Welcome to the Liebe Group Spring Field Day for 2008.

As you would have observed when you drove here today, the countryside is well into spring bloom which has brought relief to many who have experienced dry winter conditions over the past two years. The substantial rainfall events that were received in April and July created significant soil moisture reserves from which crops could flourish.

The trial site looks fantastic and much of the credit for this must go to our hosts, Clint, Ian and Helen Hunt. I thank them for allowing trials to take place on their property and for the enthusiastic and well organised manner that they have prepared and monitored the various sites. We are privileged to see such comprehensive trial work undertaken in our local community and this would not be possible without the support of growers who are willing to offer their time and resources to host trials.

The Liebe Group's Research & Development Coordinator Chris O'Callaghan deserves our commendation for successfully implementing and managing the trials. Thanks also to the members of the R&D committee who along with our research partners helped to plan and design the trial site. As a result, we have been able to deliver trials that cover the main crops grown in our catchment area including wheat, barley, canola, lupins, chickpeas and pastures species. Chris has received valuable support from all Liebe Group staff members and I congratulate Sophie Carlshausen and her team for producing an event that offers so much to its participants.

We would not be in a position to offer the divergence of trials without the ongoing support of our research partners. Thanks must be extended to the Department of Agriculture and Food (DAFWA) who have contributed 11 field trials, static displays or presentations. We appreciate the professional manner that members of DAFWA have exhibited in preparing their sites. Kalyx Agriculture continues their involvement with Wheat and Canola NVT and has provided valuable input into Practice for Profit. Landmark, CBWA, CSBP, and Elders have included trials to further broaden the scope of field demonstrations.
Presentations and static displays will run concurrently with the field demonstrations and I thank Rabobank Syngenta, CBH, ALOSCA, CSIRO and Primary Safety for their input.
Given the changing landscape for grain marketing in 2008, a marquee will accommodate various organisations and consultants who will participate in the new deregulated environment. I encourage you to gather as much information as possible to allow informed decision making during the coming harvest.

The Liebe Group is reliant upon the ongoing commitment of GRDC to be able to deliver local research. As such we are grateful to the Grower Group Alliance in arranging our guest speaker, Clive Kirkby from CSIRO. He will deliver a presentation entitled "Carbon Myth Busters" which will provide quality information on soil carbon and its impact on soil health.

Thankyou to Elders who again are the event sponsors of the Spring Field Day.

Next year the 2009 Spring Field Day will be hosted by the McIlroy family of Pithara and site preparation has already commenced to help ensure trials are given the optimum chance of success. We continue to seek your feedback as to what trials are the most pertinent for your farm businesses and welcome your input.

Enjoy the day.

Ian Hyde
R&D Committee Chairperson

CONTENTS

DISCLAIMER: All information in this booklet is believed to be true and correct. No responsibility is taken for incorrect information printed.

2008 SPRING FIELD DAY AGENDA

Choose Your Own Field Day

9.00	**9.30**	Registration				
9.30	**9.35**	Welcome – Ron Carlshausen, Liebe Group President				
9.35	**9.40**	Farm Information – Clint Hunt, Main Trial Site Host Farmer				
9.40	**9.50**	Housekeeping – Chris O'Callaghan, Liebe Group R&D Co-ordinator				
Time		**Session 1**	**Session 2**	**Session 3**	**Session 4**	**Session 5 - Marquee**
10.00	**10.30**	**(5) Wheat national variety trial** Kalyx Agriculture (1 of 3)	**(3) New pasture varieties** DAFWA (1 of 2)	**(12) Boxer® Gold efficacy trial** Elders (2 of 2)	**(17) Soil health workshop 1 soil pit** DAFWA (1 of 2)	**(M1) Legume innoculation** ALOSCA (1 of 2)
10.40	**11.10**	**(1) Wheat time of sowing** DAFWA (1 of 2)	**(8) Canola national variety trial** Kalyx Agriculture (1 of 2)	**(2) seed dressings on wheat/ barley varieties** Landmark (1 of 2)	**(10) Saltbush agronomy** DAFWA (1 of 2)	**(M1) Soil health workshop 2 Long term consequences of liming on profitability** DAFWA (2 of 2)
11.20	**11.50**	**(6) Practice for profit** Liebe Group (1 of 3)	**(13) Canola seed dressing trial** CBWA (1 of 2)	**(12) Boxer® Gold efficacy trial** Elders1 of 2)	**(9) Lupin variety trial** DAFWA (1 of 2)	**(M1) Input costs: drivers and predictions** Rabobank (1 of 2)
12.00	**12.30**	**(5) Wheat national variety trial** Kalyx Agriculture (2 of 3)	**(3) New pasture varieties** DAFWA (2 of 2)	**(2) Seed dressings on wheat/ barley varieties** Landmark (2 of 2)	**(4) Chickpea varieties** DAFWA (1 of 2)	**(M1/15) Setting up for a liquid banding system** CSBP (1 of 1)
12.30	**1.10**	**Lunch**				
1.10	**1.55**	**GUEST SPEAKER – Clive Kirkby, "Carbon Mythbusters Roadshow"**				
1.55	**2.10**	**R&D Planning Session**				
2.20	**2.50**	**(1) Wheat time of sowing** DAFWA (2 of 2)	**(8) Canola national variety trial** Kalyx Agriculture (2 of 2)	**(11) New radish herbicides** DAFWA (1 of 2)	**(M2) EXTRA OPPORTUNITY TO BROWSE GRAIN MARKETING TENT**	**(M1) Legume Innoculation** ALOSCA (2 of 2)
3.00	**3.30**	**(6) Practice for profit** The Liebe Group (2 of 3)	**(7) N & P for canola and wheat** CSBP (1 of 2)	**(16) Working at heights demonstration** Primary Safety (1 of 2)	**(4) Chickpea varieties** DAFWA (2 of 2)	**(M1/14) Nozzles and spray applcations** Syngenta (1 of 2)
3.30	**3.50**	**Afternoon Tea**				
4.00	**4.30**	**(5) Wheat national variety trial** Kalyx Agriculture (3 of 3)	**(10) Saltbush agronomy** DAFWA (2 of 2)	**(13) Canola seed dressing trial** CBWA (2 of 2)	**(9) Lupin variety trial** DAFWA (2 of 2)	**(M1) Input costs: drivers and predictions** Rabobank (2 of 2)
4.40	**5.10**	**(6) Practice for profit** Liebe Group (3 of 3)	**(7) N & P for canola and wheat** CSBP (2 of 2)	**(11) New radish herbicides** DAFWA (2 of 2)	**(16) Working at heights demonstration** Primary Safety(2 of 2)	**(M1/14) Nozzles and spray applications** Syngenta (2 of 2)
5.20	**5.30**	Close – Dave Scholz, Elders Dalwallinu				
5.30 onwards		Georgie Gardner Singing, Bar Open and BBQ.				
Note:		(1 of 2) – Number of Presentations in the day; (17) – Presentation number, use map to locate, (M1) – Marquee Presentation in Main Marquee; (M2) – Grain Marketing Marquee				

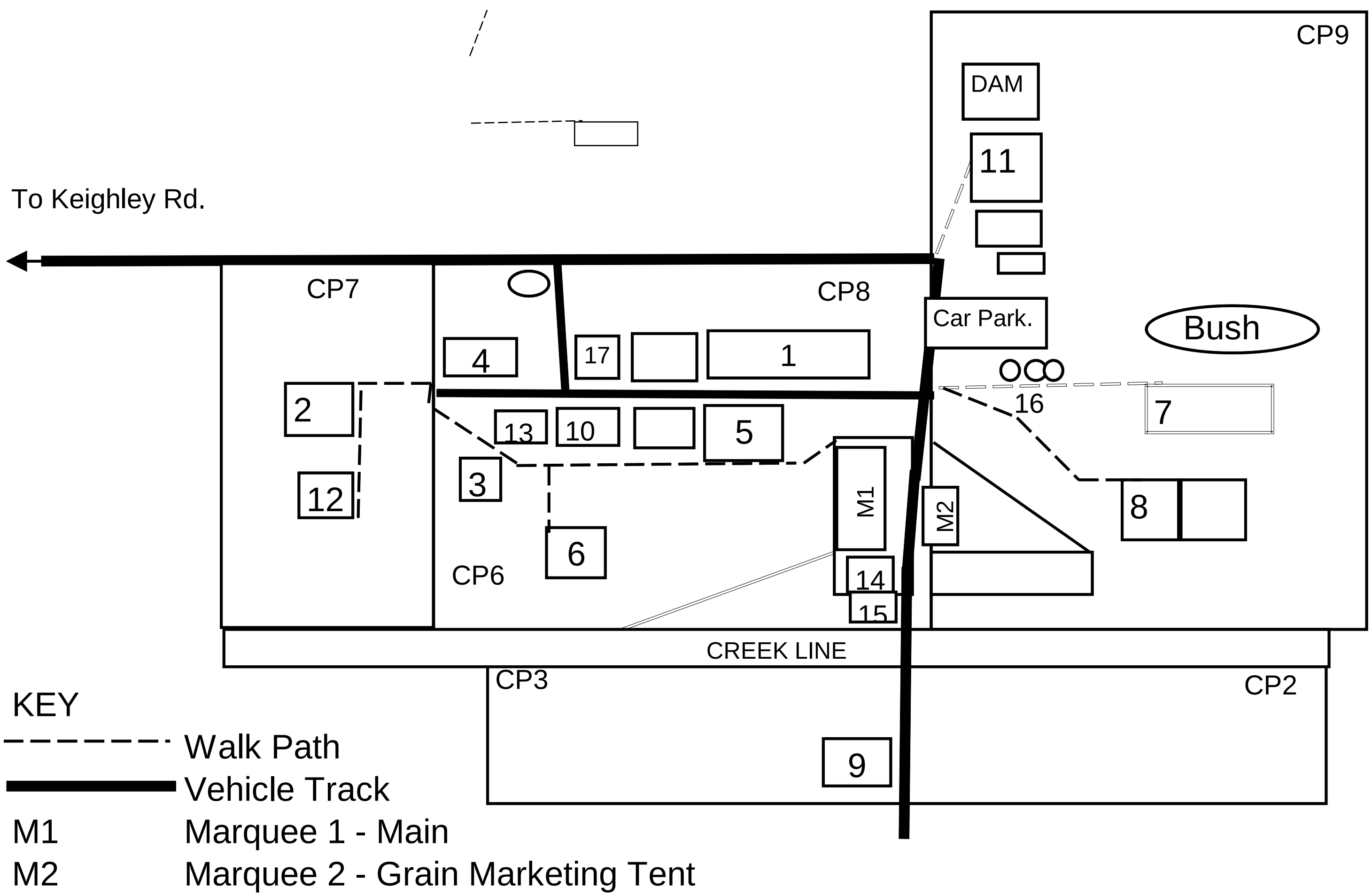
2008 PRESENTATION DESCRIPTIONS

PRESENTATION NUMBER	PAGE NO.	TITLE	COMPANY	PRESENTERS	DESCRIPTION
FIELD TRIAL PRESENTATIONS					
1	9	Wheat time of sowing trial	DAFWA	Christine Zaicou-Kunech	To assess different wheat varieties, sown at 3 different times.
2	11	Seed treatments in wheat. Barley variety trial.	Landmark	Darren Chitty	To assess the affect of different seed treatments on wheat on vigour and yield. To assess 9 barley varieties for yield and quality.
3	13	New pasture varieties	DAFWA	Angelo Loi	Assessing the growth of Eastern Star Clover and Bladder Clover.
4	14	Chickpea variety trial	DAFWA	Wayne Parker	To assess the yield and quality of numerous chickpea varieties.
5	16	Wheat national variety trial	Kalyx Agriculture	Peter Burgess Matu Peipi Kevin Young Iain Barlclay	An evaluation of wheat varieties from breeding companies from around Australia. All relevant breeding companies will be in attendance.
6	18	Wheat Practice for Profit	Liebe Group	Sally Porter	To assess different input packages, low, medium, high and seasonally active, on gross margins.
7	21	N and P Rates on Canola and Wheat	CSBP	Erin Cahill	To assess the interaction between Nitrogen and Phosphorus rates on Wheat and Canola, in one trial.
8	25	Canola National Variety Trial	Kalyx Agriculture	Peter Burgess, Milton Sanders, Nick Joyce	An evaluation of canola varieties from breeding companies from around Australia. All relevant breeding companies will be in attendance
9	27	Lupin variety trial	DAFWA	Alan Meldrum	To assess yield and quality of numerous lupin varieties.
10	29	Saltbush agronomy	DAFWA	Lorinda Hunt	To present information on the development of an agronomy package for salthbush species.
11	31	Large scale wild radish herbicides demonstration	DAFWA	Peter Newman	To evaluate new radish herbicides on a large scale
12	33	Boxer® Gold efficacy trial	Elders	Dave Scholz	To demonstrate the crop safety aspects of Boxer® Gold and Trifluralin on Wheat.
13	34	Canola seed dressing trial	CBWA	Milton Sanders	To demonstrate the effect of seed dressings on early vigour and establishment of canola varieties with three different maturity dates.
OTHER PRESENTATIONS					
14	36	Nozzles & spray applications	Syngenta & Teejet	Craig Ruchs Jake Lanyon	A demonstration of different spray nozzles and their impact on spray application.
15	23	Setting up a liquid banding system	CSBP	Erin Cahill	A presentation showing recommendations for setting machines up for liquid fertiliser banding.

16	N/A	Working at heights demonstration.	Primary Safety	Ben Olsen Barry Barton	A demonstration of farm safety when working on silos and working at heights, including harness and lanyard demonstration.
17	37	Soil health workshop 1 – Soil Pit	DAFWA	Stephen Davies	A presentation of a soil pit looking at root growth and pH on 2 different soil types.
Marquee 1	43	Maximising Nitrogen Fixation	ALOSCA	Chris Poole	A presentation outlining the aims methods and benefits of the current survey evaluating *Rhizobium* paddock strain nitrogen fixing efficacy for lupin and sub-clover.
Marquee 1	40	Soil health workshop 2 – The long term consequences of lime on crop profitability	DAFWA	Stephen Davies	A presentation on long-term research conducted by the DAFWA, looking at the economics of liming.
Marquee 1	45	Input Costs – Drivers and Predictions	Rabobank	Crawford Taylor	A presentation on the drivers behind the rising input costs and the predictions for the future.
Marquee 1	46	Carbon Mythbusters GUEST SPEAKER	CSIRO	Clive Kirkby	A presentation aiming to increase grower knowledge of the role of soil carbon, the impacts on fertility, the ability to sequester carbon and can we increase carbon levels.
STATIC DISPLAYS					
Marquee 1	N/A	Biosecurity in the Northern Agricultural Region	DAFWA	Static Display	A poster display to increase grower awareness of skeleton weed and other declared plants in the Northern Agricultural Region
Marquee 1	N/A	Small on farm infra-red analyser	CBH	Static Display	An opportunity for growers to view and ask questions about this new technology that is currently being developed.
Marquee 2	N/A	Grain Marketing Expo	Various	Information Tables	An opportunity for growers to access some of the grain marketing organizations available to them, giving deregulation of the marketing system.

DISCLAIMER: The Liebe Group does not endorse any product or service included in this publication. The information is of a general nature and is intended for growers to use to make more informed decisions about these products or services. Please interpret results carefully, decisions should not be based on one season's data.

CLINT, IAN & HELEN HUNT - LIEBE MAIN TRIAL SITE 2008



FIELD TRIALS

1. Wheat Time of Sowing Trial - DAFWA
2. Seed treatments on wheat and barley variety trial - Landmark
3. New pasture varieties - DAFWA
4. Chickpea Variety Trial- DAFWA
5. Wheat National Variety Trial - Kalyx Agriculture
6. Wheat Practice for Profit - Liebe Group
7. N & P Rates on Canola & Wheat - CSBP
8. Canola National Variety Trial - Kalyx Agriculture
9. Lupin Variety Trial- DAFWA
10. Saltbush Agronomy Trials- DAFWA
11. Large Scale New Radish Herbicides Demonstration - DAFWA
12. Boxer Gold V Trifluralin - Elders
13. Seed dressings on Canola - CBWA

OTHER PRESENTATIONS

14. Nozzle Demonstration and spray applications - Syngenta
15. CSBP Liquid Systems Presentation
16. Farm Safety Demonstration
17. Soil Workshop part 1 - Soil Pit

MARQUEE 1

Guest Speaker - Clive Kirby, "Carbon Mythbusters"
Soil Workshop part 2 - Managing Acidic Subsoils
Input Costs: Drivers and Predictions
Biosecurity in the Northern Agricultural Region, DAFWA Static display
Small on farm infratech analyser - CBH
ALOSCA Strain Survey

MARQUEE 2

Grain Marketing Organisations

2008 Main Trial Site Paddock Information

Paddock CP6 (Section 1 – Eastern half)

Soil Components	0-10cm	10-20cm
Description	Yellow clay sand, good medium country	
Nitrate N (mg/kg)	21	6
Ammonium N (mg/kg)	6	1
Phosphorus (mg/kg)	31	8
Potassium (mg/kg)	113	76
Sulphur (mg/kg)	21.3	17.8
Organic Carbon (%)	0.88	0.44
Reactive Iron (mg/kg)	571	480
Electrical Conductivity (dS/m)	0.091	0.046
pH ($CaCl_2$)	5	4.3
pH (H_20)	5.5	4.9
Crop Rotation	2008 – Wheat, 2007 – Canola, 2006 – Wheat, 2005 – Brown Manured Pasture	

Paddock CP6 (Section 2 – Western half)

Description	Red loam	
Nitrate N (mg/kg)	9	3
Ammonium N (mg/kg)	3	1
Phosphorus (mg/kg)	37	15
Potassium (mg/kg)	105	59
Sulphur (mg/kg)	16.4	11.5
Organic Carbon (%)	0.79	0.34
Reactive Iron (mg/kg)	338	557
Electrical Conductivity (dS/m)	0.082	0.049
pH ($CaCl_2$)	5.6	5.2
pH (H_20)	6.1	5.8
Crop Rotation	2008 – Wheat, 2007 – Canola, 2006 – Wheat, 2005 – Brown Manured Pasture	

Paddock CP8

Nitrate N (mg/kg)	8	4
Ammonium N (mg/kg)	3	1
Phosphorus (mg/kg)	37	11
Potassium (mg/kg)	143	121
Sulphur (mg/kg)	19	13.8
Organic Carbon (%)	0.92	0.49
Reactive Iron (mg/kg)	521	486
Electrical Conductivity (dS/m)	0.071	0.038
pH ($CaCl_2$)	5.4	4.5
pH (H_20)	5.9	5.3
Crop Rotation	2008 – Wheat, 2007 – Canola, 2006 – Wheat, 2005 – Brown Manured Pasture	

Paddock CP3

Description	Yellow Sandplain	
Nitrate N (mg/kg)	3	2
Ammonium N (mg/kg)	2	1
Phosphorus (mg/kg)	20	15
Potassium (mg/kg)	80	45
Sulphur (mg/kg)	14.8	4.9
Organic Carbon (%)	0.78	0.41
Reactive Iron (mg/kg)	249	260
Electrical Conductivity (dS/m)	0.048	0.02
pH ($CaCl_2$)	5.8	4.8
pH (H_20)	6.3	5.5
Rotation	2008 – Lupins, 2007 – Wheat, 2006 – Wheat, 2005 – Wheat, 2004 - Lupins	

Paddock CP9b (Southern side)

Description	Red gravelly loam	
Nitrate N (mg/kg)	4	1
Ammonium N (mg/kg)	1	1
Phosphorus (mg/kg)	27	12
Potassium (mg/kg)	108	92
Sulphur (mg/kg)	9.1	8.4
Organic Carbon (%)	0.83	0.54
Reactive Iron (mg/kg)	283	286
Electrical Conductivity (dS/m)	0.052	0.037
pH ($CaCl_2$)	5.8	4.7
pH (H_20)	6.1	5.4
Rotation	2008 – Canola 2007 – Wheat, 2006 – Brown Manured Pasture, 2005 - Wheat	

MAIN TRIAL SITE RAINFALL 2008

AS AT 1ST OF SEPTEMBER, 2008.

Table 1. Rainfall chart for 2008 Liebe Group main trial site as of the 1/9/08. Values are in millimetres**.**

Date	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1							1					
2						4						
3							1.5	3				
4												
5							5.5					
6							2.5					
7												
8												
9						4						
10												
11							6					
12												
13							1.5					
14					4.75							
15												
16							26					
17				25		10.5						
18							6.5					
19												
20							14					
21		26										
22												
23					3.5	3	13					
24												
25												
26							10.5					
27						8.5		7				
28								1				
29				43.5		8	21.5					
30							8.5	2.5				
31			3				4					
TOTAL	0	26	3	68.5	8.25	38	122	13.5				
Cumulative	0	26	29	97.5	105.75	143.75	265.75	279.25				
Apr-Oct					76.75	114.75	236.75	250.25				

WHEAT TIME OF SOWING

Christine Zaicou-Kunesch, DAFWA

Department of Agriculture and Food

TAKE HOME MESSAGES

- Early maturing varieties are available for the late sowing opportunities
- Unlikely to have Australian hard varieties released in 2008. (Tammarin Rock released in 2005)
- High yielding ASW may have a fit however price will influence adoption
- New APW varieties released and some will have a fit for growers
- New udon noodle wheat has similar maturity to Calingiri

BACKGROUND

This time of sowing trial is one component of a DAFWA/GRDC funded research program which aims to provide growers in the northern agricultural region with information needed for making decisions on wheat variety choice and management.

TRIAL DETAILS

Plot size & replication:	20m x 1.54m x 3 replications
Soil type:	Gravelly loam
Sowing date:	TOS 1: 1/5/08; TOS 2: 16/5/08; TOS 3: 12/6/08
Fertiliser (kg/ha):	100 kg/ha Agstar extra; 40 kg/ha urea
Herbicides:	Pre: 1 L/ha Roundup; 1.5 L/ha Sprayseed IBS: 1.5 L/ha Treflan Post: 200 mL/ha Lontrel; 1 L/ha Jaguar
Insecticides:	100 mL/ha Talstar; 200 mL/ha Dominex

VARIETY LIST

Arrino
Axe
Binnu
Bonnie Rock
Calingiri
Carinya
Carnamah
Catalina
Correll
Derrimut
Espada
Gladius
IGW2838
IGW2856
Lincoln
Magenta
RAC1372
RAC1423
Tammarin Rock
Wentworth
Wyalkatchem
Yandanooka
Yitpi
Young

RESULTS

DAFWA is continuing experimentation in 2008 to predict flowering time of new wheat varieties. This will help growers with decisions on planting times to ensure varieties don't flower too early when there is a risk of frost and disease or too late when there is the risk of high temperatures and drought.

One aspect of this experimentation involves seeding over 40 varieties at 4 different sowing times in single row plots at DAFWA's Research Support Unit at Wooree in Geraldton. Varieties sown on the 26th April have flowered in mid winter (see Table below).

Table 1: Flowering date (50%) of wheat varieties sown on the 26th April at Geraldton in 2008.

	4th week June	1st week July	2nd week July	3rd week July	4th week July
Axe					
Calingiri					
Espada					
Gladius					
IGW 2836					
IGW 2838					
IGW 2856					
Magenta					
RAC 1372					
RAC 1423					
Wyalkatchem					

Barley Variety Trial

Darren Chitty, Landmark

Take Home Messages

- Buloke has been the highest yielding malt barley variety in the NVT for the past two years. It has superior disease resistance compared to commonly grown varieties, particularly powdery mildew.

- Hindmarsh is a new short season feed variety with excellent disease resistance to powdery mildew, scald and Cereal Cyst Nematode. It has outstanding yield potential, yielding 10% higher than Mundah in 2007. It is currently undergoing international brewing evaluation trials.

Trial Details

Plot size & replication:	10m x 2m x 3 replications
Soil type:	Sandplain
Sowing date:	20/5/08
Sowing rate:	75 kg/ha
Fertiliser (kg/ha):	100 kg/ha Agstar Extra 80 kg/ha Urea
Herbicides:	2 L/ha Roundup Powermax 2.5 L/ha Boxer Gold 2 L/ha Precept
Insecticides:	Alpha-cypermetherin 200 mL/ha

Trial Layout

N →

Buffer		
Buloke	Yagan	Mundah
Hindmarsh	Lockyer	Baudin
Mundah	Vlamingh	Hindmarsh
Lockyer	Hamelin	Hamelin
Fleet	Buloke	Fleet
Yagan	Mundah	Vlamingh
Hamelin	Baudin	Lockyer
Baudin	Hindmarsh	Buloke
Vlamingh	Fleet	Yagan
Seed treatment trial		

Seed Treatments in Wheat

Plot size & replication:	10m x 2m x 3 replications
Soil type:	Sandplain
Sowing date:	20/5/08
Sowing rate:	75 kg/ha of Westonia
Fertiliser (kg/ha):	100 kg/ha Agstar Extra; 80 kg/ha Urea
Herbicides:	2 L/ha Roundup Powermax; 2.5 L/ha Boxer Gold; 2 L/ha Precept
Insecticides:	Alpha-cypermetherin 200 mL/ha

TRIAL LAYOUT

N →

Barley Variety trial		
Untreated	Raxil	Baytan
Raxil	Product Y	Dividend
Hombre	Dividend	Product X
Baytan	Intake IF	Untreated
Zorro	Product X	Product Y
Dividend	Hombre	Zorro
Dividend	Untreated	Intake IF
Product X	Dividend	Hombre
Product Y	Baytan	Dividend
Intake IF	Zorro	Raxil
Buffer		

COMMENTS

The ‘stress shield’ effect from Hombre and Zorro has generated plenty of interest in these two seed dressings, particularly with the yield increase guarantee. This trial aims to investigate the most beneficial seed dressing.

PASTURE LEGUMES DEMONSTRATION

Dr Angelo Loi & Mr Bradley Nutt, Department of Agriculture and Food Western Australia

TAKE HOME MESSAGES

- AGWEST® Bartolo is a new annual pasture legume (Released in 2008) that has impressed farmers and seed producers through its consistently high forage and seed production and this variety should increase the stability of legume pastures grown in rotation with cereal crops.
- AGWEST® Bartolo can be grown successfully across mildly acid to alkaline sandy-loam and loam soils (pH 5 to 8 $CaCl_2$) and is suited to regions with 325 to 500 mm annual rainfall. High seed yields in excess of 1 t/ha that can be direct harvested by grain harvesters makes bladder clover a lower cost alternative to subterranean clover and annual medics in many situations.
- AGWEST® Bartolo is hardseeded with over 50% of the seed remaining hard after one summer and has good protection against false breaks of season. The levels of hard seed suggest a potential use of bladder clover in both, self-regenerating ley systems or short-term phase farming systems.

- *AGWEST* Sothis is the first cultivar of eastern star clover released to world agriculture.
- *Sothis* germinates very late in the season compared to traditional pasture legumes and weeds.
- The delay in germination allows the use of non-selective herbicides or intensive grazing after the break of season for a long period of time (3-6 weeks) to obtain >90% control of troublesome crop weeds.
- Although slow to germinate, Sothis can grow rapidly in late winter/spring and produce a productive legume-dominant pasture for grazing or forage conservation.
- Sothis is suitable for use on acid and alkaline fine textured soils in low to medium rainfall areas (325-450 mm).

- The trial includes also Dalkeith subterranean clover, a new yellow serradella with greater level of softening compared to the current cultivars in the market and **a new early (3 Weeks) type of Cadiz French serradella.**

TRIAL DETAILS

Plot size & replication	20m x 6m
Soil type:	Sandy Loam
Sowing date:	21/5/08
Seeding rate:	10 kg/ha
Fertiliser (kg/ha)	21/5/08: 200 kg/ha Super-Potash 3:2
Herbicides:	10/5/08: 1 L/ha Glyphosate 23/7/08: 500 ml/ha Select 29/8/08: 330 g/ha of Fusion
Insecticides:	21/5/08 Talstar (bifenthrin 100g/L)

CHICKPEA VARIETY TRIAL

Wayne Parker & CVT Program, Department of Agriculture and Food, Western Australia

BACKGROUND

Desi chickpea varieties are making a slow comeback against the dreaded ascochyta disease. The chickpea CVTs demonstrate the abilities of the resistant varieties two years before their potential release. Genesis lines continue to be the standout varieties for disease resistance and ease of management. WACPE Lines developed from collaboration between DAFWA and COGGO will be available in 2010. These lines have been bred for ascochyta levels as experienced under WA conditions.

TRIAL DETAILS

Plot size & replication:	20m x 1.54m x 3 replications
Soil type:	Gravelly loam
Sowing date:	15/5/08
Fertiliser (kg/ha):	80 kg/ha DAP
Herbicides:	Pre: 1 L/ha Roundup; 1.5 L/ha Simazine Post: 100 g/ha Balance
Insecticides:	100 ml/ha Lorsban

TRIAL LAYOUT

Recommended varieties in bold. Sufficient ascochyta resistance for the Liebe chickpea growing region.

Sonali	Sonali	Sonali
CICA0512	WACPE2159	WACPE2156
WACPE2171	WACPE2152	WACPE2144
WACPE2175	WACPE2177	**Genesis510**
WACPE2133	97020-1351	WACPE2167
WACPE2146	WACPE2162	WACPE2172
WACPE2136	Cica0718	CICA0603
WACPE2168	Cica0719	WACPE2174
WACPE2155	WACPE2166	WACPE2170
Genesis836	Cica0717	CICA0604
CICA0503	97020-1489	WACPE2178
WACPE2160	Genesis079	WACPE2117
Genesis090	CICA0505	WACPE2117
WACPE2133	WACPE2115	WACPE2176
WACPE2151	WACPE2145	Cica0713
15 98318-3007	WACPE2165	WACPE2173
16 97020-1489	98318-3007	Cica0713
Genesis510	WACPE2146	Cica0718
Cica0719	WACPE2155	CICA0512
WACPE2156	WACPE2117	WACPE2162
Genesis079	WACPE2175	WACPE2145
WACPE2117	WACPE2144	WACPE2160
CICA0603	WACPE2168	WACPE2177
WACPE2166	WACPE2178	**Genesis836**
CICA0604	WACPE2133	WACPE2165
WACPE2173	WACPE2151	Cica0717
WACPE2152	WACPE2174	CICA0503
WACPE2170	WACPE2171	WACPE2159
WACPE2167	WACPE2176	CICA0505
WACPE2115	Genesis090	WACPE2133
97020-1351	WACPE2172	WACPE2136
Cica0713	WACPE2136	WACPE2115
CICA0505	98318-3007	WACPE2146
WACPE2162	WACPE2133	Cica0719

WACPE2178	WACPE2160	97020-1351
WACPE2176	CICA0604	97020-1489
WACPE2177	WACPE2117	WACPE2133
WACPE2165	**Genesis510**	WACPE2155
WACPE2117	CICA0512	Genesis090
WACPE2159	WACPE2167	WACPE2175
WACPE2145	WACPE2156	WACPE2152
WACPE2144	CICA0603	Genesis079
WACPE2172	**Genesis836**	WACPE2171
Cica0717	WACPE2170	WACPE2168
WACPE2174	WACPE2173	WACPE2166
Cica0718	CICA0503	WACPE2151
Sonali	Sonali	Sonali

COMMENTS

A successful chickpea crop is the result of variety selection and dedicated management. Call Wayne Parker at DAFWA Geraldton, 99568555, for discussion as how chickpea might fit your system.

WHEAT NATIONAL VARIETY TRIAL

Kalyx Agriculture and Australian Crop Accreditation Service (ACAS)

Kalyx AGRICULTURE

GRDC Grains Research & Development Corporation

TRIAL AIM:

To evaluate a range of current and soon to be released wheat varieties established at a single sowing time under grower practice at Marchagee, Western Australia. The results of the research will be extended to Liebe Group members and to the wider agricultural community.

TRIAL DETAILS

Plot size & replication:	20m x 1.54m x 3 replications
Soil type:	Sandy Loam
Sowing date:	8/5/08
Fertiliser (kg/ha):	8/5/08: 100 kg/ha Urea 8/5/08: 100 kg/ha MAPSZC Plus 4/7/08: 100 kg/ha Urea
Herbicides:	8/5/08: 1.6 L/ha Trifluralin 8/5/08: 2 L/ha Roundup Power Max 8/5/08: 35 g/ha Logran 4/7/08: 750 mL/ha MCPA LVE 4/7/08: 3 g/ha Ally 4/7/08: 120 g/ha Lontrel
Insecticides:	8/5/08: 1 L/ha Chlorpyrifos

TRIAL LAYOUT

Field Plan ← N

Fence

	Range 6	Range 5	Range 4	Range 3	Range 2	Range 1
	Buffer					
Row 1	Calingiri	BR7030W	IGW2971	Cascades	IGW3001	Bullet
Row 2	Carnamah	IGW2886	Wyalkatchem	Gladius	Correll	Magenta
Row 3	PACW4877	WI25053	WAGT025	LPB05-1843	WI25057	AUBR31009W
Row 4	Eld-03SB52	Tammarin Rock	Axe	IGW2952	IGW2975	Binnu
Row 5	IGW2972	WAGT011	EGA Bonnie Rock	IGW2856	IGW2939	RAC1400
Row 6	WAGT001A	WAGT050	IGW2838	Yandanooka	WAGT022	WAGT026
Row 7	LPB05-1500	IGW2979	LPB04-0965	HRZ 02.2.15	GBA Sapphire	Yitpi
Row 8	IGW2885	Westonia	EGA Eaglehawk	LPB05-2148	Arrino	RAC1423
Row 9	IGW2981	Guardian	IGW2960	IGW2980	IGW2945	IGW2976
Row 10	LPB05-1525	Catalina	IGW2836	EGA Wentworth	Young	RAC1372
Row 11	Sentinel	WAGT029	Espada	Lincoln	LPB05-1528	IGW2770B
Row 12	LPB05-1516	IGW2944	IGW2995	Kennedy	HRZ 03.6297.2	RAC1412
Row 13	IGW2838	IGW3001	WAGT026	IGW2944	Gladius	Lincoln
Row 14	RAC1400	EGA Wentworth	RAC1412	WAGT050	IGW2856	Eld-03SB52
Row 15	IGW2975	RAC1423	BR7030W	Magenta	Kennedy	HRZ 02.2.15
Row 16	IGW2960	IGW2939	AUBR31009W	Arrino	LPB05-1500	IGW2995
Row 17	LPB05-2148	Binnu	IGW2979	WI25057	Yitpi	Calingiri
Row 18	IGW2886	Yandanooka	Carnamah	WI25053	IGW2952	Wyalkatchem
Row 19	Axe	IGW2945	RAC1372	IGW2981	EGA Eaglehawk	WAGT029
Row 20	Cascades	IGW2836	Sentinel	Young	Guardian	WAGT011
Row 21	Espada	IGW2980	Catalina	IGW2770B	IGW2971	IGW2885
Row 22	HRZ 03.6297.2	WAGT022	Bullet	Tammarin Rock	LPB05-1525	LPB04-0965
Row 23	Correll	WAGT025	LPB05-1528	IGW2972	LPB05-1843	LPB05-1516
	no establishment in this row due to seeding problems					
Row 24	EGA Bonnie Rock	IGW2976	GBA Sapphire	Westonia	WAGT001A	PACW4877
Row 25	IGW2995	LPB05-1528	PACW4877	Correll	IGW2836	Westonia
Row 26	IGW2770B	Kennedy	IGW2945	IGW2939	Carnamah	Cascades
Row 27	Gladius	GBA Sapphire	WAGT011	LPB05-1525	BR7030W	WAGT025
Row 28	AUBR31009W	IGW2971	HRZ 03.6297.2	Yitpi	IGW2972	Catalina
Row 29	HRZ 02.2.15	LPB05-1843	Binnu	IGW2885	WAGT050	IGW2960
Row 30	Young	LPB04-0965	WAGT001A	IGW2975	Espada	IGW2944
Row 31	Wyalkatchem	Arrino	Eld-03SB52	IGW3001	IGW2981	IGW2979
Row 32	WI25057	RAC1412	WAGT029	LPB05-1500	Yandanooka	Axe
Row 33	Lincoln	RAC1372	RAC1423	WAGT022	EGA Bonnie Rock	WI25053
Row 34	IGW2856	Magenta	Guardian	Calingiri	EGA Wentworth	IGW2838
Row 35	Bullet	IGW2952	RAC1400	IGW2976	LPB05-2148	Sentinel
Row 36	EGA Eaglehawk	WAGT026	IGW2886	LPB05-1516	Tammarin Rock	IGW2980
	Buffer					

COMMENTS:

The National Variety Testing (NVT) program is in its fourth year of operation. This amounts to 256 trials, 80 canola and 176 wheat, across Western Australia over this time.

In the first year (2005) there were 16 wheat breeding institutions providing entries to the wheat NVT. We are now down to the big three; Australian Grain Technologies (AGT), Intergrain (IGW) and Longreach Plant Breeders (LRPB) as well as a few smaller breeding operations including; CSIRO, EGA QLD and NSW, Elders, NuGrain, and Pacific Seeds, to name a few. This landscape has the potential to change over the next few of years as takeovers and mergers continue to dominate.

The wheat varieties in the trial have been evaluated across a wide range of soil types and environmental conditions; from Binnu in the north to Salmon Gums in the south east. The varieties in the trials are either currently available to growers or will soon be released onto the market. To access information on variety performance for your region, I encourage you to log onto www.nvtonline.com.au . Here, you will not only be able to compare variety performance in your region but you will be able to compare variety performance across the state and the nation.

WHEAT PRACTICE FOR PROFIT

Sally Porter, Kalyx Agriculture

BACKGROUND

The trial was developed in 2001 (adapted from the "Maxi-Pac" concept conducted by Farmanco Management Consultants) with the aim: To test the effect of four management inputs on grain yield, quality and profitability. This trial has been funded by the Liebe Group for the last seven years and managed by Kalyx Agriculture.

TREATMENT LIST

LOW	**1**	Arrino	Trifluralin	1	L/ha	IBS
	2	Calingiri	Flexi N	55	L/ha	IBS
	3	Wyalkatchem	Seed Rate	50	kg/ha	
	4	Bonnie Rock	MacroPro Plus	55	kg/ha	sidebanded
			LVE MCPA	400	mL/ha	Z13-Z14
			Diuron	350	mL/ha	Z13-Z14
DISTRICT	**5**	Arrino	Trifluralin	1.8	L/ha	IBS
	6	Calingiri	Logran	35	g/ha	IBS
	7	Wyalkatchem	Flexi N	55	L/ha	IBS
	8	Bonnie Rock	Seed Rate	70	kg/ha	
			MacroPro Plus	80	kg/ha	sidebanded
			2,4-D Amine	1	L/ha	Z16
			Flexi N	40	L/ha	5-6 leaf
HIGH	**9**	Arrino	Trifluralin	2	L/ha	IBS
	10	Calingiri	Logran	35	g/ha	IBS
	11	Wyalkatchem	Flexi N	55	L/ha	IBS
	12	Bonnie Rock	Seed Rate	80	Kg/ha	
			Jockey	3	L/tonne	with seed
			Twin Zinc	300	mL/100kg	with seed
			MacroPro Plus	100	kg/ha	sidebanded
			Paragon	300	mL/ha	Z13
			Flexi N	60	L/ha	5-6 leaf
			Tilt (regardless)	250	mL/ha	Z30
			Flex N	40	L/ha	Flag leaf
ACTIVE	**13**	Arrino	Trifluralin	1.5	L/ha	IBS
	14	Calingiri	Logran	35	g/ha	IBS
	15	Wyalkatchem	Flexi N	55	L/ha	IBS
	16	Bonnie Rock	Seed Rate	60	kg/ha	
			MacroPro Plus	80	kg/ha	sidebanded
			Flexi N	30	L/ha	5-6 leaf
			Ester LV 680	0.7	L/ha	Z30
			Flexi N	40	L/ha	Flag – season dependent

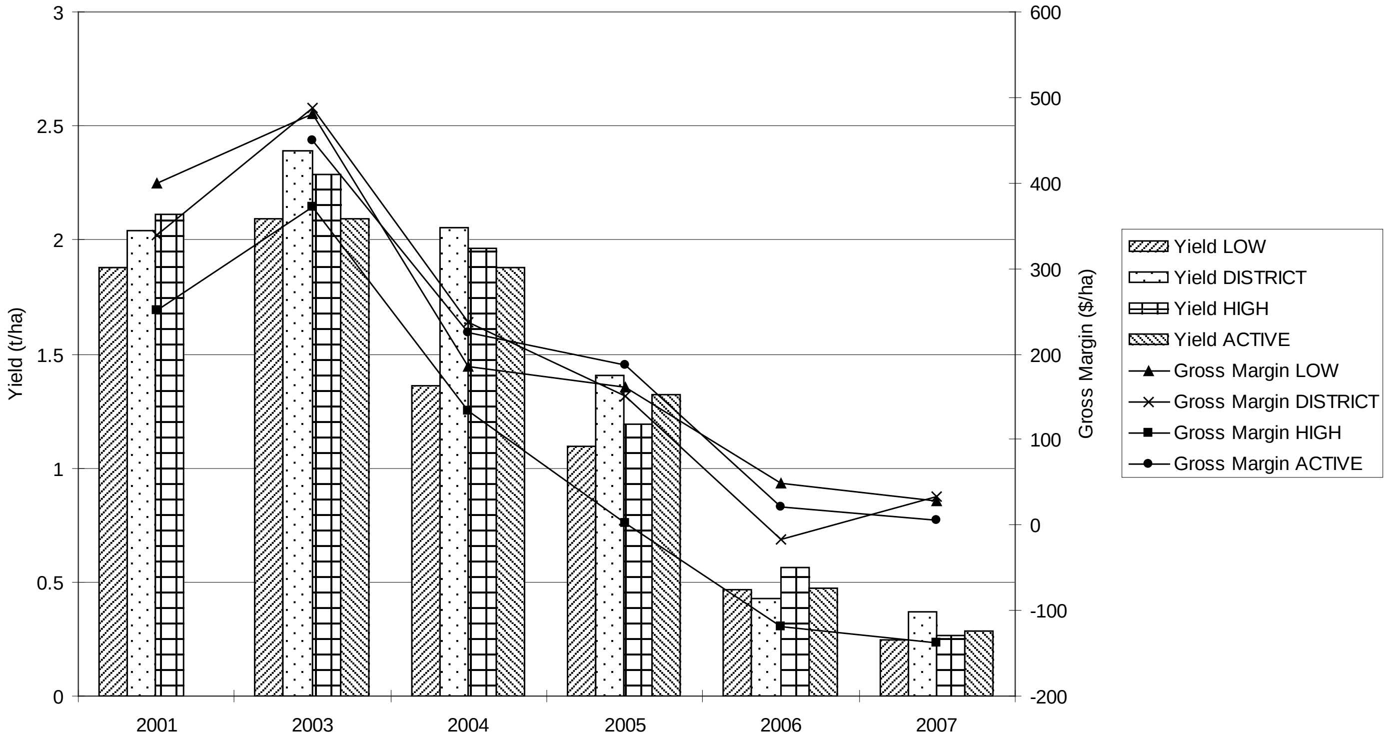
Trial Layout

N

Rep 1		Rep 2		Rep 3	
101 Arrino Low Input 1	109 Arrino High Input 9	201 Calingiri High Input 10	209 Wyalkatchem Low Input 3	301 Arrino High Input 9	309 Calingiri High Input 10
102 Calingiri Low Input 2	110 Calingiri High Input 10	202 Arrino Active Input 13	210 Calingiri Active Input 14	302 Bonnie Rock Active Input 16	310 Wyalkatchem District Input 7
103 Wyalkatchem Low Input 3	111 Wyalkatchem High Input 11	203 Arrino Low Input 1	211 Wyalkatchem Active Input 15	303 Wyalkatchem Low Input 3	311 Calingiri Low Input 2
104 Bonnie Rock Low Input 4	112 Bonnie Rock High Input 12	204 Wyalkatchem High Input 11	212 Bonnie Rock High Input 12	304 Arrino District Input 5	312 Wyalkatchem Active Input 15
105 Arrino District Input 5	113 Arrino Active Input 13	205 Calingiri District Input 6	213 Bonnie Rock District Input 8	305 Calingiri District Input 6	313 Bonnie Rock High Input 12
106 Calingiri District Input 6	114 Calingiri Active Input 14	206 Arrino High Input 9	214 Wyalkatchem District Input 7	306 Calingiri Active Input 14	314 Bonnie Rock Low Input 4
107 Wyalkatchem District Input 7	115 Wyalkatchem Active Input 15	207 Bonnie Rock Low Input 4	215 Calingiri Low Input 2	307 Wyalkatchem High Input 11	315 Arrino Active Input 13
108 Bonnie Rock District Input 8	116 Bonnie Rock Active Input 16	208 Arrino District Input 5	216 Bonnie Rock Active Input 16	308 Bonnie Rock District Input 8	316 Arrino Low Input 1

RESULTS AND ECONOMIC ANALYSIS SCENARIOS

Figure 1: Yield and gross margin averaged across four wheat varieties for four input levels across six years.



COMMENTS

- This year, for the first time since 2005, we have a season where a range of management practices can be evaluated under reasonable seasonal conditions.
- With the below average seasons thrown our way in recent times it is obvious that the high input treatment is extremely high risk.
- When this trial was first initiated there was a tendency for growers to risk higher inputs that would hopefully return a greater profit in good years. The data generated from this long term trial program, specifically developed for this purpose, shows that for consistent farm returns across seasons, a lower risk management practice is more profitable.
- In saying this, the other extreme is also true, that is, if you go too low with inputs, opportunities can be missed. Seasonal conditions, risk management and nutrient depletion strategies must be managed across and evaluated season by season.
- So, it's essential to set-up a crop to enable it to achieve yield potential but you must also carefully consider those extra passes to apply added crop protection and nutrition that in reality may not be required. This type of practice can very quickly result in a cost blow out and a reduction in gross margin.
- This won't be news to you; in fact the district and active management practices have been relatively consistent over time in terms of gross margin returns for yield and inputs.
- It must be remembered that the Liebe Group's membership comprises a wide and varied region. These trials have been conducted under some extremely poor seasonal conditions and some excellent growing conditions. The data that has been generated from the trials can be used by all group members to assist with the development and implementation of management practices that suit their specific farm operation but the location and seasonal details for each of the years of the trial should be consulted before making such decisions for individual farms.
- Use data from current and past research, use existing and new models and add a bit of gut feel to assist with developing farm management decisions that are right for you.

N AND P RATES – CANOLA AND WHEAT

Erin Cahill, Regional Agronomist, CSBP

CSBP
Grow to your full potential.

BACKGROUND

To demonstrate and compare N and P responses in wheat and canola.

TRIAL DETAILS

Soil type:	Gravelly sandy loam
Sowing date:	5/5/08
Sowing rate:	5 kg/ha Cobbler canola (jockey treated) 80 kg/ha Calingiri wheat
Fertiliser (kg/ha):	6/4/08 150 kg/ha Gypsum 26/6/08 Flexi N as per design 22/7/08 Flexi N as per design
Herbicides:	<u>Canola:</u> PSPE: 2 L/ha Atrazine + 200 ml/ha Talstar + 300 ml/ha Imidan 1/7/08 2l/ha Atrazine, 450mls select + oil + S of Amm <u>Wheat :</u> Pre : Roundup Powermax, 2 L/ha Treflan PSPE: 200 ml/ha Talstar + 300 ml/ha Imidan

TRIAL LAYOUT

Plt	Trt	Variety	At sowing					
			IAS (L/ha)	Band (Kg/ha)	Z14/Rosette	Z30/Bolting	N	P
1	2	Wheat	-	60 Big Phos TE	-	-	0	8
2	5	Wheat	-	120 Big Phos TE	-	-	0	16
3	4	Wheat	50 Flexi-N	60 Big Phos TE	50 Flexi-N	100 Flexi-N	84	8
4	7	Wheat	50 Flexi-N	120 Big Phos TE	50 Flexi-N	100 Flexi-N	84	16
5	3	Wheat	50 Flexi-N	60 Big Phos TE	50 Flexi-N	-	42	8
6	1	Wheat	-	-	-	-	0	0
7	6	Wheat	50 Flexi-N	120 Big Phos TE	50 Flexi-N	-	42	16
8	8	Wheat	50 Flexi-N	-	50 Flexi-N	100 Flexi-N	84	0
9	1	Wheat	-	-	-	-	0	0
10	2	Wheat	-	60 Big Phos TE	-	-	0	8
11	3	Wheat	50 Flexi-N	60 Big Phos TE	50 Flexi-N	-	42	8
12	4	Wheat	50 Flexi-N	60 Big Phos TE	50 Flexi-N	100 Flexi-N	84	8
13	5	Wheat	-	120 Big Phos TE	-	-	0	16
14	6	Wheat	50 Flexi-N	120 Big Phos TE	50 Flexi-N	-	42	16
15	7	Wheat	50 Flexi-N	120 Big Phos TE	50 Flexi-N	100 Flexi-N	84	16
16	8	Wheat	50 Flexi-N	-	50 Flexi-N	100 Flexi-N	84	0
17	3	Wheat	50 Flexi-N	60 Big Phos TE	50 Flexi-N	-	42	8
18	6	Wheat	50 Flexi-N	120 Big Phos TE	50 Flexi-N	-	42	16
19	5	Wheat	-	120 Big Phos TE	-	-	0	16
20	2	Wheat	-	60 Big Phos TE	-	-	0	8
21	7	Wheat	50 Flexi-N	120 Big Phos TE	50 Flexi-N	100 Flexi-N	84	16
22	4	Wheat	50 Flexi-N	60 Big Phos TE	50 Flexi-N	100 Flexi-N	84	8
23	1	Wheat	-	-	-	-	0	0
24	8	Wheat	50 Flexi-N	-	50 Flexi-N	100 Flexi-N	84	0

Plt	Trt	Varity	Seeding (Banded)				N	P
			(L/ha)	(Kg/ha)	Z14/Rosette	Z30/Bolting	N	P
1	13	Canola	-	120 Big Phos TE	-	-	0	16
2	10	Canola	-	60 Big Phos TE	-	-	0	8
3	15	Canola	50 Flexi-N	120 Big Phos TE	50 Flexi-N	100 Flexi-N	84	16
4	14	Canola	50 Flexi-N	120 Big Phos TE	50 Flexi-N	-	42	16
5	16	Canola	50 Flexi-N	-	50 Flexi-N	100 Flexi-N	84	0
6	12	Canola	50 Flexi-N	60 Big Phos TE	50 Flexi-N	100 Flexi-N	84	8
7	9	Canola	-	-	-	-	0	0
8	11	Canola	50 Flexi-N	60 Big Phos TE	50 Flexi-N	-	42	8
9	9	Canola	-	-	-	-	0	0
10	10	Canola	-	60 Big Phos TE	-	-	0	8
11	11	Canola	50 Flexi-N	60 Big Phos TE	50 Flexi-N	-	42	8
12	12	Canola	50 Flexi-N	60 Big Phos TE	50 Flexi-N	100 Flexi-N	84	8
13	13	Canola	-	120 Big Phos TE	-	-	0	16
14	14	Canola	50 Flexi-N	120 Big Phos TE	50 Flexi-N	-	42	16
15	15	Canola	50 Flexi-N	120 Big Phos TE	50 Flexi-N	100 Flexi-N	84	16
16	16	Canola	50 Flexi-N	-	50 Flexi-N	100 Flexi-N	84	0
17	13	Canola	-	120 Big Phos TE	-	-	0	16
18	16	Canola	50 Flexi-N	-	50 Flexi-N	100 Flexi-N	84	0
19	9	Canola	-	-	-	-	0	0
20	11	Canola	50 Flexi-N	60 Big Phos TE	50 Flexi-N	-	42	8
21	14	Canola	50 Flexi-N	120 Big Phos TE	50 Flexi-N	-	42	16
22	15	Canola	50 Flexi-N	120 Big Phos TE	50 Flexi-N	100 Flexi-N	84	16
23	12	Canola	50 Flexi-N	60 Big Phos TE	50 Flexi-N	100 Flexi-N	84	8
24	10	Canola	-	60 Big Phos TE	-	-	0	8

Management and Observations

- **Apr 6** Pegged out blocks. Spread 150kg/ha Gypsum over all the plots. No soil moisture.
- **Apr 28** 42mm rainfall.
- **May 5** Conservapak seeded Calingiri (Jockey) at 80kg/ha and Cobbler (Jockey) at 5kg/ha into drying soil. Seeded at 3cm depth. Flexi-N sprayed IAS on the 9th May. Sprays were as above. Farmer has sown same variety, same day, no till.
- **May 9** Trial has germinated, not emerged yet. Sprayed out IAS Flexi-N.
- **Jun 26** Wheat at mid tillering and canola at late rosette. Sprayed Flexi-N top ups.
- **Jul 1** Sprayed 2L/ha atrazine, 450ml/ha Select + oil + SoA. Plant sampled trts 1,2,5,8,9,10,13,16. 20 plants per plot. Cleaned up inter rows and sprayed out pathways.
- **Jul 22** Applied Z30/Bolting treatments. Wheat at 2nd node; canola at 1st flower. Sprayed out some ryegrass from between plots. Low P with N is going better than high P with no N. Good soil moisture
- **Aug 5** The wheat is at ear emergence and the canola is at 70-80% flowering. The wheat had 145 ml/ha Folicur and 125 alpha cyper meth applied and the canola had 125 ml/ha alpha cyper meth applied, both using the motorbike. The site had good soil moisture and two soil samples were taken, one from the wheat and one from the canola site.
- **Aug 15** Crops looking strong with the wheat having 3t/ha plus potential. Both crops obviously well supplied with N. Scored plots. *Wheat:* No response to P without N, but a weak response where 84N supplied; response to 8P only. Response up to 84N – best treatment is 84N, 8P. *Canola:* stronger response to P, lesser response to N compared to wheat. Best treatment is 42N, 16P. First rep is a lot weaker than 2nd and 3rd reps. Weak patch through plots 5 to 9 coinciding with wash

FERTILISER DECISIONS FOR 2009

Erin Cahill, Regional Agronomist Central, CSBP

TAKE HOME MESSAGES

- Soil test (EARLY) and plant test thoroughly to identify main limitations for each paddock.
- Set target fertilising yield based on a five year paddock average on a paddock by paddock basis.
- Rank each paddock based on its production history and main yield limitations
- Don't crop any marginal or high risk areas in 2009.

BACKGROUND

Fertiliser prices in the last 12 months have continued to rise. Growers are likely to be using the highest cost nutrients in history to plant the 2009 crop. It is therefore critical that careful planning is undertaken to maximize returns out of the dollars spent on fertiliser. If current grain prices stay strong the economics of cropping still look very sound but risk minimisation will be an important factor in ensuring profitability going forward.

COMMENTS

The 2009 season will be the highest risk season in terms of what growers will have to spent to put a crop in on a per hectare basis. Fertiliser inputs will make up the lions share of those costs with nutrient values at the time of writing at the highest point in history. Nitrogen and potassium are currently sitting at around $2.50/kg while phosphorus the building block of any crop is at $6.50/kg. Despite costs being at these highs there is still very good profitability in cropping and the biggest challenge will be managing the usual risks associated with farming as well as significant increased pressure on cash flow as well.

The most valuable tool going forward in managing these risks will undoubtedly be soil testing. Normally a paddock should be getting soil tested every 3-4 years for monitoring overall trends in nutrition. When confronted with the current situation a soil test to understand the background nitrogen levels alone could save thousands of dollars in fertiliser and minimize risk for growers. Soil testing is probably going to be the cheapest input many of you put on your paddocks in 2009!

When doing a soil test one of the things growers need to do is set a target yield for the adviser so that he can determine the nutrient requirements for a given paddock. This is one area which can definitely be improved to ensure fertiliser dollars are utilized more effectively. Many growers still ask for all test recommendations to be done up for one yield potential across the whole farm. It is important to target yield potentials on a paddock by paddock basis to ensure that we aren't over or under fertilising. One of the best ways to set an accurate target yield potential is to work out the five year average for each crop type (cereal, pulses, oilseeds) on a given paddock and use this as the basis for the fertiliser decision. Many growers have this for their whole farm but not many on a paddock by paddock basis.

Once you have worked out your five year average the next step is to rank paddocks according to this, from highest to lowest and then do a nutrition audit on each looking at its background nutrient levels and any other factors such as fixing capacity, pH and percentage of land with shallow depth of soil etc. When conducting this step it would be good to look at any plant test data to see how well the nutrients in the soil have been making it into the plant. If there are for example very high trace element levels in the plant tests why spend money this year on trace elements in the fertiliser- that decision alone could save anywhere between $40 and $130 a tonne. A more prudent management strategy in this situation would be to use a "straight" product and tissue test in season and then manage any trace element issues if they arose with a foliar spray.

Some paddocks will have very good background levels of phosphorus and will require a maintenance only application of phosphate at seeding. If you are in this situation it would be wise to use a product that has a moderate (e.g. Agstar) phosphorus analysis so that you get better granule distribution down the drill row due to its higher use rate per ha. Even on soil tests that would be normally considered unresponsive to P we have seen strong phosphate responses in the last two seasons due to the very dry soil conditions when crops have been trying to establish. These products also have the added advantages of better sulphur levels and a higher nitrogen content giving you slightly more time to delay your post emergent nutrient applications to look at the season.

If you are in a situation where you have large areas of potassium responsive soil, don't just put a pen through NPK compounds as an "expensive" option. There is more trial work this year again highlighting the much greater efficiency we are seeing with drilling or banding potassium compared to broadcasting muriate of potash. If you only have pockets of potassium responsive soils patching potash out will still be the cheapest option.

In the current environment it is certainly worth the effort and cost of sitting down and really analysing your nutrition application programmes, whole farm nutrition status and application techniques to ensure that you can maximise the returns out of your fertiliser dollars for next year.

CANOLA NATIONAL VARIETY TRIAL

Australian Crop Accreditation Service and Kalyx Agriculture

TRIAL AIM:

Evaluate a range of current and soon to be released canola varieties established at a single sowing time under grower practice at Marchagee, Western Australia. The results of the research will be extended to Liebe Group members and to the wider agricultural community.

TRIAL DETAILS

Plot size & replication:	20m x 1.54m x 3 replications
Soil type:	Sandy Loam
Sowing date:	2/5/08
Fertiliser (kg/ha):	2/5/08: 150 kg/ha Maxam 2/5/08: 100 kg/ha MAPSZC Plus 4/7/08: 100 kg/ha Urea
Herbicides:	1/5/08: 2 L/ha Trifluralin 1/5/08: 2 L/ha Sprayseed 1/5/08: 1.1 kg/ha Atrazine 3/6/08: 1.1 kg/ha Atrazine 3/6/08: 250 mL/ha Select 3/6/08: 250 mL/ha Su Savvy 3/6/08: 300 mL/ha Lontrel
Insecticides:	1/5/08: 200 mL/ha Cypermethrin 1/5/08: 1 L/ha Chlorpyrifos

TRIAL LAYOUT

N ⟶

	Buffer - Surpass 501 TT					
Row 1	ATR Cobbler	Filler 1 - Bravo TT	CB Boomer	ThunderTT	ATR Stubby	Filler - Surpass 501
Row 2	Filler 4 - Surpasss 501	CB Telfer	TornadoTT	Tawriffic TT	CB Scadden	Rottnest TTC
Row 3	CB Pilbara	Filler 2 - Surpass 501	CB Argyle	BravoTT	Filler 3 - Bravo TT	CB Tanami
Row 4	BravoTT	ATR Stubby	CB Pilbara	Rottnest TTC	CB Argyle	ATR Cobbler
Row 5	TornadoTT	CB Tanami	Filler 1 - Bravo TT	Filler 2 - Surpass 501	Filler 4 - Surpass 501	Tawriffic TT
Row 6	CB Scadden	CB Boomer	Filler - Surpass 501	Filler 3 - Bravo TT	ThunderTT	CB Telfer
Row 7	Filler 3 - Bravo TT	Tawriffic TT	ATR Stubby	CB Telfer	CB Pilbara	CB Boomer
Row 8	Rottnest TTC	Filler - Surpass 501	Filler 4 - Surpass 501	ATR Cobbler	TornadoTT	Filler 2 - Surpass 501
Row 9	ThunderTT	CB Argyle	CB Tanami	CB Scadden	Filler 1 - Bravo TT	BravoTT

COMMENTS

The National Variety Testing (NVT) program is in its fourth year of operation. This amounts to 256 trials, 80 canola and 176 wheat, across Western Australia over this time.

The main breeding institutions providing material for the canola NVT are ‘the local company’; Canola Breeders Western Australia (CBWA), Pacific Seeds, NuSeed and Pioneer Hybrid (IT and conventional varieties at 2 sites only). In all likelihood, this will change over the next couple of years as takeovers and mergers ensue. Who knows, GM canola may be allowed into WA by 2012 and with it, a reinvigoration of canola variety research? In the interim, we will manage with what we can get.

The canola varieties in the trial have been evaluated across a wide range of soil types and environmental conditions; from Nabawa in the north, Merredin in the east and Munglinup in the south east with site mean yields from 0t/ha – 4.1t/ha. Over the last couple of years we have seen a few canola varieties developed for the drier rainfall zones that provide growers with a viable option for the rotation rather than the traditional wheat on wheat. There have also been some measurable genetic improvements to mid season varieties.

The varieties in the trials are either currently available to growers or will soon be released to the market. To access information on variety performance for your region, I encourage you to log onto **www.nvtonline.com.au** . Here you will not only be able to compare variety performance in your region but you will be able to compare variety performance across the state and the nation.

LUPIN VARIETY TRIAL

Alan Meldrum, Pulse Australia & CVT Program, DAFWA

TAKE HOME MESSAGES

The key message for lupin growers today is that Mandelup remains as the variety of choice for the medium future. While breeding continues to seek higher yielding varieties, better disease and herbicide tolerance, Mandelup remains as the top yielding variety for the northern wheatbelt.

TRIAL DETAILS

Plot size & replication:	20m x 1.54m x 3 replications
Soil type:	Sandplain
Sowing date:	1/5/08
Sowing rate:	90 kg/ha
Fertiliser (kg/ha):	100 kg/ha Superphosphate;
Herbicides:	Pre: 1 L/ha Roundup, 1.5 L/ha Simazine Post: 500 ml/ha Nitro 240
Insecticides:	100 ml/ha Lorsban

TRIAL LAYOUT

Belara	Tanjil	Tanjil
WALAN2333	Jenabillup	Mandelup
Belara	WALAN2291	WALAN2299
WALAN2275	WALAN2274	WALAN2284
WALAN2303	Mandelup	WALAN2334
WALAN2289	WALAN2318	Tanjil
WALAN2336	Danja	Coromup
WALAN2294	Quilinock	Mandelup
WALAN2274	WALAN2334	WALAN2333
Tanjil	WALAN2336	Quilinock
Danja	Mandelup	WALAN2303
WALAN2299	Mandelup	mp(general)
Jenabillup	WALAN2275	WALAN2294
Coromup	WALAN2284	WALAN2291
Mandelup	Belara	WALAN2289
WALAN2284	WALAN2289	Mandelup
WALAN2318	Coromup	WALAN2275
WALAN2334	WALAN2294	Danja
Quilinock	WALAN2299	WALAN2274
WALAN2291	WALAN2333	WALAN2336
Mandelup	Tanjil	Belara
Mandelup	WALAN2303	Jenabillup
Tanjil	Tanjil	Tanjil

COMMENTS

Why Mandelup?

Mandelup is the top yielding variety for this zone (2 & 3) since its release in 2004, and to date no other lupin beats it. Coromup was released in 2006 for its higher protein accumulation but its yield is less than Mandelup. Unless the protein bonus rises, the financial return per hectare from Mandelup will be better than Coromup.

YIELD

Coromup ⓓ produces lower grain yields than Mandelup ⓓ and Quilinock ⓓ but similar to Belara and Tanjil ⓓ.

Comparative yields based on CVT trials containing Coromup ⓓ between 2000 and 2005.

	Lupin Zone							
	1	2	3	4	5	6	7	8
Coromup ⓓ *(no. of trials)*	98 *(13)*	104 *(14)*	101 *(14)*	99 *(10)*	104 *(12)*	95 *(13)*	106 *(18)*	102 *(6)*
Belara	101 *(9)*	104 *(10)*	101 *(12)*	103 *(8)*	107 *(9)*	98 *(8)*	99 *(13)*	110 *(4)*
Kalya	96 *(9)*	100 *(9)*	93 *(10)*	98 *(8)*	96 *(9)*	99 *(8)*	100 *(13)*	100 *(4)*
Mandelup ⓓ	106 *(9)*	113 *(9)*	110 *(9)*	111 *(8)*	112 *(7)*	107 *(7)*	112 *(12)*	115 *(4)*
Quilinock ⓓ	101 *(9)*	110 *(9)*	105 *(9)*	114 *(8)*	109 *(7)*	117 *(7)*	114 *(12)*	113 *(4)*
Wonga ⓓ	98 *(7)*	104 *(7)*	96 *(7)*	98 *(6)*	99 *(6)*	100 *(7)*	101 *(7)*	101 *(3)*
Tanjil ⓓ	100 *(10)*	100 *(9)*	100 *(14)*	100 *(19)*	100 *(9)*	100 *(8)*	100 *(13)*	100 *(4)*

The key advantages of Mandelup are:

- Highest yielding variety for most areas of WA.
- Early maturity allowing croptopping as a safe option to control weed “escapees”
- High tolerance of metribuzin allowing better management of doublegees and radish
- Tall height for better harvesting efficiency

Grain loss in 2007

Many growers last year across the state reported grain loss before and during harvest in Mandelup. This is the first time this has been reported in ten years of testing and 5 years of commercial production. While some growers delayed harvesting Mandelup for logistical reasons, and thereby increased the risk of grain loss, most experienced the loss as the crop matured. As this affect has not been observed before on such a wide scale, the current thinking suggests it is the result of the unusual growing conditions last spring. Poor winter growth was followed by a season saving rain which caused rapid pod fill in lupins. It is suspected that this rapid growth caused a weakness in the pod wall and in the connection between the pod and the stem. The best advice for growers is to continue with Mandelup in the expectation that last year was a one-off event.

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DIRECT SOWING OF OLDMAN SALTBUSH, RIVER SALTBUSH, BLUEBUSH & RHAGODIA

Lorinda Hunt, Development Officer, Department of Agriculture & Food WA

TAKE HOME MESSAGES

- Oldman saltbush, River saltbush and Bluebush are well adapted to the saline, harsh conditions of the Northern Agricultural Region (NAR), with rhagodia emerging as suitable perennials for the fresher part of the landscape.
- Direct sowing of saltbush by seed is considered risky, however establishment can be improved by targeting the 'mild' part of the landscape, priming the seed and good weed control.
- This trial investigates the herbicide tolerance of germinating forage shrubs to agricultural herbicides that would control slender iceplant and other grasses and broadleaf weeds.

BACKGROUND

One of the major constraints to the widespread adoption of saltbush-based saltland pastures has been the lack of cheap and reliable methods for establishing the plants by seed. By priming the seed in water or dilute solutions of plant growth regulators (gibberellic acid, kinetin and salicylic acid), improved saltbush establishment has been demonstrated.

However, germinating saltbush is vulnerable to most environmental factors, thus direct seeding carries a high risk of failure compared to nursery raised seedlings. Weed competition exacerbates moisture deficiencies and with less moisture, salinity can be exacerbated at the surface. Weed control becomes more imperitive in marginal rainfall areas, especially when sowing saltbush by seed.

TRIAL DETAILS

Plot size & replication	18m x 3m x 3 replications	
Soil type:	Sandy Loam	
Sowing date:	21/7/08	
Seed Priming Treatments:	Oldman saltbush (*Atriplex nummularia*):	Gibberellic Acid, Kinetin, Salicyclic Acid
	River Saltbush (*Atriplex amnicola*):	Gibberellic Acid, Kinetin, Salicyclic Acid
	Bluebush (*Maireana brevifolia*):	Gibberellic Acid
	Rhagodia (*Rhagodia presseii*):	Pectinase, Gibberellic Acid
Fertiliser (kg/ha)	21/7/08: 100 kg/ha 5 : 1, Super : Potash	
Herbicides:	14/7/08: 2 L/ha Glyphosate 21/7/08: All pre-emergent treatments	
Insecticides:	23/7/08: 75 ml/ha Cypermethrin	

TREATMENTS

No.	Grp	Pre-Emergent Herbicide Treatments	Rate	Common Name	Cost $/Ha GST excl.
1		Control			
2	G	Oxyfluorfen (240g/L)	250ml	Goal®	8.00
3	G	Oxyfluorfen (240g/L)	500ml	Goal®	16.00
4	D	Trifluralin (480g/L)	1L		6.37
5	D	Trifluralin (480g/L)	2L		12.75
6	D	Pendimethalin (330g/L)	1L	Stomp®	6.50
7	D	Pendimethalin (330g/L)	2L	Stomp®	13.00
8	E	Triallate (500g/L)	1.6L	AvadexXtra®	21.09
9	J	Prosulfocarb (800g/L) + S-metolachlor (120g/L)	1L	Boxer Gold®	11.59
10	J	Prosulfocarb (800g/L) + S-metolachlor (120g/L)	2L	Boxer Gold®	23.18
11	J	Prosulfocarb (800g/L)	2L	Boxer®	Not available
12	B	Flumetsulam (800g/kg)	25g	Broadstrike®	16.80

TRIAL LAYOUT

PSPE: Herbicide application after sowing
IBS: Herbicides incorporated by sowing

←N Sowing direction ↕

No		Herbicides (IBS)	**Bluebush**		**Oldman Saltbus**		**River Saltbus**		**Rhagodia**		**rep**
Spraying direction (3m) ↔			PSPE	IBS	PSPE	IBS	PSPE	IBS	PSPE	IBS	
1	G	250ml Goal®									R1
2	K	250ml S-metolachlor									R1
3	B	2L Boxer®									R1
4	E	1.6L AvadexXtra									R1
5	C	2L Boxer Gold®									R1
6		CONTROL									R1
7	B	25g Broadstrike®									R1
8	G	500ml Goal®									R1
9	D	1L Trifluralin									R1
10	J	1L Boxer Gold®									R1
11	D	2L Stomp®									R1
12	D	2LTtrifluralin									R1
13	D	1L Stomp®									R1
			Rhagodia		**River Saltbush**		**Bluebush**		**Oldman Saltbus**		
			PSPE	IBS	PSPE	IBS	PSPE	IBS	PSPE	IBS	
14	D	2L Stomp®									R2
15	G	500ml Goal®									R2
16	B	25g Broadstrike®									R2
17	D	1L Stomp®									R2
18	D	1L Trifluralin									R2
19	C	2L Boxer Gold®									R2
20	G	250ml Goal									R2
21	K	250ml S-metolachlor									R2
22	D	2L Trifluralin									R2
23	B	2L Boxer®									R2
24	E	1.6L AvadexXtra									R2
25	J	1LBoxer Gold®									R2
26		CONTROL									R2
			Oldman Saltbush		**Rhagodia**		**River Saltbush**		**Bluebush**		
			PSPE	IBS	PSPE	IBS	PSPE	IBS	PSPE	IBS	
27	B	25g Broadstrike®									R3
28	J	1L Boxer Gold®									R3
29	G	250ml Goal									R3
30	K	250ml S-metolachlor									R3
31	D	1L Stomp®									R3
32	D	2L Trifluralin									R3
33	E	1.6L AvadexXtra									R3
34	D	2L Stomp®									R3
35	C	2L Boxer Gold®									R3
36		CONTROL									R3
37	B	2L Boxer®									R3
38	D	1L Trifluralin									R3
39	G	500ml Goal®									R3

ACKNOWLEDGEMENTS

- National Landcare Program (NLP) for funding of the project and NACC for administration
- Clint, Ian and Helen Hunt for providing the trial site
- Ron Yates, John Titterington & Dave Nicholson for technical assistance in sowing & spraying
- Meir Altman & Chris Loo for seed preparation and treatment

LARGE SCALE WILD RADISH HERBICIDE DEMONSTRATION

Peter Newman & Trevor Bell, DAFWA

BACKGROUND

There are a number of new wild radish herbicides on the market in Western Australia. Some represent genuine new chemistry where others are merely variations on old themes. This demonstration is designed to evaluate the new herbicides on a large scale. This will enable us to observe low levels of wild radish survival that are difficult to measure for small scale trials.

TRIAL DETAILS

Plot size & replication:	70m x 14m x 2 replications
Soil type:	Sandy loam
Sowing date:	12/6/08

TRIAL LAYOUT

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Dam				
	14m	14m	14m	14m
2.5 leaf crop Sprayed 1 July 08 70m	Barracuda 600 mL/ha (30)	EcoPar 400 mL/ha + MCPA Amine 500 mL/ha (5)	Velocity 670 mL/ha + Hasten 1% (6)	XPand 165 g/ha + Uptake 0.5% (16)
Buffer 14m				
4 leaf crop 70m Sprayed 14 July 08	Precept 300 500 mL/ha + Hasten 1% (14)	Torpedo 100mL/ha + MCPA LVE 500 mL/ha + Uptake 0.5% (2)	Paragon 500 mL/ha + Bromoxynil 750 mL/ha (64)	? (12)
Buffer 14m				
2.5 leaf crop 70m Sprayed 1 July 08	Velocity 670mL/ha + Hasten 1% (15)	XPand 165 g/ha + Uptake 0.5% (29)	Barracuda 600 mL/ha (135)	EcoPar 400 mL/ha + MCPA Amine 500 mL/ha (240)
Buffer 14m				
4 leaf crop 70m Sprayed 14 July 08	Paragon 500mL/ha + Bromoxynil 750 mL/ha (5)	? (69)	Precept 300 500 mL/ha + Hasten 1% (350)	Torpedo 100mL/ha + MCPA LVE 500 mL/ha + Uptake 0.5% (265)

Note: Numbers in brackets are numbers of wild radish plants in a 70m x 0.7m transect on July 1.

About the herbicides

Jaguar® is not a new herbicide but there is renewed interest in this product as it offers wild radish control without the use of phenoxy herbicide. Jaguar gives excellent control of small radish (2 leaf). Jaguar is a mix of Bromoxynil and Diflufenican. Growers in a lupin/wheat rotation may be best to avoid Jaguar® in the cereal phase to preserve the diflufenican (eg. Brodal®) for the lupin phase.

Ecopar® is a new herbicide from Sipcam Pacific Australia. The active is pyraflufen ethyl 20 g/L (Group G) and will be mixed with MCPA Amine (500) 500 mL/ha. It is registered from the 2 leaf stage of the crop. Ecopar® is a contact type herbicide that relies on the phenoxy to destroy the crown of the plant. Ecopar® may struggle to kill phenoxy resistant radish.

Precept® is a new Bayer product. It is a combination of a new active, pyrasulfotole 25 g/L (group H) and LVE MCPA 125 g/L + softener and will be registered at 1 to 2 L/ha (new formulation is double this strength). Bayer have reported that stand alone wild radish control can be achieved at 50 gai/ha pyrasulfotole (2 L/ha Precept®). The 2 L/ha rate may be cost prohibitive for some growers. At 1 L/ha, Precept® will rely on phenoxy herbicides to do at least some of the killing. Crop safety with Precept® appears to be excellent at this stage. So far there has been no recorded cross resistance to diflufenican.

Velocity® is another new Bayer product due for commercial release in 2009. It is a combination of their new molecule pyrasulfotole (group H) and Bromoxynil (Group C). This is a very exciting product as it offers wild radish control without the reliance on phenoxy herbicides and pyrasulfotole is a new molecule to Australia with no known resistance. It will be registered at 500 to 670 mL/ha from the 2 leaf stage of the cereal crop.

Torpedo® is a new Dow product that is a co-formulation of clorpyralid 300 g/L (Lontrel) + florasulam 50 g/L (group B). Florasulam is from the Eclipse® (metosulam) family of group B herbicides. Michael Walsh (WAHRI) tested this over 74 radish populations last year. At this rate 25% of populations had surviving wild radish plants (28% for Logran and 43% for Glean). So this product may be marginally better than other group B products but growers will need to test it in their own paddocks prior to using it on a broad scale.

X-Pand® is another new Dow product. X-Pand® is a combination of florasulam 40g/Kg and isoxaben 610 g/kg. For best results this herbicide should be applied to small (cot to 2 leaf) radish but the product is registered from the three leaf stage of the crop. Isoxaben is known to have some residual activity on wild radish and gives good stand alone control of very small weeds, particularly where there is good soil moisture. Results with florasulam will vary according to resistance status. Future research will look into applying at earlier crop stages to target smaller weeds.

The *Paragon® + Bromoxynil* mix is a brew that NuFarm have developed through their trial work. It works on the theory of having three herbicide modes of action at lethal or near lethal rates. If a wild radish plant is resistant to one of the herbicide groups then in theory the other two herbicide groups should kill it and in some cases one of the herbicide groups will be adequate. This is a very sound theory that NuFarm have done a great job of promoting and one which has my full support. Paragon® is a mix of Picolinafen (Group F) and MCPA LVE. Growers are likely to be put off by the cost but some growers are running out of options for radish control.

BOXER® GOLD EFFICACY TRIAL

Dave Scholz, Elders Dalwallinu

TAKE HOME MESSAGES

Boxer Gold is an important tool in the management of annual ryegrass in Western Australia. Different mode of action, crop safety & logistical advantages with time to incorporation are some of the main benefits.

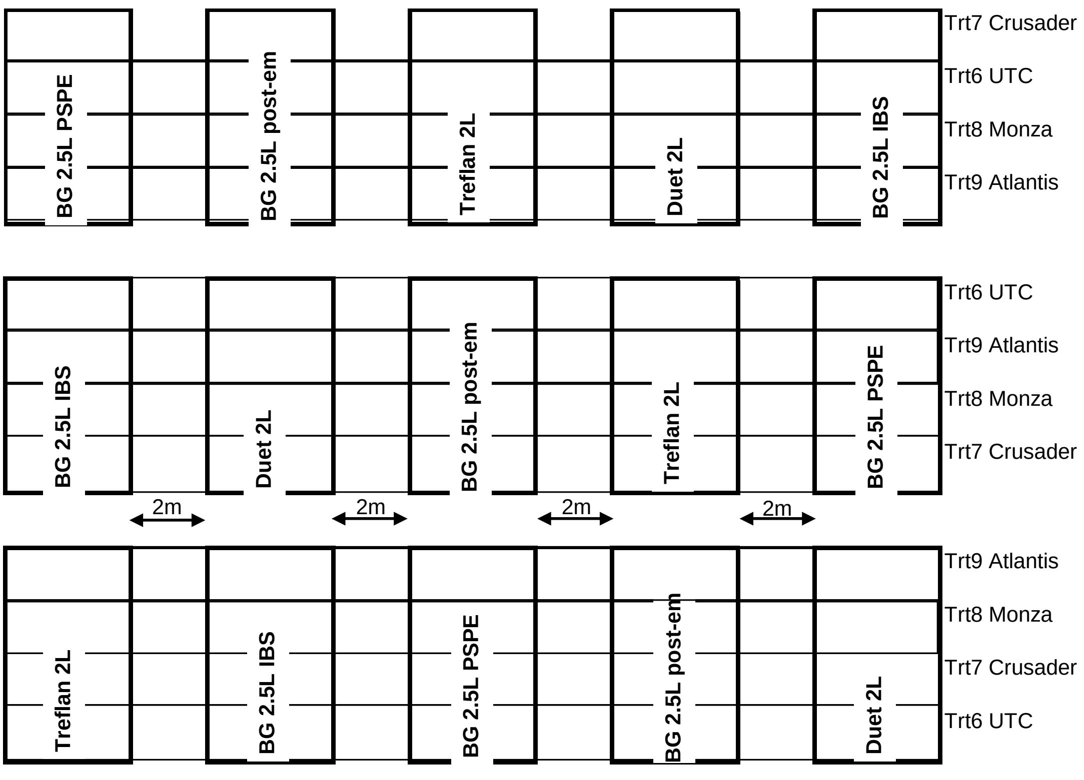
BACKGROUND

Boxer Gold offers growers 7 days to incorporation, Group J and Group K Modes of action as a direct alternative to trifluralin for pre-emergent ryegrass control. Its efficacy compared to Trifluralin is being assessed here. Activity on brome grass may be a secondary benefit of this which would increase its importance in wa farming systems.

TRIAL DETAILS

Plot size & replication:	16m x 5m x 3 replications
Soil type:	Sandplain
Sowing date:	10/5/08

TRIAL LAYOUT



CANOLA SEED DRESSING TRIAL

Milton Sanders, CBWA

BACKGROUND

Canola Breeders was formed with a mandate to breed low-rainfall canola varieties. We have had success in a short period of time in meeting a huge demand for low rainfall canola. We have now begun to develop canola varieties for higher rainfall environments. Look for the CB™ trademark in front of our TTOP® (triazine tolerant open pollinated) canola variety names.

TRIAL DETAILS

Plot size & replication:	20m x 2m x 3 Replications
Soil type:	Loamy Sand

TRIAL LAYOUT

Buffer		
Buffer		
Buffer		
Scadden + Jockey + Micro Nutrients	Tanami Untreated	Argyle + Jockey
Scadden + Jockey + Gaucho	Tanami + Jockey	Scadden + Jockey
Scadden + Jockey	Scadden Untreated	Argyle + Jockey + Micro Nutrients
Scadden Untreated	Argyle + Jockey + Gaucho	Scadden + Jockey + gaucho
Tanami + Jockey + Micro Nutrients	Tanami + Jockey + Gaucho	Tanami + Jockey + Gaucho
Tanami + Jockey + Gaucho	Scadden + Jockey + Micro Nutrients	Scadden + Jockey + Micro Nutrients
Tanami + Jockey	Argyle + Jockey	Tanami Untreated
Tanami Untreated	Scadden + Jockey + Gaucho	Argyle Untreated
Argyle + Jockey + Micro Nutrients	Tanami + Jockey + Micro Nutrients	Argyle + Jockey + Gaucho
Argyle + Jockey + Gaucho	Argyle Untreated	Tanami + Jockey + Micro Nutrients
Argyle + Jockey	Argyle + Jockey + Micro Nutrients	Scadden Untreated
Argyle Untreated	Scadden + Jockey	Tanami + Jockey
Buffer		
Buffer		
Buffer		

COMMENTS

CB™ Boomer
Early-Medium season TTOP® variety
Adapted to medium low rainfall environments (300-450 mm)
Large seeds - vigorous early growth
CAA blackleg rating MS-S (refer to Canola Association of Australia 2008 blackleg rating guide)
Even maturity suits direct harvesting

CB™ Tanami
Early season TTOP® variety
Targeted for low rainfall – or for late planting in higher rainfall areas
Tolerant of drought stress
CAA blackleg rating MS

CB™ Argyle
Medium season TTOP® variety – suited to 350 mm +
High yielding variety – with leading performance in all states in the 2007 mid-season TT NVT trials
CAA blackleg rating MR
High oil

Future Varieties from Canola Breeders – seed available 09/10

CB™ Telfer

Early season, low rainfall TTOP® variety
High oil
Good blackleg resistance

CB™ Pilbara

Early season, low-mid rainfall TTOP® variety
Excellent blackleg resistance
Broadly adapted across Australia

CB™ Scaddan

Medium season, medium-high rainfall TTOP® variety
Excellent blackleg resistance
Excellent early vigour

TTRIUMPH® Jardee – seed available 2009/10

The first TT hybrid canola in the world!
High yield and moderate to high blackleg resistance
Excellent early vigour

PRACTICAL TIPS ON SPRAY APPLICATION

Craig Ruchs, Technical Services Lead, Syngenta Crop Protection
Jake Lanyon, Technical Specialist, TeeJet Australasia

TAKE HOME MESSAGES

- Nozzle choice and boom height are critical to maximising product performance and minimising product losses
- Correct choice of nozzle and sprayer set-up will determine spray quality and subsequently maximise return on crop protection spend
- Growers need to select a nozzle that best suits likely operating pressures, desired spray quality range and operating speeds
- Regular checks of variability in nozzle output are important to identify nozzle wear

BACKGROUND

With increased production costs putting pressure on net returns from agricultural production, the need to maximise return of investments in crop protection has created increased interest in nozzle technology. A great number of factors influence both spray quality and the level of efficacy achieved when applying crop protection products. Syngenta and TeeJet are industry leaders in knowledge relating to application technology and aim to discuss some practical tips to correct nozzle selection and getting the best results from spray applications.

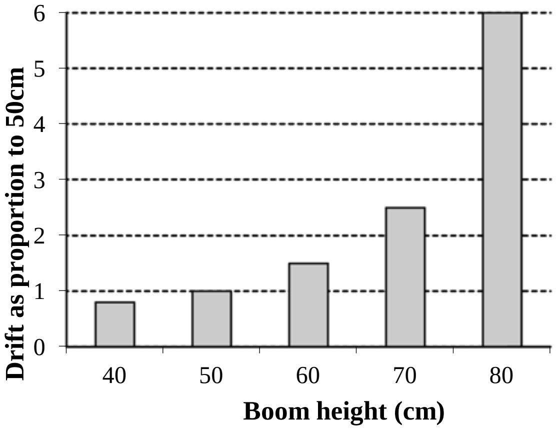
MATERIALS & METHODS

A demonstration of different nozzle types and effects of operating pressure will be conducted using an ATV-mounted spray boom to illustrate differences in spray quality and droplet behaviour.

COMMENTS

- Higher pressure decreases droplet size and drift potential particularly when using standard flat fan nozzles
- Halving droplet size will increase the number of droplets by a factor of 8
- Drift doubles from 50cm to 70cm and doubles again from 70cm to 80cm above the target (Figure 1)
- Pre-orifice flat fan nozzles (eg. Turbo TeeJet) reduce drift (<150µm) potentially by 30% when compared to extended range (XR) flat fan nozzles
- Air induction nozzles may reduce drift (<150µm) by a further 14% when compared to a pre-orifice flat fan nozzle
- Nozzles should be replaced when variability in output exceeds 10% of that stated by the manufacturer

Figure 1: Effect of boom height on spray drift as a proportion to 50cm (above the target)



LONGEVITY AND BENEFITS OF DEEP RIPPING IN A CONTROLLED TRAFFIC FARMING SYSTEM

Stephen Davies, David Gartner and Chris Gazey, Department of Agriculture and Food WA

TAKE HOME MESSAGES

- Deep ripping a compacted sandplain soil substantially improves wheat root growth into the subsoil below 15 cm improving access to subsoil water and nutrients.
- Benefits from deep ripping, including soft soil and improved root growth into the subsoil, are maintained in a controlled traffic farming system.

BACKGROUND

Hardpans as a result of compaction and subsoil acidity are common constraints in sandplain soils. Deep ripping can be used to mechanically break-up and remove hardpans while direct placement of lime behind the tynes of a deep ripper is being investigated as a means of rapidly ameliorating subsoil acidity.

MATERIALS & METHODS

The site was established in 2005 on a poor performing paddock with subsoil compaction and subsoil acidity as the main constraints. The soil at the site is an acid yellow sandy earth with a loamy sand topsoil grading to sandy clay loam from 20cm with the sand fraction being quite coarse. Treatments at the site included combinations of deep ripping with and without surface applied or deep banded lime. Deep placement of lime was achieved by delivering limesand from a modified airseeder bin into the subsoil via delivery boots attached to the tynes of an Agrowplow shallow leading tyne (SLT) deep ripper. This setup was a able to simultaneously deep rip to 30 cm and place a total of 2.5 t/ha of limesand distributed at 10, 20 and 30cm or to place a total of 5 t lime/ha in two passes at 10, 20 and 30cm in the first pass and at 30, 40 and 50cm in the second pass.

RESULTS & DISCUSSION

2005-07 Growing Seasons

In 2005 Calingiri wheat was sown on the site on 18th May. Growing season rainfall (Apr-Oct) was 299mm. Above-ground biomass was measured on 19 September (Table 1). There were significant biomass and grain yield responses to deep ripping to 50cm with an 800 kg/ha grain yield increase relative to the unripped control (Table 1, Gazey and Gartner 2006).

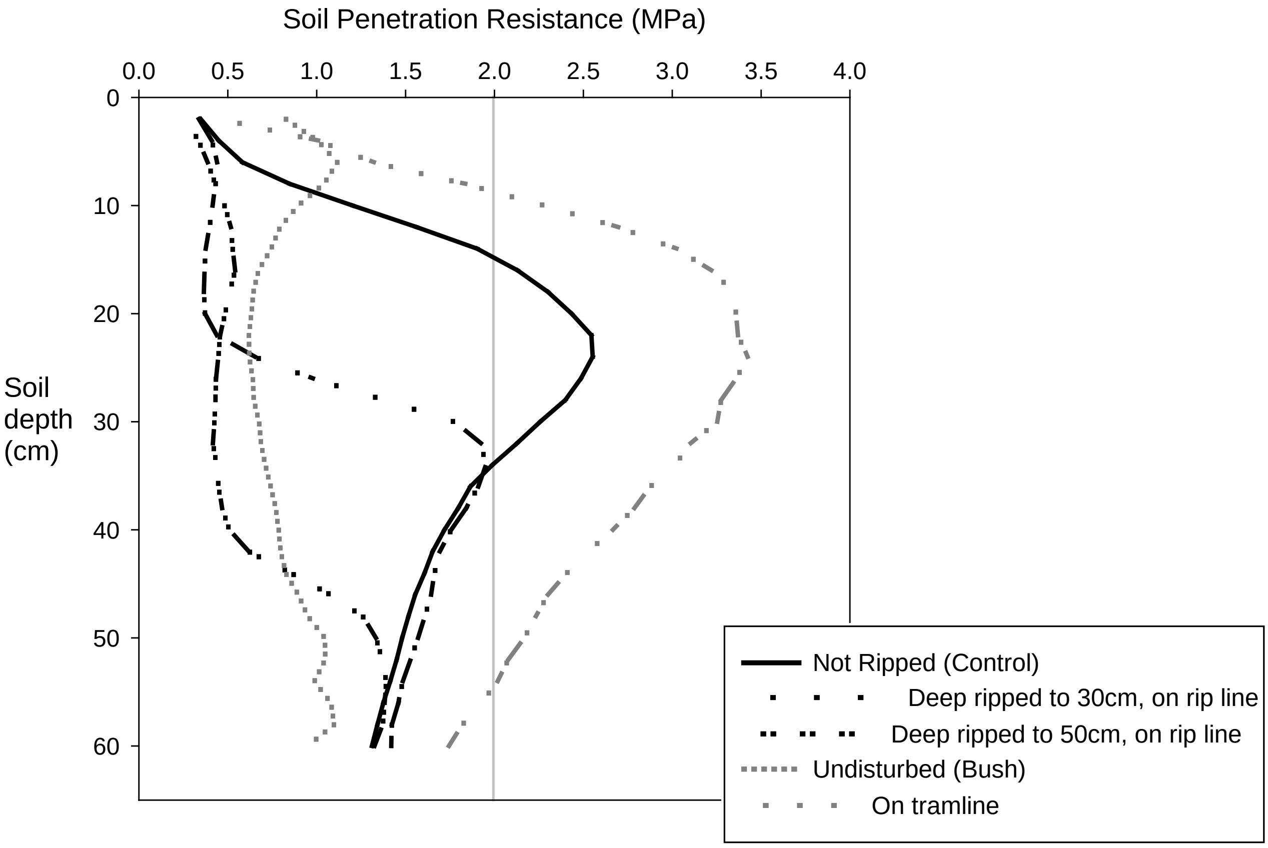
Table 1. Biomass yield (t/ha) measured on 19/09/05 and grain yield (t/ha) for Calingiri wheat grown at Maya.

Treatments	Yield (t/ha)	
	Biomass	Grain
Control (No deep ripping, No product)	4.0ab	2.5ab
Deep ripped to 30 cm	4.6b	2.9ab
Deep ripped to 30 cm while injecting lime @ 2.5 t/ha	4.6b	2.9ab
Lime applied to the surface @ 2.5 t/ha then deep ripped to 30 cm	4.5b	2.7ab
Lime applied to the surface @ 2.5 t/ha	3.8a	2.4a
Deep ripped to 30 cm while injecting lime @ 2.5 t/ha then deep ripped again to 50 cm while injecting lime @ 2.5 t/ha (total = 5 t lime/ha)	5.6c	3.3c
Deep ripped to 30 cm then deep ripped again to 50 cm	5.4c	3.3c

The paddock was not cropped in 2006 and 2007 due to the dry seasons.

2008 Growing Season

On 31 July 2008 wheat root abundance was assessed using small pits and soil penetration resistance measured using a cone penetrometer. The site received ~90 mm of rain in July including some rain the day prior to measurements and the conditions were ideal for using a cone penetrometer with a wet soil profile to a depth of at least 1m. A soil penetration resistance measurement of 2 megapascals (MPa) or more is considered to be strong enough to substantially slow root growth. This correlates well with what was observed in the field. Deep ripping with the SLT ripper in 2005 has resulted in greatly reduced soil penetration resistance 3-years later in a controlled traffic farming system (Figure 1). Application of lime, either deep placed or incorporated by deep ripping, had no effect on soil strength so treatments were combined to look at the impact of deep ripping only. Penetration resistance in the deep ripping lines is 0.5 MPa or less to depths of up to 22cm for the 30cm deep ripping and to 42cm for the 50cm deep ripping treatments (Figure 1). In the unripped control soil penetration resistance exceeded 2 MPa at 15 to 30cm. The strength of a tramline was also measured. Directly on the tramline the strength exceeded 2 MPa from 10-50cm and exceeded 3 MPa from 15 to 30cm (Figure 1). This highlights the impact of multiple machinery passes on compaction and the firm footing that tramlines provide for machinery movement, contributing to improved trafficability and fuel savings. Soil penetration resistance at an undisturbed (uncleared) site at the edge of the paddock was ~1 MPa or less throughout the top 60cm of the soil profile (Figure 1).



Root abundance

Root abundance was assessed on 31 July 2008 using the scoring system of McDonald *et al.* 1990 based on the number of fine roots (<2 mm diameter) in a 10 cm^2 area on a soil pit face (Table 2). Root abundance measurements were made for two of the original 2005 treatments, deep ripped to 30cm with no lime and deep ripped to 30cm while injecting 2.5 t/ha of lime. Root abundance was assessed both in the rip line, on the edge of the rip line and in the unripped soil in between the rip lines.

Table 2. Root abundance scoring system (McDonald *et al.* 1990)

Score	Rating	Number of roots in 10 cm^2
0	None	0
1	Few	1-10
2	Common	10-25
3	Many	25-200
4	Abundant	>200

Soft, deep ripped soil provided a preferential pathway for root growth, which was reflected both in the root abundance scores (Table 3) and from visual observation (Figs. 2 & 3). Without ripping there were almost no roots at 30-40 cm whereas with ripping roots were present at this depth, albeit only 1-10 roots/10 cm^2 (Table 3).

Table 3. Root abundance scores. Data are the means of 3 replicate plots per treatment and 2 rip lines per plot.

Depth (cm)	Deep ripped to 30 cm			Deep ripped to 30 cm + 2.5 t/ha lime		
	No Rip	Edge of Rip	Rip	No Rip	Edge of Rip	Rip
0-10	3.3	3.7	3.6	3.2	2.9	4.0
10-20	2.0	2.3	2.6	1.3	2.0	3.0
20-30	0.7	1.3	1.8	0.5	1.1	2.0
30-40	0.0	0.5	0.8	0.3	0.3	1.0

Addition of lime had little obvious impact on root abundance in the rip line at the time of measurement (Table 3). Because of this the treatments were combined when assessing the proportion of observations that contained roots (Table 4). At 20-30 cm all of the observations in the rip lines contained roots compared with just over half (54%) of the observations containing roots where there was no ripping, in-between 1the rip lines (Table 4). This contrast was greater at 30-40 cm where only 14% of the observations contained roots where there was no ripping compared with 90% of the observations containing roots where the soil had been ripped.

Table 4. Proportion of observations that had roots present.

Depth (cm)	No Rip	Edge of Rip	Rip
0-10	100	100	100
10-20	92	100	100
20-30	54	92	100
30-40	14	38	90

ACKNOWLEDGEMENTS

Funding for this research was provided by the Grains Research and Development Corporation through DAW00014 and UWA00081 ‘Managing Hostile Subsoils in WA’ research projects. Our thanks to: Adam Clune and Breanne Best for technical support; Brian and Tracy McAlpine for hosting the trial; the Liebe Group for ongoing support.

REFERENCES

- Gazey C, Gartner D (2006) Deep ripping and deep placement of lime. Local Research and Development Results 2006. Liebe Group.
- McDonald RC, Isbell RF, Speight JG, Walker J, Hopkins MS (1990). Australian Soil and Land Survey. Field Handbook, Second edition. Inkata Press.

LONG TERM PROFITABILITY OF LIMING

Stephen Davies, Chris Gazey and David Gartner, Department of Agriculture and Food WA

TAKE HOME MESSAGES

- Surface application of 2 t lime/ha at a site in Bindi Bindi in 1996 has provided an average financial benefit of $64/ha/year for 4 wheat crops over 12 seasons.
- Longer-acting inputs such as lime should be viewed as a capital investment.
- Cost of liming to correct acidification can be considerably higher than the cost to prevent acidification.

BACKGROUND

Application of lime and other neutralising soil amendments is the principal strategy to prevent and ameliorate soil acidification in agricultural soils. Research trials run over 25 years by the Department of Agriculture and Food Western Australia, and other research organisations, have shown the value of surface applications of lime to acid soils. Applications of lime at rates of 2–2.5 t/ha, measured for over 50 trial seasons, have given an average wheat grain yield increase of approximately 12% (excluding the year of application) with productivity benefits lasting at least 5-years (Davies *et al.* 2006b). Long-term lime trials can be used to assess the benefit of lime as a capital investment.

MATERIALS & METHODS

In 1996 limesand was applied at 0, 1 and 2 t/ha to the surface of a sandy gravel soil at Bindi Bindi. The experiment was sown and managed by the co-operating farmer. Wheat yield response to liming was measured in 4 wheat crops over a 12 season period in 1996, 1998, 2004 and 2007. The paddock is in a wheat-annual pasture rotation with flexibility to leave the paddock in pasture in poorer seasons. Soil pH_{Ca} was measured in a 1:5 soil:0.01M $CaCl_2$ extract in 1997 and 2007, and $CaCl_2$ extractable soil aluminium levels measured in 2007. The economic analyses used a 3-year average farm gate grain price for wheat of $250/t and an estimated 2007 lime application cost of $38/t/ha amortized over 12 years (1996–2007) at an annual interest rate of 8% to account for the opportunity cost of the capital. Estimated cost of applying 2t of lime at 2007 prices is $76/ha, comprising $11/t for limesand, $17/t for freight (Cervantes to Bindi Bindi) and $20/ha for lime spreading.

RESULTS

Since the experiment was established in 1996 the soil has continued to acidify. Where no lime has been applied the soil pH has declined by between 0.3–0.4 pH units with the biggest decline occurring at 20–30cm (Fig. 1). Application of 2 t lime/ha initially increased the pH at 0–10cm to 6.0 (data not shown) but this has subsequently declined and is now slightly less than the starting pH for 0–10 and 10–20cm depths (Fig. 1). The pH decline was greater in the 20–30cm depth than in the surface, and decreased by slightly more than 0.1 of a pH unit (Fig. 1). Application of 1 t lime/ha in 1996 maintained the surface soil pH at the same level as the 2 t lime/ha application but the subsoil acidified with a decline of 0.2–0.3 pH units (Fig. 1).

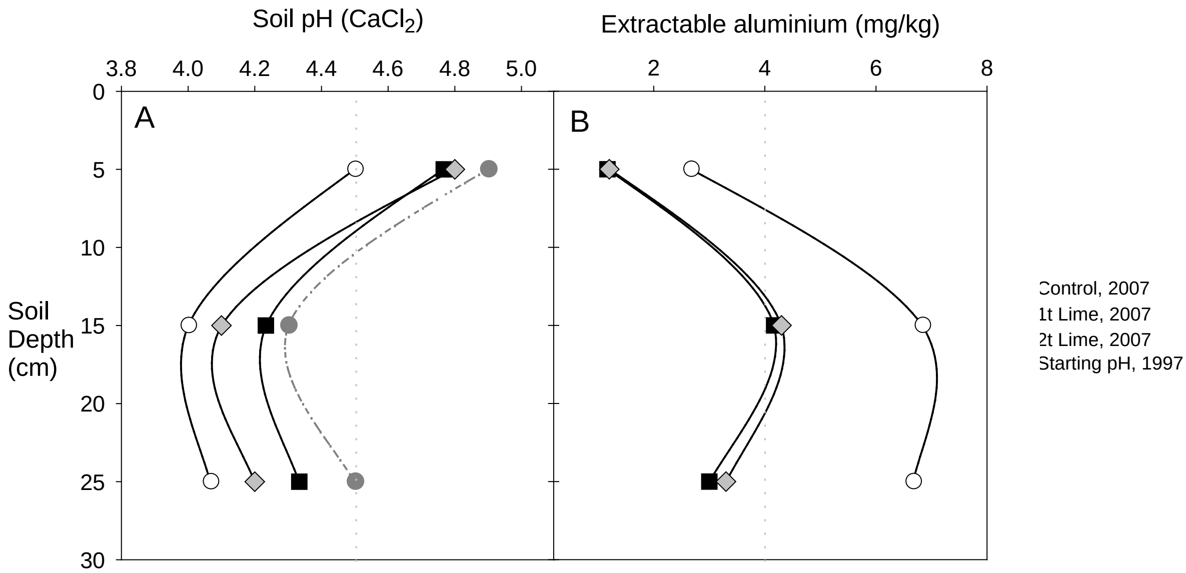


Figure 1. Soil pH_{Ca} (A) and $CaCl_2$ extractable aluminium (B) levels at Bindi Bindi in unlimed soil (control) and soil limed with 1 or 2 t limesand/ha in 1996**.**

Surface application of lime did not significantly increase wheat grain yield in the year the lime was applied in 1996 (Table 1). In three subsequent wheat crops 3, 9 and 12 seasons after the lime was applied yields were increased by 6–8% where 1t lime/ha had been applied and 10–28% where 2t lime/ha had been applied (Table 1). On average 2 t lime/ha increased wheat yields by 13% (300 kg/ha) over the four wheat crops. The average financial benefit over the 4 cropping years was $31/ha/year from applying 1 t lime/ha and $64/ha/year from applying 2 t lime/ha in 1996 (Table 1).

Table 1. Grain yield responses of wheat to surface applied lime spread in 1996 at Bindi Bindi relative to unlimed grain yield and difference in gross income.

		Yield relative to control (%)		**Gross income ($/ha) difference compared with unlimed control***	
Year	**Control yield (t/ha)**	**1 t lime/ha in 1996**	**2 t lime/ha in 1996**	**1 t lime/ha in 1996**	**2 t lime/ha in 1996**
1996	2.2	105	100	20	-10
1998	1.6	108	113	27	42
2004	2.5	108	128	45	165
2007	2.6	106	110	32	57

*Farm gate price used for gross income calculations based on 3-year average farm gate price for wheat grain of $250/t less 12-year annualised lime application cost (see details below) and an 8% opportunity cost of capital.

In 2007 grain protein was increased by 1.2% where 1 or 2t lime/ha had been applied (Table 2). Increased grain yields with higher protein in the limed treatment may be indicative of not only improved root growth and access to soil nitrogen but also of greater nitrogen supply coming from the pasture years. Pasture biomass has been observed to be much greater where the lime had been applied and a single pasture biomass measurement in September 2005 showed that total biomass was 70% greater (2.9 t/ha) where there had been 2t lime/ha compared with the control (1.7 t/ha). There was a trend towards lower screenings where lime had been applied (Table 2).

Table 2. Grain yield and quality of wheat grown at Bindi Bindi in 2007.

Treatment	Yield (t/ha)	Protein (%)	Screenings (%)	Hectolitre Weight (kg/hL)
No Lime	2.64	11.6	3.1	80.6
1t/ha Surface Lime	2.79	12.8	2.9	80.1
2t/ha Surface Lime	2.91	12.8	2.4	80.7
LSD (5%)	0.23	0.5	ns	ns

COMMENTS

Over 10 years the soil pH at the Bindi Bindi site has continued to acidify under a wheat-annual pasture rotation where no lime has been applied. Consequently the soil pH is acid, pH_{Ca} 4.5, in the surface 10cm and strongly acid at depth with a pH 4.1 or less at 10–30cm. It is estimated that this soil would now require the application of 4–5 t/ha of high quality lime over the next 10 years to correct both the topsoil and subsoil acidity. Two applications of 2.5t lime/ha would cost approximately $170/ha at 2007 prices. Additional costs as a result of ongoing productivity losses that would still be incurred while the acid soil is ameliorated have not been taken into account. By comparison where 2 t lime/ha was applied in 1996 the soil pH in 2007 is similar to that measured in 1997. Grain yields have been on average 13% higher (300 kg/ha) than the unlimed control yields over 4 wheat crops. An additional 2–3t/ha of lime is required over the next 10 years to continue to maintain and increase the soil pH at an estimated cost of $75–104/ha at 2007 prices. There was a large benefit in the long term from applying lime in 1996 to maintain the soil pH and crop and pasture productivity. Higher yields and improved grain protein show that prevention of acidification by liming has improved crop and pasture water and N uptake. Lost productivity and future cost of pH amelioration need to be considered in the medium to long-term when making decisions about investing in liming.

ACKNOWLEDGEMENTS

Thanks to Mal and Justin King of Bindi Bindi. We acknowledge the technical support of Adam Clune and Breanne Best (DAFWA Northam) and advice of Rob Grima (DAFWA Geraldton) and Joel Andrew (Precision SoilTech). Funding for this research was provided by the Grains Research and Development Corporation and the Avon Catchment Council with investment from the State and Federal Governments.

REFERENCES

- Davies SL, Gazey C, Tozer P (2006b). Long-term productivity and economic benefits of subsurface acidity management from surface and subsurface liming. 2006 Agribusiness Crop Updates, Perth, WA. WA Department of Agriculture and Food. www.agric.wa.gov.au Accessed 28 April 2008.

MAXIMISING NITROGEN FIXATION IN LUPINS & SUB CLOVER

Chris Poole, Technical Advisor , ALOSCA Technologies Pty Ltd

ALOSCA Technologies Pty Ltd

TAKE HOME MESSAGES

- Research into background paddock strains of nitrogen fixing bacteria *(Rhizobium)* suggest that variance in persistence and nitrogen fixation efficiency within paddock populations is reducing the potential for biologically fixed nitrogen benefits.
- ALOSCA Technologies and the Liebe Group have undertaken a paddock survey of Lupin and Sub-clover inoculants to benchmark year-to-year persistence and nitrogen fixation efficiency of background paddock strains within the Liebe catchment.
- Western Australian legume inoculant research has and is currently developing inoculant strains and methodologies to maximize the benefits and efficiencies of on-farm nitrogen production.

BACKGROUND

It has been common practice for growers to rely on naturalised/background strains of root nodule bacteria (RNB) to meet their needs for paddock inoculation of Lupins and sub clover based pasture. A field survey conducted in 2005 by the Centre for *Rhizobium* Studies (CRS), Murdoch University assessed the nitrogen fixing efficiency of naturalised lupin inoculant strains in key lupin growing regions. The study revealed that there was significant variation within the paddock populations sampled and highlighted that although a number of the naturalised strains isolated were equal to or better than the currently available commercial strains, many were less effective.

From the CRS survey in 2005 the Lupin strain WSM4024 was identified in glasshouse evaluations to have elite nitrogen fixation capacity and has subsequently been evaluated in several trials in the northern agricultural region in 2006 - 2008. The 2008 trial at the Mingenew-Irwin Group sand plain site has returned some promising nodulation data to support earlier glasshouse and field evaluations.

In 2006 the National *Rhizobium* Program following development by the CRS released the improved Group C (sub clover) strain WSM1325. The new strain brings improved strain survival and performance in more acidic soil environments as well as improved host range, with Group C now covering nearly all the trifoliate annual clovers.

These strain developments provide an opportunity to improve legume performance at a low cost per hectare in an environment of escalating applied nitrogen costs. The question is, how do we assess what is currently there?

MATERIALS & METHODS

The current methods available for determining soil numbers and strain fixation efficiency of root nodule bacteria requires the growth of glasshouse seedlings with a minimum of four weeks turnaround for soil numbers and three to four months on fixation efficiency. The materials consumed, time necessary and expertise required to competently execute these techniques make them prohibitively expensive and typically unviable for growers to access.

Background *Rhizobium* level testing

The most reliable current assessment method of *Rhizobium* background levels (cell numbers per gram of soil at any given time) or strain persistence involves running what is known as a Most Probable Number (MPN) calculation or assessment. The method requires a 4-6 week glasshouse seedling infection evaluation to which the basic steps are outlined below.

- Soil samples collected from the field and kept fresh by refrigeration at 4^{o}C.
- Target host species, e.g. sub-clover, seed surface sterilized and germinated in agar plates.
- 6 treatment rates by 4 replicates of germinated seed, from the agar plates, of the target host species are planted into sterilized soil and given time to emerge to early cotyledon stage.

- The field sample is sub-sampled and *Rhizobium* from the sub-sample is suspended in saline solution and tenfold serial diluted down six times to make the six treatment rates. That is, a 1mL sample is diluted 10 times and then 10 times again and again and so on giving a 10 fold, through to 1,000,000 fold dilution.
- The *Rhizobium* dilutions are then applied to the prepared seedlings and allowed to initiate and establish nodulation over the next 6 weeks.
- At 6 weeks the seedlings (typically at 5-6 leaf stage) are assessed for nodule or no nodule formed. These results are then calculated to give a give a probable number of *Rhizobium* per gram of soil expressed as CFU/g or Colony Forming Units per gram. A CFU/g of 1000 cells or $1x10^3$ is generally accepted as sufficient to initiate good early nodulation.

Strain fixation efficiency testing

For the purposes of this survey, controlled environment glasshouse plant biomass production will be used to evaluate the nitrogen fixing efficiency of the strains collected from the field. The basic steps are outlined below.

- Plant samples are collected from the field targeting high and low vigor plants, these are kept fresh by refrigeration at 4^oC until strain isolation.
- Nodules from the collected plants are removed, surface sterilized, crushed and grown out on agar plates to isolate the strains in preparation for plant infection/inoculation.
- As with the MPN method, surface sterilized seed is germinated and planted into sterilized soil and allowed to emerge before being treated with the collected isolates of *Rhizobium* from the agar cultures.
- The seedling are grown for 7-8 weeks in a controlled glasshouse environment to exhaust seed nitrogen reserves and induce differences due to the ability of each isolate to supply nitrogen to the plant. Plant biomass or weight is then measured and tabled to assess the comparative nitrogen fixing ability for each strain within the test group and the +/- nitrogen supplied controls.

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RESULTS OR ECONOMIC ANALYSIS SCENARIOS

Due to the timeframes involved in analysis it is too early to present survey findings for the Spring Field Day on the **11th of September** however the **marquee presentations at 10:00am and 2:20pm** will;

- Provide some basic tools and/or rules-of-thumb to gauge legume fixation performance and assess the need to re-inoculate paddocks.
- Review relevant research to date looking at both strain survey and new strain developments.
- Background and detail Liebe project methods and materials and timeframe expected results.

COMMENTS

The full results are scheduled to be tabled at the regional 2009 autumn updates.

A TIGHT FUNDAMENTAL OUTLOOK FOR KEY FERTILISER MARKETS IN AUSTRALIA AND NEW ZEALAND

Rabobank Media Release

TAKE HOME MESSAGES

Fertiliser prices have seen extraordinary increases during the past 18 months with diammonium phosphate (DAP) prices rising by 338 per cent since the beginning of 2007 according to a recently released report from leading agribusiness lender Rabobank.

The Fertiliser Industry Note says, in fact, prices for all nutrient classes, including urea, super phosphate (TSP), monoammonium phosphate (MAP) and potash have increased by between 150 per cent and 365 per cent. Prices have risen primarily on the back of a tightening in the global fertiliser market.

"Since 2006/07, fertiliser consumption has increased by an average of 4 per cent per year, this compares to the yearly average of 2 per cent per annum over the previous five years," the report said.

The majority of the growth in fertiliser consumption has come from Asia, and to a lesser extent Latin America, with Asia accounting for 69 per cent of the total growth in fertiliser consumption since 2005.

"Over the same time period, fertiliser supply struggled to keep pace, not only in terms of actual production, but also in relation to capacity expansion," the report said.

SUPPLY AND DEMAND OUTLOOK FOR KEY FERTILISER MARKETS

According to the Fertiliser Industry Note, the key fertiliser domestic markets for Australia and New Zealand continue to be high analysis fertilisers, such as urea and processed phosphate fertilisers, which make up nearly 90 per cent of total fertiliser consumption in Australia. The supply and demand balance for these two nutrient groups is expected to remain tight over the next few years.

The Industry Note says, relief from the tight market conditions is not likely until at least 2011 for urea, and 2010 for phosphates, when new plants under construction begin to come on line. That being said, current higher prices should result in a limited amount of demand rationing in a number of key regions where little government support exists, the note said.

"Much will also depend on movements in agricultural commodity markets, if they remain at higher levels over the next few years, the ability of farmers to pay higher prices for inputs such as fertilisers will be sustained," the report said.

PRICE OUTLOOK

As a result of the current market outlook, there appears little downside potential in prices, especially until the current supply and demand balance improves. However according to the Rabobank Fertiliser Industry Note, there remain a number of factors that could impact the market in the more immediate future.

The Fertiliser Industry Note says, the most significant of these is China's assessment of their temporary export tax policy implemented in April 2008. The tax is due to expire at the end of September 2008, and any potential relaxation or removal of export duties could see a reduction in price expectations as Chinese supply re-enters the international market. However, there remains a strong perception in the market that the tax will remain in place, at least until the end of the year, as the Chinese government looks to retain its self-sufficiency in agriculture policy and ensure adequate domestic supplies.

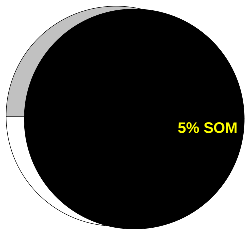
Furthermore a number of other export countries have hinted that they may look to implement export restrictions, in order to retain adequate domestic supplies. "If this were to eventuate it has the potential to once again result in a dramatic increase in prices as the market looks to secure supplies for the next crop year," the report concluded.

(SOIL) ORGANIC MATTERS: CARBON AND A LOT MORE

Clive Kirkby, phD student, CSIRO Plant Industry

TAKE HOME MESSAGES

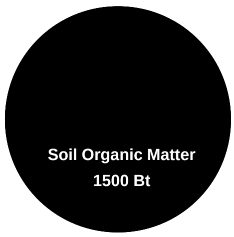
The talk will concentrate on actions farmers can do to increase soil organic matter (SOM) and hopefully dispel some common myths, but first some introduction.
Soil is not as solid as it seems: about 50% is holes (filled with air or water depending on how wet or dry the soil is), 45% is the mineral component (sand, silt or clay) while the SOM comprises only about 5%.



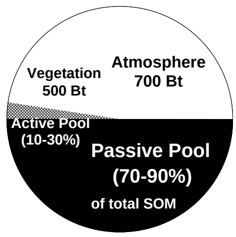
Major components of soil

As everyone knows organic matter contains a lot of carbon (C) and from the diagram above you might think that the SOM isn't a very big C pool – but you'd be wrong.

While all the land plants on earth contain approximately 500 billion tonnes of C and the atmosphere contains about 700 billion tonnes (about double what it was 100 years ago - climate change and all that stuff) the SOM in the top one meter of soil contains 1500 billion tonnes (more then all the land plants and the atmosphere combined).



Billions of tonnes of carbon in different carbon pools



The non-living SOM contains at least two pools passive (humus) pool is the biggest

It also important to recognise that the SOM contains at least two distinct pools of non-living organic matter which can behave very differently.
Passive pool: (often called humus) relatively stable, resists further decomposition, even after cultivation.
Active pool: (sometimes called fresh organic matter – FOM) is composed mainly of recently dead plant material and which under the right circumstances can be easily decomposed (with significant loss of C).

And now for some of the myths,

Myth 1: Increasing SOM will always increase my water holding capacity

No, although increasing SOM will generally increase a light soil's water holding capacity increasing SOM can actually decrease the water holding capacity of a clay soil.

Soil	0% charcoal added	15% charcoal	30% charcoal	45% charcoal
sand	6.7	7.1	7.5	7.9
loam	10.6	10.6	10.6	10.6
clay	17.8	16.6	15.4	14.2

Effect of adding charcoal on percentage of available water (Tryon 1948)

Myth 2: SOM is generally estimated by measuring soil C, so is that all there is to it?

No, as already mentioned organic matter does contain a lot of C, but it contains other elements as well.

	Humus	Wheat stubble	Ave microbe
C	58	47	55
N	4.8	0.8	6.6
P	1.2	0.08	0.8
S	0.8	0.08	0.3

% C, N, P and S in humus, stubble and soil microbes

Humus	Wheat stubble	Ave microbe
10,000	10,000	10,000
833	170	1200
200	17	150
143	17	60

N, P and S per 10,000 units of C

Notice that for every 10,000 units of C humus contains 833 units N, 200 units P and 143 units S.

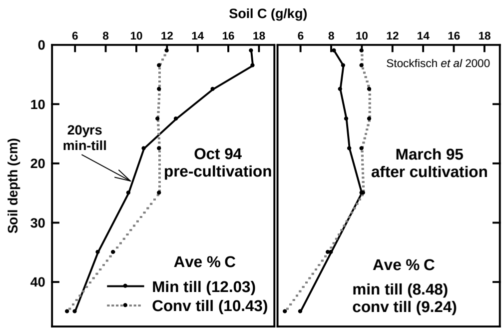
- You can't make humus without the N, P and S, and quite a lot of it.
- Notice also how nutrient poor stubble is compared to humus (explains why large amounts of stubble generally only create small amounts of humus) it's much closer to the composition of microbes.
- Recent research suggests humus is essentially dead microbes (and their residues).

Myth 3: All SOM is equal

No, although most soils will benefit from increasing any form of organic matter the "different types" have pros and cons when it comes to "making" or retaining them.

Fresh organic matter	Crop residues, root material and root exudates, can be partially decomposed - is the major form that builds-up under minimum till systems and pastures. **Pros**: easy and cheap to get, just retain stubble; plus, when left on the surface protects soil from erosion and helps retain moisture. **Cons**: material is fragile and likely to decompose if soil is cultivated resulting in a significant decline in SOM.
Humus	**Pros**: is relatively stable and is largely retained even if soil is cultivated. **Cons**: is nutrient rich, and therefore expensive "to make", ties-up significant quantities of nutrients.
Compost	**Pros**: similar to humus is relatively stable and is largely retained even if soil is cultivated. **Cons**: While infield composting is common in Europe (where stubble loads are very high) it requires considerable inputs to make (manpower and machinery, especially turners) and so is also expensive and probably not worth the investment in many parts of Australia.
Biochar or agrichar	Lot of interest lately and research needed to sort out the whoo-ha. **Pros**: again relatively stable however recent research suggests that under the right circumstances it isn't as recalcitrant as generally supposed. **Cons**: recent research suggests that increased yields only eventuate if extra nutrients are added along with the char. Requires special pyrolysis units to make the stuff (heats FOM under reduced oxygen conditions) and so is probably quite expensive to make.

Myth 4: Cultivation always results in a large loss of SOM



No, Stockfish et al (2000) cultivated a long term min till site and an adjacent conventionally cultivated site and found that while the min till site suffered significant C loss the cultivated site lost only a small amount.

AWB MARKET UPDATE

Ryan Duane, AWB Grain Marketer, Wongan Hills/Moora

WHEAT MARKET UPDATE / GLOBAL OUTLOOK

With the lack of any fundamental changes in the market, wheat has again drifted back towards support at 775 US c/bu. The US winter wheat crop harvest is complete and US spring wheat is now more than 60% harvested. With Northern Hemisphere production known, attention is now turned towards the pace of US demand and southern hemisphere production which will affect prices as we move toward harvest.

On the supply side, the market has shifted focus to the weather forecast across Australia and Argentina. The Australian wheat crop still hangs in the balance with rain over the next month critical in most areas if the country. Areas of WA, Vic and NSW received moderate rainfall over the last week which has been factored in by buyers of the market – softening prices. If this does not eventuate it is likely that wheat prices may again strengthen.

Argentina received moderate rainfall last week, however was less that what is needed to prevent further reductions in production. The current crop forecast is 12-13 MMT vs 16MMT last year.

On the demand side, with the Northern Hemisphere harvest drawing closer to completion attention is now focused on US exports. Last week exports were below expectations and are needed to be maintained above 18 mil bu per week to meet USDA forecasts.

Last week Iran bought 200KMT form Kazakhstan in preference to US wheat allowing US prices to slide and are currently uncompetitive on the global market. There remains concern over the amount of quality milling wheat in the international market which may push demand back towards the US despite higher prices. However to date buyers have been willing to buy lower quality milling wheat from the Black Sea and Russia.

The AUDUSD has consolidated in a 0.8500 - 0.8800 range over the last fortnight in the aftermath of the decline from 0.9850 during late July. The low at 0.8492 has not traded since September 2007. The AUD has remained under pressure from a falling Euro with the low of the fortnight trading after the August German IFO business climate index showed its worst result in three years, sending the Euro to a six-month low against the USD.

Last week the Reserve Bank of Australia cut official interest rates for the first time in almost seven years. The official rate was reduced by 25 basis points to 7.00%.

TRIALS AND DEMONSTRATIONS IN THE LIEBE AREA

FARMER	LOCATION	TYPE	TITLE	COMPANY	CONTACT
Main Trial Site – Clint, Ian & Helen Hunts, Marchagee					
Clint Hunt	Marchagee	Trial	Wheat Time of Sowing	DAFWA	Christine Zaicou-Kunech
Clint Hunt	Marchagee	Trial	Noodle Wheat CVT	DAFWA	Jen Garlinge
Clint Hunt	Marchagee	Trial	APW/AH Wheat CVT	DAFWA	Jen Garlinge
Clint Hunt	Marchagee	Trial	Wheat Practice for Profit	Kalyx Ag	Peter Burgess
Clint Hunt	Marchagee	Trial	Longreach Breeders Trial	Longreach	Matu Peipi
Clint Hunt	Marchagee	Trial	Wheat NVT	Kalyx	Peter Burgess
Clint Hunt	Marchagee	Trial	Barley Varieties	Landmark	Dave Meharry
Clint Hunt	Marchagee	Trial	Lupin CVT	DAFWA	Jen Garlinge
Clint Hunt	Marchagee	Trial	Canola NVT	Kalyx	Peter Burgess
Clint Hunt	Marchagee	Trial	CBWA Breeder Trial	Kalyx	Peter Burgess
Clint Hunt	Marchagee	Trial	CBWA Seed Dressing Trial	Kalyx	Milton Sanders
Clint Hunt	Marchagee	Trial	Saltbush tolerance to Herbicides	DAFWA	Lorinda Hunt
Clint Hunt	Marchagee	Trial	Direct seeding of Saltbush	DAFWA	Lorinda Hunt
Clint Hunt	Marchagee	Trial	Perrenial Pasture Species	DAFWA	Lorinda Hunt
Clint Hunt	Marchagee	Demo	Bladder Clover & Eastern Star Clover	DAFWA	Angelo Loi
Clint Hunt	Marchagee	Trial	N & P Rates for Canola & Wheat	CSBP	Erin Cahill
Clint Hunt	Marchagee	Trial	Chickpea CVT	DAFWA	Jen Garlinge
Clint Hunt	Marchagee	Trial	Boxer Gold + Group B Herbicides x Timing	Elders	Dave Scholz
Clint Hunt	Marchagee	Trial	Bayer Herbicides	Bayer/Kalyx	Peter Burgess
Clint Hunt	Marchagee	Trial	New Herbicides Demo	DAFWA	Peter Newman
Clint Hunt	Marchagee	Trial	Hombre/Zorro – Seed Treatment	Landmark	Dave Meharry
Long Term Research Site – Stuart & Leanne McAlpine, West Buntine					
Stuart McAlpine	Buntine	Trial	Pasture Regeneration Trial	DAFWA	Angelo Loi
Stuart McAlpine	Buntine	Trial	*Bituminaria* Concept Trial	DAFWA	Daniel Real
Stuart McAlpine	Buntine	Trial	Subtropical Grasses	DAFWA	Geoff Moore
Stuart McAlpine	Buntine	Trial	*Cullen* Species	UWA	Richard Bennett
Stuart McAlpine	Buntine	Trial	TM21 trial	B.E.S.T.	Stuart McAlpine
Stuart McAlpine	Buntine	Trial	Liebe Group soil biology trial	Liebe Group	Lara Swift
Stuart McAlpine	Buntine	Trial	Wheat varieties with drought traits trial.	CSIRO	Steve Milroy
Stuart McAlpine	Buntine	Trial	Water use efficiency of high and low risk crop rotations	CSIRO	Steve Milroy
East Dalwallinu Satellite Site – Steve & Lee-Anne Carter's, Xantippe					
Steve Carter	Xantippe	Demo	Barley Varieties	Liebe Group	Chris O'Callaghan
Steve Carter	Xantippe	Trial	Barley NVT	DAFWA	Jen Garlinge
Steve Carter	Xantippe	Trial	Barley CVT	DAFWA	Jen Garlinge
Steve Carter	Xantippe	Trial	Lupin CVT	DAFWA	Jen Garlinge
Steve Carter	Xantippe	Trial	Shallow Gravel Management Trial	Liebe Group NLP Project	Chris O'Callaghan
Other trials and demonstrations in the Liebe area					
Geln Carlshausen	Wubin	Demo	Barley varieties	Liebe Group	Chris O'Callaghan
Doug Cail	Goodlands	Demo	Pasture Varieties	Liebe Group	Chris O'Callaghan
Ross Fitzsimons	Buntine	Trial	Perrenial Grass	DAFWA + Grain & Graze	Geoff Moore
Vern Muller	Marchagee	Trial	Pulse Breeders Trial	DAFWA	Trevor Bell

Gary Butcher	Pithara	Trial	Wheat NVT	Kalyx	Peter Burgess
Brian McAlpine	Latham	Trial	Wheat NVT	Kalyx	Peter Burgess
Rod Stewart	Miling	Trial	Wheat NVT	Kalyx	Peter Burgess
Mike Dodd	Buntine	Demo	New Wheat Varieties	Liebe Group	Chris O'Callaghan
Stuart McAlpine	Buntine	Demo	APSIM Modelling	DAFWA	Bob French
Nigel Dickens	Pithara	Demo	APSIM Modelling	DAFWA	Bob French
Ian Hyde	Dalwallinu	Demo	Grazing Cereals	Liebe Group	Chris O'Callaghan
Brad McIlroy	Pithara	Trial	Shallow Gravel Management Trial	Liebe Group NLP Project	Chris O'Callaghan
Alex Keamy	Watheroo	Trial	Acidic Subsoil Management Trial	Liebe Group NLP Project	Chris O'Callaghan
Liebe Group GRDC adoption project trials					
Grant Hudson	Goodlands	Demo	Lime incorporation trial	Liebe Group GRDC project	Lara Swift
Brian McAlpine	Maya	Demo	Deep banding of Lime trial	Liebe Group GRDC Project	Lara Swift
Colin Bryant	Maya	Demo	Deep banding of Lime trial	Liebe Group GRDC project	Lara Swift
Ross Fitzsimons	Buntine	Demo	Skip row seeding Trial	Liebe Group GRDC project	Lara Swift
Lance Kennedy	Miling	Demo	Variable Rate Fertiliser Trial	Liebe Group GRDC project	Lara Swift
Ian Bowman	Carnamah	Demo	Long Term Lime trial	Liebe Group GRDC project	Lara Swift
Rod Birch	Coorow	Demo	Nitrogen/Nutrient trial	Liebe Group GRDC project	Lara Swift
Tony Mason	Perenjori	Demo	Deep Banding of Lime Trial	Liebe Group GRDC Project	Lara Swift
Colin Cail	East Wubin	Demo	Customer Formulated Fertiliser (CFF)	Liebe Group GRDC project	Lara Swift

CALENDAR OF LIEBE EVENTS 2008

EVENT	LOCATION	WHEN	ATTENDEES	CONTACT
Liebe Group General Meeting	Liebe Group Office	15/09/08	Members	Sophie Carlshausen 96642030
Liebe Group General Meeting	Liebe Group Office	15/10/08	Members	Sophie Carlshausen 96642030
Liebe Dinner	Dalwallinu Wheatlands Motel	17/10/08	Members	Michelle Fong 96642030
Liebe Group General Meeting	Liebe Group Office	15/12/08	Members	Sophie Carlshausen 96642030

LIEBE GROUP CONTACTS

MANAGEMENT COMMITTEE

Ron Carlshausen (President)
Ian Syme (Vice President)
Sophie Carlshausen (Treasurer)
Michelle Fong (Secretary)
Chad Scott
Keith Carter
Merrie Carlshausen
Stuart McAlpine
Mike Dodd
Ross Fitzsimons
Clint Hunt
Rod Birch
Gary Butcher
Rob Nankivell
Ian Hyde

RESEARCH & DEVELOPMENT COMMITTEE

Ian Hyde (Chair)
Clint Hunt (MTS Representative)
Mike Dodd (LTRS Representative)
Ian Syme
Geln Carlshausen
Rob Nankivell
Steve Sawyer
Brad McIlroy
Vern Muller
Brendan Manual
Michael O'Callaghan
Stuart McAlpine
Steve Carter

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Liebe Group Partners

The Liebe Group would like to thank our event sponsor:

In particular David and Anthea Scholz and staff

The Liebe Group appreciates the on-going support from our major sponsors:

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The Liebe Group would like to Acknowledge and thank our VALUABLE supporters:
Department of Agriculture & Food WA, Grains Research & Development Co-orporation, National Landcare Program, Northern Agricultural Catchment Council, Summit Fertilizers, Dalwallinu Shire, CSIRO, Grower Group Alliance, Grant Woodhams, Wesfarmers Federation Insurance, Western Milling and Farm Weekly.

Trials, Demonstrations & Presentations at the Main Trial Site have been conducted by:
Rabobank, CSBP, Elders, Landmark, Canola Breeders of Western Australia, Syngenta, Kalyx Agriculture, The Department of Agriculture and Food, The Liebe Group, CSIRO, ALOSCA Technologies, Longreach plant breeders, Primary Safety & Bayer.

LIEBE GROUP ANNUAL SURVEY

1) Are you (please tick):

Liebe Member ☐ **Non-Member** ☐
Researcher/Agribusiness ☐ **Other** ☐ ____________________

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

____
____
____

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

____
____
____
____

3) Please list any new technologies that you have adopted in the last 12 months.

____
____
____
____

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

____
____
____
____

5) Are you interested in any particular concept/products/practices that you would like tested on your farm?

Name: ____
What: ____
____

6) Can you please provide us with specific feed back to today's Spring Field Day?

____
____
____

7) Would you like to join the team?

Name: ____
Committee: ____________________________________

Thank you very much for your input!