

PROFITABLE FARMING SYSTEMS WITH RETAINED STUBBLE ON LOWER EYRE PENINSULA

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The Project

Between 2013 – 2018 GRDC are funding ten farming systems groups across the South Region to find locally relevant solutions to many of the issues that are arising from retaining stubble in modern farming systems. The issues the LEADA project will investigate include managing weeds, particularly ryegrass, with high levels of resistance to a spectrum of herbicides; the management of diseases such as yellow leaf spot, eyespot and blackleg; the development of cost-effective nitrogen strategies in stubble retained systems and possibly better solutions to manage snails and other pests that have been increasing with stubble retained systems.

2013 Trials

LEADA established two sites in 2013, one just south of Cummins and one not far from Ungarra. It was been lucky enough to have been given the use of two demonstration/ plot seeders. Thanks to Ramsey Bros, Cummins, we have had the use of a DBS seeder and thanks to Scott Siviour we have had the use of a Cross Slot seeder.

Site Details:

Cummins sowing dates: 17 & 18th June 2013

GPS Coordinates: -34.340601, 135.676689

Paddock history: 2012: Canola, 2013: Wheat

Ungarra sowing dates: 1, 2 & 3 July 2013

GPS Coordinates: -34.19874 136.09470

Paddock history: 2012: Faba Beans, 2013: Canola

Chemical Treatments:

1. Sakura @ 118gms/ha
2. Boxer Gold @ 2.5l/ha
3. Trifluralin @ 1/lha + Avadex Xtra @ 1.6l/ha
4. Sakura @ 118gms/ha + Trifluralin @ 1/lha + Avadex Xtra @ 1.6l/ha
5. Boxer Gold @ 2.5l/ha + Trifluralin @ 1/lha + Avadex Xtra @ 1.6l/ha

Varieties:

Wyalkatchem & Scout

Seeders:

DBS – 5 tynes on 12 spacings with 4inch blades, airseeder delivery system

Cross-Slot – 5 seeding modules, constantly adjusting downwards pressure, on 13 inch spacings, combine gravity seed delivery system

Results - Cummins**Table 1. Cummins site – Wheat and ryegrass emergence counts**

Pre- Emergent Chemical	Variety	Seeder	Wheat em (plants/ m²)	annual ryegrass (plants/ m²)
Sakura @ 118gms/ha	Scout	Cross Slot	121	1.6
Sakura @ 118gms/ha	Scout	DBS	150	3.2
Sakura @ 118gms/ha	Wylkatchem	Cross Slot	126	4.6
Sakura @ 118gms/ha	Wylkatchem	DBS	129	3.8
Boxer Gold @ 2.5l/ha (IBS)	Scout	Cross Slot	113	0.0
Boxer Gold @ 2.5l/ha (IBS)	Scout	DBS	92	0.0
Boxer Gold @ 2.5l/ha (IBS)	Wylkatchem	Cross Slot	108	0.0
Boxer Gold @ 2.5l/ha (IBS)	Wylkatchem	DBS	170	7.0
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha	Scout	Cross Slot	146	1.2
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha	Scout	DBS	126	11.0
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha	Wylkatchem	Cross Slot	130	2.6
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha	Wylkatchem	DBS	166	1.5
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Boxer Gold @ 2.5l/ha	Scout	Cross Slot	102	0.1
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Boxer Gold @ 2.5l/ha	Scout	DBS	132	2.3
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Boxer Gold @ 2.5l/ha	Wylkatchem	Cross Slot	104	0.8
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Boxer Gold @ 2.5l/ha	Wylkatchem	DBS	149	0.3
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Sakura @ 118gm/ha	Scout	Cross Slot	110	0.9
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Sakura @ 118gm/ha	Scout	DBS	124	3.3
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Sakura @ 118gm/ha	Wylkatchem	Cross Slot	169	0.3
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Sakura @ 118gm/ha	Wylkatchem	DBS	186	4.3

Table 2. Cummins site – annual ryegrass weed control (between plots). Scored October 9= 100% annual ryegrass cover, 0= nil ryegrass present.

Herbicide Treatment	Weed Score (October)
Boxer Gold @ 2.5l/ha (IBS)	7.1
Sakura @ 118gms/ha	2.6
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha	7.4
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Boxer Gold @ 2.5l/ha	4.6
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Sakura @ 118gm/ha	1.8

Table 3. Cummins site – dry matter yield (t/ha) – soft dough

Seeder/ Variety	Scout	Wylkatchem	Ave. Seeder
Cross Slot	7.06	8.17	7.61
DBS	6.47	7.76	7.11
Ave. Variety	6.77	7.96	7.36
CV	14.5		

Isd (5%)

Seeder	1.51
Variety	1.51
Seeder x variety	2.14

Table 4. Cummins site – harvest yield (t/ha)

Seeder/ Variety	Scout	Wylkatchem	Ave. Seeder
Cross-slot	2.99	3.40	3.20
Cross-slot 2	3.24	2.99	3.11
DBS	2.68	3.14	2.91
Ave. Variety	2.97	3.18	3.07
CV	18.2		

Isd (5%)

Seeder	0.47
Variety	0.38
Seeder x variety	0.67

Comments (Cummins Site):

- The site was sown late
- During July/ August the site became quite waterlogged – large areas of ponding.
- In Spring the gaps between the plots became infested with ryegrass – there were some interesting results from pre-em herbicides (see table 2.)
- Most of the trial had to be sprayed with glyphosate prior to harvest to stop ryegrass setting seed. A small, weed free area was kept to harvest.

Results – Ungarra**Table 5. Ungarra site – dry matter yield (t/ha) – milky dough**

Seeder/ Variety	Scout	Wylkatchem	Ave. Seeder
Cross Slot	5.19	5.45	5.32
DBS	5.69	4.31	5.00
Ave. Variety	5.44	4.88	5.16
CV			

Isd (5%)

Seeder	1.6
Variety	1.6
Seeder x variety	2.3

Table 6. Ungarra site – Wheat emergence counts – ryegrass negligible.

Pre- Emergent Chemical	Variety	Seeder	Wheat em (plants/ m ²)
Sakura @ 118gms/ha	Scout	Cross Slot	135
Sakura @ 118gms/ha	Scout	DBS	168
Sakura @ 118gms/ha	Wylkatchem	Cross Slot	122
Sakura @ 118gms/ha	Wylkatchem	DBS	214
Boxer Gold @ 2.5l/ha (IBS)	Scout	Cross Slot	117
Boxer Gold @ 2.5l/ha (IBS)	Scout	DBS	190
Boxer Gold @ 2.5l/ha (IBS)	Wylkatchem	Cross Slot	89
Boxer Gold @ 2.5l/ha (IBS)	Wylkatchem	DBS	238
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha	Scout	Cross Slot	110
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha	Scout	DBS	185
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha	Wylkatchem	Cross Slot	123
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha	Wylkatchem	DBS	207
Boxer Gold @ 2.5l/ha (Post Em 1-2 leaf)	Scout	Cross Slot	73
Boxer Gold @ 2.5l/ha (Post Em 1-2 leaf)	Scout	DBS	185
Boxer Gold @ 2.5l/ha (Post Em 1-2 leaf)	Wylkatchem	Cross Slot	102
Boxer Gold @ 2.5l/ha (Post Em 1-2 leaf)	Wylkatchem	DBS	226
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Boxer Gold @ 2.5l/ha	Scout	Cross Slot	139
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Boxer Gold @ 2.5l/ha	Scout	DBS	181
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Boxer Gold @ 2.5l/ha	Wylkatchem	Cross Slot	78
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Boxer Gold @ 2.5l/ha	Wylkatchem	DBS	196
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Sakura @ 118gm/ha	Scout	Cross Slot	117
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Sakura @ 118gm/ha	Scout	DBS	183
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Sakura @ 118gm/ha	Wylkatchem	Cross Slot	122
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Sakura @ 118gm/ha	Wylkatchem	DBS	233

l.s.d. (5%)

Herbicide x seeder	35
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Table 7. Ungarra site – harvest yield – pre-emergent herbicide treatments (t/ha)

Pre- Emergent Chemical	Yield (t/ha)
Boxer Gold @ 2.5l/ha (IBS)	2.07
Boxer Gold @ 2.5l/ha (Post Em 1-2 leaf)	2.07
Sakura @ 118gms/ha	2.07
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha	2.08
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Boxer Gold @ 2.5l/ha	2.06
Trifluralin @ 1l/ha + Avadex Xtra @ 1.6l/ha + Sakura @ 118gm/ha	2.07
Isd (5%)	0.07

Table 8. Ungarra site – harvest yield – Seeder treatments (t/ha)

Seeder	Yield (t/ha)
Cross-slot	2.10
Cross-slot 2	2.01
DBS	2.10
Isd (5%)	0.10

Table 9. Ungarra site – harvest yield – Variety treatments (t/ha)

Variety	Yield (t/ha)
Scout	2.11
Wylkatchem	2.03
Isd (5%)	0.04

Comments- (Ungarra Site):

- the site was sown very late
- the cross slot found it hard to penetrate the harder soil type (more weight on seeder required)
- as a result the cross-slot had lower emergence
- however no different in yields (grain or dry matter) between any of the treatments (ie seeder had no effect)

The Future

From 2014 this project will start to concentrate on the individual issues

1. Ryegrass
 - a. How effective can competition/ early vigour be suppressing ryegrass numbers.
 - b. What effect does a management strategy in one year have over time – getting the RIM model to work.
 - c. Getting more efficacy from pre-emergent herbicides.
 - d. How effective will seed capture techniques be in reducing ryegrass numbers?
2. Diseases
 - a. Yellow leaf spot – fungicide and varietal management strategies
 - b. Eyespot – fungicide and varietal management strategies
 - c. Blackleg – can managing canola stubble reduce blackleg?
3. Nutrition
 - a. Nitrogen – strategies to improve nitrogen efficiency in retained stubble systems
 - b. Potassium – what effect does burning windrows have on potassium?
4. Paddock monitoring
 - a. To track snail numbers
 - b. To get data on how stubble are effecting production on Lower Eyre Peninsula