GOA Individual Trial Site report

Project Name

Triazine Tolerant Canola herbicide demonstration 2012 - Triazine products and their effectiveness on annual ryegrass control in Canola.

Trial Code

GOA1210

Trial Location

Curban NSW - Landmark trial site, approximately 20km North of Gilgandra, on the Newell Highway.

Trial commencement date

May 2012

Background

In 2012 the GOA region saw a significant swing towards the use of triazine tolerant canola. Traditionally the area was predominantly sown to Clearfield canola varieties. Reason behind this change is thought to be two fold;

1. The prevalence of Group A and B resistant ryegrass has been getting progressively worse over the last few season, and the potential to introduce a lower risk herbicide group in the triazines to control these was very enticing.

2. An improvement in the performance of triazine tolerant canola with varieties such as Hyola 555TT reduced the yield drag normally associated with the growing of triazine tolerant canola lines.

Generally, the regions growers and advisors have had limited experience in the herbicide management of the triazine tolerant canola crops in comparison to Clearfield canola. With the multiple triazine herbicides and the timings that are able to be used within triazine tolerant canola systems, it was thought the trial may shed some light on the strengths and weaknesses of the various approaches.

Aims

- To demonstrate the various combinations of the three triazine actives and timings for the control of annual ryegrass in canola.

- To demonstrate the various approaches using triazine tolerant canola with the more regionally traditional Clearfield herbicide packages as well as the inclusion of trifluralin in both systems.

Methods

- Trial design was a randomised complete block design with three replicates; plots were 10m x 1.8m sown by a plot seeder.
- Pre-sowing herbicide treatments were applied by a boom spray mounted on an ATV directly before sowing.
- Sowing was then carried out by a cone plot seeder applying seed and starter fertiliser through a knife point and press wheel arrangement. Soil moisture at the time of sowing was quite marginal and it was likely little seed would germinate without rainfall.
- Post sowing pre-emergent treatments (PSPE) was applied again by an ATV mounted boom.
- Following the application of the pre-sowing and PSPE treatments and the site was sown with canola, Wimmera ryegrass was hand broadcast across the sown trial area. The ryegrass seed was purchased from a reputable commercial pasture seed distributor and as such a reasonable assumption could be made that it is susceptible to the common herbicide groups.
- Following rainfall and subsequent emergence of the crop the post emergent treatments were applied by ATV mounted boom spray.
- Assessment of the resultant effectiveness of the herbicide treatments were by visual biomass reductions at early flowering of the canola crop.
- The trial was sprayed out before harvest to prevent seed set and because yield performance was not needed to meet the aims of this trial.

Treatment table

	Treatment	Rate/ha
1	UTC	Nil
2	Pre Sow Gesaprim	2.2kg
3	PSPE Gesaprim	2.2kg
4	Post Emergent Gesaprim	1.1kg
5	Split Pre & PSPE Gesaprim	1.1kg + 1.1kg
6	Split Pre & Post Emergent Gesaprim	1.1kg + 1.1kg
7	Pre Sow Gesaprim + Post Emergent Gesaprim + Select	1.1kg / 1.1kg + 250ml
8	PSPE Gesaprim + Gesatop	1.1kg + 1.1kg
9	PSPE Gesatop	2.2kg
10	Pre sow- Gesaprim + trifluralin	1.1kg + 1.5L
11	Pre Sow trifluralin	1.5L
12	PSPE Terbyne	1.4kg
13	PSPE Terbyne + Pre Sow trifluralin	1.4kg + 1.5L
14	Post emergent Intervix	750ml
15	Post emergent Intervix + Select	300ml + 250ml

Application details

Herbicide Applications	Date	Water rate	Nozzle	Pressure
Pre-emergent herbicides	21/05/2012	100L/ha	TTAI015	4 bar
PSPE	21/05/2012			
Post emergent	29/06/2012		AIXR015	
Sowing	**Date**	**Type**	**Rate**	
Seed	21/05/2012	Hyola 559 TT / 575 Cl	3 kg/ha	
Starter fertiliser	21/05/2012	MAP	80 kg/ha	
Topdressing	**Date**	**Type**	**Rate**	
Urea	09/07/2012	Granular	60kg/ha	

Rainfall

22mm- 25th May (4 days after sowing)

16mm- 2/3/4th June (11 days after sowing)

14mm 17th June (27 days after sowing, 12 days prior to post emergent applications)

68mm- 11th July (12 days after post emergent applications)

Results

Only one assessment of ryegrass control was completed during this trial. Earlier assessments were prevented by the very wet condition following sowing. These wet conditions also delayed the post emergent application by around 7 days from optimal treatment timing.

Assessment of the level of ryegrass control could only be reliably assessed by visual biomass reduction as the broadcast spreading of ryegrass seed resulted in some unevenness and high plant numbers in the population.

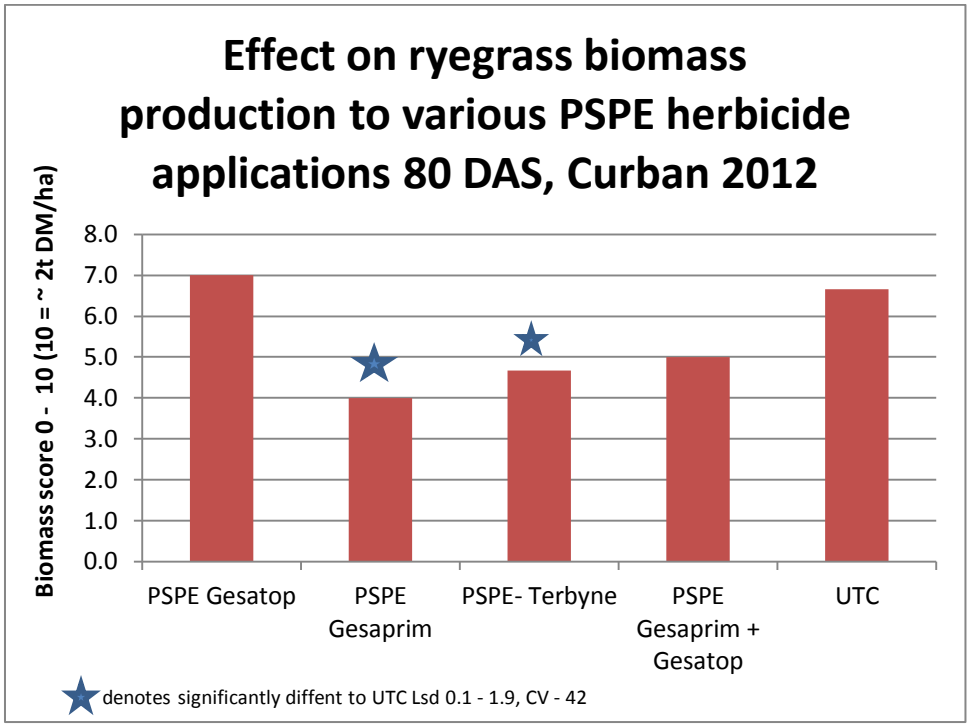
Table 1. Effect of herbicide treatment on the visual biomass of ryegrass at 80 days after sowing (DAS).

Treatment	Mean Biomass score (80DAS)	
UTC	6.7	AB
Pre Sow Gesaprim	7.0	A
PSPE Gesaprim	4.0	DE
Post Emergent Gesaprim	6.0	ABC
Split Pre & PSPE Gesaprim	2.3	EF
Split Pre & Post Gesaprim	3.7	DE
Pre Sow Gesaprim + Post emergent Gesaprim + Select	0.0	G
PSPE Gesaprim + Gesatop	5.0	BCD
PSPE Gesatop	7.0	A
Pre sow- Gesaprim + trifluralin	1.0	FG
Pre Sow trifluralin	1.5	FG
PSPE- Terbyne	4.7	CD
PSPE Terbyne + Pre Sow trifluralin	1.3	FG
Post emergent Intervix	0.7	FG
Post emergent Intervix + Select	0.2	G
LSD (0.1)	1.9	
CV	42.0	

0 = nil biomass, 10= ~2t DM/ha. Means within columns followed by the same letter are not significantly different at the 90% level according to least significant difference (LSD) test.

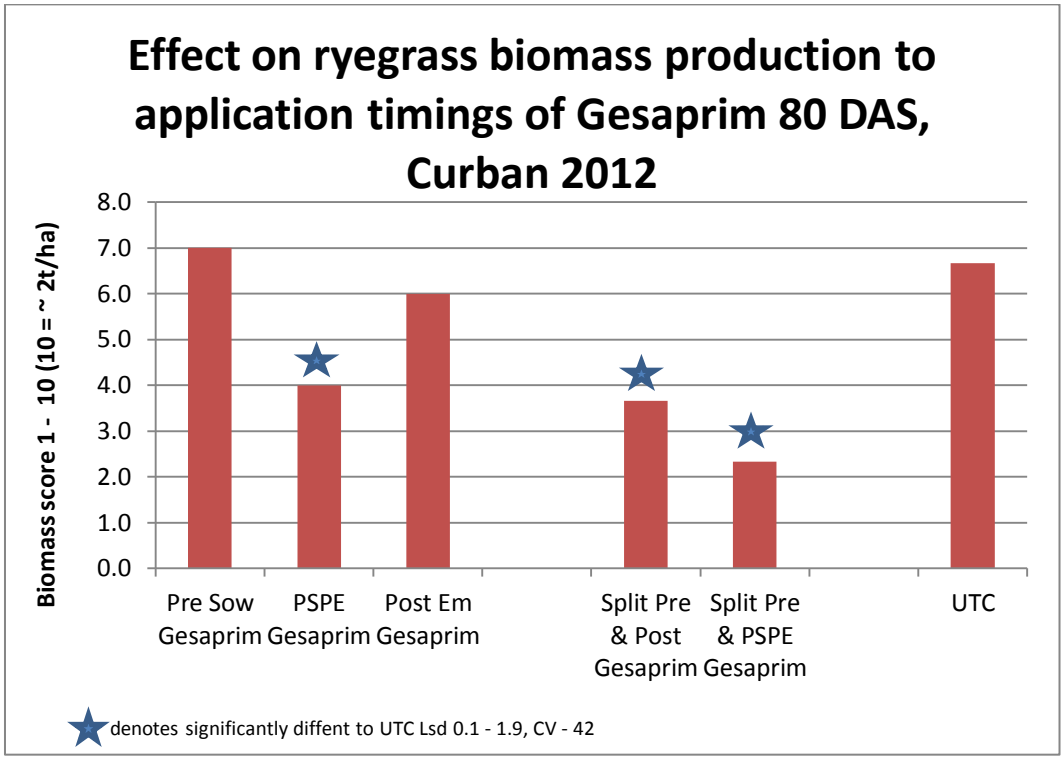
By looking at the common treatment timing of PSPE allows comparison of the three triazine herbicides. Figure 1 below shows that only Gesaprim or Terbyne were significantly better than UTC. The mean reduction in ryegrass with a mixture of Gesatop and Gesaprim was better than UTC but not significant. Biomass reduction with strait Gesatop alone was quite poor.

Figure 1. Effect on annual ryegrass biomass production to various PSPE herbicide applications, 80 DAS



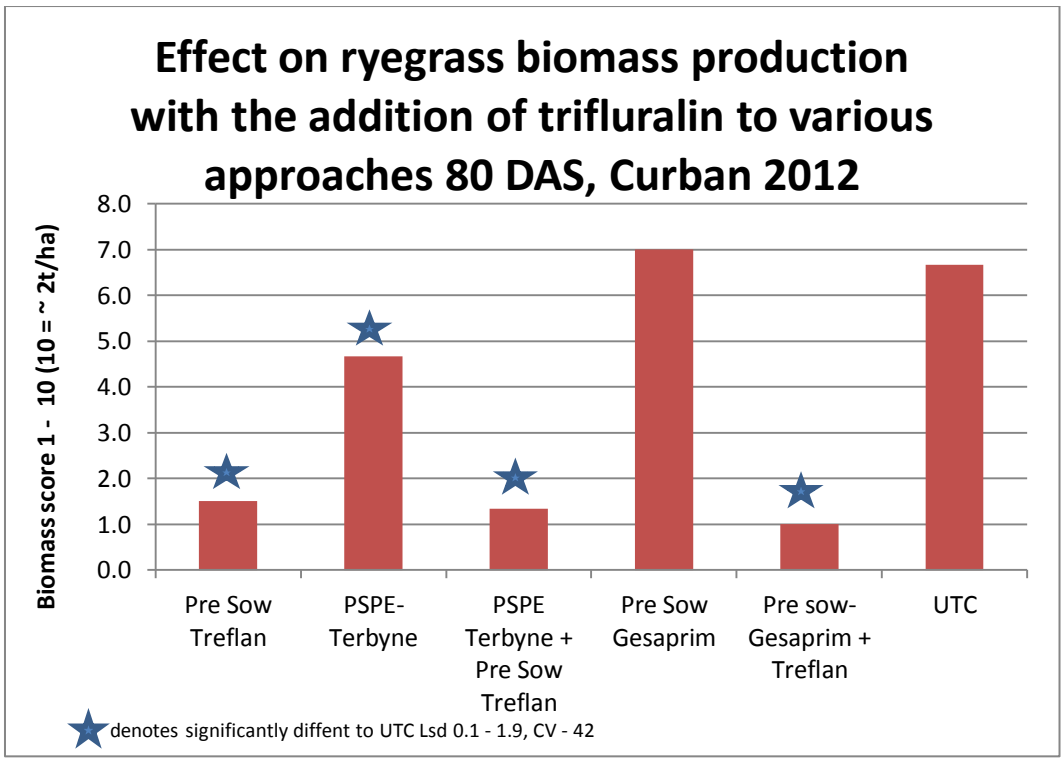
In terms of effectiveness as a function of herbicide timing we can examine the effect timing has had when using Gesaprim as demonstrated in figure 2 below. In terms of a single pass treatment only PSPE was better than UTC; however, both two pass strategies were better than UTC.

Figure 2. Effect on annual ryegrass biomass production to various application timings of Gesaprim herbicide applications, 80 DAS



As can be seen from both these figures the level of control achieved by any triazine or timing was quite poor but when trifluralin applied as a pre-emergent, control was significantly increased as demonstrated in figure 3 below.

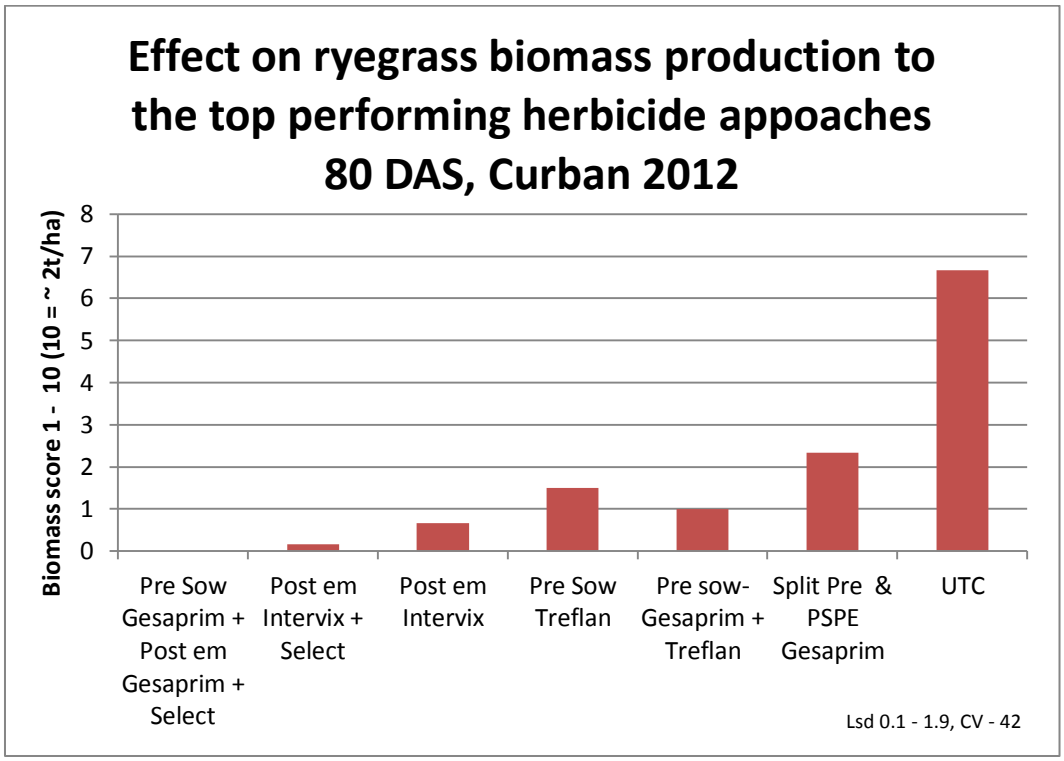
Figure 3. Effect on annual ryegrass biomass production to the addition of trifluralin to various approaches, 80 DAS



As can be seen in figure 3, the mixtures of trifluralin with either Terbyne or Gesaprim are effective but when compared to that of strait trifluralin one could suggest that the majority of the reduction in biomass would most likely be as a result of the trifluralin.

In terms of what would be acceptable in a grower's eyes this was only achieved through the addition of Select or the use of Intervix at full label rates, this is demonstrated in Figure 4 below.

Figure 4. Effect on annual ryegrass biomass production to the top performing herbicide approaches, 80 DAS



Discussion

Although the number of assessments and the precision of these assessments was limited in this trial the level of impact on ryegrass biomass was visually clear.

The level of control by the triazine herbicides regardless of timings was quite poor. None of the combinations of triazine products or timings resulted in a level of control that would be commercially acceptable.

Pre-emergent herbicides can often be variable in their level of control often as a function of the rainfall patterns that follow their application. In this trial, although established in dry conditions a number of good rainfall events followed and this should have been sufficient to result in reasonable expectations of effectiveness. A point to note in this situation was that the trifluralin still offered good levels of control in the same conditions.

Various triazines treatments however may have reduced plant populations however, the tillering of any surviving plant quickly compensated for any reduced populations. This reduction in population however could reduce subsequent selection pressure on follow up herbicide application in terms of resistance development. This unfortunately could not be assessed in this trial.

The addition of trifluralin as a pre-emergent herbicide was notably more effective in reducing ryegrass biomass than any triazine approach. Tank mixes with other triazines also reduced populations but no more than trifluralin alone. However either program still did not reduce the ryegrass population to a commercially acceptable level and certainly would require follow up treatment.

Typically either situation would require a grass selective product to be applied in crop to control these escapes. However it should be noted that the trifluralin treatments would have had significantly less weed numbers to control than any other treatments and so reducing selection pressure on the herbicide.

In comparison to the more typical canola production system in the GOA region the Clearfield system worked very well. Either a single pass of the higher rate of Intervix or the lower rate mixed with the same rate of Select applied to the triazine system resulted in very good control.

Conclusions

These conclusions are only based upon this one trial in one location which should be taken into consideration by the reader.

In answer to some of the original motivations to the implementation of TT system-

- None of the triazine treatments offered any reasonable control as a standalone treatment
- None of the triazine treatments appeared to reduce the populations of ryegrass significantly and hence the pressure on post emergent selective herbicides significantly
- Trifluralin as an alternate pre-emergent option offered much better levels of control and the resultant lower ryegrass population would have significantly reduced pressure on post emergent options
- The Clearfield herbicide options offered superior weed control to the TT systems. Where group B herbicide resistance is not an issue this could be a good option. And although as stated earlier the yield performance of the TT varieties has improved the non TT's varieties particularly some of the Clearfield lines still generally perform better.
- The TT system requires investment and application of herbicides at sowing to maximise their efficacy. This limits plant back options in the case of failed establishments. Clearfield or open pollenate varieties do not have this early commitment.