Local Research and Development Results

February 2010

2010

LiEBE GROUP

Working together in Agriculture

Dear Liebe Group Members and Supporters,

It is with great pleasure that we present to you the Liebe Group Local Research and Development results book for 2009. This book contains results from research and development conducted in the Coorow, Dalwallinu, Perenjori and Wongan-Ballidu shires from the 2009 season. The book also outlines current Liebe Group projects to keep you updated with the interesting work that is going on in the district. Due to unavoidable circumstances there are some results that are not available at the time of printing, these will be published in subsequent Liebe Group newsletters.

Many thanks must go to the researchers, agribusiness organisations and growers who have cooperated to conduct valuable local research and development. 2009 was a great year for trial work and there are a lot of interesting results that have come out as a result of this. We thank you for the opportunity to present these results in our 2009 book.

Also we would like to remind you that many trial results will be reviewed at the **2010 Liebe Group Crop Updates on the 3rd of March** (flyer found in this book). We invite you to bring this book along to that day so you can follow the trials and ask questions regarding any results you may have found interesting.

Please interpret the results in this book carefully. Decisions should not be based on one season's data and please contact the Liebe office if you have any further queries.

Throughout the book our major financial sponsors are promoted. All of our sponsors and supporters play a vital role in ensuring the continued success of the Liebe Group. We acknowledge the invaluable support we receive from the Grains Research and Development Corporation (GRDC), the Department of Agriculture and Food WA (DAFWA), the Department of Agriculture, Fisheries and Forestry (DAFF), Rabobank, CSBP, COGGO, the Farm Weekly, the Grower Group Alliance and many others.

All the best for the 2010 season and lets hope it brings plenty of rain!

Kind regards,

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LIEBE GROUP SUPPORTERS

The Liebe Group would like to thank the following organisations for their invaluable support:

- Grains Research and Development Corporation
- Department of Agriculture and Food WA
- Department of Agriculture, Fisheries and Forestry – Caring for Our Country
- Department of Agriculture, Fisheries and Forestry – FarmReady
- University of Western Australia
- CSIRO
- Farm Weekly
- Shire of Dalwallinu
- Future Farm Industries CRC
- Grower Group Alliance
- Northern Agricultural Catchments Council

LONG TERM RESEARCH SITE SUPPORTERS

GRDC
Grains Research & Development Corporation

The Liebe Group would like to acknowledge and thank all the sponsors and contributors to the Long Term Research site for 2009. Without the generous support and assistance from supporters and contributors the management of this unique site would not be possible.

The following is a list of people/organisations the Liebe Group would like to thank:

- **Grains Research and Development Corporation (GRDC)**
- **DAFWA -** Technical advice throughout the year and harvesting of the soil biology trial.
- **The University of Western Australia -** For technical assistance.
- **CBH Group -** Grain sampling and analysis.
- **CSBP labs -** Analysing soil samples.
- **Scholz Rural Supplies -** Chemical donations for the 63ha site and agronomic advice throughout the season.
- **CSIRO -** For providing and maintaining the weather station, classifying soils and technical advice.
- **Stuart McAlpine and staff -** For seeding and harvesting the site and also agronomic assistance and monitoring the site throughout the season.
- **Michael Dodd and staff -** For use of his machinery, agronomic assistance, spraying and monitoring of the site throughout the season.
- **Syngenta -** Chemical donations for the 63ha site.
- **Bayer** - Chemical donations for the 63ha site.
- **Summit Fertilizers -** Fertiliser donation for the 63ha site.
- **Wesfarmers Federation Insurance –** Donation of crop insurance.

LiEBE GROUP
Working together in Agriculture

CROP UPDATES

Wednesday 3rd March 2010

8.30 am Registration - 5.00 pm Close

In the air-conditioned Buntine Hall & Bowling Club

CROP updates

PRESENTATIONS

'**Grain marketing, a review of 2009 and strategies in 2010**' Don McTaggart, Farmanco
'**To sheep or not to sheep?**' Rob Grima, DAFWA
'**On farm grain storage and options to push value back behind the farm gate**' Dave Feinberg, CBH
'**National Variety Trials Review**' Peter Burgess, Kalyx Agriculture
'**Herbicide resistance and GM crops**' Dr Stephen Powles, WAHRI
'**Review of 2009 season and preparations for 2010**' Dave Scholz, Elders Dalwallinu

KEYNOTE SPEAKERS

'Increasing resilience of Australian cropping systems to climate variability & change'
Steve Crimp - Climate Applications Scientist, CSIRO

'Discussions with the Minister'
Terry Redman, Western Australian Minister for Agriculture & Food

Stay & enjoy BEER APPRECIATION with CBH GROUP at the Buntine Club

COST

FREE Liebe members and presenters **$50 Non-Liebe members and industry**

Along with the wealth of information also included is a presentation booklet, morning & afternoon tea, lunch and a sausage sizzle after the event.

DIAMOND SPONSORS

Rabobank
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COGGO

EVENT SPONSORS

GRDC Grains Research & Development Corporation
Department of Agriculture and Food
CSBP

COGGO

Proud to be
a Diamond Sponsor of the LIEBE Group.

COGGO, a public company limited by guarantee, was formed by ten Grain Grower Organisations in 1997.
The Liebe Group was one of those organisations.

COGGO is delivering!!!

Delivered

Equity in a WA Based Canola Breeding Company & New Canola Varieties Suited to WA

COGGO investment in Canola Breeders WA (CBWA) has been a vital support to the development of the CBWA breeding Program. COGGO holds equity in the company and CBWA has become a major supplier of new high quality canola varieties.

Joint Venture to Develop Wheat Suited to WA Environment

Australian Grain Technologies and COGGO have formed a partnership to develop new wheat varieties with a specific fit for the WA environment.

COGGO Seeds

COGGO Seeds is helping facilitate seed delivery to WA growers and assisting End Point Collection, in turn assisting continuation or development of new plant breeding programs.

In the Pipeline

New Chickpea Varieties

COGGO funding has made possible a Western Australian based chickpea program which should deliver the first of a new range of chickpea varieties, to COGGO members in 2012. Project collaborators are DAFWA, CLIMA and the Indian plant breeding institute, ICRISAT.

New Anthracnose Resistant Albus Lupin Varieties

COGGO funding of lupin breeding, in conjunction with DAFWA, should provide COGGO members with a new anthracnose resistant Albus lupin variety about the time the new chickpea becomes available.

ARE YOU A COGGO MEMBER?

COGGO - Unit 15/210 Canning Hwy South Perth WA 6151
Telephone: (08) 9363 3400 Email: mark.tucek@coggo.net.au

Together we've spent the past 100 years developing WA's broadest range of fertiliser products.

In 1910, we started with one product and now have more than 150 products specifically created for local WA conditions, so you can apply the right product at the right time for the best results.

In 1945, we began adding trace elements to Super Phos to turn light, coastal sands into productive farmland. As cropping operations increased we introduced Agras in 1971, then developed our comprehensive Ag range throughout the 1980s and 1990s. By the 2000s, increasing use of potassium in farmers' custom blends led to the development of K-Till and MacroPro.

Alongside farmers we pioneered the Flexi range of liquid fertilisers and a complementary range of trace element liquids called StrataSol.

At CSBP, we pride ourselves on working with our customers and industry partners to develop and deliver fertiliser products to help you get the most out of your land and maximise your profits. Something we practised 100 years ago and will continue to practise 100 years from now.

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CSBP CELEBRATING 100 YEARS

INDEX

UNDERSTANDING TRIAL RESULTS AND STATISTICS

We have tried to present all trial results in one format throughout this results book. However, due to differences in trial designs, this isn't always possible. The following explanations and definitions should provide you with sufficient statistical understanding to get the most from the trial results.

Mean

The results of replicated trials are often presented as the average (or mean) of all replicates for each treatment. Statistics are used to determine if the difference between means is a result of treatment or natural variability (i.e. soil type).

Significant Difference

In nearly all trial work there will be some difference between treatments, i.e. one rate of fertiliser will result in a higher yield than another. Statistics are used to determine if the difference is a result of treatment or some other factor (i.e. soil type). If there is a significant difference then there is a very strong chance the difference in yield is due to treatments, not some other factor. The level of significance can also play a role. If it says P<0.05% there is a greater than 95% guarantee that a difference is a result of treatment and not some other factor.

The LSD test

To determine if there is a significant difference between two or more treatments a least significant difference (LSD) is often used. If there is a significant difference between two treatments their difference will be greater than the LSD. For example when comparing the yield of five wheat varieties (table 1), the difference in yield between variety 4 and 5 is greater than 0.6 t/ha (LSD), therefore it can be said there is a significant difference. This means it is 95% (P=0.05) certain that the difference in yield is a result of variety not soil type or some other factor. Whilst there is a difference in yield between variety 1 and 2, it is less than 0.6, therefore it is unsure if the difference is a result of variety; it may be due to subtle soil type change or other external factors. Letters are often used to indicate which varieties are significantly different, using the LSD value (table 1.), so in this example, there is no significant difference between varieties 1, 2 and 3, whereas varieties 4 and 5 are significantly different to each other and the rest of the varieties.

Table 1: Yield of five wheat varieties.

Treatment	Yield (t/ha)
Variety1	2.1 a
Variety2	2.4 a
Variety3	2.3 a
Variety4	2.9 b
Variety5	1.3 c
LSD (P=0.05)	0.6

Non-replicated Demonstrations

This book presents the results from a range of non-replicated demonstrations. In this case we cannot say for certain if a difference is the result of treatment or some other factor. Whilst the results from demonstrations are important, they need to be interpreted carefully as they are not statistically sound.

WHEAT NATIONAL VARIETY TRIAL – PITHARA

Information from Australian Crop Accreditation System Limited

AIM

Wheat variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	Mcllroy family, Pithara
Plot size & replication	1.76m x 12m x 3 replicates
Soil type	Loamy Clay
Sowing date	30/05/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	30/05/09: 100 kg/ha Urea, 100 kg/ha Vigour special 31/07/09: 80 kg/ha Urea
Paddock rotation	2006 = Barley, 2007 = Pasture, 2008 = Chickpea
Herbicides, Insecticides & Fungicides	29/05/09: 1.5 L/ha Sprayseed, 260 g/ha Logran, 1 L/ha Chloropyrifos 1.8 L/ha Trifluralin 30/05/09: 3.5 L/ha Sprayseed, 25 g/ha Monza, 300 mL/ha MCPA LVE, 300 mL/ha Lontrel, 3g/ha Ally
Growing Season Rainfall	201mm

RESULTS

Table 1: Yield and quality of wheat sown at Pithara.

Variety	Yield (t/ha)	Percentage of site mean (%)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)
AGT Katana	2.55	111	80.3	12.4	2.29
Arrino	2.33	101	75.9	11.7	1.03
Binnu	2.35	102	75.1	11.4	4.89
Bullaring	2.16	94	75.7	12.1	5.45
Bumper	2.40	104	77.2	11.6	3.25
Calingiri	2.13	92	73.3	13.5	2.47
Carnamah	2.32	101	71.7	11.9	5.54
Cascades	2.05	89	70.9	12.3	2.16
Correll	2.09	91	72.4	13.5	4.2
Datatine	1.89	82	74.9	11.4	5.38
EGA Bonnie Rock	2.40	104	72.6	12.4	2.41
EGA Wentworth	2.02	88	70.6	12.5	5.48
Espada	2.31	100	73.5	13.3	7.17
Fang	2.16	94	75.9	13.4	11.54
Fortune	2.07	90	75	13.4	2.57
Gladius	2.20	96	75.1	12.1	4.52
Guardian	2.51	109	77.5	11.5	9.64
Kennedy	2.61	113	74.1	12.5	5.64
King Rock	2.34	102	76.9	12.6	2.85
Mace	2.37	103	75.8	12.1	1.99
Magenta	2.22	97	71.2	13.8	7.31

Variety	Yield (t/ha)	Percentage of site mean (%)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)
Peake	2.20	96	74.9	11.8	7.05
Scout	2.68	117	77.2	12.2	3.91
Tammarin Rock	2.27	98	75.2	11.8	5.15
Westonia	2.32	101	69.8	13.1	6.7
Wyalkatchem	2.41	105	74.3	12.5	2.49
Yandanooka	2.20	96	75.8	12.2	1.64
Yitpi	2.05	89	77	12.1	5.05
Young	2.65	115	79	12	5.83
Zippy	2.48	108	78	11.3	1.9
Site Mean (t/ha)	2.3		75.9	11.7	
CV (%)	6.68		75.1	11.4	
LSD (t/ha)	0.25	11	75.7	12.1	0.25

COMMENTS

- NVT results will be presented at the Liebe Group Crop Updates on the 3rd of March, 2010.

CONTACT:

For more information please refer to www.nvtonline.com.au

WHEAT NATIONAL VARIETY TRIAL – COOROW

Information from Australian Crop Accreditation System Limited

Grains Research & Development Corporation

National Variety Trials

AIM

Wheat variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	Mike Bothe, Coorow
Plot size & replication	1.76m x 12m x 3 replicates
Soil type	Sandy Loam
Sowing date	04/06/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	04/06/09: 100 kg/ha Urea, 100 kg/ha Vigour special 31/07/09: 80 kg/ha Urea
Paddock rotation	2006 = Pasture, 2007 = Wheat, 2008 = Lupin
Herbicides, Insecticides & Fungicides	02/06/09: 2.5 L/ha Boxer Gold, 2L/ha, Roundup PowerMax, 1 L/ha Chloropyrifos 03/07/09: 800 mL/ha Jaguar, 3 g/ha Ally, 300 mL/ha Lontrel
Growing Season Rainfall	279mm

RESULTS

Table 1: Yield and quality of wheat sown at Coorow.

Variety	Yield (t/ha)	Percentage of site mean (%)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)
AGT Katana	3.47	106	79.9	10.8	3.49
Arrino	3.43	105	78.6	10.8	0.81
Binnu	3.54	108	77.5	9	1.76
Bullaring	3.31	101	74	9.5	1.89
Bumper	3.5	107	79	10.2	2.62
Calingiri	3.11	95	76.8	10.4	1.45
Carnamah	3.45	105	77	10.3	1.6
Cascades	2.83	86	73	11	1.85
Catalina	3.23	98	77.8	10.1	2.51
Correll	2.99	91	70	10.8	4.56
Datatine	3.23	98	76.3	9.2	2.15
EGA Bonnie Rock	3.3	101	78	10.9	1.73
EGA Gregory	2.96	90	73.4	10.9	4.66
EGA Kidman	2.52	77	75.2	11.3	3.28
EGA Wentworth	2.61	80	73.2	10.9	3.76
Espada	3.42	104	76.9	10.6	1.89
Fang	2.61	80	72.7	10.2	3
Fortune	3.08	94	72.6	10.9	1.13
Gladius	3.2	98	76.6	10.9	1.63
Guardian	3.38	103	78.5	10.2	5.69
Kennedy	3.16	96	76.2	10.6	2.08
King Rock	3.43	105	76.3	10.9	1.64
Lincoln	2.81	86	75	10.2	4.33

Variety	Yield (t/ha)	Percentage of site mean (%)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)
Mace	3.52	107	76	10.2	2.64
Magenta	3.46	105	78.6	10.6	3.15
Scout	2.97	91	74.7	9.9	4.43
Tammarin Rock	3.55	108	77.1	10.1	2.81
Westonia	3.74	114	75.1	10.4	2.94
Wyalkatchem	3.59	109	75.6	10.4	0.49
Yandanooka	3.19	97	78.8	11	1.09
Yitpi	2.85	87	75.7	10.3	5.12
Young	3.59	109	78.2	10.5	1.78
Zippy	3.59	110	77.8	10.8	1.59
Site Mean (t/ha)	3.28				
CV (%)	5.32				
LSD (t/ha)	0.29				

COMMENTS

- NVT results will be presented at the Liebe Group Crop Updates on the 3rd of March, 2010.

CONTACT:

For more information please refer to www.nvtonline.com.au

WHEAT NATIONAL VARIETY TRIAL – MILING

Information from Australian Crop Accreditation System Limited

AIM

Wheat variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	Wade Pearson, Miling
Plot size & replication	1.76m x 12m x 3 replicates
Soil type	Loamy Clay
Sowing date	26/05/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	26/05/09: 100 kg/ha Urea, 100 kg/ha Vigor special
Paddock rotation	2006 = Pasture, 2007 = Wheat, 2008 = Pasture
Herbicides, Insecticides & Fungicides	26/05/09: 1.5 L/ha Trifluralin, 35 g/ha Logran, 300 mL/ha Chlorophyifos, 250 g/ha Diuron 07/07/09: 700 mL/ha bromoxynil & diflufenican, 3 g/ha metsulfuron methyl, 300 mL/ha chlopyralid, 300 mL/ha Cloquintocet-Mexyl
Growing Season Rainfall	257mm

RESULTS

Table 1: Yield and quality of wheat sown at Miling.

Variety	Yield (t/ha)	Percentage of site mean (%)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)
AGT Katana	3.40	104	77.6	10.3	1.87
Arrino	3.70	113	74.2	9.9	0.27
Binnu	3.64	111	73.5	8.7	1.79
Bullaring	3.05	93	66.8	9.6	4.09
Bumper	3.73	114	77.1	9.9	3.43
Calingiri	3.49	106	77.6	9.4	1.49
Carnamah	3.44	105	79.3	9.2	1.88
Cascades	2.84	87	73	9.6	1.18
Catalina	3.35	102	78.5	9.9	1.73
Correll	3.29	101	73	9.8	2.88
Datatine	3.20	98	67.4	9.2	4.6
EGA Bonnie Rock	3.35	102	78	9.9	2.3
EGA Gregory	3.25	99	76.2	9.7	2.28
EGA Kidman	3.02	92	76.1	10	1.34
EGA Wentworth	2.84	87	76	9.3	2
Espada	3.77	115	74.8	9.4	0.72
Fang	2.79	85	74.7	9.2	5.47
Fortune	2.80	85	76.9	9.3	0.55
Gladius	3.33	102	70.6	10.1	1.9
Guardian	3.34	102	77.4	9.5	6.16
Kennedy	3.74	114	75.9	10.2	1.34
King Rock	3.17	97	75.8	9.3	1.78
Lincoln	3.61	110	77.1	9.6	2.23

Variety	Yield (t/ha)	Percentage of site mean (%)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)
Mace	3.24	99	72.6	9.6	1.53
Magenta	3.78	116	75.7	9.2	2.21
Preston	2.81	86	68.4	10.5	3.35
Scout	3.28	100	77	9.9	3.04
Tammarin Rock	3.56	109	74.9	9.5	2.6
Westonia	3.34	102	71.3	9.5	1.64
Wyalkatchem	3.48	106	76.1	10.6	1.24
Yandanooka	3.28	100	77.2	10.1	0.53
Yitpi	3.18	97	73.2	9.8	3.2
Young	3.74	114	76.2	9	1.78
Zippy	3.35	102	77.6	10.2	0.65
Site Mean (t/ha)	3.28				
CV (%)	7.24				
LSD (t/ha)	0.4	12			

COMMENTS

- NVT results will be presented at the Liebe Group Crop Updates on the 3rd of March, 2010.

CONTACT:

For more information please refer to www.nvtonline.com.au

WHEAT NATIONAL VARIETY TRIAL – BUNTINE

Information from Australian Crop Accreditation System Limited

Grains Research & Development Corporation

National Variety Trials

AIM

Wheat variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	Stuart McAlpine, Buntine
Plot size & replication	1.76m x 12m x 3 replicates
Soil type	Sandy Loam
Sowing date	04/06/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	04/6/09: 100 kg/ha Urea, 100 kg/ha Vigour special 31/07/09: 50 kg/ha Urea
Paddock rotation	2006 = Pasture, 2007 = Wheat, 2008 = Lupin
Herbicides, Insecticides & Fungicides	02/06/09: 2.5 L/ha Boxer Gold, 2L/ha, Roundup PowerMax, 1 L/ha Chloropyrifos
Growing Season Rainfall	280mm

RESULTS

Table 1: Yield and quality of wheat sown at Buntine.

Variety	Yield (t/ha)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)	Yellow Leaf Spot Score 0=None 9=Maximum
AGT Katana	3.37	77.30	11.1	2.40	4.0
Arrino	3.40	73.70	11.2	0.98	5.0
Binnu	3.59	77.50	10.4	2.05	4.7
Bullaring	3.15	70.70	10.4	4.87	5.5
Bumper	3.45	77.80	10.8	3.04	4.0
Calingiri	3.16	74.60	11.7	2.44	3.3
Carnamah	3.38	73.40	10.9	2.63	5.3
Cascades	2.83	71.70	11.1	1.85	2.7
Catalina	2.96	77.00	11.1	3.17	4.7
Correll	2.86	71.40	11.7	4.44	6.3
Datatine	3.08	69.20	10.0	5.92	4.0
EGA Bonnie Rock	3.27	75.10	11.3	2.56	2.3
EGA Gregory	2.47	71.70	11.3	3.30	5.0
EGA Kidman	2.53	73.30	11.3	2.45	5.3
EGA Wentworth	2.54	71.30	11.1	5.00	6.0
Espada	3.31	74.00	11.5	2.46	2.7
Fang	2.59	71.50	11.0	7.00	1.7
Fortune	3.17	74.30	11.4	1.41	4.0
Gladius	3.07	74.40	11.3	3.10	2.3
Guardian	3.06	77.20	10.5	4.42	6.0

Variety	Yield (t/ha)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)	Yellow Leaf Spot Score 0=None 9=Maximum
Kennedy	3.06	72.90	11.6	2.58	5.7
King Rock	3.31	76.70	11.5	2.43	3.3
Lincoln	3.17	74.10	10.9	3.95	5.3
Mace	3.41	77.60	11.0	1.91	5.7
Magenta	3.40	74.40	11.3	3.13	2.7
Preston	2.50	70.60	12.1	2.70	3.7
Scout	2.91	76.80	10.6	4.60	6.7
Tammarin Rock	3.06	73.70	10.4	4.42	5.3
Westonia	3.64	74.50	10.8	2.79	4.7
Wyalkatchem	3.51	78.30	10.9	1.85	4.7
Yandanooka	3.07	76.00	11.3	2.05	3.3
Yitpi	2.95	73.00	11.3	3.90	6.2
Young	3.21	81.50	11.0	2.13	3.0
Zippy	3.32	77.10	10.8	2.55	6.7
Site Mean (t/ha)	3.19				
CV (%)	4.1				
LSD (t/ha)	0.21				

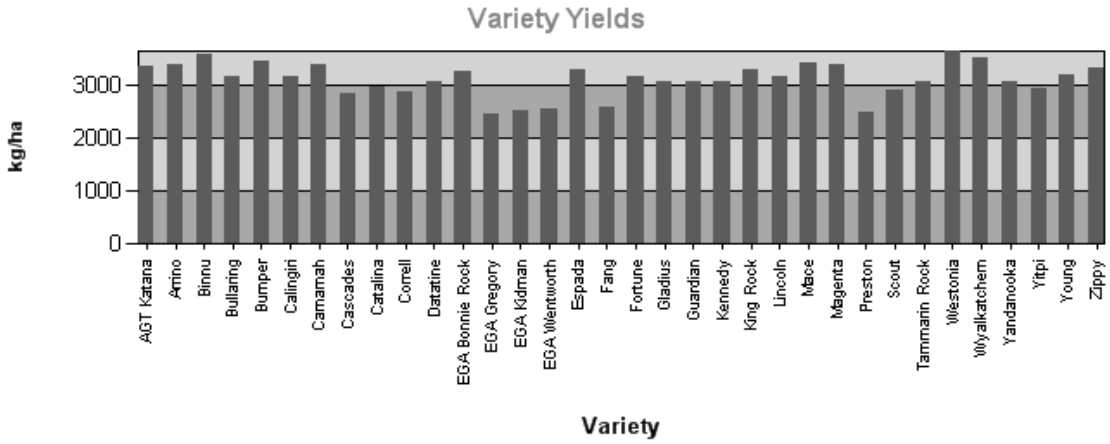

Figure 1: Yield comparisons of wheat varieties sown at Buntine.

COMMENTS

- NVT results will be presented at the Liebe Group Crop Updates on the 3rd of March, 2010.

CONTACT:

For more information please refer to www.nvtonline.com.au

WHEAT NATIONAL VARIETY TRIAL – WONGAN HILLS

Information from Australian Crop Accreditation System Limited

AIM

Wheat variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	Wongan Hills
Plot size & replication	1.76m x 12m x 3 replicates
Soil type	Sandy Loam
Sowing date	14/06/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	30/05/09: 100 kg/ha Urea, 100 kg/ha Vigour special
Paddock rotation	2006 = Barley, 2007 = Pasture, 2008 = Chickpea
Herbicides, Insecticides & Fungicides	14/06/09: 1.5 L/ha Sprayseed, 35 g/ha Logran, 1 L/ha Chloropyrifos 2 L/ha Trifluralin 07/08/09: 750 mL/ha MCPA LVE, 300 mL/ha Lontrel, 3g/ha Ally, 100 mL/ha Topik
Growing Season Rainfall	314mm

RESULTS

Table 1: Yield and quality of wheat sown at Wongan Hills.

Variety	Yield (t/ha)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)
AGT Katana	2.13	77.70	9.7	3.40
Arrino	2.20	74.30	9.6	0.40
Binnu	2.25	73.70	8.8	4.84
Bullaring	2.14	74.20	8.8	2.44
Bumper	2.17	76.50	8.9	3.01
Calingiri	2.19	78.60	9.0	0.81
Carnamah	2.50	74.20	9.4	2.69
Cascades	1.79	72.00	9.3	2.85
Catalina	1.75	77.20	9.3	3.43
Correll	1.87	73.50	9.7	3.51
Datatine	1.95	72.90	8.9	3.90
EGA Bonnie Rock	2.21	79.20	9.7	3.11
EGA Gregory	1.50	76.00	9.8	9.73
EGA Kidman	1.30	77.30	10.7	4.18
EGA Wentworth	1.57	75.80	9.3	4.41
Espada	2.23	74.20	9.7	3.36
Fang	1.65	74.40	9.4	6.27
Fortune	2.04	74.20	9.5	1.72
Gladius	1.87	75.90	9.9	2.08
Guardian	1.91	77.90	9.4	7.45
Kennedy	1.85	72.80	8.7	3.30
King Rock	2.26	78.30	10.0	2.53

Variety	Yield (t/ha)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)
Lincoln	1.83	76.10	9.2	5.01
Mace	2.28	77.30	8.7	2.51
Magenta	2.32	77.20	9.1	2.87
Preston	1.79	74.90	9.7	1.84
Scout	1.65	69.40	9.2	5.14
Tammarin Rock	2.18	76.20	9.2	3.17
Westonia	2.35	72.60	8.9	2.49
Wyalkatchem	2.17	77.40	9.2	1.74
Yandanooka	1.89	73.90	9.5	2.99
Yitpi	1.90	78.20	9.9	3.06
Young	2.09	77.00	9.8	4.96
Zippy	1.66	75.70	10.2	4.89
Site Mean (t/ha)	2.04			
CV (%)	6.9			
LSD (t/ha)	0.24			

COMMENTS

- NVT results will be presented at the Liebe Group Crop Updates on the 3rd of March, 2010.
- Temperatures below zero were recorded at this trial multiple times between August and October but damage from these frosts has not been significant to affect the trial results or variety rankings.

CONTACT:

For more information please refer to www.nvtonline.com.au

WHEAT NATIONAL VARIETY TRIAL – CARNAMAH

Information from Australian Crop Accreditation System Limited

AIM

Wheat variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	Scott Walton, Carnamah
Plot size & replication	1.76m x 12m x 3 replicates
Soil type	Sandy Loam
Sowing date	05/06/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	04/06/09: 100 kg/ha Urea, 100 kg/ha Vigour special 31/07/09: 100 kg/ha Urea
Paddock rotation	2006: Fallow, 2007: Wheat, 2008: Canola
Herbicides, Insecticides & Fungicides	04/06/09: 2 L/ha Roundup PowerMax, 2 L/ha Trifluralin Plus, 1 L/ha Chloropyrifos 30/07/09: 800 mL/ha Jaguar, 120 g/ha Lontrel, 3 mg/ha Ally, 10 g/ha Logran
Growing Season Rainfall	296mm

RESULTS

Table 1: Yield and quality of wheat sown at Carnamah.

Variety	Yield (t/ha)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)
AGT Katana	3.05	81.80	10.2	2.39
Arrino	3.07	80.20	10.3	0.85
Binnu	3.09	75.50	9.0	2.73
Bumper	2.87	79.20	9.8	3.11
Calingiri	2.76	75.90	10.1	2.38
Carnamah	2.92	77.50	9.9	2.71
Cascades	2.67	76.40	10.4	2.54
Correll	2.66	78.40	9.6	4.67
EGA Bonnie Rock	2.89	81.20	10.3	2.90
EGA Wentworth	2.57	78.90	9.5	2.43
Espada	2.90	76.00	10.4	2.95
Fang	2.73	69.90	10.1	3.41
Fortune	2.84	77.20	10.0	1.99
Gladius	2.81	76.60	10.0	2.80
Guardian	2.95	78.50	10.1	5.06
Kennedy	2.89	77.50	10.2	3.35
King Rock	3.06	79.20	10.3	2.44
Mace	3.04	77.20	9.8	2.26
Magenta	2.94	77.40	10.1	2.46
Scout	2.93	78.10	9.3	2.78
Tammarin Rock	3.18	77.90	9.3	2.45
Westonia	3.18	75.00	9.7	2.64

Variety	Yield (t/ha)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)
Wyalkatchem	3.14	77.20	10.1	2.03
Yandanooka	2.58	76.60	10.6	1.34
Yitpi	2.64	76.50	10.9	2.84
Young	3.08	79.80	9.8	3.07
Zippy	3.45	80.70	10.0	1.45
Site Mean (t/ha)	2.94			
CV (%)	3.7			
LSD (t/ha)	0.19			

COMMENTS

- NVT results will be presented at the Liebe Group Crop Updates on the 3rd of March, 2010.
- Seasonal conditions at this site have favoured early season varieties. Interpret results with caution.

CONTACT:

For more information please refer to www.nvtonline.com.au

DURUM WHEAT NATIONAL VARIETY TRIAL – CARNAMAH

Information from Australian Crop Accreditation System Limited

AIM

Wheat variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	Scott Walton, Carnamah
Plot size & replication	1.76m x 12m x 3 replicates
Soil type	Sandy Loam
Sowing date	05/06/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	05/06/09: 100 kg/ha Urea, 75 kg/ha MAPSCZ, 25 kg/ha Sulphate of Potash 31/07/09: 100 kg/ha Urea
Paddock rotation	2007: Fallow, 2008: Wheat, 2009: Canola
Herbicides, Insecticides & Fungicides	04/06/09: 2 L/ha Roundup PowerMax, 2 L/ha Trifluralin Plus, 1 L/ha Chloropyrifos 30/07/09: 800 mL/ha Jaguar, 120 g/ha Lontrel, 3 mg/ha Ally, 10 g/ha Logran
Growing Season Rainfall	296mm

RESULTS

Table 1: Yield and quality of wheat sown at Carnamah.

Variety	Yield (t/ha)	Hectolitre Weight (kg/hectolitre)	Protein (%)	Screenings (%)
Caparoi	2.21	79.00	10.7	3.10
EGA Bellaroi	2.06	76.70	11.7	5.37
Hyperno	2.01	73.20	10.9	15.47
Jandaroi	2.26	78.00	11.8	4.65
Kalka	2.12	77.80	11.0	6.30
Saintly	2.47	73.80	10.4	8.65
Wollaroi	2.37	77.90	11.4	5.44
Yallaroi	2.01	73.40	11.4	6.44
Site Mean (t/ha)	2.11			
CV (%)	4.5			
LSD (t/ha)	0.16			

COMMENTS

- NVT results will be presented at the Liebe Group Crop Updates on the 3rd of March, 2010.

CONTACT:

For more information please refer to www.nvtonline.com.au

LONGREACH PLANT BREEDERS WHEAT VARIETY TRIALS – WESTERN AUSTRALIA 2009

Matu Peipi & Matt Whiting, LongReach Plant Breeders

AIM

To evaluate new wheat germplasm adapted to the main Western Australian Agricultural Zones and develop and release commercial varieties to WA farmers.

BACKGROUND

LongReach Plant Breeders[1] has conducted trials in all the main production environments of the Australian wheatbelt since it commenced operations in 2002. The LongReach breeding program reached full scale in 2005. Approximately 40% of the LongReach breeding investment is targeted at varieties for Western Australian growers.

In winter 2009, LongReach conducted over 27 field trials across the WA wheat belt, with the aim of testing new germplasm at various stages of development. Nine of these trial sites were Elite line evaluations, each planted with a total of 68 entries, including LongReach wheat lines closest to release (first year NVT entries in 2009), as well as commercially available controls to enable agronomic, disease, yield and quality comparisons. This report details results for one of these trials, located at Buntine.

All of the LongReach trials are planted by independent contractors in carefully selected paddocks provided by farmer co-operators. Various assessments, including establishment, foliar disease resistance, maturity, height and lodging, were made through out the season. Each of the trial sites have been harvested and subsequently analyzed for yield and will also be tested for receival standards. Samples from each development stage will be fully evaluated against industry standards for wheat quality and suitability for classification into WA commodity grades.

TRIAL DETAILS

Property	Stuart McAlpine, Buntine
Plot size & replication	10m x 1.5m x 3 replicates
Soil type	Sandy Loam
Sowing date	04/06/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	04/06/09: 100 kg/ha Urea, 100 kg/ha Vigour + Zincstar 12/08/09: 80 kg/ha Urea
Herbicides	04/06/09: 3 L/ha Roundup PowerMax, 2.5 L/ha Boxer Gold, 1 L/ha Chorpyriphos 22/07/09: 800 mL/ha Jaguar, 300 mL/ha Lontrel, 4 g/ha Ally
Paddock rotation	2006 = Pasture, 2007 = Wheat, 2008 = Lupin

RESULTS

Table 1 lists the yield results of only the top ranking varieties, from the LongReach Buntine trial, including some of the new LongReach wheat lines in comparison with commercially available varieties.

Table 1: Yield of wheat varieties sown at the LongReach Plant Breeders Buntine trial site (2009).

Variety	Yield (t/ha)	% of Mean	Rank
Westonia	**2.93**	**127**	**1**
LPB07-0956	2.92	126	2
Mace agt	**2.90**	**126**	**3**
Ega Bonnie Rock	**2.85**	**123**	**4**
Bullet	**2.73**	**118**	**5**
Wyalkatchem	**2.72**	**118**	**6**
LPB07-0982	2.68	116	7
LPB07-0935	2.66	115	8
LPB07-0980	2.60	113	9
LPB07-3024	2.59	112	10
LPB07-1325	2.55	110	11
LPB06-1047	2.54	110	12
Lincoln	**2.52**	**109**	**13**
Espada	**2.51**	**109**	**14**
Carnamah	**2.47**	**107**	**15**
LPB07-0957	2.46	106	16
LPB06-0919	2.46	106	17
Tammarin Rock	**2.44**	**105**	**18**
Guardian	**2.43**	**105**	**19**
Gladius	**2.40**	**104**	**24**
Catalina	**2.39**	**103**	**27**
Magenta	**2.27**	**98**	**37**
Calingiri	**2.17**	**94**	**49**
Arrino	**2.08**	**90**	**57**
Yitpi	**1.89**	**82**	**65**
Mean General	**2.31**		
Reps w/data	3		
Entries w/data	68		
Design Used	RCB		
LSD (5%)	0.47		
LSD (1%)	0.62		
CV %	7.63		
RSQ:	0.78		

COMMENTS

- The LongReach breeding objectives emphasize consistent field performance, attractive end-use quality and diverse disease resistance, and these targets are reflected in the evaluations conducted during the variety development processes. Currently the LongReach breeding pipe line carries a diverse range of materials from numerous local and international sources, including derivatives of proven WA wheat lines.
- The 2010 trial program will continue testing a full range of germplasm, assessing each line for a range of agronomic features and post harvest traits. Promising lines will continue to be included in the NVT network and other independent collaborative trials to enable growers and advisors to determine their suitability within each AgZone. LongReach Plant Breeders aim to have high quality milling wheats, with specific suitability to WA environments, available for commercial release within the next two years.

[1] LongReach Plant Breeders is a Joint Venture between Pacific Seeds Pty Ltd and Syngenta Seeds Pty Ltd.

ACKNOWLEDGEMENTS

- LongReach Plant Breeders acknowledges the assistance of numerous independent professional contract service providers, including Kalyx Agriculture for seeding and trial maintenance, and public agency researchers with the development of LongReach varieties, including LongReach Guardian.
- The support of farmer co-operators, in all parts of the Australian wheatbelt (including Stuart McAlpine and family, Buntine) who have provided trial sites since 2001, has been invaluable and is acknowledged.

PAPER REVIEWED BY: Matt Whiting, LongReach Plant Breeders.

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WHEAT VARIETY DEMONSTRATION, EAST WUBIN

Nadine Hollamby, GRDC Project Coordinator, Liebe Group

AIM

To determine yield and quality of three new wheat varieties, sown using farmer equipment.

BACKGROUND

This trial was conducted using farmer equipment. Farmer scale demonstrations are a valuable way to explore new varieties, products or practices, complementing results which are produced through small plot, more rigorous type trials. This demonstration explored three APW wheat varieties. Axe is a very early maturing variety, Mace is a short-mid maturing variety and Espada is a mid maturing variety.

TRIAL DETAILS

Property	Keith Carter, Wubin
Plot size & replication	100m x 13.7m x 5 replicates
Soil type	Sand over gravel
Sowing date	29/05/09
Seeding rate	50 kg/ha
Fertiliser (kg/ha)	75 kg/ha K Till plus, 10 kg/ha MOP, 40 L/ha Flexi N banded, two applications x 30 L/ha of Flexi N
Paddock rotation	2007 = Wheat, 2008 = Canola
Herbicides	28/08/09: 0.8 L/ha Spray seed, 4 L/ha Tigrex, 30 g/ha Logran 08/08/09: 100 mL/ha Folicur, 4L/ha LVE MCPA
Growing season rainfall	237mm

RESULTS

Table 1: Wheat yield and quality at East Wubin .

Variety	Yield (t/ha)	Protein (%)	Screenings (%)	Weight (g)
Axe	2.0a	10.6	4.6	79.5
Espada	2.4b	9.8	6.2	78.7
Mace	2.5b	9.8	4.9	81.0

Yields with different letter denotes a significant difference from each other.

Figure 1: Average yield of Axe, Espada and Mace at Wubin.

COMMENTS

- Axe yielded significantly lower than Mace and Espada in the demo.
- Due to the early maturity of Axe relative to Mace and Espada, Axe did not receive the full liquid nitrogen program before coming to head which may have had an impact on final yield.
- High screenings were the result of cracked grain rather than small grain.
- Interpret results of farmer demonstrations carefully and utilise numerous sources of data to make final decisions regarding varieties.

ACKNOWLEDGEMENTS

- Thank you to Keith Carter and staff for hosting and implementing the trial.

REFERENCES

- Ben Curtis, Steve Penny, Christine Zaicou-Kunesch, Harmohinder Dhammu, Sarah Ellis, Dorthe Jorgensen, Shahajahan Miyan, Brenda Shackley and Darshan Sharma, 2009. *Wheat Variety Guide 2009 Western Australia.* WA Department of Agriculture & Food.

PAPER REVIEWED BY: Chris O'Callaghan, Liebe Group.

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CEREAL VARIETY PRACTICE FOR PROFIT

Peter Carlton, Research Agronomist, Kalyx Agriculture

AIM

To examine the effect of increasing inputs to three commonly grown cereal varieties representing APW, noodle and malt segregations, and a new wheat investigating the prospects for ethanol production from wheat, on profitability for growers in the Liebe Group area.

BACKGROUND

This trial was designed to investigate the responses of three commonly grown cereal varieties (Wyalkatchem wheat, Calingiri wheat and Hamelin barley) and a wheat variety suited to ethanol production (RAC 1505) to increasing seeding rate, fertiliser, disease management and weed management strategies. Low, District and High management strategies that ranged in cost from $220-$542/ha were applied to each variety, and crop growth, disease infection, yield and gross margin were measured. Management practices are explained below.

- **Low** input treatments are based on a farmer delivering grain to the bin at the lowest possible cost, regardless of seasonal conditions ($219.98/ha).
- **District** average inputs are based on what is considered common grower practice in the Liebe Group area as determined by growers in the area via Liebe R&D Committee ($305.79/ha).
- **High** input treatments simulate a paddock with high yield potential matched with increased management inputs to maximise yields and profitability ($528.16/ha, $528.93/ha for Hamelin barley).

Analysis in this report is based on estimated 2009 input prices and returns calculated from current cash grain prices.

TRIAL DETAILS

Property	McIlroy Family, Pithara
Plot size & replication	8.8m x 12m x 3 replicates
Soil type	Sandy Loam
Sowing date	28/05/2009
Seeding rate	As per protocol
Fertiliser (kg/ha)	As per protocol
Paddock rotation	2008 = Lupins
Herbicides	As per protocol
Growing Season Rainfall	201mm

TREATMENTS

No.	Date	Product	Timing/Placement	Rate
1	27/05/2009	Roundup PowerMAX Chlorpyrifos	IBS	1.5 L/ha 1 L/ha
2	08/07/2009	Achieve Hoegrass Supercharge	post emergent Z22	200 g/ha 200 mL/ha 0.75% v/v
3	26/08/2009	Logran	post emergent Z45-55	15 g/ha

Treatments

Inputs	No.	Variety	Treatment	Rate		Timing		Date
Low	**1**	Wyalkatchem	Trifluralin	1.5	L/ha	IBS	A	27/05/2009
	2	Calingiri	Flexi N	30	L/ha	IBS	A	27/05/2009
	3	Ethanol	Seed Rate	50	kg/ha		B	27/05/2009
	4	Hamelin	Agflow	30	kg/ha	banded	B	27/05/2009
			2,4-D Amine	1	L/ha	Z24	C	27/07/2009
			Diuron	350	mL/ha	Z24	C	27/07/2009
District	**5**	Wyalkatchem	Trifluralin	1.5	L/ha	IBS	A	27/05/2009
	6	Calingiri	Flexi N	30	L/ha	IBS	A	27/05/2009
	7	Ethanol	Seed Rate	80	kg/ha		B	27/05/2009
	8	Hamelin	Agras	90	kg/ha	banded	B	27/05/2009
			2,4-D Amine	1	L/ha	Z24	C	27/07/2009
			UAN	30	L/ha	Z24	C	27/07/2009
			Tilt	300	mL/ha	Z30	D	06/08/2009
High	**9**	Wyalkatchem	Trifluralin	2	L/ha	IBS	A	27/05/2009
	10	Calingiri	Flexi N	55	L/ha	IBS	A	27/05/2009
	11	Ethanol	Jockey *	3	L/T	On seed	B	27/05/2009
	12	Hamelin	Twin Zinc	300	mL/100kg seed	On seed	B	27/05/2009
			Seed Rate	90	kg/ha		B	27/05/2009
			MacroPro Plus	130	kg/ha	banded	B	27/05/2009
			Axial	150	mL/ha	Z24	C	27/07/2009
			Agador	0.5	%	Z24	C	27/07/2009
			Paragon **	500	mL/ha	Z24	C	27/07/2009
			UAN	30	L/ha	Z24	C	27/07/2009
			Tilt	300	mL/ha	Z30	D	06/08/2009
			Flexi N	30	L/ha	Z30	D	06/08/2009
			Flexi N	30	L/ha	Z45	E	26/08/2009

* Barley used Baytan at 100 mL/100 kg

** Paragon use increased from 400 mL/ha

RESULTS

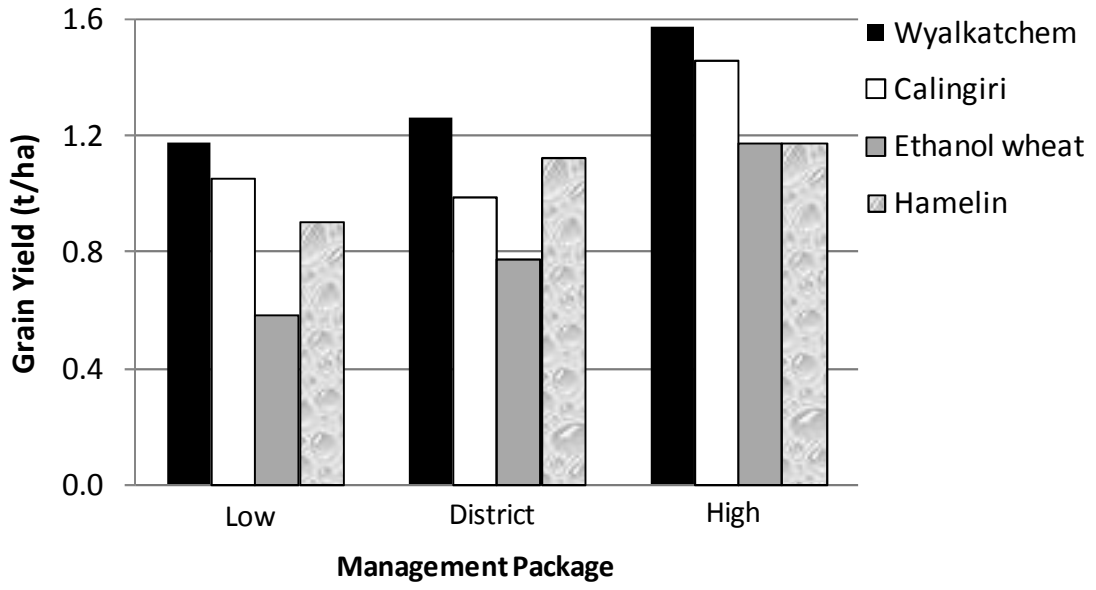

Figure 1. Yield (t/ha) for each cereal variety relative to management practice at 181 DAS (LSD = 0.65 t/ha).

Table 1. Crop density (36 DA-S), ryegrass and wild radish density (91 DA-S), yield, quality and gross margin for each wheat variety and management treatment.

No.	Input	Variety	Crop density (/m^2)	Ryegrass density (1-9)	Wild radish density (1-9)	Crop Yield (t/ha)	Protein (%)	Screening %	Gross Margin $/ha
1	Low	Wyalkatchem	81 d	5.7 ab	3.7 a	1.17 a	9.3	4.7	- 18
2		Calingiri	91 d	4.0 bcd	3.7 a	1.05 a	10	5.2	- 36
3		Ethanol Wheat	99 cd	7.0 a	4.3 a	0.58 a	10.9	9.4	- 149
4		Hamelin Barley	98 d	3.3 cd	4.0 a	0.91 a	10.5	23.1	- 86
5	District	Wyalkatchem	123 bc	5.0 bc	3.3 a	1.26 a	10.5	5.3	- 57
6		Calingiri	134 b	3.7 cd	3.3 a	0.99 a	10.5	6.9	- 142
7		Ethanol Wheat	134 b	5.0 bc	4.0 a	0.77 a	11.2	7.7	- 198
8		Hamelin Barley	135 ab	2.3 d	2.7 a	1.13 a	12.3	55.3	- 154
9	High	Wyalkatchem	134 b	3.0 d	3.7 a	1.58 a	10.7	3.7	- 229
10		Calingiri	147 ab	2.7 d	3.3 a	1.45 a	11.2	4.6	- 271
11		Ethanol Wheat	160 a	3.3 cd	3.7 a	1.17 a	10.3	8.1	- 340
12		Hamelin Barley	142 ab	2.3 d	2.7 a	1.17 a	11.7	37.4	- 369
LSD (P=.05)			**25.0**	**2.0**	**1.9**	**0.647**			
CV			**12.0**	**29.9**	**31.2**	**34.600**			
Replicate F			**1.299**	**2.176**	**4.157**	**1.238**			
Replicate Prob(F)			**0.293**	**0.137**	**0.029**	**0.309**			
Treatment F			**8.581**	**4.523**	**0.624**	**1.541**			
Treatment Prob(F)			**0.000**	**0.001**	**0.789**	**0.187**			

Means followed by same letter do not significantly differ (P=.05, LSD).
All prices are based on 2009/10 cash prices as of January 4, 2010.

Table 2: Factorial analysis for crop density (36 DA-S), ryegrass and wild radish density (91 DA-S) and yield (181 DA-S).

No.	Variety	Crop Density (/m2)	Ryegrass Density (1-9)	Wild radish Density (1-9)	Crop Yield (t/ha)
TABLE OF A MEANS					
1	Low	92.1 c	5.0 a	3.9	0.929 b
2	District	131.7 b	4.0 b	3.3	1.037 ab
3	High	145.7 a	2.8 c	3.3	1.345 a
		12.5	**1.0**	**NSD**	**0.323**
TABLE OF B MEANS					
1	Wyalkatchem Wheat	112.7	4.6 a	3.6	1.338
2	Calingiri Wheat	124.1	3.4 b	3.4	1.163
3	Ethanol Wheat	130.7	5.1 a	4.0	0.843
4	Hamelin Barley	125.1	2.7 b	3.1	1.070
		NSD	**1.2**	**NSD**	**NSD**

COMMENTS

- Increasing inputs from Low to District Practice significantly increased crop emergence for all four varieties, setting up a high yield potential, but also increasing the risk of yield loss from infrequent rainfall events and drying soil early in the season.
- Ryegrass plant number was high at this site and was highest in the Wyalkatchem and Ethanol wheat plots. Ryegrass density was related to the management strategy imposed with higher rates of nutrition, herbicide application and seeding rate associated with significantly lower ryegrass numbers (Table 2) although the relationship between crop density and ryegrass density was not significant (r=0.6ns).
- Wild radish was also prevalent with moderate levels of infestation. The presence of wild radish was not related to the level of inputs used or to variety.

- Grain yield was quite low, varying from 0.58 t/ha under Low Inputs to 1.58 t/ha under High Inputs and reflected the high weed burden of ryegrass and wild radish at this site. The High Management Practice resulted in the highest grain yield and was significantly higher than the Low Management practice. Wyalkatchem wheat was the highest yielding variety for all input strategies, although it was not significantly better than Calingiri, ethanol suited wheat or Hamelin barley for any input strategy.
- Protein varied between varieties from 9.3 to 10.9% in the Low Input treatment and appeared to benefit from the lupin crop grown in 2008. Increasing N in the District Input treatment increased protein by about 0.5% but the improvement was inconsistent at the High Input treatment. Hamelin barley showed the largest response to applied N with an increase in grain protein of 1.8% under District Inputs. There was no further improvement under High Inputs. Screenings were high in Hamelin barley and ranged from 23 to 55%.
- No wheat or barley under any management practice produced a positive return on investment. Losses were as high as $369 /ha under the High Input Strategy and the Low Input Practice resulted in the smallest loss with Wyalkatchem returning a loss of only $18 /ha under the Low Input Strategy.
- Results in previous years have suggested that an Active Management strategy, where inputs are dependent on seasonal conditions and the aim is to establish a reasonable yield potential early and then play the season with remaining inputs, appeared to be the most reliable strategy, producing the highest, or close to the highest, margin over several years, even in the dry season of 2007. In 2009 the Lowest Input Strategy resulted in the smallest loss but it is not possible to draw any definitive conclusions from this trial as there were no verifiable differences in yield between varieties or between input packages.
- The biggest variation in cost between input strategies in 2009 was nutrition, however, some of the variation was also due to differences in herbicide selection and rate, and, as such, efficacy of weed control may vary between management packages especially in Low Input Strategies. Thus decisions regarding cost savings on inputs such as herbicides need to account not only for poor weed control in the current year but also the cost of potential increased weed seed set in lower input management packages and weedy paddocks in future years.

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CEREAL PRACTISE FOR PROFIT ON SANDY SOIL

Peter Carlton, Research Agronomist, Kalyx Agriculture

AIM

To examine the effect of increasing inputs for crop varieties representing APW wheat, oats, triticale and a new wheat investigating the prospects for ethanol production from wheat, on profitability for growers on a sandy soil with a highly acidic subsoil in the Liebe Group area.

BACKGROUND

This trial was designed to investigate the responses of a range of cereal types to increasing seeding rate, fertiliser, disease management and weed management strategies. Low Input and District Input, with and without grazing, strategies that ranged in cost from $204-$340 /ha were applied to each variety, and crop growth, disease infection, yield and gross margin were measured. Management practices are shown below:-

- **Low input** treatments are based on a farmer delivering grain to the bin at the lowest possible cost, regardless of seasonal conditions ($204-$208/ha).
- **Low input + grazing** treatments will attempt to increase the value of the crop by grazing (simulated) prior to Z30 and then take the crop through to harvest ($204-$207/ha).
- **District input** is based on what is considered common farm practice for the area as determined by growers via Liebe R&D Committee ($320-$340/ha).
- **District + grazing** will attempt to increase the value of the crop by grazing (simulated) prior to Z30 and then manage the crop according to common farm practice through the season ($332-$338/ha).

Analysis in this report is based on estimated 2009 input prices and returns calculated from current cash grain prices.

TRIAL DETAILS

Property	Alex Keamy
Plot size & replication	8.8m x 12m x 3 replicates
Soil type	Yellow sandplain
Sowing date	31/05/2009
Seeding rate	As per protocol
Fertiliser (kg/ha)	As per protocol
Paddock rotation	2008- Pasture
Herbicides	As per protocol
Growing Season Rainfall	278.6mm April-October

TREATMENTS

Crop Protection

No.	Date	Product	Timing/Placement	Rate
1	31/05/2009	Roundup PowerMAX Chlorpyrifos	IBS	1.5 L/ha 1 L/ha

Treatments

Input	No.	Variety	Treatment	Rate	Timing		Date
Low	1	Wyalkatchem wheat	Trifluralin (wheat, triticale)	1.5 L/ha	IBS	A	31/05/2009
	2	Kangaroo oats	Dual Gold (oats)	400 mL/ha	IBS	A	31/05/2009
	3	Ethanol wheat (RAC 1505)	Flexi N	30 L/ha	IBS	A	31/05/2009
	4	Pacific Falcon triticale	Seed Rate	50 kg/ha		B	31/05/2009
			MacroPro Plus	30 kg/ha	banded	B	31/05/2009
			2,4-D Amine	1 L/ha	Z22	C	06/08/2009
			Lontrel	40 g/ha	Z22	C	06/08/2009
District	5	Wyalkatchem wheat	Trifluralin (wheat, triticale)	1.5 L/ha	IBS	A	31/05/2009
	6	Kangaroo oats	Dual Gold (oats)	400 mL/ha	IBS	A	31/05/2009
	7	Ethanol wheat (RAC 1505)	Logran (wheat)	30 g/ha	IBS	A	31/05/2009
	8	Pacific Falcon triticale	Flexi N	40 L/ha	IBS	A	31/05/2009
			Seed Rate	70 kg/ha		B	31/05/2009
			MacroPro Plus	75 kg/ha	banded	B	31/05/2009
			2,4-D Amine	1 L/ha	Z22	C	06/08/2009
			Lontrel	40 g/ha	Z22	C	06/08/2009
			Flexi N (wheat, oats)	20 L/ha	Z22	C	06/08/2009
			Flexi N	45 L/ha	Z37-Z45	D	26/08/2009
Low	9	Wyalkatchem wheat	Trifluralin (wheat, triticale)	1.5 L/ha	IBS	A	31/05/2009
+	10	Kangaroo oats	Dual Gold (oats)	400 mL/ha	IBS	A	31/05/2009
Grazing	11	Ethanol wheat (RAC 1505)	Flexi N	30 L/ha	IBS	A	31/05/2009
	12	Pacific Falcon triticale	Seed Rate	50 kg/ha		B	31/05/2009
			MacroPro Plus	30 kg/ha	banded	B	31/05/2009
			2,4-D Amine	1 L/ha	Z22	C	06/08/2009
			Lontrel	40 g/ha	Z22	C	06/08/2009
			Simulated Grazing		Before Z30		
District	13	Wyalkatchem wheat	Trifluralin (wheat, triticale)	1.5 L/ha	IBS	A	31/05/2009
+	14	Kangaroo oats	Dual Gold (oats)	400 mL/ha	IBS	A	31/05/2009
Grazing	15	Ethanol wheat (RAC 1505)	Logran (wheat)	30 g/ha	IBS	A	31/05/2009
	16	Pacific Falcon triticale	Flexi N	40 L/ha	IBS	A	31/05/2009
			Seed Rate	70 kg/ha		B	31/05/2009
			MacroPro Plus	75 kg/ha	banded	B	31/05/2009
			2,4-D Amine	1 L/ha	Z22	C	06/08/2009
			Lontrel	40 g/ha	Z22	C	06/08/2009
			Flexi N	20 L/ha	Z22	C	06/08/2009
			Simulated Grazing		Before Z30		
			Flexi N	45 L/ha	Z37-Z45	D	26/08/2009

RESULTS

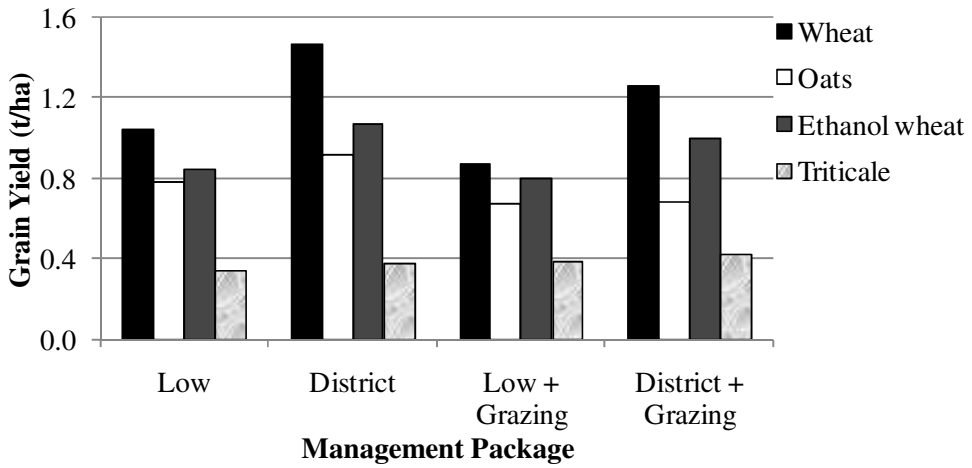

Figure 1. Yield (t/ha) for each cereal variety relative to management practice at 203 DAS (LSD = 0.17 t/ha).

Table 1. Crop density and vigour (51 DA-S), leaf disease and crop head number (123 DA-S) and yield (203 DA-S), quality and gross margin for each crop variety and management treatment.

No.	Input	Variety	Crop density (/m2)	Crop vigour (1-9)	Leaf disease (1-9)	Crop head density (/m2)	Grain yield (t/ha)	Protein (%)	Screenings (%)	GM $/ha
1	Low	Wyalkatchem	92 f	5.0 cde	3.7 a	120 ef	1.04 cd	7.5	5.5	-26
2		Oats	117 de	6.7 a	3.3 a	130 ef	0.78 de	7.2	18.1	-104
3		Ethanol wheat	116 de	4.3 ef	3.0 a	120 ef	0.85 cde	7.0	8.1	-69
4		Triticale	104 ef	4.0 f	2.7 a	139 def	0.35 f	-	-	-159
5	District	Wyalkatchem	115 de	5.7 bc	4.3 a	143 c-f	1.47 a	9.1	4.4	-60
6		Oats	138 ab	6.7 a	2.3 a	198 ab	0.92 cde	8.5	21.5	-216
7		Ethanol wheat	147 a	5.0 cde	2.3 a	194 ab	1.07 c	8.5	9.8	-165
8		Triticale	127 bcd	4.0 f	2.3 a	178 bc	0.38 f	10.4	10.1	-271
9	Low + Grazing	Wyalkatchem	94 f	5.0 cde	2.3 a	112 f	0.87 cde	7.6	6.7	-64
10		Oats	117 de	6.0 ab	2.3 a	134 def	0.67 e	7.5	17.3	-118
11		Ethanol wheat	127 bcd	4.7 def	2.7 a	134 def	0.80 de	7.2	10.2	-87
12		Triticale	115 de	4.3 ef	2.3 a	149 cde	0.38 f	9.8	5.9	-154
13	District + Grazing	Wyalkatchem	119 cde	5.3 bcd	4.3 a	146 c-f	1.26 b	9.3	6.0	-118
14		Oats	153 a	6.7 a	4.0 a	218 a	0.68 e	9.0	23.3	-246
15		Ethanol wheat	148 a	5.0 cde	3.3 a	185 ab	1.00 cd	8.7	12.3	-203
16		Triticale	137 abc	4.3 ef	2.0 a	168 bcd	0.42 f	-	12.7	-118
LSD (P=.05)			**19.1**	**0.8**	**2.7**	**35.8**	**0.172**			
CV			**9.3**	**9.2**	**55.2**	**13.9**	**12.740**			
Replicate F			**10.565**	**2.888**	**1.225**	**3.645**	**0.144**			
Replicate Prob(F)			**0.000**	**0.071**	**0.308**	**0.038**	**0.867**			
Treatment F			**7.605**	**11.528**	**0.680**	**6.605**	**29.782**			
Treatment Prob(F)			**0.000**	**0.000**	**0.783**	**0.000**	**0.000**			

Means followed by same letter do not significantly differ (P=.05, LSD)

Table 2: Factorial analysis for crop density and vigour (51 DA-S), leaf disease and crop head number (123 DA-S) and yield (203 DA-S).

No.	Variety	Crop density (/m2)	Crop vigour (1-9)	Leaf disease (1-9)	Crop head density (/m2)	Grain yield (t/ha)
TABLE OF A MEANS						
1	Low	107.1 b	5.0	3.2	127.1 b	0.754 bc
2	District	131.8 a	5.3	2.8	178.3 a	0.959 a
3	Low + Grazing	113.1 b	5.0	2.4	132.2 b	0.679 c
4	District + Grazing	139.1 a	5.3	3.4	179.1 a	0.839 b
		9.6	**NSD**	**NSD**	**17.9**	**0.086**
TABLE OF B MEANS						
1	Wyalkatchem wheat	104.9 c	5.3 b	3.7	130.2 b	1.159 a
2	Kangaroo oats	131.1 ab	6.5 a	3.0	169.9 a	0.762 c
3	Ethanol wheat	134.6 a	4.8 c	2.8	158.2 a	0.928 b
4	Triticale	120.6 b	4.2 d	2.3	158.4 a	0.382 d
		9.6	**0.4**	**NSD**	**17.9**	**0.086**

Means followed by same letter do not significantly differ (P=.05, LSD)

COMMENTS

- Increasing inputs from Low to District Practice significantly increased crop emergence for all four varieties, reflecting the increased seeding rate. This has set the crop up for a high yield potential, but has also increased the risk of yield loss from infrequent rainfall events and drying soil early in the season. Kangaroo oats had the highest establishment, a reflection of lighter grain, but it was not significantly different to the Ethanol wheat. There was also a trend to increased plant vigour under the District Input strategy, but the increase was not significant.

- Crop head density was higher under the District Input Practice, reflecting the higher seeding rate and crop nutrition, and was positively correlated with seedling establishment. Crop head density was not much higher than crop establishment, indicating that most plants did not tiller well, with an accompanying limited yield potential. Grazing had no effect on head number and grazed plots had similar head density to the ungrazed treatment under both Low Input and District Input practices.
- Grain yield was quite low, varying from 0.35 to 0.42 t/ha for triticale to 0.87 to 1.47 t/ha for Wyalkatchem wheat. Significant differences existed between varieties and crops although this mainly reflected the lack of adaptation of the long season oat and triticale varieties. The poor yield did not warrant District Input (0.96 t/ha) and the increase in yield compared to the Low Input of 0.21 t/ha was at an additional cost of about $125/ha.
- Simulated grazing reduced grain yield with a significant reduction in the District Input practices of about 12%. However, because of the low yields at this site it is difficult to identify the implications of this reduction. Much of the reduction in yield under High Input was attributed to reduced yield of Wyalkatchem wheat and oats of 14 and 26% respectively.
- Grain quality reflected the poor yield and can be considered marginal with, for example, protein in Wyalkatchem wheat of 7.5% under Low Input. Screenings varied 4.4 to 12.7% for wheat and triticale and 17.3 to 23.3% for oats. District Input increased protein to 9.1% in Wyalkatchem and there was a tendency for screenings to increase slightly in the wheats following grazing.
- No wheat, oat or triticale under any management practice produced a positive return on investment. Losses were as high as $246 /ha under the District Input Strategy and the Low Input Practice resulted in the smallest loss with Wyalkatchem returning a loss of only $26 /ha under the Low Input Strategy although costs and value adding associated with grazing have not been considered.
- An Active Management strategy, where the aim is to establish a reasonable yield potential early and then play the season with remaining inputs, has appeared to be the most reliable strategy, producing the highest, or close to the highest, margin over several years, even in the dry season of 2007. In 2009, with yields of 1.47 t/ha and lower, the District Input turned out to be high risk with losses of $60 to $246/ha. On the yellow sandplain, with acidic subsoil, the Low Input Practice resulted in the lowest yield but it was also the smallest loss but otherwise it is not possible to draw any definitive conclusions from this trial. However, too low inputs, demonstrated in earlier years, that opportunities can be missed. Seasonal conditions, risk management, weed control, weed seed set and nutrient depletion strategies must be managed across and evaluated season by season.
- It is worth noting that in years in which a crop has established well but the outlook for the remainder of the season is poor, then grazing may be a valid option to consider if it is thought that the value from grazing offsets a possible reduction in yield. There was no quantification of the value of grazing in this trial.
- It must be remembered that the Liebe Group's membership comprises a wide and varied region. In the end, this trial was conducted under poor seasonal conditions. The data generated from this trial needs to be evaluated in light of the season, soil type, variety choice and inputs and compared with similar trials from previous years.

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RESPONSE OF WHEAT VARIETIES TO SOWING TIME AT PITHARA IN 2009

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Department of Agriculture and Food

AIM

To investigate how new wheat genotypes respond to sowing times and environments in the Central Agricultural Region.

BACKGROUND

Growers are faced with a greater choice of new varieties from both Western Australia and the Eastern states, about which there is often little relevant information available in their local environment. Climate and weather conditions greatly influence the performance of new wheat cultivars both for yield and quality. Research in the CAR is assessing the responsiveness of new wheat varieties compared to existing wheat varieties to the time of sowing.

TRIAL DETAILS

Property	McIlroy family, Pithara
Plot size & replication	20m x 1.8m x 3 replicates
Soil type	Sandy Loam
Time of Sowing date	3: TOS1: 28/05/2009, TOS2: 17/06/2009, TOS3: 03/07/2009
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	100 kg/ha Macropro plus banded at each seeding time, 85 kg/ha of urea as topdressed and 60 L flexi-N/ha
Paddock rotation	2006 = Wheat, 2007 = Wheat, 2008 = Lupins
Herbicides	2 L Sprayseed and 2 L Trifluralin/ha at each sowing time, 300 ml Axial, 0.5 % Adgor, 1 L Jaguar and 15 Logran were also applied
Growing Season Rainfall	201mm

RESULTS

Table 1. Effect of sowing time on yield, quality and economic returns of wheat varieties at Pithara 2009

Grade	Variety	Grain Yield (t/ha)				Protein (%)				Screenings (%)				Gross income ($/ha)		
		28-May	17-Jun	3-Jul	ave	28-May	17-Jun	3-Jul	ave	28-May	17-Jun	3-Jul	ave	28-May	17-Jun	3-Jul
AH	Carnamah	1.40	1.02	0.71	1.05	12.9	13.5	14.7	13.7	3.2	4.6	4.5	4.1	345	253	176
	King Rock	1.79	1.35	1.02	1.39	12.5	13.5	14.3	13.4	2.9	3.5	7.1	4.5	433	332	228
	Mace	1.57	1.35	1.02	1.31	12.6	12.6	13.8	13.0	3.4	3.2	5.2	3.9	381	325	253
APW	Axe	1.27	0.90	0.71	0.96	14.6	14.0	15.0	14.5	3.4	3.4	7.7	4.8	285	202	156
	DerrimutWt	1.16	0.99	0.58	0.91	12.9	13.0	15.0	13.6	8.6	6.6	11.5	8.9	254	217	121
	Espada	1.41	1.29	0.81	1.17	13.4	12.8	14.5	13.6	5.0	3.3	6.6	5.0	315	290	181
	Fang	1.22	0.87	0.63	0.91	14.0	13.5	14.9	14.1	14.7	10.0	6.6	10.4	212	182	132
	Gladius	1.30	1.15	0.86	1.10	13.4	13.4	13.8	13.5	4.1	4.4	4.5	4.3	292	257	192
	Katana	1.53	1.28	0.76	1.19	14.3	13.2	14.3	13.9	6.2	2.7	5.0	4.6	343	287	169
	Magenta	1.62	1.28	0.74	1.21	13.1	13.7	15.8	14.2	4.9	5.5	4.6	5.0	364	287	165
	Scout	1.43	1.10	0.80	1.11	14.2	12.6	14.8	13.9	8.1	4.6	7.5	6.7	313	246	175
	LR Lincoln	1.00	1.04	0.74	0.92	14.4	13.3	15.2	14.3	7.9	7.7	9.9	8.5	210	221	154
	Waagan	1.36	0.99	0.82	1.06	13.2	14.0	13.8	13.7	6.1	6.3	9.5	7.3	283	208	171
	Wyalkatchem	1.64	1.45	1.02	1.37	13.3	13.1	14.0	13.5	2.2	2.3	3.1	2.5	366	325	229
	Zippy	1.44	1.21	0.92	1.19	12.7	12.9	13.8	13.1	3.6	3.1	4.5	3.7	322	271	206

Grade	Variety	Grain Yield (t/ha)				Protein (%)				Screenings (%)				Gross income ($/ha)		
		28-May	17-Jun	3-Jul	ave	28-May	17-Jun	3-Jul	ave	28-May	17-Jun	3-Jul	ave	28-May	17-Jun	3-Jul
SFT	Bumper	1.68	1.27	0.9	1.28	12.4	12.8	13.9	13.0	3.2	3.8	6.3	4.4	359	272	188
ASWN	Binnu	1.67	1.23	0.94	1.28	11.7	12.2	13.9	12.6	3.2	3.8	6.3	4.4	365	263	202
	Calingiri	1.23	0.99	0.90	1.04	13.3	13.1	13.4	13.3	2.0	2.6	3.2	2.6	263	213	193
	Yandanooka	1.40	1.25	0.83	1.16	13.2	13.4	14.0	13.5	2.8	3.4	5.0	3.7	299	268	177
	Fortune	1.46	1.20	0.85	1.17	12.9	12.3	14.2	13.1	2.5	3.7	5.0	3.7	312	257	181
	Average within each TOS	1.43	1.16	0.82	1.14	13.3	13.1	14.4	13.6	4.9	4.4	6.2	5.2			
	TOS (lsd)	0.38				1.6				2.5						
	Var (lsd)	0.18				0.7				1.5						
	Var(lsd) between TOS	0.44				1.8				3.2						
	Var (lsd) within TOS	0.32				1.3				2.5						
	%CV	15				5.8				22						

COMMENTS

- A field trial was conducted at Pithara in 2009. Twenty four wheat breeding lines from various Australian breeding companies were selected and sown at three times of sowing in a randomised block design with three replications. The first time of sowing (TOS), was in late May and subsequent sowings were at 17-20 days after TOS1 as rainfall allowed.
- Growing season rainfall from April-October was 263.8.mm. Low rainfalls in September, October and November were associated with yield reductions and high proteins in the latest sowing in the trial site.
- The highest grain yield was recorded in TOS 1. The average grain yield with late May sowing was 19% and 43% higher than the average yield with mid June and early July sowings respectively. The average grain yield and gross returns of the newly released variety King Rock exceeded all of the wheat varieties.
- At this site, most of the AH varieties achieved more than 13% protein at all sowing times except TOS1. However, all noodle wheat recorded above the delivery standard of 11.5% at all time of sowing. However, the gross return of Mace and King Rock were recorded higher than Scout, Katana and Magenta. Screenings have been at 5% or less most of the varieties except Fang, Derrimut Wt, Scout, LR Lincoln and Waagan. Hectolitre weight has exceeded the delivery standard of 74 kg/hl.
- Data on grain yield, grain protein and screenings were recorded and analysed using Genstat.
- Note: Screenings include whole and cracked grain. Gross income was calculated on the average yield and quality for each treatment using cash price. Base scale: APW $224. Grade spreads: AH1 +23, AH2 + 18, AUH -$5, ASW1 -$10, ANW1 -$10, AGP -$15, Feed -$50.

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INFLUENCE OF SOWING TIME ON WHEAT VARIETY AT COOROW IN 2009

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Department of Agriculture and Food

AIM

To support growers with agronomic decisions such as sowing time and variety selection to enhance industry profitability through improved wheat yields and grain quality.

BACKGROUND

Twenty commercially popular or recently released wheat varieties were sown at three sowing times at Coorow to provide growers with useful information to understand the impact of sowing time on the yield and quality. This trial is one of a state wide set of trials conducted by DAFWA's GRDC funded project 'Variety specific agronomy for wheat yield and quality in the Western Region'.

TRIAL DETAILS

Property	Michael Bothe, Coorow
Plot size & replication	20m x 1.54m x 3 replicates
Sowing date	13/05/09 (dry sown, rained 20/05/09 effective sowing date), 02/06/09, 15/06/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	100 kg/ha Agstar Extra drilled below + 50 kg/ha Urea topdressed at seeding
Herbicides	For each sowing time: SpraySeed, Treflan and Dominex IBS Post emergence sprays: Jaguar, Ally and Lontrel
Growing Season Rainfall	May-Sept: 267mm; Jan-Apr: 28mm

RESULTS

Table 1: Yield, quality and grade of wheat sown at Coorow.

	Grain Yield (t/ha)				Protein (%)				Screening (%)		
	20 May	2 Jun	15 Jun	Av t/ha (% Wyalk)	20 May	2 Jun	15 Jun	Av	20 May	2 Jun	15 Jun
Axe	3.50	3.38	2.20	3.03 (82)	13.7	11.0	11.9	12.2	2.7	3.1	3.0
Binnu	4.23	3.44	2.95	3.54 (96)	11.9	10.2	10.5	10.9	4.9	4.8	7.3
Bumper	4.73	3.69	3.20	3.87 (105)	11.9	10.3	11.2	11.1	3.2	3.6	4.9
Calingiri	4.05	3.26	2.79	3.37 (91)	12.8	11.0	12.1	12.0	2.6	2.8	3.3
Carnamah	3.90	3.67	2.87	3.48 (94)	12.7	10.8	11.6	11.7	3.4	2.9	3.9
EGA Bonnie Rock	4.29	3.55	3.03	3.62(98)	12.5	10.6	11.3	11.5	4.8	4.6	6.0
Espada	4.04	3.65	2.84	3.51 (95)	12.4	10.8	12.0	11.7	3.9	4.1	5.4
Fang	3.31	2.90	2.57	2.92 (79)	13.1	10.6	12.0	11.9	15.3	6.7	11.0
Fortune	3.75	2.95	2.67	3.12 (84)	12.1	11.6	11.8	11.8	2.5	2.6	3.5
Gladius	3.70	3.51	2.87	3.36 (91)	13.2	10.7	12.0	12.0	3.3	3.9	4.1
Katana	4.17	3.94	3.15	3.75 (101)	12.8	10.5	11.8	11.7	3.7	3.4	3.6
King Rock	4.52	3.83	3.11	3.82 (103)	12.5	10.6	11.6	11.6	3.6	3.3	5.5
Lincoln	3.58	3.44	3.03	3.35 (91)	12.6	10.5	11.2	11.5	6.9	4.9	6.2
Mace	4.08	3.94	3.43	3.82 (103)	11.2	10.2	10.4	10.6	3.2	2.5	3.6
Magenta	3.61	3.26	2.77	3.21 (87)	13.2	11.3	11.7	12.1	5.4	4.8	4.9

	Grain Yield (t/ha)			Av t/ha	Protein (%)			Av	Screening (%)		
	20 May	2 Jun	15 Jun	(% Wyalk)	20 May	2 Jun	15 Jun		20 May	2 Jun	15 Jun
Wyalkatchem	4.37	3.68	3.06	3.70 (100)	12.1	10.4	11.2	11.2	1.7	1.3	2.4
Yandanooka	3.32	3.09	2.63	3.01 (81)	13.3	11.2	12.4	12.3	3.1	3.4	6.1
Zippy	3.67	3.94	3.34	3.65 (99)	12.5	10.2	11.5	11.4	3.2	3.4	3.1
Ave within each TOS	3.94	3.54	2.95		12.5	10.7	11.6	11.6	4	3	4
TOS (lsd)	<.001	0.19			0.001	0.47			0.02	0.6	
Var (lsd)	<.001	0.31			<.001	0.49			<.001	1.3	
Var (lsd) between TOS	ns				ns				0.012	2.2	
Var (lsd) within TOS										2.2	
%CV	9.6				4.5%				7%		

COMMENTS

- Crop yields declined by an average of 31 kg/ha/day when sowing was delayed from the 20th May to the 2nd June. Delaying seeding from 2nd June to the 15th June resulted in an average yields decline of 45 kg/ha/day. Note: the first sowing treatment at Coorow was dry sown on the 14th May. Rain initiated germination of this treatment on 20th May.
- There were not any significant interactions between varieties in their response to delayed sowing time from 20th May to the 15th June. The top performing AH/APW varieties were Carnamah, EGA Bonnie Rock, Espada, Katana, King Rock, Mace, Scout, Wyalkatchem and Zippy. Screenings of these varieties was less than 5% at each sowing time.
- The varieties Binnu, EGA Bonnie Rock, Espada, Fang, Lincoln and Yandanooka produced screenings greater than 5% when sown in mid June.

ACKNOWLEDGEMENTS

- Thanks to the GRDC for financial support, Michael Bothe and family for use of the land, the Liebe Group for support with achieving practice change and DAFWA technical services for trial management. Thanks to Steve Penny for comments on the manuscript.

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BARLEY NATIONAL VARIETY TRIAL – WONGAN HILLS

Information from Australian Crop Accreditation System Limited

AIM

Barley variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	Wongan Hills
Plot size & replication	1.76m x 12m x 3m
Soil type	Sandy Loam
Sowing date	04/06/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	04/05/09: 80 kg/ha MacroPro Plus
Herbicides, Insecticides & Fungicides	24/02/09: 50 mL/ha Triclopyr, 1 L/ha Glyphosate, 600 mL/ha 24 D Ester, 140 g/ha Dicamba 04/06/09: 1.5 L/ha Trifluralin, 1 L/ha Paraquat & Diquat, 100 mL/ha Alpha-cypermethrin 22/07/09: 1 L/ha Bromoxynil & Diflufenican, 1 L/ha Bromoxynil & Diflufenican 11/08/09: 500 mL/ha Propiconazole
Growing Season Rainfall	310 mm

RESULTS

Table 1: Yield of barley sown at Wongan Hills.

Variety	Yield (t/ha)
Baudin	3.07
Buloke	3.36
Capstan	2.90
Commander	3.16
Doolup	3.34
Finniss	3.11
Flagship	2.88
Fleet	3.33
Gairdner	3.08
Grout	3.05
Hamelin	2.81
Hannan	3.46
Hindmarsh	3.35
Lockyer	3.27
Mackay	2.50
Maritime	3.44
Molloy	3.17
Mundah	2.99
Oxford	3.12
Roe	3.42
Stirling	3.00
Vlamingh	3.25
Site Mean (t/ha)	**3.1**
CV (%)	**4.6**
LSD (t/ha)	**0.23**

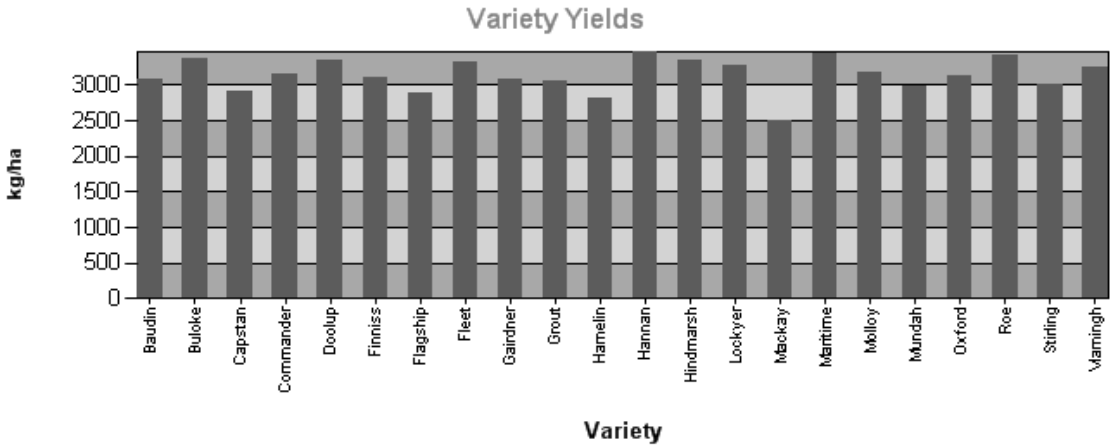

Figure 1: Yield comparisons of barley varieties sown at Wongan Hills.

CONTACT:

For more information please refer to www.nvtonline.com.au

LANDMARK BARLEY VARIETY X FUNGICIDE TRIAL

Sally Edwards, Dalwallinu Agronomist, Landmark

AIM

To compare new and existing barley varieties and their response to different fungicides.

BACKGROUND

Recently released barely varieties, such as Buloke and Hindmarsh, have shown significant improvements in disease suppression compared to existing varieties, such as Baudin and Hamelin. The profitability of a fungicide application may not be warranted with some of these new varieties.

VBHT 805 is a new barley variety being investigated for imidazilinone tolerance across Australia.

TRIAL DETAILS

Property	McIlroy family, Pithara
Plot size & replication	10m x 2m x 3 replicates
Soil type	Acid Sandy Loam
Sowing date	15/06/2009
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	15/06/09: 90 kg/ha Agstar Xtra, 75 kg/ha Urea
Paddock rotation	2007 = Wheat, 2008 = Lupins
Herbicides	15/06/09: 2.5 L/ha Boxer Gold; 2 L/ha Sprayseed 21/07/09: 500 mL/ha Jaguar; 500 mL/ha Velocity
Growing Season Rainfall	201mm

RESULTS

Table 1: Yield and gross margin of barley varieties.

Variety	Yield (t/ha)	% of Baudin	Gross Margin $
Baudin	0.79	100%	126
Buloke	0.95	120%	152
Hamelin	0.76	96%	122
Hindmarsh	0.87	110%	139
VBHT805	1.04	131%	166
LSD	**0.31**	**39%**	

Based on Feed Barley price of $160/tonne.

There was no response to the fungicides Prosaro, Tilt or Folicur in this trial and results have not been included.

COMMENTS

- This trial was severely impacted by both an acid subsoil layer and compaction zone, which has reduced yields significantly with the dry finish in September and October. This highlights the importance of subsoil pH testing, which was only carried out after the trial was sown. Deep ripping and liming would have been of benefit to access moisture further down the soil profile, particularly with the dry finish.
- The best yielding barley varieties were Buloke and the imidazilinone tolerant variety VBHT805, yielding 0.95 t/ha and 1.04 t/ha respectively. This was 20% and 31% higher than Baudin.
- Due to the low yields there was no significant response to fungicide application and further work is required.

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CANOLA NATIONAL VARIETY TRIAL - PITHARA

Information from Australian Crop Accreditation System Limited

GRDC Grains Research & Development Corporation

National Variety Trials

AIM

Canola variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited

TRIAL DETAILS

Property	Mcllory family, Pithara
Plot size & replication	1.32m x 12m x 3 replicates
Soil type	Loamy Sand
Sowing date	29/05/2009
Seeding rate	3.5 kg/ha
Fertiliser (kg/ha)	29/05/2009: 150 kg/ha Maxam, 100 kg Vigour Special 31/07/2009: 100 kg/ha Urea
Paddock rotation	2006: Lupins, 2007: Wheat, 2008: Wheat
Herbicides, Insecticides & Fungicides	28/05/2009: 1.1 kg/ha Atrazine, 1.6 L/ha Trifluralin, 1.5 L/ha Roundup Powermax, 1 L/ha Chlorpyrifos 30/09/2009: 0.5 L/ha Chlorpyrifos, 0.4 L/ha Alpha-Cyp
Growing Season Rainfall	201mm

RESULTS

Table 1: Yield and flowering date of canola sown at Marchagee.

Variety	Yield (t/ha)	% of site mean	Early Growth Score 1- Poor 0 – Excellent	Establishment 0-none 9-Maximum	50% Flowering Yearday
ATR Cobbler	1.56	118	4.7	6.0	231.33
BravoTT	1.19	90	5.0	5.7	237.67
CB Argyle	1.33	101	3.0	4.0	242.00
CB Jardee HT	1.33	101	5.0	5.7	238.67
CB Scaddan	1.29	98	5.0	5.7	237.67
CB Tanami	1.45	110	4.7	5.0	232.00
CB Telfer	1.61	122	5.3	5.7	228.00
CB Tumby HT	1.31	99	4.3	5.3	237.67
Hurricane TT	1.34	102	4.7	6.3	235.00
Rottnest TTC	1.33	101	4.3	4.3	242.67
Lightning TT	0.96	73	5.0	5.3	234.00
Tawriffic TT	1.13	86	4.7	4.0	238.67
Site Mean (t/ha)	1.32				
CV (%)	6.43				
LSD (t/ha)	0.14	11			

COMMENTS

- NVT results will be presented at the Liebe Group Crop Updates on the 3rd of March, 2010.

CONTACT:

For more information please refer to www.nvtonline.com.au

CANOLA VARIETY DEMONSTRATION PITHARA

Nadine Hollamby, GRDC Project Coordinator, Liebe Group

AIM

To evaluate new and existing canola varieties, sown using farmer equipment.

BACKGROUND

As part of the state wide Oilseeds WA program, 14 triazine tolerant canola varieties were trialed using farmer machinery. Oilseeds WA trials complement NVT trials and provide information relevant to local environment for growers to base their decisions regarding varieties.

TRIAL DETAILS

Property	Mcllroy family, Pithara
Plot size & replication	70m x 12m x 2 replicates
Soil type	Sandy Loam
Sowing date	19/05/09
Seeding rate	5 kg/ha
Fertiliser (kg/ha)	100 kg/ha Agras, 60 kg/ha Urea
Paddock rotation	2008: Volunteer Pasture, 2007: Oats
Herbicides	2.2 kg/ha Atrazine 300ml/ha select
Growing Season Rainfall	201mm

RESULTS

Table 1: Yield, protein and oil of canola sown at Pithara.

Variety	Yield (t/ha)	Protein (%)	Oil (%)
T2196	0.4a	24.1ab	41.8a
Argyle	0.5a	26.3a	38.2b
Rottnest	0.5a	22b	42.3a
Hurricane	0.6a	23.1b	41.6a
Bravo	0.6a	25.5a	41.8a
Thunder	0.6a	24.2ab	42.3a
Scadden	0.6a	23.7b	39.8b
Tawriffic	0.6a	23.3b	41.4a
ATR409	0.6a	23.8b	40.2ab
Cobbler	0.7ab	24.1ab	42.3a
Telfer	0.7ab	24.6a	42.4a
Jardee	0.7ab	25.1a	41.4a
Tornado	0.8ab	25.9a	37.9b
Tanami	1.1b	25.3a	40.6ab
LSD	0.4	2.3	2.5

Results with different letter denotes a significant difference from each other p=0.05.

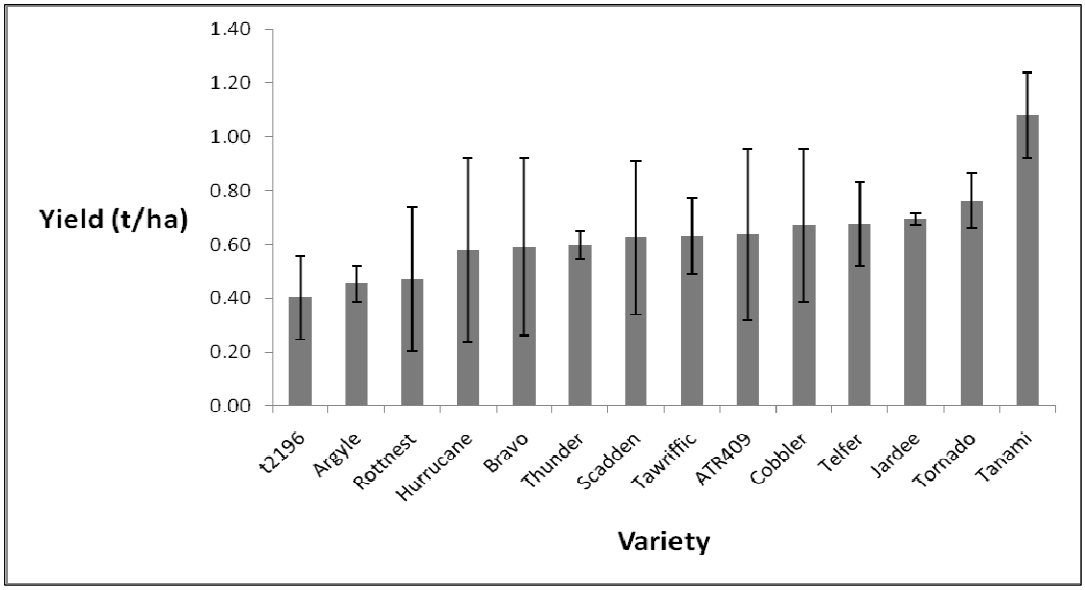

Figure 1: Yield (t/ha) of canola varieties grown at Pithara. Values are means of two replicates

COMMENTS

- Tanami was the highest yielding variety in this trial although not significantly higher than all other varieties.
- Some varieties had poor establishment in the 2nd replicate which resulted in high variability between replicates.
- Please interpret results of farmer demonstrations carefully and utilise numerous sources of data to make final decisions regarding varieties.

ACKNOWLEDGEMENTS

- Thank you to Brad and Darrell McIlroy for hosting the demonstration and carrying out seeding, harvesting and maintenance of the trial.

REFERENCES

- DAFWA, FarmNote: 346 '*canola variety guide Western Australia*', 2009.

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LUPIN NATIONAL VARIETY TRIAL – PITHARA

Information from Australian Crop Accreditation System Limited

GRDC Grains Research & Development Corporation

National Variety Trials

AIM

Lupin variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	McIlroy Family, Pithara
Plot size & replication	1.76m x 12m x 3 replicates
Soil type	Sandy Loam
Sowing date	28/05/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	28/05/09: 80 kg/ha Big Phos Manganese
Paddock rotation	2006 = Wheat, 2007 = Lupin, 2008 = Wheat
Herbicides, Insecticides & Fungicides	28/05/09: 100 mL/ha Bifenthrin, 1.1 L/ha Simazine, 2 L/ha Paraquat & Diquat 04/07/09: 150 mL/ha Diflufenican 13/07/09: 100 mL/ha Hasten, 500 mL/ha Clethodim 01/09/09: 160 mL/ha Alpha-cypermethrin 10/10/09: 300 mL/ha Alpha-cypermethrin
Growing Season Rainfall	201mm

RESULTS

Table 1: Yield of lupins sown at Pithara.

Variety	Yield (t/ha)
Belara	1.68
Coromup	1.63
Danja	1.39
Jenabillup	1.76
Mandelup	1.76
Quilinock	1.59
Tanjil	1.42
Site Mean (t/ha)	**1.7**
CV (%)	**4.2**
LSD (t/ha)	**0.12**

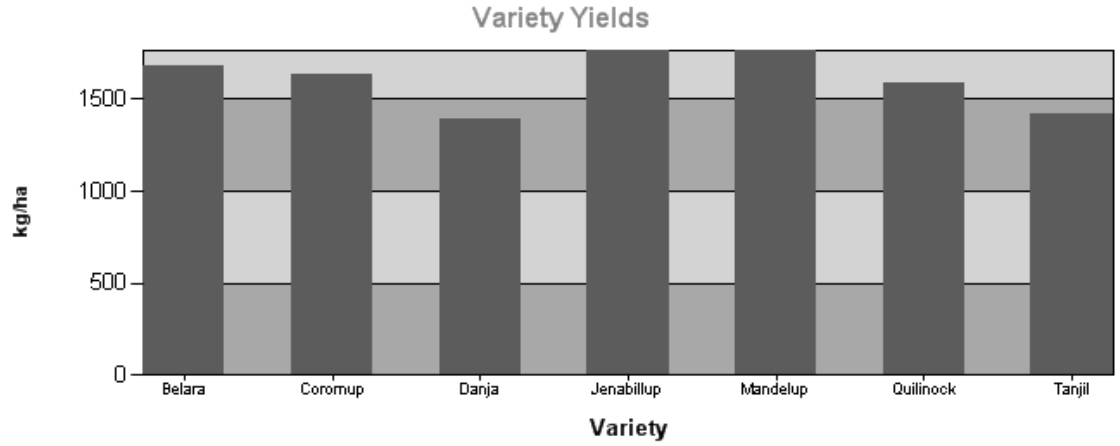

Figure 1: Yield comparisons of lupin varieties sown at Pithara.

CONTACT:

For more information please refer to www.nvtonline.com.au

LUPIN NATIONAL VARIETY TRIAL – WONGAN HILLS

Information from Australian Crop Accreditation System Limited

AIM

Lupin variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	Wongan Hills Research Station
Plot size & replication	1.76m x 12m x 3 replicates
Soil type	Sandy Loam
Sowing date	25/05/09
Seeding rate	100 kg/ha
Fertiliser (kg/ha)	25/05/09: 80 kg/ha Big Phos Manganese
Paddock rotation	
Herbicides, Insecticides & Fungicides	09/03/09: 600 mL/ha 2,4-D Ester, 1 L/ha glyphosate, 25/05/09: 100 mL/ha bifenthrin, 2 L/ha Paraquat & Diquat, 01/07/09: 500 mL/ha clethodim, 100 mL/ha Hasten, 14/07/09: 150 mL/ha Diflufenican, 25/08/09: 800 mL/ha Dimethoate 09/10/09: 300 mL/ha alpha-cypermethrin
Growing Season Rainfall	309mm

RESULTS

Table 1: Yield of Lupins sown at Wongan Hills.

Variety	Yield (t/ha)
Belara	2.18
Coromup	2.02
Danja	1.73
Jenabillup	2.15
Mandelup	2.44
Quilinock	1.87
Tanjil	1.86
Site Mean (t/ha)	2.07
CV (%)	10.4
LSD (t/ha)	0.37

CONTACT:

For more information please refer to www.nvtonline.com.au

CHICKPEA NATIONAL VARIETY TRIAL – PITHARA

Information from Australian Crop Accreditation System Limited

AIM

Chickpea variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	McIlroy Family, Pithara
Plot size & replication	1.76m x 12m x 3 replicates
Soil type	Sandy Loam
Sowing date	03/06/09
Seeding rate	75 kg/ha
Fertiliser (kg/ha)	03/06/09: 80 kg/ha DAP
Paddock rotation	2008= Wheat, 2007 = Volunteer pasture
Herbicides, Insecticides & Fungicides	25/03/09: 2 L/ha Alpha-cypermethrin 03/06/09: 100 kg/ha Isoxaflutole, 1 L/ha Paraquat & Diquat, 1 kg/ha Simazine, 1 L/ha Trifluralin 13/07/09: 10 mL/ha Hasten, 500 mL/ha Clethodim 01/09/09: 160 mL/ha Alpha-cypermethrin 10/10/09: 300 mL/ha Alpha-cypermethrin
Growing Season Rainfall	201mm

RESULTS

Table 1: Yield of chickpeas sown at Pithara.

Variety	Yield (t/ha)
Genesis 079	0.83
Genesis 090	0.58
Genesis 510	0.87
Genesis 836	0.86
Howzat	0.63
PBA HatTrick	0.80
PBA Slasher	0.78
Sonali	1.03
Yorker	0.63
Site Mean (t/ha)	**0.75**
CV (%)	**9.5**
LSD (t/ha)	**0.14**

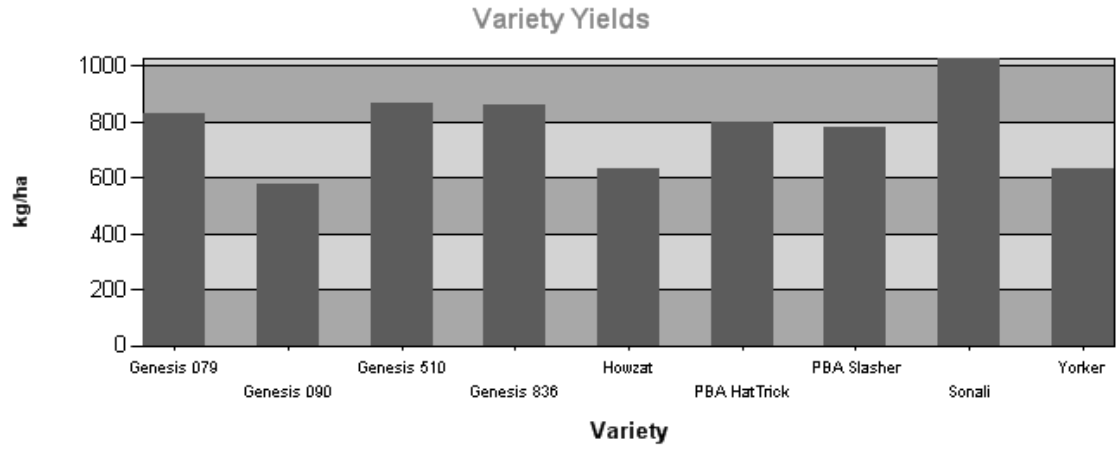

Figure 1: Yield comparisons of chickpea varieties sown at Pithara.

CONTACT:

For more information please refer to www.nvtonline.com.au

CHICKPEA NATIONAL VARIETY TRIAL – WINCHESTER

Information from Australian Crop Accreditation System Limited

Grains Research & Development Corporation

National Variety Trials

AIM

Chickpea variety evaluation.

BACKGROUND

NVT is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. The program is supported by the Australian Government and growers through the Grains Research and Development Corporation and is managed by the Australian Crop Accreditation System Limited.

TRIAL DETAILS

Property	Bruce White, Winchester
Plot size & replication	1.76m x 12m x 3 replicates
Soil type	Loamy Sand
Sowing date	28/05/09
Seeding rate	
Fertiliser (kg/ha)	28/06/09: 80 kg/ha DAP
Paddock rotation	
Herbicides, Insecticides & Fungicides	28/05/09: 100 mL/ha Alpha-cypmethrin, 2 L/ha Simazine, 110 kg/ha Isoxaflutole, 03/07/09: 500 mL/hasten, 500 mL/ha clethodim, 14/07/09: 25 g/ha Flumetsulam, 03/08/09: 1.5 L/ha Chlorothalonil, 17/09/09: 100 mL/ha Alpha-cypmethrin,
Growing Season Rainfall	

RESULTS

Table 1: Yield and quality of chickpeas sown at Winchester.

Variety	Yield (t/ha)
Genesis 079	1.85
Genesis 090	1.73
Genesis 510	1.74
Genesis 836	1.78
Howzat	1.70
PBA HatTrick	1.67
PBA Slasher	1.78
Sonali	2.02
Yorker	1.74
Site Mean (t/ha)	1.69
CV (%)	4.9
LSD (t/ha)	0.16

CONTACT:

For more information please refer to www.nvtonline.com.au

THE SEARCH FOR A NEW LUPIN HERBICIDE

Peter Newman, Weeds Research Officer, Department of Agriculture and Food, WA

Department of Agriculture and Food

AIM

To identify some herbicide options that show promise for post-emergent control of wild radish control with acceptable crop safety in lupins.

BACKGROUND

Narrow leaf lupins *Lupinus angustifolius* are a relatively small crop on a global scale. Consequently, there is very little investment by chemical companies into the development of new herbicides for use in lupins. Wild radish is a major threat to the lupin industry as it is rapidly developing resistance to the small range of herbicides that are registered for its control. As a part of a new GRDC funded project, the search is on to find new herbicide options for wild radish control in lupins. In the event of finding a viable herbicide option, we will seek to collaborate with the relevant chemical company/s to seek registration of the product.

TRIAL DETAILS

Property	McIlroy family, Pithara
Plot size & replication	24m x 3m x 3 replicates
Soil type	Gravelly Sand
Sowing date	15/05/09 dry. Germinating rain 21 May 2009.
Seeding rate	100 kg/ha Mandelup
Fertiliser (kg/ha)	80 kg/ha Agras
Paddock rotation	2006 = Lupins, 2007 = Wheat, 2008 = Wheat
Herbicides	Simazine 1.1 kg/ha pre sowing, Post emergent treatments applied 3rd July 09. Crop 4 to 8 leaf at spraying. Wild radish 2 leaf (5cm) to 6 leaf (30cm) at spraying. DG11002 nozzles 200 kpa, 63 L water/ha.
Growing Season Rainfall	201mm

RESULTS

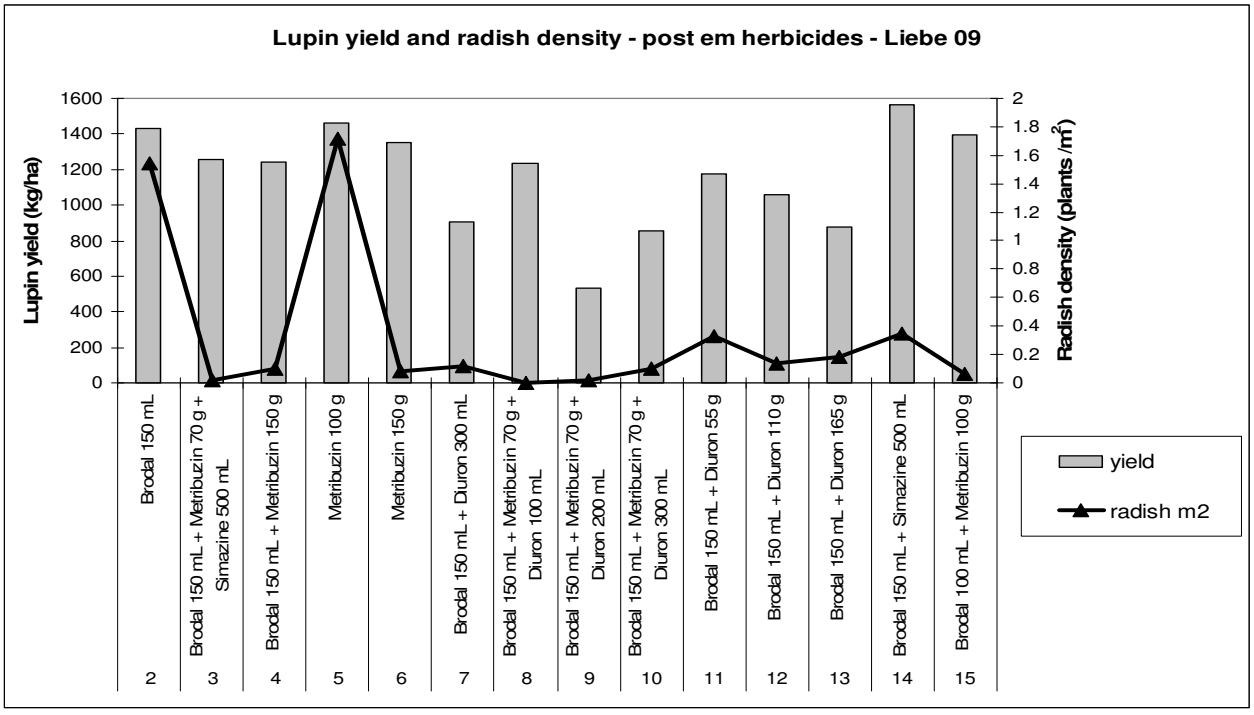

Figure 1: Lupin yield (kg/ha) and wild radish density (plants/m^2) for a range of post-emergent herbicides applied at the 8 leaf stage of lupins – Liebe '09.

COMMENTS

- Very high levels of crop phyto-toxicity were observed at this trial approximately seven days after spraying. Generally speaking, the treatments that caused the greatest crop phyto-toxicity gave the best wild radish control. There was a very strong correlation between crop biomass (rated 12th August) and final lupin yield. The lupins recovered remarkably well from this damage, probably as a result of the favourable growing conditions after spraying.
- This trial demonstrates just how difficult it is to develop new herbicide options in lupins. The herbicide brews that gave the greatest weed control also caused the greatest crop damage and the lowest yields. The old standards of Brodal + simazine, Brodal + metribuzin and the three way mix of Brodal + simazine + metribuzin gave the best weed control with the most acceptable crop damage. The very poor radish control with Brodal alone demonstrates just how important it is to mix this product with a group C herbicide for best results. All of the mixes containing Diuron post-emergent were very damaging probably as a result of heavy rain in the weeks following spraying. The most surprising result in this trial was the high level of wild radish control achieved with metribuzin 150 g/ha alone. This was also observed at two other trials in 2009. Heavy rainfall after spraying may have contributed to this result.
- Ultimately, the lupin industry needs a new post-emergent wild radish herbicide of novel mode of action. At the moment, indications are that this is unlikely to happen in the coming years. These trials demonstrate that there are a number of suitable herbicide options for wild radish control, the problem is that lupinas have very poor herbicide tolerance. There is potential to pursue registration of some pre-sowing herbicides that may offer improved suppression of wild radish but are unlikely to offer high levels of control. Future research will continue to explore novel herbicides as well as investigate the possibility of crop safteners/plant breeding to enhance lupin herbicide tolerance.
- Another trial at Mingenew in 2009 explored the option of applying Brodal first followed by metribuzin alone one or two weeks later. There was no benefit of the split application in this trial but it was applied late to large weeds. The paddock surrounding this trial at Liebe was also sprayed with a split application of Brodal and Metribuzin also with disappointing results. This option will be further investigated on smaller weeds in the future.

ACKNOWLEDGEMENTS

- Many thanks to the McIlroy family and the Liebe Group for their cooperation.
- Thank you also to Dave Nicholson and the Geraldton RSU for technical support.

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SAKURA® 850WG COMPARED TO STANDARD HERBICIDES FOR THE PRE-EMERGENT CONTROL OF ANNUAL RYEGRASS (*LOLIUM RIGIDUM*) IN WHEAT AND BARLEY

Rick Horbury, Technical Advisor, Bayer CropScience

AIM

To demonstrate the crop safety and efficacy of Sakura 850WG pre-emergent herbicide on annual ryegrass (*Lolium rigidum*) in wheat and barley compared to currently available chemistry.

BACKGROUND

Bayer CropScience is planning to launch Sakura 850WG containing the new active ingredient pyroxasulfone in time for the 2011 season.

Sakura 850WG has been submitted for registrations for the pre-emergent control of annual ryegrass and barley grass in wheat, barley and triticale. This pre-emergent herbicide works through both root and shoot uptake. Sakura 850WG can be applied up to 14 days prior to sowing with knife points and press wheels or knife points and harrows. Sakura® 850WG works best when incorporated by sowing (IBS).

Sakura 850WG is to be applied at 118 g/ha and is compatible with a range of other knockdown and pre-emergent products.

TRIAL DETAILS

Property:	McIllroy family, Pithara
Plot size & replication:	2.5 m x 10 m x 3 replicates
Soil type:	Sandy Loam
Application date:	26/05/09 (1 hour prior to incorporation)
Water Rate:	80 L/ha
Ground Speed:	9.1 kph applied by quad bike
Nozzle Type:	DG11002 (Yellow Drift Guard 02's)
Sowing date:	26/05/09
Soil condition:	Low stubble, mostly bare ground with nil green weeds at application
Seeding Rate/ Treatment:	80 kg/ha wheat (Wyalkatchem) + Jockey® Stayer® at 4.5 L/tonne 65 kg/ha barley (Hindmarsh) + Jockey Stayer at 3 L/tonne
Seeding depth:	3 cm
Seeding Equipment:	Primary sales plot seeder with Morris Gumbo no til points & press wheels
Paddock rotation	2008 = Lupins, 2007 = Wheat
Fertiliser (kg/ha):	100 kg/ha MAPSZC Plus; 100 kg/ha urea 31/07/09 60 kg/ha urea topdressed
Herbicides:	26/05/09 - 2 L/ha Sprayseed® 07/07/09 - 670 mL/ha Velocity® + Hasten® 1% v/v
Insecticides:	1 L/ha chlorpyrifos
Fungicides:	25/08/09 - 150 mL/ha Prosaro® + 10 L/ha Summit UAN + Uptake® 0.5% v/v
Growing season rainfall:	201mm

RESULTS

Table 1: Crop effects and yield from Wyalkatchem wheat.

	Assessment Date		24/06/09	24/06/09	11/08/09	11/09/09	24/11/09	24/11/09
	Appl.-Ass.Interval		28 DAA	28 DAA	76 DAA	107 DAA	181 DAA	181 DAA
	Rating Type		Rating	Rating	Rating	Rating	Harvest	%REL
	Rating Scale		%	%	%	%	Weight	Weight
Treatment	**Rate**	**Unit**	**Phytotox.**	**Biomass Reduction**	**Biomass Reduction**	**Biomass % Untr.**	**t/ha**	**% untreated**
Untreated			0	0	0	100	0.74 b	100
Sakura® 850 WG	118.0	g/ha	0	0	0	108	1.88 a	255
Treflan® EC	1.5	L/ha	0	0	0	107	1.54 a	210
Treflan EC	2.0	L/ha	0	0	0	103	1.54 a	210
Boxer® Gold	2.5	L/ha	0	0	0	103	1.48 a	201

CROP SAFETY IN WHEAT

There was no phytotoxicity (discolouration) or reduction in biomass recorded from any treatment during the trial. A biomass rating 107 DAA (untreated = 100%) recorded an increase in biomass for Sakura 850WG (108%) and Treflan at 1.5 L/ha (107%), the other treatments recorded a comparable biomass rating (103%) to the untreated. Harvest yields between herbicide treatments were not statistically significantly different although all herbicide treatments yielded significantly better than the untreated plots.

Sakura 850WG was very safe on wheat in this trial.

Table 2: Control of annual ryegrass (*Lolium rigidum)* in Wyalkatchem wheat.

	Assessment Date		24/06/09	11/08/09	11/09/09
	Appl.-Ass.Interval		28 DAA	76 DAA	107 DAA
	Rating Type		Rating	Rating	Rating
	Rating Scale		%	%	%
Treatment	**Rate**	**Unit**	**Control**	**Control**	**Control**
Untreated			0	0	0
Sakura 850 WG	118.0	g/ha	75	64	79
Treflan EC	1.5	L/ha	82	55	57
Treflan EC	2.0	L/ha	82	56	62
Boxer Gold	2.5	L/ha	78	52	57

WEED CONTROL IN WHEAT

Treflan was slightly more active under the early drier conditions of the season than Sakura 850WG and Boxer Gold at 28 DAA. Ratings of early ryegrass control recorded slightly lower control from Sakura 850WG and Boxer Gold compared to Treflan at 28 DAA. A wet July stimulated further ryegrass germinations and under these conditions Sakura 850WG recorded a higher level of control than Treflan or Boxer Gold. The residual nature of Sakura 850WG, and its ability to recharge after rain events, resulted in Sakura 850WG providing a higher level of season end control of ryegrass than both Treflan and Boxer Gold in wheat.

Table 3: Crop effects and yield from Hindmarsh barley.

	Assessment Date		24/06/09	24/06/09	11/08/09	11/09/09	24/11/09	24/11/09
	Appl.-Ass.Interval		28 DAA	28 DAA	76 DAA	107 DAA	181 DAA	181 DAA
	Rating Type		Rating	Rating	Rating	Rating	Harvest	%REL
	Rating Scale		%	%	%	%	Weight	Weight
Treatment	**Rate**	**Unit**	**Phytotox.**	**Biomass Reduction**	**Biomass Reduction**	**Biomass % Untr.**	**t/ha**	**% untreated**
Untreated			0	0	0	100	1.02 b	100
Sakura 850 WG	118.0	g/ha	0	0	3	102	1.60 a	156
Treflan EC	1.5	L/ha	0	0	0	105	1.69 a	165
Treflan EC	2.0	L/ha	0	0	0	108	1.81 a	177
Boxer Gold	2.5	L/ha	0	0	0	102	1.42 a	139

CROP SAFETY IN BARLEY

There were no issues with phytotoxicity recorded from any treatment during the trial. A Biomass rating (untreated = 100%) at 107 DAA recorded an increase in biomass from both Treflan treatments, Sakura 850WG and Boxer Gold recorded comparable biomass to the untreated.

Harvest yields between herbicide treatments were not significantly different statistically although all herbicide treatments yielded significantly better than the untreated plots. Sakura 850WG demonstrated acceptable crop safety on Hindmarsh barley in this trial.

Table 4: Control of annual ryegrass (*Lolium rigidum)* in Hindmarsh barley.

	Assessment Date		24/06/09	11/08/09	11/09/09
	Appl.-Ass.Interval		28 DAA	76 DAA	107 DAA
	Rating Type		Rating	Rating	Rating
	Rating Scale		%	%	%
Treatment	**Rate**	**Unit**	**Control**	**Control**	**Control**
Untreated			0	0	0
Sakura 850 WG	118.0	g/ha	77	67	76
Treflan EC	1.5	L/ha	78	69	65
Treflan EC	2.0	L/ha	78	70	60
Boxer Gold	2.5	L/ha	80	66	60

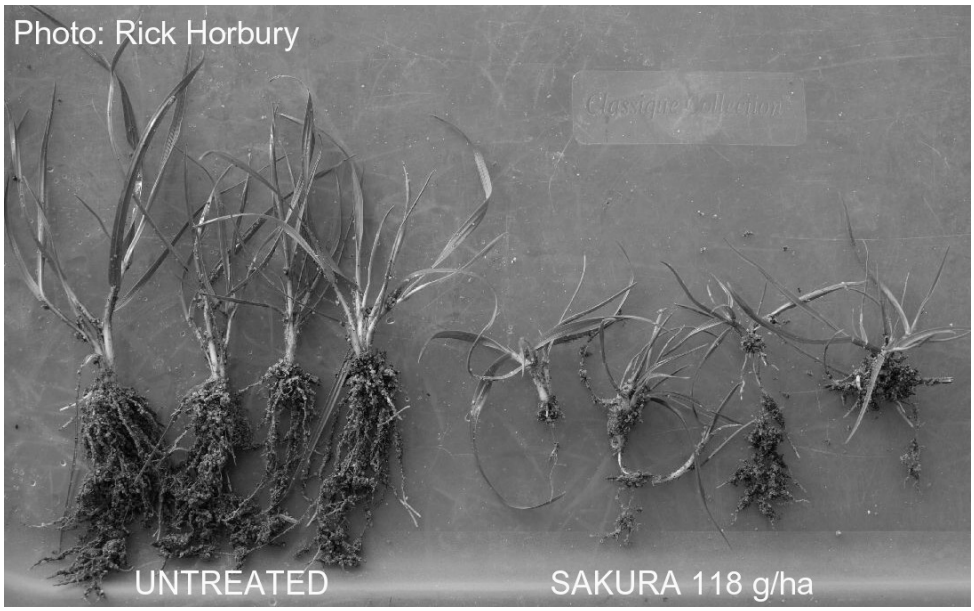

Figure 1: Sakura root pruning and biomass reduction in annual ryegrass 07/07/09 – 41 days after application.

WEED CONTROL IN BARLEY

Ratings of early ryegrass control recorded similar levels of control from all 3 herbicides out to 76 DAA. Overall numbers of ryegrass were lower in the barley due to better crop competition. The residual nature of Sakura 850WG, and its ability to recharge after rain events, resulted in Sakura 850WG providing a higher level of season end control of rye grass than both Treflan and Boxer Gold in barley.

COMMENTS

- There was a very low stubble burden on this site with no weeds present for an application of glyphosate as part of a double knockdown strategy. Despite nil weeds being present on the site on the day of sowing, Sprayseed was applied at 2 L/ha pre sowing.
- The site recorded 25 mm of rainfall 4 days prior to sowing which stimulated a heavy germination of ryegrass.
- A lack of soil moisture at depth and 3 weeks of limited rainfall resulted in the top 3-5 cm of the soil rapidly drying out which made the herbicides unavailable.
- The efficacy of pre emergent herbicides can decline as weed density increases. The seed bank at this site was very high with numbers of ryegrass in the untreated up to 1000 per m^2.
- Due to the timing of application and sowing a large germination of ryegrass emerged through the treatments only a couple of days after application. The dry top soil meant that the herbicides were not available and not as active as they would be under good soil moisture. Some of this initial germination remained growing in the treated plots, with improved control of subsequent germinations recorded when the soil moisture was good. Root activity of Sakura 850WG was observed at this site with a percentage of the original germination controlled or significantly reduced in biomass and seed set due to root pruning (figure 1).
- At the time of publication Sakura 850WG is not registered. An application for the registration of Sakura 850WG has been made.
- Prosaro®, Velocity®, Jockey® and Stayer® are Registered Trademarks of Bayer CropScience.
- Sakura® is a Registered Trademark used under license by Bayer CropScience.

PAPER REVIEWED BY: Greg Skinner, Bayer CropScience.

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VELOCITY® AND PRECEPT® 300EC COMPARED TO STANDARD HERBICIDES FOR THE POST-EMERGENT CONTROL OF WILD RADISH (*RAPHANUS RAPHANISTRUM*) IN WHEAT

Rick Horbury, Technical Advisor, Bayer CropScience

AIM

To demonstrate the efficacy and crop safety of Velocity® and Precept® 300EC post-emergent herbicides applied alone or in tank mixtures compared to currently available standards for the control of wild radish (*Raphanus raphanistrum*) in wheat.

BACKGROUND

Velocity® and Precept® 300EC released in 2009 are two new herbicides from Bayer CropScience containing the active ingredient pyrasulfotole, in conjunction with bromoxynil and MCPA respectively.

Pyrasulfotole is the first HPPD inhibitor (Group H) registered into the Australian cereal market and works in three ways to control broadleaf weeds:

1) Disrupts the energy supply in the target weed.
2) Disrupts the production of vitamin E in the target weed.
3) Destroys the plants protective layer leaving it vulnerable to UV light.

- Velocity® will control wild radish resistant to Group B, Group F and Group I herbicides.
- Velocity® and Precept® 300EC incorporating the latest Bayer CropScience safener provide outstanding crop safety.
- Velocity® and Precept® 300EC provide tank-mixing compatibility with grass herbicides for flexibility and efficiency.

TRIAL DETAILS

Property	Mcllory family, Pithara
Plot size & replication:	2.5m x 15m x 3 replicates
Soil type:	Sandy Loam
Application date:	17/07/09
Water Rate:	80 L/ha
Ground Speed:	7.3 kph applied by Quad bike
Nozzle Type:	DG11015 (Green Drift Guard 015's)
Crop Stage:	Z13/21 - Z14/24
Weed Stage:	40 per m^2 = Cot: 67%, 1 leaf: 12%, 2 leaf: 13%, 5 leaf: 3%, 6 leaf: 3%, 8 leaf: 2%
Sowing date:	28/05/09
Seeding Rate:	Arrino at 65 kg/ha
Paddock rotation	2008 = Wheat
Fertiliser (kg/ha):	80 kg/ha Agras 17/08/09 80 L/ha Flexi N
Growing season rainfall:	201 mm

RESULTS

Table 1: Crop effects in Arrino wheat.

		Assessment Date		11/08/09	11/08/09	21/09/09	21/09/09
		Appl.-Ass.Interval		25 DAA	25 DAA	66 DAA	66 DAA
		Rating Type		Rating	Rating	Rating	Rating
		Rating Scale		0-100	0-100	0-100	0-100
Treatment	**FL-Type**	**Dosage Form.**	**Dosage Unit**	**Discolour**	**Biomass Reduction**	**Discolour**	**Biomass Reduction**
Untreated				0	0	0	0
Velocity	EC	500	mL/ha	0	0	0	0
Hasten	SL		% v/v				
Velocity	EC	670	mL/ha	0	0	0	0
Hasten	SL	1	% v/v				
VelocityY	EC	500	mL/ha	0	0	0	0
MCPA LVE	EC	400	mL/ha				
Hasten	SL	1	% v/v				
Velocity	EC	500	mL/ha	15	0	0	0
Jaguar	EC	250	mL/ha				
Hasten	SL	1	% v/v				
Velocity	EC	500	mL/ha	0	0	0	0
Ally	WG	5	g/ha				
Hasten	SL	1	% v/v				
Velocity	EC	500	mL/ha	0	13	0	2
Atlantis OD	OD	330	mL/ha				
Hasten	SL	1	% v/v				
Precept 300	EC	500	mL/ha	0	0	0	0
Hasten	SL	1	% v/v				
Precept 300	EC	750	mL/ha	0	0	0	0
Hasten	SL	1	% v/v				
Precept 300	EC	500	mL/ha	0	0	0	0
Ally	WG	5	g/ha				
Hasten	SL	1	% v/v				
Jaguar	EC	750	mL/ha	15	0	0	0
Tigrex	EC	750	mL/ha	15	0	0	0
BROMICIDE 200							
Tigrex	EC	750	mL/ha	15	0	0	0
Bromicide 200	EC	500	mL/ha				
Ally	WG	5	g/ha	0	0	0	2
MCPA LVE	EC	500	mL/ha				
Torpedo	SC	100	mL/ha	0	3	0	3
MCPA LVE	EC	500	mL/ha				

CROP SAFETY

Products containing diflufenican (Jaguar® & Tigrex®) recorded general flecking and discolouration normally associated with the application of these products at 25 DAA. Application of Velocity® at 500 mL/ha + Hasten® 1% v/v in tank mixture with Jaguar® at 250 mL/ha recorded no additional phytotoxicity from application with a crop oil. All symptoms had dissipated by 66 DAA.

Velocity® applied at 500 mL/ha + Hasten® in tank mixture with Atlantis® OD recorded some biomass reduction at 25 DAA although by 66 DAA this was negligible and equivalent to that recorded in the Ally® + MCPA or Torpedo® + MCPA treatments.

Table 2: Control ratings and counts (plants/ plot) of wild radish (*Raphanus raphanistrum)* in Arrino wheat.

		Assessment Date		11/08/09	21/09/09	21/09/09	
		Appl.-Ass.Interval		25 DAA	66 DAA	66 DAA	
		Rating Type		Rating	Rating	Count	
		Rating Scale		0-100	0-100	% untreated	
Treatment	**FL-Type**	**Dosage Form.**	**Dosage Unit**	**Control**	**Control**	**Control**	
Untreated				0	0	72plants / plot	a
Velocity	EC	500	mL/ha	93	92	99	bc
Hasten	SL		% v/v				
Velocity	EC	670	mL/ha	96	97	99	bc
Hasten	SL	1	% v/v				
Velocity	EC	500	mL/ha	93	96	99	bc
MCPA LVE	EC	400	mL/ha				
Hasten	SL	1	% v/v				
Velocity	EC	500	mL/ha	94	95	99	bc
JAGUAR	EC	250	mL/ha				
Hasten	SL	1	% v/v				
Velocity	EC	500	mL/ha	80	92	98	bc
Ally	WG	5	g/ha				
Hasten	SL	1	% v/v				
Velocity	EC	500	mL/ha	94	92	98	bc
Atlantis OD	OD	330	mL/ha				
Hasten	SL	1	% v/v				
Precept 300	EC	500	mL/ha	79	91	97	bc
Hasten	SL	1	% v/v				
Precept 300	EC	750	mL/ha	77	92	97	bc
Hasten	SL	1	% v/v				
Precept 300	EC	500	mL/ha	82	92	96	bc
Ally	WG	5	g/ha				
Hasten	SL	1	% v/v				
Jaguar	EC	750	mL/ha	79	87	93	bc
Tigrex	EC	750	mL/ha	78	92	96	bc
Tigrex	EC	750	mL/ha	96	95	98	bc
Bromicide 200	EC	500	mL/ha				
Ally	WG	5	g/ha	52	76	73	b
MCPA LVE	EC	500	mL/ha				
Torpedo	SC	100	mL/ha	79	83	90	bc
MCPA LVE	EC	500	mL/ha				

WEED CONTROL

The wild radish density was low and variable across the site so plant counts were conducted on a per plot basis. Results are typical of low density populations when good coverage of target weeds is possible.

The application of Velocity® at 500 mL/ha + Ally® at 5 g/ha + Hasten® 1% recorded a slower speed of kill than Velocity® 500 mL/ha + Hasten® 1% at 22 DAA.

At 66 DAA based on plant counts and ratings all Velocity® treatments and tank mixtures provided excellent control (92-99%) of wild radish.

Based on ratings 66 DAA Velocity® at 670 mL/ha (97%) recorded a higher level of wild radish control than Jaguar® at 750 mL/ha (87%).

At 66 DAA based on plant counts and ratings all Precept® 300EC treatments and tank mixtures (91-97%) provided control of wild radish comparable to Tigrex® applied at 750 mL/ha (92-96%).

There was an increase in control when bromoxynil (98%) was added to Tigrex®.

All Velocity®, Precept® 300EC, Jaguar® and Tigrex® treatments (93-99%) provided superior numerical control based on plant counts compared to Torpedo® + MCPA (90%).

Based on plant counts Ally® + MCPA (73%) did not provide adequate control of wild radish at 66 DAA.

COMMENTS

- Velocity®, Precept® 300EC, Atlantis® OD, Jaguar® and Tigrex® are Registered Trademarks of Bayer CropScience.
- Targeting broadleaf weeds more effectively:
  1. Targeting multiple germinations
     - Apply a herbicide with residual activity on wild radish like Jaguar early (3 leaf crop) to thin emergence of subsequent germinating wild radish.
     - Plan for at least two herbicide applications each from different groups i.e. early bromoxynil & late MCPA mixtures.
  2. Herbicide rate
     - Inspect the paddock and determine representative weed size and potential problem areas.
     - If you have six leaf wild radish in the paddock use a rate to target that size plant.
  3. Timing of application
     - Apply broadleaf & grass herbicides separately if possible.
     - Follow the label guidelines and apply in the timing windows specified.
     - Increase rates if several days between consultants recommendation and field application, but not beyond maximum label rate.
  4. Coverage
     - Increase water rates (70 L/ha – 100 L/ha).
     - Apply first residual spray with diflufenican early to ensure maximum ground coverage.
     - Ground speed 20 - 25 kph.
     - Reduce stubble height in high yielding crops to avoid issues the following year.
  5. Resistance
     - Know the resistance status of the weeds in the paddock (if you are concerned get it tested).

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DEMONSTRATION OF ATLANTIS® OD VS COMPETITOR PRODUCTS FOR THE CONTROL OF BARLEY GRASS IN WHEAT

Rick Horbury, Technical Advisor, Bayer CropScience

AIM

1. To demonstrate the efficacy of Atlantis OD and Monza® for management of barley grass.
2. To demonstrate the tank mix properties of Velocity® and Precept® 300 EC for one pass weed control.

BACKGROUND

Atlantis OD is a formulation containing ODesi® fluid power technology from Bayer CropScience that was released in Western Australia during the 2009 season.
Atlantis OD contains the active ingredient mesosulfuron-methyl and is a Group B herbicide (ALS inhibitors).
Atlantis OD is registered for the post-emergent control of wild oats and suppression of brome grass and barley grass in wheat and is recommended to be applied with Hasten® at 1% v/v.
Atlantis OD will substantially reduce the growth of barley grass and its ability to compete with the crop and will reduce seed-set but may not give a significant reduction in plant numbers. For best results apply Atlantis OD within 4 to 7 weeks after sowing when the majority of barley grass is at the 3 leaf stage and prior to early tillering (Z14, 22). Wheat should be at the 3 leaf stage (Z13), or more advanced, before the application of Atlantis OD.

Velocity and Precept 300 EC provide tank-mixing compatibility with selective grass herbicides for flexibility and efficiency.

TRIAL DETAILS

Property	Mcllroy family, Pithara
Plot size & replication:	2.5m x 12m x 4 replicates
Soil type:	Clay Loam
Application date:	08/07/09
Water rate:	80 L/ha
Ground speed:	5.1 km/h applied by hand boom
Nozzle type:	Agrotop, airmix 110-01
Crop stage:	Z13-21
Weed stage:	725/m^2 = 30% Z11; 40% Z12; 20% Z13; 10% Z21
Sowing date:	28/05/09
Crop type:	Wheat variety Westonia
Seeding rate:	65 kg/ha
Paddock rotation	2008 = Wheat
Fertiliser (kg/ha):	80 kg/ha Agras 30/07/09 50 kg/ha urea topdressed
Growing season rainfall:	201 mm

RESULTS

Table 1: Crop phytotoxicity (0-100) 26/08/2009 49 DAA Z39; Grain yield (t/ha) 24/11/2009 139 DAA.

Treatment	Rate	Crop phytotoxicity	Grain yield	
			t/ha	% untreated
Untreated		0	1.43 c	100.0
Atlantis OD Hasten	330 mL/ha 1 % v/v	0	1.86 ab	130.1
Atlantis OD Velocity Hasten	330 mL/ha 670 mL/ha 1 % v/v	0	1.93 a	135.4
Atlantis OD Precept 300 Hasten	330 mL/ha 500 mL/ha 1 % v/v	0	1.81 ab	127.0
Crusader® BS 1000	500 mL/ha 0.25 % v/v	0	1.79 ab	125.2
Crusader Velocity BS 1000	500 mL/ha 670 mL/ha 0.25 % v/v	0	1.78 ab	124.8
Crusader Precept 300 BS 1000	500 mL/ha 500 mL/ha 0.25 % v/v	0	1.72 ab	120.8
Monza Bonza®	25 g/ha 1 % v/v	0	1.89 ab	132.3
Monza Velocity Bonza	25 g/ha 670 mL/ha 1 % v/v	0	1.86 ab	130.5
Monza Precept 300 Bonza	25 g/ha 500 mL/ha 1 % v/v	0	1.91 ab	133.6

CROP SAFETY

An early assessment of crop safety was conducted by the contractor however this data was unavailable for inclusion in this report at the time of writing. Application of Atlantis OD like most Group B herbicides may result in some early crop discolouration and biomass reduction in the first few weeks after application. An assessment at 49 DAA recorded no crop discolouration or biomass effects in this trial.

GRAIN YIELD

All Atlantis OD, Monza and Crusader treatments significantly out-yielded the untreated. Atlantis OD applied at 330 mL/ha + Hasten 1% and Monza applied at 25 g/ha + Bonza 1% recorded comparable crop yields that were numerically higher than Crusader applied at 500 mL/ha + BS 1000 0.25%. Atlantis OD, Monza or Crusader applied in tank mixtures with Velocity at 670 mL/ha or Precept 300EC at 500 mL/ha did not record any significant yield differences. Atlantis OD, applied in tank mixture with Velocity recorded the highest (numerical) yield in this trial.

Table 2: Barley grass control ratings (0-100) and counts (plants /m2) 26/08/2009 49 DAA Z22-Z41.

Treatment	Rate	Barley grass		
		Rating % Control	Count % Control	
Untreated		0	337/ m²	b
Atlantis OD Hasten	330 mL/ha 1 % v/v	80	49	a
Atlantis OD Velocity Hasten	330 mL/ha 670 mL/ha 1 % v/v	80	49	a
Atlantis OD Precept 300 Hasten	330 mL/ha 500 mL/ha 1 % v/v	73	37	ab
Monza Bonza	25 g/ha 1 % v/v	79	53	a
Monza Velocity Bonza	25 g/ha 670 mL/ha 1 % v/v	70	31	ab
Monza Precept 300 Bonza	25 g/ha 500 mL/ha 1 % v/v	69	22	ab

WEED CONTROL

The trial was orientated incorrectly and instead of header rows running evenly across all plots within a replicate they ran along the plots. As a result the weed counts were variable due to some plots having a higher density of barley grass in them from the old header rows while other plots contained a more moderate and even density. This was taken into account when doing plot ratings and as a result they give the most accurate reflection of the barley grass suppression offered by each treatment.

Based on control ratings Atlantis OD applied at 330 mL/ha + Hasten 1% and Monza applied at 25 g/ha + Bonza 1% recorded comparable control of barley grass. Atlantis OD applied in a tank mixture with Velocity at 670 mL/ha did not record any difference in grass control although there was a slight reduction in the tank mixture with Monza. Atlantis OD and Monza treatments recorded a slight reduction in control when applied in tank mixture with Precept 300 EC at 500 mL/ha compared to solo application although none was statistically significant based on plant counts.

COMMENTS

- Velocity®, Precept® ODesi® and Atlantis® are Registered Trademarks of Bayer.

ACKNOWLEDGEMENTS:

- Thanks to Kalyx Agriculture for conducting the trial.

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SPRAY.SEED KNOCKDOWN MIXTURES FOLLOWING ROUNDUP READY* CANOLA

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Jason Sabeeney, Technical Services Manager, Syngenta
Ian Macdonald, Northern Area Manager, Syngenta

AIM

The objective of this trial was to evaluate the knockdown efficiency of Spray.Seed with and without common tank mix 'spikes', at various rates, on the control of grass and broadleaf weeds including Roundup Ready* canola volunteers.

*Simulated by TT canola

BACKGROUND

Spray.Seed is commonly used as a knockdown herbicide to control small weeds. This trial aims to demonstrate that higher use rates, or the addition of common "spikes" can increase the knockdown efficiency of Spray.Seed and widen the use "window" to include the control of larger weeds (grass and broadleaf).

In the event that Roundup Ready canola becomes an option to WA growers, Spray.Seed has been identified as an important tool to control volunteers or as a knockdown option following a RR canola crop. This trial seeks to demonstrate the knockdown efficiency of Spray.Seed on Canola at various growth stages, both stand alone and in mixes with "spikes".

Ryegrass, canola and lupins were topdressed prior to seeding the site in order to ensure a sufficient weed density and spectrum was present prior to spray applications. A significant background population of wild radish was also present.

The trial was designed to have two timings of spray application to coincide with weed growth stages of ryegrass at GS12 and broadleaves 1-5cm diameter for timing one (T1) and ryegrass GS14 and broadleaves 5-10cm diameter for timing two (T2). In reality an extended dry spell after topdressing of the ryegrass, lupins and canola meant that these "weeds" did not germinate as quickly as expected, and as a result the T1 and T2 sprays were applied slightly earlier than these growth stages

TRIAL DETAILS

Property	McIlroy Family, Pithara	
Plot size & replication	15m x 2.5m x 3 replicates	
Soil type	Sandy Loam	
Herbicides, Insecticides & Fungicides	**T1** Application date: 25/08/09 Cloud Cover: 95% Temperature: 20.5°C Relative Humidity: 52% Wind: E 5-7 km/hr All treatments applied at 89 L/ha water volume	**T2** Application date: 03/09/09 Cloud Cover: 55% Temperature: 11.9°C Relative Humidity: 51% Wind: SE 7-10 km/hr 1.5 bar with Teejet 110001 flat fan nozzles
Growing Season Rainfall	201mm	

RESULTS

Table 1. Average pre spray (T1) weed counts per m^2.

	Ryegrass	Canola	Radish	Lupin
Cotyledon	-	41	2	7
1 leaf	70	-	-	-
2 leaf	7	1	2	7
>2 leaf	4	0.5	5	-

Table 2. Herbicide efficacy 38 days after treatment (DAT) of T1 spray treatments.
Efficacy rated on 0-100 scale where 0 = no effect and 100 = full death/brownout. Treatments followed by the same letter are not significantly different. LSD (P<0.05).

NO.	TREATMENT	TIMING	PRODUCT RATE (per ha)	EFFICACY			
				Ryegrass	Radish	Canola	Lupin
1	Untreated	---	---	0 l	0 i	0 d	0 h
2	Spray.Seed®	T1	1.0 L	65 k	46.7 gh	73.3 c	68.3 g
3	Spray.Seed ®	T1	1.2 L	71.7 ijk	33.3 h	90 ab	71.7 fg
4	Spray.Seed®	T1	1.8 L	76.7 f-j	63.3 c-g	96.7 a	85 a-g
5	Spray.Seed® + LV ester	T1	1.0 L + 400 ml	70 jk	53.3 fgh	91.7 a	80 c-g
6	Spray.Seed® + Logran® B-Power + Adigor®	T1	1.0 L + 50 g + 1.0 %	81.7 c-h	81.7 abc	100 a	93.3 a-d
7	Spray.Seed® + Hammer®	T1	1.0 L + 50 ml	75 g-j	56.7 efg	90 ab	75 efg
8	Spray.Seed® + Cadence®	T1	1.0 L + 200 g	75 g-j	60 d-g	86.7 abc	81.7 b-g
9	Spray.Seed® + Cadence® + LV ester®	T1	1.0 L + 200 g + 400 ml	76.7 f-j	76.7 a-e	96.7 a	76.7 d-g
10	Spray.Seed® + Ally®	T1	1.0 L + 5 g	73.3 h-k	46.7 gh	96.7 a	90 a-e
11	Spray.Seed® + Ally® + LV ester	T1	1.0 L + 5 g + 400 ml	78.3 e-j	63.3 c-g	93.3 a	88.3 a-f
12	Spray.Seed® + Lontrel®	T1	1.0 L + 100ml	70 jk	60 d-g	76.7 bc	70 g
13	Spray.Seed® + Boxer® Gold	T1	1.2 L + 2.5L	81.7 c-h	68.3 b-f	86.7 abc	71.7 fg
14	Spray.Seed® Spray.Seed®	T1 T2	1.2 L 1.2 L	91.7 ab	90 a	95 a	95 abc

- Higher rates of Spray.Seed® (1.8L/ha compared to 1L/ha) provided significantly greater levels of final ryegrass, radish, canola and lupin control.
- Addition of spikes with some Ryegrass activity (Logran® B Power, Boxer® Gold) provided greater final levels of Ryegrass control.
- Two shots of Spray.Seed® provided highest level of ryegrass control.
- Higher rates of Spray.Seed® (1.8L/ha compared to 1L/ha) provide greater levels of final radish control.
- Good control of canola was achieved with all mixes. The 1L/ha Spray.Seed rate struggled on Canola.
- High rates of Spray.Seed® and mixes containing Group B chemistry gave the best control of Lupins

Table 3. Average pre spray (T2) weed counts per m^2.

	Ryegrass	Canola	Radish	Lupin
Cotyledon	n/a	29	0	2
1 leaf	33	-	-	-
2 leaf	41	24	2	7
3-4 leaf	14	2	1	7
>4 leaf	7	0	4	2

Note: Whilst the weed size was bigger the starting rate of Spray.Seed has also been increased from 1L/ha in T1 to 1.8L/ha in T2

Table 4. Herbicide efficacy 29 days after treatment (DAT) of T2 spray treatments.
Efficacy rated on 0-100 scale where 0 = no effect and 100 = full death/brownout. Treatments followed by the same letter are not significantly different. LSD (P<0.05).

NO.	TREATMENT	TIMING	PRODUCT RATE (per ha)	EFFICACY			
				Ryegrass	Radish	Canola	Lupin
15	Untreated	---	---	0 l	0 i	0 d	0 h
16	Spray.Seed®	T2	1.2 L	83.3 b-g	78.3 a-d	98.3 a	83.3 a-g
17	Spray.Seed®	T2	1.8 L	90 abc	81.7 abc	100 a	83.3 a-g
18	Spray.Seed®	T2	2.4 L	93.3 a	88.3 ab	100 a	91.7 a-e
19	Spray.Seed® + LV ester	T2	1.8 L + 400 ml	91.7 ab	85 ab	100 a	95 abc
20	Spray.Seed® + Logran® B-Power + Adigor®	T2	1.8 L + 50 g + 1.0 %	93.3 a	86.7 ab	100 a	95 abc
21	Spray.Seed® + Hammer®	T2	1.8 L + 50 ml	93.3 a	81.7 abc	100 a	95 abc
22	Spray.Seed® + Cadence®	T2	1.8 L + 200 g	91 abc	83.3 abc	100 a	100 a
23	Spray.Seed® + Cadence® + LV ester®	T2	1.8 L + 200 g + 400 ml	94.3 a	83.3 abc	100 a	95 abc
24	Spray.Seed® + Ally®	T2	1.8 L + 5 g	85 a-f	76.7 a-e	100 a	90 a-e
25	Spray.Seed® + Ally® + LV ester	T2	1.8 L + 5 g + 400 ml	86.7 a-e	85 ab	100 a	98.3 ab
26	Spray.Seed® + Lontrel®	T2	1.8 L + 100ml	80 d-i	78.3 a-d	100 a	88.3 a-f
27	Spray.Seed® + Boxer® Gold	T2	1.8 L + 2.5L	88.3 a-d	86.7 ab	96.7 a	88.3 a-f

- Significantly higher levels of final ryegrass control were achieved from using the higher rate of Spray.Seed® (2.4L/ha compared to 1.2L/ha).
- Ryegrass control was similar for all other mixes, except Lontrel® which appeared to reduce the effectiveness of the Spray.Seed® on Ryegrass.
- There was no significant difference in Radish, Canola or Lupin control between any of the sprayed treatments.

COMMENTS

Final conclusions:

- Spikes without residual activity are generally ineffective presumably due to the fast acting nature of Spray.Seed®.
- Increasing the rate of Spray.Seed is (in most cases) as good an option as adding a spike to a low rate of Spray.Seed®.
- If taking out RR canola is the objective then adding some SU spike is probably the best option.
- Addition of Lontrel® appeared to reduce the efficacy of Spray.Seed on ryegrass control.
- When deciding on the best option, growers should always consider the total cost of products and application, in addition to keeping to a sound resistance management strategy.

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COMPATIBILITY OF AXIAL WITH VARIOUS BROADLEAF HERBICIDES FOR EARLY WILD OAT AND WILD RADISH CONTROL IN WHEAT

Richard Devlin, Research Agronomist, Living Farm
Jason Sabeeney, Technical Services Manager, Syngenta
Ian Macdonald, Northern Area Manager, Syngenta

AIM

The objective of this demonstration was to evaluate the biological compatibility and crop safety of Axial compared with Achieve or Wildcat, when applied alone or in mixtures with common broadleaf herbicides for early wild oat and wild radish control in wheat.

BACKGROUND

Growers are increasingly looking for one pass options to control both grass and broadleaf weeds. However, grass herbicide efficacy is often compromised when mixed with common broadleaf herbicides. This trial was conducted to demonstrate the crop safety of Axial when mixed with various broadleaf herbicides when compared to other similar group A grass selectives.

AXIAL is a Group A grass selective herbicide, its active ingredient is Pinoxaden. Unlike Achieve which is a group A DIM and Wildcat, a group A FOP, Axial is part of the sub group DEN's. AXIAL is strong on wild oats and will control FOP resistant wild oats, at appropriate rates it provides similar levels of control to Achieve on susceptible and DIM resistant ryegrass populations.

To ensure adequate population of target species canola and domestic oats were topdressed to the site prior to seeding to simulate radish and wild oats respectively.

TRIAL DETAILS

Property	McIlroy Family, Pithara
Plot size & replication	18m x 1.25m unreplicated demonstration
Soil type	Sandy Loam
Sowing date	06/06/09
Seeding rate	70 kg/ha Westonia
Fertiliser (kg/ha)	06/06/09: 75 kg/ha DAP drilled at seeding
Paddock rotation	2008 = Lupins, 2007 = Wheat
Herbicides	06/06/09: 2 L/ha Spray.Seed pre seeding 22/07/09: Spray treatments applied with water volume of 80 L/ha with Hardi flat fan 110001 nozzles.
Growing Season Rainfall	201mm

RESULTS

Table 1. Herbicide efficacy (44 days after treatment) of various grass and broadleaf sprays.
Efficacy rated on 0-100 scale where 0 = no effect and 100 = full death/brownout.
Crop Phytotoxicity 0 = no crop effect 100 = crop death.

Treatment	Rate	Crop Phytotoxicity	Radish	Oats
Untreated	--	0	0	0
AXIAL® + Adigor®	150 mL + 0.5%	0	0	100
AXIAL® + Adigor®	200 mL + 0.5%	0	0	100

Treatment	Rate	Crop Phytotoxicity	Radish	Oats
AXIAL® + MCPA LVE 500 + Adigor®	200 mL + 500 mL + 0.5%	0	80	100
AXIAL® + Tigrex+ Adigor®	200 mL + 750 mL + 0.5%	0	95	100
AXIAL® + Jaguar+ Adigor®	200 mL + 1.0 L + 0.5%	0	95	100
AXIAL® + Bromicide 200 + Adigor®	200 mL + 2.1 L + 0.5%	0	100	60
AXIAL + Bromicide MA + Adigor®	200 mL + 1.4 L + 0.5%	0	90	70
AXIAL® + Paragon + Adigor®	200 mL + 250 mL + 0.5%	0	90	100
AXIAL® + Velocity + Adigor®	200 mL + 500 mL + 0.5%	0	90	90
AXIAL® + Precept + Adigor®	200 mL + 2.0 L + 0.5%	0	100	100
AXIAL® + Precept® + MCPA LVE + Adigor®	200 mL + 1.0 L + 500 mL + 0.5%	0	95	100
AXIAL® + Logran® + MCPA LVE + Adigor	200 mL + 15 g + 500 mL + 0.5%	0	70	70
AXIAL® + Paragon + Bromicide MA + Adigor®	200 mL + 150mL + 750mL + 0.5%	0	90	95
Untreated	--	0	0	0
Achieve® WG + Supercharge®	380 g + 0.75%	0	0	100
Achieve® + MCPA LVE 500 + Supercharge®	380 g + 500 mL + 0.75%	0	75	100
Achieve® + Tigrex+ Supercharge®	380 g + 750 mL + 0.75%	0	95	100
Achieve® + Jaguar+ Supercharge®	380 g + 1.0 L + 0.75%	0	85	95
Achieve® + Bromicide® 200 + Supercharge®	380 g + 2.1 L + 0.75%	0	80	90
Achieve ®+ Bromicide® MA + Supercharge®	380 g + 1.4 L + 0.75%	0	80	100
Achieve® + Paragon® + Supercharge®	380 g + 250 mL + 0.75%	0	70	100
Achieve® + Velocity® + Supercharge®	380 g + 500 mL + 0.75%	0	60	50
Achieve® + Precept® + Supercharge®	380 g + 2.0 L + 0.75%	0	95	100
Achieve® + Precept® + MCPA LVE + Supercharge®	380 g + 1.0 L + 500 mL + 0.75%	0	100	95
Achieve® + Logran® + MCPA LVE + Supercharge®	380 g + 15 g + 500 mL + 0.75%	0	95	40
Achieve® + Paragon® + Bromicide® MA + Adigor®	380 g + 150 mL + 750 mL + 0.75%	0	100	60
Untreated	--	0	0	0
Wildcat® + Adigor®	300 mL + 0.5%	0	0	100
Wildcat® + MCPA LVE 500 + Adigor®	300 mL + 500 mL + 0.5%	0	80	95
Wildcat® + Tigrex®+ Adigor®	300 mL + 750 mL + 0.5%	0	90	100
Wildcat® + Jaguar®+ Adigor®	300 mL + 1.0 L + 0.5%	0	100	75
Wildcat® + Bromicide® 200 + Adigor®	300 mL + 2.1 L + 0.5%	0	60	70
Wildcat® + Bromicide® MA + Adigor®	300 mL + 1.4 L + 0.5%	0	90	80
Wildcat® + Paragon® + Adigor®	300 mL + 250 mL + 0.5%	0	90	90
Wildcat® + Velocity® + Adigor®	300 mL + 500 mL + 0.5%	0	100	100
Wildcat® + Precept® + Adigor®	300 mL + 2.0 L + 0.5%	0	100	90
Wildcat® + Precept® + MCPA LVE® + Adigor®	300 mL + 1.0 L + 500 mL + 0.5%	0	90	80
Wildcat® + Logran® + MCPA LVE + Adigor®	300 mL + 15 g + 500 mL + 0.5%	0	80	60
Wildcat® + Paragon® + Bromicide® MA+ Adigor®	300 mL + 150 mL +750 mL + 0.5%	0	85	70

COMMENTS

- **Note:** This trial was an unreplicated demonstration with observations/assesments based on one plot per treatment only, and as such results may not be definitive.
- Crop phytotoxicity was similar between all three grass selective herbicides. Consistent, low levels of phytotoxicity were observed in mixes containing Tigrex®, Jaguar® and Paragon® when assessed at 7 and 13 days after treatment (DAT). No crop effects were visible by the final assessment timing (44DAT).
- Axial® and Achieve® provided the greatest level of oat control. Oat control with Wildcat® was generally 10% poorer than Axial® or Achieve® at 44 DAT.
- Broadleaf herbicides containing or mixed with Bromoxynil generally had a reduced effect on wild oat control regardless of the grass selective partner (Axial®, Achieve® or Wildcat®). Mixes with Logran® and MCPA also gave very poor oat control.
- Although the trial did not set out to evaluate ryegrass control, there were significant natural levels of ryegrass in the trial plots and so observations were made. It should be noted that the Axial® rate of 200mL is below the recommended label rate for ryegrass control (250 to 300mL). Axial® at 200 mL/ha generally performed similarly or slightly better than Achieve® at 380 g/ha for control of ryegrass. The overall level of control at 44 DAT was only 50% which in part would reflect the low application rate but may also be expected due to background level of group A resistant ryegrass. Wildcat was poorer again than Axial® or Achieve® for ryegrass control, presumably due to a dominant FOP resistant ryegrass population
- Most broadleaf and grass mix treatments provided high levels of radish control at 44 DAT. Mixes containing MCPA LVE and MCPA LVE + Logran® were generally less effective, however this may be due more to the resistance status of the radish than any antagonism between the grass selectives and broadleaf herbicides.
- At 13 DAT and 44 DAT Velocity® and Precept® provided very good crop safety and similar levels of radish control compared with Jaguar® and Tigrex® when in mixes, regardless of the grass selective partner. The Precept grass selective mixes did appear to be slightly weaker than the similar Tigrex® mixes when assessed 7 DAT.

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EFFECT OF LIMING ON WILD RADISH CONTROL

David Scholz, Manager/Agronomist, Elders Dalwallinu

AIM

Liming is proven to be beneficial to our cropping and pasture systems in WA; is improved radish control an added gain?

BACKGROUND

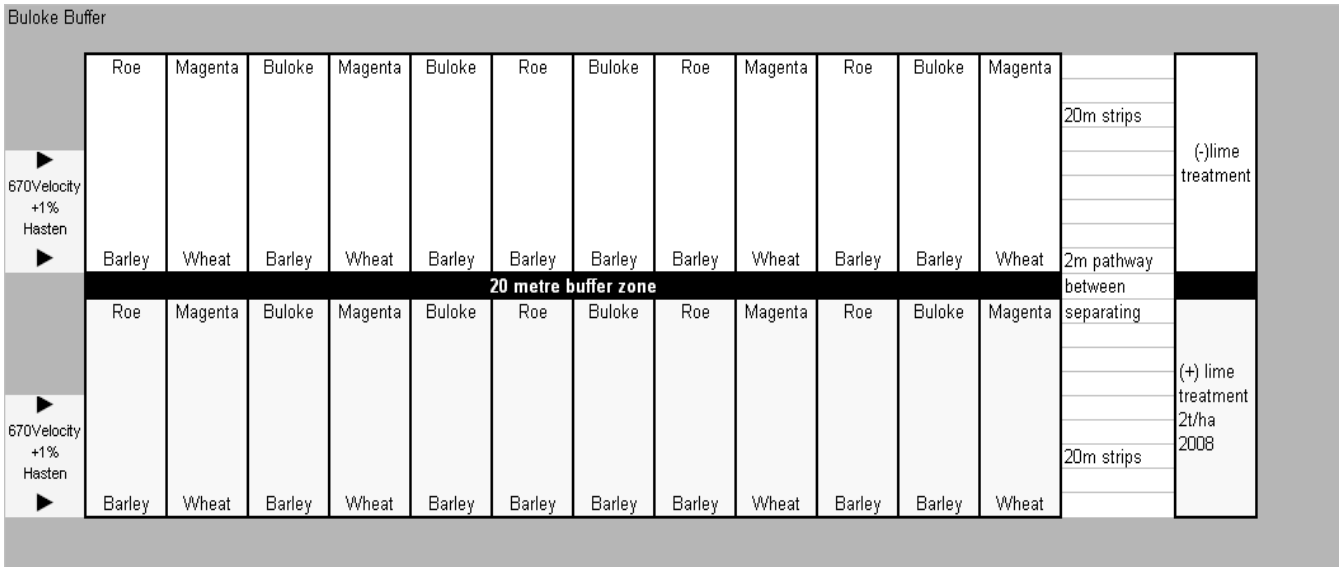
Research done by Willis & Walsh (Crop Updates Proceedings 2007) determined that in the presence of wheat competition, increasing the soil pH by liming resulted in a 41% reduction in the aboveground biomass of wild radish.

Soil acidity was noted as an issue in early 2008 by the host farmer, with a pH of 4.7 in the area designated for the trial. Consequently, the McIlroys limed the paddock at 2 t/ha, agreeing to leave a control strip unlimed in a known radish area. This trial included two blocks, one which was limed with the rest of the paddock in 2008 at 2 t/ha and the other a control where the spreader was turned off. Two varieties of barley and one of wheat were sown across both blocks. The limed and unlimed sections were split again to evaluate any +/- herbicide interaction.

TRIAL DETAILS

Property	McIlroy family, Pithara
Plot size & replication	10m x 2.5m x 4 replicates
Soil type	Sandy Loam
Sowing date	05/06/09 using a Great Plains Disc Drill
Seeding rate	60 kg/ha
Fertiliser (kg/ha)	70 kg/ha MAPSZC, 100 kg/ha urea and 100 kg/ha MOP topdressed
Paddock rotation	2007 = Wheat, 2008 = Lupins
Herbicides	05/06/09: 1 L/ha Glyphosate 17/07/09: Sprayed section had 670 mL/ha Velocity + 1% Hasten 05/06/09: 2.5 L/ha Trifluralin 480
Rainfall	201mm

TRIAL DESIGN



RESULTS

Table 1: Yield (t/ha) of Magenta wheat, Buloke & Roe barley for limed and unlimed, sprayed and unsprayed.

Treatment - Magenta	Radish	Mean Yields (t/ha)	Treatment - Buloke	Radish	Mean Yields (t/ha)	Treatment - Roe Barley	Radish	Mean Yields (t/ha)
Plus Lime	Sprayed	**1.64**	Plus Lime	Sprayed	**1.35**	Plus Lime	Sprayed	**1.45**
Minus Lime	Sprayed	**1.29**	Minus Lime	Sprayed	**1.12**	Minus Lime	Sprayed	**1.03**
Plus Lime	Unsprayed	**0.52**	Plus Lime	Unsprayed	**0.35**	Plus Lime	Unsprayed	**0.40**
Minus Lime	Unsprayed	**0.32**	Minus Lime	Unsprayed	**0.24**	Minus Lime	Unsprayed	**0.24**
	LSD (5%)	0.12		LSD (5%)	0.27		LSD (5%)	0.15

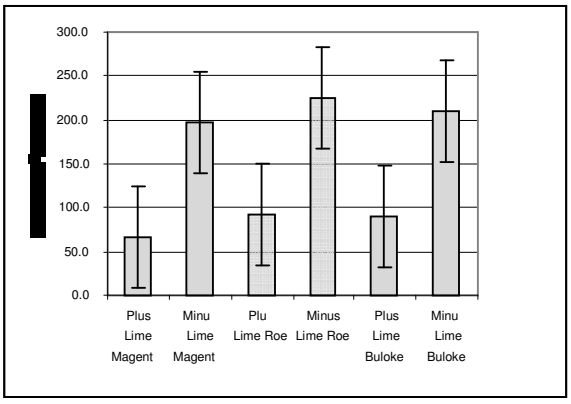


Figure 1: Radish counts on the sprayed plots, plus and minus lime, for the three varieties.

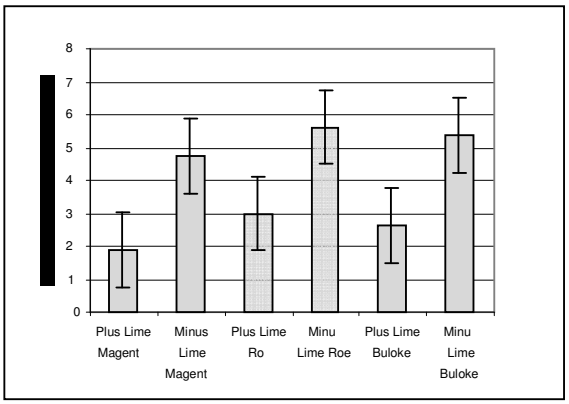


Figure 2: Biomass ratings on the sprayed plots. 100% = all radish, 0% = no radish.

COMMENTS

- There was a significant yield difference due to liming in the Magenta and Roe plots (Table 1) however the Buloke plots were not significantly different. These plots had a high CV (22.6) indicating an external factor (such as germination) may have affected these results. The wheat performed better on this soil type compared to the two barley varieties. As expected, a large significant difference in yields was observed for all three varieties to the post–emergent Velocity spray in July (noted in Table 1 as Sprayed).
- Soil pH ($CaCl_2$) increased from avg. 4.68 (unlimed) to avg. 5.24 (limed). The increase was greater in the adjacent paddock (4.7 to 5.8), most likely due to extra disturbance from McIlroy's seeding equipment. Aluminium (mg/kg) was measured at 1.35 (limed) compared to 3.65 (unlimed). A green line in the oats surrounding the trial was also observed, indicating where the spreader had been (limed) and hadn't been. This was illustrated to those who saw the soil pits as a function of deeper root systems in the limed oats.
- This site had a massive radish seed bank after poor control in lupins in 2008. Before spraying, these plots averaged 305 plants/m^2 and it must be noted that the Velocity did an excellent job, however the weed burden was too high to control all of the radish. Both the radish counts (Figure 1) and the biomass ratings (Figure 2) were taken 60 days after the Velocity was applied. Both the radish counts and the biomass for each of the unlimed Magenta, Buloke and Roe plots were all significantly higher than their corresponding limed plots, therefore liming significantly reduced the amount of radish in these plots.
- It was observed during the 2009 growing season that there were diflufenican (DFF) residues from 2008. These residues only appeared in the limed section. There was 300 ml/ha of DFF applied in 2008 in two attempts to control radish. The DFF residue from the lupin phase was a major cause of the difference in radish between the limed and unlimed plots. No work has been done on the improved residual characteristics of DFF as the pH improves, but it is obvious from this study that there is an interaction. The speed of kill when the Velocity was applied appeared quicker, but this may have been tainted by the DFF residue. That said, the radish turned into skeletons and disintegrated appreciably quicker in the limed plots.

- Ratings were also conducted on the ryegrass present which did show some significant differences due to liming, however there was a lot of variation due to old harvester trails which skewed the results. This would be a topic for future research.

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USING NITROGEN APPLICATIONS TO MANAGE WHEAT CANOPY

James Easton, Field Research Manager, CSBP

AIM

To determine the response of wheat to different Flexi-N strategies at two seeding rates i.e. canopy management.

BACKGROUND

The theory of 'canopy management' involves varying inputs to regulate crop development and maximise water use and yields. Part of this strategy involves reduced seeding rates and delayed N applications with the aim of conserving soil moisture until grain fill.

A similar trial at Xantippe in 2007 (similar to the one conducted in 2009) was severely drought affected and no grain was harvested, but it did show 'haying off' at the higher seeding rate (80kg/ha). Interestingly, there was no 'haying off' effect with N rates of up to 65kg N/ha.

Soil test results from the 2009 site showed strong N reserves (Nitrate N 22ppm, Ammonium N 6ppm) following lupins in 2008, but indicated that sub soil acidity could limit wheat production (soil pH 4.2, Al 7.1 $CaCl_2$).

TRIAL DETAILS

Property	McIlroy Family, Pithara
Plot size & replication	20m x 2.5m x 3 replicates
Soil type	Sand
Sowing date	02/06/09
Seeding rate	40 and 80 kg/ha
Fertiliser (kg/ha)	Basal 80kg/ha Agstar; Flexi-N applied at seeding (banded), Z14 and Z30.
Paddock rotation	2007 = Wheat, 2008 = Lupins
Herbicides	02/06/09: Power Max and Triflur X 22/07/09: Jaguar
Growing Season Rainfall	201mm

RESULTS

Table 1: Effect of Seed Rate and Flexi-N strategy on Wheat Yield and Quality at Pithara.

	Treatment					Harvest			
Trt	Seed (kg/ha)	Banded (l/ha)	Z14 (l/ha)	Z30 (l/ha)	N	Yield (t/ha)	Protein (%)	HL wt (kg/HL)	Screens (%)
1	40	-	-	-	11	2.07	10.3	75	3.7
2	40	-	80 Flexi-N	-	45	2.08	11.1	73	4.1
3	40	-	-	80 Flexi-N	45	2.24	11.3	75	3.8
4	40	40 Flexi-N	-	40 Flexi-N	45	2.01	10.5	73	4.8
5	40	-	40 Flexi-N	40 Flexi-N	45	2.10	11.3	73	4.6
6	40	-	80 Flexi-N	80 Flexi-N	79	2.25	11.0	75	4.2
7	40	40 Flexi-N	40 Flexi-N	80 Flexi-N	79	2.13	11.3	75	3.6
8	80	-	-	-	11	2.18	10.4	74	3.8
9	80	-	80 Flexi-N	-	45	2.27	10.7	75	3.3
10	80	-	-	80 Flexi-N	45	2.25	11.6	73	4.8
11	80	40 Flexi-N	-	40 Flexi-N	45	2.29	10.6	75	3.7
12	80	-	40 Flexi-N	40 Flexi-N	45	2.16	11.2	74	4.2
13	80	-	80 Flexi-N	80 Flexi-N	79	2.13	12.1	75	3.8
14	80	40 Flexi-N	40 Flexi-N	80 Flexi-N	79	2.27	11.1	75	3.3
					Prob	0.80	0.002	0.487	0.383
					LSD	ns	0.59	ns	ns

COMMENTS

- This site was unresponsive to N and there was no significant effect of either seed rate or N timing upon yield. There was no adverse effect of high N or seed rates on grain weights or screening levels.
- Crop vigour was poor through the season and this was most likely related to sub soil acidity and aluminium toxicity.
- Plant testing confirmed adequate supply of all nutrients.
- These results show that understanding the overall need for N is more important than application strategy and that a 40 kg/ha sowing rate was as good as 80 kg/ha for a 2 t/ha crop yield.

ACKNOWLEDGEMENTS

- The McIlroy family.

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ASSESSMENT OF WMF NPK CROP PLUS AND WMF MICROBES ON WHEAT YIELD AND QUALITY

Paul Storer, Microbiologist, Western Mineral Fertilisers
Richard Devlin, Research Agronomist, Living Farm

AIM

To evaluate wheat yield and quality when growing wheat with conventional granular fertilisers or Western Mineral's granular mineral fertiliser. To compare the effects of different methods of "extra" nitrogen application.

BACKGROUND

Western Mineral Fertilisers (WMF) Mineral and Microbe cropping programs have basically performed well on relatively low applications of Nitrogen and Phosphorus. This current trial is part of on-going research being conducted to examine mineral fertiliser/microbe programs and the *value* of adding various forms of extra or top up N. As Nitrogen fertilisation is a significant cost in cereal production, the development of a symbiosis between diazotrophic (N_2 fixing) bacteria and cereal would be of enormous economic value.

The objective of this trial is to evaluate different types of Nitrogen (solid, liquid or Microbial) applied: 1) at seeding, 2) post seeding or 3) as a N_2 fixing microbial seed treatment (PSN microbes). The parameters being tested include vigour, nutrient status (plant tissue analysis), yield and quality.

TRIAL DETAILS

Property	McIlroy family, Pithara
Plot size & replication	15m x 1.25m x 3 replicates RCB
Soil type	Sandy Loam
Sowing date	05/06/09
Seeding rate	70 kg/ha Westonia
Fertiliser (kg/ha)	See Treatment List (over page)
Paddock rotation	2008 = Oats, 2007 = Pasture
Herbicides	05/06/09: 2.5l/ha Trifluralin, 2L/ha Roundup, 30g/ha Logran 08/07/09: 25g/ha Monza, 2%v/v DC Trate 29/07/09: 380g/ha Achieve, 1.2l/ha Bromicide MA, 0.75%v/v Supercharge
Growing Season Rainfall	201mm

RESULTS

Table 1. Assessment results for WMF trial at Liebe Group Main trial site.

Trt.	Treatment	Vigour 03/08/09	Vigour 25/08/09	Vigour 03/09/09	Yield (t/ha)	Protein %	Hectolitre weight	Screenings %
1	Untreated Check NO Fertiliser	3.7d	3.7e	3.7d	1.14d	7.63d	75.46a	2.29d
2	70 kg/ha NPK Crop Plus 750 g/t Ag Microbes on seed No nitrogen	5.0c	6.3bcd	5.3c	1.22cd	7.73cd	73.89abc	2.64cd
3	70 kg/Ha NPK Crop Plus 750 g/t Ag Microbes on seed 10.5 Units Liquid N inject	7.0a	7.7ab	8.0a	1.44ab	8.67b	71.51bcd	3.82abc
4	70 kg/Ha NPK Crop Plus 750 g/t Ag Microbes on seed 10.5 Units Gran Urea 4W.A.S	6.7ab	8.0ab	8.3a	1.40abc	8.87ab	70.67d	3.87abc
5	70 kg/Ha NPK Crop Plus PSN Microbes on seed NO Nitrogen	5.3c	5.0de	6.3bc	1.28bcd	7.97cd	73.85abc	3.03bcd

Trt.	Treatment	Vigour 03/08/09	Vigour 25/08/09	Vigour 03/09/09	Yield (t/ha)	Protein %	Hectolitre weight	Screenings %
6	70 kg/Ha NPK Crop Plus PSN Microbes on seed 10.5 Units Liquid N inject	7.0a	7.0abc	7.3ab	1.49a	8.13c	73.51a-d	2.89cd
7	70 kg/Ha NPK Crop Plus PSN Microbes on seed 10.5 Units Gran Urea 4W.A.S	5.7a	8.3a	8.5a	1.40ab	9.20a	70.64d	4.54a
8	70 kg/ha Macro Pro Extra 400 ml/ha Impact in Furrow NO Nitrogen	7.7bc	5.7cd	6.3bc	1.36abc	7.77cd	75.35a	2.60cd
9	70 kg/ha Macro Pro Extra 400 ml/ha Impact in Furrow 10.5 Units Liquid N inject	7.3a	8.7a	8.0a	1.47ab	9.17a	71.28cd	4.34a-d
10	70 kg/ha Macro Pro Extra 400 ml/ha Impact in Furrow 10.5 Units Gran Urea 4W.A.S	3.7a	8.7a	8.5a	1.46ab	8.53b	72.90a-d	3.21ab
LSD (P=.05)		1.22	1.57	1.357	0.1656	0.397	2.6299	1.2721
Standard Deviation		0.72	0.92	0.797	0.0972	0.233	1.5441	0.7469
CV		11.58	13.5	11.58	7.13	2.8	2.11	22.87
Bartlett's X2		3.431	4.59	6.294	8.276	9.38	12.25	12.389
P(Bartlett's X2)		0.945	0.868	0.79	0.602	0.496	0.269	0.26

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 2. Plant tissue analysis (03/08/09) for all treatments.

Treatment.	N %	P %	K %	S %	Na %	Ca %	Mg %	Cl %	Cu mg/kg	Zn mg/kg	Mn mg/kg	Fe mg/kg	NO_3 mg/kg	B mg/kg
1	3.5	0.4	4.1	0.3	0.1	0.4	0.2	1.7	6.4	34.3	272.1	150.5	40	4.3
2	3.3	0.5	4.3	0.3	0.1	0.3	0.2	1.8	5.7	32.9	267.6	174.2	38	4.3
3	3.7	0.4	3.7	0.3	0.1	0.3	0.2	1.8	5.0	28.5	168.8	142.4	71	4.5
4	3.7	0.5	4.0	0.4	0.1	0.3	0.2	1.7	5.5	30.1	179.8	164.9	30	4.2
5	3.5	0.5	3.9	0.3	0.1	0.3	0.2	1.8	5.7	30.8	231.4	147.0	40	4.2
6	3.7	0.5	4.1	0.4	0.1	0.4	0.2	1.7	5.9	34.2	192.5	165.8	38	4.7
7	3.9	0.5	4.3	0.4	0.1	0.4	0.2	2.1	5.8	33.0	205.1	162.9	58	4.1
8	3.8	0.5	4.2	0.4	0.1	0.3	0.2	1.8	6.2	33.2	207.8	149.2	42	4.5
9	3.8	0.4	3.9	0.4	0.1	0.4	0.2	1.7	5.5	32.1	177.5	154.4	42	3.9
10	3.9	0.5	4.5	0.4	0.1	0.4	0.2	1.7	6.1	33.6	188.0	176.5	100	4.6

COMMENTS

- Yields and protein were generally low across the trial.
- Addition of granular starter fertiliser had a significant effect on yield vs the untreated for all treatments except treatment 2 and 5.
- Throughout the season there was a consistent response of increased plant vigour with the addition of starter fertiliser and additional nitrogen.
- There was no statistically significant difference in yield when comparing PSN Microbes to Ag Microbes.
- For the W.M.F. microbe treated plots, the addition of nitrogen (regardless of form) gave a statistically significant yield increase over microbe treated plots which did not receive Nitrogen. Nitrogen form (inject vs granular) did not have a significant yield difference. NPK Crop Plus with PSN microbes with nitrogen applied at seeding (in liquid form) showed the highest yield (1.49 t/ha), and NPK Crop Plus with PSN microbes with nitrogen applied as granular urea showed the highest Protein (9.2%) levels.
- There was no statistically significant difference in yield between comparable NPK Crop Plus treatments and Macro Pro Extra treatments.
- Addition of N to the Macro Pro plots did not give a statistically significantly yield increase.
- Those plots which did not receive post emergent N were generally significantly lower in protein.

- A later application of nitrogen (urea form) generally resulted in higher protein levels compared to same amount of nitrogen applied at seeding (in liquid form)
- Hectolitre weights were generally higher for those treatments which did not receive any extra nitrogen.
- Screenings results were varied, but were generally lower in treatments that received NO extra nitrogen.
- Plant tissue analysis generally showed little difference between treatments across all elements when assessed on 03/08/09.

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FIELD EVALUATION OF TEDERA (*BITUMINARIA BITUMINOSA* VAR. *ALBOMARGINATA*) FOR LOW RAINFALL AREAS OF SOUTHERN AUSTRALIA

Dr. Daniel Real, Senior Plant Breeder, Future Farm Industries CRC
Department of Agriculture and Food, WA

AIM

To evaluate the potential of Tedera (*Bituminaria bituminosa* var. *albomarginata*) as a prospective new perennial legume for cropping areas of southern Australia.

BACKGROUND AND METHODS

Tedera is a perennial forage legume native to Lanzarote, Canary Islands Spain. Lanzarote Island has a Mediterranean climate with an annual rainfall that varies from 150mm to 300mm, and three to five months with almost no rainfall. This species was sown at the Liebe Group long term research site in 2006, 2007, 2008 and 2009. The 2006 trial consisted of 225 plants corresponding to 15 plant origins and the main purpose was to explore the adaptation of this novel species to the climate and soil. The 2007 trial evaluated the capacity of the species (nine accessions) to establish from seed and survive the first summer. Both of these trials were funded by the Salinity CRC (now Future Farm Industries CRC). The research program was expanded in 2008. A spaced plant nursery of 1900 plants was transplanted to select the best individuals for breeding purposes. Another trial sown with seed in 1m rows contrasts the performance of Tedera with several other new perennial legume species. These two trials are funded by the Future Farm Industries CRC. A third trial funded by RIRDC has been designed to test the productivity of Tedera and the native forage legume *Cullen australasicum* at five sowing densities (1, 2, 4, 8 or 16 plants/m^2) and four cutting regimes (1, 2, 3 or 4 cuts per year). The set of trials sown in 2008 have also been replicated at Merredin and Newdegate. In 2009, a new spaced plant nursery of 1000 plants was transplanted, in which we are evaluating thirty four accessions of Tedera that includes the latest germplasm collection conducted in the Canary Islands in June 2008.

RESULTS AND COMMENTS

- The 2006 and 2007 trials were sown as proof of concept/adaptation for Tedera and demonstrated that the species is very drought tolerant and able to remain green during a dry summer/autumn (Photos (A) and (B).

Photo A: Transplanted seedling in July 2006.

Photo B: Adult plant in March 2007.

The 2008 and 2009 trials have established very well. Data was collected during 2009 and information is being analysed. The following photos taken on the 20th November 2008 provide a view of the 3 trials (Spaced plant nursery – photos (C) and (D); Row trial – photos (E) and (F) and Sowing density by cutting trial – photos (G) and (H).

Photo (C): Spaced plant Tedera nursery 2008.

Photo (D): Spaced plant nursery 2008 being grazed.

Photo (E): Row trial – species evaluation from seed.

Photo (F): Row trial - Tedera

Photo (G): Sowing density by cutting trial – Cullen.

Photo (H): Sowing density by cutting trial – Tedera.

ACKNOWLEDGEMENTS

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- I would also like to thank the Liebe Group and in particular Stuart McAlpine for the collaboration with this research work and the FFI, CRC and RIRDC for research funding.

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PERENNIAL PASTURE DEMONSTRATION

Chris O'Callaghan, Executive Officer, Liebe Group

AIM

To evaluate new fodder shrubs on poor performing areas.

BACKGROUND

Enrich is a project based out of SARDI which is exploring multipurpose healthy grazing systems using perennial shrubs. The enrich perennial pastures trial is exploring the general performance of a range of fodder shrubs at the Liebe Group Long Term Research Site. The trial aims to assess this performance on a soil type gradient from poor shallow gravel through to good sandy loam. The plots were replicated four times with two replicates on the good soil and two on the poor soil.

TRIAL DETAILS

Property	Long Term Research Site, West Buntine
Plot size & replication	36 shrubs (6 x 6) per plot x 4 replicates
Soil type	Shallow Gravel – Sandy Loam Gradient
Sowing date	02/07/2009
Fertiliser (kg/ha)	None
Paddock rotation	2006 = Lupins, 2007 = Wheat, 2008 = Wheat
Herbicides	None
Growing Season Rainfall	

RESULTS

Table 1: Average survival percentage of the perennial species grown at the Liebe long term research site west of Buntine. Percentages are the mean of four replicates ± standard error

Species	Survival (%)	Standard error ±
Acacia saligna	65	15
Chenopodium nitrariaceum	59	20
Atriplex amnicola	58	2
Atriplex rhagodioides	57	9
Atriplex nummularia	56	37
Rhagodia parabolica	54	22
Rhagodia crassifolia	53	11
Atriplex semibaccata	53	21
Enchylaena tomentosa	47	17
Chameacytisis prolifer	39	23
Rhagodia preissii	32	20
Medicago strasseri	24	14
Convulvulus remotus	20	21
Eremophila glabra	2	2
Rhagodia spinescens	0	0

COMMENTS

- All plants performed poorly on the shallow gravel with moisture stress becoming evident.
- Weed control was poor with wild radish competing strongly with the perennials for moisture.
- The trial will continue for the next 2 years with more results becoming available during this time, including palability, feed value and persistence.

ACKNOWLEDGEMENTS

- Jason Emms, SARDI, for organising the freight of the plants to Buntine.

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PROMISING RESULTS FROM INVERSION PLOUGHING

Stephen Davies and Peter Newman, Research Officers, DAFWA Geraldton

Department of Agriculture and Food

AIM

To examine whether inversion ploughing can be used to manage herbicide resistant weeds, water repellence and subsoil acidity on sandplain soils and to understand the risks and opportunities associated with the practice.

BACKGROUND

For the past 3 years researchers and farmers have been assessing the impact of a one-off soil inversion of sandplain soils using mouldboard ploughs at 6 on-farm demonstration sites and 3 trial sites. Soil inversion is being considered as a tool to: control herbicide resistant weed populations; ameliorate subsoil acidity through the burial of lime; and overcome water repellence by burying the repellent topsoil. It is suggested that mouldboard ploughing be used as a one-off tool to renovate 'problem' paddocks with the aforementioned constraints. Once inverted it is recommended that these paddocks not be disturbed by ploughing for at least another 10+ years giving weed seeds time to completely breakdown.

Wind erosion is the biggest risk associated with the practice. It is recommended that the soils only be ploughed when wet and that a cover crop be sown immediately after ploughing. Seeding is difficult after ploughing and rolling of the soil after ploughing will be necessary. Growers have started to plough soils on a larger scale with nine-furrow ploughs that are able to cover ~4 ha/hour and have estimated the cost at $70-100/ha with benefits including increased productivity and lower herbicide use.

TRIAL DETAILS

Properties	Various including: Northampton, Casuarina, Mingenew and Badgingarra
Soil types	Various including: Yellow loamy sands, Pale deep sands, Sandy duplex and Sandy gravels

RESULTS

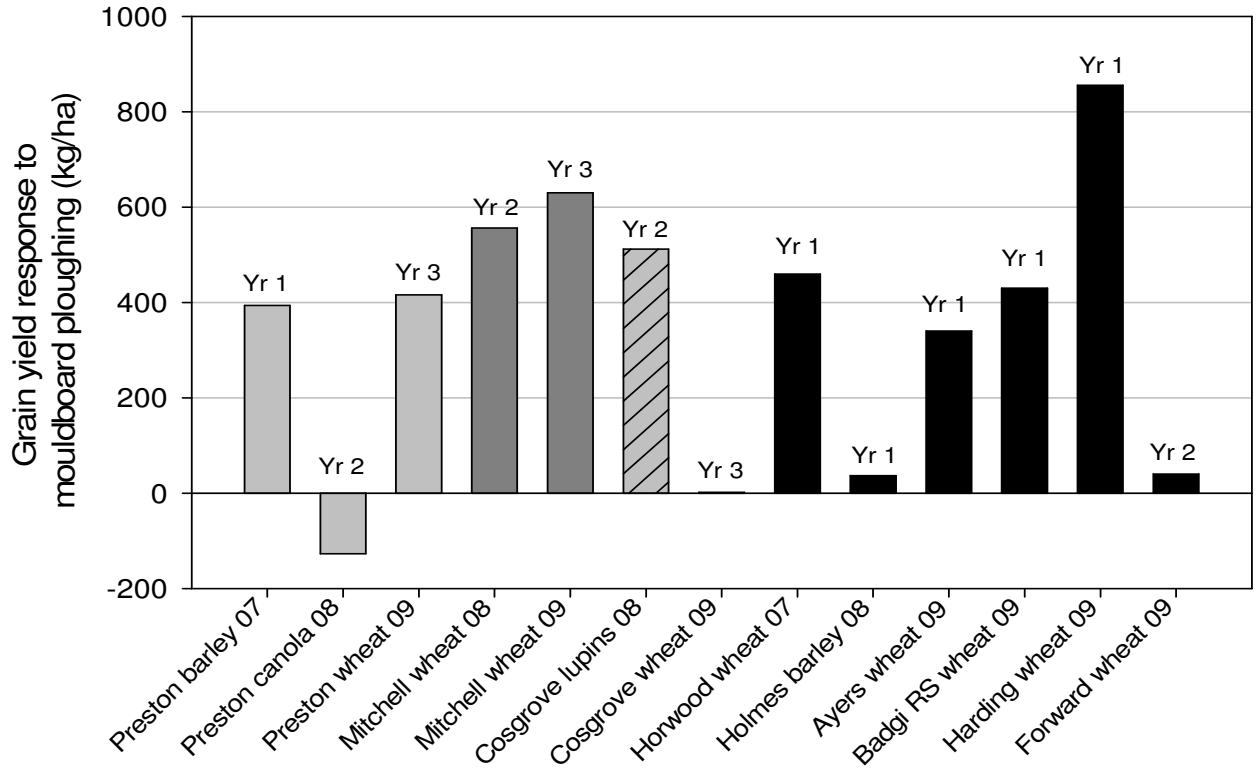

Figure 1: Summary of grain yield responses (kg/ha) to mouldboard ploughing compared with neighbouring unploughed (control) soil at 9 sites in the NAR, 2007-09. Years after ploughing is shown above each column with Yr 1 being the plough year. Note: Horwood, Preston, Cosgrove and Mitchell sites were all ploughed in 2007 but Cosgrove's and Mitchell's had unharvested cover crops in 2007; Holmes and Forward sites were ploughed in 2008, Forward's was cover cropped only and not harvested; Harding , Ayers and the Badgingarra Research Station sites were ploughed in 2009. All sites, except for Harding and Cosgrove, were ploughed with a small 3-furrow mouldboard plough which works at a depth of 25-30cm. Harding and Cosgrove sites were ploughed with a larger seven and nine-furrow mouldboard ploughs working at depths of 30-35cm. Ploughing was mainly conducted in June or July.

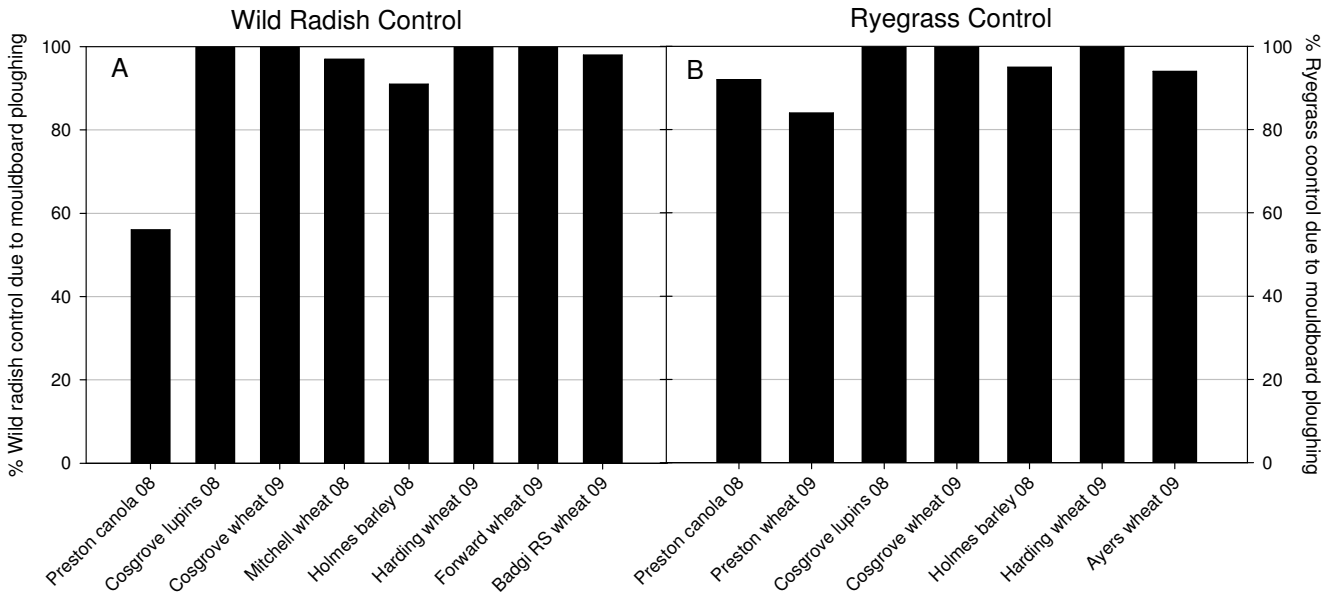

Figure 2: Summary of wild radish (A) and ryegrass (B) control as a result of mouldboard ploughing several sites in the NAR, 2007-2009. See Figure 1 legend for details on ploughing.

COMMENTS

- Grain yield responses in the first few years after mouldboard ploughing have so far been encouraging (Fig. 1). The longevity of the yield response to ploughing is still unclear. Several sites (Cosgrove, Preston and Mitchell) have now had a third season following mouldboard ploughing but results have been mixed with good yield responses in 2009 at Preston's (416 kg/ha) and Mitchell's (630 kg/ha) but no response at Cosgrove's. The Cosgrove site does include a wide range of soil types. Here the sandy gravels, shallow duplex and pale sand have not responded to the same extent as the yellow deep sand. Weed control has also been encouraging with generally 90% or more control of wild radish (Fig. 2A) and annual ryegrass (Fig. 2B). Some wild radish plants survived ploughing at the Preston's site in 2007 as the plants were large and did not get completely buried and seed set from these resulted in the poorer result at this site in 2008 (Fig. 2A).
- Soil inversion also has a significant impact on a number of soil properties. Mouldboard ploughs do loosen the soil to the depth of working thus they effectively have a deep ripping effect. Mouldboard ploughing also provides an opportunity to bury lime and high pH topsoil however at the same time it brings acidic subsoil to the surface which may need to be treated with lime. We are yet to see a response to buried lime in these trials and lime incorporated in this way does not get mixed into the subsoil reducing its impact. Inversion ploughing also buries water repellent topsoil and brings non-repellent subsoil to the surface. For example, laboratory measured water droplet penetration times on a highly repellent soil at Badgingarra have gone from >5 minutes on untreated soil to less than a second for ploughed soil. It is not yet known how long the buried water repellent topsoil will remain repellent but it is hoped that microbial breakdown will reduce the repellence of this soil over time. Invariably the non-repellent subsoil brought to the surface will become repellent again as crop residues are added to the soil surface. We do not know how long this will take and it will vary with soil type and the type and amount of residues returned. Soil inversion also

redistributes the nutrients in the topsoil and we do not know yet how this has affected nutrient availability to the crop.

ACKNOWLEDGEMENTS

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Crop Performance of Biological Stimulant TM21 vs Untreated

Barry Porter, Technical Rep, RYMC Pty Ltd.

AIM

To compare the performance of wheat crops grown using normal farming practices and inputs, to those grown with 2x250 ml/ha applications of the biological stimulant TM21 in addition to the normal farming practices and inputs.

BACKGROUND

Rising costs, pressure on margins and increased risk have resulted in a review of best practice to maximize sustainable outcomes. Improved efficiency of nutrient and water utilisation by plants in soils with higher levels of biological activity have been noted by researchers in many organizations world wide. TM21 is a biological stimulant and as such may increase biological activity in soils, thus improving the comparative performance of crops, where soil is lacking in biological activity, moisture or nutrient supply.

TRIAL DETAILS

Property	McIlroy family, Pithara
Plot size & replication	50m x 8m x 3 replicates
Soil type	Sandy Loam
Sowing date	28/05/09
Seeding rate	65 kg/ha Arrino
Fertiliser (kg/ha)	28/05/09: 80 kg/ha Agras 17/08/09: 80 kg/ha Flexi N
TM21 applications	1x250 mL /ha prior to seeding and 1x250 mL/ha at mid tillering
Herbicides	As per farmer practice
Growing Season Rainfall	201mm

RESULTS

Table 1: Yield and quality of wheat sown at Pithara.

Treatment	Yield t/ha	Protein (%)	Screening (%)	% Control	Gross Margin $/ha
TM21x2x250ml/ ha applications	1.44	12.0	3.3	89	326.88
untreated	1.62	11.6	3.9	100	367.74
TM21x2x250ml/ ha applications	1.82	12.0	3.3	110	413.14
Untreated	1.65	11.6	3.9	100	374.55
TM21x2x250ml/ ha applications	1.78	12.0	3.3	119	404.06
Untreated	1.48	11.6	3.9	100	335.96

COMMENTS

- Harvest results for this trial show a yield and quality improvement for the areas where the TM21 was applied. One of the replications was adversely impacted by mechanical damage incurred during either spraying or fertilizer application in the later stages of crop development.

- During the growing period it was observed that root development in the treated plots to be greater in mass than the untreated areas. Tiller development was also observed to be more even in treated plots with late tillers being less developed in the untreated plots.

ACKNOWLEDGEMENTS

- We acknowledge the support of the Liebe Group and its farmer members in making available the site for this trial. We also acknowledge the trial harvesting by Living Farm.

PAPER REVIEWED BY: Stuart McAlpine, McAlpine Farms.

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IMPROVED SOIL & STUBBLE MANAGEMENT FOR MORE PROFITABLE FARMING SYSTEMS

Nadine Hollamby, Project Coordinator, Liebe Group

AIM

The Liebe Group's GRDC project '*Improved stubble management practices for sustainable farming systems in the Liebe area*' has the following project aims:

1) To increase Liebe grower and researcher knowledge of the implications of stubble management on soil water.
2) To provide information that contributes to informed Liebe grower decision making leading to effective adoption of soil amelioration practices.
3) To increase Liebe grower and researcher knowledge of the long term effects of soil biology on crop productivity.

BACKGROUND

In low and medium rainfall areas, maximising every drop of rainfall is of vital importance to ensure higher yielding and higher quality crops. In addition, maximising input efficiencies is of equal importance to ensure improved gross margins and increased productivity. Liebe members have identified a greater understanding of soil and stubble management practices on soil water and plant development is required to increase crop resilience through extended winter dry periods and to increase flexibility in the farming system.

As the climate changes, winter rainfall is predicted to be reduced or more sporadic and summer rainfall is predicted in increase. This means summer rainfall is going to play an increasingly important part in the farming system, but little is known about the effects stubble management has on evaporation, infiltration and storing summer rainfall for the subsequent winter crop.

The Liebe Group is commencing work on a new 3 year project to investigate the long term effects of stubble and soil management on soil water and productivity.

PROJECT COMMITTEE

The direction of the project will be driven by a committee consisting of grower representatives and expert industry personnel, whom are listed below. There is room for more grower representatives on this committee, if any member is interested.

Name	Organisation	Role within Project
Nadine Hollamby	Liebe Group	Project Coordinator.
Chris O'Callaghan	Liebe Group	Project Supervisor.
Yvette Oliver	CSIRO	Farming Systems Scientist - providing technical advice and assistance for the stubble management research.
Andrew Wherrett	UWA/DAFWA	Soil scientist - to provide technical advice for the Soil Biology Trial.
Elizabeth Petersen	Advance choice economics	Evaluation specialist - To provide technical support with project evaluation & surveying.
Steve Davies	DAFWA	Soil scientist - Technical advice for the soil amelioration demonstrations.
Rob Sands	Farmanco	Consultant - Results interpretation & Economic Analysis.

Name	Organisation	Role within Project
Roy Murray-Prior	Muresk	Associate Professor - Adoption specialist & project development.
Dave Scholz	Elders Dalwallinu	Agronomist - providing local agronomic advice.
Blayn Carlshausen	Grower	Grower input.
Keith Carter	Grower	Grower input.
	Grower	Grower input.

The main focus areas of the project will be as follows:

Long term soil biology trial
The Liebe Group's soil biology trial commenced in 2003 and investigates the potential of biological and organic matter inputs to increase soil water storage, increase yield in the long term and improve soil heath and structure. The new project will allow the continuation of the trial in 2010, 2011 and 2012. Over the years this trial has been refined to its current level which is looking at managing paddocks for to increase soil carbon, with soil carbon being an important energy source for many microbial activities.

In 2010 Biochar will be added to the trial, in order to give growers and researchers a more fundamental understanding of the Biochar concept and its opportunities. Biochar is formed through a process called pyrolysis, which is the high temperature heating of organic materials in the absence of oxygen which produces a very inert form of carbon. This has potential to increase fertiliser efficiencies as well as potentially having a role in carbon sequestration.

This will be compared to other treatments which are tillage, addition of organic matter and burning.

Stubble management over summer trial
Different practices for managing stubble over the summer (burning, raking and full stubble retention) will effect stored soil water storage, evaporation, infiltration and nitrogen mineralization, all of which will effect growth and yield of the subsequent crop. In many areas, summer rainfall events are increasing and the resulting stored soil moisture is going to play an increasingly important part in the farming system. Currently there is little quantitative data available on the contribution summer rainfall events have on the following crops establishment and yield, therefore monitoring the effects summer rainfall events have on weeds, crop establishment and yield will be a focus in this trial.

Soil moisture probes situated in each of the treatments will continually monitor soil moisture to a depth of 0.5 m. This will enable us to fully monitor and understand how summer rainfall moves down the soil profile and how long that moisture is retained. To account for the differences soil type plays in water holding capacity the trial will be based on heavy and light land sites.

Data from the trial will complement and validate CSIRO's simulation modeling. The modeling will be used to extend trial information to other farming systems, soil zones and rainfall zones.

On farm soil amelioration demonstrations
Amelioration will also be a focus of this project to complement the other two aspects of the project. Through ensuring there are no constraints to production, crops are able to then fully utilise the rain that falls and that which is already stored in the soil. The demonstrations may include but are not limited to liming rates, gypsum rates, deep ripping, and overcoming non wetting soils. Upon completion the changes in soil health and the economic impact of improving soil constraints will be assed.

Reporting and Outputs

Members will be continually be informed on the development and outcomes of this project throughout the three years, with case studies, management guidelines and forums all being developed as part of the project.

To continue the work from the previous three year GRDC Adoption Project, grower interviews will be conducted at the end of the project to monitor adoption trends and current management practices. This will provide continuity with the technical audits that were conducted in 2006 and 2008.

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INCREASING WATER USE EFFICIENCY AND MANAGING INPUT COSTS FOR MORE SUSTAINABLE FARMING

Chris O'Callaghan, Executive Officer, Liebe Group

Australian Government
Department of Agriculture, Fisheries and Forestry

AIM

The overall objectives of the project are:

- Increased adoption of strategies aimed at reducing input costs and whilst maintaining sustainability of nutrients, soil health, ground cover, rotations, finances and more.
- Increased adoption of strategies aimed at increasing water use efficiency.
- Increased capacity of growers to determine the appropriate best practice management strategy for particular seasons and soil types.
- Increased community awareness of the projected impacts of climate change and seasonal variability on the farming system.
- Increased grower awareness and practise of strategies available to mitigate the effects of climate change and season variability.

BACKGROUND

Through the Australian Government's FarmReady initiative, and the Grains Research and Development Corporation, the Liebe Group is currently delivering a project aimed at assisting Liebe growers to better adapt to a changing and more variable climate.

The project aims to raise awareness of the drivers of climate and some of the predictions and scenarios going into the future. It will look at the current research into climate change, where the debate on climate change is at, and how farmers can adapt to an increasingly volatile climate. Mr Steve Crimp from CSIRO will be running a seminar on the 3rd of March at the Liebe Group Crop Updates, outlining some of the research that CSIRO is conducting and how growers may have to adapt their farming systems to suit a more variable climate. Mr Crimp is a Climate Applications scientist who leads a multi-disciplinary team exploring and evaluating options to increase resilience of Australian cropping systems to climate variability and change.

Increasing water use efficiency is an area where significant improvements to the farming system can be made. This can be achieved by an increase in the adoption of best practice management strategies including; optimising sowing time, using the suitable crop varieties, managing soil type differences correctly, conserving soil moisture, managing fertiliser inputs correctly and understanding the capacity of their different soil types to make in-season decisions according to how the season is progressing.

Advances in precision agriculture techniques also allow growers to achieve best practice by increasing their capacity and efficiency across all farming operations. By managing inputs more effectively, chemical and fertiliser savings can be made, leading to a more financially resilient farming system.

Some of the activities planned for the project are workshops on Water Use Efficiency and Precision Agriculture, Case Studies on various aspects of crop management, an input trial and water use efficiency demonstrations and also scenario planning workshops which will help growers plan for the future looking at numerous different scenarios. Look out for these opportunities throughout the year.

ACKNOWLEDGEMENTS

- This project is supported by funding from the Australian Government Department of Agriculture, Fisheries and Forestry under the Australia's Farming Future initiative.
- This project is also support by the Grains Research and Development Corporation.

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INNOVATIVE AND IMPROVED STRATEGIES TO MANAGE WIND EROSION RISK IN NAR

Chris O'Callaghan, Executive Officer, Liebe Group

CARING FOR OUR COUNTRY

LIEBE GROUP
Working together in Agriculture

AIM

The overall aims of this project is to:

- Increase adoption of strategies which reduce the extent and severity of wind erosion.
- Explore innovative strategies being used by farmers to combat wind erosion.
- Increase community knowledge of Natural Resource Management.

BACKGROUND

Through the Australian Government's Caring for our Country initiative, the Liebe Group are working with growers to develop innovative strategies to overcome problems with erosion.

Growers have always been at the forefront of driving innovation when it comes to overcoming on farm issues and the Liebe Group are working directly with them to capture exactly how growers are adapting to different issues.

With the numerous different types of farming systems in the Liebe area, it is important to capture the whole range of strategies growers have been using to overcome erosion given different soil types, rainfall zones and enterprise mix.

The aim of most wind erosion control strategies is to maintain or increase ground cover, whether by increasing plant growth through amelioration of low production soil zones; through growing an alternative crop or pasture that may provide more cover than traditional crops on a specific soil type; through managing stock differently so that over grazing of paddocks doesn't occur; or by managing stubble in a strategic way so that a paddock is never left bare.

Some of the innovative ways growers have identified to control wind erosion have been developed around these basic principles and range from simple soil improvement techniques which produce better crops and therefore more ground cover, through to companion cropping, strip grazing, alley farming and even more of the blue sky technologies such as virtual fencing to prevent stock from reaching high risk erosion areas.
The Liebe Group will work with growers who have implemented or are about to implement some of these strategies, follow their decision making and assess the impacts of their strategy over an extended period of time.

With numerous different farming systems in the region, the management strategy, or combination of strategies, will differ from property to property, even from paddock to paddock. This project will present a range of different strategies in the form of paddock scale demonstrations which will be documented in grower case studies and include economic analyses

This approach allows growers to learn from growers, with the costs and being weighed up as well as focusing on what strategies have the highest impact on the extent and severity of the erosion.

The project will be driven by a grower committee, who will identify the focus strategy/s, and help in developing the type of information that is required to assist other growers in their decision making.

These focus paddocks will then be produced into case studies which will be distributed to local growers.

ACKNOWLEDGMENTS

- This project is supported by funding from the Australian Government's Caring for our Country initiative.

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PLANFARM BANKWEST BENCHMARKS 2008-2009 SEASON

Both Planfarm and Bankwest – producers of the two dominant and most respected farm business benchmarking surveys in Western Australia, have decided to join forces to create the Planfarm Bankwest Benchmarks.

The Planfarm Bankwest Benchmarks are derived mostly from the information supplied by clients of Planfarm Pty Ltd, Bankwest and Bedbrook Johnston Williams, and represents a large cross section of WA broadacre farm businesses.

The survey results need to be viewed in context of the individual situation. If the performance of a business is low in a certain area then the factors affecting this area will need to be analysed. If the lower performance can be justified by something which cannot be changed (e.g. the farm in question has a lower than average rainfall or poorer than average soils than the group) then there may be little need for concern. Where however there are factors affecting performance that are directly influenced by management, then an assessment should be made on what changes will improve performance and profitability.

DEFINITION OF TERMS

Effective Area (Hectare) – land area used directly for the purposes of producing crops or livestock. Does not include non-arable land such as salt lakes, rocks and bush.

Gross farm income ($Eff/ha) – all income produced from farm related activities with respect to the area farmed.

Fertiliser ($Eff/ha) – cost of fertiliser applied with respect to the area farmed.

Plant Investment ($/Crop ha) – measures the value of machinery with respect to the area cropped.

Operating Costs (OPEX) – relates to any payments made by the farm business for materials and services excluding capital, finance and personal expenditures.

Operating Costs ($Eff/ha) – relates to any payments made by the farm business for materials and services excluding capital, finance and personal expenditures with respect to the area farmed.

Operating Surplus ($Eff/ha) – farm income less operating costs. Measures the return on farming activity before account is taken of depreciation expense.

Pesticides/Herbicides ($/Crop ha) – cost of any pesticides or herbicides used with respect to the area cropped.

May – October Rainfall (mm) – growing season rainfall (May-Oct) of survey participants.

Total Sheep Shorn – total number of sheep shorn including lambs.

Wool Cut (Kg/WGHa) – amount of wool cut with respect to winter grazed hectares.

Wool Price ($/kg) - value of wool sold with respect to the amount of wool cut.

Bottom 25% - the average of the low 25% of farms in the group surveyed ranked by operating surplus.

Top 25% - the average of the top 25% of farms in the group surveyed ranked by operating surplus.

These results have been extracted from the 'Planfarm BankWest Benchmarks 2008-09'.
For more information please contact the BankWest Agribusiness Centre on (08) 9420 5178.

Table 1: Farm Group Statistics Medium Rainfall Zone, Region 2.

Variables	**Top 25%**	**Ave.**	**Bottom 25%**
Effective Area (ha)	4153	3763	3499
May – October Rainfall (mm)	242	248	252
Permanent Labour (persons)	2.4	2.3	2.5
Casual Labour (weeks)	21.1	15.8	12.1
Eff Area/Perm Labour (ha)	1695	1688	1541
Income/Perm Labour ($'s)	1,085,133	866,417	624,796
Op Surplus/Perm Labour ($'s)	557,152	432,227	288,236
Gross Farm Income (GFI) ($/eff ha)	635	506	394
Operating Costs (OPEX) ($/eff ha)	335	327	329
Farm Operating Surplus ($/eff ha)	**300**	**179**	**65**
OPEX as % GFI (%)	52	66	83
Return on Capital (%)	12.1	6.0	-0.5
Wheat Yield (t/ha)	2.44	2.21	2.16
Wheat Area (ha)	2317	1844	1607
Wheat kg/mm ave (kg/mm)	12.71	10.62	10.14
Lupin Yield (t/ha)	1.40	1.40	1.14
Lupin Area (ha)	365	377	294
Barley Yield (t/ha)	2.55	2.23	2.01
Barley Area (ha)	468	414	307
Canola Yield (t/ha)	1.56	1.35	1.20
Canola Area (ha)	569	430	331
Total Crop area (ha)	3647	2901	2303
% Crop	88	78	66
% Legumes	7	10	7
N Use on Cereals (kg/ha)	41.5	45.1	47.8
P Use on Whole Farm (kg/ha)	10.7	10.2	9.2
Herbicide Costs ($/ha crop)	54.09	62.89	78.16
Plant Investments ($/ ha crop)	317	389	535
Opening Sheep Numbers (hd)	3135	3615	4137
No. of Ewes Mated (hd)	1532	1737	2281
Lambs/WG Ha (no.)	3.69	1.90	1.35
Wool Price ($/kg net)	4.23	4.69	4.48
Wool Cut/Grazed Area (kg/wgha)	21.2	19.0	20.7
Stocking Rate (dse/wgha)	4.6	4.2	4.4
Wool Production (kg greasy)	14230	16025	22029
Ave kg/Sheep Shorn (kg)	4.35	4.31	4.67

Table 2: Farm Group Statistics Low Rainfall Zone, Region 2.

Variables	Top 25%	Ave.	Bottom 25%
Effective Area (ha)	5197	5818	4502
May – October Rainfall (mm)	204	218	229
Permanent Labour (persons)	2.2	2.4	2.6
Casual Labour (weeks)	15.2	15.5	21.6
Eff Area/Perm Labour (ha)	2654	2434	2034
Income/Perm Labour ($'s)	1,503,878	1,040,276	455,382
Op Surplus/Perm Labour ($'s)	975,518	601,853	264,320
Gross Farm Income (GFI) ($/eff ha)	622	423	258
Operating Costs (OPEX) ($/eff ha)	225	203	182
Farm Operating Surplus ($/eff ha)	**397**	**220**	**76**
Farm Operating Surplus/mm GSR rainfall ($/eff ha)	2.10	1.13	0.36
OPEX as % GFI (%)	36	51	69
Return on Capital (%)	33.0	18.2	4.3
Wheat Yield (t/ha)	2.57	2.01	1.49
Wheat Area (ha)	3405	3129	2035
Wheat kg/mm ave (kg/mm)	13.79	10.52	7.44
Lupin Yield (t/ha)	1.77	1.37	1.07
Lupin Area (ha)	232	329	348
Barley Yield (t/ha)	2.43	2.04	1.72
Barley Area (ha)	413	494	834
Canola Yield (t/ha)	1.34	1.13	0.88
Canola Area (ha)	272	316	261
Total Crop Area (ha)	4075	4002	2870
% Crop	80	72	60
% Legumes	5	6	5
N Use on Cereals (kg/ha)	18.2	18.8	16.2
P use on whole farm (kg/ha)	7.0	6.1	4.9
Herbicide Costs ($/ha crop)	35.18	45.75	53.65
Plant Investment ($/ ha crop)	296	290	306
Opening Sheep Numbers (hd)	2040	2317	2370
Closing Sheep Numbers (hd)	2225	2054	1359
No. of Ewes Mated (hd)	1639	1296	927
Lambs/WG Ha (no.)	0.94	0.70	0.50
Wool Price ($/kg net)	4.89	4.70	4.52
Wool Cut/Grazed Area (kg/wgha)	9.0	7.3	6.2
Stocking Rate (dse/wgha)	1.8	1.7	1.2
Wool Production (kg greasy)	9587	10228	7909
Ave kg/sheep shorn (kg)	4.78	4.72	4.59

2009 RAINFALL REPORT

	Perenjori	Latham	Coorow	Dalwallinu	Goodlands	Kalannie	Pithara	Buntine	Wongan Hills
Jan	52.2	25.8	2.8	6.3	10.6	14	20	25	19.2
Feb	7	2.4	N/A	25.7	0.6	3.4	6	5.4	4.2
Mar	12	1.4	16	37.2	20	4	0	0	1.7
Apr	7.2	6.4	9.6	14.7	19.8	17.6	0	3	13
May	25.8	37.2	37.3	31.3	28	44.2	24	71	19
Jun	25.8	41.6	62.1	42.7	43.6	47	9	48.4	56.6
Jul	43.4	70.6	89.8	79.3	71	69.1	87	81.6	102.2
Aug	24.4	30.8	40.1	55.8	40.6	52.1	56.5	32.6	62.4
Sep	23.8	26.4	37.7	29	34.8	22.2	18.5	28	35.8
Oct	5	5.2	11	10.8	5	11.3	6	15	24.6
Nov	7.8	21.2	7.9	16.1	19.4	13.8	14	5	18
Dec	11.8	9.6	N/A	36.4	9	N/A	10	N/A	6.6
Total	**246.2**	**278.6**	**314.3**	**385.3**	**302.4**	**298.7**	**251**	**315**	**363.3**

Prepared by (JR) Western Australian Climate Services Centre in the Western Australian Regional Office of the Bureau of Meteorology, Perth on 7th January 2010.

Contact us by phone on (08) 9263 2222, by fax on (08) 9263 2233 or by email at climate.wa@bom.gov.au

We have taken all due care but cannot provide any warranty nor accept any liability for this information.

2009 LIEBE GROUP MEMBERSHIP SURVEY RESULTS

* Results are not necessarily ranked in order of priority or preference.

What do you see as the biggest agronomic issues in farming?

- Weeds
- Radish resistance
- Ryegrass resistance
- Rainfall/climate
- Brome grass
- Soil acidity
- Salinity
- Water use efficiency
- Lack of profitable legume
- Soil health
- Rotation for profit
- Increasing OM
- Varietal genetics
- Long term rain forcast
- Soil fertility
- Stubble management
- Agronomic practices with stubble
- Non wetting sands
- Budget constraints
- Barley Grass

What do you see as the biggest issues in your farm business?

- Grain marketing/outlook
- Succession/planning
- Profitability
- Cost of production/cost price squeeze/gross margins
- Rising input costs
- Grain prices
- Sustainability
- Fluctuating markets
- Cost of capital
- Social aspects of shrinking communities
- Conflicting agronomic information
- Managing profit risk
- Economies of scale
- Technology change with increased cost/adoption
- Inadequate prices for animal products
- Terms of trade
- Tax
- Cost of ameliorating acidity on low pH soils
- Communication
- Putting a business structure into a family enterprise
- Grain storage and handling

What training and workshops do you think are beneficial to your organisation?

- Grain marketing
- Integrated Weed Management
- Business management/time management/human resources
- Succession/progression/planning
- Conflict resolution/understanding people
- Agronomic training for farmers
- Variety demonstrations
- Grain storage practices/techniques
- General learning skills
- Hands on workshops
- Spraying workshops/chemical demonstration
- Nutrition
- Claying non wetting soils
- Stress free stock handling
- Electrical & wiring course
- Cropping trials
- General farm knowledge & advice
- Welding
- Use of multi meter
- Wheat varieties
- Different chemical rotations
- Email/elders
- Working with people
- Chemcert
- Agrimaster
- IT
- Field trials
- What can be done to iron stone and shallow sands
- New technologies

Are you interested in any particular concept/ products/practices that you would like tested?

- Spading/claying/mouldboard
- Chemicals
- Wheat varieties
- Deep ripping trials
- GM
- Disease in peas
- Clover regeneration
- Resistant varieties
- Calsap V lime trials
- Seed dressing trials
- Dolomite - Low Mg
- A legume pasture for our areas to fit with cropping
- Summer break crops for fallowing
- Integrated Weed Management
- Crop rotations
- Biology v chemistry

- Pasture species on sandy soils
- Using non-arable land for profit
- Canopy Management
- Grain storage/aeration
- Weed seeds killing percentages
- Precision Agriculture
- Deep ripping trials
- Long term lime trials
- Chemcert
- Biological farming systems
- Seeding practices
- Grass weed control with higher pH e.g. liming effect on grass control
- Sakura wide scale demonstration
- More pulse trials
- Effect of Ph on radish
- Baling behind headers
- Biochar

Can you please provide us with specific feedback on today's Spring Field Day?

- Don't change anything
- Site looks great
- Very well run, well organised
- Great variety of trials
- Sites are close together
- Informative & relevant
- Trial layout great
- Need better tent/use a shed
- Too many weeds on some trials
- More time to fill out survey
- Practice for Profit trial not well done
- Good site - real life problem.
- Will recommend others in my area to attend
- Map & agenda to be put on opposite pages
- NVT excellent
- More chemical trials
- Found weed control & NVT very interesting
- More manual workshops - welding etc
- Would have liked to have gone to any session but agenda forces you to compromise
- More animal orientated topics - grazing systems, pastures
- Move the trial site out east!
- Maybe more central location of marquee
- Plenty of time to get to each site
- The radish and ryegrass trials have been a big help to me in how I need to move in my farming business
- More information/feedback from previous years trial results
- Peter Newman IWM presentation very informative
- Grain Storage pres ok – would have liked more on the costs & different options for storing on farm
- Great host farmer!

LIEBE GROUP STRATEGIC PLAN 2007 – 2012
UPDATED: MARCH 2007

Vision
Vibrance and innovation for rural prosperity.

Mission Statement
A progressive group working together to improve rural profitability, lifestyle and natural resources.

Core functions
- Agricultural research, development, implementation and validation
- Provide information, education, skills and training opportunities to members and wider community
- Strengthen communication between growers and industry and whole community

Our 2012 targets
- Recognised by stakeholders as a leading farmer group involved in rural profitability, lifestyle and natural resources.
- 20% increase in membership, as measured by land area in Dalwallinu, Coorow and Perenjori shires.
- 20% increase in attendance at major events.
- 100% of Liebe Group members have made an effective decision concerning the adoption of new technology assisted by the Liebe Group.
- All committee positions willingly filled.
- We will be a 'best practice' community group measured by an external audit.
- We will have one year's overhead costs in reserve.
- The Liebe Group will be viewed by the industry as a desired place of employment.

Objectives
1. Conduct high-priority research, development, implementation and validation.
2. Provide information, education, skills and training opportunities for members and wider community.
3. Target specific industry bodies and community media to raise awareness of successes in the agriculture industry and the needs of farmers.
4. Maintain sound financial base of the Liebe Group.
5. Support and maintain high performing staff.
6. Follow corporate governance strategies correctly and maintain group process.

Liebe Group Values
- Member-driven, honesty, co-operation, innovation and passion.

Key:
EO- Executive Officer; **AM**- Administration Manager; **PC** Project Coordinator; **R&D Coord –** R&D Coordinator, **SC** – Sponsorship Coordinator
Committees:
MGT – Management Committee; **R&D Com -** Research & Development Committee; **Finance** – Finance Committee; **EAC**- Employment Advisory Committee; **Women's** – Women's Committee, **Ethics** – Ethics Committee
Industry Bodies:
GGA- Grower Group Alliance; **GRDC** – Grains Research and Development Corporation; **DAFWA** – Department of Agriculture and Food WA.

OBJECTIVE 1
Conduct high-priority research, development, implementation and validation.

STRATEGIES	WHO	WHEN
1. Attract and form partnerships with agribusiness and research organisations.		
• Key organisations on Liebe newsletter mailing list	EO	Ongoing
• Maintain close relationship with Department of Agriculture and Food (local officers and Regional Manager) and CSIRO project partners	EO	Ongoing
• Keep abreast of GRDC research priorities and maintain close relationship with Western Panel and grower group contact (Stuart Kearns)	PC & Staff	Ongoing
• Develop and maintain partnerships other industry and research bodies when opportunities arise	R&D Coord, PC and EO	Ongoing
• Distribute Liebe R&D priorities and trial site details to major research organisations and agribusiness	R&D Coord	Jan
• Invite key personal to R&D planning meeting.	R&D Coord	Feb
2. Develop trials and demonstrations to address local priorities at Main Trial Site (MTS), Long Term Research Site (LTRS), satellite sites & on-farm		
• Determine research and development priorities from annual member survey and R&D planning meeting	R&D Coord	Sept and Feb
• Develop trial program for the MTS using agribusiness and research organisations partners	R&D Coord	Feb, March
• Develop trial program for the satellite sites in conjunction with DAFWA and agribusiness	R&D Coord	Feb, March
• Organise and conduct on-farm demonstrations	R&D Coord	Ongoing
• Discuss Strategic R&D priorities at general meeting	MGT	Ongoing
• Ensure we seek R&D opportunities that encompass a whole systems approach	EO and R&D Coord	Ongoing
• Maintain soil biology trial at LTRS	PC	Ongoing
• Raise profile of LTRS and attract research bodies wishing to conduct trials of a long term nature to the site	PC	Ongoing
• Maintain trial program at LTRS	PC	Ongoing
• Ensure R&D protocols are adhered to	PC and R&D Coord	Ongoing
3. Increasing adoption of new technologies		
• Benchmark adoption level of Liebe members	PC	Feb 2007
• Conduct final audit to assess the influence of the project on growers decision making processes towards technology adoption.	PC	2009
• Conduct farmer case studies and economic analysis on growers that have adopted new technology	PC	2007/2008 2009
• Conduct on-farm demonstrations and economic modelling with growers that are considering technology adoption	PC	2007/2008/ 2009

OBJECTIVE 2
Provide information, education, skills and training opportunities for members and wider Community.

STRATEGIES	WHO	WHEN
1. Extend Liebe Group research, development, implementation and validation results.		
• Conduct a Spring Field Day at the Main Trial Site	R&D Coord & EO	Sept
• Field walk at the Satellite Trial Sites	R&D Coord	Aug/Sept
• Field walk at the LTRS	PC	Aug/Sept
• Hold Crop Update to prepare growers for coming season	R&D Coord & EO	March
• Promote results in R&D Results Book and review priority research at Trials Review day	R&D Coord	Feb

• Promote results to wider community	R&D Coord, PC & EO	Ongoing
• Assist in attracting members to events by having high profile guest speakers	Staff	At events
2. Workshops and study tours		
• Use member survey and feedback to identify member requirements.	Staff	Sept & Ongoing
• Conduct high priority workshops annually (e.g. Agronomic, Management, Financial, Skills based, Communication)	AM and staff	Ongoing
• Conduct Intra or Interstate tours, visiting innovative, interesting and sustainable farming systems	EO and AM	Annually or on demand
3. Communication		
• Members informed of local, relevant and timely information and case studies in monthly newsletters	AM and staff	Monthly
• Early notification of all dates and opportunities to provide members with plenty of time to schedule time off the farm. Add dates to GGA calendar and check with local organisations to avoid clashes	AM	Ongoing
4. Encourage all sectors of community to attend Liebe Group activities		
• Conduct events that encourage young farmers and women to be involved	Committees, staff and Women's	As required
• Encourage mentorship within the Liebe Group through encouraging interaction processes at events	Committees and staff	Ongoing
• Ensure we are being inclusive when catering for events	Relevant Committees	Ongoing
5. Member Development.		
• Encourage greater input from non-involved members to come along to Liebe events. Bring a buddy philosophy.	Committees	Ongoing
• Promote external workshop or development opportunities to members via email and newsletter	EO	Ongoing
• Investigate sources of financial assistance for members to take up development opportunities or investigate possibility for the Liebe Group to provide financial assistance	EO and MGT	Ongoing
• Review standard proposal for members to receive remuneration for voluntary time (e.g. $/hr and travel cost).	MGT	Prior to AGM
• Ensure members are being well serviced and areas for improvement are sought by phone interviews, farm visits and talking with them at events	Staff	Ongoing
• Ensure a sense of fun is incorporated at all Liebe Group events	Staff	Ongoing

OBJECTIVE 3

Target specific industry bodies and community media to raise awareness of successes in the agriculture industry and the needs of farmers.

STRATEGIES	WHO	WHEN
1. Develop & maintain linkages with agribusiness, government agencies, tertiary institutions and political organisations		
• Maintain friends list for newsletter with all industry contacts made throughout the year and review each year	EO	Jan
• The prospectus to be made available to above bodies with an update occurring when necessary	AM	Ongoing
• Liebe Group website to be maintained monthly and placed under high priority as our 'industry face'	AM and staff	Ongoing
• Encourage relevant industry to attend General Meetings.	EO and MGT	As required
• Attend an Agricultural Industry Workshop developed by GGA and similar opportunities	EO, staff and MGT	Oct- Annually
• Encourage attendance of above bodies to Liebe Group events	EO & Staff	For events
• Maintain industry profile so that we are approached to facilitate contact if farmers individual opinions are required.	EO and MGT	As required

2. Promote agricultural successes in rural and non rural media		
• Maintain partnership with Farm Weekly produce monthly Liebe updates for the paper	AM and staff	Monthly
• Invite media to main Liebe Group events and publish appropriate press releases	AM	As required
• Develop contact and build rapport with the West Australian and Sunday Times to promote agriculture outside the agriculture industry	EO	Ongoing
• Publish monthly updates in local papers	AM	Ongoing
3. Celebrate Liebe and members success		
• Keep abreast of awards and nominate appropriate members / group	Staff and MGT	Ongoing
• Hold an annual Liebe Dinner	AM and staff	Oct
• Cater for post event celebrations	Staff	At events
• Promote great achievements and member success in Liebe newsletters	AM and staff	Monthly
• Maintain and develop Liebe Group identity through staff uniform and badges to be worn at all events, promote sale of Liebe shirts and jumpers on membership flyer	Staff	Ongoing
• Develop system to recognise farmers that have contributed significantly to the Liebe Group	AM	By July 2007

OBJECTIVE 4
Maintain sound financial base of the Liebe Group.

STRATEGIES	WHO	WHEN
1. Finance Committee to oversee Liebe finances and budget.		
• Review project funding timeline	Finance	Ongoing
• Prepare budget and allocations for subcommittees	Finance	As required
• Approve finance for expensive purchase items	Finance	Ongoing
• Track progress of income and expenditure areas	Finance	Ongoing
• Committee meets regularly and when necessary	Finance	Quarterly
2. Seek funding.		
• Maintain strong links with Sponsors and Partners	SC and AM	Bi-Annually
• Seek new sponsors and partners	SC and AM	Ongoing
• Review sponsorship guidelines and return on investment for each	SC and AM	Ongoing
• Identify & target high-return sources of funding (sponsors, programs, membership and subcontracting)	Finance, SC and staff	Ongoing
3. Develop membership contributions.		
• Review stability of membership numbers and ensure members are being well serviced	Finance, MGT and staff	Prior to AGM
• Recommendation of fees and value of membership.	Finance	AGM

OBJECTIVE 5
Support and maintain high performing staff.

STRATEGIES	WHO	WHEN
1. Support and develop Liebe Group employees each year.		
• Review performance appraisal document	EAC	Annually
• Review performance, competitive salary, goals and objectives taking care to enhance employee's areas of special interest	EAC	Dec
• Conduct annual performance appraisals. Include self and team assessment process (SWOT)	President & Staff	Nov
• Review new employee induction program. Guided by protocol and list of required training.	EAC & EO	As required
• Provide staff with professional development	EO	Ongoing
• Conduct fortnightly team meetings	Staff	Ongoing
• Ensure Management Committee adopt ethos of supporting staff	MGT	Ongoing
• Review mentor program for employees	EO	Ongoing

2. Maintain and increase employment base in order to meet group requirements.		
• Review list of all roles and responsibilities, delegating each responsibility to appropriate staff member.	EO	Oct
• Identify "gaps" in roles and skills, and investigate employment options	EO	Oct
• Seek external contracting of funding specialist	EO	As required
• Seek feedback from employees to develop and maintain a conducive working environment.	EAC	Ongoing

OBJECTIVE 6

Follow corporate governance strategies correctly and maintain group process.

STRATEGIES	WHO	WHEN
1. Management Committee, Sub-committee and reporting structure		
• Management Committee meets on a monthly basis at a General Meeting (except May, Nov and Jan)	MGT and staff	Monthly
• Sub-committees meet as required	Committee chairs	As required
• Finance, R&D, Women's and Ethics sub-committees report to the Management Committee	Finance, Ethics, MGT R&D Com, Women's	When required
• Employment sub-committees report to the EO	EAC and EO	When required
• EO must sit on every Liebe Group committee	EO	Ongoing
• Review Management Committee and sub committee operation and responsibilities annually	Committees	Pre AGM
• After each AGM review responsibility of each committee (esp. Governance responsibilities)	All committees	After AGM
• Analyse resources, skills and interests required for successful Liebe Group management and sub committees and individually approach members to be involved in various committees	EO and staff	Prior AGM
• Identify training and educational opportunities for all Liebe Group committee members	Committees / Staff	Ongoing
• Distribute folder for subcommittee members and include guidelines for effective committee meetings	EO	AGM
• Follow succession strategy to increase member involvement on committees, as per succession protocol	Committee	As required
2. Effective Group Process		
• Develop 5 year strategic plan and review objectives annually as a working document	Staff and MGT	Annually
• Ensure inclusive processes are always used	All	Always
• Maintain transparency in processes	All	Always
• Develop written protocols on Liebe Group process to aid in transition of staff and group positions	Staff	Ongoing
• All committees and staff are to operate by Liebe Group Code of Ethics	Ethics	Annually

LIEBE GROUP CALENDAR OF EVENTS 2010

EVENT	DATE	LOCATION	CONTACT
Liebe Group AGM	15th February 2010	Buntine Bowling Club	Chris O'Callaghan (08) 9664 2030
Liebe Group Crop Updates	3rd March 2010	Buntine Hall	Nadine Hollamby (08) 9664 2030
March General Meeting	15th March 2010	Liebe Office	Chris O'Callaghan (08) 9664 2030
April General Meeting	21st April 2010	Liebe Office	Chris O'Callaghan (08) 9664 2030
June General Meeting	14th June 2010	Liebe Office	Chris O'Callaghan (08) 9664 2030
Women's Field Day	22nd June 2010	Dalwallinu Recreation Centre	Chris O'Callaghan (08) 9664 2030
Post Seeding Field Walk & Beer 'n' Burger Night	22nd July 2010	Main Trial Site - Nankivell's Property, Maya	Chris O'Callaghan (08) 9664 2030
July General Meeting	26th July 2010	Liebe Office	Chris O'Callaghan (08) 9664 2030
Annual Liebe Group Dinner	4th August 2010	TBC	Chris O'Callaghan (08) 9664 2030
August General Meeting	23rd August 2010	Liebe Office	Chris O'Callaghan (08) 9664 2030
Spring Field Day	9th September 2010	Main Trial Site - Nankivell's Property, Maya	Chris O'Callaghan (08) 9664 2030
September General Meeting	20th September 2010	Liebe Office	Chris O'Callaghan (08) 9664 2030
October General Meeting	18th October 2010	Liebe Office	Chris O'Callaghan (08) 9664 2030
December General Meeting & Christmas Drinks	13th December 2010	Liebe Office	Chris O'Callaghan (08) 9664 2030