Hart Beat

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

August 2009 **Issue 3**

Dear members,

Recently Hart was involved with a GRDC supported Soil to Grain workshop.

Three key points from this workshop were

- Stored soil moisture from out of season rainfall can be just as valuable as rainfall during the grain filling period in spring.
- Early sowing requires a better understanding of the variety you are using (does it have the genetic capacity to regulate its maturity with the season), adjust the sowing rate to match the sowing time (lower with very early starts) and make sure that nitrogen is not excessive in the early stages of crop growth.
- Use either livestock or a growth regulator to help manage excessive early sown crops. However be selective making sure the varieties you practise this on are suitable and that you are in an area that can respond positively to these management procedures.

Keeping these key points in mind will minimise early water use saving some for the critical spring grain filling period.

Grant Roberts, Chairman
Hart Field site Group

Some of the speakers for the main field day

- Haydn Kuchel, AGT – wheat varieties
- Victor Sadras, SARDI – water use efficiency & soil moisture
- Chris Preston, University of Adelaide – pre-emergent herbicides & fence line weed control
- Mick Faulkner, Agrilink Agricultural consultants – wheat agronomy
- Kym I'Anson, Farmer- zone management & crop sensors
- Larn McMurray, SARDI – pulse varieties & disease management

Spraying the commercial crop 18th August

Barley agronomy trial 17th August (Sown 30th April)

Canola demo 17th August

Dates for 2009

Hart Field Day
Tuesday 15th September Gates open 9:00am

Spring Twilight Walk
Thursday 15th October – at the site 4:00pm

Hart Site information as of 20th August 2009

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

The season so far

Rain to date: 194mm
GSR to date: 185mm
GSR decile: 4
Maximum temp since sowing: 26.7ºC
Minimum temp since sowing: -1.2ºC
Day degrees since sowing: 1213ºC
Current predicted soil N status: 60kg/ha
Current predicted PAW: 18mm
Current push probe depth: 59cm

Grain & hay yield predictions

Yield prophet estimate: (Date of report 20/08/2009)
50% chance of producing 2.6t/ha grain or 5.3t/ha hay when sown on the 18th May (see graph).
50% chance of producing 3.3t/ha grain or 2.6/ha hay when sown on the 5th May.

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.

French & Schultz yield estimate: 3.4t/ha
This model assumes that there is 110mm of evaporation and decile 5 (94mm) rainfall for the remainder of the growing season.

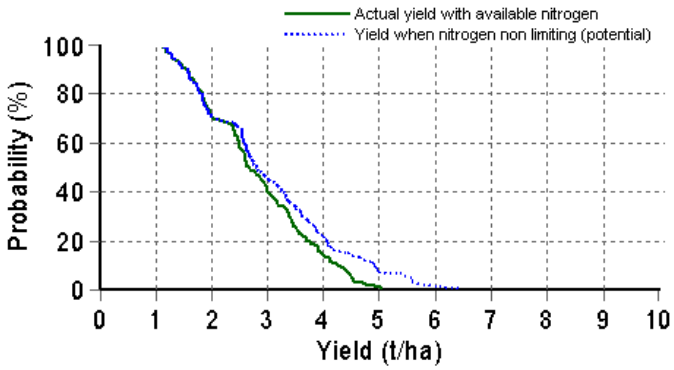
Pre-sowing soil nitrogen and water

(measured 2nd April)
Soil N prior to sowing (0-90cm): 94kg/ha
Plant available water at sowing (0-90cm): 0mm

Crop growth

Variety: Gladius
Sowing date: 18th May
Nitrogen fertiliser at sowing: 30kgN/ha
Plant density: 162 plants per square metre
Current growth stage: Flag leaf emergence (GS37)
Predicted date of mid flowering: 23rd September

Grain Yield Outcome



Condowie Site information as of 19th August 2009

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

The season so far

Rain to date: 173mm
GSR to date: 164mm
GSR decile: 5
Maximum temp since sowing: 29.3ºC
Minimum temp since sowing: -1.2ºC
Day degrees since sowing: 1395ºC
Current predicted soil N status: 174kg/ha
Current predicted PAW: 4mm
Current push probe depth: n.a.

Grain & hay yield predictions

Yield prophet estimate: (Date of report 20/08/2009)
50% chance of producing 2.6t/ha grain or 4.4t/ha hay when sown on the 30th April (see graph).
50% chance of producing 2.0t/ha grain or 4.3t/ha hay when sown on the 15th May.

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.

French & Schultz yield estimate: 2.6t/ha
This model assumes that there is 110mm of evaporation and decile 5 (75mm) rainfall for the remainder of the growing season.

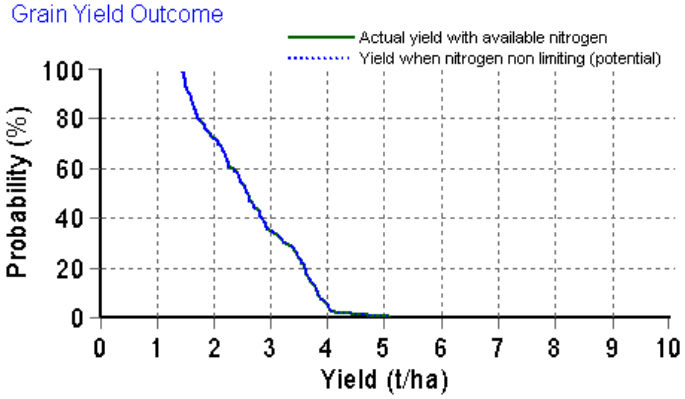
Pre-sowing soil nitrogen and water

(measured 27th March)
Soil N prior to sowing (0-90cm): 244kg/ha
Plant available water at sowing (0-90cm): 0mm

Crop growth

Variety: Gladius
Sowing date: 30th April
Nitrogen fertiliser at sowing: 20kgN/ha
Plant density: 162 plants per square metre
Current growth stage: start of flowering (GS61)
Predicted date of mid flowering: 31st August

Grain Yield Outcome



Spalding Site information as of 19th August 2009

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

The season so far

Rain to date: 247mm
GSR to date: 227mm
GSR decile: 6
Maximum temp since sowing: 24.9ºC
Minimum temp since sowing: -1.9ºC
Day degrees since sowing: 1181ºC
Current predicted soil N status: 33kg/ha
Current predicted PAW: 62mm
Current push probe depth: 81cm

Grain & hay yield predictions

Yield prophet estimate: (Date of report 20/08/2009)
50% chance of producing 4.7t/ha grain or 7.8t/ha hay when sown on the 9th May (see graph).
50% chance of producing 4.6t/ha grain or 8.2/ha hay when sown on the 15th May.

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.

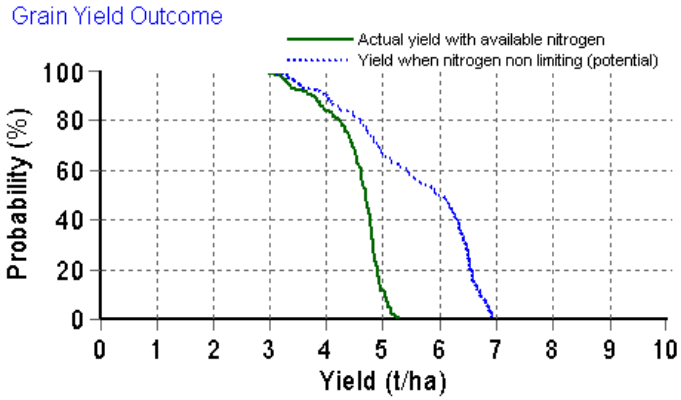
French & Schultz yield estimate: 4.5t/ha
This model assumes that there is 110mm of evaporation and decile 5 (106mm) rainfall for the remainder of the growing season.

Pre-sowing soil nitrogen and water

(measured 2nd April)
Soil N prior to sowing (0-90cm): 107kg/ha
Plant available water at sowing (0-90cm): 0mm

Crop growth

Variety: Gladius
Sowing date: 9th May
Nitrogen fertiliser at sowing: 40kgN/ha
Plant density: 182 plants per square metre
Current growth stage: Flag fully emerged (GS39)
Predicted date of mid flowering: 16th September



Tarlee Site information as of 19th August 2009

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

The season so far

Rain to date: 281mm
GSR to date: 261mm
GSR decile: 6
Maximum temp since sowing: 24.9ºC
Minimum temp since sowing: 0.6ºC
Day degrees since sowing: 923ºC
Current predicted soil N status: 55kg/ha
Current predicted PAW: 94mm
Current push probe depth: 70cm

Grain & hay yield predictions

Yield prophet estimate: (Date of report 20/08/2009)
50% chance of producing 4.8t/ha grain or 7.2t/ha hay when sown on the 1st June (see graph).
50% chance of producing 5.0t/ha grain or 6.1t/ha hay when sown on the 10th May.

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.

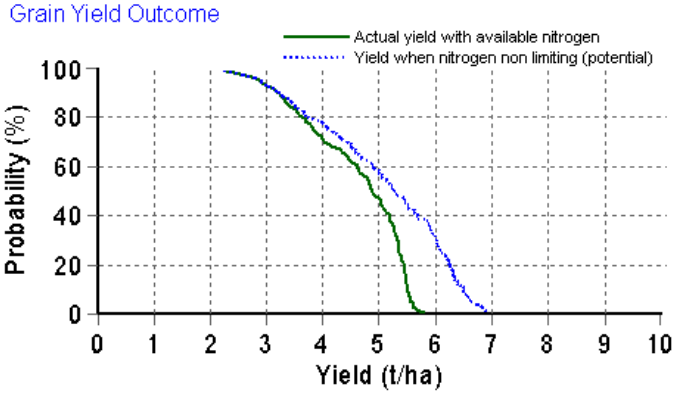
French & Schultz yield estimate: 5.5t/ha
This model assumes that there is 110mm of evaporation and decile 5 (123mm) rainfall for the remainder of the growing season.

Pre-sowing soil nitrogen and water

(measured 27th March)
Soil N prior to sowing (0-70cm): 143kg/ha
Plant available water at sowing (0-90cm): 7mm

Crop growth

Variety: Gladius
Sowing date: 1st June
Nitrogen fertiliser at sowing: 50kgN/ha
Plant density: 142 plants per square metre
Current growth stage: 1st node (GS31)
Predicted date of mid flowering: 28th September



Hart Beat

HART
SA's premier cropping field site

WUE site locations

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.

Push probe – a 10mm, steel rod 1m long with a rounded bulb on one end and a 30mm T handle on the other (see picture on cover) the probe is pushed down into the soil with reasonable force.

Push probe depth (cm) – is the depth reached by the push probe when reasonable downward force is applied.

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.

***Yield Prophet*®** has been very accurate throughout Australia, over the past 5 seasons. At the Hart fieldsite 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.

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 rock	383*	263*	120*

*depth to 125cm

Hart field site contact information

Sponsorship enquiries
Grant Roberts, Chairman, 8842 3364
Trials information
Peter Hooper, 8842 3230

Membership enquiries
Sandy Kimber, 8842 1718
Email
admin@hartfieldsite.org.au