LIEBE GROUP NEWS

March 2019
Volume 22
Issue 2

What's Inside

LiEBE GROUP
Working together in Agriculture

From the Cover

Assessing on-farm lime sources - article page 31

DIAMOND PARTNERS

Rabobank

MEMBER NEWS

EVENTS

PARTNER UPDATES

NEWS

FROM THE EXECUTIVE OFFICER

Bec McGregor

WELCOME to the March edition of the Liebe Group newsletter. This month has already been off to a fantastic start with the Crop Updates and Trials Review Day held on 6th March in Dalwallinu. The day was a great success with a strong turnout of over 80 members and industry partners as well as positive feedback from many members on the day. A full wrap up of the event is on page 6.

Finalised last week, the Liebe Group Annual Research and Development Results Book from the 2018 season is now available to members. The results encompass the trial activities by the Liebe Group and other industry partners throughout the region. We apologise for the delay in getting the book to you however hope that you enjoy reading through the many trials and demonstrations conducted throughout our region. Please let us know if you haven't received your copy of the book and we will ensure we get one to you.

The second Liebe Group AgChats was held on Wednesday 13th March with Agrimaster providing an update on the requirements for Single Touch Payroll and Paul O'Meehan, Butterfield Beef and Steve Sawyer, Wimmera Farm talking staff management techniques and how to foster culture in the workplace. The event was a fantastic success with a total of 26 in attendance and some great discussion and question around the room. Full details and photos from the event can be found on page 8.

Coming up in the Liebe Group event calendar we have a Farm Safety Workshop on Monday 1st April, and the next AgChats talking agronomics of barley on Thursday 4th April. We have also been lucky enough to confirm Lyn Beazley as the key note speaker for the Liebe Group Women's Field Day which will be held on Thursday 20th June!

Trials and demonstrations for the season are being prepared at our Main Trial Site as well as other project sites throughout the Liebe region. If you have something that you would like to trial on your own property that Liebe can help with please contact the office.

Wishing you all the best for start of the 2019 growing season.

GOLD PARTNERS

Elders SCHOLZ RURAL

FARMANCO

IMTRADE AUSTRALIA Agriculture Reimagined

BAYER

SoilTech

SILVER PARTNERS

Syngenta
Pacer Legal
Agrimaster
Adama Australia
GrainGrowers
Landmark
Advanta Seeds
Australian Grain Technologies
Scott's Watheroo Dolomite
Refuel Australia
Tek Ag
NuFarm
Intergrain

FROM OUR PATRON

Michael Robertson
Science Director
CSIRO

AS I write the news is dominated by the impact of extreme weather on agriculture in the eastern states. There is flooding in North Queensland and persistent drought further south. Unfortunately the images associated with these events paints a rural sector as being helpless victims, unable to prepare for such events, weather them, and recover when good times arrive. The ability of farmers to adapt to changing patterns of weather is sometimes under-recognized by those outside agriculture. Grain growers in the northern region of WA have experienced remarkable fluctuations in seasons in the last 10 years. While last season was a bumper crop for many, if you go back to the 2006/2007 drought it sent many farmers to the wall. Despite increasing fluctuations in our seasons and an overall downward trend in rainfall, growers have continued to increase yields. For example, average state wheat yields have doubled since the 1980s despite declining rainfall. Even during the 2006/07 drought, some farmers came out the other side with increased equity in their farms and greater resilience to withstand the next dry spell. This is an amazing testament to technical and business ingenuity as well as the role of science and technology.

Science and technology together with grower groups like Liebe have a vital role to play in assisting farmers' ongoing journey of adapting to a changing climate. I think this is through three main means. Firstly, grower groups can share success stories with peers where farmers have successfully adapted and built a more resilient farming business. Secondly, advances in varieties and agronomy can be tested and refined at a local level in grower group trials. Thirdly, growers can provide valuable feedback to researchers about the attractiveness and viability of their ideas.

The key message coming out of the analysis of past changes in climate and future projections is that seasons will become more variable. This means that farmers will need to be ready to respond to good seasons and have strategies about how to batten down the hatches when poor seasons come along. Decision support along with seasonal climate forecasts can help with that. Again, grower groups have an important role to play in testing these strategies and evaluating whether the tools been produced by researchers help them make a better or more confident decision. One tool that CSIRO has been working on for the last couple of years is the Graincast app, which uses satellite technology and crop production models to forecast crop yields for any nominated paddock using local climate data and soil type information. A sizeable number of growers have been road testing the app in the 2018 season and will do so again this coming season. Most of the interest for the app is coming from agribusiness who want to get an understanding of the volume of the crop they are likely to have to deal with at the end of the season, but we also can see many applications of the tool for growers themselves, their advisers, and other agribusiness.

I hope your preparations for the upcoming season go well and look forward to interacting with a number of you at Liebe Group events this year.

A WORD FROM THE NEW LIEBE GROUP PRESIDENT

Blayn Carlshausen
President
Liebe Group

WELCOME for the first newsletter of the new membership year.

Firstly an introduction of myself, I am a partner in a 100% cropping business in the Dalwallinu and Moora shires, our business has been involved in the Liebe group since its inception, and feel our business has received some real benefits from our involvement. These have come from the hosting of the main trial site and other satellite sites, personal development training, mentoring opportunities and probably the most satisfying is, peer to peer learning at Liebe hosted events.

The last event was a successful Crop Updates and Trials Review day, which was very well supported by our grower members. Some very interesting topics were discussed during the day concluding with David Carter from Austral Fisheries giving us an insight into their fishing agribusiness. The day was capped off with sundowner of oysters and champagne hosted by Scott's Watheroo Dolomite who donated a necklace which was won by long term Liebe member, Ian Hunt.

Thank you to our staff for their hard work, which resulted in a day that was full of interest and ran very smoothly. Thank you to our presenters for their input, our members who helped and also to our valued sponsors.

Congratulations to one our long term members Bob Nixon who was recognised with the "Seed of Light" award at the recent Perth GRDC updates for his industry involvement and work with Morrell soils in the wheat belt. A huge achievement for Bob and his family to be the first grower to receive this award.

A new introduction of AgChats and Bitesize Learning will give our members and partners an exciting opportunity to be involved with short peer to peer learning sessions which will be targeted agronomic and business management topics relevant to the time. We have had a great response already and encourage anyone to attend and also to bring topics which they believe could be of benefit to our members.

This year's Main Trial Site will be hosted by the Keamy family east of Watheroo. The R&D Committee, along with our R&D Co-ordinator Alana Hartley, have been busy organising for the numerous trials for the site along with many other satellite site trials which the group will be involved with. The Liebe Group Management Committee has decided to set up and finance a new "Practice for Profit" site which we believe this will bring a large benefit to our members.

Lastly I would like ask our members to consider how to get the most out of your membership, this could be by encouraging any of those involved in your business whether it be your husband, wife, uni student child/ren and staff to attend as many events as they can. Best wishes for a safe and prosperous 2019.

CROP UPDATES & TRIALS REVIEW DAY 2019

OVER 80 members and industry partners came together on Wednesday 6th March for the annual Liebe Group Crop Updates and Trials Review Day in Dalwallinu.

The Trials Review Day kicked off with concurrent sessions providing members with an opportunity to review and discuss trials from the 2018 season. Discussions included review of Liebe Group demonstration projects including the GRDC investments "Demonstrating the benefits of legumes for reliable profitability" and the "Ripper-gauge demonstrations". Trial partners Bayer, Imtrade and CSBP presented on their trials from the 2018 Main Trial Site at Kalannie with other popular trial discussions including the interactions of lime, gypsum and tillage and the results from the National Variety Trials.

Trials Review Discussion with Dean Thomas from CSIRO

Following the Trials Review the Crop Updates event commenced with CBH CEO Jimmy Wilson provided the audience with an update on plans for their network and a review of the 18/19 harvest.

Roberto Busi, from the Australian Herbicide Resistance Initiative (AHRI) provided an interactive presentation from his work in herbicide resistance surveys in the Kwinana West region. Roberto provided a fantastic insight into herbicide resistance issues in the region and encouraged growers to get involved in ryegrass resistance testing through AHRI's free testing service for WA farmers.

Roberto Busi, AHRI, presenting to Liebe Group members.

Michael Dodd, Liebe Group member said that “Roberto’s presentation showed a great passion towards combatting the chemical resistance of ryegrass and, along with his humour, delivered an important message to growers to test the ryegrass resistant status to improve future application decisions”.

Roberto can be contacted via the details below if you would like to get involved.

Email: roberto.busi@uwa.edu.au Phone: 08 6488 1423

With calculators in hand, the audience had their heads down for a practical presentation from Ben White, Kondinin Group who discussed machinery investment and replacement options with results presented from case studies of growers throughout the Wheatbelt.

Members were also fortunate to hear from Liebe’s own Dylan Hirsch and Boyd Carter who provided an update on their Nuffield Scholarship travels and studies from around the globe.

To finish off the day, the Liebe Group had the pleasure to hear from David Carter, CEO of Austral Fisheries who delivered a fascinating and inspiring presentation on the story of Austral Fisheries. David talked about the successes and challenges of their business and provided a great insight into the impact of social license in agribusiness.
The day concluded with a sundowner where members were treated with oysters and champagne kindly provided by Tony Pekin from Scotts Watheroo Dolomite. The Liebe Group would like to thank events partner GRDC, our Diamond partners and the research and industry partners who presented on the day.

David Carter, CEO of Austral Fisheries presents to Liebe Group members

Ian Hunt, Marchagee winner of the pearl necklace sponsored by Scott’s Watheroo Dolomite

LIEBE MEMBERS DISCUSS ON-FARM STAFF MANAGEMENT

Staff management and on-farm human resources were the hot topic at the latest Liebe Group AgChats which saw a group of 26 members in the Liebe office on Wednesday 13th March. After an informative presentation on Single Touch Payroll by Agrimaster, the Liebe Group members were lucky enough to hear insights from two farm businesses on their experience with staff management.

Steve Sawyer, Wimmera Farms and Liebe Group member, shared an insight into how they manage the logistics and team for their large scale operation. Steve noted that in sourcing staff, marketing their business via Facebook and promoting their farm is key to attracting staff from around the world. Steve said that “word of mouth and social media is vital to attracting seasonal staff for our business”.

Steve also discussed the importance of providing safe working conditions and a fun environment where staff are treated as team members and are encouraged to develop their skills. Steve noted that to him flexibility is key in management. “I think it is important to plan a direction and not a path and be open to different personalities, skills and ideas” Steve said.

Liebe members were also fortunate to hear from Paul O’Meehan of A O’Meehan & Co who travelled to Dalwallinu from the Stirling Ranges to share his business experience. Paul shared with the group some of the key techniques their business uses promote a strong team culture in their workplace. This included giving team members input into the direction and decision making and dedicating ample time and resources to the HR management of their business. Paul explained that “We see HR as part of our business, like any other maintenance, it’s part of our DNA”.

The Liebe Group would like to thank both presenters for their time in being involved and GrainGrowers for supporting the AgChats initiative.

Alan Meldrum, GrainGrowers, Steve Sawyer, Wimmera Farm, and Paul O'Meehan, A O'Meehan & Co at the Liebe Group AgChats

Paul O'Meehan presenting to the 26 Liebe Group members that attended the March AgChats

LIEBE GROUP ATTENDS 3RD INTERNATIONAL CTF CONFERENCE

Alana Hartley
Research & Development Coordinator
Liebe Group

A few weeks ago, I had the privilege of flying to Victoria to attend the Control Traffic Farming conference, held in the gold rush town of Ballarat. This event was the third international conference, coordinated by the Australian Control Traffic Farming Association (ACTFA).

The conference attracted growers and industry partners from across Australia, with a significant cohort from WA, Europe, North and South America and, South Africa. The event was opened by former Governor General and national advocate for soil health, Major Michael Jeffery, of whom is a strong believer of soil health underpinning the future sustainability of agricultural industries around the world.

Control Traffic Farming (CTF) has experienced mixed levels of adoption over the years and the growers who spoke were just a handful who have adopted full CTF systems in their farm businesses.

Photo credit: Department of Primary Industries and Regional Development, 2018

Opening speaker, Steve Larocque, farmer and agronomy advisor from Canada, spoke about his nine year journey and adoption of CTF on the heavy vertisol soils north east of Calgary. Having adopted a nine meter CTF system and having great success in improving yields, he then began to focus on continuing to gain a greater understanding of improving soil biology on top of the usual chemical and physical properties farmers have always focussed on and now understand well. A simple technique that Steve's farm had adopted in attempt to build soil biological function was 'fence-row farming'; which uses precise planting on or directly beside the previous season's stubble. The benefits seen from this simple change from inter-row sowing, saw greater stubble concentration and organic matter, leading to greater nutrient concentration where it is needed, improved root architecture and a significant improvement in water infiltration and retention.

Flip back to Australia and high rainfall farmers Matthew and Rachel Hinkley from Derrinallum in Victoria, said the foray into CTF was 'a means to an end'. After having purchased a new property that appeared tired and worn out, the adoption of a CTF system was critical to managing waterlogging. Furthermore, they established their CTF runs based on rigorous topographical mapping. Coupled with raised bed cropping on a significant portion of the arable country, and strategic positioning of drains, the CTF system allowed their heavy cracking clays to rejuvenate a natural friable soil structure, absorbing more rainfall. The CTF run lines and drains would then effectively drain excess water away from the growing crop. Where machinery wheels run in the gutters alongside the 2m raised beds, crop is still sown. For the Hinkley's this added to overall paddock yield and assisted with weed competition.

Moving up to Griffith in NSW, Michael Pfitzner, a cropping and livestock farmer, described himself and his neighbours (and much of Australia's dryland croppers) as 'moisture farmers'. He explained 'what we do with that moisture is up to what our farming system is comprised of but, at the end of the day, our profitability is driven by how good we are as moisture managers'. After extensive research and touring to other farms that had adopted CTF, Michael settled on a 12m system on 3m centres, which has now become a common practice across Australian broadacre systems.

Presenter panel discussion at the 3rd International CTF Conference 2019. Photo by Bindi Isbister, DPIRD

The common question that Michael said every CTF farmer is asked is, 'does it pay?' With many inferring to the time and cost to upgrade machinery and managing those upgrades for when each machine is ready to be traded in or upgraded. Most of the machinery that can be purchased today is either already set up for CTF or, can be affordably upgraded before it leaves the dealership. Older machinery is where the timing and cost becomes a little more challenging. During the changeover process of Michael's machines, he conducted a few simple trials to be able to put dollars and cents to the practice. He recorded crop performance on areas of the farm that weren't impacted by wheeled traffic versus areas that were.

After taking samples from each of the zones, and converting each cut row to t/ha/row, a gross margin profit/loss showed a staggering $152/ha improvement in net return from the areas of crop that were not influenced by wheel tracks. Where crop was measured on the trafficked area and, taking into account the loss of yield on a randomised traffic pattern across a paddock on a non-CTF system, this accounted for a $20,000 loss of profit. Extrapolating this effect across his whole farm saw a calculated loss of more than $425,000. The benefits of adopting the CTF system was therefore a 'no brainer' in his mind. Michael's journey now sees him implementing variable rate applications of seed, fertiliser and ameliorants in attempt to reach maximum production potential.

Many growers today are using cultivation practices to remove compaction and improve soil structure, increase rooting depth and maximising the 'bucket' size for water holding capacity. The Department of Primary Industries and Regional Development (DPIRD) senior researcher Wayne Parker, highlighted the concerning nature of compaction as a result of larger, heavier farm machinery. The depth of peak compaction is now up to 500mm in sandy soils of WA's Northern Agricultural Region. Many of these soils such as the deep yellow loamy sands will often re-compact naturally, even in a CTF system, due to the wetting and drying cycles; thus requiring deep ripping approximately every three years. One way Wayne explained to maintain the longevity of an activity such as deep ripping, is through the burial of organic matter from top soils using slotting plates.

Wayne Parkers 2015 research followed the reaction of various soil types across the WA wheatbelt to ripping with slotting plates for four years. Results from this work indicated the ripping effects were still evident in sandy soils four years after ripping with more roots being evident at depth on treatments where ripping to 600mm and CTF was adopted. Wayne's results showed that the yield benefit of deeper deep ripping persists for approximately three years on the sandy soils with return on investments ranging from $1/ha to $5/ha

Ensuring that there is return on the investment for upgrading a farming system to CTF, there are a number of information sources and tools available to assist with decision making and support. Bindi Isbister, DPIRD gave the audience a quick overview of the CTF calculator, which was developed through the GRDC investment Minimising the impact of compaction on crop yield in WA. This tool is an updated version of 'Trackman', developed by Peter Walsh and Troy Jensen from Queenslands DPI in 1998. Using such a tool to monitor the percentage of trafficked area a farm is enduring, helps growers visualise and quantify the extent of yield loss being incurred in a non-CTF system and the potential yield gains that can come from switching.

Many of the presenters from the conference reiterated the importance of having an investment plan when approaching the task of upgrading machinery to a full CTF system. They also reaffirmed that dedication to the cause is also a must, as changing over to a full CTF system can take between 8 to 10 years. A key message that emerged from day one of the conference was persistence: securing a sustainable future for agriculture begins from the ground up. As the honourable Major Michael Jeffry said, 'If we are going to feed a growing global population, improving our soil health must be a priority and CTF is just one small step in achieving this'.

Clint Della Bosca speaking about experiences in changing to a CTF system at Souther Cross at the 3rd Internailnal CTF Conference 2019.
Photo by Ty Kirby, Niabing

Further reading and tools

Department of Primary Industries and Regional Development, Control Traffic Farming calculator, www.ctfcalculator.org

The Science of Soil Compaction, https://www.agric.wa.gov.au/soil-compaction/science-soil-compaction?nopaging=1

Fencerow farming lifts yield of Maize crops by 75%, http://beyondagronomy.com//cmsFiles/documents/document55a269b5c1f8d.pdf

Mitchell Farm, http://mitchellfarm.com

CurvTrak, Loran Steinlage, Iowa, USA, https://youtu.be/hNfsE_jub8c

Machinery adaptation, Loran Steinlage, https://www.youtube.com/user/edgefxx

WOMEN OF LIEBE
KIRSTEN STRICKLAND

We caught up with one of the women of the Liebe Group to chat about their background, involvement in the group and their own goals and aspirations.

Note: Views stated in the Women of Liebe articles are strictly those of the individual and do not necessarily represent those of the Liebe Group.

Tell us about yourself - what is your background?
I grew up in rural Zimbabwe before moving to Hong Kong and then Perth with my family. After high school, I studied Anthropology and Education at university. I have had the privilege of teaching in numerous schools within the Wheatbelt, as well as in Hong Kong. About 10 years ago I moved onto my husband's family farm and have been teaching as well as raising the next generation.

What is your role in your farm business? How long have you been in this role and how do you enjoy it?
While I don't make day-to-day operational decisions, I am part of the constant and ongoing round table discussions and decision making that keeps our family farm going. Not coming from a farming background, I have thoroughly enjoyed learning to step out of my comfort zone and embrace the highs and lows that come with farming/ running a rural business.

What do you enjoy most about living in a rural area?
After spending many years in metropolitan Perth and Hong Kong, I really appreciate being able to constantly see the horizon and hear the wildlife without the interruptions of urban background noise. I also enjoy the community spirit and being able to belong and commit to various organisations.

What has been the involvement you have had with the Liebe Group? You have recently joined the Women's Committee, what are you hoping to get from being involved?
Since arriving on the farm, I have been a member of the Liebe Group, and have attended numerous field days, workshops and trials. By being involved with the Women's Committee, I hope to develop a network of like-minded people within the agricultural industry who can continue to enhance my knowledge of the various operations and dealings of a farm.

Who or what inspires you the most?
No one thing or person inspires me but rather many people. Those who succeed despite adversity and those who are able to get the best out of others while being passionate and fair.

Photo: Kirsten with husband Ben, and children Joshua and Isla

PAPERLESS FARM OFFICE

Made possible with support from MLA (Meat and Livestock Australia) and 'Profitable Grazing Systems – your pathway to success'

A workshop to transition your business to a paperless farm office administration system.

Participants will gain the key knowledge, tips and tricks to develop and manage their own paperless farm office. Learn how to use technology to increase the productivity and efficiency of the administration and management side of your farm business.

DALWALLINU Tue 26 Mar 19

Liebe Group Office, 17 Johnston St, Dalwallinu

Start: 8.45am sharp - Finish: 3pm

REGISTRATIONS ESSENTIAL via

www.pingwa.org.au/paperless

Enquiries: workshops@pingwa.org.au

Who should attend?

All members of your business involved in administrating or managing the farm office.

PROUDLY SUPPORTED BY:

Hosted by:

TOPICS COVERED

- Equipment and connections
- Efficient scanning
- Internet & enhancing your data use
- Data storage & security (including cloud storage)
- Back-ups & virus protection
- Efficient email communication and management
- Electronic storage and management of:
  - Finance records
  - Plant & Machinery records
  - HR records
  - Operations, livestock & technical info
- Mapping your paperless system.
- Tips and tricks for improving efficiency
- Note: This workshop does not cover application or integration of machinery software

COST: $325 (+ GST) for the first person from a farm business. $175* (+ GST) for additional members of the same business

- *Price Includes workshop manual & catering*
- **No discount for non-farm bus.*
- *Minimum 8 farm businesses.*
- *Maximum 20-25 participants.*

What other farmers thought:

... Inspiring, useful, relevant, informative, amazing!...

...**extremely in-depth information, very knowledgeable presenter, lots and lots of information provided** ...LIGHT BULB MOMENT FOR MY FARM MANAGEMENT!... Great info, amazing presenter, loved it!!... Best way to get motivated to start making some changes...

EVENTS

FARM SAFETY WORKSHOP

DATE:
MONDAY 1ST APRIL

TIME:
10AM - 3PM

LIEBE GROUP
Working together in Agriculture

WHERE:
Liebe Group
17 Johnston St,
Dalwallinu

RSVP:
27th March

COST:
Liebe Member $35
Non-Member $85
Includes morning tea, lunch and resources

EVENT PARTNERS

MURESK INSTITUTE
CULTIVATING MODERN AGRICULTURE

SAFEFARMSWA
SINCE 1994

AusChem Training WA

An opportunity to learn about farm safety requirements and how it can affect your farm business with guest presentations from:

Maree Gooch
SafeFarms WA

Legalities of farm safety
- Responsibilities and penalties for employees and employers
- Changes to legislation
- Key sections of the SafeFarms WA manual

Tracy McAlpine
Elserae Farm

Inductions
- Staff, contractors and family members

Jennifer Birch
Catalina Farm

Safe practices
- Introducing safe practices on farm

REGISTRATIONS: http://tix.yt/farm-safety-workshop

• SAVE THE DATE •

The Liebe Group Women's Field Day

THURSDAY 20TH JUNE 2019 DALWALLINU

Please mark your calendars for the annual Liebe Group Womens Field Day. Further information to follow.

Special guests:

Professor Lyn Beazley
University of Western Australia

Rosemary Bartle
Rabobank Australia

LIEBE GROUP
Working together in Agriculture

LIEBE GROUP AGCHATS

BARLEY BUSINESS – AGRONOMY IN THE FARMING SYSTEM

THURSDAY 4TH APRIL 8–10AM

RSVP to the Liebe Group Office on (08) 9661 1907 or admin@liebegroup.org.au

LIGHT SNACK AND TEA AND COFFEE PROVIDED

SUPPORTED BY

Grain Growers

Join David Cameron (Farmanco) and Michael Lamond, for a discussion on barley agronomy.

Topics of discussion include:

- Herbicide management
- N management - including learnings from the GRDC Yardstick demonstrations
- Crop competition and canopy structure
- Flowering window and frost – using DPIRD's Flower Power to help growers select varieties and sowing dates
- Disease management – in light of net blotch resistance information from CCDM
- Market indicators – crop topping, glyphosate declared stacks and price influencers (Chinese tariffs)

UNNOTICED NUTRIENT DEFICIENCY SHOWS UP AT HARVEST

Angus McAlpine
Central Midlands Agronomist
CSBP

LOW proteins were again a widespread observation from last year's harvest. Low wheat protein or protein deficiency in most cases are linked to the under applications of nitrogen (N) for the given yield potential of the season. Factors such as new higher yielding wheat varieties being grown in soils with low nitrogen levels and less legumes in the rotations result in low soil supply and high crop demand. However simply applying more N is not the answer. We must make informed decisions that take into account timing of N applications, economics and risk when applying any fertiliser including N.

Timing of N applications are critical. Grain protein will only begin to increase once we have fulfilled the nitrogen requirements to achieve the higher end of the crop's yield potential. The response curve is better represented in a graph and can help explain the relationship between nitrogen, yield and protein.

The diagram below demonstrates that with increasing N application rates we see big yield improvements (phase I) until the yield increments slow down, while at the same time the diluted protein levels pick up (phase II) until the yield and protein potential is reached (phase III). The diagram is taken from a 1990 CSBP publication, published over 20 years ago.

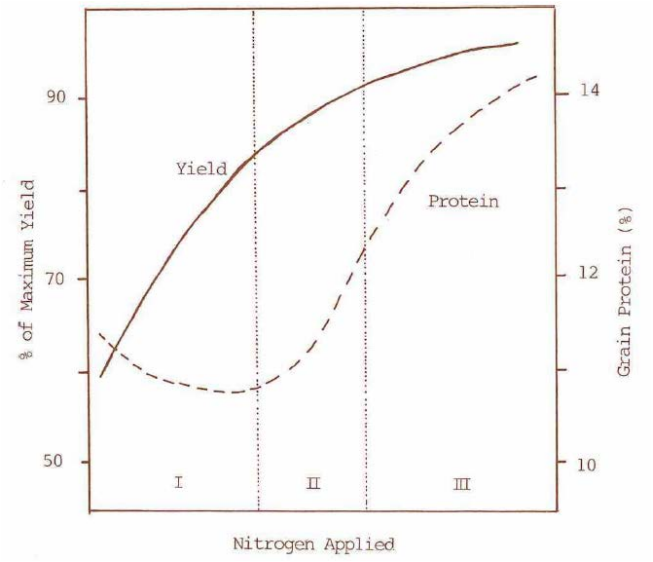


Figure 1. Grain yield and protein response to nitrogen fertiliser (Ian Duncan. The Implications of Protein Payments for Nitrogen Fertiliser Strategies. In: CSBP Productivity Focus, Vol 8, No 1, March 1990)

CSBP field trials last year backed up the yield-protein relationships. The three N trials below (Figures 2 - 4) from 2018 are a good example of typical response curves. The yield response to nitrogen is high on the early part of the curve and declines as the maximum yield potential approaches. The grain protein is low at the start of the response curve and increases with the higher N rates. The Scaddan trial is an example of how increasing N rates resulted in both yield and protein increases to just above 10.5% protein. The Carnamah and Kalannie trials still had significant yield and protein responses however given that grain proteins were less than 10% it is an indication that higher rates of N may have resulted in more yield and higher grain protein.

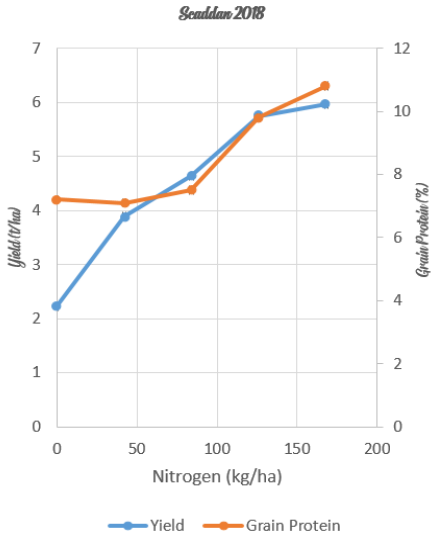


Figure 2: Scaddan 2018

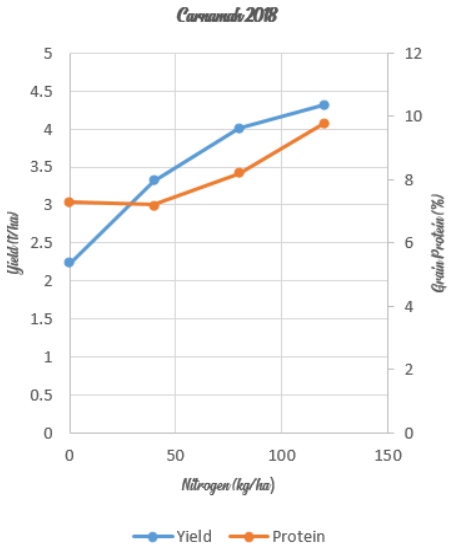


Figure 3: Carnamah 2018

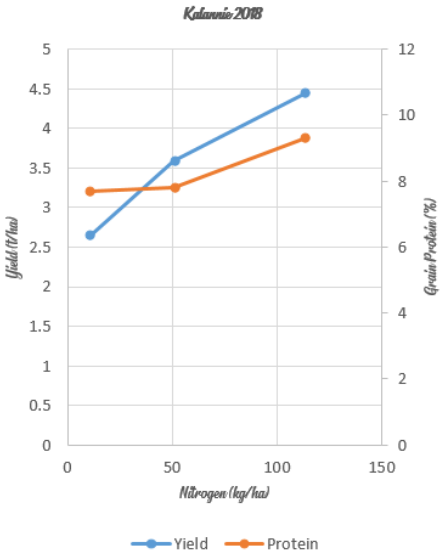


Figure 4: Kalannie 2018

Table 1: Results from Scaddan 2018
0-10cm Soil OC 1.1%, Nitrate N 6 mg/kg, Ammonium N 1 mg/kg

Treatment	Seeding Banded	Z30 Mid Row Banded	N	Yield t/Ha	Protein %	Hl Wt Kg/Kg	Screen %
1	-	-	0	2.23	7.2	77	1.3
2	100 Flexi-N	-	42	3.89	7.1	77	0.8
3	100 Flexi-N	100 Flexi-N	84	4.63	7.5	77	0.9
4	100 Flexi-N	200 Flexi-N	126	5.75	9.8	78	1.1
5	100 Flexi-N	300 Flexi-N	168	5.96	10.8	79	0.9
LSD	0.05			0.44	1.14	1.42	ns

Basal Seeding fertiliser 135kg Big Phos Manganese, 20 kg/ha of Sulphate of Potash

Table 2: Results from Carnamah 2018
0-10cm Soil OC 0.7%, Nitrate N 9 mg/kg, Ammonium N 1 mg/kg

Treatment	Banded (L/ha)	Banded (kg/ha)	Z23 (L/ha)	N	Yield t/Ha	Protein %	Hl Wt Kg/Hl	Screen %
1	-	70 BigPhos	-	0	2.23	7.3	78	3.3
2	73 Flexi-N	66 Agstar Extra	-	40	3.32	7.2	79	2.5
3	73 Flexi-N	66 Agstar Extra	95 Flexi-N	80	4.01	8.2	80	2.6
4	73 Flexi-N	66 Agstar Extra	190 Flexi-N	120	4.32	9.8	79	1.0
LSD	0.05				0.20	0.52	NS	0.83

Table 3: Results from Kalannie 2018
0-10cm Soil OC 0.8%, Nitrate N 19 mg/kg, Ammonium N 8 mg/kg

Treatment	Banded (kg/ha)	Banded (L/ha)	Z23 (L/ha)	Z30 (L/ha)	N	Yield t/Ha	Protein %	Hl Wt Kg/Hl	Screen %
1	80 Agstar Extra	-	-	-	11	2.65	7.7	77	2.1
2	80 Agstar Extra	43 Flexi-N	50 Flexi-N	-	51	3.59	7.8	78	1.9
3	80 Agstar Extra	43 Flexi-N	100 Flexi-N	100 Flexi-N	114	4.45	9.3	80	2.1
LSD	0.05					0.26	0.63	1.59	NS

Since protein is one of the parameters that determines the grade and price of the grain it is important to not just consider yield but also protein when making economic nitrogen decisions. The grades below 10% protein are usually discounted to a greater extent than the premiums above 10.5%. This means the economic returns are greatest for applications of N up to the APW1 (10.5%) grade, because both yield increases are the greatest below and up to 10% and the price per tonne for each grade received increases. High demand for H1 (13%) and H2 (11.5%) wheat grades over the past harvest has pushed premiums to a point where profitable returns could have be made at these higher proteins even when assuming there is no further yield response.

The challenge with making N decisions is that applications need to occur in-season prior to stem elongation to be most effective. Stem elongation occurs midway to later in the year but the seasonal conditions which occur later during grain fill are known to have a large impact on the final crop yield and proteins. Nevertheless confident N decisions can still be made by having a good understanding of the crop's yield potential and target protein while taking into account what factors may limit that crop from achieving its yield potential.

NUlogic® soil analysis can calculate the total N supply from the soil and the N required to achieve a yield and protein target at any time throughout the season. Plant testing in season can track N uptake and ensure other nutrients are non-limiting. Given yield potential is influenced by the seasonal conditions such as rainfall and time of sowing, the rate of N required can change over the course of a season. Understanding that a majority of the N application decisions need to occur before stem elongation, there will be some level of risk with the application. The decision to either apply enough for an optimistic finish or to not apply any more in a pessimistic finish season wise is up to each person's own attitude to risk. Having good relevant information on hand to make a confident decision is important and the economics of risk and returns are part of that decision-making process. Post-harvest assessments of actual grain yield, protein and water use efficiency can help evaluate the N strategies utilised throughout the season and aid in future planning.

Planning for next season's nitrogen strategies should already be under way with NUlogic® soil testing. Given the soft finish at the end of last season and the above average yields, the soil nitrogen levels are as low as they have been over the last few years. So depending upon crop rotations, focusing on what N inputs are likely to be required in 2019 will be very worthwhile.

Figure 5. Liebe Main Trial Site Post Seeding Field Walk 18th July 2018, Fertiliser applications to date Trt 13 (LHS) 72 kg/ha Nitrogen, Trt 2 (RHS) 6 kg/ha Nitrogen

CELEBRATING 20 YEARS OF EDUCATING LEADERS IN AGRICULTURE

Denise Shaw
Media Relations
Rabobank

Skye Ward
Media Relations
Rabobank

2019 marks the 20th year of Rabobank's Business Management Programs, with over 1200 of Australia and New Zealand's most progressive farmers graduating from the programs over the past two decades.

Developed specifically for primary producers looking to take their business to the next level, the Executive Development Program (EDP) caters for experienced business owners or senior managers, while the Farm Managers Program (FMP) has been developed for younger farmers looking to enhance their management capabilities.

Applications for the 2019 intake for both programs are now open.

Rabobank Australia CEO Peter Knoblanche (pictured) said in the 20 years the programs had been running, it was perhaps "more important now, than ever, for farming businesses to invest in their 'human capital'".

"While it is a good time to be in agriculture, with opportunities continually opening up with improved market access and increased investment in the sector, there are also many mounting pressures," Mr Knoblanche said. "These include climate challenges presented by drought and other recent weather events and natural disasters. And from a macro level, there are signs the global economy is starting to decelerate – particularly in China – which could have significant flow-on effects on the Australian ag sector.

"While it is impossible to future-proof farming businesses from extreme weather events such as the devastating floods in north-west Queensland, many external risks can be managed if not mitigated through strategic long-term planning – with the programs covering topics such as financial and risk management, strategies for growth, negotiation, leadership, communication and innovation."

Mr Knoblanche said both programs – which have been likened to mini-MBAs – were highly interactive and had significant emphasis on the direct application of the learnings back into the business. "And being residential programs, the participants have the opportunity to build a strong network of likeminded farmers from across Australia and New Zealand," he said.
This year, the Farm Managers Program will be held in Christchurch, New Zealand from June 23 to 28, with the program including a visit to one of the region's leading farm businesses.

The Executive Development Program, which runs as two modules (a year apart) will be held at the Macquarie Graduate School of Management in Sydney. The first module will run from August 25 to 30, with the second scheduled from July 19 to 24, 2020.

Applications for the FMP close on Friday, March 29 and the EDP on Thursday, April 26. Further information and applications can be found at https://www.rabobank.com.au/agribusiness/business-management-programs/

INSTANT ASSET WRITE-OFF: A REVISIT BUT NOT YET LAW!

Judy Snell
Director
RSM

THE $20,000 threshold has been recently extended to 30 June 2019 on 3rd October 2018

If you buy an asset and it costs less than $20,000, you can write off the business portion in your tax return for the relevant income year.

You are eligible to use simplified depreciation rules and claim an immediate deduction for the business portion of each asset (new or second hand) costing less than $20,000 if:

- you had a turnover less than $10 million (increased from $2 million on 1 July 2016), and
- the asset was first used or installed ready for use in the income year you are claiming it in.

Assets that cost $20,000 or more can't be immediately deducted. They will continue to be deducted over time using the general small business pool. You write off the balance of this pool if the balance (before applying any other depreciation deduction) is less than $20,000 at the end of an income year.

The $20,000 threshold applies from 12 May 2015 to 30 June 2019 and reduces to $1,000 on 1 July 2019.

Extension of instant asset write-off and increase in threshold

On 29 January 2019 the Prime Minister, Scott Morrison, announced that:

- the small business entity (SBE) instant asset write-off, which is due to revert to $1,000 on 1 July 2019, will be extended until 30 June 2020; and
- the threshold will increase from $20,000 to $25,000 with effect from 29 January 2019.

This means from 29 January 2019 small businesses can claim an immediate deduction for each and every asset under $25,000. It is proposed that legislation to implement the proposal will be introduced into parliament when it commences sitting on 12 February 2019 – unfortunately it is still in Parliament and there is only 3 sitting days left!

Any further queries please contact Judy Snell or Keiran Sullivan at RSM Moora on 96 511 606.

GRASS ROOTS FUND MAKING A DIFFERENCE IN REGIONAL COMMUNITIES

Christine D'Souza
CBH Group

SINCE CBH established the Grass Roots Fund in 2014, over $1.2 million and 439 community groups, clubs and organisations across our grain growing regions have benefited from a cash injection for their community events and projects.

The Grass Roots Fund is a key part of CBH's Community Investment Fund, which has invested $7.6 million into regional Western Australia over the past five years. We offer two funding rounds per year in March and August for community events and small scale infrastructure projects.

As the name indicates, the Grass Roots Fund is focused on making a material difference at the foundation of our growing communities. We support groups large and small that provide a service to their community, so they can continue to inject vitality and wellbeing into their local areas through sports, arts, culture and heritage, events, skills-based training and promotion of agriculture.

We've contributed funds to things like ovals, undercover areas, shades, playgrounds, renovations and upgrades, community gardens, toy libraries, curtains, water tanks, sheds, and all manner of fun and engaging community events.

Applications are currently open and we're inviting community groups to apply for a grant of up to $5,000 for community related events and up to $20,000 for small scale infrastructure projects. To apply, head to our website www.cbh.com.au/grassrootsfund to read the criteria and fill out the online form.

The next round will open in August 2019, so if you have an event or project coming up, be sure to mark this date in your calendar.

Bike it to Ballidu 2017, funded by CBH Grass Roots Fund. Image: Viv Brennan

LEGUMES IN THE DRYLAND REGIONS OF WA

Peter Borstel
Agronomist
Farmanco

KEY Points

- Early flowering variety selection is essential.
- Select paddocks with a controllable weed spectrum suitable for the legume.
- Be mindful of input costs ensuring that grazing value or nitrogen input will cover this cost.
- Hard seeded varieties will persist better than soft seeded varieties.
- Plant species suitable to soil type and pH.

Legume Pasture Species

Dalkeith and Nungarin sub-clovers have been the backbone of the legume pasture phase for the last generation. This is because they both are early flowering and have relatively hard seed. Over the last 20 years there has been a steady decline in clover in the pasture phase. There are many reasons for this, some include:

- Shorter rotations as economics drive cropping over livestock.
- Soil acidification with increased cropping leading to rhizobia decline.
- Residual herbicides affecting subsequent germinations and growth.
- Increase in non-wetting soils through cropping reducing even germinations.

Never the less, the result of the reduction of legumes in the farming system has led to increases in nitrogen inputs in the following crops as well as reduced metabolizable energy for livestock.
In the dryland farming areas, the options for legume establishment are limited. There are four main selection parameters you should look at.

Soil type and pH

These are generally linked, heavier neutral to alkaline soils will grow medic, lucerne. biserulla and some sub-clover species, whereas lighter soils will suit serradellas, biserulla, bladder clover and some sub-clovers.

Maturity

The growing season is usually short. Mid to late flowering varieties will generate more dry matter production, however, will be unlikely to set a viable seed at the end of the season. Selecting an early flowering variety will give you every chance of setting viable seed each year. Broadleaf herbicides will generally affect the growth of a pasture legumes. Given the short growing season, an early flowering variety has a better chance of setting viable seed after a setback from herbicides.

Some legume species have a limited range of herbicides to control weeds. Avoid paddocks with weeds that are uncontrollable.

FARMANCO

Hard seed percentage

A species with little hard seed content will not persist. Given a false break, the bulk of Cadiz serradella will germinate and die out, whereas Margurita serradella with at least 50% hard seed, and 20% survival through sheep rumens, will persist.

Sub-clovers

As the name suggests, sub-clovers bury their seed protecting it from grazing. Set grazing can be adopted. Sub-clovers are generally more tolerant to herbicides than other legumes. Herbicides such as Broadstrike®, Raptor®, Spinnaker®, Jaguar®,Ecopar® and MCPA can be used to control broadleaf weeds.

Izmir Sub Clover is seen as a direct replacement for Nungarin in areas receiving less than 375mm annual rainfall. It has a similar flowering period (78-80 days), but has greater hard seed characteristics than Nungarin, which should result in greater persistence in cropping rotations.
Mawson® is a new early, brachycalycinum type sub clover bred in Australia by SARDI. Mawson has excellent long-term persistence by regenerating through having higher levels of hard-seed (43%) and is well suited to heavier soils.

Medic

Annual medics are autumn, winter and spring growing legumes that regenerate annually. They are usually sown in a cropping rotation system on neutral to alkaline soil types. Medics have limited tolerance to herbicides. Herbicides such as Broadstrike®, Raptor®, and Ecopar® can be used to control broadleaf weeds. They are aerial seeders so grazing must be managed.

Scimitar® is a hybrid Spineless Burr Medic developed as a replacement for Santiago Burr Medic. Scimitar is very productive on highly saline soils which are not subject to prolonged waterlogging and has a more erect growth habit, higher level of soft seed and increased herbage production relative to Santiago.

Vetch

Vetch is a winter-growing, multipurpose, annual legume. It produces branched tendrils, which can grow as a dense, pure stand to about 80 cm or will trellis on cereals or canola. Vetch can be grazed or conserved as hay or harvested. Vetch flowering and maturity is 'parallel' with development of nodules for nitrogen fixation. Earlier maturing equates to earlier nodule development. In this climate vetch could be a useful tool in the livestock rotation. Radish herbicide control is limited. Herbicides such as Broadstrike® and Ecopar® can be used to control broadleaf weeds

Volga® vetch was bred as a high yielding grain/seed vetch variety for low and mid rainfall areas. It is particularly suited to shorter season areas where the growing season finishes sharply. Volga was included in the Liebe Group legume trials in 2018 and performed well in the wetter season.

Serradella

French serradella is an annual pasture legume. Cadiz® and Eliza® are soft seeded varieties while Margurita® and Erica® are hard seeded. Serradellas' produce large quantities of high-quality feed with high seed yields on deep course textured sandy soils. Herbicides such as Broadstrike®, Raptor® and Spinnaker® can be used to control broadleaf weeds.

Margurita has been selected from hard seeded lines of Cadiz and demonstrates a continual breakdown pattern over the summer period resulting in approximately 50% of the seed able to germinate the following year. Margurita pods require dehulling and scarifying to overcome their hard seededness for high rates of germination. Margurita is the most common serradella grown in the dryland areas,

PARTNER UPDATES

Bladder Clover

Bartolo® is the first cultivar of bladder clover commercially available. It can be grown successfully across mildly acid to alkaline sandy-loam and loam soils and is suited to regions with 320-500mm annual rainfall. Bladder clover has an advantage for seed-setting over subterranean clover on hard setting soils, where subterranean clover is unable to bury its burrs. Bartolo is sensitive to most broadleaf herbicides so clean paddocks are required.

Bladder Clover

Although Cefalu® arrowleaf clover is an early maturing legume, its high-water requirements (400mm) prohibits the success of long term establishment and persistence.

Biserulla

Biserrula is a persistent pasture legume. Biserrula has hard seed, a deep root system and a high level of grazing tolerance. Biserrula is suitable for use on fine textured acidic and alkaline soils, including sandy loams and clay loams.

Biserrula has an acid-tolerant rhizobium, which can persist and give excellent nodulation on soils with a pH as low as 4.2 (CaCl2. Young biserrula seedlings appear to survive short periods of drought much better than most other temperate annual pasture legume species

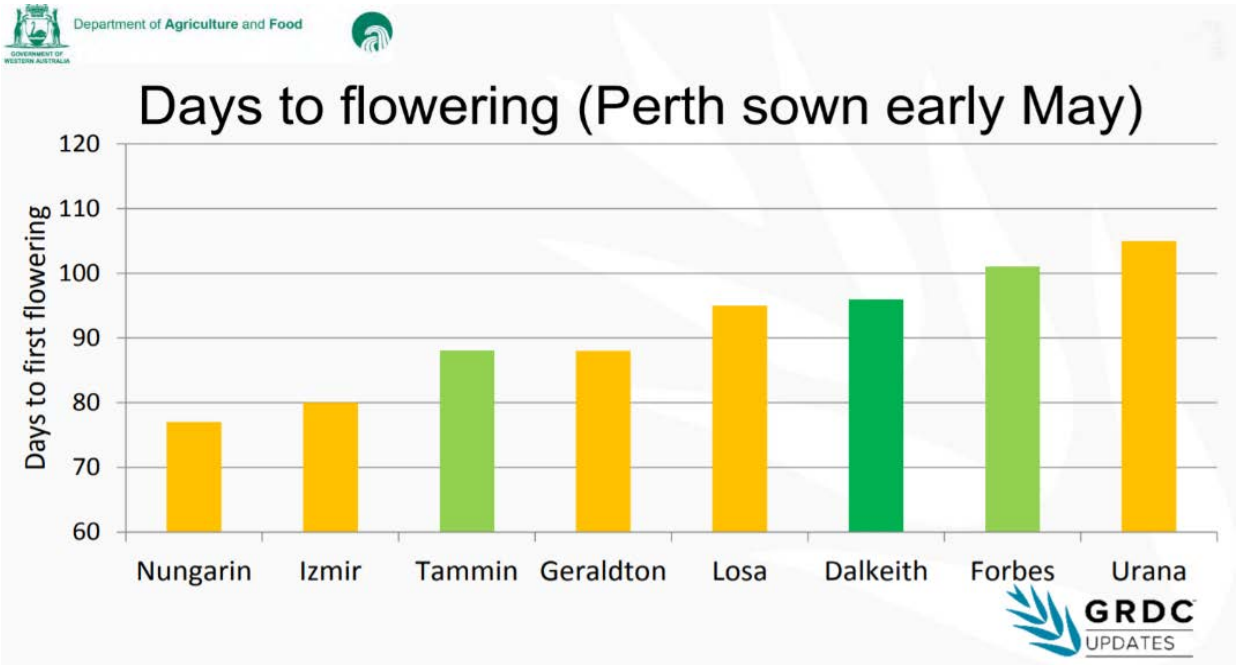
Casbah® is a mid-season cultivar, flowering about 100-105 days after emergence. It is suited to regions with 325-500 millimetres (mm) annual rainfall. Several outbreaks of photosensitivity have occurred in sheep grazing Casbah biserrula pastures, so it is advised that a mixed sword is maintained

Tedera

Lanza is an herbaceous drought tolerant perennial pasture legume that is ideal for Mediterranean environments. Herbicide testing is underway, but no registrations are available.

Lanza® tedera was bred by the Department of Primary Industries and Regional Development (DPIRD) as part of the Future Farm Industries Cooperative Research Centre.it is suited to the medium to high rainfall environments (> 300 mm of annual rainfall) however would be worth looking at when seed becomes available. Best suited to well drained soils with soil pH(CaCl2) ≥ 4.8+.

Sub-clover flowering times



Pasture Legume Information

Legume and Inoculum Group	Flowering	Soil type	Hard Seed	Sowing Rate kg/ha	Approx $/ ha	Comments
Sub-clover (C)						5kg/ha in mixed sword
- Dalkeith	95 days	range	yes	5-10	35-70	Good chemical range
- Nungarin	78 days	range	yes	5-10	35-70	Farmer purchase
- Tamin®	89 days	range	yes	5-10		Available 2020
- Izmar	80 days	range	yes	5-10	50-100	Certified only
- Mawson	88 days	heavier	yes	5-10	50-100	Brachycalycinum Clover
Serradella (GS)						
- Cadiz	110 days	sand	no	10 pod	40	Little available
- Margurita	114 days	sand		5	50	Most common
Bisurulla (BS)						
- Casbah	100-105	Range acid sand 4.2pH	yes	2-5	30-75	Limited available chemical Photosensitive to sheep
Bladder (C)						
- Bartolo	105	Heavier 5.8 ph+		5	50	Limited available chemical Farmer free to trade
Medic (AM)						
- Scimitar	85-90	Heavier alkaline	yes	4-10	34-85	Spineless burr medic. Limited chemical
- Cavalier®	90-95	Heavier alkaline	some	4-10	34-85	Softer seed Limited chemical
Vetch (E)						
- Volga	90-100	range	yes	40	100	Grazing and nitrogen
anza (WSM 4083)						
- Tedera	mid	Well drained		10	?	Perennial legume limited availability. 4.8 pH+
Lucerne (AL)	various	Salt tolerant	limited	3-9	45-105	Perennial needs moisture Discuss with agronomist

Inoculation

As with all legumes it is important to inoculate the seed or soil with the correct rhizobia group. If reseeding a paddock, it is advisable to use new inoculum. The new rhizobia bacteria strains are more effective at inoculating and producing nitrogen in the nodules. There are four basic available types of rhizobia formulation in WA. Peat freeze dried vile and pelleted. Rhizobia is a live bacterium which needs to infect the legume roots. Both peat and vile application cannot be effectively used in dry sowing situations as the bacteria dry and die. These must be applied under wet conditions to the seed or soil. The pelleted formulation (this year's production only) can be applied to dry soil at planting and will survive to inoculate the legume roots.

Acknowledgments and references.
Heritage Seeds, Seednet, DPIRD, Irwin Hunter, Pasture Genetics and GRDC.

TRUFLEX® CANOLA WITH ROUNDUP READY TECHNOLOGY

Clare Johnston
Agronomist
Elders Scholz Rural

ON the January 9th TruFlex ® canola cleared the final hurdle, being approved by China's Ministry of Agriculture and Rural Affairs (MARA). Timing for this allowed small volumes to be released for the 2019 season and will ensure a good bulk up ready for larger supply in 2020.

Pacific Seeds, Nuseed and BASF all will have some volume of TruFlex Canola for 2019 with Pacific seeds having the majority. All BASF TruFlex varieties will have PodGuard technology. This is technology which strengthens canola pods and greatly reduces the risk of pod shatter.

Pioneer Seeds have developed a different gene shuffling technology, Optimum GLY®. This is yet to be approved by China however is expected to be approved and available for 2020.

In 2020 we also expect to have varieties with stacked tolerances of Clearfield and triazine available. These will be a particularly useful tool for managing chemical residues.

What is TruFlex canola with Roundup Ready Technology?

Glyphosate works by interrupting the production of proteins necessary for plant growth. TruFlex canola plants are the next generation of Roundup Ready technology. TruFlex canola is able to tolerate higher levels of glyphosate than Roundup Ready canola and at a later timing. It gives you greater flexibility allowing spraying up until emergence of the first flower and either a third spray at the 0.9 kg/ha rate or two sprays at 1.3 kg/ha (Figures 1 & 2.) TruFlex technology allows you to sow dry, knowing you have the ability to get weeds following rain and will be able to get a 2nd or 3rd spray by emergence of the first flower.

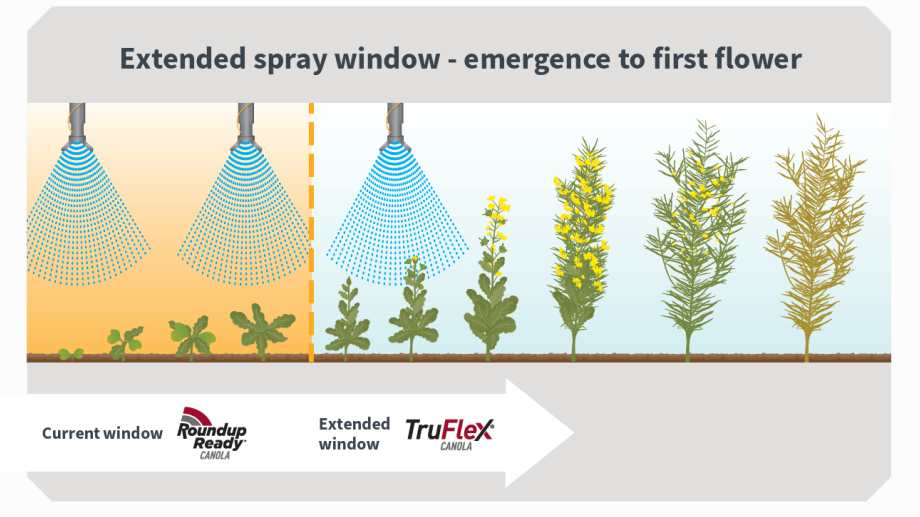
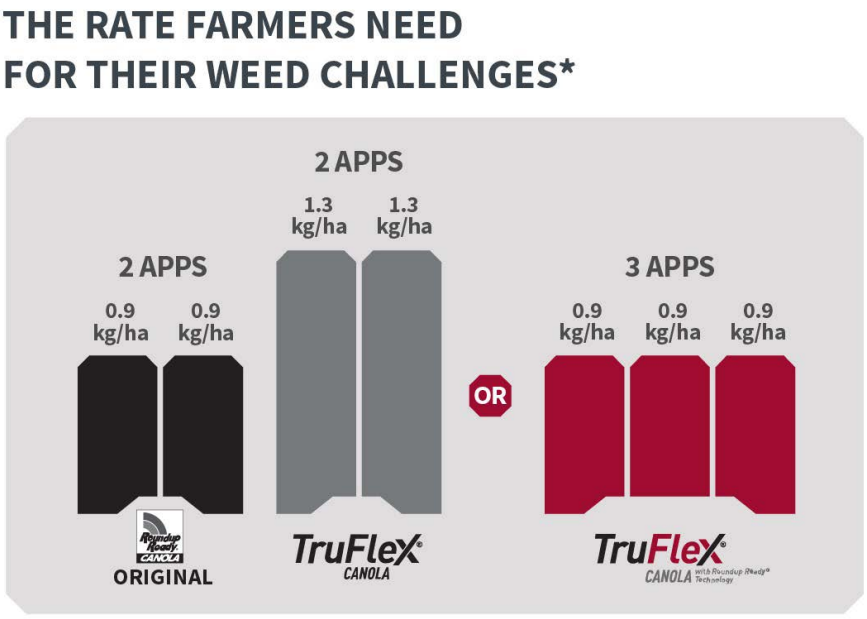


Figure 1: TruFlex spray timing

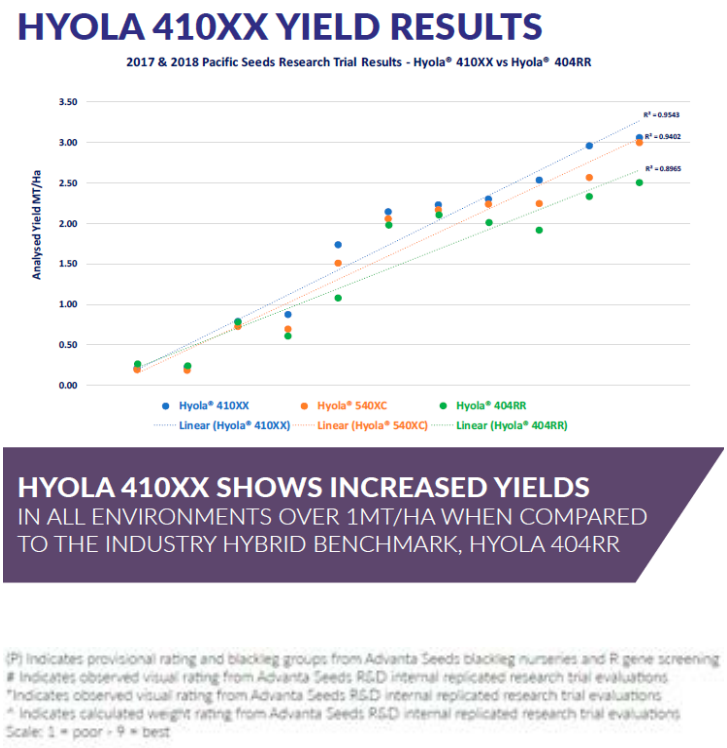


*of Roundup Ready® Herbicide with PLANTSHIELD® by Monsanto.
* Either apply three applications at 0.9 kg/ha or apply two applications of 1.3 kg/ha of Roundup Ready® Herbicide with PLANTSHIELD®.

Figure 2: TruFlex Roundup Ready Plantshield Rate options

Hyola 410XX attributes and Yield results

Yield adaptability	0.75 - 3.5t/ha
Blackleg rating	R (P)
Blackleg groups	ABD - Tri-gene Protection (P)
Oil potential	Consistantly very high oil %
Herbicide tolerance	TruFlex Technology
Maturity	Mid - Early
Plant vigour	9.0
Plant height	Medium
# Lodging resistance	8.5
* Shatter tolerance	8.0
^ Hectolitre weight	8.0
Alternative sowing option to:	45Y25, 44Y27, GT53, GT42, 43Y23, InVigour R 5520, DG 408RR, GT 41, Hyola 404RR, Hyola 506RR



(P) Indicates provisional rating and blackleg groups from Advanta Seeds blackleg nurseries and R gene screening
# Indicates observed visual rating from Advanta Seeds R&D internal replicated research trial evaluations
*Indicates observed visual rating from Advanta Seeds R&D internal replicated research trial evaluations
^ Indicates calculated weight rating from Advanta Seeds R&D internal replicated research trial evaluations
Scale: 1 = poor - 9 = best

Due to the different management practices you will need to be accredited to grow TruFlex. This applies even if you have already done your Licensed and Stewardship Agreement (LSA) for Roundup Ready. Contact the office to run through requirements.

If interested in seed or for more information
contact Clare Johnston, Elders Scholz Rural, (08) 9661 2000.

A LOOK BACK TO THE 2017 SEASON – A COMPARISON OF PRE-EMERGENT HERBICIDES FOR ANNUAL RYEGRASS CONTROL

Matt Willis
Customer Advisory Representative
Bayer Crop Science

BACKGROUND

In 2017 two trials were conducted by Bayer Crop Science and Syngenta with the Liebe Group and Mingenew-Irwin Group in the northern WA Wheatbelt comparing the yield, profitability and level of weed control of different pre-emergent and early post-emergent herbicides in a wheat crop.

There are a range of pre-emergent herbicide modes of action available for use by growers to control grass weeds which all perform differently due to the varying properties of their respective active ingredients. These properties include the unique herbicidal capabilities of each product, the level of water solubility, soil/stubble binding characteristics, volatility, residual lifespan, as well as their spectrum of activity on other weeds.

Key messages

- All pre-emergent herbicides showed a positive $ROI when compared to the untreated control, however even the best treatments were allowing some annual ryegrass (ARG) panicles to set seed. This emphasises the need for integrated weed management strategies to be used alongside herbicides.
- The superior performance of the three Sakura treatments with their longer residual activity and the trifluralin + post-emergent Boxer Gold treatment (when applied under good conditions) highlighted the strength of a longer period of activity to reduce annual ryegrass numbers.
- Post emergent applications of Boxer Gold are highly reliant on favourable conditions, as seen when comparing results at West Buntine and Arrino. When applied to small weeds in a moist soil profile, and a follow up rainfall event occurs – this can be a successful method of weed control.
- Early weed control ratings (at 2-6 weeks after weed germination) are not reflective of the final number of weed seeds re-entering the seed bank.

Seasonal conditions and site comments

The Arrino trial was sown on the 18th of May 2017 with germinating rains totalling 20 mm received within a week of sowing. The post emergent treatment was applied under dry conditions 28 days after sowing due to the weed size at the time (2-3 leaf). No further significant rainfall events occurred until the 21st of June, after which a second flush of annual ryegrass was observed following 15 mm of rain over three days. Steady rainfall events occurred for the rest of the growing season.

The West Buntine trial was sown on the 24th of May 2017. No weed emergence or crop germination occurred. The next rainfall event was not for another 41 days, on the 3rd of July; 8 mm of rain fell over the course of a week, resulting in an evenly emerged crop. The first substantial rains of the growing season were not received until 65 days after sowing, where 21 mm fell over four days: this was enough to germinate a large stand of annual ryegrass. The post emergent Boxer Gold application was applied 79 days after sowing three days after a 17 mm rainfall event. The target weed (annual ryegrass) was mostly at the 2-3 leaf growth stage and the crop at Z14,21 (early tillering). 23 mm of follow-up rain was received on the 12th of August.

Results - Weed Control

Table 1: Level of annual ryegrass control in Scepter wheat at trials at Arrino and Buntine. Arrino trial ARG control rating assessed on 27th June (40 DAA, 12 DAB) and 3rd August (77 DAA, 49 DAB), panicle count assessed on 12th October (147 DAA, 119 DAB). Buntine trial ARG control rating assessed on 17th August (85 DAA, 6 DAB) and 14th September (113 DAA, 34 DAB), panicle count assessed on 11th October (140 DAA, 61 DAB).

			Arrino site					Buntine site				
	Pre-emergent treatment	Herbicide Modes of Action	% ARG control 12 DAB	% ARG control 49 DAB	ARG panicles /m²		Panicles % UTC	% ARG control 6 DAB	% ARG control 34 DAB	ARG panicles /m²		Panicles % UTC
1	Untreated	-	0	0	**554**	a	**0**	0	0	**765**	a	**0**
2	Trifluralin 2 L/ha	D	76	73	283	b-e	**49**	80	73	367	b	**52**
3	Trifluralin 2 L/ha + Logran® 25 g/ha	D + B	77	73	266	cde	**52**	-	-	-	-	**-**
4	Trifluralin 2 L/ha + Monza® 25 g/ha	D + B	-	-	-		**-**	82	81	316	bcd	**59**
5	Trifluralin 2 L/ha + Avadex® Xtra 2 L/ha	D + J	78	73	251	cde	**55**	83	75	249	b-e	**67**
6	Trifluralin 2 L/ha + Arcade® 2.5 L/ha	D + J	78	70	329	bc	**41**	85	73	332	bc	**57**
7	Arcade 2.5 L/ha	J	78	72	277	cde	**50**	75	55	419	b	**45**
8	Arcade 3.0 L/ha	J	-	-	-		**-**	78	70	415	b	**46**
9	Boxer Gold® 2.5 L/ha	J + K	80	72	298	bcd	**46**	84	75	316	bcd	**59**
10	Sakura® WG 118 g/ha	K	89	87	161	de	**71**	90	85	176	cde	**77**
11	Sakura® Flow 210 mL/ha	K	91	84	153	de	**72**	93	86	130	e	**83**
12	Sakura WG 118 g/ha + trifluralin 1.5 L/ha	K + D	93	90	124	e	**78**	94	86	146	de	**81**
13	Boxer Gold 2.5 L/ha + trifluralin 2 L/ha	J+K+D	-	-	-		**-**	88	79	263	b-e	**66**
14	Trifluralin 2 L/ha followed by post emergent Boxer Gold 2.5 L/ha	J+K+D	83	76	251	cde	**55**	88	91	126	e	**84**
15	Nil followed by post emergent Boxer Gold 2.5 L/ha	J + K	75	68	438	ab	**21**	-	-	-	-	**-**
				LSD P=Various	143.2				LSD P=Various	150.9		
				St Dev	84.6				St Dev	90.3		
				CV	29.98				CV	29.49		

Means followed by same letter do not significantly differ (Duncan's New Multiple Range at 5% significance level).

Early weed control is important for removing competition for moisture and nutrition for an early developing crop to help set up the best possible final yield. It is important to note however, that early weed control in June or July does not necessarily equate to final ARG control at the end of the growing season. The best measure of treatment performance in relation to weed seed bank management is a count of panicles prior to harvest.

Due to the dry start to the season at the West Buntine site there was no germination of ARG until July. The complete lack of early moisture meant that the herbicide treatments did not activate immediately. During the first weed control rating at Buntine (see table 1) in August it was observed that the best level of control was observed in the three Sakura treatments (90-94% rating), Boxer Gold + trifluralin (88%) and the split trifluralin followed by Boxer Gold post emergent also recorded good control. The two standalone Arcade treatments recorded reduced control compared to Boxer Gold highlighting the improved control from the S-metolachlor.

The highest level of ARG control from the second assessment during the Liebe Group Field Day in September was recorded for the trifluralin + post emergent Boxer Gold treatment (91%). The three Sakura treatments (85-86% control rating) recorded the next best control.

Final panicle counts (see table 1) on the 11th October showed that the highest level of ARG control was recorded from trifluralin + post emergent Boxer Gold (84%) and Sakura Flow (84%). Sakura WG and Sakura WG + trifluralin treatments recorded slightly lower control based on counts although earlier ratings recorded similar performance, with the addition of trifluralin improving control. Trifluralin + Avadex Xtra and Boxer Gold + trifluralin provided a reduction in panicle numbers in the range of 63-67%. All other treatments provided a reduction of less than 60% of panicle numbers.

Early weed control ratings at Arrino (see table 1) showed the highest levels (84-93%) of ARG control from the Sakura treatments across both assessment timings, and initially from the trifluralin followed by post-emergent Boxer Gold treatment (83% control 12 DAB).

Conditions at the Arrino site were different to the Buntine site due to the germinating rain in the week after sowing. This early season rain allowed all herbicide treatments to activate and a significant flush of annual ryegrass to occur. However, a proportion of the ARG did not germinate until the next significant rain in late June. As a result the Arrino trial is a good comparison of residual weed control with reduced ARG panicle reduction (≤55%) from trifluralin, prosulfocarb and triallate treatments due to this later germination of ARG. Sakura treatments with their longer residual activity recorded improved ARG panicle reduction (71-78%) although the extended dry conditions reduced overall efficacy.

Yield & Return on Investment*

At the Arrino trial there was a significant (P≤0.05) increase in yield between the Sakura treatments and the other treatments. The yield of the wheat in the trifluralin treatment was 1.71 t/ha, whereas it increased to 1.97 t/ha when treated with Sakura instead. The addition of trifluralin to Sakura resulted in a yield of 2.06 t/ha. There also appeared to be a trend between the level of weed control and the yield of the wheat. Although there was no statistical difference in the yield between the treatments at the Buntine site, there was a trend observed toward increased yield for treatments with higher control of annual ryegrass panicles.

At the Arrino trial Sakura recorded $62.70 $ROI/ha and the addition of trifluralin resulted in improved weed control and an ROI of $74.84/ha. No other treatment returned an ROI above $33.58. Gross margin calculations at Buntine highlighted the benefits of weed control in a low yielding year. The trifluralin + Monza treatment, with an improvement of $63.68/ha when compared to the untreated control recorded the highest $ROI, with trifluralin + post emergent Boxer Gold and Sakura WG treatments returning +$49.96/ha and +$48.05/ha respectively. Other treatments recorded +$34.39 or less.

Conclusion

All pre-emergent herbicides showed a positive $ROI when compared to the untreated control. However, even the best treatment across the two trials was still allowing 124/m2 annual ryegrass panicles to survive.

Pre-emergent herbicides and rotation of chemical mode of action groups should form part of a fully integrated weed management program with harvest weed seed management practices also recommended to reduce weed numbers and delay the build-up of resistant weed populations. Do not rely solely on herbicides.

* See 2017 Liebe Group R&D Book for full details.

ASSESSING ON-FARM LIME SOURCES

Jo Fulwood
GRDC

HIGH freight costs associated with carting coastal lime hundreds of kilometres into the eastern wheatbelt are encouraging growers to search on-farm for lime sources to improve their acidic soils.

Acidic soils are commonly improved using limestone, limesand or dolomite, and a growing number of growers in the eastern wheatbelt are discovering these deposits are already on their properties.

The Liebe Group and Map IQ, with GRDC investment, have developed an information resource to assist growers determine if they have an on-farm morrel lime source, and if it can be used to improve acidic soils. The online fact sheet will guide growers in how to locate, sample and test the sources, plus how to screen and spread this sand onto acidic soil paddocks.

The Liebe Group believes there is significant areas of morrel lime deposits throughout the eastern wheatbelt, and if found suitable, these deposits could provide a real solution to the financial barrier of trucking lime from the coastal regions.

The Liebe Group development and support officer Rebecca Wallis says the key for growers before undertaking any extraction is to test the deposits for both pH and for Effective Neutralising Value (ENV).

“On-farm lime sources are generally found on heavy loam soils, look light pink to brown in colour and have carbonate nodules on or near the surface,” Rebecca says.

These carbonate nodules will generally become a fine white powder when crushed, he says.

Morrel soil with carbonate nodules near the surface. This source has an NV near 50 per cent.

Deposits of on-farm lime are frequently found near stands of Black Morrel trees or Salmon Gums and are often lower in the landscape. They may also be poorer performing areas.

Map IQ principal Joel Andrew says his aerial imagery has shown the deposits are often on the darker red soil types in the vicinity of water courses or salt chains.

GRDC
GRAINS RESEARCH & DEVELOPMENT CORPORATION

These deposits typically have a pH of 7.0 or above, and a potassium value above 500mg/kg (up to 1500 mg/kg) generally in the top 10 cm layer.

"If you think you have a morrel lime source on your property, the first test to do is a fizz test," Joel says.

High carbonate levels contained in a viable on-farm lime source will fizz when acid is applied to the sample.

"Pouring vinegar onto a sample is the easiest and cheapest way to determine if a deposit is worth testing further," Joel says.

"If the sample gives an energetic fizz response, then the next stage is to progress with laboratory neutralising value testing."'

Three types of laboratory analysis are currently available – these being a Bulk Neutralising Value test, a Dry Sieve Neutralising Value test, and a Wet Sieve Neutralising Value test.

A sample of on-farm lime before (top) and after (bottom) vinegar is applied. The acid in the vinegar reacts with the carbonate in the on-farm lime to form carbon dioxide gas.

"The Wet Sieve test has found to be the most accurate test for morrel lime, but it is also the most expensive test, so growers will have to weigh up how serious they are about using the on-farm source they have identified, and what testing might be the most suitable," Joel says.

Once an on-farm lime source has been tested, the deposits should be extracted by scrapping off the top soil (5-10 cm) in shallow runs.

"We don't recommend you use any sort of ripping machinery to break up the soil first as this can leave large blocks of soil that can damage the spreader," Joel says.

He says the morrel lime may need to be screened and crushed before applying to acidic soils.

"But spreading this morrel lime is no different from spreading any other lime product, however, the density and fineness of the lime particles will affect results, and you will need to set up your spreader accordingly," Joel says.

On-farm lime can also be stockpiled, because, unlike coastal lime, it has less chance of blowing away and isn't affected by rain.

The online resource, "Locating and assessing On-Farm Lime Sources" contains growers case studies is available online: https://grdc.com.au/resources-and-publications/all-publications/publications/2019/locating-and-assessing-on-farm-lime-sources

Contact: Joel Andrew, MapIQ, 0429 917 743, or joel@mapiq.com.au
Contact: The Liebe Group (08) 9661 1907 or admin@liebegroup.org.au

Source: GRDC's GroundCover Newsletter - Issue 138 Jan/Feb 2019

LIEBE GROUP TEAM

Executive Officer

Bec McGregor
(08) 9661 1907
eo@liebegroup.org.au

Administration & Communications Officer

Danielle Hipwell
(08) 9661 1907
admin@liebegroup.org.au

Research & Development Coordinator

Alana Hartley
(08) 9661 1907
research@liebegroup.org.au

Finance Manager

Sophie Carlshausen
sophie@liebegroup.org.au

Development & Support Officer

Rebecca Wallis
rebeccawallis01@gmail.com

Liebe Group
PO Box 340, Dalwallinu WA 6609
Phone: (08) 9661 1907

www.liebegroup.org.au

CALENDAR OF EVENTS

Event	Date	Location
Farm Safety Workshop	Monday 1st April	Liebe Group Office
Liebe Group AgChats	Thursday 4th April	Liebe Group Office
Women's Field Day	Thursday 20th June	Dalwallinu Recreation Centre
Post Seeding Field Walk	Wednesday 25th July	Main Trial Site, Watheroo
Spring Field Day	Thursday 12th September	Main Trial Site, Watheroo