

# GOA Site Report

## 1. Pre-emergent herbicides options for annual ryegrass control in Albus Lupins, 2014

Trial Code; GOAWE022141

Date; Winter 2014

Location; "Inglewood" Curban. 12km NNE of Gilgandra, NSW

### 1.1 Background

Annual ryegrass (ARG) is currently developing herbicide resistance to many of our in crop herbicides and in many cases 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 clethodim<sup>1</sup> which traditionally exhibited less resistance.

However a recent herbicide resistance survey<sup>2</sup> 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 through 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.**

### 1.2 Aim

- Compare a range of pre-emergent options and their effectiveness to reduce the populations of annual ryegrass in broadleaf lupins
- 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 three replicates. The trials were established in growers' paddocks with known populations of ARG.

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<sup>1</sup> Common trade names include Select, Status, Platinum

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

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Herbicide treatments were applied ahead of growers seeding equipment by ATV mounted boom and incorporated by the growers' equipment. Any PSPE applications were applied after seeding before crop emergence.

Resultant weed control was assessed a number of times before the site was sprayed out with herbicides to prevent seed set.

Results were analysed by 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	24 <sup>th</sup> April, 2014
Seeding equipment	Gason Scari-till with knife point and press wheel arrangement with 13 1/3 inch spacing
Variety and seeding rate	Luxor Albus Lupins sown at 100kg/ha
Soil type	Red sandy loam
Paddock history	wheat 2013, medium stubble fully retained

**Table 2: Herbicide treatments, incorporation method and rates applied**

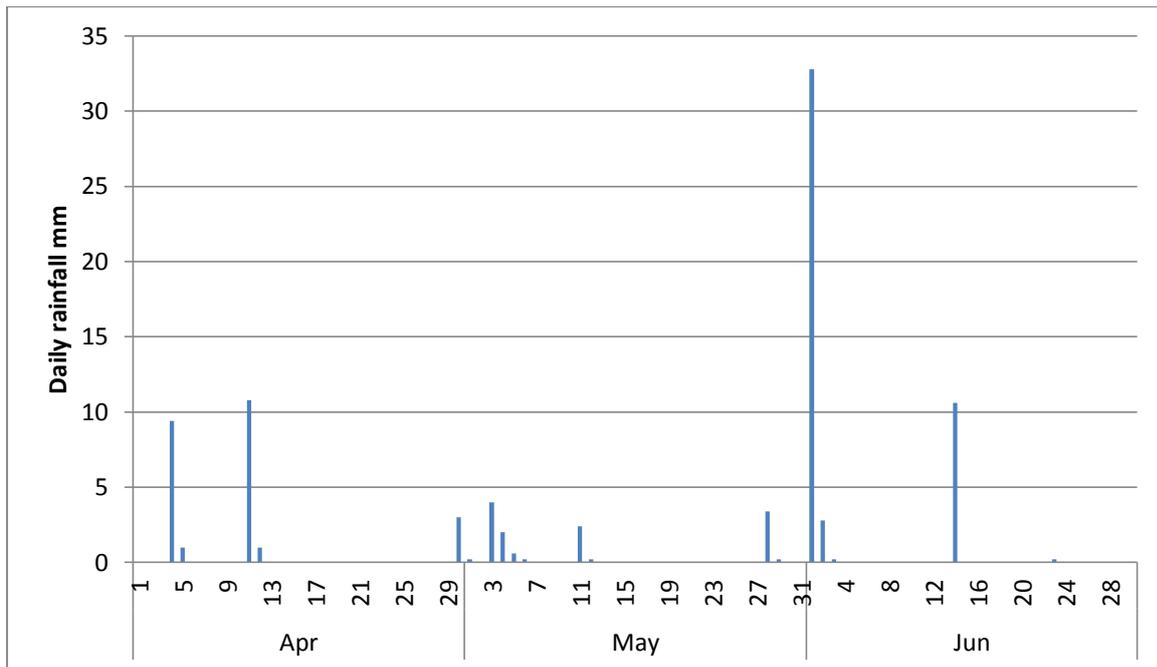
Treatment Table		
Treatment and application timing		Rate (L/g)
1	Nil	
2	Trifluralin (IBS)	1.7
3	Simazine 900DF (IBS)	2200
4	Terbyne (PSPE)	1000
5	Trifluralin (IBS), Simazine 900DF (IBS)	1.7 & 2200
6	Trifluralin (IBS), Terbyne (IBS)	1.7 & 1000
7	Trifluralin (IBS), Avadex Xtra (IBS)	1.7 & 1.6
8	Trifluralin (IBS), Simazine 900DF (IBS), Avadex Xtra (IBS)	1.7, 2200 & 1.6
9	Simazine 900DF (IBS), Avadex Xtra (IBS)	2200 & 1.6
10	Outlook (IBS)	1.0
11	Outlook (IBS), Simazine 900DF (IBS)	1.0 & 2200
12	Outlook (IBS), Terbyne (IBS)	1.0 & 1000
13	Boxer Gold (IBS)	2.5
14	Sakura (IBS)	118

IBS- incorporated by sowing, PSPE- Post sowing pre-emergent

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**Table 3: Herbicide application details for IBS and PSPE treatments**

<b>Date Applied</b>	24/04/2014	<b>Temperature</b>	Wind vel.	Wind Dir.	Humidity
<b>Start time</b>	9.50 a.m.	25-28° C	4-11km/h	N	34%
<b>Finish Time</b>	11.30 a.m.	<b>Δt</b>	10.3	<b>% Cloud</b>	5
<b>Water rate</b>	100lt/ha	<b>Nozzle</b>	AITT015	<b>Pressure</b>	3 Bar
<b>Equipment</b>	ATV	<b>Speed</b>	7 km/h		



**Figure 1:** Daily rainfall from April till June 2014 – Gilgandra BOM site

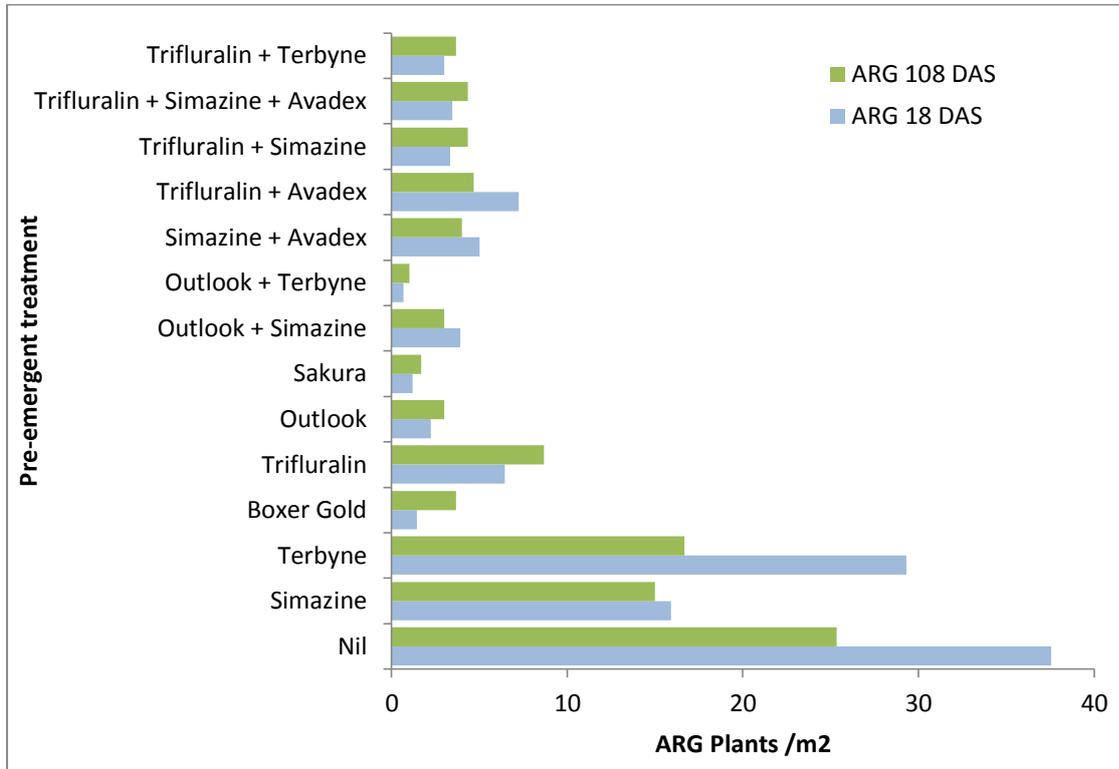
## 1.4 Results

There was no impact on crop establishment by the different treatments compared to the nil treatment.

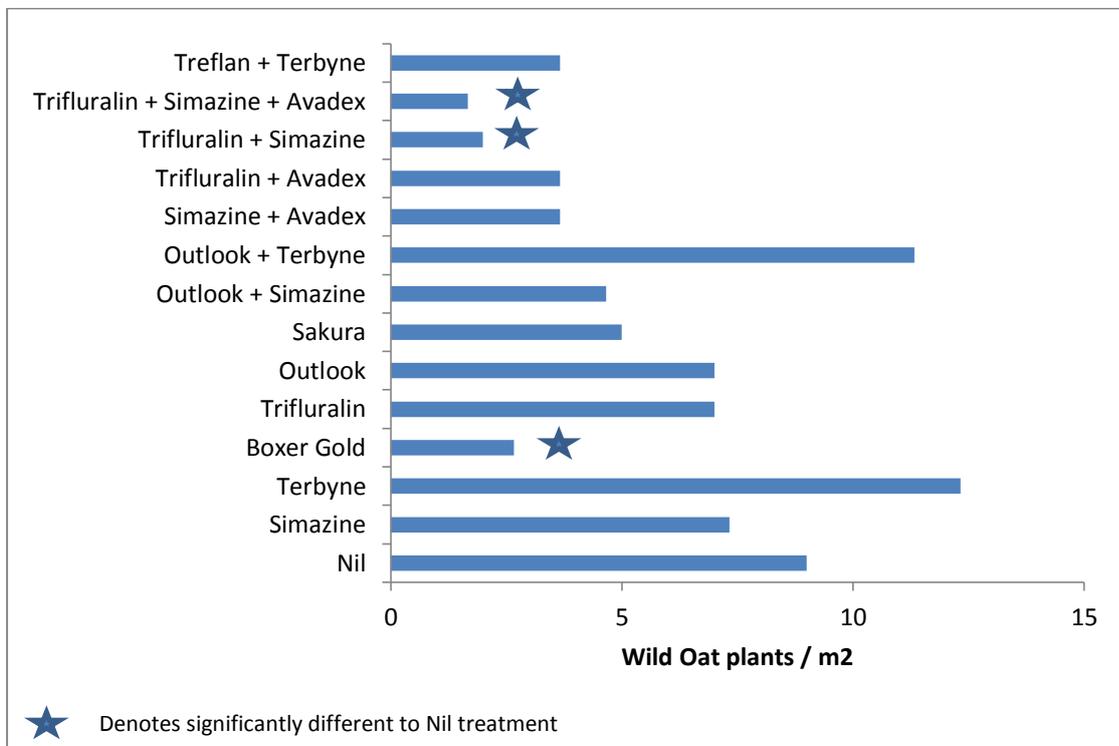
All treatments applied resulted in a reduction in ARG population compared to the Nil treatment with the exception of Terbyne (at the earlier assessment date) as shown in Figure 2. At the later assessment all products resulted in a reduction in ARG populations.

Black or wild oats were also present in this trial site. Low and variable weed populations meant only three treatments resulted in wild oats populations significantly less than the Nil treatment although a number of other options showed a trend towards lower average populations. These are demonstrated in Figure 3 below.

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**Figure 2:** ARG populations at 18 and 108 days after various pre-emergent herbicide treatments



**Figure 3:** Wild Oat populations 110 days after various pre-emergent herbicide treatments

## 1.5 Discussion

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It should be noted that following the establishment of the trial there was limited rainfall. Only 10mm of rain was recorded in the 14 days following application, with the largest daily fall of only 4mm. The first fall of greater than 5mm did not occur until the June 1<sup>st</sup> with 33mm of rain. This lack of incorporating or activating rainfall may have reduced the effectiveness of many of the herbicides. Potentially the post sowing pre-emergent (PSPE) application of Terbyne may have been most disadvantaged due to the lack of an incorporating rain and may explain the disparity between the two assessments.

Despite this the trial has demonstrated that using any of the pre-emergent herbicides tested reduced ARG population, however there were differences between the treatments in their level of control.

A single application of Simazine, which in the past has probably been the most common pre-emergent herbicide used in lupins in the region, reduced ARG populations by less than half, with residual weed populations of around 15 plants/m<sup>2</sup>. Terbyne resulted in a similar level of residual weed population.

Alternate single product pre-emergent options; Boxer Gold, Outlook and Sakura all resulted in much better levels of control than simazine alone with residual ARG populations of only 1-3 plants/m<sup>2</sup>.

Trifluralin offered improved control over simazine but not quite as good as the options listed above.

Tank mixing herbicide options or multiple product approaches in general showed improved control over that achieved by those products applied alone. In many cases the resultant control was almost the addition of the control achieved by each of the components.

The results indicate a number of herbicides, such as trifluralin or Outlook, when mixed with the district standard of simazine improved control.

An interesting point to note is the addition of Avadex to trifluralin in this trial has improved the control of the ARG although not statistically different to the use of trifluralin alone. However control may have been slightly more persistent as evidenced by comparing the later control levels.

Only three treatments resulted in any reduction in wild oats populations.

- Boxer Gold which has some known effect on wild oats but with no registered claims for control. This is confirmed in this trial with it demonstrating only around 75% control.
- The other two treatments are a combination of trifluralin and simazine or trifluralin + simazine + Avadex. The level of reduction on population or control was around 75%.

All three options would not be effective in their own right for wild oats control but as part of a weed control package may offer some value.

## 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.

This trial has demonstrated that the common practice of just simazine provides only moderate control of ARG populations, and that there are a number of other options that are far more effective.

In this trial the newer herbicides Sakura and Boxer Gold showed improved weed control over that of common practice. It also demonstrated the advantage or improved control that can be achieved through combinations of products, for example the addition of trifluralin to simazine resulted in control that matched that of Boxer Gold and Sakura .

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Growers and advisors should not base their pre-emergent ARG control options solely on the results presented in this report. Consideration should also be given to results from other trials and should also take into account the following:

- 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 considerations?
- Herbicide rotations and resistance management?
- The herbicide resistance status of the weeds you are targeting

## 1.7 Acknowledgement

GOA would like to thank the Kilby family of “Inglewood” Curban for their hosting of this trial.