Getting The Crop In

Trial results from 2014

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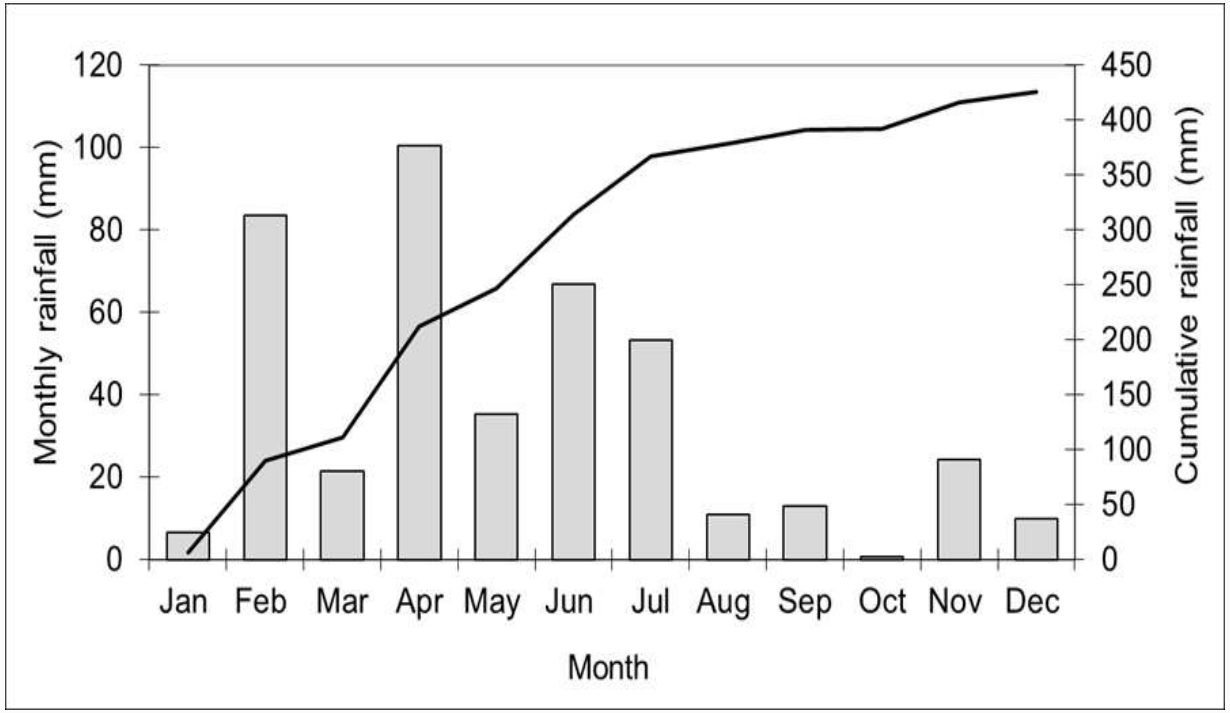
Hart – rainfall 2014



Average GSR (Apr-Oct)	**305 mm**	**Average rainfall**	**400 mm**
2014 GSR (Apr-Oct)	280 mm	2014 total rainfall	426 mm
2014 GSR (Apr-Oct)+summer	392 mm		

- Wheat time of sowing
- Management strategies for improved productivity and reduced nitrogen losses
- Harvest weed seed control – Narrow windrow burning in canola

Wheat time of sowing

Why do the trial?

- Majority of our current wheat varieties need to be sown in the first half of May to flower during the optimal period for grain yield.
- Research in southern NSW has shown they have well adapted winter and slow maturing cultivars that when sown in mid-late April will out-yield fast maturing cultivars sown in May.
- Currently options for growers in SA who wish to sow early are not well known.

Wheat time of sowing

Wheat varieties trialed

Exposure to cool temperatures

Variety	Maturity
EGA Wedgetail	Mid-maturing winter (strong vernalisation moderate photoperiod)
Rosella	Fast-maturing winter (strong vernalisation weak photoperiod)
Trojan	Mid-fast maturing spring (moderate vernalisation, moderate photoperiod)
Mace	Fast-maturing spring (weak vernalisation, weak photoperiod)
RAC1843	Very fast maturing spring (no vernalisation, no photoperiod)

Day length response

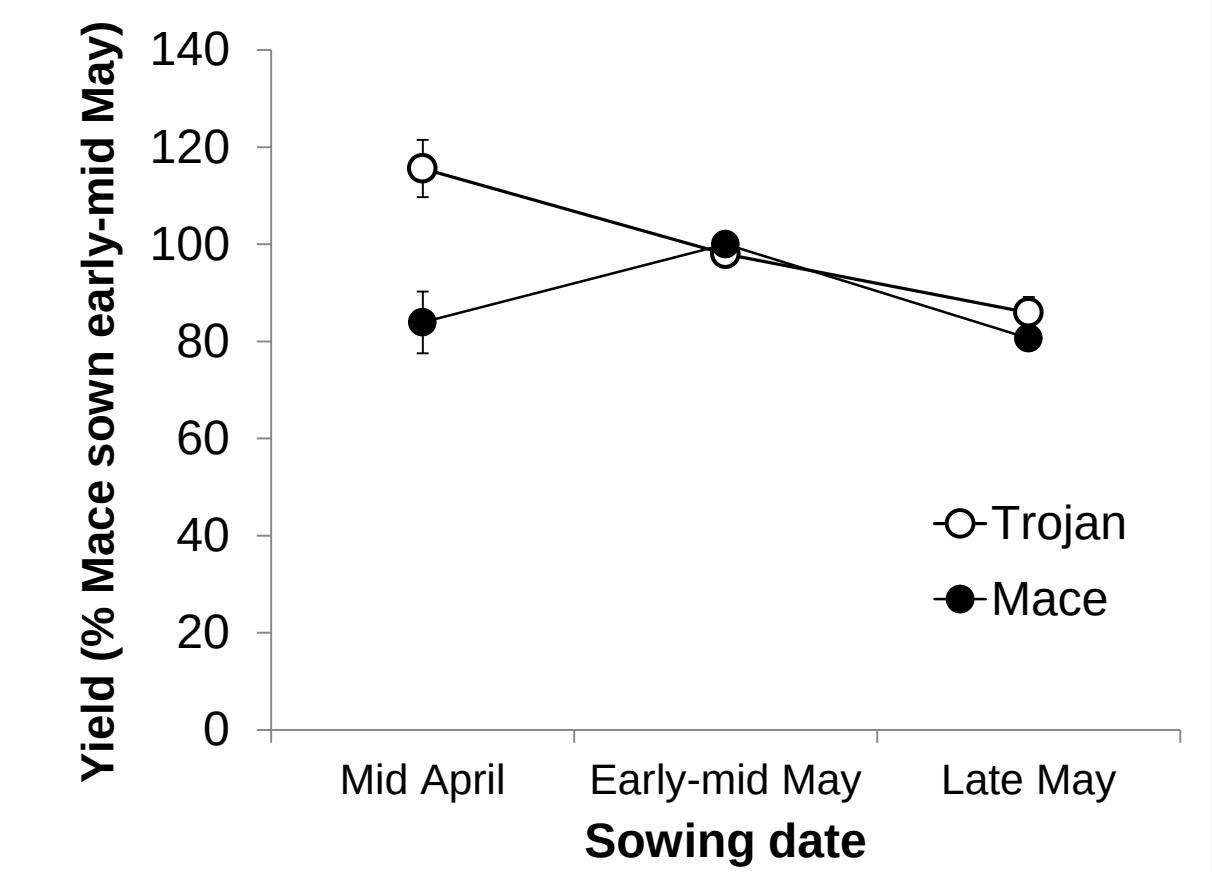
Wheat time of sowing – grain yield

Yield (t/ha)	**Time of sowing**		
Cultivar	14-Apr	8-May	2-Jun
Wedgetail	4.5	4.0	3.0
Rosella	4.3	3.7	2.8
Trojan	5.7	5.3	3.7
Mace	3.9*	4.7	3.3
RAC1843	0.8*	3.6	3.5
LSD (P≤0.05)		0.3	

** frost damage*

- Trojan sown on 14 April and 8 May were the highest yielding wheat treatments, out-yielding Mace sown on 8 May by 1.0 and 0.6 t/ha, respectively.
- Slow maturing cultivars bred in other states (Wedgetail and Rosella) showed poor adaptation to SA and this was also reflected at four other sites.

Cereal time of sowing – all trial sites

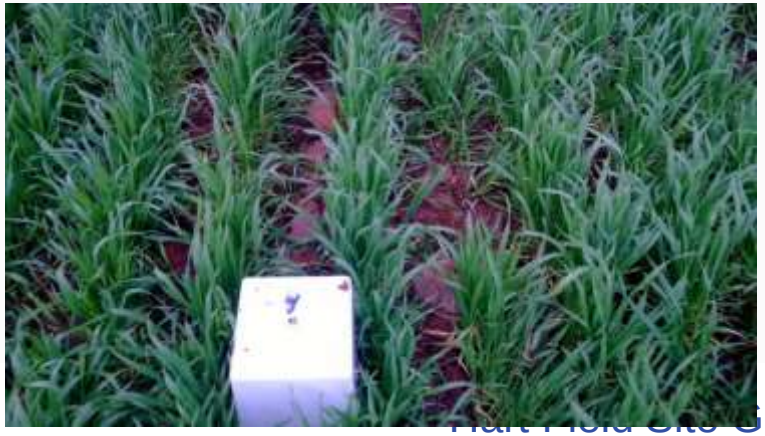


- Similar result was achieved in experiments at Minnipa, Cummins, Pt Germein and Tarlee.
- Trojan can be included in cropping program to complement Mace (general rule of thumb, 7-10 days earlier than Mace from 2014 data).

Management strategies for improved productivity and reduced nitrogen losses

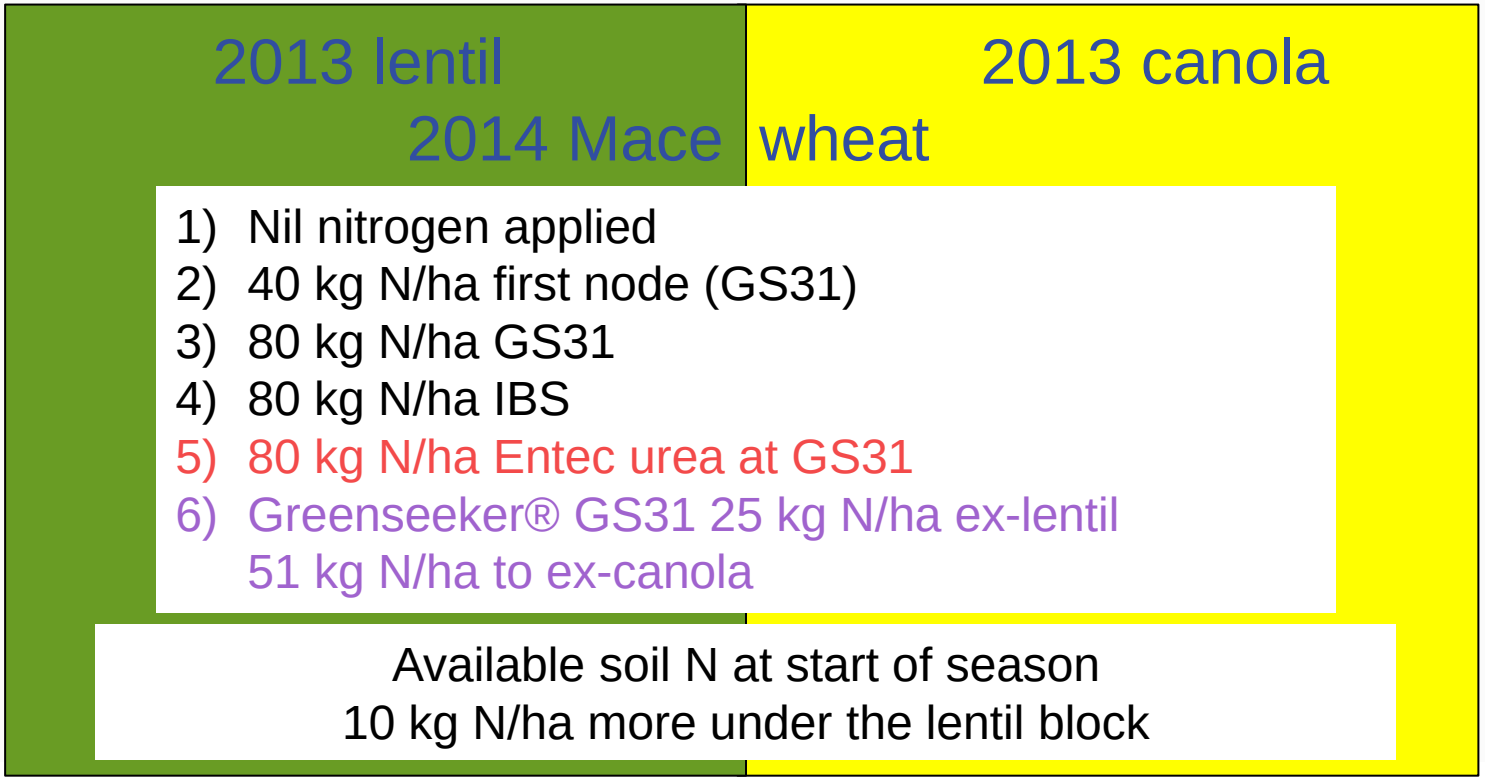
Why do the trial?

- Four nitrogen gases can be lost from soil and fertiliser applications.
- Nitrous oxide is a greenhouse gas with 300x warming potential of carbon dioxide.
- We sample nitrous oxide as it is the easiest gas to measure.
- *AIM: To measure how much soil/fertiliser nitrogen we are losing to the air during the growing season.*



Trail design

1) Crop rotation
2) N rate and timing
3) Nitrification inhibitors
4) Tactical using Greenseeker®

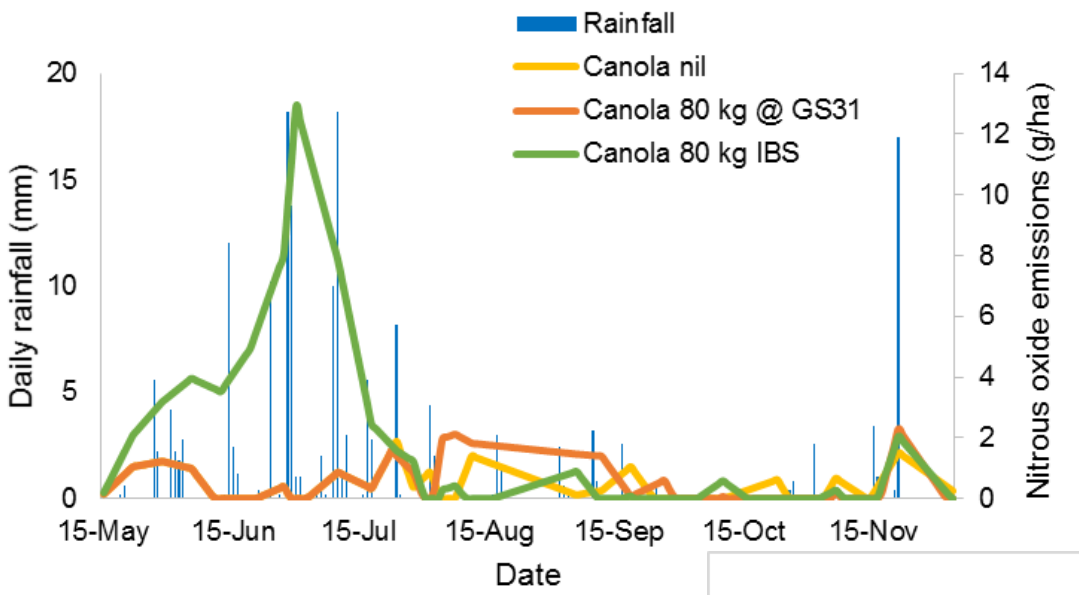


Wheat grain yield and quality

Previous crop	Nitrogen rate	Grain yield t/ha
Lentils	Nil	3.77
	40 kg @ GS31	4.73
	80 kg @ GS31	6.07
	80 kg @ sowing	5.49
	80 kg @ GS31 + inhibitor	6.04
	25 kg @ GS31	5.54
	LSD (P≤0.05)	0.74
Canola	Nil	2.77
	40 kg @ GS31	4.12
	80 kg @ GS31	5.14
	80 kg @ sowing	4.39
	80 kg @ GS31 + inhibitor	5.01
	51 @ GS31	4.33
	LSD (P≤0.05)	0.81

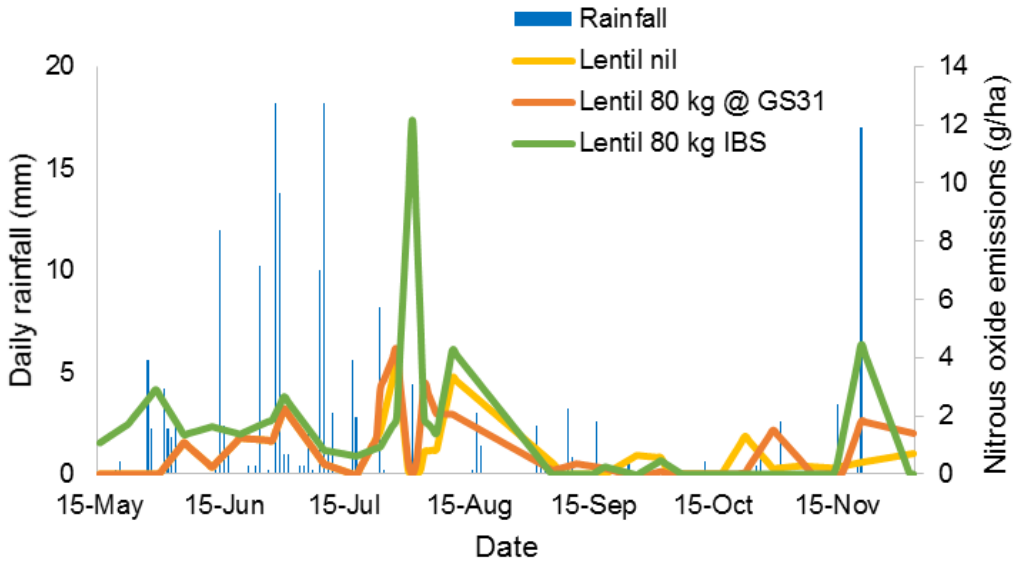
- Wheat yield after lentils were higher compared to wheat after canola.
- 80 kg applied IBS or at GS31 yielded similar, as did the N inhibitor.
- Greater variation in canola and protein was not maintained when N applied IBS.
- Small differences in screenings across N rates.

Nitrogen lost as nitrous oxide



- IBS 80 kg N/ha > applied at GS31.
- Dependent on rainfall, soil moisture and temperature.
- Higher emissions canola/wheat than lentil/wheat.

- Only 0.4 kg of N_2O per hectare (8-12 kg N/ha).
- Riverine Plains similar trends, but 4.5× higher N_2O emissions compared to Hart in half the time.

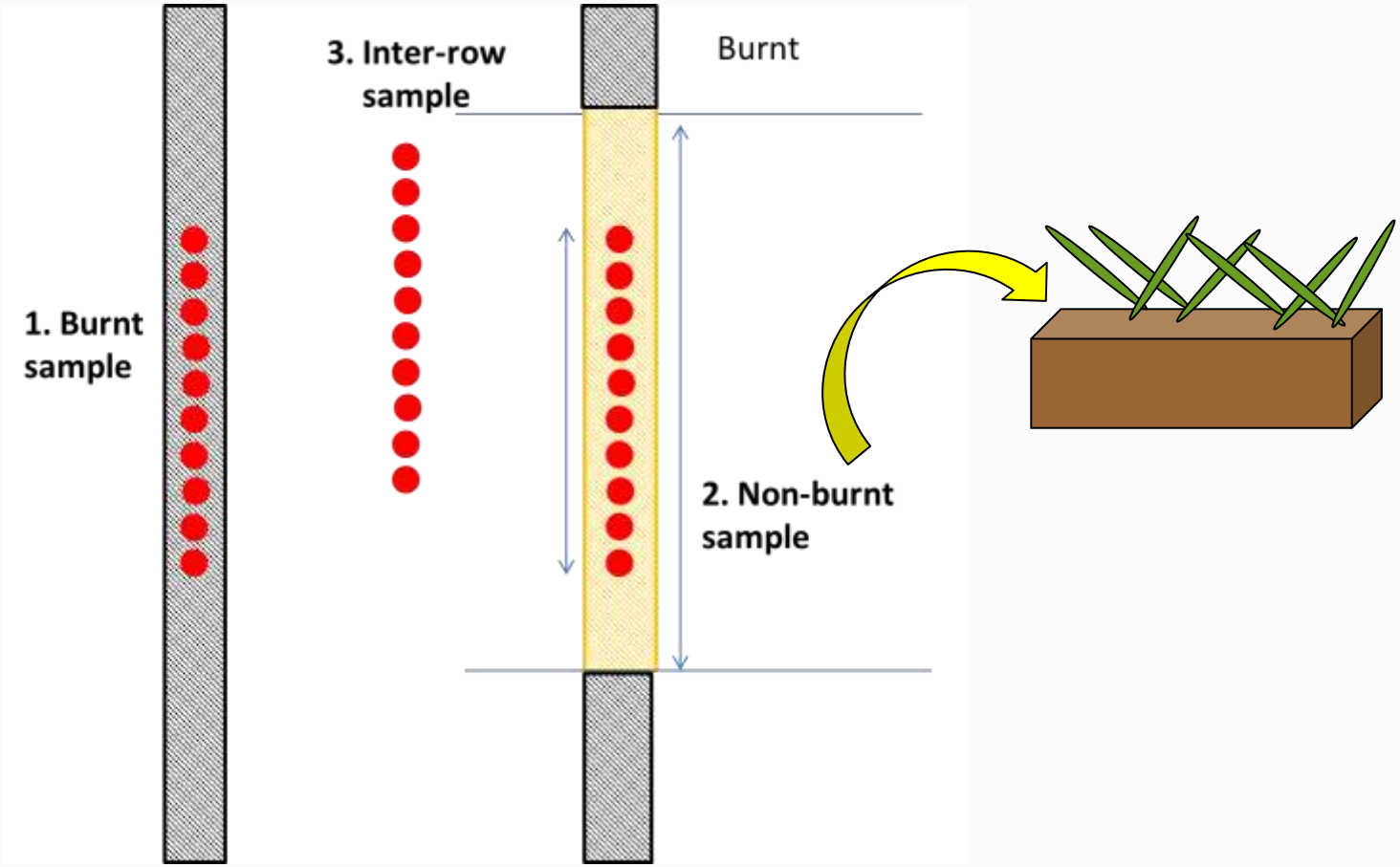


Harvest weed seed control – Narrow windrow burning in canola

Why do the trial?

- Non-chemical weed control strategies.
- Weed seed kill levels of 99% for both annual ryegrass and wild radish have been recorded from the narrow windrow burning of wheat, canola, and lupin chaff and straw.
- The simplicity and low cost of this narrow-windrow system has resulted in its adoption by an estimated 70% of crop producers in WA.
- In South Australia the adoption of this practise is not as high as there have been a limited number of trials able to show the reduction in weed seed number.

Sampling canola paddocks for annual ryegrass



Narrow windrow burning – annual ryegrass control

- Narrow windrow burning appears to be an effective tactic for late seed set control for annual ryegrass, provided the seeds can be captured.
- Consider the growth habit of annual ryegrass.
- Option for where grass selective herbicides have failed due to resistance.

Paddock	Stubble/cutting height (cm)	Stubble biomass (t/ha)
1	42.8	2.8
2	31.6	2.4
3	34.0	2.6

1	540 (236)	8210 (1357)	93
2	88 (18)	8563 (789)	99
3	52 (15)	10600 (979)	99

Acknowledgements

Cereal time of sowing

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Narrow windrow burning

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