

1 Better pre-emergent herbicides to reduce annual ryegrass in Field peas 2014

Trial Code; GOWE02114-1

Date; Winter 2014

Location; "Winnibri Woolshed" Warren, 21km E of Warren NSW

1.1 Background

Annual ryegrass (ARG) is currently developing herbicide resistance to in crop herbicides and in many cases to multiple modes of action. In many paddocks most of the Group A Fop herbicides are no longer effective nor are the common Group B herbicides like Logran. As a result on many (or a number of) farms where ARG levels are increasing through the cereal phase of crop rotations the aim has been to reduce these weed populations in the broadleaf phases with products such as clethodim¹ which traditionally exhibited less resistance.

However a recent herbicide resistance survey² undertaken by GOA in the Central West of NSW revealed 22% of ARG samples submitted demonstrated resistance to clethodim (and a number of other herbicides) and for many of these populations there are few effective alternative herbicide options left. The remaining effectiveness of this product must be protected as best as possible to prolong its useful life and using it to control large populations of ARG may be exposing the product to excessive resistance selection pressure.

This trial is designed to investigate a number of pre-emergent herbicide options aimed at reducing the populations that clethodim may be targeted at in-crop and hence the risk of resistance developing.

However, it should be remembered that information gained though this trial will only form part of the solution or management of this issue and weed populations must be targeted at every other chance. And the lack of effective in crop selective options means that these must include pre-emergent options or other modes of control.

DISCLAIMER

Following is a report on a scientific experiment. It may contain some herbicide treatments that are not registered for the situation, manner or rate at which they are used in this trial. This document or anything else resulting from, construed or taken from this or by GOA or its representatives should not be taken as a suggestion, recommendation or endorsement of any unregistered herbicide uses.

¹ Common trade names include Select, Status, Platinum

² <http://www.grainorana.com.au/documents?download=29>

1.2 Aim

- Compare a range of pre-emergent options and their effectiveness to reduce the populations of annual ryegrass in field peas
- If other weeds are present in the trial assess the treatments for their effectiveness to control them

1.3 Methods

The trials used a small plot randomised complete block design with 3 replicates. The trials were established in growers' paddocks with known ARG populations.

Incorporated by sowing herbicide treatments were applied and incorporated by a trial plot seeder with 2 hours of application and PSPE applications were applied immediately post seeding. Applications were made by an ATV mounted boom.

Resultant weed control was assessed by plant counts before the site was sprayed out with herbicides to prevent seed set.

Results were analysed using ANOVA and results compared by using a LSD method with a 95% confidence interval. Any references to differences between treatments should be assumed to be statistically different unless otherwise stated.

Table 1: Trial site details

Seeding date	4 th June 2014
Variety and seeding rate	Maki field peas @ 60kg/ha
Seedling equipment	Trial plot seeder- Horwood Bagshaw DBS parallelogram, 275mm tine spacings
Soil type	Grey vertisol
Paddock history	Wheat 2013, light stubble- full retention

Table 2. Herbicide application details for IBS and PSPE treatments

Pre trial	Date Applied	4/06/2014	Temp. °C	Wind vel.	Wind Dir.	Humidity
	Start time	2.00 pm	18	light	N	34%
	Finish Time	2.30 pm	Δt	8.4	% Cloud	clear
	Water rate	100 L/ha	Nozzle	TT015	Pressure	3 Bar
	Equipment	ATV	Speed	7 km/h		
IBS & PSPE	Date Applied	4/06/2014	Temp. °C	Wind vel.	Wind Dir.	Humidity
	Start time	4.00 pm	19.3	2-5 km/h	N	42.7%
	Finish Time	5.30 pm	Δt	7	% Cloud	clear
	Water rate	100 L/ha	Nozzle	TT015	Pressure	3 Bar
	Equipment	ATV	Speed	7 km/hr		

GOA Site Report

Table 3: Herbicide treatment, application timing and rates applied

	Treatment	Rate/ha (L/g)
1	UTC	0
2	Trifluralin (IBS)	1.7
3	Trifluralin (IBS), Terbyne (IBS)	1.7 & 1000
4	Trifluralin (IBS), Diuron WDG (IBS)	1.7 & 1100
5	Trifluralin (IBS), Metribuzin WDG (PSPE)	17 & 280
6	Metribuzin WDG (PSPE), Spinnaker (PSPE)	280 & 34
7	Trifluralin (IBS), Avadex Xtra (IBS)	17 & 1.6
8	Trifluralin (IBS), Experimental X	1.7 & 1.0
9	Trifluralin (IBS), Terbyne (IBS), Experimental X	1.7 , 1.1 & 1.0
10	Terbyne (IBS)	1100
11	Outlook (IBS)	1.0
12	Outlook (IBS), Terbyne (IBS)	1.0 & 1000
13	Boxer Gold (IBS)	2.5
14	Spinnaker (PSPE)	70
15	Sakura (IBS)	118
16	Terbyne (IBS), Diuron WDG (IBS)	1100 & 1100

IBS- Incorporated by sowing, PSPE- post sowing pre-emergent

Please note "Experimental X is not currently registered for use in field peas and should not be used.

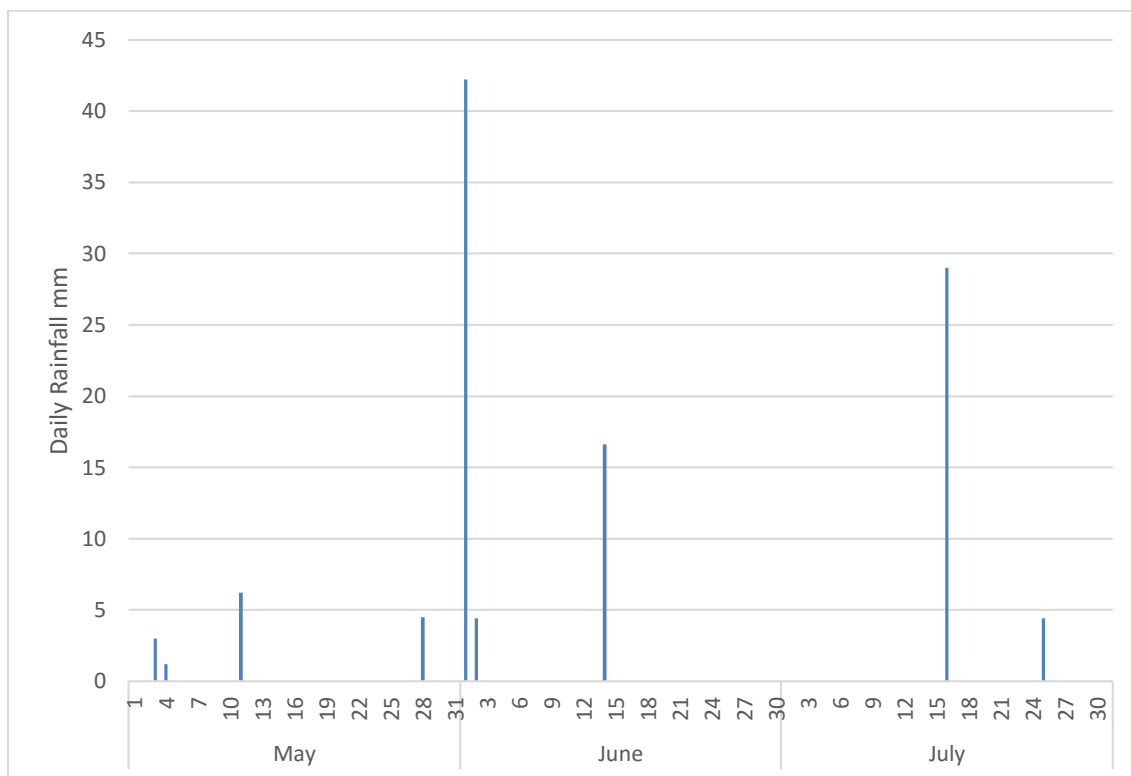


Figure 1: Daily rainfall from May till July at Warren- Old Bundemar BOM site, 2014

1.4 Results

There were no observable differences in crop establishment by any of the treatments but the trials establishment was delayed and the whole trial/ crop growth was retarded significantly by the colder and wetter conditions experienced.

All treatments applied resulted in a significant reduction in ARG populations 105 days after sowing (DAS) as shown in Figure 2 below. There were also differences between the effectiveness of individual treatments with the best performing treatments reducing the ARG population in the UTC from 36 plants/m² to less than 1 plant/m². Although nine of the most effective treatments were no different to each other.

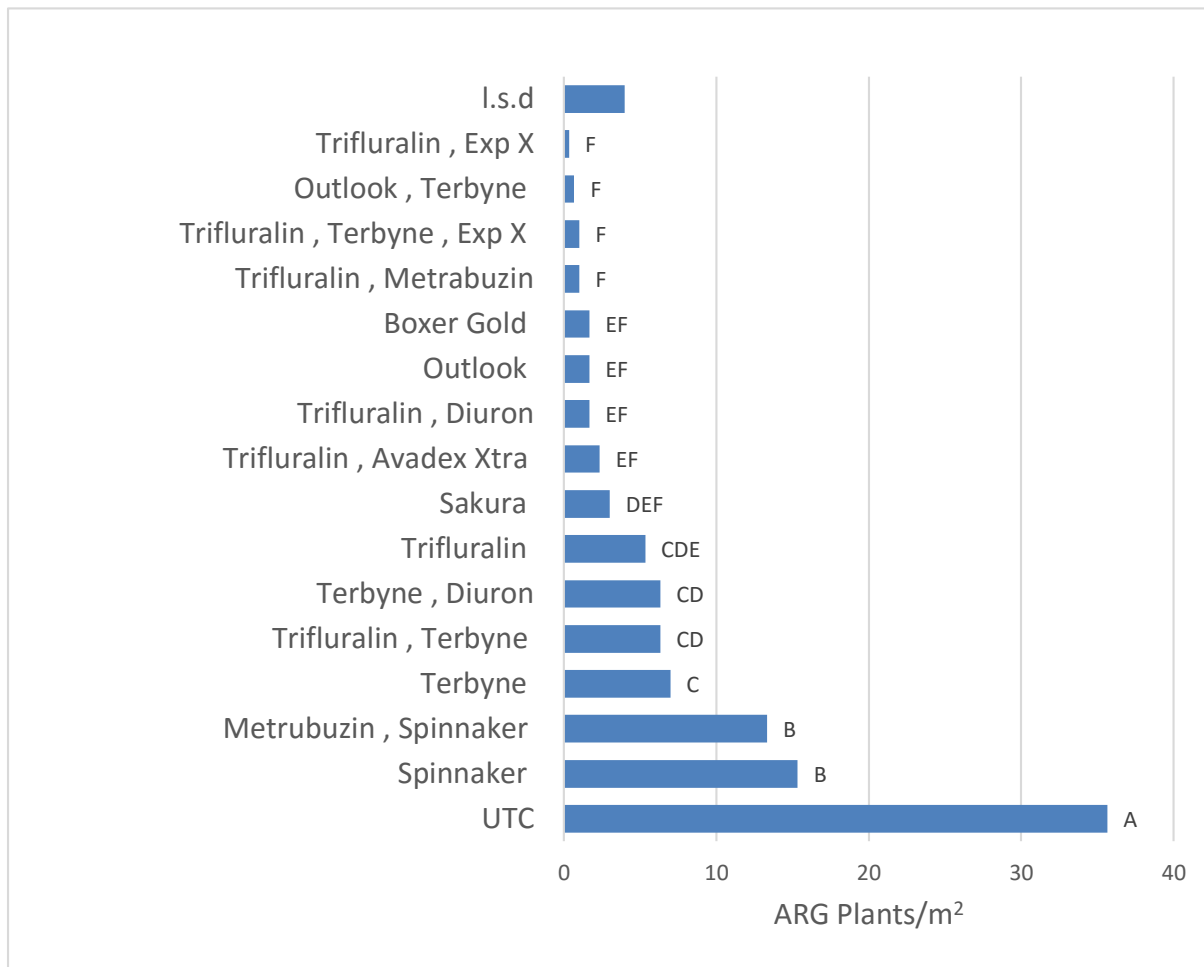


Figure 2: ARG populations 105 days after application in response to various pre-emergent herbicide treatments. Treatments sharing the same lettering denotes no statistical difference.

1.5 Discussion

As discussed above all treatments showed some ability to reduce ARG numbers compared to the UTC. With the later sowing of this trial and the lack of a competitive crop readers should be cautious about placing too much emphasis on the specific performance of any one treatment over the next in this trial.

However, the trial did demonstrate that some pre-emergents or as demonstrated in this trial, multiple mixes of pre-emergents proved to be very effective on ARG. The most effective treatment in this trial resulted in greater than 98% control of a low to moderate population of ARG. The resulting residual population may have arguably, not affected crop yields with the seed set of the remaining weeds better targeted by other means such as pre harvest desiccation or harvest weed seed control.

1.6 Conclusion

This trial has demonstrated that the use of pre-emergent herbicides can reduce ARG populations which in turn will reduce the “pressure” growers would be applying for the development of resistance to clethodim when used to control these populations.

This trial demonstrated high levels of control of up to 98%, by a number of products. This high level of efficacy may have even negated the need for a selective in crop herbicide to be used. If this could be achieved it may conserve another useful “shot” of the herbicide or if they were to be used, targeting such a low population may reduce the likelihood of selecting for resistance.

In consideration of the use of alternatives growers and advisors should base their choices on more than the results of just this one trial. Growers should also take into account a number of other factors including;

- What other weeds are present and the effectiveness of the alternatives are on these?
- What is the cost of these alternatives in comparison to each other?
- Any varietal differences in crop tolerances of the particular alternatives?
- Plant back or residue restrictions?
- Herbicide rotations and resistance management?
- The herbicide resistance status of the weeds you are targeting?

1.7 Acknowledgements

GOA would like to thank the McKay family of Warren for their hosting of this trial.