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Hart Beat

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

August 2013 Issue 24

Controlling annual ryegrass

Different crop rotations were assessed for controlling annual ryegrass numbers, between 2006 and 2011. Ryegrass counts were carried out in the same paddock locations. Growers were selected to cover a range of control strategies including: export oaten hay, legume or oilseed break crops, short term (1 yr) pasture, chaff catching or continuous cereal (Figure 1).

Based on six years of results there was no clear strategy that provided improved annual ryegrass control compared to another. Also no single strategy was able to consistently reduce annual ryegrass numbers (Figure 1). The results however, show that more recent control options such as export oaten hay or chaff catching provided equivalent ryegrass control compared to older techniques (e.g. break crops, pasture phase).

Key messages

- Low annual ryegrass numbers (<50 plants per square metre) are easier to **maintain** at **manageable levels** and will potentially only require intermittent control.
- A **one year break** (control of annual ryegrass seed set) can have a big effect on plant numbers in the following season. Higher initial numbers will normally require 2 or 3 break crops to see the same reduction.
- **Timeliness** and attention to detail of operations was an important feature in paddocks where annual ryegrass numbers were successfully reduced.
- Continued **monitoring** and follow up assessment of control strategies is key for detection of escapes, and therefore late season seed set control.

The read the full article go to the 2011 Hart Trials Results book, pg 49-51.

Events

HART FIELD DAY
Tuesday 17th 2013

Spring Twilight Walk
15th October 2013

Getting the Crop In seminar
12th March 2014

www.hartfieldsite.org.au

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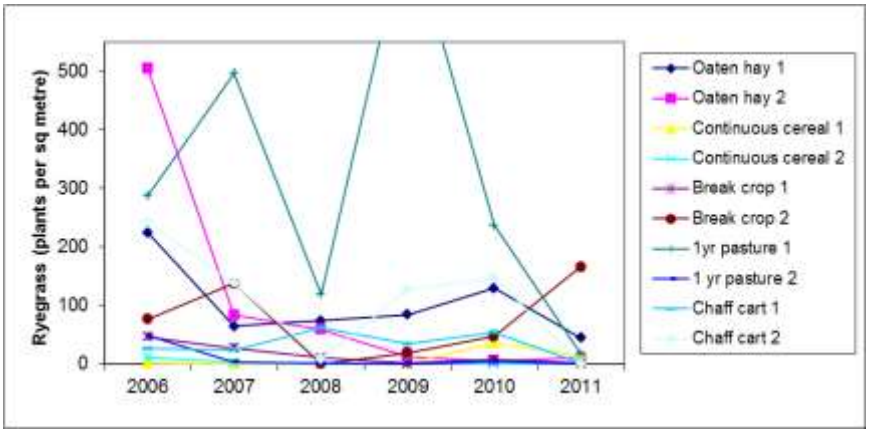


Figure 1*. Ryegrass numbers for 5 control strategies and 10 paddocks in the Mid North from 2006 to 2011.*

Hart (sandy clay loam)

The season so far

Annual rain to date: 329mm
GSR to date: 277mm
GSR decile: 9.0
Current predicted PAW: 126mm

Crop growth

Variety: Mace wheat **Sowing date:** 1st May
Nitrogen fertiliser: 65 kg N/ha

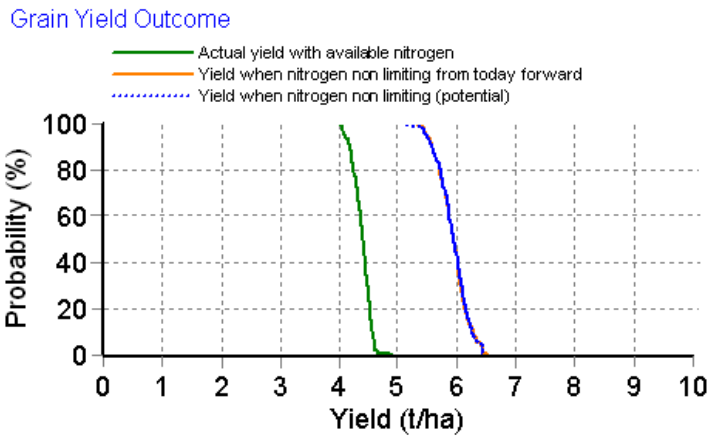
Site information as of 13th August 2013

Grain yield predictions

These estimates are based on a 50% probability

Yield t/ha	Sown 1st May (see graph)	Change since last report	Sown 20th May	Change since last report
Grain	5.2	0.1	5.4	0.1

French & Schultz grain yield estimate:
100% WUE: 5.3 t/ha, 80% WUE: 4.3 t/ha
This model assumes that there was 0mm stored moisture, 110mm of evaporation and decile 5 (100mm) rainfall for the rest of the season.



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.

Pinery (silty clay loam)

The season so far

Annual rain to date: 282mm
GSR to date: 255mm
GSR decile: 9.0
Current predicted PAW: 60mm

Crop growth

Variety: Mace wheat **Sowing date:** 1st May
Nitrogen fertiliser: 65 kg N/ha

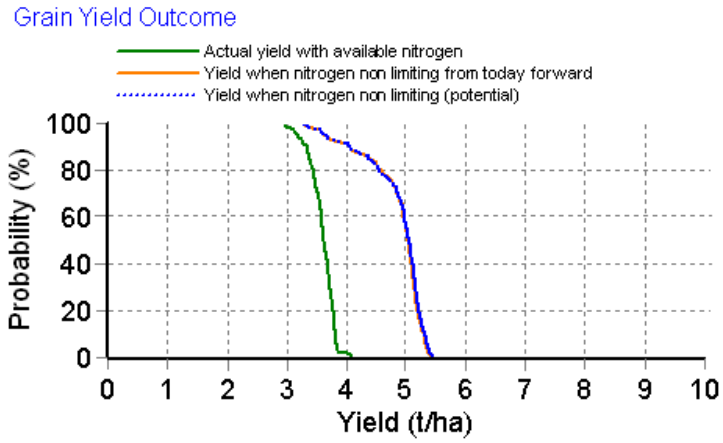
Site information as of 13th August 2013

Grain yield predictions

These estimates are based on a 50% probability

Yield t/ha	Sown 1st May (see graph)	Change from last report	Sown 20th May	Change since last report
Grain	4.3	0.0	3.7	-0.1

French & Schultz grain yield estimate:
100% WUE: 4.9 t/ha, 80% WUE: 3.9 t/ha
This model assumes that there was 0mm stored moisture, 110mm of evaporation and decile 5 (100mm) rainfall for the rest of the season.



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.

Kybunga (clay loam)

The season so far

Annual rain to date: 326mm
GSR to date: 295mm
GSR decile: 9.0
Current predicted PAW: 136mm

Crop growth

Variety: Mace wheat **Sowing date:** 1st May
Nitrogen fertiliser: 65 kg N/ha

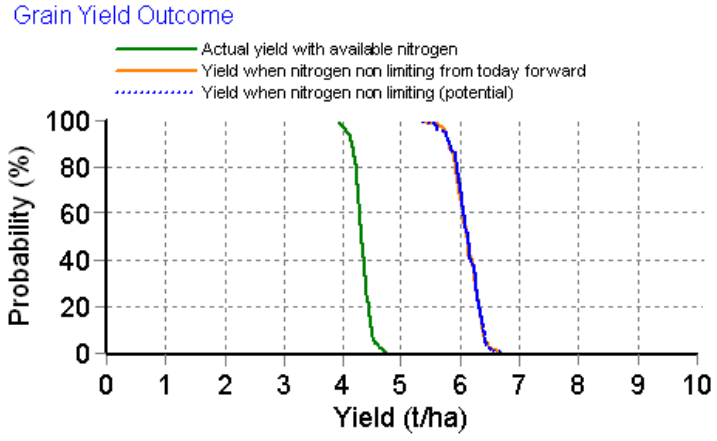
Site information as of 13th August 2013

Grain yield predictions

These estimates are based on a 50% probability

Yield t/ha	Sown 1st May (see graph)	Change from last report	Sown 20th May	Change since last report
Grain	5.2	0.0	5.3	0.0

French & Schultz grain yield estimate:
100% WUE: 6.3 t/ha, 80% WUE: 5.0 t/ha
This model assumes that there was 0mm stored moisture, 110mm of evaporation and decile 5 (128mm) rainfall for the rest of the season.



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.

Spalding (red brown earth)

The season so far

Annual rain to date: 293mm
GSR to date: 254mm
GSR decile: 8.0
Current predicted PAW: 115mm

Crop growth

Variety: Mace wheat **Sowing date:** 1st May
Nitrogen fertiliser: 65 kg N/ha

Site information as of 13th August 2013

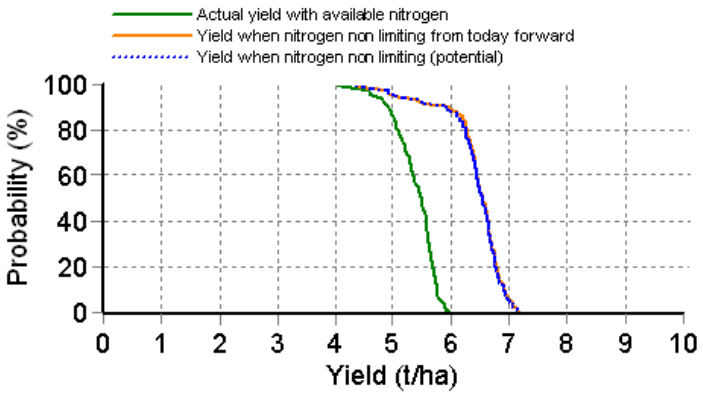
Grain yield predictions

These estimates are based on a 50% probability

Yield t/ha	Sown 1st May (see graph)	Change from last report	Sown 20th May	Change since last report
Grain	6.0	0.0	5.7	0.0

French & Schultz grain yield estimate:
100% WUE: 5.2 t/ha, 80% WUE: 4.2 t/ha
This model assumes that there was 0mm stored moisture, 110mm of evaporation and decile 5 (118mm) rainfall for the rest of the season.

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.

Farrell Flat (red clay loam)

The season so far

Annual rain to date: 328mm
GSR to date: 289mm
GSR decile: 8.0
Current predicted PAW: 143mm

Crop growth

Variety: Mace wheat **Sowing date:** 1th May
Nitrogen fertiliser: 65 kg N/ha

Site information as of 13th August 2013

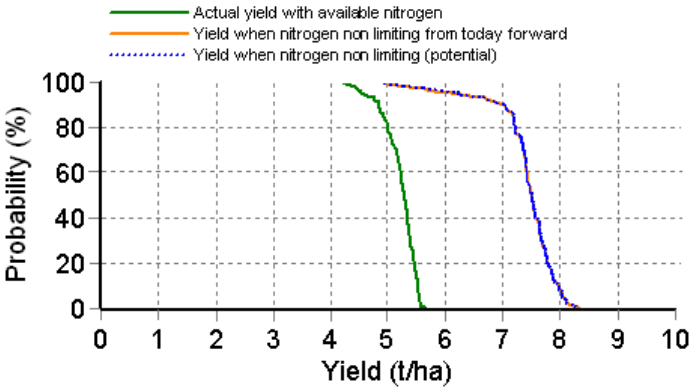
Grain yield predictions

These estimates are based on a 50% probability

Yield t/ha	Sown 1st May (see graph)	Change from last report	Sown 20th May	Change since last report
Grain	6.5	0.1	6.3	0.0

French & Schultz grain yield estimate:
100% WUE: 6.2 t/ha, 80% WUE: 5.0 t/ha
This model assumes that there was 0mm stored moisture, 110mm of evaporation and decile 5 (132mm) rainfall for the rest of the season.

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.

Tarlee (clay loam)

The season so far

Annual rain to date: 282mm
GSR to date: 248mm
GSR decile: 7.0
Current predicted PAW: 76mm

Crop growth

Variety: Mace wheat **Sowing date:** 1st May
Nitrogen fertiliser: 65 kg N/ha

Site information as of 13th August 2013

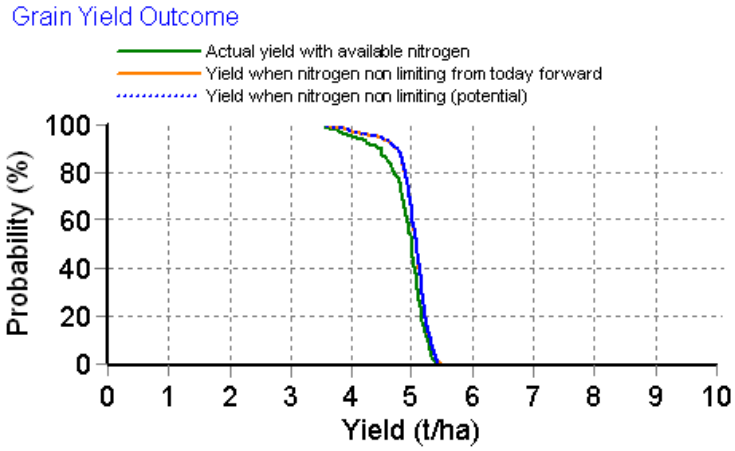
Grain yield predictions

These estimates are based on a 50% probability

Yield t/ha	Sown 1st May (see graph)	Change from last report	Sown 20th May	Change since last report
Grain	5.0	-0.2	5.2	-0.2

French & Schultz grain yield estimate:
100% WUE: 5.5 t/ha, 80% WUE: 4.4 t/ha
This model assumes that there was 0mm stored moisture, 110mm of evaporation and decile 5 (138mm) rainfall for the rest of the season.

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.

Hart Beat

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.
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® 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.

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