



Hart Beat

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

3rd October 2012 Issue 21

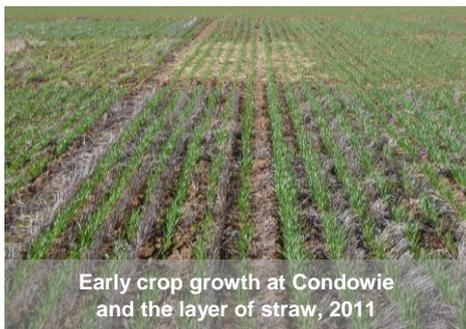
Improving water use efficiency: reducing soil evaporation

Key findings

- The addition of a straw layer acted to reduce evaporation and significantly increased grain yields and water use efficiency in 2010 and 2011 at 3 field sites.
- Soil evaporation also decreased with increasing light interception from larger crop canopies.

Throughout southern Australia many trials have recently focussed on improving the retention of summer rainfall and have clearly shown that effective and early summer weed control increases stored soil moisture. Soil cover i.e stubble, throughout the summer period was shown to provide limited additional benefit. However, good stubble cover prior to sowing has been shown to increase the retention of autumn moisture, and improve the ability to sow earlier.

These trials were conducted on the previously established sites at Hart, Condowie, Saddleworth and Spalding. 6 tonnes/ha of oaten straw was spread evenly over plots of gladius wheat, immediately after sowing. This straw layer provided about 95% soil cover. 50 kg N/ha was spread on the 23rd July to some treatments. Measurements of gravimetric soil water content and light interception were taken to calculate soil evaporation throughout the growing season.



Results

In 2011, the addition of straw increased wheat grain yields by 8, 19, 26 and 11% at Spalding, Saddleworth, Condowie and Hart respectively. Condowie produced the largest increase in grain yield from 1.91 t/ha to 2.40 t/ha, while Spalding had the lowest increase (Figure 1). The addition of extra nitrogen increased grain yield significantly at Condowie and Hart. The increased grain yield came from

extra crop growth or dry matter, and longer retention of green leaves.

Figure 1. The influence of straw or straw and extra nitrogen on wheat grain yields at Hart, Condowie, Saddleworth and Spalding in 2011. (LSD's (0.05) for grain yield were 0.16, 0.32, 0.93 and 0.43 for Condowie, Hart, Saddleworth and Spalding, respectively).

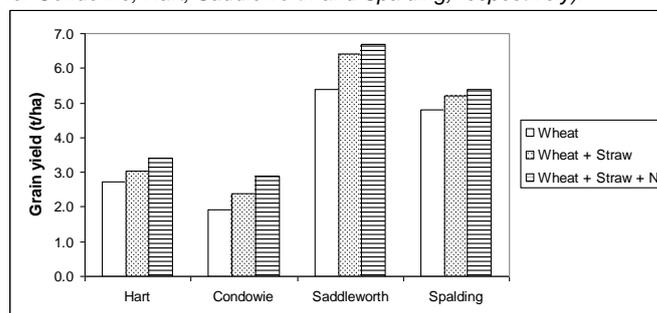
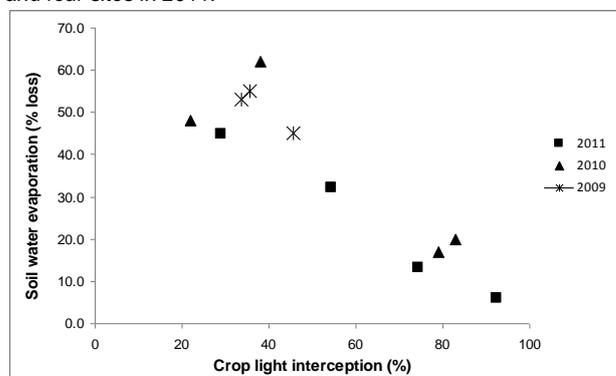


Figure 3. The percentage of total crop available water evaporated from the soil and the amount of light intercepted by the crop canopy during stem elongation at three sites in 2009 and 2010, and four sites in 2011.



Reducing the amount of sunlight hitting a soil surface, will decrease the amount of moisture lost from soil evaporation.



Figure 3 shows how the developing crop canopy at each of the sites was also able to reduce soil evaporation, thus leaving more water available for the crop. Previous work in other states has shown that standing stubble may be as effective at reducing moisture loss, compared to laying stubble. This work has continued in 2012.

Acknowledgements

This trial is funded by the GRDC and conducted in collaboration the University of Adelaide.

SPRING TWILIGHT WALK

Tuesday 16th October 2012

5pm at Hart

Please join us for BBQ tea and drinks
 supplied at the walk's conclusion

www.hartfieldsite.org.au

Hart

The season so far

Annual rain to date: 227mm (17mm since last report)

GSR to date: 148mm

GSR decile: 1.0

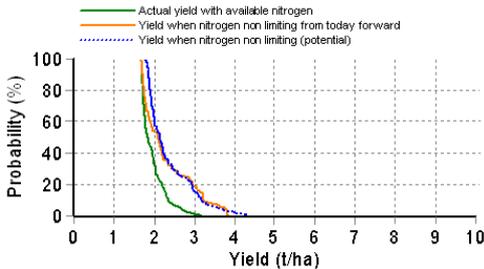
Current predicted PAW: 11mm

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 3rd October 2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 3/10/2012)

These estimates are based on a 50% probability

Yield t/ha	Sown 30 th May (see graph)	Change from last report	Sown 10 th June	Change from last report
Grain	1.9	-0.8	1.8	-0.6

French & Schultz grain yield estimate:

100% WUE: 1.9t/ha, 80% WUE: 1.5/ha

This model assumes that there is 26mm stored moisture, 110mm of evaporation and decile 5 (29mm) rainfall for the rest of the season.



Condowie

The season so far

Annual rain to date: 243mm (12mm since last report)

GSR to date: 156mm

GSR decile: 1.0

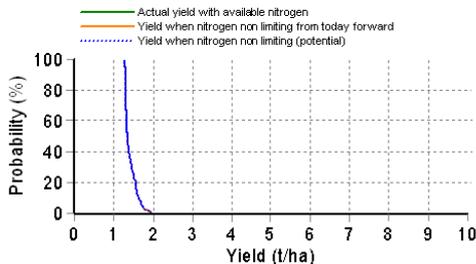
Current predicted PAW: 2mm

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 3rd October 2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 3/10/2012)

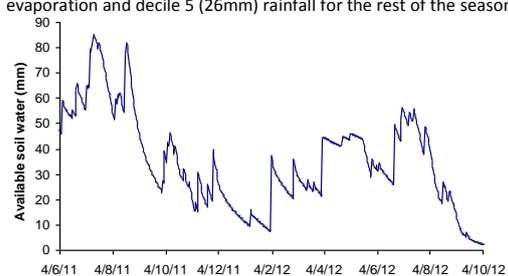
These estimates are based on a 50% probability

Yield t/ha	Sown 18 th May (see graph)	Change from last report	Sown 5 th June	Change from last report
Grain	1.3	-0.5	1.2	-0.4

French & Schultz grain yield estimate:

100% WUE: 1.6t/ha, 80% WUE: 1.3/ha

This model assumes that there is 7mm stored moisture, 110mm of evaporation and decile 5 (26mm) rainfall for the rest of the season.



Kybunga

The season so far

Annual rain to date: 310mm (17mm since last report)

GSR to date: 223mm

GSR decile: 2.5

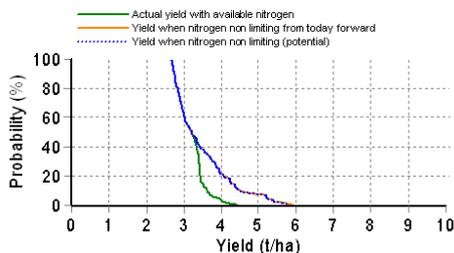
Current predicted PAW: 12mm

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 3rd October 2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 3/10/2012)

These estimates are based on a 50% probability

Yield t/ha	Sown 17 th May (see graph)	Change from last report	Sown 5 th June	Change from last report
Grain	3.2	-1.1	2.5	-1.0

French & Schultz grain yield estimate:

100% WUE: 3.3t/ha, 80% WUE: 2.7/ha

This model assumes that there is 14mm stored moisture, 110mm of evaporation and decile 5 (40mm) rainfall for the rest of the season.



Spalding

The season so far

Annual rain to date: 279mm (22mm since last report)

GSR to date: 178mm

GSR decile: 1.0

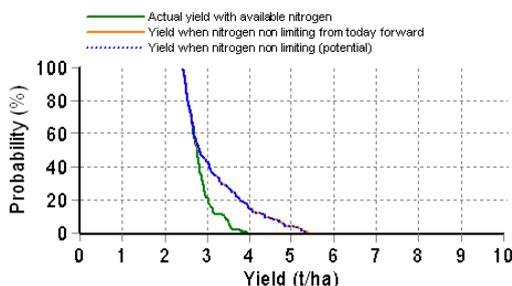
Current predicted PAW: 11mm

Crop growth

Variety: Gladius Sowing date: 18th 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 3rd October 2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 3/10/2012)

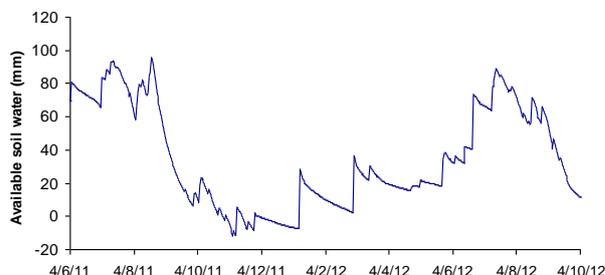
These estimates are based on a 50% probability

Yield t/ha	Sown 18 th May (see graph)	Change from last report	Sown 5 th June	Change from last report
Grain	2.8	-1.1	2.4	-1.1

French & Schultz grain yield estimate:

100% WUE: 2.4t/ha, 80% WUE: 1.9/ha

This model assumes that there is 22mm stored moisture, 110mm of evaporation and decile 5 (31mm) rainfall for the rest of the season.



Farrell Flat

The season so far

Annual rain to date: 269mm (19mm since last report)

GSR to date: 195mm

GSR decile: 1.0

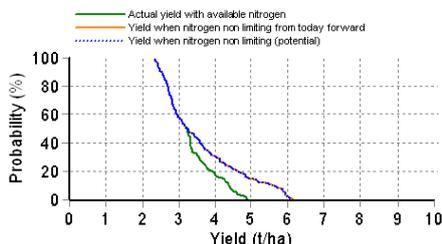
Current predicted PAW: 19mm

Crop growth

Variety: Scout Sowing date: 15th 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 3rd October 2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 3/10/2012)

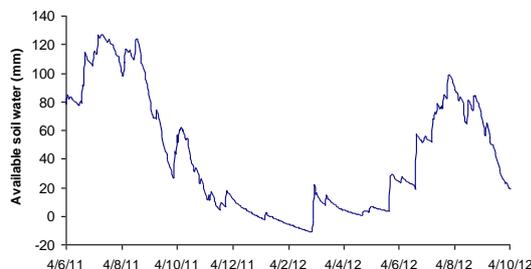
These estimates are based on a 50% probability

Yield t/ha	Sown 15 th May (see graph)	Change from last report	Sown 5 th June	Change from last report
Grain	3.3	-1.1	2.5	-1.0

French & Schultz grain yield estimate:

100% WUE: 2.7t/ha, 80% WUE: 2.2/ha

This model assumes that there is 15mm stored moisture, 110mm of evaporation and decile 5 (37mm) rainfall for the rest of the season.



Tarlee

The season so far

Annual rain to date: 333mm (25mm since last report)

GSR to date: 249mm

GSR decile: 2.0

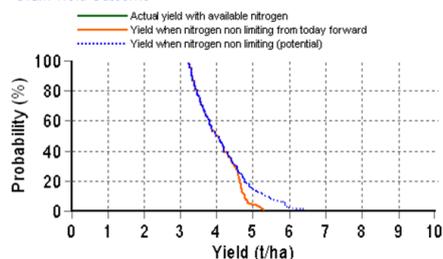
Current predicted PAW: 18mm

Crop growth

Variety: Scout Sowing date: 12th May

Nitrogen fertiliser: 50kgN/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 3rd October 2012

Grain & hay yield predictions

Yield prophet estimate: (Date of report 3/10/2012)

These estimates are based on a 50% probability

Yield t/ha	Sown 12 th May (see graph)	Change from last report	Sown 5 th June	Change from last report
Grain	4.0	-0.8	3.2	-1.4

French & Schultz grain yield estimate:

100% WUE: 4.1t/ha, 80% WUE: 3.3/ha

This model assumes that there is 25mm stored moisture, 110mm of evaporation and decile 5 (43mm) rainfall for the rest of the season.





Hart Beat

BIG CROWD FOR 30TH ANNUAL HART FIELD DAY

About 600 farmers and industry personnel gathered for the 30th annual Hart Field Day on September 18 to hear more than 30 speakers and researchers provide updates on the latest agronomy trials, varieties and technologies.

Visitors travelled from most cropping areas of the state, as well as some from as far as Western Australia, Victoria and even India and Japan and were greeted with a picture perfect outlook at the Hart site.

Hart Field-Site Group chairman Matt Dare said the group was thrilled with the success of the day.

“We had another great roll up and it’s a very fitting way to celebrate the 30th anniversary of Hart,” he says. “The crowd is testament to what we’re doing here. The site looks magnificent and we’ve really had a top quality program and speakers. Going forward we’re looking to continue the tradition and maintain the quality of research happening at the Hart Field-Site.”

Founding member of the field day, Kevin Jaeschke OAM, whose vision some 30 years ago helped cement the Hart Field Day’s position as one of the leading agronomy field days in Australia, was extremely proud of what he saw as he walked around the field day this year.

“Thirty years is a long time for this group to be functioning and I’m so pleased with the way this younger group

continue what we began,” he says. “We’ve had highs and lows, but the group now own this land and it’s all paid for. I think it’s great, it’s more than great. This field day has helped so many farmers and people in agribusiness.”

Dr Allan Mayfield has also been involved in the field day almost since its inception and gave an engaging lunch time speech to the crowd.



Hart Field Day 2012

GRDC Southern Panel chairman David Shannon presented SARDI senior research scientist Rob Wheeler with the *Seed Of Light* award in recognition of his contribution to research and extension of crop variety information to growers across the state.

New technologies including the Harrington Seed Destructor (HSD) were on display, with Mid North growers given the opportunity to sign up to trial the HSD this

harvest.

The rolling program also featured information on snail and weed control, varieties, agronomy and harvest management across a broad range of crops.

The perfect weather conditions for the field day could have only been topped by the forecast of rain on the horizon for some growers who are now looking for good, soaking rains in the next few weeks to bring home the harvest.

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)
Condownie	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

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