0.6
5t/ha Biosolids + 6kg/ha P	2.7	11.5	79.1	0.8
3t/ha Chicken litter	2.3	12.4	79.3	0.4
3t/ha Chicken litter + 6kg/ha P	2.7	11.9	80.0	0.5
10kg/ha	2.9	11.7	79.7	0.5
Foliar 1	2.5	11.6	79.7	0.5
Foliar 2	2.6	11.7	79.7	0.5
LSD (0.05)	0.2	0.2	ns	0.2

Rainfall and water soil characteristics for WUE sites

Site	Average annual rainfall (mm)	Soil type	Pre-sowing soil moisture (0-90cm)(mm)	Pre-sowing soil nitrogen (0-90cm)(kg/ha)	Plant Available Water Capacity (mm)
Condowie	350	Sandy loam	13	114	127
Hart	400	Sandy clay loam	15	65	201
Spalding	430	Red brown earth	36	94	150
Tarlee	470	Clay loam over clay on rock	95	170	163
Kybunga	428	Friable clay loam	10	159	263
Farrell Flat	474	Red clay loam over clay	31	87	173

HART FIELD-SITE GROUP INC – Contact information

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