LEADA Lower Eyre Agricultural Development Association

LEADA Spring Field Walk

8 September 2017

PROGRAM

Time	Place	Presenter	Topic
10.30am	Meet at the: Cummins Oval		Meet and arrange bus travel
11.10am	Andrew Green - Wanilla	Liz Farquharson, SARDI	**Profitable Beans on highly acidic off-type soils**. Exploring new acid tolerant inoculants and how they can give us access to profitable legumes on soils down to a pH of 4.
12.30pm	LUNCH – Yallunda Flat Showgrounds		
1.45pm	Jamie Phillis - Ungarra	Dr Sam Kleemann, University of Adelaide Jake Giles, SARDI	**Efficiency of pre-emergent herbicides in dry sown cereals** **High density seeding rates to maximise yields in late breaks**
3.15pm	Ian Proctor - Yeelanna	Dr Sam Kleemann, University of Adelaide	**New pre-emergent herbicides for ryegrass & broadleaf control in canola**
4.20pm	Mark Modra - Yeelanna	Andrew Ware, SARDI	**Canola Agronomy Trials** – • time of seeding comparisons • Nitrogen • late sown varieties trial
4.15pm	Finish – Cummins Oval		

This day would not be possible without the valued support of all our funders and sponsors.

Thank you to our funders:

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CONTENTS

OPTIMISING LEGUME INOCULATION FOR DRY SOWING

Liz Farquharson and Ross Ballard (SARDI)

SAGIT Project: **S716**
Trial Locaton: Wanilla
Co-operator: Andrew Green
Crop: Faba Bean-PBA Samira
Soil pH $_{CaCl_2}$:4.3
Soil Rhizobia: No bean rhizobia detected.

Main Trial

Aim: To compare a range of inoculant formulations for their effectiveness in nodulating faba bean and fixing nitrogen when dry sown**.**

This trial consisted of nine treatments, three of which were uninoculated (nil) controls and the remaining six were commercial Gr F inoculants (Table 1). Nil2 and Nil3 treatments were sown between granular treatments to account for any contamination between sowing of granular treatments.

All inoculants were applied at the recommended commercial rates with the exception of treatment 3 which was BASF peat combined with New Edge Freeze dried inoculant to deliver a higher rate of rhizobia cells on seed (4 x RR). Peat was applied on seed within 24 hours of sowing and granular products were applied in furrow with seed.

Table 1 :Inoculation Treatments TOS Trial

1	Nil
2	BASF Peat
3	BASF Peat + New Edge FD
4	BASF Granules
5	BASF Peat + Granules
6	Nil2
7	Alosca Granules
8	Nil3
9	Novozymes Granule (Tag-team)

Treatments were sown on either the 28th April (TOS1) at 10cm depth and were in dry soil for approximately four weeks and then again on 16th June (TOS2) and were in dry soil for 2 weeks (figure 1).

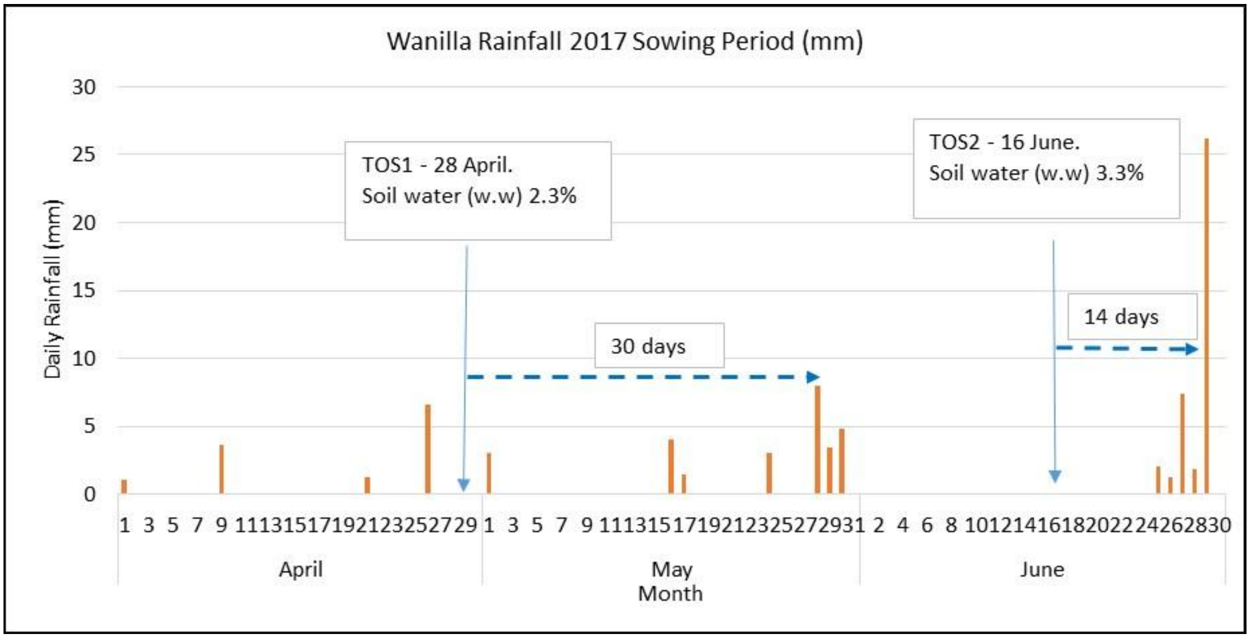


Figure 1. Rainfall and sowing times for Wanilla Bean trials 2017.

Peat Rate Trial :

Aims: (i) To determine if increasing the rate of peat applied rhizobia inoculant on seed improves nodulation of faba bean when sown dry. (ii)To compare the suitability of two Gr E-F rhizobia stains with putative acid tolerance to dry sowing.

This trial had ten treatments (Table 2), one uninoculated (nil) control, the commercial Gr F rhizobium strain WSM1455, and two strains with putative acid tolerance (SRDI954 and SRDI969). All were grown up in sterile peats at SARDI and applied at one of three rates to seed (0.5, 1.0 or 2.0 times the recommended rate) within 24 hours of sowing.

This trial was sown at TOS1 on the 28th of April.

Table 2: Inoculation Treatments for Rate*Strain Trial	
1	Nil
2	WSM1455 0.5xRR
3	WSM1455 1.0xRR
4	WSM1455 2.0xRR
5	SRDI954 0.5xRR
6	SRDI954 1.0xRR
7	SRDI954 2.0xRR
8	SRDI969 0.5xRR
9	SRDI969 1.0xRR
10	SRDI969 2.0xRR

Early Results (Figure 2)

- The Nil treatments had no nodules confirming this is a responsive site.
- The two new strains nodulated beans at all rates of application.
- The commercial strain only nodulated plants when applied at 2x RR.

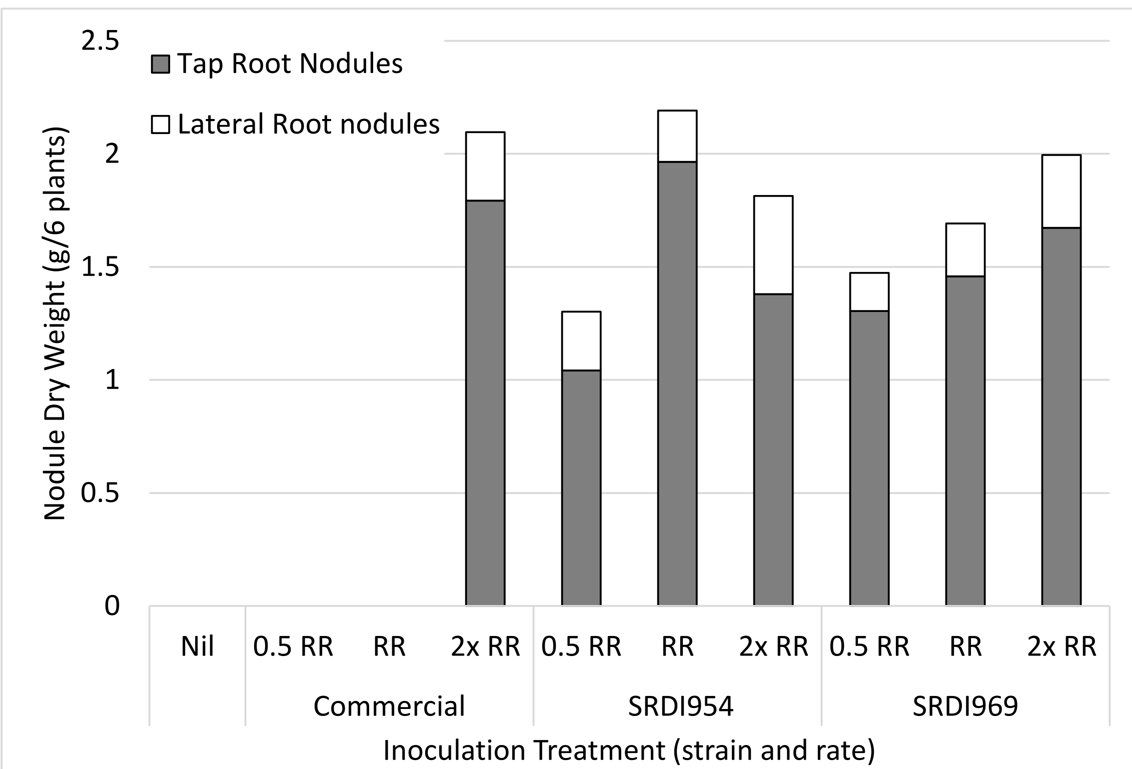
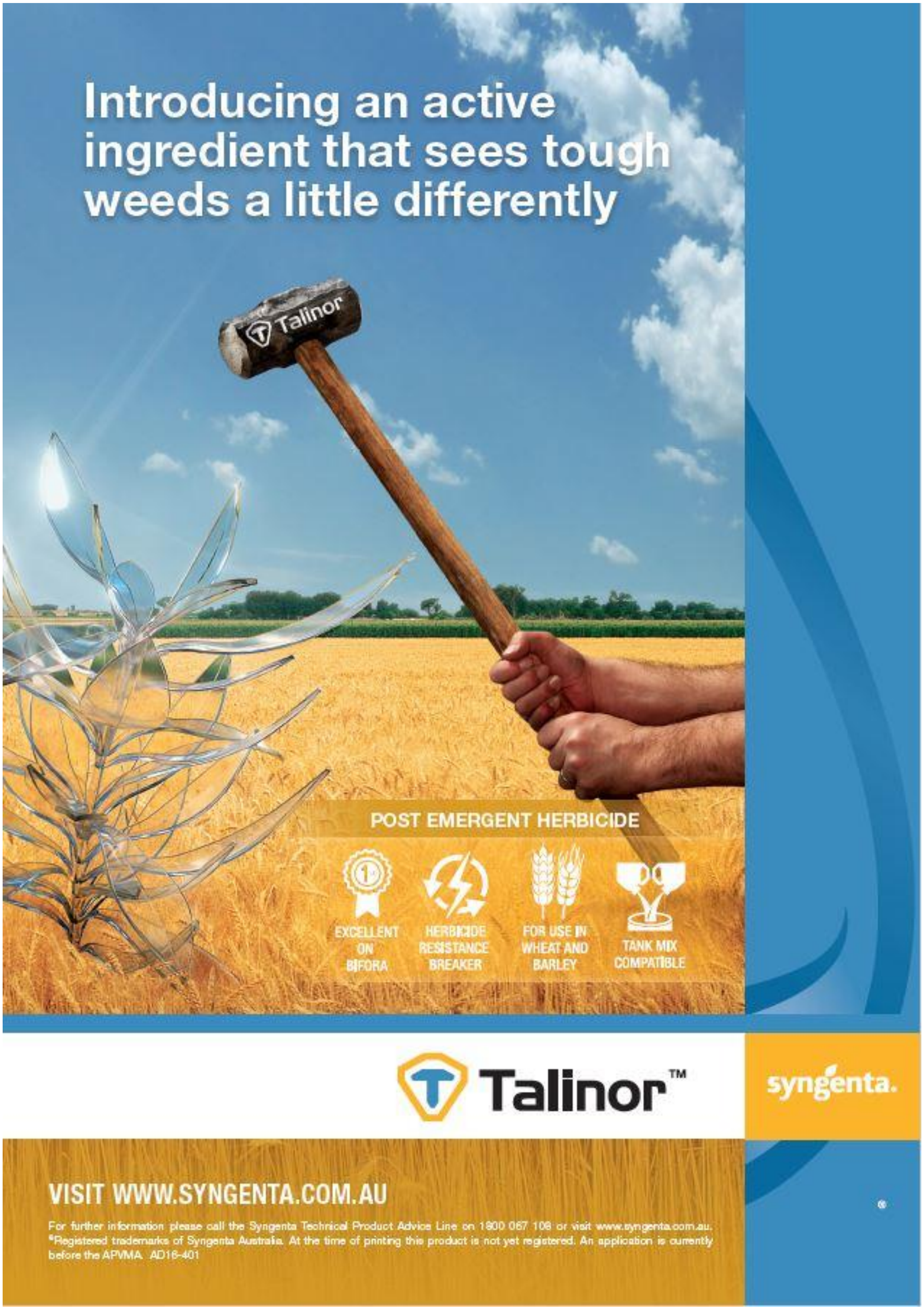


Figure 2. Total dry weight of nodules on bean tap roots (grey) and lateral roots (white) sampled on August 22nd. (LSD Tap =0.8, Lat=0.3).



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For further information please call the Syngenta Technical Product Advice Line on 1800 067 108 or visit www.syngenta.com.au. ®Registered trademarks of Syngenta Australia. At the time of printing this product is not yet registered. An application is currently before the APVMA. AD16-401

FACTORS INFLUENCING BEHAVIOUR AND PERFORMANCE OF PRE-EMERGENT HERBICIDES IN WHEAT

Sam Kleemann, Gurjeet Gill & Chris Preston
School of Agriculture, Food & Wine, University of Adelaide

Key messages

- The behaviour of pre-emergent herbicides can be influenced by several factors including herbicide properties (e.g. water solubility, binding affinity, volatility, and photodecomposition), and their interaction with the environment (soil type, rainfall etc.), particularly soil water, and the rate of herbicide applied.
- The break to the season in 2017 has not been favourable for the performance of soil applied herbicides and crops are likely to have more ryegrass plants.
- Late seed set control tactics such as spray-topping, seed capture and burning may need to be considered to limit the amount of ryegrass seed set and seedbank replenishment.

Background

Overreliance on post-emergent herbicides has resulted in the development of widespread herbicide resistance in annual ryegrass. As a result greater emphasis is now placed on pre-emergent herbicides to provide effective weed control. Traditionally trifluralin was used for control, however many ryegrass populations across the lower EP are now resistant to this important herbicide (Table 1; source Boutsalis). Fortunately, two alternate pre-emergent herbicides Boxer Gold® and Sakura® were released to Australian growers in 2008 and 2012, respectively. Both products contain different modes of action to trifluralin (i.e. group J & K) and can be applied in wheat to control group D resistant ryegrass. However, maximising the performance of these herbicides requires a greater understanding of how they interact with the crop, soil type, environment, and seeding systems.

Table 1. Annual ryegrass populations resistant to pre-emergent herbicides on the Eyre Peninsula (source: Boutsalis, 2014). Populations were considered resistant if 20% individuals survived the herbicide.

Herbicide	Southern EP	Northern EP
	Populations resistant (% tested)	
Trifluralin	51	10
Sakura®	0	0
Boxer Gold®	1	0
Avadex Xtra®	3	0
Propyzamide*	0	0

*only registered for canola

Herbicide availability for uptake by weeds can vary greatly depending on the interaction between several factors including herbicide properties (i.e. water solubility, binding affinity to soil & OM, herbicide photodegradation & volatility), soil factors (structure, pH etc.), the environment (i.e. residue levels), particularly soil water and the rate of herbicide applied.

Water solubility, binding & interaction with crop residues

Water solubility of herbicides can affect their mobility in the soil profile. In heavy crop residues, greater solubility can be beneficial and allows the herbicide to be washed with rain from residue into the weed seed zone. Although Boxer Gold® and Sakura® both show some water solubility, lodged or flattened stubbles (i.e. wheel tracks) can still prevent the herbicide from reaching the soil surface and reduce weed control. The amount of herbicide intercepted by the stubble will be proportional to the percent of ground cover of the stubble and/or weeds present (Figure 1).

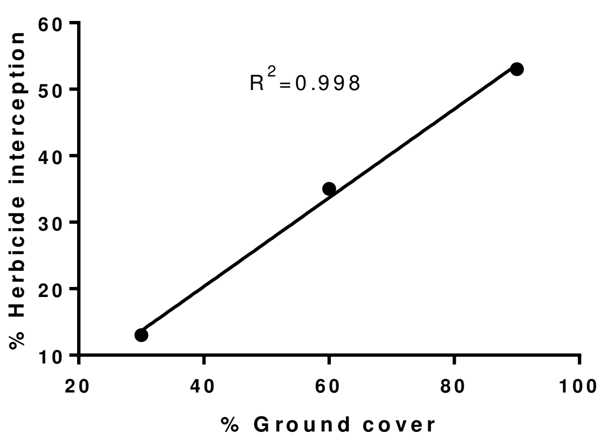

Figure 1. The percentage of herbicide intercepted in relation to the amount of stubble ground cover (%). (Source: Shaner 2013).

In situations with high stubble cover, using nozzles that produce larger droplets and use higher water rates (≥100 L/ha) is strongly recommended. However, too much herbicide movement can result in crop damage, with concentration of herbicide in and around the germinating crop seed.

In contrast to Sakura® and Boxer Gold®, trifluralin binds tightly to soil and organic matter and shows little water solubility (i.e. does not "wash-off" stubbles; Figure 2). However, crop damage can still arise when the soil and/or organic matter particles to which trifluralin has bound are moved by excessive rain or wind. This lack of trifluralin mobility has allowed growers to use high herbicide rates safely in situations with adequate separation between the germinating crop seed and treated soil (e.g. knife-point and press wheels). However, widespread trifluralin resistance in ryegrass across the lower EP is now reducing weed control in many situations.

Photodegradation & volatility

Herbicide that remains on stubble and is not incorporated either by sowing (i.e. with soil throw) or with sufficient rainfall can be vulnerable to photodegradation (chemical breakdown by sunlight). Herbicides like s-metolachlor, one of the two active ingredients in Boxer Gold® is vulnerable to photodegradation, particularly if applied under warm and dry conditions where no follow up rainfall is received within a few weeks of application.

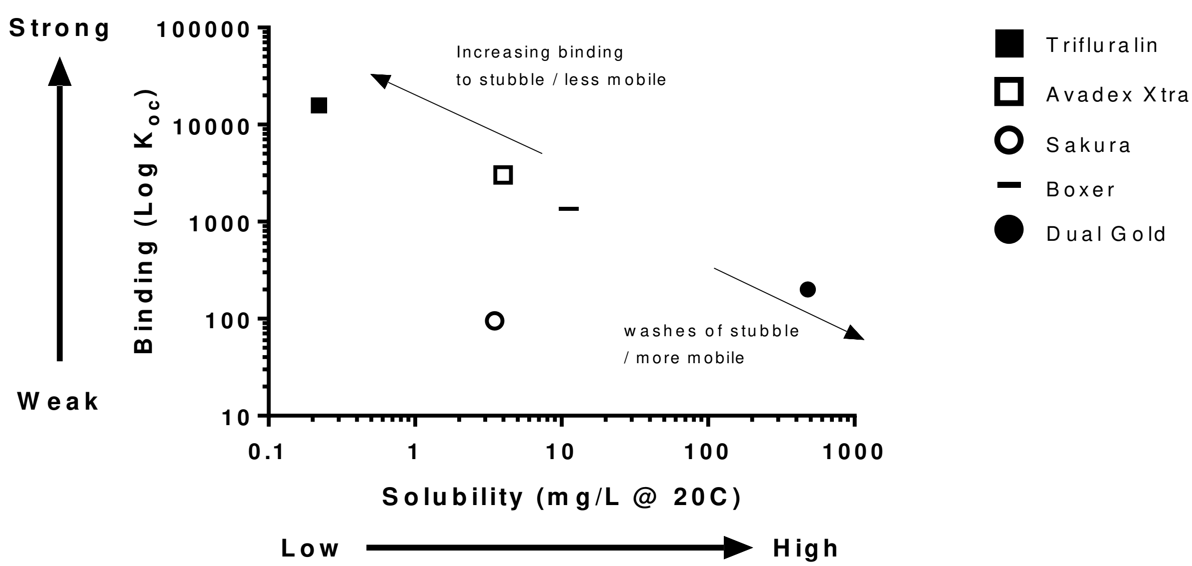

Figure 2. Interactions between solubility and binding of soil applied herbicides. (Source: GRDC Soil Applied Herbicides).

Trifluralin and Avadex Xtra are considered volatile herbicides, which means they more easily transition into gaseous phase because of their high vapour pressures. Because of its high volatility, trifluralin requires soil incorporation within 24h of application, beyond which its effectiveness can diminish through herbicide losses to the atmosphere. In contrast, there is less urgency for soil incorporation of Boxer Gold® and Sakura®, which have low volatility (i.e. low vapour pressures) and are much more stable on the soil. However, it is still recommended that Boxer Gold® should be incorporated within 7 days and Sakura® within 3 days after application.

Herbicide persistence & breakdown

How long a herbicide remains active in the soil depends upon the soil type (i.e. binding), temperature, water, organic matter, speed and type of breakdown (microbial and hydrolysis) and application rate. The rate of herbicide persistence is usually reported as the "half-life", or the number of days required for 50% of the herbicide in the soil to breakdown. Boxer Gold® and Sakura® are considered non-persistent (10-50 days required for 50% herbicide breakdown), however Sakura® tends to persist longer than Boxer Gold®, thereby providing longer residual weed control. In contrast, trifluralin is much more persistent in the soil because of its strong binding and thus requires >100 days for more than 50% of the herbicide to breakdown. However, even though Sakura® and Boxer Gold® have lesser soil persistence than trifluralin, their rate of application allows them to provide the desired length of residual weed control.

Herbicide uptake

Most pre-emergent herbicides act on susceptible weeds like ryegrass through uptake from the roots or the shoots or both. The position of germinating weeds can influence the level of herbicide control. For example if the weeds are germinating below the herbicide layer root uptake is likely to be poor, needing shoot uptake to improve weed control. In contrast if weed germination is occurring from the soil surface then shoot uptake is likely to be limited and root uptake more desirable. Combination of root and shoot activity will provide more consistent weed control. Products like Boxer Gold® and Sakura® have multiple sites of action and can be taken up by ryegrass via either the roots and/or shoots. In the past, combinations of trifluralin and Avadex Xtra have achieved similar control of ryegrass from the surface and at depth. Fortunately, under no-till and disc sowing most weed seeds (~90%) are left on or near the soil surface where they are in close proximity to the pre-emergent herbicides.

Environmental factors influencing herbicide performance

Rainfall

Performance of all pre-emergent herbicides is strongly influenced by soil moisture and rainfall, which is required to synchronise weed germination and activation of the herbicide. Rainfall is also important for incorporating more soluble pre-emergent herbicides like Sakura® and Boxer Gold®.

Unfortunately, the 2017 season break was characterised by infrequent and small rainfall events (27mm from April to June at Yeelanna; long-term average = 127mm). This dry start to the season is likely to reduce pre-emergent herbicide activity through poor incorporation and activation.

Soil type

Soil type has a significant influence on how much herbicide is bound to clay and organic matter and how much is dissolved in the soil water and available for root uptake. Several factors can interact to influence herbicide binding and availability and include soil texture, pH, cation exchange capacity (CEC), organic matter content, herbicide solubility and soil moisture content. Generally, heavy soils tend to bind more herbicide, reducing the potential for leaching but may require higher application rates to achieve effective control. Conversely light textured soils have low clay and organic matter content and low CEC. Therefore, there is less binding of herbicides on light soils so more herbicide is available for plant uptake. However, such soils are more prone to herbicide leaching with rainfall and often lower rates are recommended because of increased risks to crop safety.

Heavy soils are also more prone to crusting and leaving a cloddy seedbed, particularly following dry conditions. This can have a significant impact on herbicide distribution allowing weeds to evade the herbicide and germinate and establish through cracks. The poor condition of seedbeds with sowing dry this season may have also compromised herbicide performance and therefore weed control.

Conclusion

Unfavourable dry soil conditions during the break to the season (i.e. April to June) could have reduced the activity of soil applied herbicides. As a consequence more ryegrass is likely to be present in crops this year. Late seed set control tactics ((i.e. spray-topping, seed capture, burning) should be considered to limit the amount of ryegrass seed set and seedbank replenishment.

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MANAGING CLETHODIM RESISTANT RYEGRASS IN CANOLA WITH CROP COMPETITION AND PRE-EMERGENT HERBICIDES

Sam Kleemann, Gurjeet Gill & Chris Preston
School of Agriculture, Food & Wine, University of Adelaide

Key messages

- Ryegrass seed production was reduced by more than 50% for the hybrid cultivar compared to open-pollinated when used in combination with effective pre-emergent herbicide strategies.
- Pre-simazine or pre-propyzamide/simazine with post-atrazine, were more effective than herbicide strategies that relied just on pre-emergent herbicides.
- New pre-emergent herbicides (e.g. Butisan and Altiplano) are currently being evaluation in trials at Yeelanna, Hart and Roseworthy.
- Crop competition is an easy and simple tool for integrated management of grass weeds in canola.

Background

Clethodim (Select®) has been a major herbicide used for the control of annual ryegrass in canola and pulse crops. However, resistance to clethodim in ryegrass has been increasing steadily in the southern region, which makes it more difficult for the growers to control. Some growers have responded by using increased rates of the herbicide but weed control achieved can still be disappointing. As canola is more sensitive to clethodim than pulse crops, increasing clethodim dose can cause crop damage.

Crop competition has long been known to be a useful tool in weed management. Practices such as decreasing row spacing, increasing seeding rates, and growing more competitive cultivars have all been demonstrated in research settings as practices that can reduce weed interference. However, adoption of more competitive crops has been mixed. Over the past few years, we have been looking at how to improve weed control where crop competition offered by a hybrid canola in combination with pre-emergent herbicides can greatly reduce ryegrass seed set. Competition, therefore, could provide an easy and simple to use tool for integrated management of grass weeds in canola.

What's been undertaken?

A field trial was established at Roseworthy in 2016 to investigate the effect of crop competition and different pre-emergent herbicides and their mixtures on annual ryegrass control in canola. The trial was established in a split-plot design to compare a triazine (TT) open-pollinated (OP) cultivar (ATR-Stingray) with a TT-Hybrid (Hyola559TT) under six pre-emergent herbicide strategies (Table 1).

Seeding rate was adjusted according to germination and size to obtain a target density of 35 plants/m^2. This resulted in ATR-Stingray sown at 1.6 kg/ha and Hyola559TT at 2.4 kg/ha on May 14th.

Table 1. Pre-emergent herbicide strategies used in canola competition trial at Roseworthy in 2016.

Herbicide treatment	Herbicides applied
1	Nil
2	Propyzamide 500 g/L (1 L/ha) pre
3	Propyzamide 500 g/L (1 L/ha) + Tri-allate 500 g/L (2 L/ha) pre
4	Simazine (1.1 kg/ha) pre + atrazine (1.1 kg/ha) post
5	Propyzamide 500 g/L (1 L/ha) + simazine (1.1 kg/ha) pre
6	Propyzamide 500 g/L (1 L/ha) + simazine (1.1 kg/ha) pre + atrazine (1.1 kg/ha) post

Results and discussion

Despite high ryegrass pressure, all herbicide treatments significantly reduced the size of the ryegrass population (~60-80%), but no there was effect of cultivar (Table 2). Herbicide treatments 4 and 6, which combined either pre-simazine or pre-propyzamide/simazine with post-atrazine were the most effective and provided 78% control relative to the nil at 12 WAS (722 plants/m^2; Table 2). Relative to just pre-propyzamide/simazine (treatment 5), addition of post-atrazine to treatment 6 provided a 27% improvement in control. This result highlights the importance of extended residual control that post-applied residual herbicides can provide, particularly in the absence of effective grass selective herbicides (i.e. loss of clethodim to resistance).

Table 2. Influence of canola cultivar and herbicide strategy on ryegrass density (12 weeks after sowing), ryegrass heads and grain yield at Roseworthy in 2016.

Herbicide treatment	Ryegrass plants/m^2			Ryegrass heads/m^2			Grain yield t/ha	
	ATR-Stingray	Hyola 559TT	**Mean**	ATR-Stingray	Hyola 559TT	**Mean**	ATR-Stingray	Hyola 559TT
T1	773	671	**722**	1186	748	**967**	0.17	0.96
T2	437	417	**427**	1062	733	**897**	0.24	1.07
T3	325	299	**312**	1135	694	**915**	0.45	0.94
T4	179	140	**160**	498	212	**355**	0.97	1.7
T5	386	321	**354**	753	510	**632**	0.54	1.12
T6	127	182	**155**	610	367	**489**	0.99	1.41
Mean	**371**	**338**		**874**	**544**			
Herb x cultivar	ns			ns			ns	
Herbicide	<0.001			<0.001			<0.001	
Cultivar	ns			<0.001			<0.001	

There were significant effects of both herbicide treatment and cultivar on the number of ryegrass heads produced (Table 2). For herbicide treatments 4 and 6, which provided greatest reduction in ryegrass plants, there were ~50% fewer heads found compared to the nil treatment (967 heads/m^2). These treatments of either pre-simazine or pre-propyzamide/simazine with post-atrazine, were far more effective than herbicide strategies that relied just on pre-emergent herbicides. In fact ryegrass seed set was similar to the untreated nil (967 heads/m^2) for pre-propyzamide (897 heads/m^2), and pre-propyzamide + tri-allate (915 heads/m^2).

Between the two cultivars, there were significantly more heads in ATR-Stingray (874 heads/m^2) compared to the hybrid Hyola559TT (544 heads/m^2). This is despite there being no difference in the number of ryegrass plants present between the two cultivars. The relationship between mean plant and mean head density of ryegrass for the two canola cultivars (Figure 1) clearly shows that seed set per plant was approx. 2-fold higher for ATR-Stingray compared to Hyola559TT. This result supports previous research that showed hybrids are more competitive against ryegrass than standard OP cultivars (Lemerle et al. 2014). The increased competitiveness of the hybrid over the OP most likely relates to the superior vigour and early growth of the hybrid compared to the OP. Obvious differences in vigour and competitive ability between canola cultivars appear to be emerging in the trial at Hart (Figure 2).

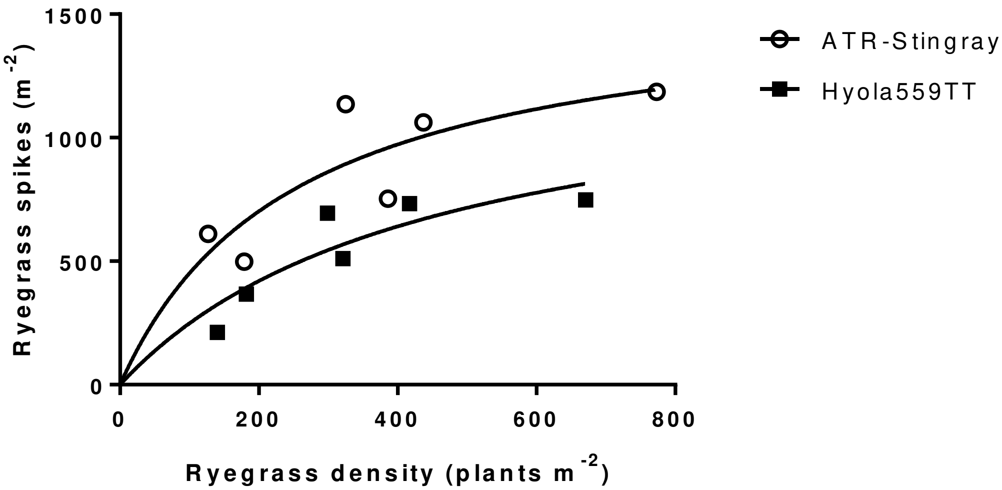

Figure 1. Relationship between mean plant density and mean head density of ryegrass across all herbicide strategies for canola cultivars ATR-Stingray and Hyola559TT. Each data point represents the mean of 4 replicates.

Figure 2. Nil treated ATR-Stingray (left) and Hyola 559TT (right) taken at Roseworthy. Note the improved vigour of Hyola 559TT compared to ATR-Stingray.

There were significant effects of both herbicide treatment and cultivar on canola yield (Table 2). Although 2016 received well above average winter and spring rainfall, canola yields were generally low and ranged from 0.17 to 1.7 t/ha in response to the high weed pressure. Most herbicide treatments resulted in higher yield outcomes relative to the nil, however herbicide treatment 4 and 6, where ryegrass control was greatest produced the highest yields for both ATR-Stingray (0.97 & 0.99 t/ha) and Hyola559TT (1.70 & 1.41 t/ha).

Conclusions

The results from this study have clearly demonstrated that where effective herbicides were integrated with more competitive cultivars of canola, ryegrass seed production was reduced by more than 50% for the hybrid cultivar Hyola559TT compared to open-pollinated ATR-Stingray. Furthermore, the hybrid appeared to better maintain grain yield in the presence of weeds, and was therefore more tolerant of weed competition than canola cultivar ATR-Stingray. Combination of effective pre-emergent herbicides with more competitive cultivars of canola can significantly reduce ryegrass seed set, and may play a critical role in the longer-term management of this troublesome weed with rampant herbicide resistance.

Acknowledgements

We are grateful to GRDC (Grains Research and Development Corporation) for providing project funding (project UCS00020), PacSeeds for supplying seed, and Jerome Martin and Alicia Merriam for providing technical support.

References

Lemerle D, Luckett DJ, Lockley P, Koetz E & Wu H. (2014) Competitive ability of Australian canola (*Brassica napus*) genotypes for weed management. Crop & Past. Sci. 65: 1300-1310

Further information:

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INVESTIGATING OPTIMAL YIELD POTENTIAL IN A LATE START

Jacob Giles, Andrew Ware, SARDI

Aim

To investigate potential methods to maximise yields in seasons with a delayed start by comparing three varieties with varying maturities, seeding rates and nitrogen regimes that are sown dry and once the season breaks.

Introduction

The option of increasing yield in a short season by increasing sowing rate is thought of as a valid option by some. Sowing early at ‘normal’ sowing rates allows individual plants to produce a number of tillers during the vegetative phase of the plant. This can take time if a plant is expected to produce many tillers. From here plants depend on the ability to support all of the tillers produced in order to maximise end yield.

In a short season, an increase in sowing rate immediately decreases the number of tillers each plant is required to produce to achieve ideal tillers per m^2. From here plants can focus carbon fixed and nitrogen acquired into the one or two tillers (heads) throughout the reproductive growth stages.

The aim of such a trial is to shorten the vegetative phase and to increase the individual plants resource allocation on one or two tillers and its resulting heads. In doing so, there is less competition towards main tillers from weak or under developed tillers produced in unfavourable conditions. Yield is therefore achieved by targeting heads per m^2 rather than tillers per plant by increasing plant number.

Table 1. Established plants (variety x sowing density) at Ungarra 2017

Variety	Kg/ha sown	Pl/m^2 established
Emu Rock	80	138
Emu Rock	160	254
Emu Rock	240	365
Scepter	80	168
Scepter	160	320
Scepter	240	463
Trojan	80	164
Trojan	160	298
Trojan	240	418

Method

TOS1 was sown dry on the 16th June, emerging on the 16th July following the break in early July. TOS2 was sown on the 20th July, emerging on August 1st.

Variation in N applications was factored into the trial from the planning phase although to date, circumstances (rainfall and yield potential) have not been favourable of such a treatment.

In-crop measurements will include establishment counts (below), tillers per m^2, flowering dates, head weight, grains per head and final yield. These measurements should assist in pinpointing the origins of yield differences.

Further information:

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CANOLA AGRONOMY TRIALS

Andrew Ware, SARDI

An information handout will be provided on the day

LEADA – COPPER MANAGEMENT FOR THE FUTURE

LEADA have been successful in getting funding from SAGIT for a new project exploring different management strategies to overcome copper deficiency in cereals. The project will compare the effectiveness of different forms of copper applied either as liquids banded at seeding or as a foliar spray. The project will also evaluate the effect of different timings of application of the foliar sprays and their efficiency.

It is anticipated that the project will investigate these key questions:

- Can we get sufficient copper supplied only at seeding in through fluid delivery?
- What timing or combination of timings is most effective?
- How often does copper need to be replenished where it is loaded up early in a cropping sequence?
- What form of copper is most efficient, if any?
- How late can copper be efficiently applied and still meet the plant's needs?

Copper deficiency disorders in cropping systems of South Australia have traditionally been most common on the more infertile and lighter soils of the State. It is estimated (Davenport) that there are approximately 3.2million hectares of arable land in South Australia, including 129,000 hectares on the lower Eyre Peninsula (>400mm rainfall), which are considered to be copper deficient. Cereal crops grown on these soils require copper applications to produce reliable profitable yields.

This project will benefit local and South Australian farmers by establishing an independent best practice management guide for copper applications for the future as well as:

- Provide growers with an increased awareness of copper deficiency and the range of options to manage it;
- Provide growers with independent data on the efficiency of different copper applications, formulations and timings;

- Assist growers to adopt an improved best management practice to overcome copper deficiency; and
- Help growers to maximise their water use efficiency and yields through maximising pollen fertility.

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LEADA FUTURE DIRECTIONS

Research & Extension

1. **What we want to do to address weeds in farming systems**

1.1 Manage emerging weeds
1.2 Develop farming systems that are not reliant on herbicides
1.3 "Cultural use" of herbicides
1.4 Dealing with the emerging issue of glyphosate resistance
1.5 What do we do for grass weed control in canola when Clethodin doesn't work?

2. **What we want to do to address research and extension capacity in the region**

2.1 There is capacity available if LEADA wants to / can pay.
2.2 LEADA committee needs ideas to be developed and implemented
2.3 Utilising the expertise and capacity of SARDI
2.4 Use local agronomists

3 **What we want to do to address break crops in farming systems**

3.1 Conduct a literature review on break crops for the region
3.2 Improve returns from bean crops
3.3 Revisit the ley farming system / role of fodder crops and pastures in rotations
3.4 Improve returns of peas on limestone
3.5 Need to grow lupins in lower EP farming systems, what will make them profitable?
3.6 Snails & Slugs are still a major issue in farming systems on the lower EP and require further research

4 What we want to do to address soil issues in farming systems

4.1 Subsoils constraints still the biggest issue on lower EP
4.2 Develop an extension program to raise awareness of issue and how to resolve it.
4.3 Examine options for weaker (sandy) soils that can't sustain intense rotations without a legume break
4.4 Examine the role of multi species cover crops on the lower EP
4.5 Why are farmers around Cummins deep ripping heavier soils?

5 What we want to do to address nutrition issues in farming systems

5.1 How much nitrogen do we need in our cropping systems - this still remains unanswered

Skill Development

6 What we want to do to address business skills

6.1 Access to farm business expertise

6.2 Role of benchmarking farm businesses

6.3 Using farm management software

6.4 Improve farmer confidence in on farm decision making

7 What we want to do to address transitioning of farming systems

7.1 Creating an environment to open people to the challenge/change

7.2 Identify problems with system and develop research options to solve these problems

7.3 Organise tours to areas with high adoption of new technologies, options to create new thinking

8 What we want to do to address communications

8.1 Provide training to improve communications skills with a range of stakeholders

8.2 Develop closer links with universities and multinationals

9 What we want to do to address workforce development

9.1 Options for workforce and time management

Leadership and Engagement

10 What we want to do to address engaging with young farmers

10.1 Understand who is being targeted

10.2 Develop strategies to engage young farmers

10.3 Develop a proper structure to engage agricultural students.

10.4 Investigate the Role of twitter and other social media to engage young farmers

11 What we want to do to address committee engagement

11.1 Employ a research officer for group

11.2 LEADA needs to sell itself by implementing the vision

11.3 Identify what is the next 'big thing'

11.4 Conduct an annual trail planning day

12 What we want to do to address taking on leadership roles

12.1 Need to provide greater support to current leaders and executive

12.2 Need to provide greater support to new leaders and executive

13 What we want to do to expand LEADA's influence

13.1 Create a LEADA web site

13.2 Tweet from trial sites regularly on progress and issues

14 What we want to do to ensure we have succession for the committee

14.1 What is the next 'big' thing to engage; the biggest problem / issue facing farmers

LEADA MEMBERSHIP SUBSCRIPTION

Membership Subscription
2017

TAX INVOICE

LEADA Lower Eyre Agricultural Development Association

ABN 560 012 353 569

From:
Lower Eyre Agricultural Development Association Inc (LEADA)
PO Box 1197
Port Lincoln SA 5606

To:

Business Name	
Mailing Address	
Contact Person	
Phone	
Mobile	
Email:	

Additional business member contacts are welcome as part of the business membership

Description	Cost Price (Net)	GST	Total
Payment for LEADA Membership 2017	$50.00	$4.50	$50.00
		TOTAL (Inc GST)	**$50.00**

Please either:

- Electronic Funds Transfer to
  LEADA
  BSB: 633108 Account: 130314131
  Email a completed copy of this invoice to LEADAEXEC@gmail.com

- Forward a copy of this form and your cheque made payable to:
  Lower Eyre Agricultural Development Association (LEADA)
  Executive Officer
  PO Box 1197, Port Lincoln, SA 5606

Do you require a receipt ☐ Yes

THANK YOU FOR YOUR VALUABLE SUPPORT OF LEADA