NSW DEPARTMENT OF PRIMARY INDUSTRIES

GRDC Grains Research & Development Corporation

Hillston and Griffith Agronomy District

Dryland and Irrigation

Agronomy and Variety Evaluation

Trial Results 2008

Compiled by

Barry Haskins
District Agronomist Hillston

Rachael Whitworth
Extension Agronomist Griffith

CWFS Central West Farming Systems

Contents

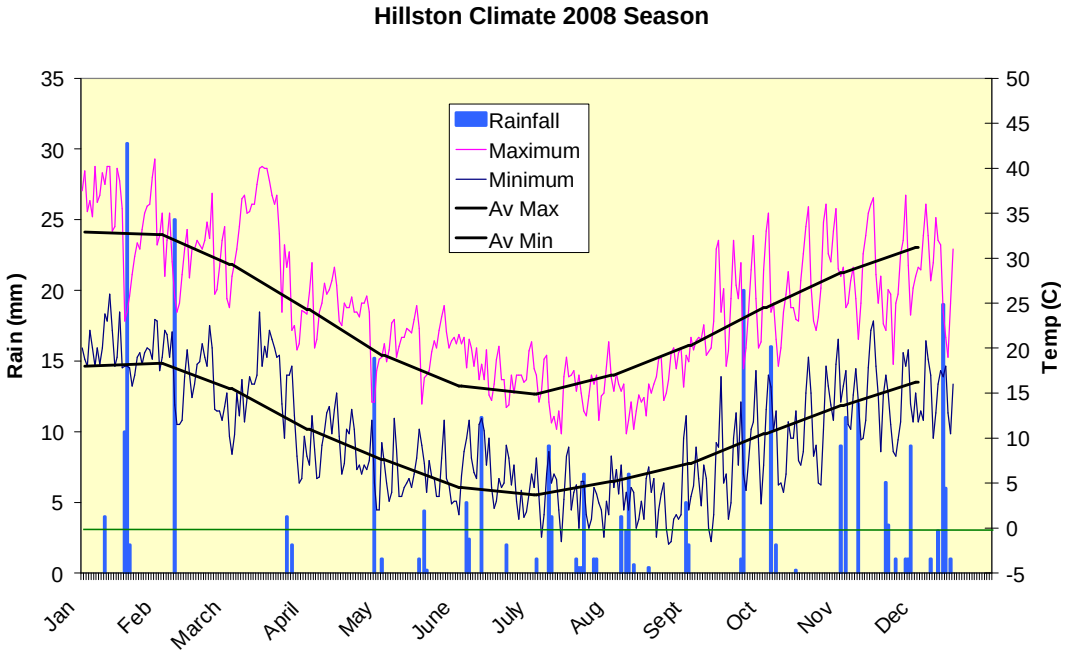
The 2008 Season

The summer rain began in November/December 2007, and resulted in one of the wettest summers we have had for a long time.
Where soil conditions were good, a lot of the rain was able to replenish dry soils, and allow a good moisture profile to be built.
Many growers had to control weeds with at least three sprays/cultivations to stop summer weeds utilising stored moisture and nutrients.
This stored moisture however was the main reason we got a crop in 2008.

The break occurred in late April, with 80% of the crop sown in the first three weeks of May. Soil and ambient temperatures were high, and crops bounced out of the ground and were quick to grow excessive foliage. This excess foliage cost the region a lot of grain, as the spring did not deliver sufficient rain to allow crops to reach their potential. Lighter sown crops performed better than expected.

Crop yields ranged a lot according to rainfall in the fallow and in crop, fallow management and variety, but in general were as below.

Crop	Average yield (t/ha)	Range (t/ha)
Wheat	1.4	0.6-3.0
Barley	1.6	0.6-3.5



	2008 Rainfall	Long term Average	Rainfall April-Oct
Hillston	287mm	370mm	135mm
Merriwagga	256mm	380mm	106mm
Rankins Springs	338mm	439mm	188mm
Griffith	306mm	382mm	151mm

Most of the trials were harvested, however there were a few trials which were too variable to get good data from.

Merriwagga CWFS tillage and rotation trial 2008

Lessons learnt 10 years into the trial

Key points

- The trial has clearly shown that no till farming is more economically viable than cultivated systems in this marginal environment, however this is only the case when continuously cropping the paddock, and not following an 18 month fallow.
- In an 18 month fallow rotation, cultivation has significantly increased both yield and gross margins. This is mostly due to better weed control of hard to kill weeds in the second summer with cultivation over herbicides, and the lack of stubble achieved in the drought years to aid moisture infiltration and minimise wind erosion.
- In the 18 month fallow rotations in seasons where weed control and stubble cover has been deemed adequate, the difference between no till and cultivation is much less. Residual herbicides are now being evaluated to allow better control of hard to kill summer weeds.
- There is a dramatic measured influence of tillage and rotations on both weed presence and root disease risks.

2008 summary:

The fallow rain began in November/December 2007, and resulted in one of the wettest summers we have had for a long time. The trial site unfortunately was in the driest part of the district, and seemed to miss out on many of the bigger rainfall events.
We had to control weeds with at least three sprays/cultivations to stop summer weeds utilising stored moisture and nutrients, and this was done quite successfully.
This stored moisture was the main reason we got a crop in 2008.

The break occurred in late April, with the wheat sown on the 7th May. Soil and ambient temperatures were high, and crops bounced out of the ground, but they soon slowed down because of minimal in crop rain during June and July. August and September were even drier, as the spring did not deliver sufficient rain to allow crops to reach their potential. The canopy was very light, which was a blessing and was the reason that the crops performed like they did.

2008 crop details:

Fallow maintenance: Each system was managed according to weed pressure, however in general the conventional treatments needed 3 cultivations over the summer, and the no till treatments needed 3 herbicide applications. Both systems were acceptably free from fallow weeds.
The plots that were difficult to keep clean (especially the no till plots) were the 18 month fallow treatments, where perennial grass species like spear grass, panics, brush wiregrass, windmill grass etc became established and were not able to be controlled easily with herbicides.
We have begun trialling Flame® as a residual herbicide in our 18 month fallow treatments aiming to get better control of these hard to kill grass weeds.

Wheat details: All systems sown on the 7th May with a JD single disc seeder with Ellison at 30kg seed/ha with 45 kg/ha MAP/Super blend.
Weeds were controlled with 460ml/ha Velocity® + 1L/ha Cheetah® Gold + Hasten® spray oil.
Rust was sprayed on the 25th August with 1L/ha Bayleton®.
Crop was harvested on the 4th December.

Pea details: All pea plots were sprayed with 800 g/ha Diuron 900 WG + 1L/ha Roundup CT + Ammonium sulphate prior to sowing with a Morris contour drill on the 29th May. Variety was Kaspa sown at 100kg/ha with 45kg MAP/ha.
Crop was then sprayed with 400 ml/ha Igran® post emergent to control fumitory (permit).
Crop was harvested on 4th December.

Yields in 2008: The yields in the trial were quite acceptable given the lack of in crop rainfall. Most of the wheat plots were averaging between 20-30 kg/mm, which is extremely high.

The 18 month fallow wheat plots looked the healthiest in July/August, however they obviously grew too much biomass and struggled to fill grain due to the dry spring. These plots along with rotation 2 (2nd yr wheat after peas) had the potential to yield at-least double of what they did if we just received one more rain in September.
The continuous wheat plots were starved of nutrients and showed less vigour than all other rotations, which in the end was an advantage, as they were always only set to yield about what they achieved, and didn't waste valuable stored soil moisture on growing vegetation.

Interestingly all plots with some sort of stubble retained (no till continuous crop) yielded higher than their cultivated comparison. That is most likely because we were able to capture the summer rainfall better with the stubble cover rather than the cultivated surface. We were also losing moisture with each cultivation for weed control in the fallow, of which obviously added up and made a difference.

Again in 2008, the cultivated 18 month cultivated fallow was more profitable than the 18 month no till fallow. The difference this year was much less than previously observed, as weed control was regarded as acceptable with both methods. The lack of stubble cover in the 18 month no till fallow was much less than desired, causing water infiltration to be compromised and wind erosion to be an issue.

Figure 1: Yields from the Merriwagga CWFS trial 2008.

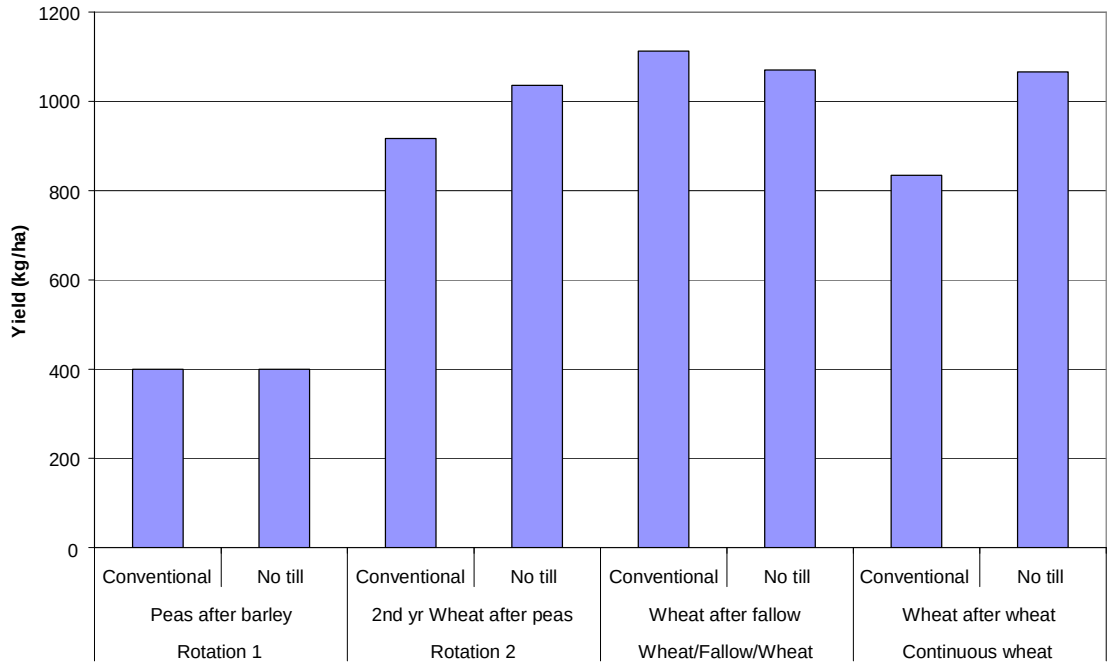
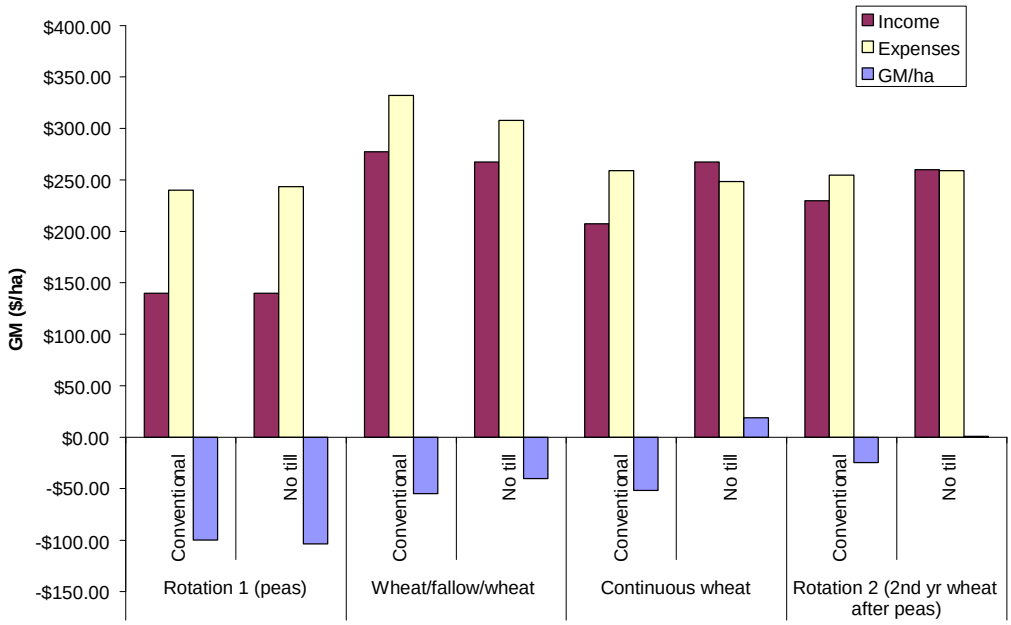


Figure 2: Gross margin comparisons between the systems in 2008.



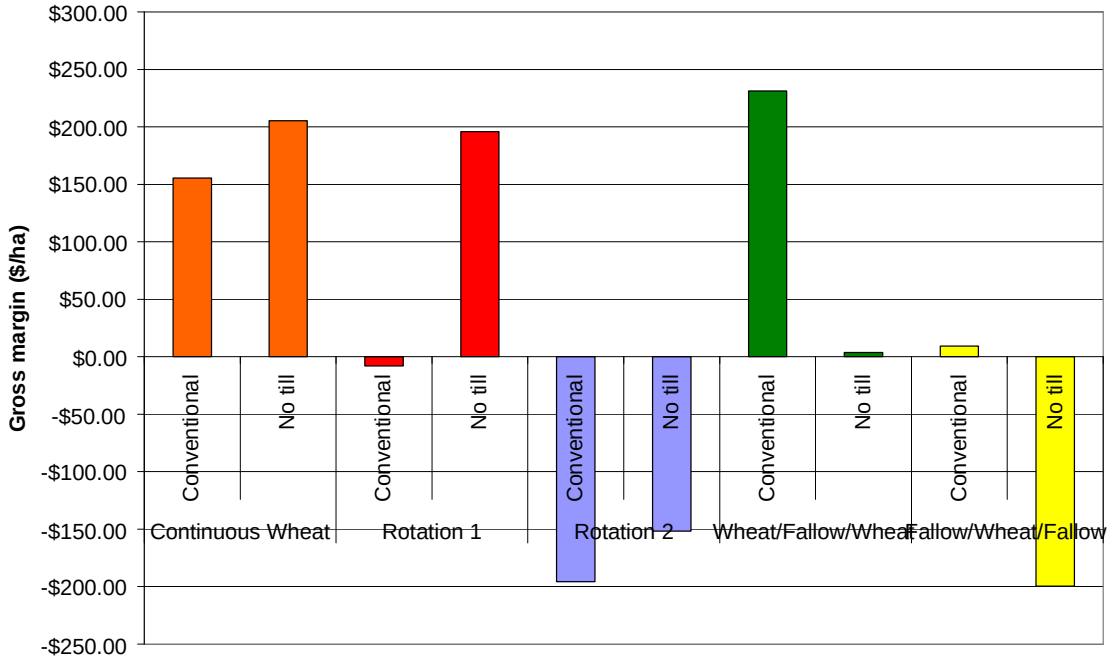
Long term gross margins: As seen in figure 3, the long term gross margins are only showing some rotations that have actually made money over the ten year period! A big reason for this is the prolonged drought, however in addition all costs are charged at contractors rates, which are usually higher than what a typical farmer would use. This has had a large influence on the gross margins achieved in this trial.

Behind all of the numbers that are associated with the ten years of these budgets, there are some trends that have occurred quite strongly.

Firstly is the performance of no till when following a previous crop. In every cropping rotation (apart from the 18 month fallow), no till has shown a higher gross margin than cultivated systems. This is due to both higher achieved yields, and also to lower costs of growing the crop.

Secondly is the trend in the 18 month fallows, where cultivation has increased yields and there for gross margins significantly. The main reasons for this are twofold, firstly where cultivation has allowed better weed control of certain hard to kill weeds, particularly in the second summer. These weeds have mainly been grass weeds such as panics, windmill grass, brush wiregrass and spear grass. Perennial shrubs have also become an issue in this system. These weeds are very good at utilising stored moisture and nutrients.
The second reason for the positive response to cultivation has been the lack of ground cover that we have been able to produce in the 18 month fallow crops. When commencing an 18 month no till fallow it is essential to have a good cover of stubble. In many years we have not been able to achieve this due to drought, resulting in lower rainfall infiltration and excessive wind erosion.

Figure 3: The long term gross margin comparisons for the trial from 1999-2008.



Long term effect on weeds: It has been quite clear that there is a significant impact of both rotation and tillage on the numbers and types of weeds that are present in the trial.
In general, the no till crops are cleaner than the cultivated crops, apart from continuous wheat, where ryegrass has become a major issue in the no till system.
In terms of rotations and in crop weed presence, the 18 month fallow rotations are the cleanest, followed by rotations 1 and 2 (2yrs cereal with 1 yr broadleaf crop) and then continuous wheat. The continuous wheat rotations are now hosting ryegrass numbers that are close to being unsustainable.

Long term effect of root diseases: The trend in root diseases as shown in figure 4 and 5 is similar to the weed trends, as there is a definite impact of both rotation and tillage on root disease risk, particularly rhizoctonia and nematodes (P.neglectus).
In general the 18 month fallow rotations host the lowest level of soil borne disease, followed by rotations 1 and 2 (2yrs cereal with 1 yr broadleaf crop) and then continuous wheat.
In terms of tillage, cultivation has seemed to lower the risk of root diseases, which is as expected.

Figure 4: The trend in rhizoctonia since 2003.

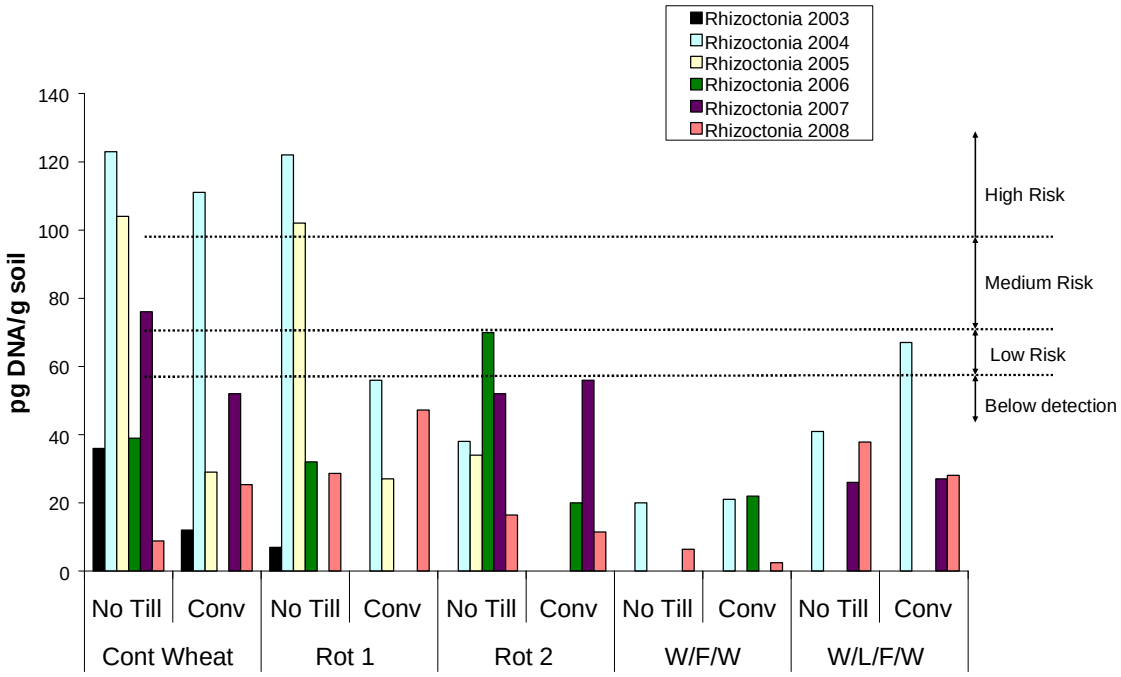
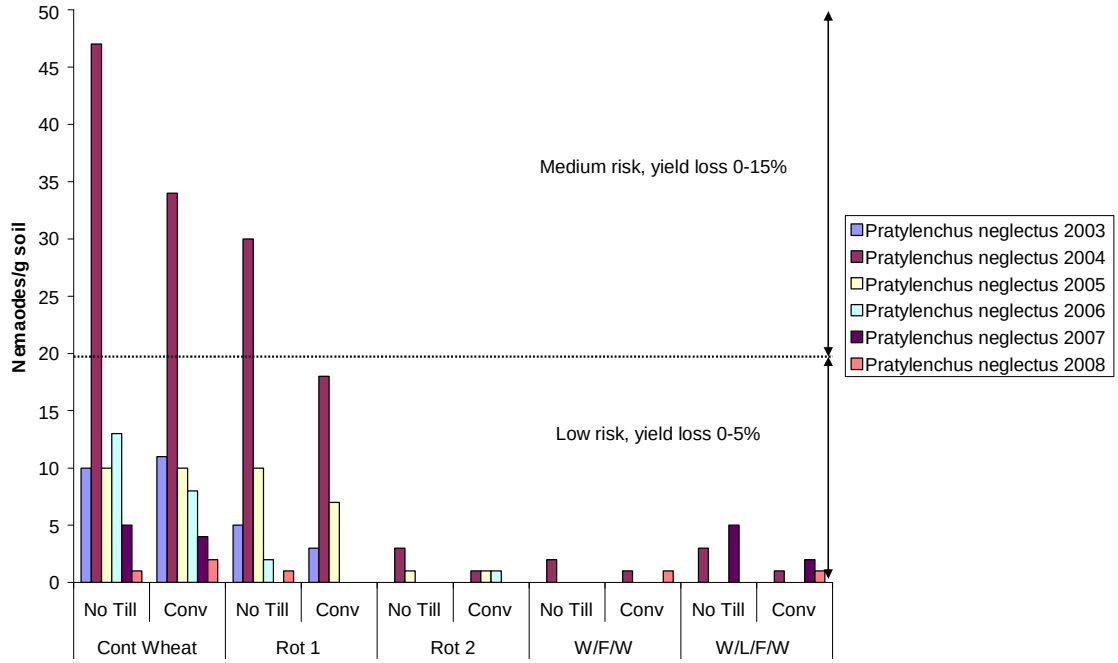


Figure 5: The trend in Pratylenchus neglectus nematodes since 2003.



Interestingly enough, whilst trends were not measured between years, common root rot, take all and pythium have been found at moderate levels in the trial, highlighting that many diseases can be found ‘sleeping’ in the soil until the suitable conditions arrive.

Fungicide management trials 2008

Author: Barry Haskins

Key findings:

- The 2008 season hosted the earliest onset of stripe rust we have locally seen, which created high disease pressure and potential yield loss in some trials.
- Triadimefon products applied either on the fertiliser or liquid injected into the seed furrow gave at least 18-20 weeks protection following sowing, which was marginally better than Intake®.
- There was no difference in length of disease protection between the fertiliser that had fungicide applied by a commercial farmer and the fertiliser used in the trial which was applied on a smaller scale.
- A full foliar fungicide strategy still allowed maximum yield potential, so long as each foliar application was made before the rust occurred.
- An ideal low risk fungicide strategy in a high disease pressure year like 2008 would incorporate a fungicide treatment at sowing followed by one (or in an extremely high yielding/high disease pressure scenario possibly two) foliar fungicides.

Background: Managing fungal diseases (particularly stripe rust) has become increasingly important as our varieties become less resistant as a result of various pathotype changes.

In the western region, because of lower yield potential, it is essential to keep costs as low as possible to ensure good return on investment. It is also difficult in this region where farm sizes are very large to physically control diseases using foliar fungicides alone within an acceptable time frame to minimise yield losses from fungal attack. For this reason many farmers are looking at disease control strategies that provide cost effective long acting protection from sowing until harvest. This may include seed/fertiliser dressings in conjunction with foliar fungicides.

Trials held in previous years have conclusively shown the expected protection from most seed dressings, however there was little data to show expected protection from the two registered fertiliser dressings.

New application methods such as liquid injection also offer alternative ways of applying fungicides in a safe and effective manner.

**Please note that some of these products are not registered for the use in which they were trialled, in particular triadimefon 125EC. The reason this product was included in the trial is because most research in the past was conducted using this product, and we felt it was important to compare that product with new products containing the same ingredient but of a different formulation, designed for fertiliser application.*

Also liquid injection of fungicide into the seed row is a new technology, and is in the initial phases of research, and hence is not yet registered for this purpose.

Trial aim: To compare and measure the effect that various fungicides may have on disease control when applied on the fertiliser, liquid injected and as a foliar.

Seasonal review: At all sites the season began quite well with good summer rain replenishing the soil profile. A rainfall event in late April allowed all trials to be sown in the first two weeks of May. In crop rainfall was adequate until August, then it turned very dry, and on occasions quite warm. Frosts were also frequent.

At all sites stripe rust was found extremely early, which put a lot of pressure on the fungicide treatments.

Trial details: This trial was replicated at four sites (two irrigated) in the Griffith/Hillston region in 2008.

Variety: Chara was used in all trials treated with Dividend®.

Treatments:

The treatments include various fungicide application methods at sowing with and without a foliar fungicide strategy as shown in table 1. Treatment 3 is used as a comparison between farmer applied fertiliser and how we applied the fertiliser in the trial (cement mixer with calculated rate of fungicide added).

The aim of these treatments is to measure their length of protection with and without the additional protection of foliar fungicides.

*Note some trials had numerous foliar fungicides applied, where the aim of those foliar fungicides was to protect the plants from fungal infection until crop maturity.

Table 1: Treatments in the trial.

Treatment	Seed treatment	Foliar treatment*
1	Triadimefon 125 EC @ 800ml/ha on MAP fertiliser	Foliar
2		Nil
3	Triadimefon 500 WG @ 200g/ha on DAP fertiliser (farmer applied)	Foliar
4		Nil
5	Intake® 250 @ 400ml/ha on MAP fertiliser	Foliar
6		Nil
7	Triadimefon 125 EC @ 800ml/ha applied as a liquid in furrow	Foliar
8		Nil
9	Control (no fungicide)	Foliar
10		Nil

*See individual trial details for foliar strategy.

Location: Griffith (Willbriggie)
First sign of stripe rust: 21st July, 2008.
Soil type: Grey Clay
Soil test values: Depth 0-10cm
pH = 5.3 (CaCl2)
Colwell P = 88mg/kg
Organic C = 2.3%
CEC = 17.3 Meq/100g
Rainfall: Annual total = 304.4mm.
In-crop = 150mm.

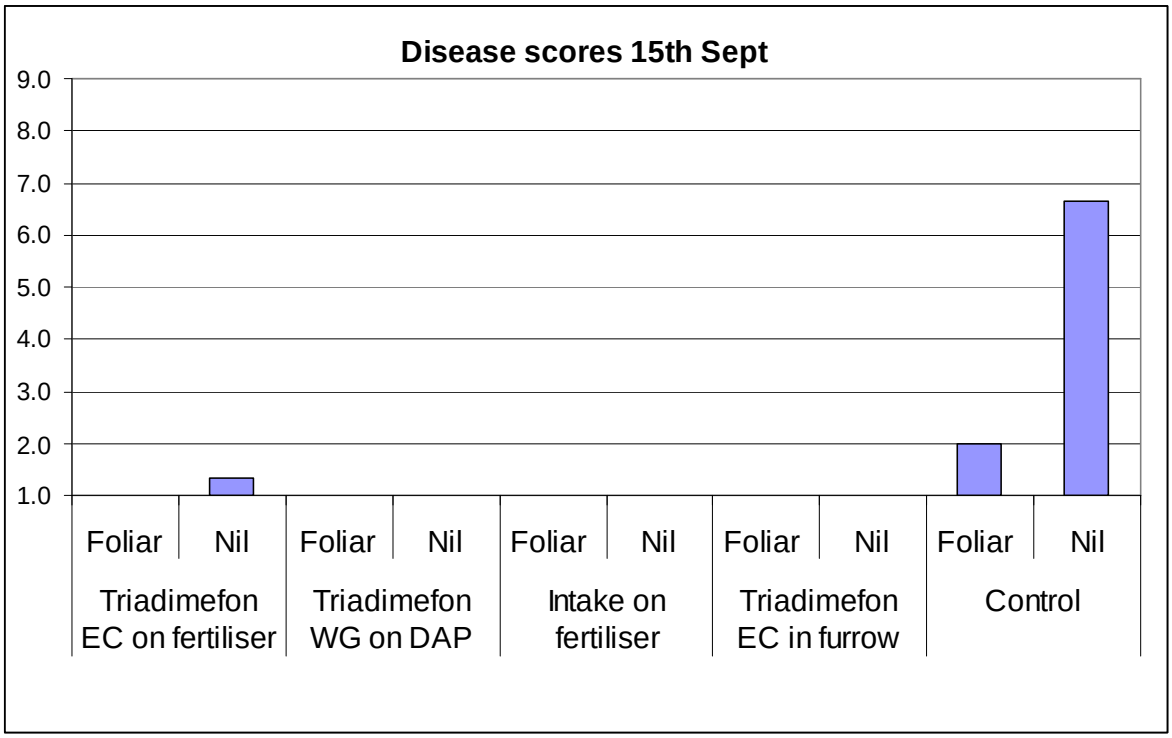
Previous crop: Failed canola
Management: Sowing rate: 100kg/ha
Sowing date: 9th May, 2008

Emergence: 15th May, 2008
Fertiliser: 100kg/ha Urea pre sow, 100kg/ha MAP, 200kg/ha Urea post sow
Herbicide: Roundup pre sowing, Axial + LVE MCPA in crop.
Fungicide: Fungicide treatments had three fungicide applications.
350ml Opus on 22nd July at mid tillering
350ml Opus on 12th Sept at full flag emergence.
250ml Folicur on 23rd Oct at Soft dough.

Harvest date: 3rd December, 2008.

Trial results

Figure 1 and 2: Disease scores taken on 15th September and 13th October. 1 being completely free from disease and 9 being completely covered in disease.



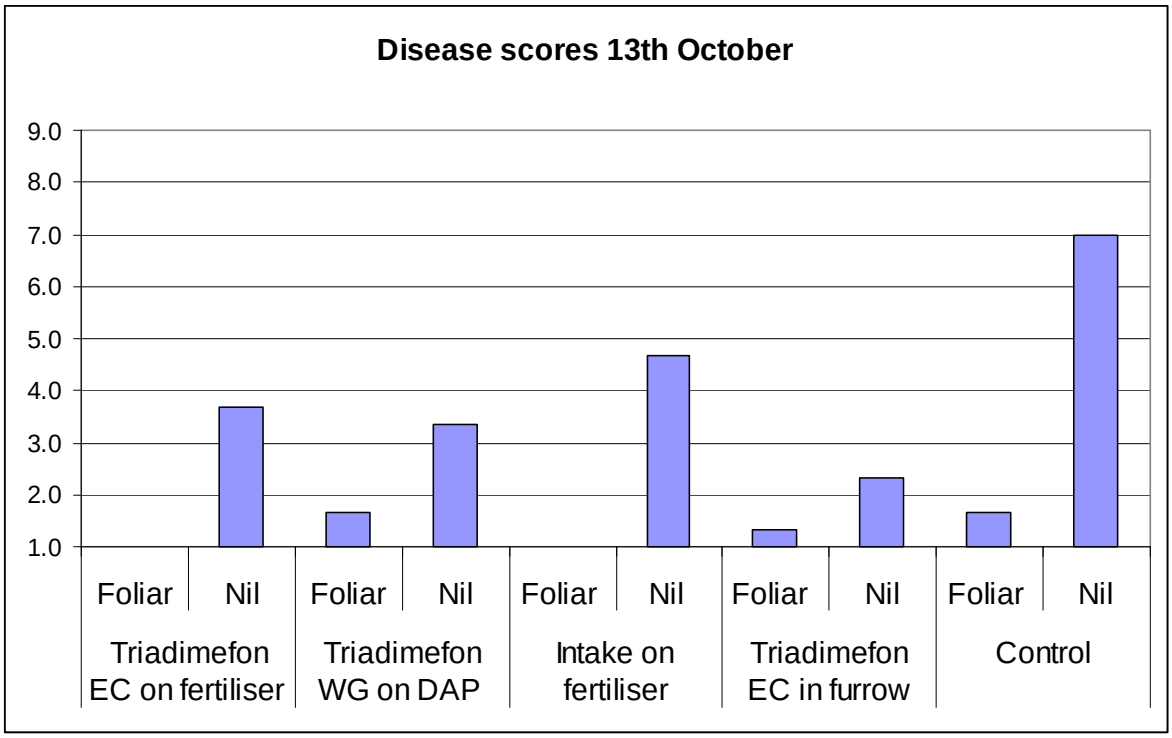
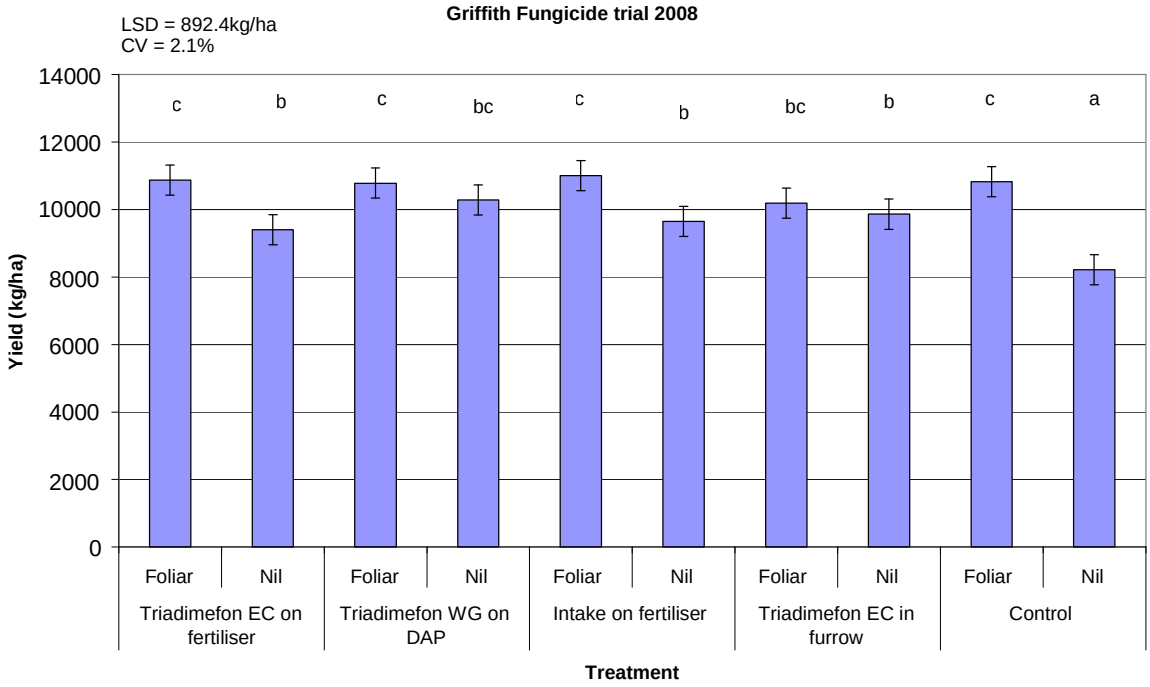


Figure 3: Yield results from the Griffith trial.



Discussion

The trial at Griffith was an extremely high yielding trial, and did not suffer at any stage of growth. The stripe rust became very active early in the season, and continued to progress vigorously throughout the spring.

It is interesting to note that there were no vigour differences between treatments at establishment apart from the liquid injected triadimefon, where establishment was significantly lower. This is because the liquid stream was applied very close to the seed, and in a practical sense may have been better directed to one side of the seed furrow rather than directly on top.

The first disease scores showed that all sowing fungicide treatments gave adequate protection until the 15th of September (about 18 weeks protection). Observations showed this continued until about the end of September (20 weeks protection).

In October, under the extreme disease pressure observed in this trial, the fungicides applied at sowing began to run out. This was shown in the disease scores shown in figure 2.

Interestingly enough, Triadimefon treatments provided longer protection than Intake®, which ran out very quickly in the first week of October. Of the triadimefon treatments, in furrow application gave the longest length of protection.

All foliar treatments were very effective against stripe rust which was as expected. Remember this trial had three foliar fungicides applied in a strategy that began before the first sign of rust. This showed that foliar fungicides can be effective at maximising yield potential even without fungicide protection at sowing, so long as the rust is not developing at the time of the first application.

Location: Hillston
First sign of stripe rust: 21st July, 2008.
Soil type: Red Clay
Soil test values: Depth 0-10cm
pH = 7.8 (CaCl2)
Colwell P = 43mg/kg
Organic C = 1.1%
CEC = 27 Meq/100g

Rainfall: Annual total = 267.6mm.
In-crop = 121mm.

Previous crop: Maize
Management: Sowing rate: 100kg/ha
Sowing date: 13th May, 2008
Emergence: 19th May, 2008
Fertiliser: 100kg/ha Urea pre sow, 100kg/ha MAP, 265kg/ha Urea post sow
Herbicide: Roundup + Treflan pre sowing, Axial + LVE MCPA in crop.
Fungicide: Fungicide treatments had three fungicide applications.
350ml Opus on 22nd July at mid tillering
350ml Opus on 3rd Sept at full flag emergence.
250ml Folicur on 23rd Oct at Soft dough.

Harvest date: 2nd December, 2008.

Trial results

Figure 4: Disease scores taken on 15th September. 1 being completely free from disease and 9 being completely covered in disease.

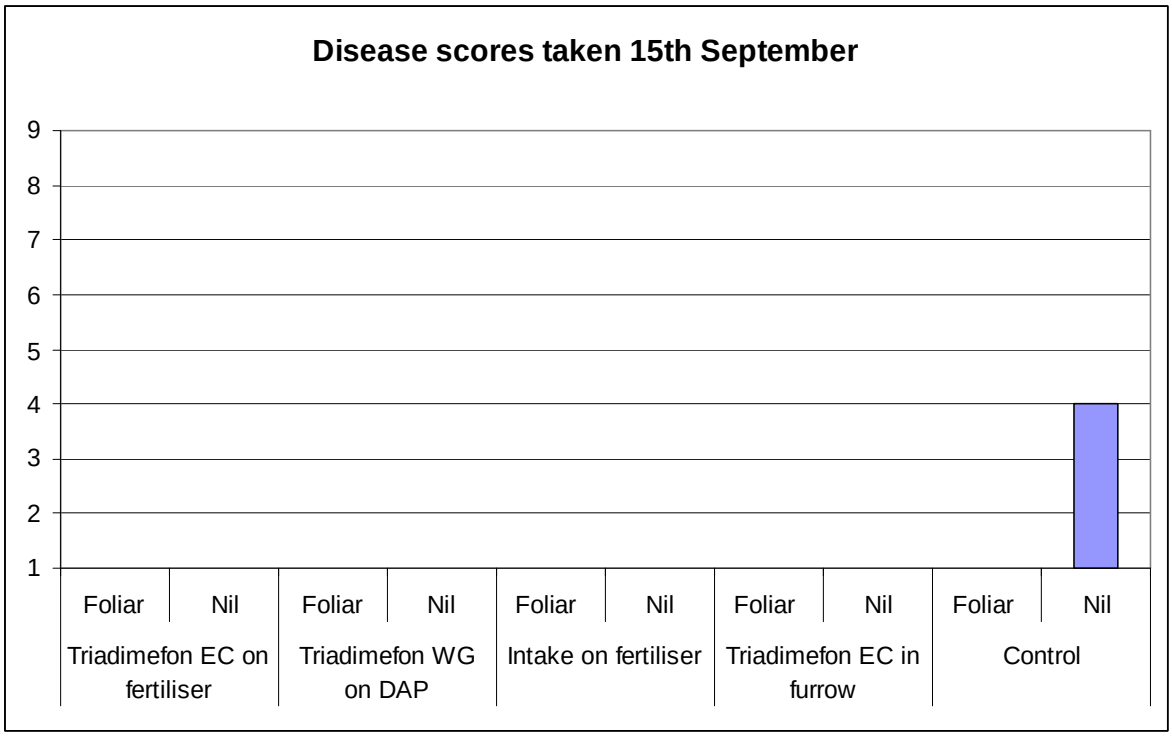
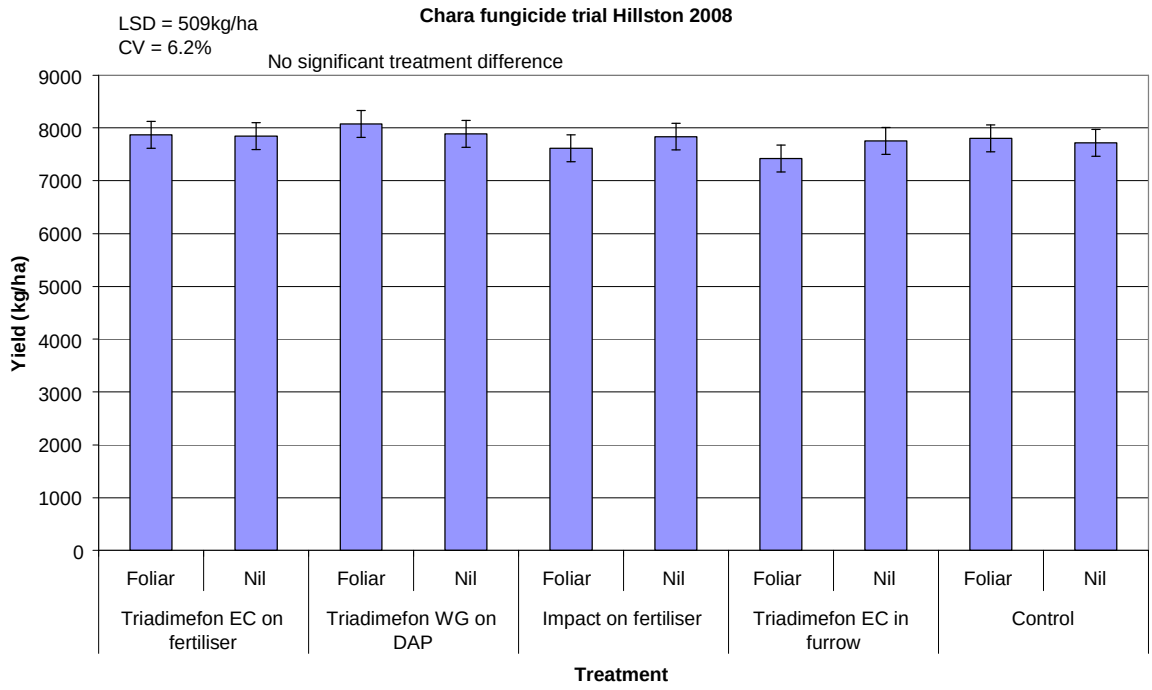


Figure 5: Yield results from the Hillston trial.



Discussion

The trial at Hillston was very different to the Griffith trial as the rust established early, but was simply not vigorous and did not continue to develop. The only plots that showed any rust at all were the control treatments, which was shown in figure 4. This did highlight that the fungicide applications at sowing held any rust away until this point.
Even during the spring following irrigations, the level of rust was very low, and not even worth scoring. This was then shown in the yield results, in figure 5.

Location: Merriwagga
First sign of stripe rust: 21st July, 2008.
Soil type: Red Sandy loam
Soil test values: Depth 0-10cm
pH = 5.5 (CaCl2)
Colwell P = 30 mg/kg
Organic C = 0.76 %
CEC = 9 Meq/100g
Rainfall: Annual total = 255.8 mm.
In-crop = 105.6 mm.

Previous crop: Chemical fallow
Management: Sowing rate: 40kg/ha
Sowing date: 7th May, 2008
Emergence: 12th May, 2008
Fertiliser: 50kg/ha MAP,
Herbicide: Roundup + Treflan pre sowing, Axial + LVE MCPA in crop.
Fungicide: Fungicide treatments had two fungicide applications.
350ml Opus on 22nd July at mid tillering
350ml Opus on 12th Sept at full flag emergence.

Harvest date: 12th November, 2008.

Trial results

Figure 6: Disease scores taken on 15th September. 1 being completely free from disease and 9 being completely covered in disease.

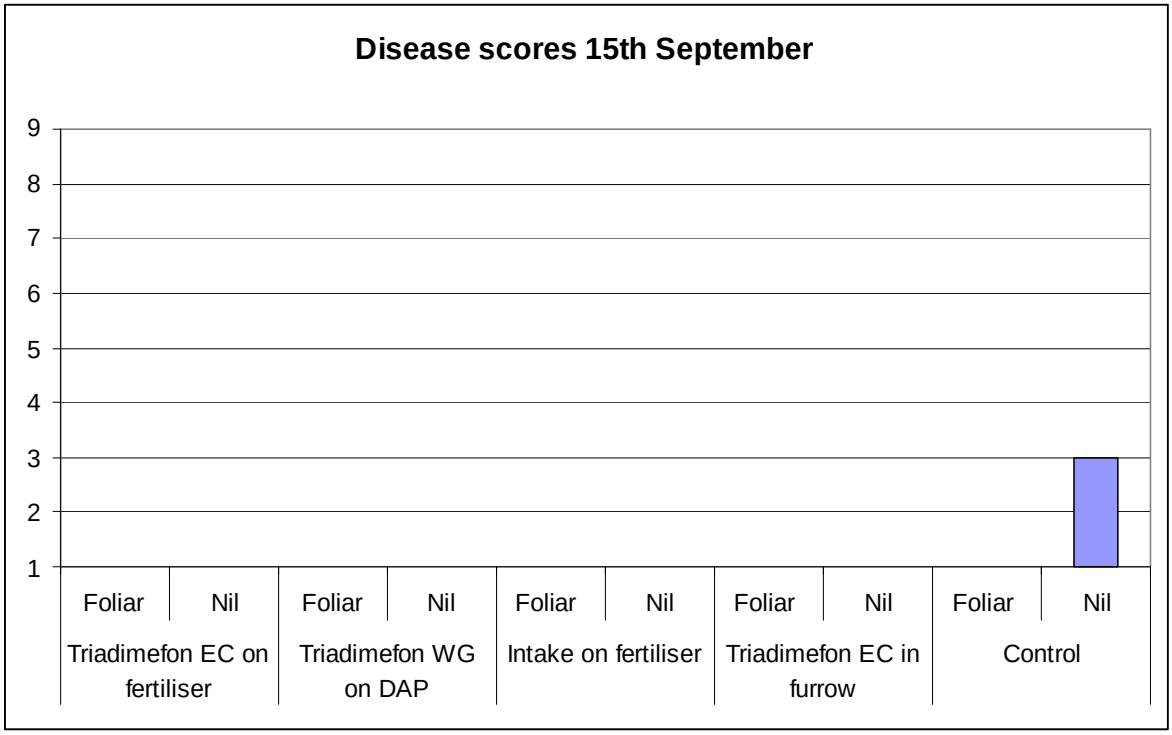
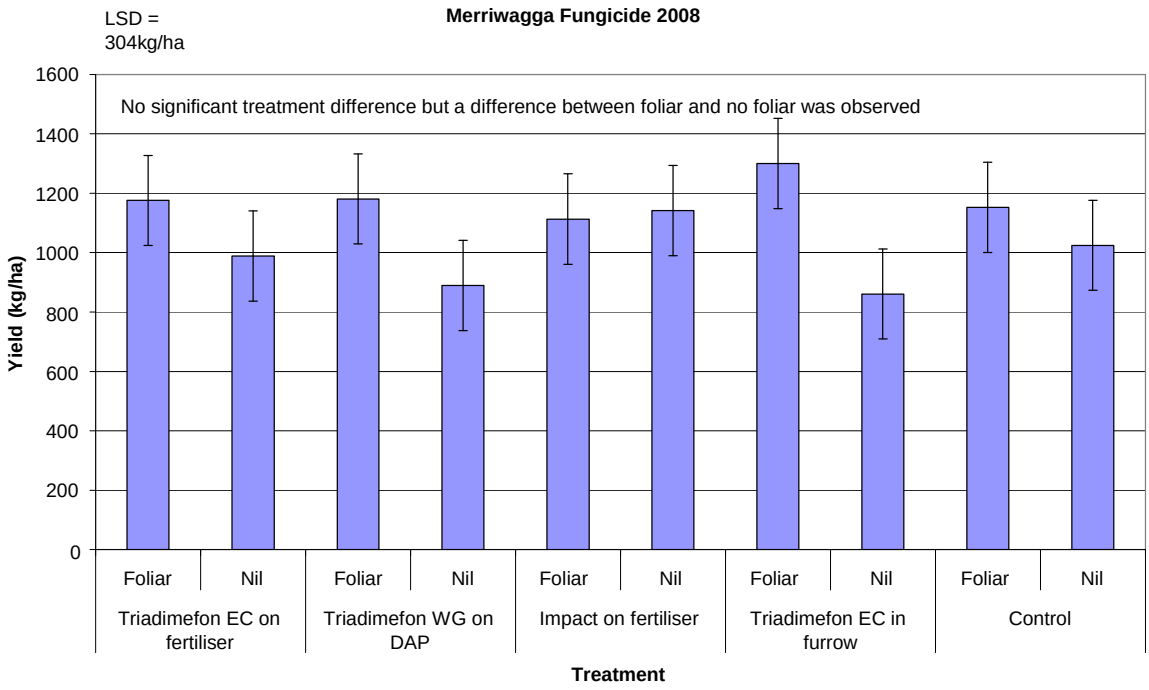


Figure 7: Yield results from the Merriwagga trial.



Discussion

The trial at Merriwagga was quite uneven due to a small rainfall event to sow on, and was extremely droughted due to lack of in crop rainfall. This trial virtually survived on stored subsoil moisture.

The outcome from this was a very low vigour crop that was not a good host for disease. As shown in figure 6, the control treatment picked up the disease early, but

the dry conditions prevented the disease from taking off. This did highlight that the sowing fungicide treatments did protect the crop until at least 15th September.
The trial showed no significant yield difference because of the variability and low yields, however very interestingly there was a significant yield advantage by applying a foliar fungicide. This was consistent across nearly all treatments. The only plausible explanation of this is that these treatments were able to stay green or remain turgid a little longer and make use of the subsoil moisture more effectively.
This is the first trial I have seen showing a yield response from a foliar fungicide when the yield potential of the crop is less than 1.2t/ha. This effect would have been magnified as a result of the very early infection.

Location: Rankins Springs
First sign of stripe rust: 21st July, 2008.
Soil type: Red Sandy loam
Soil test values: Depth 0-10cm
pH = 4.8 (CaCl2)
Colwell P = 47 mg/kg
Organic C = 1.7 %
CEC = 12 Meq/100g
Rainfall: Annual total = mm.
In-crop = mm.

Previous crop: Wheat
Management: Sowing rate: 40kg/ha
Sowing date: 8th May, 2008
Emergence: 14th May, 2008
Fertiliser: 50kg/ha MAP,
Herbicide: Roundup + Treflan pre sowing, Axial + LVE MCPA in crop.
Fungicide: Fungicide treatments had two fungicide applications.
350ml Opus on 22nd July at mid tillering
350ml Opus on 12th Sept at full flag emergence.

Harvest date: 27th November, 2008.

Trial results

Figure 8: Disease scores taken on 15th September. 1 being completely free from disease and 9 being completely covered in disease.

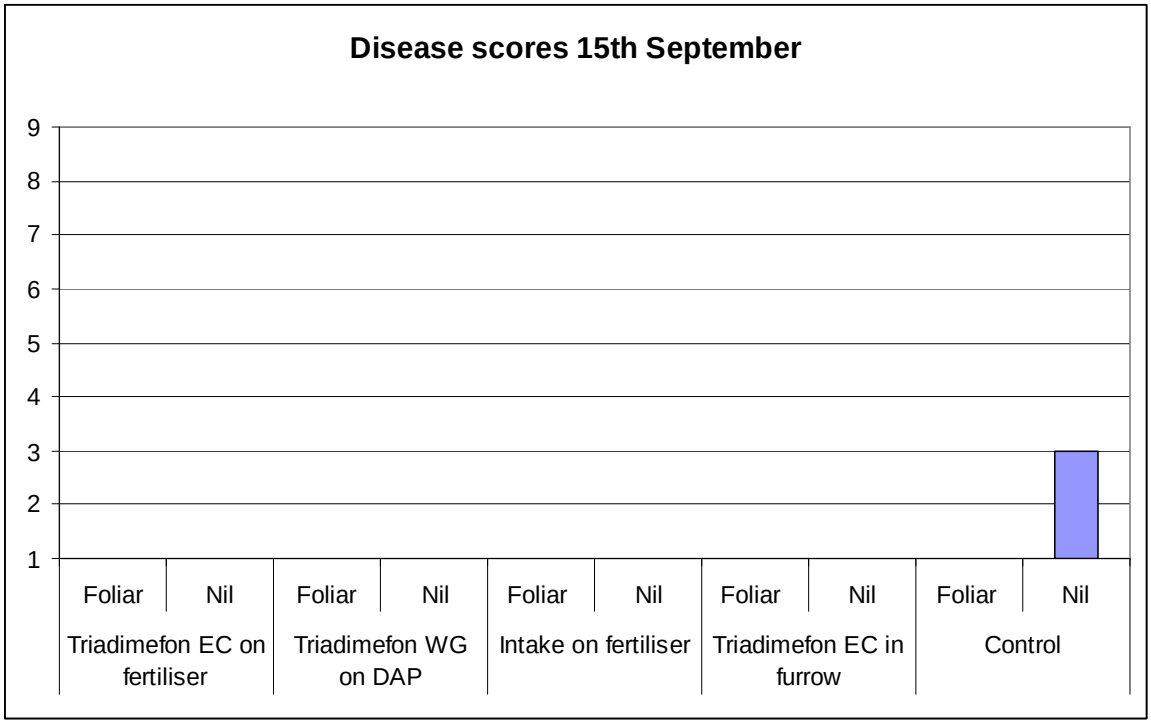
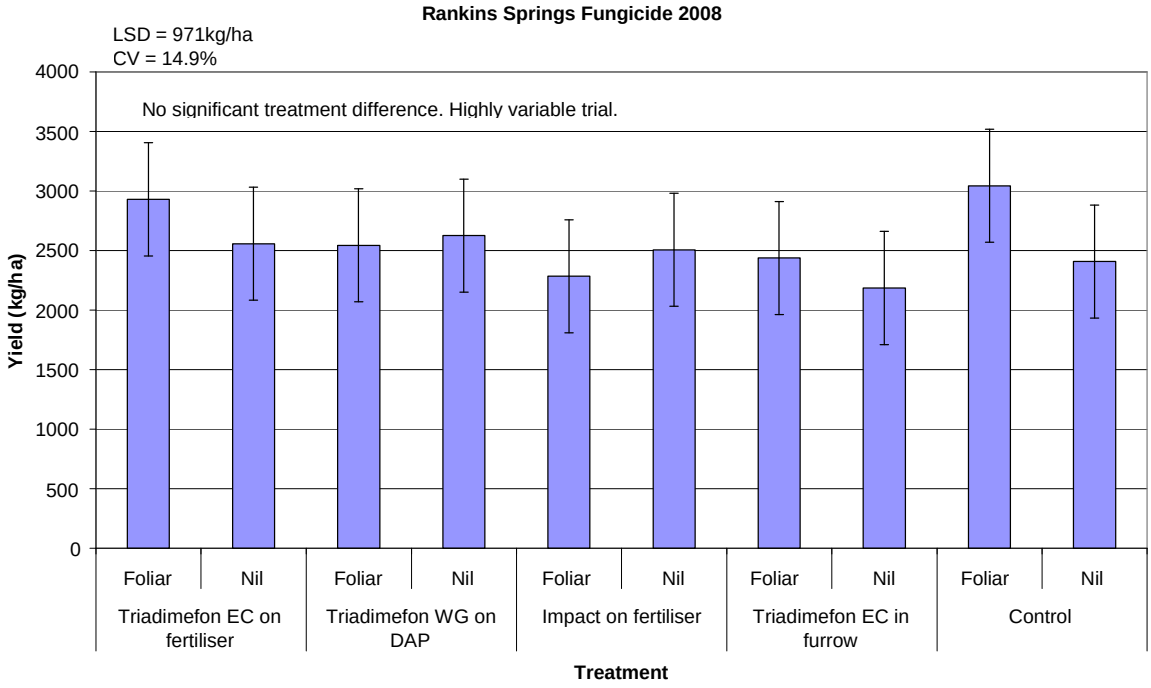


Figure 9: Yield results from the Rankins Springs trial.



Discussion

The trial at Rankins Springs was quite uneven due to a poor seeding operation creating clods and therefore subsequently uneven establishment. The trial site also had a change of soil type which was not easily identified at sowing. This caused variability between treatments.

In response the variability in this trial was too great to rely on results.

The disease scores however matched the Merriwagga trial, where as shown in figure 8, the control treatment picked up the disease early, but the dry conditions prevented

the disease from taking off. This did highlight that the sowing fungicide treatments did protect the crop until at least 15th September.

Summary

In summary we did observe a varying degree of disease infection and yield potential across the four trial sites.

All trials showed signs of stripe rust by the 21st of July, which is the earliest onset of infection we have ever had. This early infection then played a huge role in the level of damage that occurred within each trial, although this was also impacted on by the seasonal conditions that followed at each site.

It was quite clear that in every trial the fungicide applications at sowing (onto the fertiliser and liquid injection) provided adequate protection until at least 18 weeks after sowing, and in most cases this was extended to 20 weeks, even under the extreme disease pressure experienced at the Griffith trial.

The results at Griffith suggested that the triadimefon products gave superior length of protection over Intake®, but only by a few weeks. This was also the case in the 2005 trials at Griffith.

Of the triadimefon products, liquid injection seemed to give the best results, however caution must be made when directing the fungicide in the seed furrow not to apply directly onto the seed before the soil then falls behind the tine.

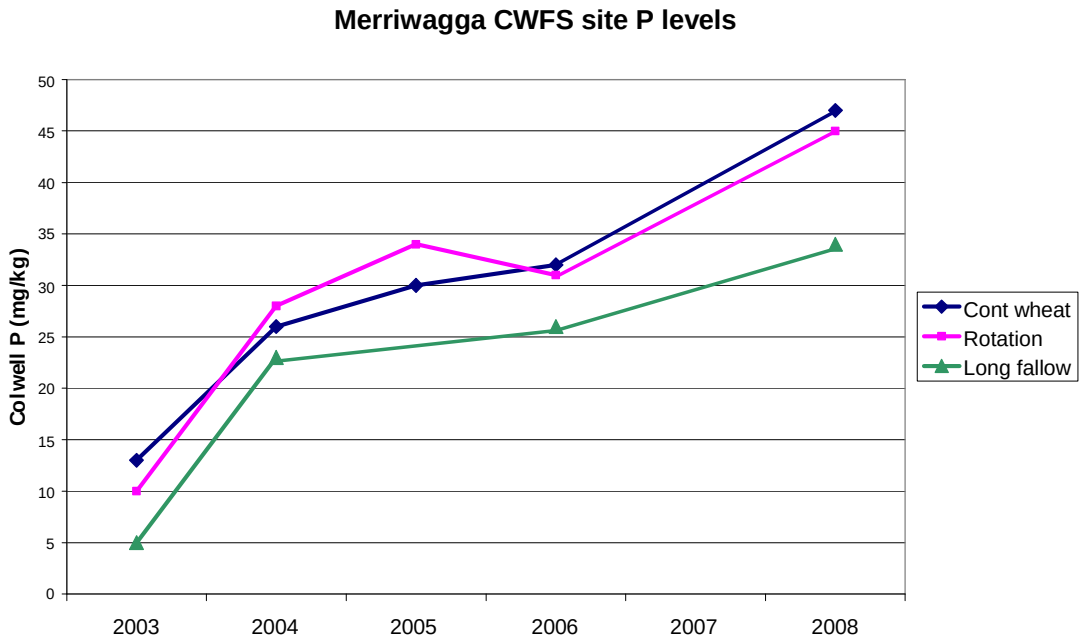
In all trials we did prove that a full foliar fungicide program that was tailored to the disease levels experienced in the trial (2 or 3 applications) maximised yield potential, so long as each fungicide was applied before any sign of rust.

We could confidently assume from our results that if a farmer was using a fungicide fertiliser or liquid injection application at sowing, then the first foliar fungicide would not be necessary until at least 18 weeks after sowing, even in extremely high rust pressure years like 2008. In many cases this may be even further delayed, especially at lower yield potential.

Phosphorus and trace elements– small plot and paddock scale trial results?

Background: Many years of trials across the state have shown the importance of phosphorous fertiliser at sowing for maximising yield and dollar return.
Seven years of below average rainfall however has caused the amount of grain harvested in many parts of this region to be well below the average (particularly the south western region), elevating soil residual phosphorous (P) levels.
As shown as an example below from the soil test results from the Merriwagga Central West Farming Systems (CWFS) site, soil P levels have risen quite sharply. There is also a strong correlation between rotations, ie continuous cropping soil P levels have risen faster than 18 month fallow rotations. This makes sense as continuous cropping rotations have fertiliser applied every year, whilst 18 month fallows are every two years.
No till has also slightly higher residual P values than where cultivation is used.
Cropping paddocks within the western region have shown a similar trend.

Figure 1: The residual soil Colwell P levels under three rotations at the Merriwagga CWFS site from 2003-2008.



The question: These results raise the question of the minimum requirement for fertiliser P, given that we have elevated residual soil P reserves. This is especially important as the majority of soil P response curves in trials were performed when soil P levels were much lower than those observed today.
We are also interested in the value of trace elements, in particular Zn, Cu and Mo, as they are regularly deficient in leaf tissue tests.

In response, in the 2008 winter cropping season, four small plot trials and seven farmer sown paddock scale trials (only four harvested) were established to evaluate;

*Phosphorous response curves in wheat and barley.
*Liquids vs granular fertilisers,
*Trace elements including zinc, copper and molybdenum.

The farmer paddock trials were all sown with a new Morris contour drill seeder on loan for the use of the trials, fully set up with liquid injection by Liquid Systems SA, and a Topcon X20 electronic variable rate controller, which made varying treatments as easy as the press of a button.

Measurements in all trials included a starting soil test, leaf tissue tests, NDVI imagery at peak biomass (some trials), yield mapping, and harvest results.

The response within treatments across variable paddocks was of particular interest, only obviously made possible with the paddock scale trials, and measured with NDVI and yield maps.

Results:

Table 1: Starting soil test and paddock history.

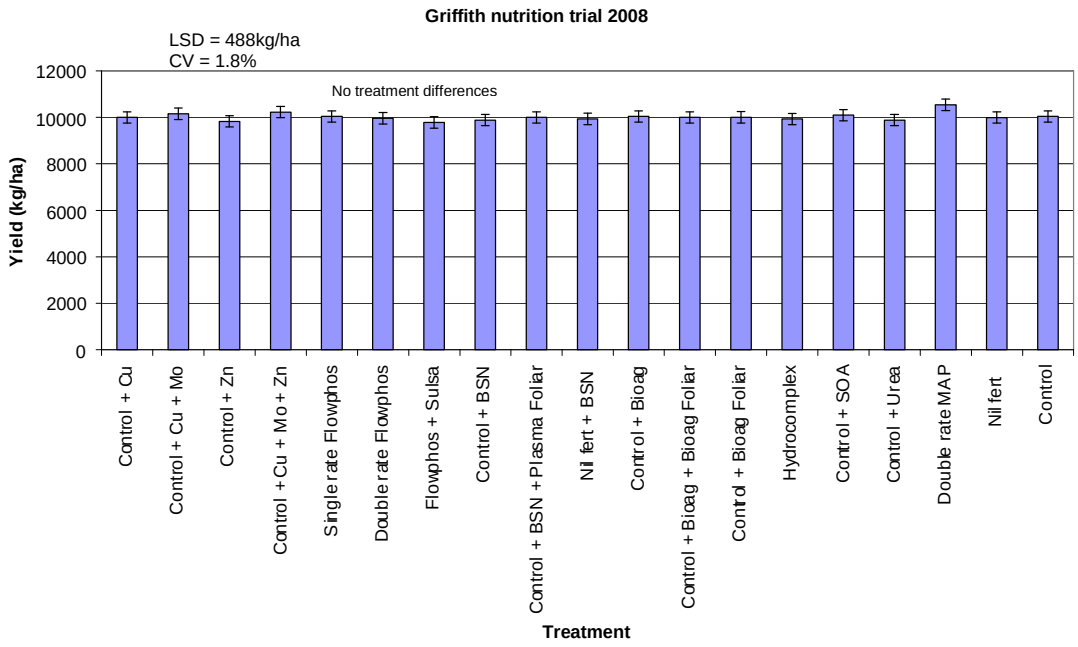
	Farmer	**Previous crop**	**Soil pH (CaCl2)**	**Colwell P (mg/kg)**	**PBI (L/kg)**
Small Plots	Barber	Fallow	5.5	30	51
	Pfitzner	Wheat	4.8	47	89
	Horneman (irrigated)	Maize	7.8	43	110
	Andreazza (irrigated)	Canola	5.3	88	150
Paddock scale trials	Pfitzner	Peas	4.5	42	58
	Ryan	Canola	5.2	41	47
	Eckermann	Peas	5.0	28	25
	Barber	Fallow	6.3	43	58

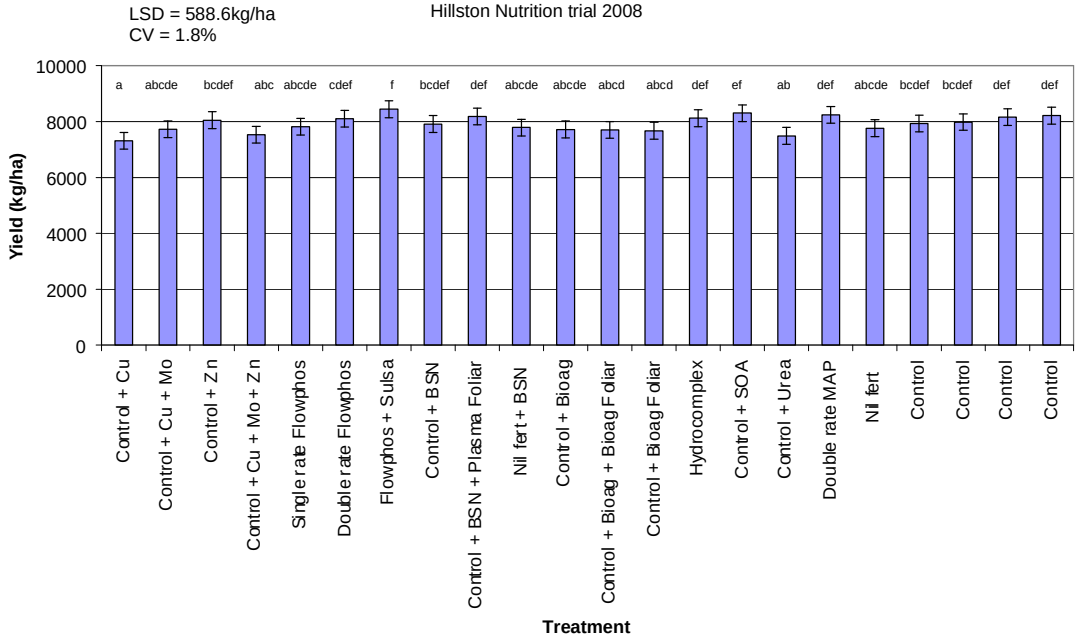
Table 2: Paddock yield and response to P fertiliser.

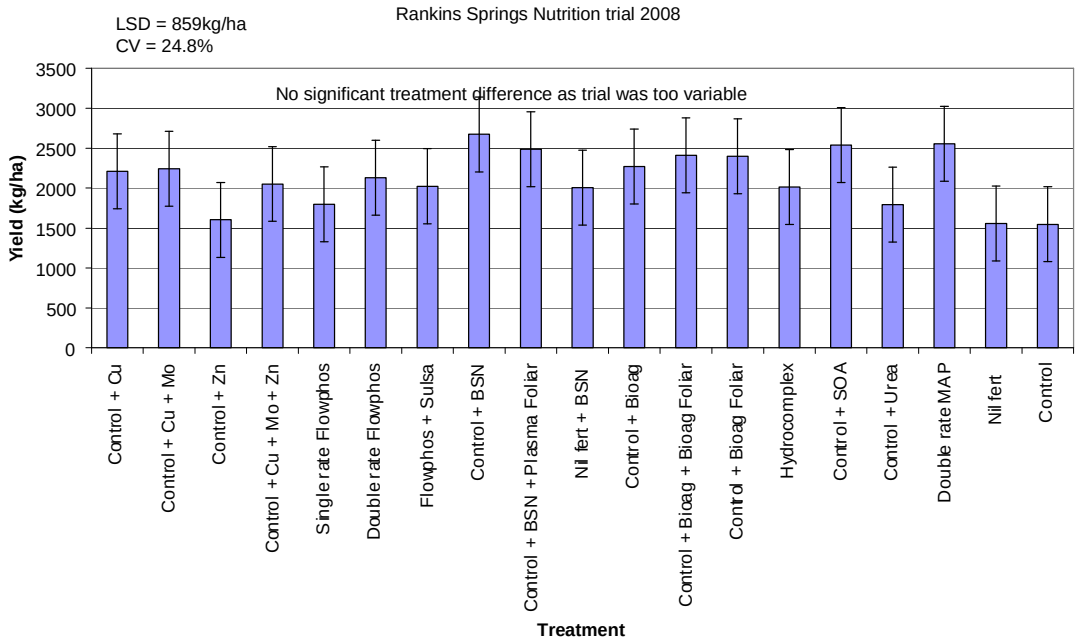
	Farmer	**Previous crop**	**Average yield (t/ha)**	**CV%**	**LSD (kg/ha)**	**Significant response to P**
Small Plots	Barber	Fallow	0.81	16.8	260	No
	Pfitzner	Wheat	2.12	24.8	859	No
	Horneman (irrigated)	Maize	7.92	1.3	589	No
	Andreazza (irrigated)	Canola	10.02	1.8	488	No
Paddock scale trials	Pfitzner	Peas	1.97	5.99	371	No
	Ryan	Canola	3.48	1.5	227	No **
	Eckermann	Peas	1.96	*	*	Maybe *
	Barber	Fallow	0.75	*	*	Yes *

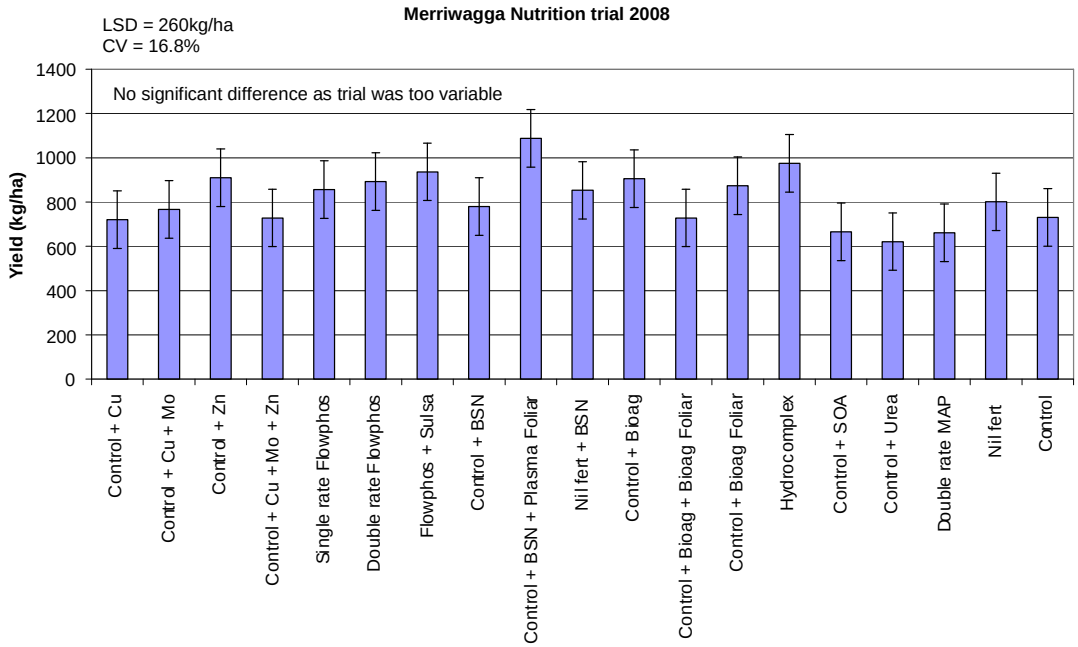
* = Not statistically analysed because of no replication/or only one rep harvested.
** = Some significant interactions were found, but not between Nil, 10 and 20 kg/ha P.

Small Plot trial treatments: The small plot trials were aimed at more intense evaluation of nutrition. We looked at BSN on the seed with and without a plasma foliar program, Bioag seed and soil liquid injection with and without a tailored Bioag foliar program, and an array of comparisons between liquid and granular N, P, and S, as well as the effect of Zn, Cu and Mo. In summary the only measurable response was a clear yield increase with both liquid and granular sulphur at Hillston.
The Griffith trial showed no significant response to any treatment, and both the Rankins Springs and Merriwagga trials showed far too much variability between treatments to confidently show any response to nutrition.
It is important to note that no variation was observed in early vigour between any treatment in any trial.


Griffith nutrition trial 2008
LSD = 488kg/ha
CV = 1.8%
No treatment differences
Yield (kg/ha)
12000
10000
8000
6000
4000
2000
0
Control + Cu
Control + Cu + Mo
Control + Zn
Control + Cu + Mo + Zn
Single rate Flowphos
Double rate Flowphos
Flowphos + Sulsa
Control + BSN
Control + BSN + Plasma Foliar
Nil fert + BSN
Control + Bioag
Control + Bioag + Bioag Foliar
Control + Bioag Foliar
Hydrocomplex
Control + SOA
Control + Urea
Double rate MAP
Nil fert
Control
Treatment


Hillston Nutrition trial 2008
LSD = 588.6kg/ha
CV = 1.8%
Yield (kg/ha)
10000
8000
6000
4000
2000
0
a
abcde
bcdef
abc
abcde
cdef
f
bcdef
def
abcde
abcde
abcd
abcd
def
ef
ab
def
abcde
bcdef
bcdef
def
def
Control + Cu
Control + Cu + Mo
Control + Zn
Control + Cu + Mo + Zn
Single rate Flowphos
Double rate Flowphos
Flowphos + Sulsa
Control + BSN
Control + BSN + Plasma Foliar
Nil fert + BSN
Control + Bioag
Control + Bioag + Bioag Foliar
Control + Bioag Foliar
Hydrocomplex
Control + SOA
Control + Urea
Double rate MAP
Nil fert
Control
Control
Control
Control
Treatment





Summary of results:

1. **Effect of P on biomass and yield:** Only two of the eight trials showed any obvious visual response to P fertiliser (as MAP). This was most obvious in the Barber paddock trial following fallow, which then went on to show a reasonable yield response by adding MAP fertiliser.

2. **Comparison between liquids and granules:** There seemed to be very little visual difference between the liquid and granular fertilisers when applied at the equivalent rates. In some trials the lower rates of liquids looked better than the equivalent rates of granules. There was no standout yield differences comparing liquids and granules. Handling the liquids was very easy, however the application rate of the products we used was about 70L/ha to apply 10kg/ha P, which is a lot of product to handle over large areas. The liquid injection system however provided a very even stream of product within the seed furrow, even at low rates. This system also allowed the trace elements (and fungicides) to be added as needed very easily.

3. **Effect of trace elements:** There was no evidence to suggest that trace elements (Zn, Cu, Mo) made any difference to yield, however some trials may have slight yield increases, particularly the large scale Pfitzner trial. It was also interesting that Zinc Sulfate Hepta-hydrate gave a better response than Chelated Zinc. There was certainly no visual difference that could be noticed.

4. **Effect of seed dressings and foliar fertilisers:** We observed no increase in either vigour or yield by using BSN applied on the seed with and without the plasma foliar program, and also the Bioag liquid Seed and Soil and foliar program. This is probably to be expected given the favourable establishment conditions that all trials were sown into.

Discussion: The lack of response to any fertiliser in this trial may be attributed to a number of factors.

- *Early sowing opportunity*: All trials were sown in May, with most of them finished by the 25th May. Soil temps at this time were ranging between 12-16 deg C, which is very warm. This obviously allowed the crop to 'bounce' out of the ground hosting very vigorous root systems, and possibly to access nutrients with those roots that they otherwise wouldn't have in a cooler, later sowing.
- *High residual P*: Obviously all soils had very high residual P rates. This would have played a major role in the lack of response to fertiliser.
- *High rainfall during the summer*: Most paddocks had reasonable summer rain prior to planting. This allowed soil moisture profiles to be lifted, and nutrients to mineralise, especially nitrogen. The end result was 'happy' plants that really didn't have any major limitations to growth until the drier conditions occurring in spring.
- *Lack of rain during spring*: Dry conditions in spring always limit the yield response to fertiliser. This may have impacted on the trial results, however interestingly the two irrigated sites did not show responses in the absence of limiting plant available moisture.

Summary: In hindsight, in most trials it was not worth adding fertiliser given the circumstances which evolved last season. There also seems to be less need for fertiliser in continuous cropping systems than fallows.

The trials have proven that there will be occasions where we can minimise the necessity for fertiliser. We do have to think of our soils as a 'bank account' for nutrients, and not overdraw. When the 'kitty' is plentiful, we may be able to reduce fertiliser rates, however that will be tapping into our stored resources. This option may provide a viable solution for short term cash flow issues, but may not be a viable option every year, and does carry some risk. We may also find that after one good season our P reserves are back to normal, and historical fertiliser rates will be needed for best dollar returns.

Obtaining responses from micro-nutrients seems to be variable, and more research is needed. It is clear however that getting soil pH right may alleviate the need to apply micro-nutrients.

Variety Specific AGRONOMY Packages

Wheat Row Space, Merriwagga

Barry Haskins, District Agronomist, Hillston

Grain yield varied significantly between some varieties. However there was no significant difference in yield between the 22.5 and 45 cm row spacing.

The extremely low rainfall and uneven establishment severely limited yield potential and the impact row space had on grain yield.

2008

The trial

Row spacing in wheat has become a very topical issue as more farmers move towards wider rows as a component of conservation cropping systems, to retain stubble and utilising incorporated-by-sowing residual herbicides.

Many past research trials have shown a negative impact on yield as row spacing increases. However with changing farming systems and varieties it is thought that the penalty for increasing row spacing may not be significant.

The aim of this trial was determine the effect of two row spacings (22.5 and 45 cm) on grain yield and grain quality of a number of recently released wheat varieties.

Site details

Location: Central West Farming Systems trial site, Merriwagga

Soil type: red sandy loam

Soil test (0-10 cm)

pH_{CaCl_2}	Colwell P	Organic C	CEC
5.5	30 mg/kg	0.76%	9 Meq/100 g

Rainfall: 256 mm annual total
106 mm in-crop (GSR).

Previous crop: chemical fallow

Management

Sowing rate: 40 kg/ha

Sowing date: 7 May

Fertiliser: MAP (10 N, 20 P)–50 kg/ha

Emergence: 12 May

Herbicide: 7 May pre-sowing–2 L/ha glyphosate (450 g/L) + 1.5 L/ha trifluralin (480 g/L)

In-crop–300 ml/ha Axial® + 500 g/L LVE MCPA

Fungicide: no foliar fungicide required

Harvest date: 12 November

Treatments

Row spacing: 22.5 and 45 cm

Varieties: wheat, with a range of growth habits–Ellison(ф), Carinya(ф), Gladius(ф), Longreach Lincoln(ф), Ventura(ф), EGA_Gregory(ф), Sentinel(ф) and Sunzell(ф)

Seasonal review

A good profile of summer rainfall was stored at the Merriwagga site. A rainfall event in late April allowed the trial to be sown early into the stored moisture. Very little rain fell after sowing until mid-June resulting in crop establishment being a little patchy.

After July in-crop rainfall was very limited, and the crop survived on stored moisture. August brought several hot windy days and frosts, which together severely reduced yield potential.

Results and interpretation

The trial at Merriwagga was quite uneven due to limited rainfall at sowing and was extremely affected by drought. Together this resulted in a high level of variability in the trial results with the yield coefficient of variation (CV) 14.6%.

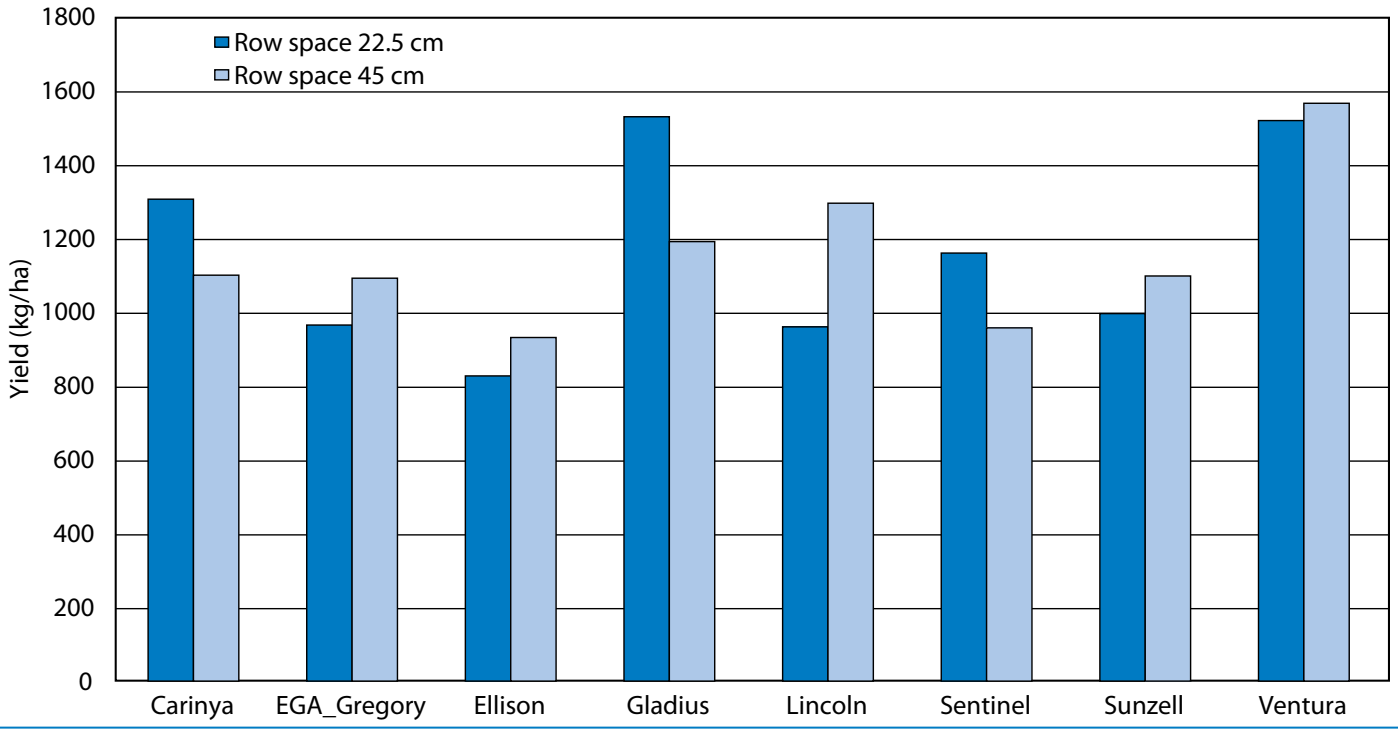


Figure 1 Grain yield of eight wheat varieties sown at two row spacings at Merriwagga, 2008.

Trial variability quite high (CV=14.6%). There was a significant difference between varieties, LSD (95%)=362 kg/ha. There was no significant difference between row spacing or row spacing by variety.

As a result there was no statistical difference between yield at the two row spacings, or between the two row spacings within any particular variety (Figure 1). The raw data indicates that Gladius and Lincoln reacted quite differently when sown at the two row spacings.

There was however a difference between grain yield of the varieties, where short-season Ventura and Gladius were standout performers. As was the case in commercial paddocks in the district, Ellison performed very poorly.

In evaluating the results, it was clear that the combination of an early sowing opportunity, good subsoil moisture and high soil nutrition allowed each of the varieties to reach their potential yield given the harsh spring conditions irrespective of row spacing. This has also been the experience in broad acre trials and observations.

As a result of the dry season, visually, the wider row spacing resulted in much less stubble cover during the summer than the narrower rows, which may cause issues when windy weather or heavy rain occurs.

Author: Barry Haskins, District Agronomist, Hillston.

Further information: available from the project team agronomists at NSW DPI Wagga Wagga, Condobolin, Parkes, Hillston, Temora, Cowra and Moulamein.

NSW DEPARTMENT OF PRIMARY INDUSTRIES

GRDC

This publication is produced as part of GRDC project DAN00098 'Development of agronomy packages for new varieties for southern NSW (VSAP)'.

Variety Specific AGRONOMY Packages

© State of New South Wales through NSW Department of Primary Industries 2009

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (March 2009). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

Variety Specific AGRONOMY Packages

Cereal Disease, Hillston

Barry Haskins, District Agronomist, Hillston

H46 was the only wheat variety that demonstrated a significant yield increase after application of foliar fungicide.

There were no fungal diseases observed in the barley varieties.

2008

The trial

The aim of this trial was to determine the effect that fungal diseases (particularly stripe rust in wheat and powdery mildew in barley) have on yield and grain quality of 12 wheat and two barley varieties.

Site details

Location: Hillston

Soil type: red clay

Soil test (0-10 cm)

pH_{CaCl_2}	Colwell P	Organic C	CEC
7.8	43 mg/kg	1.1%	27 Meq/100 g

Rainfall: 267 mm annual total
121 mm in-crop (GSR).

Previous crop: maize

Management

Sowing rate: 100 kg/ha

Sowing date: 13 May

Fertiliser: urea pre-sowing–100 kg/ha
MAP (10 N, 20 P)–150 kg/ha
urea post-sowing–265 kg/ha

Emergence: 19 May

Herbicide: 13 May pre-sowing–2 L/ha glyphosate (450 g/L) + 1.5 L/ha trifluralin (480 g/L)

24 June–300 ml/ha Axial® + 500 mL/ha Adigor + 500 g/L LVE MCPA

3 September–300 ml/ha Axial® + 500 mL/ha Adigor (targeting second germination of wild oats)

Irrigation: 14 August–1.8 ML/ha
21 September–0.8 ML/ha
16 October–0.8 ML/ha

Harvest date: 2 December

Treatments

Varieties: Twelve wheat varieties (Table 1a) were chosen for their expected resistance to stripe rust and two barley varieties (Table 1b) for their expected resistance to powdery mildew and scald.

Phenology of the varieties varied, modifying the length of time the disease has to infect the crop, develop and impact on yield.

Table 1a Characteristics of the wheat varieties.

Variety	Maturity	Stripe Rust resistance rating*
EGA_Bellaroi	Mid	MR
Drysdale	Quick	MS
EGA_Gregory	Mid/Late	MR
Ellison	Mid	MR-MS
GBA_Ruby	Mid	R-MR
GBA_Sapphire	Mid/Late	MS
H46	Quick	VS
Janz	Mid	MR-MS
Lang	Mid	MS
Livingston	Quick	R-MR
Ventura	Quick	MS
Young	Mid/Quick	MS

Table 1b Characteristics of the barley varieties.

Variety	Maturity	Disease resistance rating	
		Powdery mildew*	Leaf scald*
Schooner	Quick	MS	VS
Hindmarsh	Quick	MR	MS

* Notes on disease resistance ratings
R (Resistant): indicates a high level of resistance and grain yield is unlikely to be reduced.
R–MR (Resistant–Moderately Resistant): indicates a high level of resistance and grain yield is unlikely to be reduced.
MR (Moderately Resistant): indicates disease may develop in favourable conditions, some yield loss may occur.
MR–MS (Moderately Resistant–Moderately Susceptible): indicates disease may develop in favourable conditions, some yield loss may occur.
MS (Moderately Susceptible): indicates disease may be conspicuous in favourable situations with moderate yield losses.
MS–S (Moderately Susceptible–Susceptible): indicates disease may be conspicuous in favourable situations with moderate yield losses.
S (Susceptible): indicates high levels of disease may occur with substantial yield losses.
S–VS (Susceptible–Very Susceptible): indicates high levels of disease may occur with substantial yield losses.
VS (Very Susceptible): indicates high levels of disease may occur with substantial yield losses.

Fungicide: The wheat and barley was either completely protected from fungal diseases by three well timed foliar fungicide applications (Table 2) or not protected at all (showing the genetic potential in the presence of fungal disease).

Table 2 Foliar fungicide treatments

Growth stage	Fungicide application		
	Date	Product	Rate
Mid tillering	22 July	Opus®	350 mL/ha
Full flag emergence	3 September	Opus®	350 mL/ha
Soft dought	23 October	Folicur®	250 mL/ha

Seasonal review

Good summer rain replenished the soil moisture profile following the maize crop. The trials were sown in early May after a rainfall event in late April. Lack of post-sowing rainfall reduced crop establishment (107 plants/m^2 compared to the target 150 plants/m^2) and tiller number (350 tillers/m^2).

Ideally the trial would have been irrigated post-sowing however due to issues outside of our control the first irrigation was delayed until August. June-July rainfall was just adequate, then conditions became very dry, and on occasions quite warm and as a result, the trial was irrigated.

The resulting canopy was not excessively thick, reducing the likelihood of fungal diseases developing. Frequent frosts also affected the faster maturing varieties.

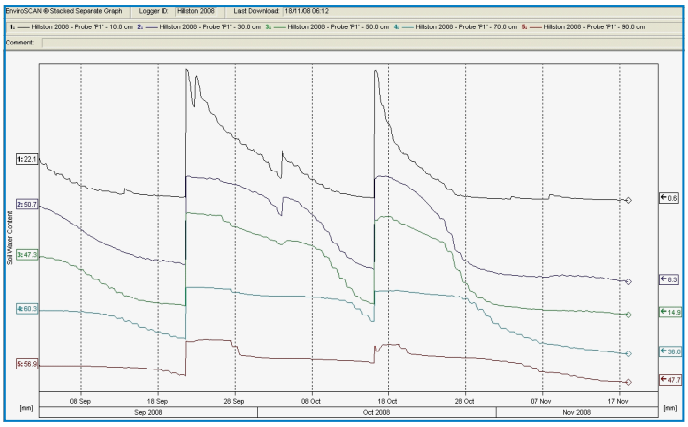


Figure 1 Enviroscan soil moisture readings for the trial paddock from just after the first irrigation.

Results and interpretation

Stripe rust first observed–mid tillering, 21 July.

Stripe rust established early, but was simply not vigorous and did not continue to develop. As expected, significant levels of stripe rust was observed only on the plots not treated with foliar fungicide.

Stripe rust was found on varieties with poor resistance (rated MR–MS, MS or VS) (see Table 3). The disease did not develop; the level of stripe rust remained the same during the spring irrigation period.

It is unknown why there was a higher incidence of stripe rust in many commercial fields throughout the district compared to the trial.

Table 3 Stripe rust scores of wheat varieties during spring; a score of 1 equals no disease, a score of 9 equals totally infected with disease.

Variety	Stripe rust score	
	12 September	9 October
EGA_Bellaroi	1	1
Drysdale	3	2
EGA_Gregory	1	1
Ellison	2	1
GBA_Ruby	2	1
GBA_Sapphire	4	3
H46	4	2.7
Janz	4	2.7
Lang	4	2
Livingston	1	1
Ventura	1	1
Young	2	1

Barley foliar disease

There was no disease observed in the two barley varieties.

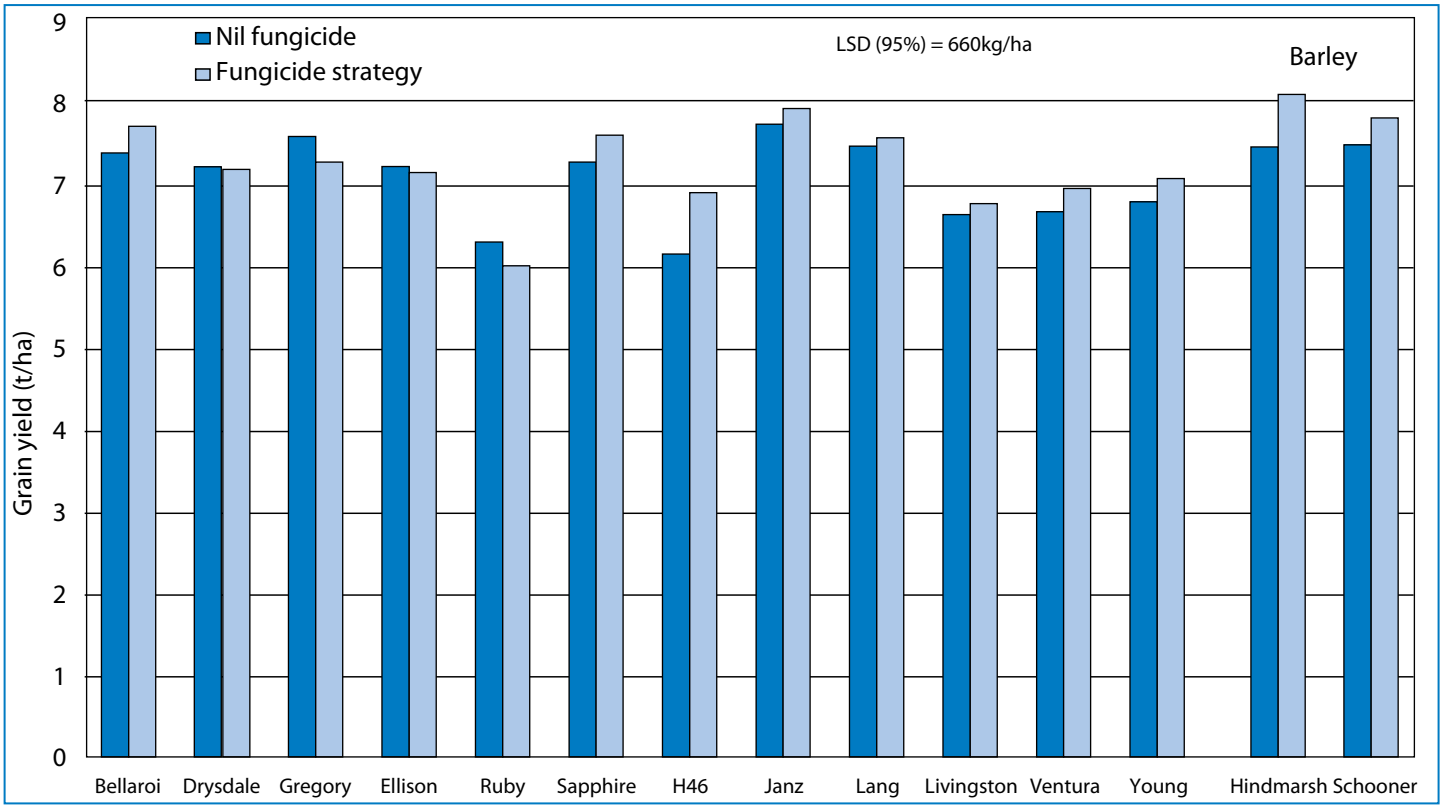


Figure 2 Grain yields of a range of wheat and two barley varieties grown with a fungicide strategy or with nil fungicide application at Hillston.

Effect of fungicides on yield

The low levels of stripe rust observed in-crop followed through to yield (see Figure 4). H46 was the only variety to respond to the foliar fungicide strategy with increased yield.

Yield variation between varieties

As expected, there was a difference in yield between varieties–the faster maturing wheat varieties were disadvantaged as they were affected by frost at flowering time.

Hindmarsh and Schooner barley both performed extremely well.

Discussion

The low levels of stripe rust observed in spring resulted in very limited yield response to the foliar fungicide (disease protection) strategy. It was expected that the stripe rust susecptible varieties (those rated MR-MS, MS and VS) would have shown some yield response to the foliar fungicide strategy. However, at the disease levels observed, stripe rust was not yield limiting, with the exception of H46, even at the high yield achieved.

A contributing factor could have been the strain of stripe rust present in the trial, which did not badly infect the wheat varieties with the Yr17 resistance gene.

A similar trend was observed in 2007, however the disease established much later in that year.

Author: Barry Haskins, District Agronomist, Hillston.

Further information: available from the project team agronomists at NSW DPI Wagga Wagga, Condobolin, Parkes, Hillston, Temora, Cowra and Moulamein.

NSW DEPARTMENT OF PRIMARY INDUSTRIES

GRDC

This publication is produced as part of GRDC project DAN00098 'Development of agronomy packages for new varieties for southern NSW (VSAP)'.

Variety Specific AGRONOMY Packages

© State of New South Wales through NSW Department of Primary Industries 2009

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (March 2009). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

Row spacing trial in barley – Rankins Springs

Neil Fettell
NSW DPI Condobolin

There has been a trend to wider row spacings in recent years. Likely benefits include:

- an ability to sow into higher levels of retained stubble
- a reduction in fuel costs during sowing and/or increased sowing speed
- ability to inter-row sow subsequent crops
- reduced soil disturbance, and
- lower cost of sowing equipment.

However, potential costs from wider spacings include:

- lower yields with wider row spacing, particularly under higher yielding conditions, and
- greater weed competition.

At six sites in 2008, barley varieties differing in plant architecture were sown at a range of row spacings (Figure 1). All trials included the varieties Buloke (tall, rapid early growth), Gairdner (medium height, prostrate early), Baudin (short) and Hindmarsh (moderately short, very erect). At all sites, Hindmarsh was the standout variety for yield. There were some variety by row spacing interactions, but these were relatively minor and so the results for each site, averaged over the varieties, are shown in Figure 1. At the higher yielding sites, Parkes and Temora, yield was maintained up to a spacing of 300 mm then declined as spacing increased to 380 mm. At the lower yielding Condobolin sites, a spacing of 430 mm gave yields equivalent to narrower values. These latter crops were sown into high stored moisture but received little in-crop rainfall, and it is likely that wider rows limited early biomass production and retained more soil moisture for use at flowering and grain-filling. This response was particularly evident at the Rankins Springs site, where yield was maintained at a 660 mm row spacing. The heavy reliance on stored moisture at this site was combined with a relatively early sowing date.

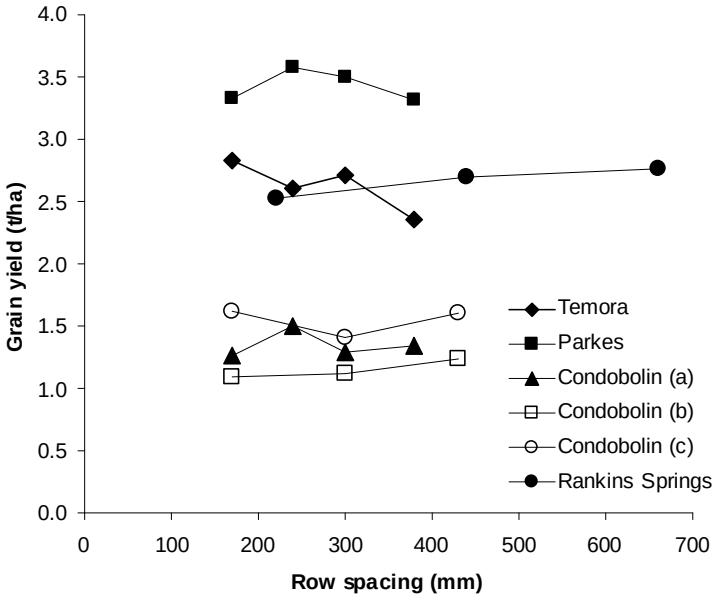


Figure 1. Yield response to row-spacing at six sites in 2008. Values are the mean of between four and eight barley varieties at each site.

Rankins Springs Barley Seeding rate.
Neil Fettell
NSW DPI Condobolin

Eight barley varieties were sown at five seeding rates (from 40 to 200 seed/m^2) on 22nd May 2008. While sowing conditions were favourable the establishment percentages were lower than expected, ranging from 30-120 plants/m^2. The yield response to plant density, averaged over the varieties, is shown in Figure 1.

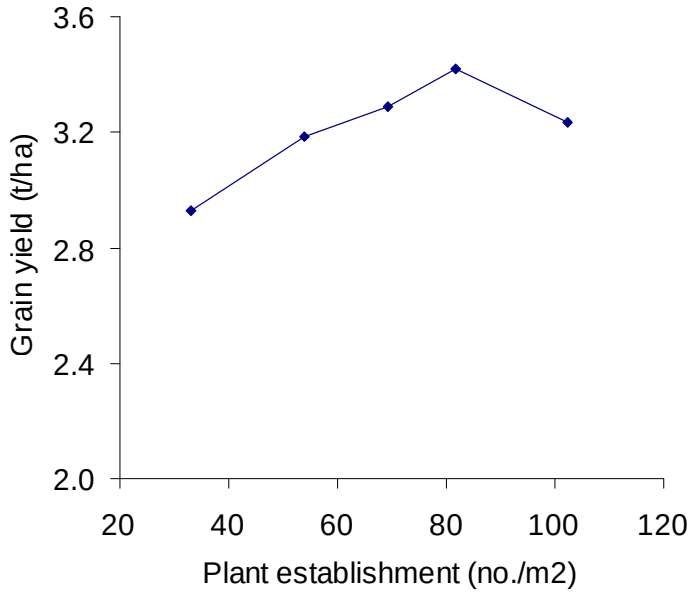


Figure 1. Grain yield response to plant density, averaged over eight barley varieties in 2008.

With low in-crop rainfall but good stored water, yields were acceptable over a range of plant densities, with the optimum being about 80 plants/m^2. The effects on grain quality will be interesting but tests have not been completed at the time of writing.

There were some differences among varieties in this response and the results for three new varieties are shown in Figure 2. Hindmarsh was higher yielding at all plant densities but also responded to higher densities, with an optimum of 100 plants/m2 compared to about 80 for Buloke and Commander. This is in line with other experiments in 2008 in which Hindmarsh was more responsive to a range of inputs such as phosphorus and seeding rate.

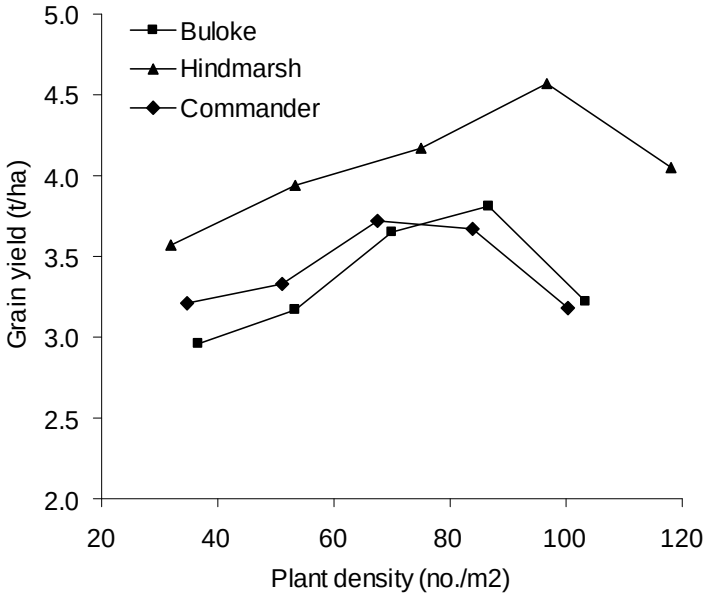


Figure 2. Grain yield response to plant density for three barley varieties in 2008.

Comparing varieties (Figure 3), Hindmarsh was the standout for yield averaging just over 4 t/ha, followed by Buloke, Commander and Flagship at 3.4 t/ha, all well ahead of Schooner (2.8 t/ha). Commander and Buloke are malting varieties while Hindmarsh, currently rated as feed, is undergoing malt evaluation.

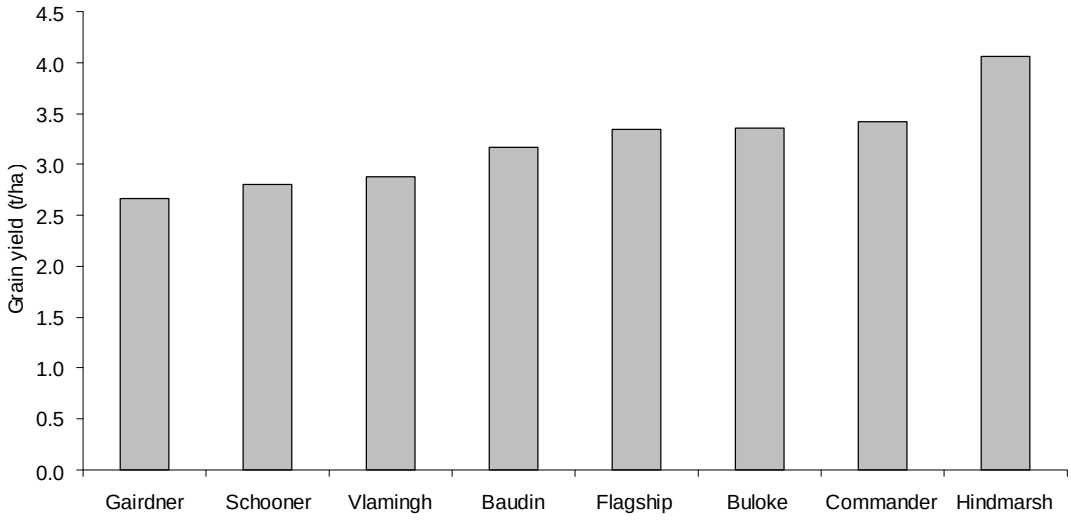


Figure 3. Grain yield of eight barley varieties, averaged over seeding rates, at Rankins Springs in 2008.

Chickpea - Plant Population Trial

Yenda

Luke Gaynor, Research Agronomist, Wagga

Eric Armstrong, Research Agronomist, Wagga

Peter Matthews, District Agronomist, Temora

2008

Key Findings

- Low plant populations significantly reduced grain yields in the 2008 season.
- Plant densities above the currently recommended target range for southern NSW of 35 - 45 pl/m^2 were significantly higher yielding under the dry conditions of 2008.

Trial Aim

To test the yield response of new varieties and advanced lines of chickpeas to changes in plant populations in southern NSW. The information from this trial plus others is used to validate and improve grower recommendations.

Trial Details

Location: "Hillview" Yenda, NSW

Soil type: Red Sandy Loam.

Previous crop: Barley, continuously cropped for 9 years.

Treatments:

	Varieties	
Desi chickpeas	CICA 0503	CICA 0512
	Flipper	Genesis 509
Kabuli chickpeas	Genesis 090	Genesis 079
	Genesis 114	
Target Plant Populations/m^2	12, 24, 36, 48 & 60	

Trial management:

Sowing rate	various
Row Spacing	30 cm
Sowing date	18th June
Fertiliser	115kg/ha Grain Legume
Herbicide	Metribuzin 750g/kg PSPE 180g/ha on 25th June Select 300ml/ha 28th August
Insecticide	Fastac 200ml/ha 3rd October
Harvest date	1st December

Method

Eight varieties and five targeted plant populations listed above were used. Plots were sown into moisture in a zero-tillage system using a cone-seeder on 30cm row spacing with Janke knife tynes. Press wheels directly followed the tynes to maximise seed-soil contact at the rear of the machine.

Seasonal Review

A wet summer prior to sowing provided opportunities to store moisture deep in soil profile which ultimately proved to be very valuable to grain yield. A very dry May, and dry spring period combined with fluctuating hot temperatures in spring had an impact on the potential grain yields. Above average rainfall in June and July helped carried crop through to finish.

The year's rainfall total in 2008 was 89.7mm less then the long term mean, with the majority of this rain deficit occurring during spring (Table 1).

Trial Results

Yield

The variety of chickpea had no significant effect on grain yields at this site. The interaction of variety by plant population was also found to be not significant. There was however a significant response ($P<0.001$) to increasing plant population in chickpeas at this site.

Table 1: Monthly long term average and 2008 rainfall (mm) for “Hillview” Yenda.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
LTA	33.5	27.6	26.8	23.6	34.5	33.3	38.5	36.8	32.2	38.0	29.5	39.7	402.9
2008	29.2	25.1	7.6	25.1	2.0	43.7	49.5	18.8	23.1	17.3	38.1	34.0	313.7

Discussion

Under dry spring conditions, the overall yields were reduced to what would be expected in an average year.

Statistical analysis showed whilst there was no significant difference between varieties, plant population had a major significant effect on grain yields. Across the range of varieties, grain yield showed a linear response to increasing plot densities, see Figure 1. For every additional chickpea plant above 10 plants/m^2, 7.5 kg/ha of extra grain yield was produced.

Given the dry hot conditions late in spring, the lower plant densities were unable to compensate for yield, by the growth of additional branches or increasing flowering nodes on the main branches.

Under these drought conditions it is difficult to recommend plant populations from this trial, for seasons with rainfall closer to average.

This is still valuable data for understanding plant densities responses under drought conditions as experienced in 2008, showing that having low plant populations was detrimental to potential crop yields.

Since management decisions are based on long term results, this report should be interpreted only in terms of those conditions experienced in 2008.

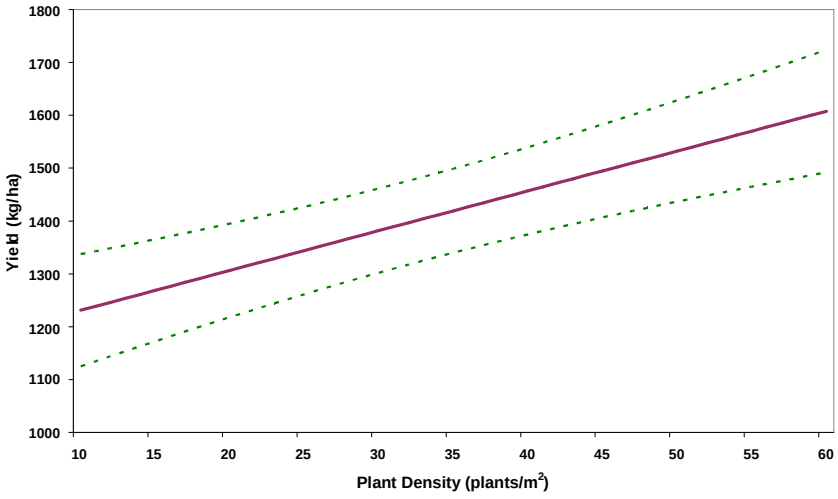


Figure 1: Chickpea yield response curve (solid line) to increasing plant population (95% confidence intervals broken lines) at Yenda in 2008.

Further Information

For further information on this trial or pulse agronomic research in southern NSW contact Luke Gaynor & Eric Armstrong 0269 381999 or Peter Matthews 0269 773333

Acknowledgements

The contributions of Chris Lisle, Gerard O'Connor, Ian Menz, Peter Shephard, Karl Moore and Kurt Lindbeck are gratefully acknowledged.

This work was conducted as part of the GRDC project “DAV00084 - New varieties, New Agronomy - Pulse Agronomic Research, South-Eastern Australia”.

GRDC
Grains Research & Development Corporation

© State of New South Wales through NSW Department of Primary Industries 2009

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (April 2009). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product name does not imply endorsement by NSW Department of Primary Industries over any equivalent product from another manufacturer.

Recognising that some of the information in this document is provided by third parties, the State of New South Wales, the author and the publisher take no responsibility for the accuracy, currency, reliability and correctness of any information included in the document provided by third parties.

ALWAYS READ THE LABEL

Users of agricultural (or veterinary) chemical products must always read the label and any Permit, before using the product, and strictly comply with the directions on the label and the conditions of any Permit. Users are not absolved from compliance with the directions on the label or the conditions of the Permit by reason of any statement made or omitted to be made in this publication.

Chickpea - Row Spacing Trial

Yenda

Southern PULSE Agronomy

Luke Gaynor, Research Agronomist, Wagga

Eric Armstrong, Research Agronomist, Wagga

Peter Matthews, District Agronomist, Temora

2008

Key Findings

- Row spacing of 20 & 30 cm was significantly higher yielding then 40 & 50 cm treatments.
- All varieties behaved similarly under different row spacing treatments with no significant variety by row spacing interactions.

Trial Aim

To investigate and model the effects of changing row spacing on chickpea yield in southern NSW. The information from this trial plus others is used to validate and improve grower recommendations.

Trial Details

Location: "Hillview" Yenda, NSW

Soil type: Red Sandy Loam.

Previous crop: Barley, continuously cropped for 9 years.

Treatments:

	Varieties	
Desi chickpeas	CICA 0503	CICA 0512
	Flipper	Genesis 509
Kabuli chickpeas	Genesis 090	
Row Spacing	20, 30,40 & 50 cm	

Method

Plots were sown into moisture in a zero-tillage system using a cone-seeder with adjustable tool bar with Janke knife tynes. Press wheels directly followed the tynes to maximise seed-soil contact at the rear of the machine. Plots consisted of two adjacent runs of the cone-seeder to provide enough rows for the wider row spacing and to minimise edge effects.

Trial management:

Sowing rate	35 plants/m2
Sowing date	19th June
Fertiliser	115kg/ha Grain Legume
Herbicide	Metribuzin 750g/kg PSPE 180g/ha on 25th June Select 300ml/ha 28th August
Insecticide	Fastac 200ml/ha 3rd October
Harvest date	28th November

Seasonal Review

A wet summer prior to sowing provided opportunities to store moisture deep in the soil profile which ultimately proved to be very valuable to grain yield. A very dry May, and dry spring period combined with fluctuating hot temperatures had an impact on the potential grain yields. Above average rainfall in June and July helped carried crop through to finish.

Rainfall total in 2008 was 89.7mm less then the long term average, with the majority of this rain deficit occurring during spring (Table 1).

Trial Results

Yield

The interaction of variety by row spacing was found to be not significant. However both the main effects of variety ($P< 0.001$) and row spacing ($P<0.05$) were significant.

Discussion

Under the dry spring conditions of 2008, the overall yield potential of all varieties was reduced, compared to what would be expected in an average year.

Whilst the statistical analysis showed there was a significant difference between row spacings, there was no variety effect with all the varieties responding similarly to increasing row spacing.

Table 1: Monthly long term average and 2008 rainfall (mm) for “Hillview” Yenda.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
LTA	33.5	27.6	26.8	23.6	34.5	33.3	38.5	36.8	32.2	38.0	29.5	39.7	402.9
2008	29.2	25.1	7.6	25.1	2.0	43.7	49.5	18.8	23.1	17.3	38.1	34.0	313.7

As shown in Figure 1 there was no significant difference between row spacings of 20cm and 30cm. However the wider rowspacing of 40cm and 50cm showed a significant yield reduction compared the 20cm and 30cm spacings as well as to each other.

From this data, we can suggest that a row spacing of 30cm incurs no yield decline when compared to the traditional 20cm row spacing. These results are similar to those reported for the 2007 season where 19cm and 30 cm row spacing showed no significant differences in grain yield.

Variety choice was also important at this site with the each varieties overall yield potential being different, with the earlier maturing line Genesis 0509 the best performing variety under the conditions in 2008 (Figure 2).

Since management decisions are based on long term results, this report should be interpreted only in terms of those conditions experienced in 2008.

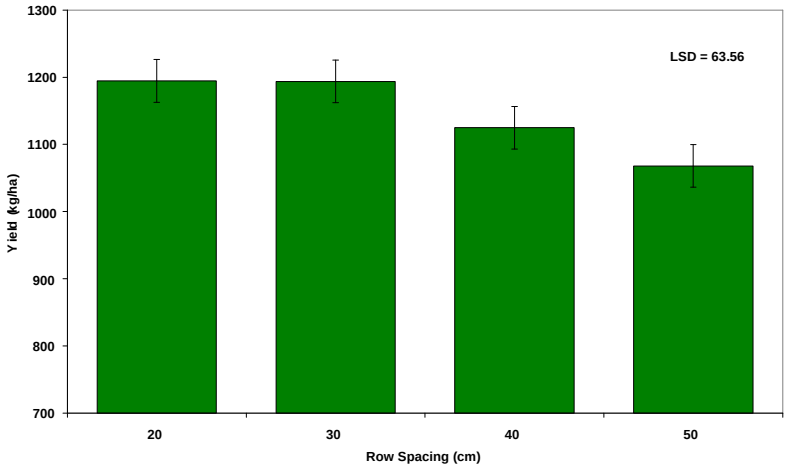


Figure 1: Yield responses of chickpea to different plant row spacing at Yenda in 2008.

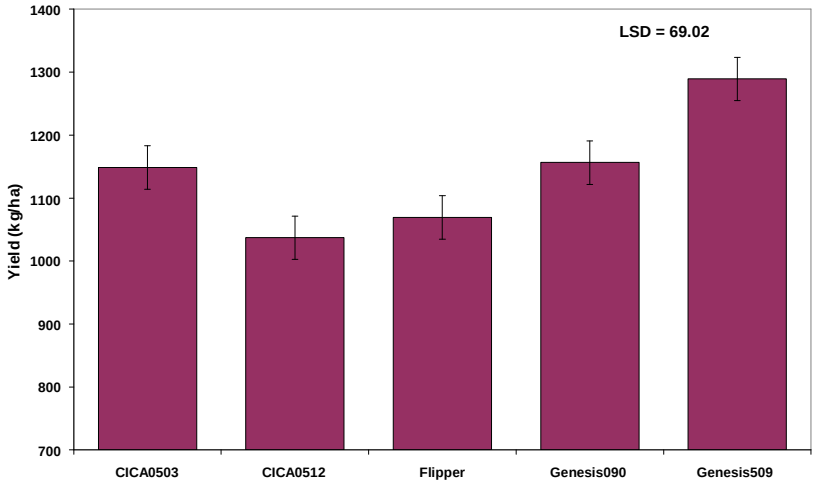


Figure 2: Chickpea yield response to variety at Yenda in the row spacing trial in 2008.

Further Information

For further information on this trial or pulse agronomic research in southern NSW contact Luke Gaynor & Eric Armstrong 0269 381999 or Peter Matthews 0269 773333

Acknowledgements

The contributions of Chris Lisle, Gerard O’Connor, Ian Menz, Peter Shephard, Karl Moore and Kurt Lindbeck are gratefully acknowledged.

This work was conducted as part of the GRDC project “DAV00084 - New varieties, New Agronomy - Pulse Agronomic Research, South-Eastern Australia”.

GRDC
Grains Research & Development Corporation

© State of New South Wales through NSW Department of Primary Industries 2009

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (April 2009). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user’s independent adviser.

The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product name does not imply endorsement by NSW Department of Primary Industries over any equivalent product from another manufacturer.

Recognising that some of the information in this document is provided by third parties, the State of New South Wales, the author and the publisher take no responsibility for the accuracy, currency, reliability and correctness of any information included in the document provided by third parties.

ALWAYS READ THE LABEL

Users of agricultural (or veterinary) chemical products must always read the label and any Permit, before using the product, and strictly comply with the directions on the label and the conditions of any Permit. Users are not absolved from compliance with the directions on the label or the conditions of the Permit by reason of any statement made or omitted to be made in this publication.

Field pea - Plant Population Trial

Yenda

Southern PULSE Agronomy

Eric Armstrong, Research Agronomist, Wagga

Peter Matthews, District Agronomist, Temora

Luke Gaynor, Research Agronomist, Wagga

2008

Key Findings

- Sturt was the highest yielding and most responsive to increasing seeding rate
- Kaspa and Yarrum showed a flat or negative response (similar to 2007), reflecting a combination of late flowering and dry warm conditions in September and October.

Trial Aim

To test yield responses of new varieties of field pea to increasing plant populations in southern NSW. The information from this trial plus many others is used to formulate grower recommendations.

Trial Details

Location: "Hillview" Yenda, NSW.

Soil type: Red Sandy Loam.

Previous crop: Barley, continuously cropped for 9 years.

Treatments:

Field pea type	Varieties (6)
Dun	Kaspa, Parafield, Yarrum, OZP0703
White	SW Celine, Sturt
Target Plant Populations	16, 32, 48, 64 & 80

Trial management:

This trial was sown on 17th June into good moisture. Excellent establishment, weed control and insect control resulted. Spray operations were carried out by the cooperating farmer using a 36m boom.

Sowing rate	various
Row Spacing	30 cm
Sowing date	17th June
Fertiliser	115 kg/ha Grain legume Super
Herbicide	Metribuzin 750g/kg 180g/ha on 25th June (PSPE) Select 300ml/ha on 28th August (grass control)
Insecticide	200 ml/ha Fastac (Alpha-cypermethrin) on 3rd October
Fungicide	Nil
Harvest date	26th November

Method

Plots were sown into moisture in a zero-tillage system using a cone-seeder on 30cm row spacing with Janke knife tynes. Press wheels directly followed the tynes to effect good seed-soil contact.

Plots were grown according to standard management practices for field pea. Establishment counts were undertaken on the 12th August when plants were at the 3-5 node stage.

Seasonal Review

This was part of a continuing run of harsh seasons with rainfall well below average. However, soil water profiles were much better than previous seasons due to some summer storms, but more significantly, above average rainfall in June and July. It was this moisture that carried the crops through since September and October were very dry and hotter than normal. Yields were below average but better than 2007.

Trial Results

Yield

Varieties were significantly different from each other, and there were significant responses to increasing plant population, but this response varied widely depending on variety (ie a significant variety x plant population interaction).

Table 1: Monthly long term average and 2008 rainfall (mm) for “Hillview” Yenda.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
LTA	33.5	27.6	26.8	23.6	34.5	33.3	38.5	36.8	32.2	38.0	29.5	39.7	402.9
2008	29.2	25.1	7.6	25.1	2.0	43.7	49.5	18.8	23.1	17.3	38.1	34.0	313.7

Sturt was the highest yielding variety and the most responsive to increasing plant population. Its yield peaked at over 60 plants/m^2 (see Figure 1). .

Kaspa, Parafield and Yarrum were the least responsive, their yields peaking around 25-30 plants/m^2.

Discussion

While Sturt’s high yield is consistent with previous findings in drier short-seasoned environments and consistent with our variety recommendations for this area, it is normally not as responsive to such high plant densities.

Interesting, Kaspa and Yarrum showed similar negative responses at Yenda in 2007, and this is probably more a reflection of their late flowering responding poorly to dry seasons.

It is important to realize plant population responses vary from season to season and from variety to variety. It is best management practice to target densities above critical minimums (approximately 30 plants /m^2) to ensure good ground cover and a sufficient number of potential podding sites (flowers) to achieve acceptable yield levels. Seed germination, soil moisture and sowing techniques become critical.

Since management decisions are based on long term results, this report should be interpreted only in terms of those conditions experienced in 2008.

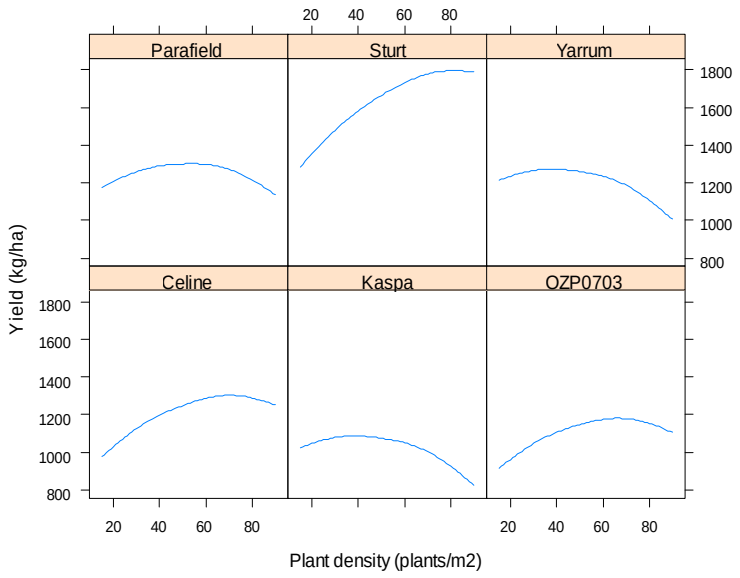


Figure 1: Field pea variety response curves to changing plant populations at Yenda in 2008.

Further Information

For further information on this trial or pulse agronomic research in southern NSW contact Luke Gaynor & Eric Armstrong 0269 381999 or Peter Matthews 0269 773333

Acknowledgements

The contributions of Chris Lisle, Gerard O’Connor, Ian Menz, Peter Shephard, Karl Moore and Kurt Lindbeck are gratefully acknowledged.

This work was conducted as part of the GRDC project “DAV00084 - New varieties, New Agronomy - Pulse Agronomic Research, South-Eastern Australia”.

GRDC
Grains Research & Development Corporation

© State of New South Wales through NSW Department of Primary Industries 2009

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (April 2009). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user’s independent adviser.

The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product name does not imply endorsement by NSW Department of Primary Industries over any equivalent product from another manufacturer.

Recognising that some of the information in this document is provided by third parties, the State of New South Wales, the author and the publisher take no responsibility for the accuracy, currency, reliability and correctness of any information included in the document provided by third parties.

ALWAYS READ THE LABEL

Users of agricultural (or veterinary) chemical products must always read the label and any Permit, before using the product, and strictly comply with the directions on the label and the conditions of any Permit. Users are not absolved from compliance with the directions on the label or the conditions of the Permit by reason of any statement made or omitted to be made in this publication.

Field pea - Row Spacing Trial

Yenda

Southern PULSE Agronomy

Eric Armstrong, Research Agronomist, Wagga

Luke Gaynor, Research Agronomist, Wagga

Peter Matthews, District Agronomist, Temora

2008

Key Findings

- Increasing row spacing had no statistically significant effect on grain yield, although there was a tendency for yield to decline at wider rows.
- Plant lodging increased and ground cover decreased at wider row spacings.
- Sturt was the highest yielding variety.

Trial Aim

To investigate and model the effects of changing row spacing on field pea yield in southern NSW. The information from this trial plus others is used to validate and improve grower recommendations.

This issue has particular relevance in current farming systems dependant on direct seeding and stubble retention.

Trial Details

Location: "Hillview" Yenda, NSW

Soil type: Red Sandy Loam.

Previous crop: Barley, continuously cropped for 9 years.

Treatments:

Field pea types	Varieties
Short dun	Kaspa and OZP0703
Tall dun	Parafield
Short white	SW Celine
Row Spacing	20, 30,40 & 50 cm

Trial management:

Sowing rate	48 plants/m2
Sowing date	19th June
Fertiliser	115kg/ha Grain Legume
Herbicide	Metribuzin 750g/kg 180g/ha on 25 June (PSPE). Select 300ml/ha on 28th August (grass control)
Insecticide	200 ml/ha Fastac (Alpha-cypermethrin) on 3rd October
Harvest date	26th November

Method

Plots consisted of two adjacent runs of the cone-seeder to provide sufficient row numbers for the wider row spacing and to minimise edge effects. Therefore the number of rows sown per plot varied from 16, 12, 8 and 6 for the 20, 30, 40 & 50cm row spacing respectively. Accordingly, plot widths varied with each treatment.

Plots were directly sown into barley stubble using a cone-seeder with Janke knife tynes attached to an adjustable tool bar. Press wheels directly followed the tynes to effect good seed-soil contact.

Plots were grown according to standard management practices for field pea. Establishment counts were undertaken in early August when plants were at the 3-5 nodes.

Seasonal Review

This was part of a continuing run of harsh seasons with rainfall well below average. However, soil water profiles were much better than previous seasons due to some summer storms, but more significantly, above average rainfall in June and July which ultimately proved to be very valuable to grain yield. It was this moisture that carried the crops through since September and October were very dry and hot. Yields were better than 2007 but still well below average.

Rainfall total in 2008 was 89.7mm less then the long term average, with the majority of this rain deficit occurring during spring (Table 1).

Table 1: Monthly long term average and 2008 rainfall (mm) for “Hillview” Yenda.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
LTA	33.5	27.6	26.8	23.6	34.5	33.3	38.5	36.8	32.2	38.0	29.5	39.7	402.9
2008	29.2	25.1	7.6	25.1	2.0	43.7	49.5	18.8	23.1	17.3	38.1	34.0	313.7

Trial Results

Yield

Increasing row spacing had no significant effect on grain yield across all varieties ($P<0.05$). However, there was a trend ($P<0.10$) for yield to decline at the wider row spacings (see Figure 1).

Sturt yielded significantly higher than all other varieties ($P<0.01$).

As row spacing increased, ground cover of all varieties at maturity declined from around 90% down to around 60%. Lodging of Kaspa and OZP0703 also increased at wider row spacings.

Discussion

Narrower row spacing tends to be better suited to dry seasons, particularly with little or no sub soil moisture at the start of the season. A row spacing of 30 cm seems fine under most conditions.

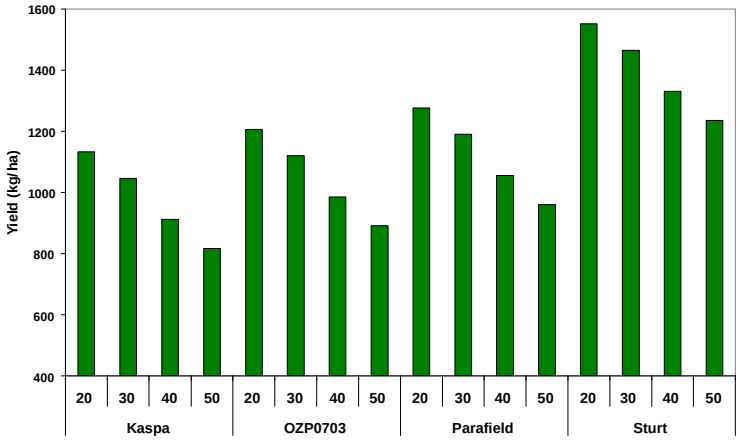


Figure 1: Effects on yield of field pea from varying row spacing (cm) at Yenda in 2008.

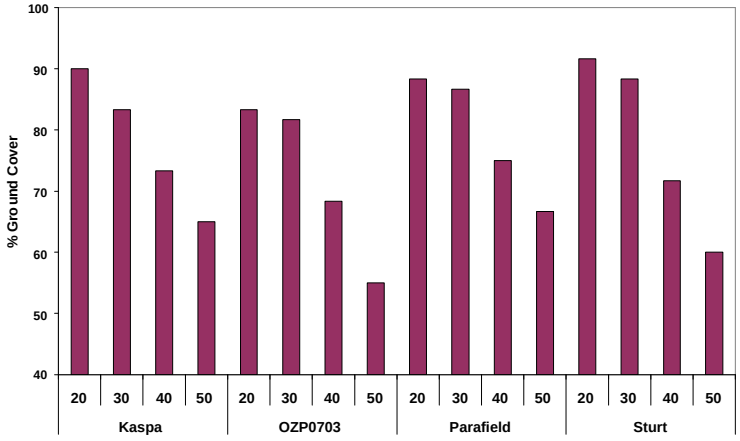


Figure 2: Changes to ground cover of field pea varieties resulting from increased row spacing (cm) at Yenda in 2008.

Since management decisions are based on long term results, this report should be interpreted only in terms of the conditions experienced in 2008.

Further Information

For further information on this trial or pulse agronomic research in southern NSW contact Luke Gaynor & Eric Armstrong 0269 381999 or Peter Matthews 0269 773333

Acknowledgements

The contributions of Chris Lisle, Gerard O’Connor, Ian Menz, Peter Shephard, Karl Moore and Kurt Lindbeck are gratefully acknowledged.

This work was conducted as part of the GRDC project “DAV00084 - New varieties, New Agronomy - Pulse Agronomic Research, South-Eastern Australia”.

GRDC
Grains Research & Development Corporation

© State of New South Wales
through NSW Department of Primary Industries 2009

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (April 2009). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user’s independent adviser.

The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product name does not imply endorsement by NSW Department of Primary Industries over any equivalent product from another manufacturer.

Recognising that some of the information in this document is provided by third parties, the State of New South Wales, the author and the publisher take no responsibility for the accuracy, currency, reliability and correctness of any information included in the document provided by third parties.

ALWAYS READ THE LABEL

Users of agricultural (or veterinary) chemical products must always read the label and any Permit, before using the product, and strictly comply with the directions on the label and the conditions of any Permit. Users are not absolved from compliance with the directions on the label or the conditions of the Permit by reason of any statement made or omitted to be made in this publication.

Wheat Variety Trial Results

Glen & Julie Andreazza, Willbriggie

National Variety Trials

GRDC Grains Research & Development Corporation

EARLY SEASON Variety Name	YIELD t/ha	YIELD %	1000 Grain Weight g/1000 seeds	Hectolitre Weight kg/hectolitre	Protein %	Screenings (0.2mm sieve) %
Amarok	10.36	112	40.2	78.6	8.8	2.1
Barham	8.95	96	42	77.4	9.1	1.6
Beaufort	10.5	113	44	76.7	9.9	3.3
Bolac	9.64	104	37.4	79.8	9.7	2.1
Chara	9.71	104	45	79.1	9.6	1.5
Currawong	9.83	106	48.2	80.8	9.4	2.7
EGA Bounty	9.51	102	46.8	81.3	10	1.6
EGA Burke	7.91	85	45.4	82.6	8.8	1.7
EGA Eaglehawk	9.08	98	41.4	82.7	9	2.2
EGA Gregory	9.25	99	46	81.3	9.4	3.2
EGA Wedgetail	9.45	102	43	78	9.9	1.2
EGA Wills	7.72	83	45.8	81.1	10.1	3.3
EGA Wylie	9.07	98	44	81.7	10.5	2.4
Ellison	-	-	-	-	-	-
Endure	9.13	98	39	82.6	9.9	1.6
Frelon	10.89	117	39.6	73.5	9.2	2.4
Gascoigne	-	-	-	-	-	-
Giles	10.43	112	44	80.5	9	1.8
Gruner	-	-	-	-	-	-
Lincoln	9.88	106	49	80.9	9.8	3.9
McCubbin	-	-	-	-	-	-
Naparoo	8.02	86	45	80.8	9.2	3.1
Rosella	9.07	98	40.4	78.7	9.5	1.4
Sentinel	10.51	113	49.6	80.9	9.9	0.9
Snipe	-	-	-	-	-	-
Strzelecki	8.63	93	44.6	78.7	9.8	2.6
Sunbri	9.42	101	37.2	82.2	10.1	2.2
Sunsoft 98	9.65	104	40.4	81	9.8	1.4
Sunvale	9.4	101	41.4	82.7	10.2	1.9
Sunzell	8.94	96	44	81.4	10.7	1.9
Thornbill	9.32	100	40.2	80.2	9.2	1.8
Whistler	9.78	105	42	79.6	9.6	3.6
Wylah	9.71	104	43.2	82.2	9.9	0.9
Site Mean (t/ha)	9.29					
CV (%)	2.61					
LSD (t/ha)	0.41	4				
Analysis Date	01/05/2009					

MAIN SEASON Variety Name	YIELD t/ha	%	1000 Grain Weight g/1000 seeds	Hectolitre Weight kg/hectolitre	Protein %	Screenings (0.2mm sieve) %
Axe	8.5	92	49.60	79.80	11.5	1.60
Barham	8.99	97	40.30	76.30	9.5	3.60
Bolac	9.6	104	36.40	79.20	9.9	3.30
Bowie	9.75	106	43.30	77.00	9.6	3.00
Bullet	9.09	99	39.00	78.90	10.2	3.50
Carinya	9.51	103	43.00	80.40	10.1	2.20
Catalina	8.83	96	47.70	81.60	10.9	2.40
Chara	9.91	107	43.00	79.50	10.0	3.10
Correll	8.82	96	45.10	77.20	11.3	4.00
Crusader	9.25	100	37.30	81.50	10.7	2.10
Dakota	9.45	102	40.90	79.00	10.2	3.00
Derrimut	9.84	107	40.40	80.40	9.4	4.20
Diamondbird	9.39	102	46.30	81.40	9.7	2.10
Drysdale	10.31	112	45.40	81.90	9.9	3.60
EGA Gregory	9.02	98	46.00	81.60	9.9	2.90
EGA Stampede	9.42	102	45.60	78.90	9.4	3.60
EGA Wills	7.41	80	46.50	78.50	10.5	3.90
Ellison	9.48	103	50.10	82.80	10.3	3.30
Espada	9.96	108	48.30	77.80	10.6	1.50
GBA Hunter	10.07	109	42.10	80.00	9.6	3.20
GBA Ruby	9.37	102	46.80	81.00	10.0	3.60
Giles	10.04	109	41.60	79.80	9.6	2.80
Gladius	9.54	103	50.10	78.20	10.5	2.00
Guardian	8.75	95	42.70	80.80	10.2	3.70
H46	8.68	94	38.70	81.30	11.3	1.30
Hornet	9.1	99	37.90	81.90	10.7	3.80
Janz	9.44	102	41.70	80.00	10.0	2.60
Kennedy	9.04	98	47.90	80.20	10.7	2.50
Lang	9.05	98	41.50	81.20	10.4	1.60
Lincoln	9.87	107	48.10	80.40	10.0	4.20
Merinda	10.16	110	42.70	81.10	10.1	2.50
Peake	9.04	98	44.00	79.60	10.2	2.30
QALBIS	10.02	109	44.40	75.50	8.8	3.40
Sentinel	10.54	114	48.60	81.00	9.8	1.60
Snipe	9.21	100	42.50	79.00	9.9	4.00
Sunvale	8.86	96	40.30	80.70	10.4	1.90
Sunvex	8.92	97	45.00	80.50	11.3	2.20
Ventura	9.17	99	46.20	81.80	10.4	2.00
Waagan	9.3	101	44.70	80.10	10.2	2.90
Young	8.79	95	39.60	80.20	10.6	3.00
Zebu	10	108	42.20	80.00	9.7	3.80
Zulu	11.36	123	43.50	79.70	7.9	3.10
Site Mean (t/ha)	9.22					
CV (%)	2.91					
LSD (t/ha)	0.45	5				
Analysis Date	01/06/2009					

NVT Trial Results: Although these trials were well designed and managed, growers should not wholly base their decision to change variety on one or two experiments in one location. When looking at NVT data be sure also to note the LSD (least significant difference) figure. Varieties within this yield range of each other are not statistically different.

Irrigated Faba Bean

Variety Trial Results

Coleambally – David Bellato

Variety Name	t/ha	%
Cairo	5.6	103
Doza	5.14	94
Farah	5.53	101
Fiesta VF	5.73	105
Fiord	5.47	100
Nura	5.14	94
Site Mean (t/ha)	5.45	
CV (%)	5.05	
LSD (t/ha)	0.46	8
Analysis Date	01/05/2009	

NVT Trial Results: Although these trials were well designed and managed, growers should not wholly base their decision to change variety on one or two experiments in one location. When looking at NVT data be sure also to note the LSD (least significant difference) figure. Varieties within this yield range of each other are not statistically different.

Management:

19th April	Single Super (HiFert)	@ 350 kg/ha
13th May	Roundup Powermax	@ 1 L/ha
	Carfentrazone-ethyl (240g/l)	@ 0.05 L/ha
15th May	Sown	
	Grain Legume Super 2%	@ 120 kg/ha
25th July	Mancozeb 800 g/kg	@ 2 L/ha
	Haloxyfop-R 520 g/L	@ 0.05 L/ha
11th September	Mancozeb 800 g/kg	@ 2 kg/ha
15th October	Carbendazim	@ 0.5 L/ha
	Alpha-cypermethrin 100 g/l	@ 0.4 L/ha
4th December	Harvested	

NSW DEPARTMENT OF
PRIMARY INDUSTRIES

2008 Irrigated Barley Variety Trial Results

Conducted by: **Neil Fettell**
Assisted by Barry Haskins and Rachael Whitworth

GRIFFITH:

Glen & Julie Andreazza, Willbriggie

VARIETY	*Yield (t/ha)*	*Lodging**
Fairview	*8.39*	*1.3*
Capstan	*8.10*	*1.3*
Yarra	*7.48*	*1.3*
Baudin	*7.42*	*1.0*
Tantangara	*7.17*	*1.0*
Gairdner	*7.12*	*6.0*
Buloke	*6.94*	*2.7*
Hindmarsh	*6.77*	*1.3*
Fleet	*6.58*	*8.3*
lsd	*0.73*	*0.8*
cv(%)	*5.91*	*4.5*

** 1 = erect, 9 = horizontal*

HILLSTON:

VARIETY	*Yield (t/ha)*	*Lodging**
Fairview	*8.90*	*3.0*
Capstan	*8.09*	*1.7*
Fleet	*8.08*	*4.3*
Yarra	*7.87*	*2.7*
Tantangara	*7.71*	*2.7*
Baudin	*7.61*	*3.0*
Gairdner	*7.50*	*3.3*
Buloke	*7.47*	*4.0*
Hindmarsh	*7.41*	*2.7*
Lsd	*0.55*	*0.8*
cv(%)	*4.2*	*15.7*

** 1 = erect, 9 = horizontal*

Comments:

Fairview a proprietary malting variety was the standout variety at both sites under full irrigation

Capstan a feed variety showed excellent lodging resistance and high yield

Hindmarsh yields were lower but it may have a role where water limited as it is a quicker maturing variety often requiring one less spring irrigation.

NSW DEPARTMENT OF PRIMARY INDUSTRIES

2008 SARDI OAT Trial Results

Glen & Julie Andreazza, Willbriggie

Grain Oat trial:

VARIETY	Grain Yield t/ha	Rank	%TM
CARROLUP	3.93	38	86
DALYUP	5.99	5	131
ECHIDNA	6.56	2	143
EURO	4.15	34	90
KOJONUP	5.67	8	124
MITIKA	5.51	10	120
MORTLOCK	2.51	48	55
NUMBAT	3.76	40	82
POSSUM	4.45	27	97
POTOROO	4.46	26	97
QUOLL	4.83	17	106
WANDERING	5.86	6	128
YALLARA	4.92	15	107
Trial Mean	4.58		
C of V	17.77		
ems	0.66		
lsd.05			

Tall Grain Oat trial:

VARIETY	Grain Yield T/ha	Rank	%TM
CARROLUP	3.75	16	101
ECHIDNA	4.02	14	108
EURO	4.19	10	113
MITIKA	4.08	12	110
MORTLOCK	2.50	32	67
POSSUM	4.66	6	125
YALLARA	3.52	19	95
Trial Mean	3.72		
C of V	14.28		
ems	0.28		

National Oat Breeding Program - SARDI

New for 2009:

Yallara[A]:

Yallara is a medium-tall milling oat variety developed by SARDI and commercialised in 2008. Limited seed of this line will be available in 2009. Yallara is a backcross line using Euro as the recurrent parent and a North Dakota line as the source of rust resistance.

Long term yield of this variety is a 2% improvement compared to Euro. However, yield increases of between 40 and 100% have been recorded for varieties with stem rust resistance similar to Yallara in years where stem rust is yield limiting. Yallara is similar to Euro agronomically and for all foliar and soil borne diseases except stem and leaf rust and is recommended to replace Euro in all areas but particularly where stem and leaf rust can be yield limiting.

In addition, Yallara has bright grain and high grain digestibility making it suitable for the horse racing industry. Based on herbicide tolerance trials conducted by the SARDI New Variety Evaluation Group, Yallara is particularly sensitive to applications of Banvel-M®.

Yallara was assessed in hay trials in 2007 for the first time. Its dry matter production is not as high as some of the lines specifically bred for this purpose but its hay quality was good.

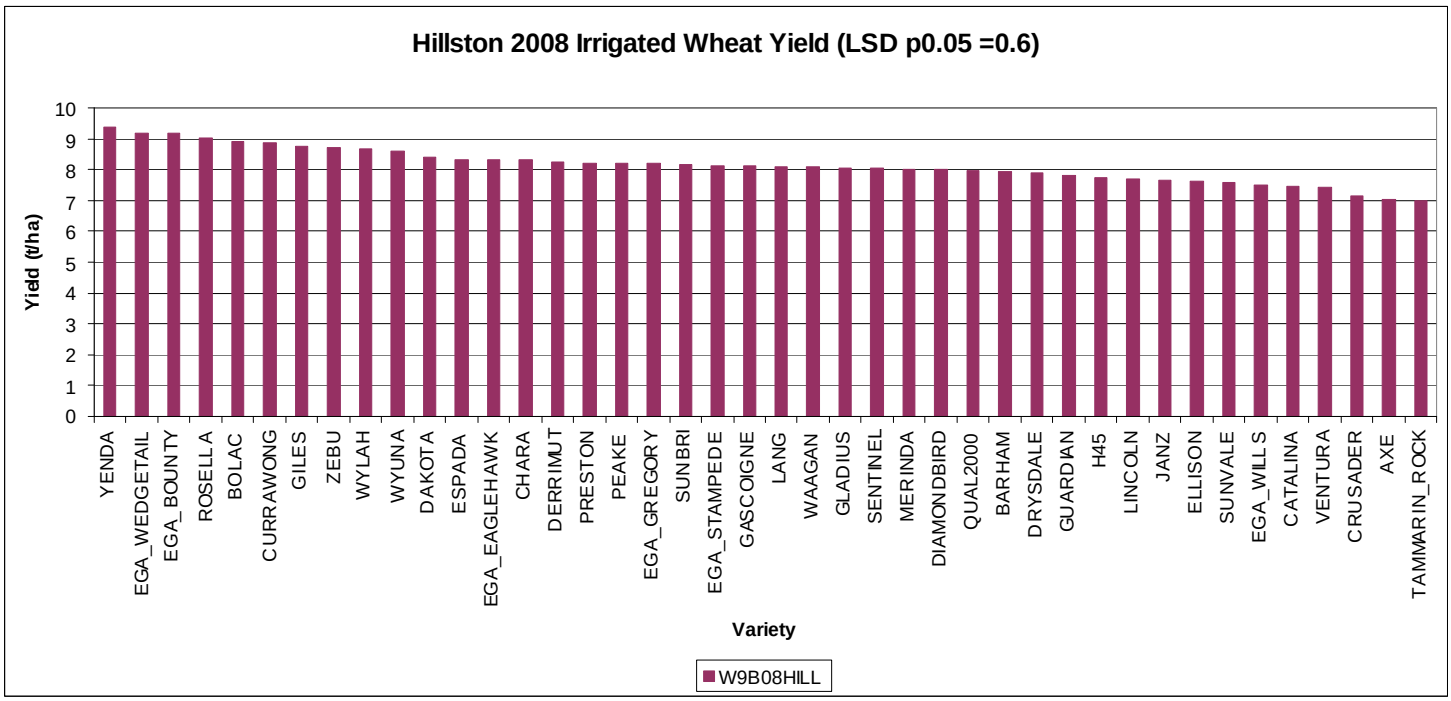
Additional information available at www.sardi.sa.gov.au

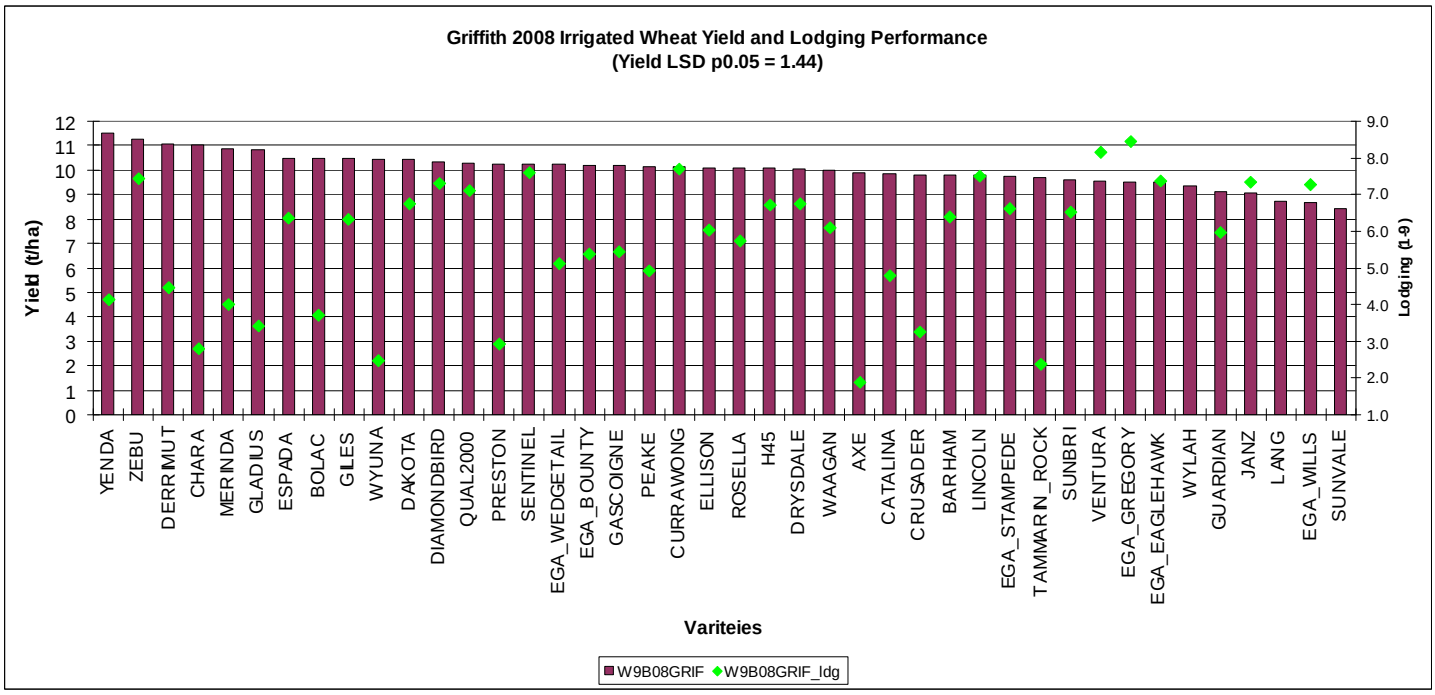
Irrigated winter cereals project – wheat results

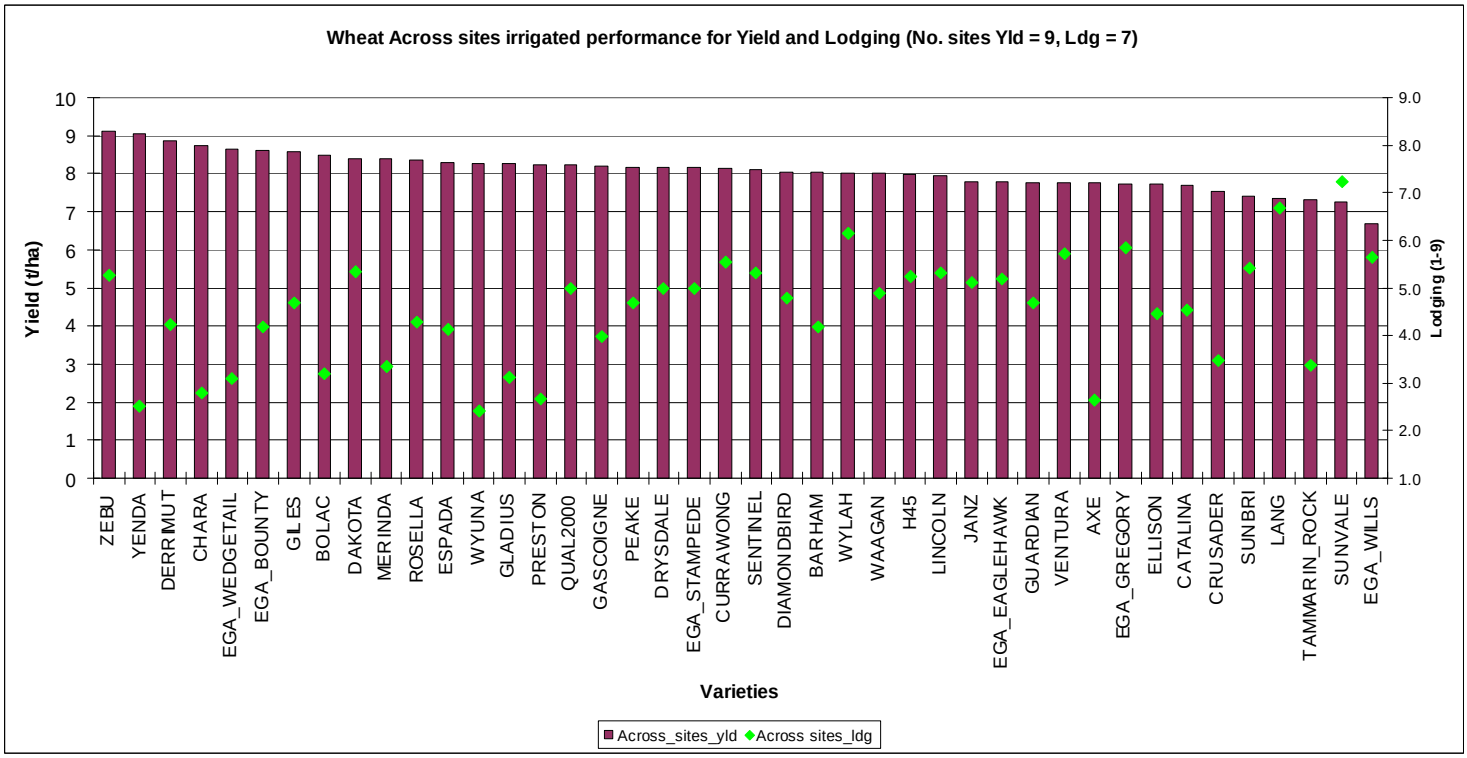
Andrew Milgate[1], John Lacy[1], Neroli Graham[1], Frank McRae[1], Damien Jones[2], Aaron Hutchison[1], Tom Thompson[1], Peter Martin[1], Barry Haskins[1], Rachael Whitworth[1], Kieran O'Keefe[1] and Rob Fisher[3]

[1]NSWDPI, [2]DPIVIC, [3]ICF

Results Summary 2008






Wheat Across sites irrigated performance for Yield and Lodging (No. sites Yld = 9, Ldg = 7)
Yield (t/ha)
Lodging (1-9)
Varieties
ZEBU
YENDA
DERRIMUT
CHARA
EGA_WEDGETAIL
EGA_BOUNTY
GLENELG
BOLAC
DAKOTA
MERINDA
ROSELLA
ESPADA
WYUNA
GLADIUS
PRESTON
QUAL2000
GASCOIGNE
PEAKE
DRYSDALE
EGA_STAMPEDE
CURRAWONG
SENTINEL
DIAMONDBIRD
BARHAM
WYLAH
WAAGAN
H45
LINCOLN
JANZ
EGA_EAGLEHAWK
GUARDIAN
VENTURA
AXE
EGA_GREGORY
ELLISON
CATALINA
CRUSADER
SUNBRI
LANG
TAMMARIN_ROCK
SUNVALE
EGA_WILLS
Across_sites_yld
Across sites_ldg

Irrigated Winter Cereals Project - Triticale, durum and barley results

Results Summary 2007 and 2008

Barley trials

The barley trials were conducted at Yanco in 2007 and 2008, and Coleambally, Jerilderie and Kerang in 2008. The management package for each of the trials is recorded in the Excel spreadsheet. The level of nitrogen available and the timing of application of water were based on the bread wheat trial; this may have increased the level of lodging that was recorded.

Across Sites Analysis

Main Points

Yield

- Lower yield at Coleambally, Deniliquin and Kerang in 2008 than at Yanco in 2007 and 2008. Predicted mean yield across all sites was 6.97 (t/ha).
- The correlation for grain yield between sites for yield was moderate to weak, this may reflet site variation across south east Australia.
- Highest yielding Australian feed variety Capstan, 8.18 (t/ha) and Australian malt variety Vlamingh 7.64 (t/ha).
- Highest yielding breeding line WB261, 8.38 (t/ha).

Lodging

- There is a weak trend of yield loss with increased levels of lodging, however when analysed across sites the trend is not significant. Coleambally 2008 had a more pronounced trend of yield loss associated with lodging than other locations.
- Predicted lodging at harvest across all sites and varieties was 5.8 (predicted lodging score).
- Moderate site correlation between Yanco in 2007 and 2008 and Kerang in 2008. Trials at Coleambally in 2008 were not as highly correlated to the other sites.
- Raised beds at Coleambally had no overall effect on level of lodging.
- Best variety for low lodging – WB261, 1.5 (predicted lodge score).
- Best breeding line for low lodging – Baudin, 2.5 (predicted lodge score).
- Most lodge variety – Fleet, 8.5 and most lodged breeding line was WI4311, 8.3 (predicted lodge score).

Triticale trials

The triticale trials were conducted at Yanco in 2007 and 2008, and Coleambally in 2008. The management package for each of the trials is recorded in the Excel

spreadsheet. The yields achieved in 2008 were slightly less than those of Yanco 2007. The level of lodging at Yanco in 2007 and 2008 was larger than lodging recorded at Coleambally in 2008. This may have been influenced by raised beds at Coleambally.

Across Sites Analysis

Main Points

Yield

- Predicted mean yield across all sites was 9.8 (t/ha)
- The correlation for yield between sites for yield was moderate. This indicates that grain yield for genotypes varied across the three trials sites.
- Highest yielding Australian variety Jawick, 10.75 (t/ha)
- Highest yielding breeding line JRCT101, 11.39 (t/ha)
- Breeding lines that had predicted means of 10 t/ha or greater at each of the three trial sites was JRCT101, JRCT56, JRCT74, TSA0078, TSA0120, TSA0133, TSA0222.

Lodging

- Predicted mean lodging at harvest yield across all sites was 6.3 (predicted lodging score).
- Lodging at Yanco, both in 2007 and 2008, 7.1 and 6.8 respectively, was greater than lodging at Coleambally in 2008, 4.8 (predicted lodge score).
- Best variety for low lodging Kosciuszko, 5.4 (predicted lodge score).
- Best breeding line for low lodging – AT616, 1.7 (predicted lodge score).

Durum trials

There were an additional four sites that had an irrigated durum wheat trial in 2008, Yanco, Coleambally, Griffith and Hillston. The management package for each of the trials is recorded in the Excel spreadsheet. As with barley and triticale the mean predicted yields in 2008 were lower than in 2007.

Across Sites Analysis

Main Points

Yield

- Predicted mean yield across all sites was 8.68 (t/ha). Two breeders lines Hazera-13 and LRD04-0010 having grain yields over 10 t/ha over all trial sites.
- The correlation for grain yield and lodging between sites for yield was weak. Indicating that grain yield and lodging varied with trial site.
- Highest yielding Australian variety Arivato, 9.56 (t/ha).
- Highest yielding breeding line Hazera-13, 10.16 (t/ha).

Lodging

- Predicted mean lodging at harvest yield across all sites was 5.1 (predicted lodging score).
- Lodging at Yanco, both in 2007 and 2008 was greater than lodging at all other sites in 2008.
- Best variety for low lodging Arivato, 3.3 (predicted lodge score)
- Best breeding line for low lodging – 27A19, 2.3 (predicted lodge score)

Durum-Griffith (D9A08GRIF)

Main points

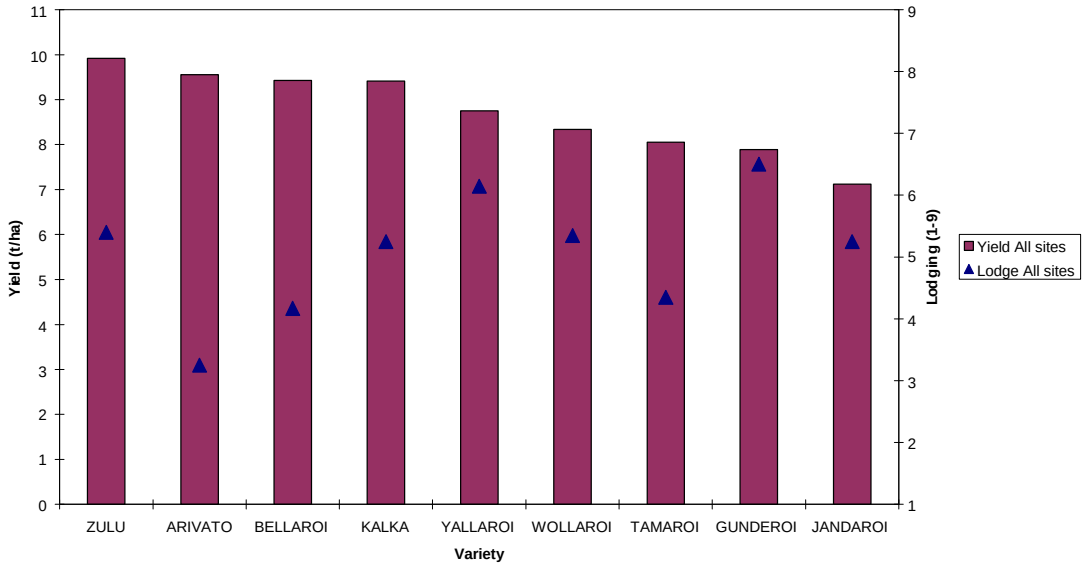
- Yield at the Griffith trial site was 8.62 (t/ha) which was similar to Coleambally yet the level of lodging at Griffith site was higher at 5.2 (predicted lodge score). Lodging however did not show a correlation with yield in the genotypes included in the trial.
- One breeding line LRD04-0012 achieved yield over 11 (t/ha) and 10 lines achieved over 10 (t/ha).
- Highest yielding variety – Arivato, 10.39 (t/ha)
- Highest yielding breeding line – LRD04-0012, 11.24 (t/ha)
- Best variety for low lodging – Bellaroi, 1.5 (predicted lodge score)
- Best breeding line for low lodging – 27P01, 1.0 (predicted lodge score)

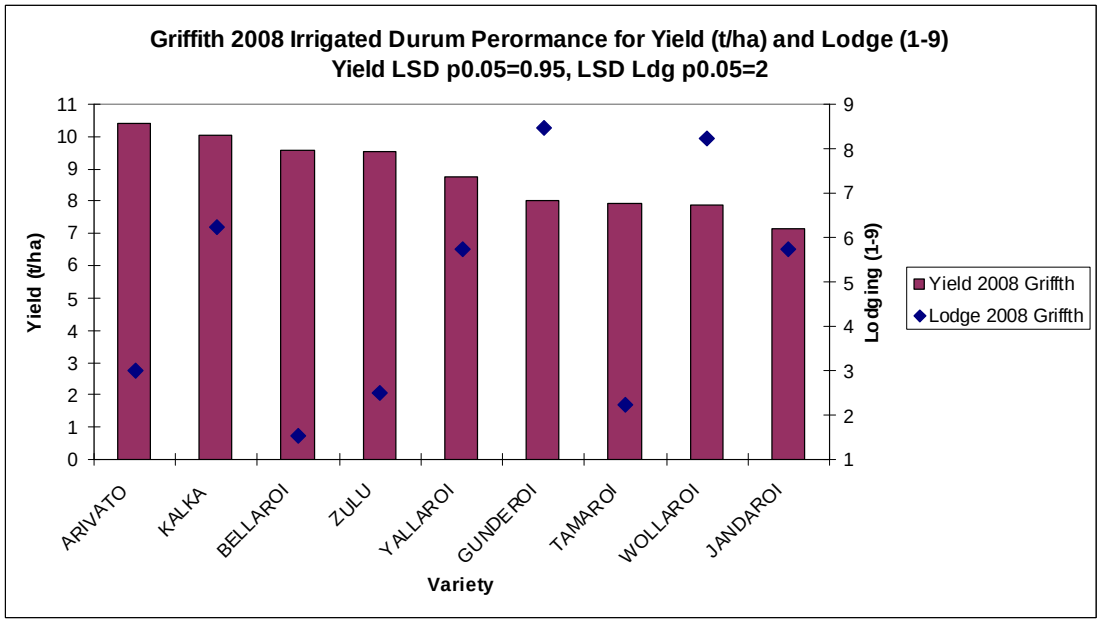
Durum-Hillston (D9A08HILL)

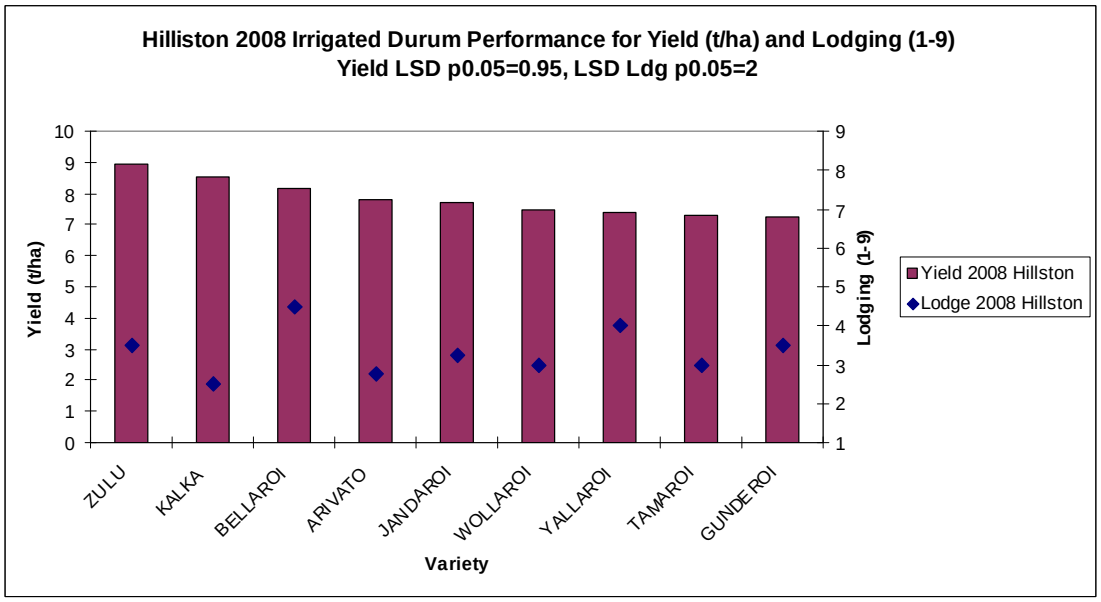
Main points

- One line WID22209 had a yield in excess of 9 (t/ha), with the mean yield of 7.74 (t/ha). The lower yield potential of the trial was accompanied with a reduced level of lodging.
- Highest yielding variety – Zulu, 8.95 (t/ha).
- Highest yielding breeding line – WID22209, 9.27 (t/ha).
- Best variety for low lodging – Kalka, 2.5 (predicted lodge score).
- Best breeding line for low lodging – 27A20, 27A25, 27A22, 2.0 (predicted lodge score).

Across Sites Irrigated Durum Yield and Lodging performance
(No. trials 5, Yield LSD p0.05= 0.57, Ldg LSD p0.05 =1.05)







Acknowledgements

All of this work is not possible without the help of many people. Thankyou!!

Elio Minato
Technical Assistant, Griffith.

Farmer Co-operators

Ian Barber – "Sylvanham" Merriwagga.

Michael Pfitzner – "Hill End" Griffith

Kym and Nick Eckermann – "Hillview" Yenda

Graham Horneman, "Wilga Glenn" Hillston.

Glenn Andreazza, Willbriggie.

Matt and Andy Ryan, Rankins Springs.

Crop Evaluation Units

Gary Bond – Finley

Research agronomists and coordinators

Peter Martin – Research Agronomist Wagga Wagga

Neil Fettell – Barley Agronomy Experiments

Rod Fisher (and team) – VSAP technical officer

Katrina McDougall and Allan L'Estrange– CWFS

Grains Research Development Corporation

Funding NVT trials and also agronomy projects within the region.

Justin James (Howard-Australia) for loaning the Morris contour drill air seeder, and collaborating fertiliser companies for donating trial product

GRDC
Grains
Research &
Development
Corporation