GOA Trial Site Report

Controlling Windmill Grass (*Chloris truncata*)- the impact of tank mixing other herbicides on the efficacy of Experimental[1] 1 + paraquat

Trial Code: GOWE04717-1

Year: Summer 2016/17

Location: 'NDF', Narromine

Trial Co-operator: Dale Foster

Keywords

GOWE047, Windmill grass, tank mixes, herbicide, resistance, paraquat, *Chloris truncata,* Narromine

Take home message

This research confirmed that a tank mix of Experimental herbicide 1 (Exp 1) + paraquat (PQ) can be effective on established windmill grass (WMG).

A number of assessed herbicides can be tank mixed with Exp 1 + PQ to increase weed control spectrum with potentially no antagonistic impacts on the control of WMG.

Tank mixing with glyphosate, although was not an issue in this trial, has reduced efficacy in past trials and is not recommended.

The impact of various tank mixes with Exp 1 + PQ on other target weeds was not tested and requires further research.

Background

Previous GOA research found that a mixture of Exp 1 + PQ can provide effective knockdown control for WMG when used as a single pass, stand-alone treatment. However, the relative narrow weed control spectrum of Exp 1 + PQ mix highlights a need to assess if adding additional herbicides will improve control over a broader range of weeds that are often present in the fallow, alongside WMG.

This trial aimed to assess if a tank mix of Exp 1 + PQ with herbicides known to be successful targeting other weeds and applied as a single pass would still provide effective control of WMG (i.e. without antagonism). An alternative weed control approach is apply Exp 1 + PQ as a double knock (DK) treatment following use of a number of possible suitable herbicides. However this study only aims to investigate the former proposition.

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

[1] Experimental 1 is a Group H herbicide registered for use in fallows but not registered for use on Windmill Grass (however, it is registered for Feathertop Rhodes Grass another Chloris species and Fleabane)

else resulting from, construed or taken from this or by GOA or its representatives should not be taken as a suggestion, recommendation or endorsement for unregistered herbicide use.

Aims

Assess the efficacy of Exp 1 + PQ on WMG when tank mixed with a range of commonly used fallow herbicides.

Method

The trial used a small plot randomised complete block design. It was established in an existing population of mature WMG.

10 commonly used summer fallow herbicides were tank mixed with Exp 1 + PQ and applied in a single pass. Exp 1 + PQ without a tank mix partner was included as a comparison as was an unsprayed treatment - Untreated Control.

At time of application, WMG was actively growing, seed heads had emerged following good recent rainfall. Following herbicide application growing conditions declined rapidly with no significant follow up rainfall combined with hot temperatures.

All treatments were applied by an ATV mounted boom spray fitted with AIXR110-015 nozzles at 50 cm spacing, running at 3 bar pressure to apply 100 L/ha of spray solution.

Results were analysed using ANOVA for the analysis of variance and results compared by using a least significant difference (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 Herbicide Treatments

Treatment	Rate (mL or g/ha)
Untreated Control (UTC)	n/a
Experimental 1 + paraquat	Exp 1 + 2000
Experimental 1 + paraquat + Hasten®	Exp 1 + 2000
Experimental 1 + paraquat + Ally®	Exp 1 2000 + 7
Experimental 1 + paraquat + LV Ester 680	Exp 1 + 2000 + 800
Experimental 1 + paraquat + Tordon Fallow Boss™	Exp 1 + 2000 + 1000
Experimental 1 + paraquat + glyphosate 450	Exp 1 + 2000 + 2000
Experimental 1 + paraquat + Amicide® Advance	Exp 1 + 2000 + 1600
Experimental 1 + paraquat + Valor®	Exp 1 + 2000 + 90
Experimental 1 + paraquat + Sharpen®	Exp 1 + 2000 + 26
Experimental 1 + paraquat + Starane® Advanced	Exp 1 + 2000 + 900
Experimental 1 + paraquat + Hotshot®	Exp 1 + 2000 + 500

Results

After the main autumn break, an assessment of regrowth was conducted, 142 days post application (DAA). Following good rain all treatments exhibited significantly less regrowth compared to UTC, as illustrated in Figure 1 below

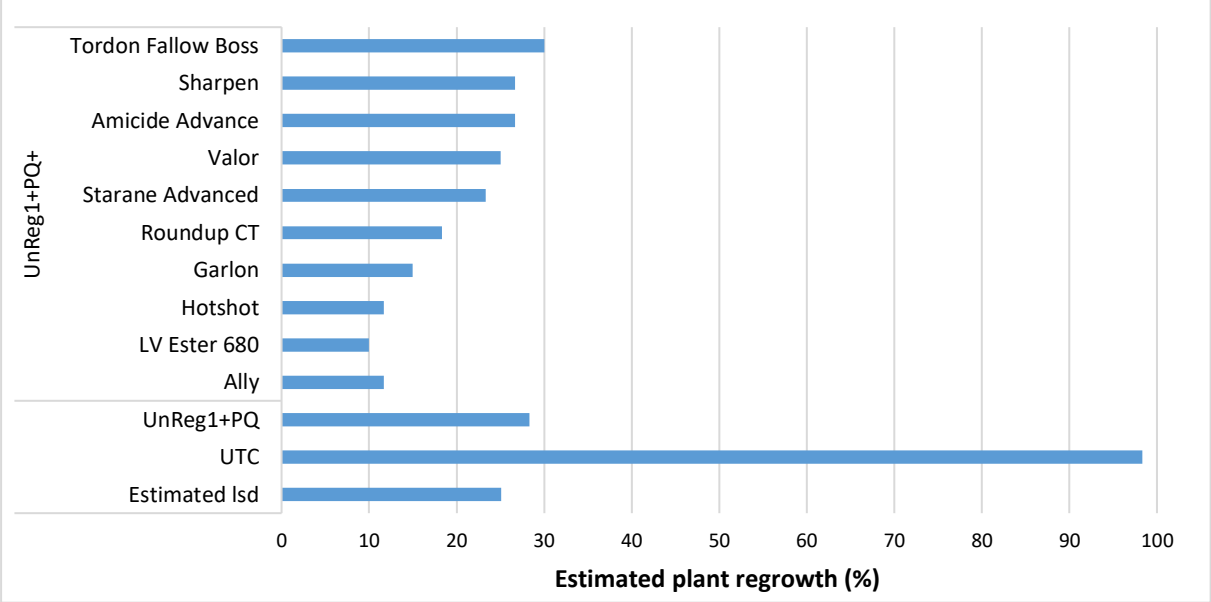

Figure 1. Estimated percentage of population of windmill grass regrowing 142DAA

Discussion

The population of relatively mature WMG at the time of application, rapidly reached full maturity post application, brought on by hot and dry conditions.

There did not appear to be any reduction in level of control achieved from various tank mixes combined with Exp 1 + PQ mix compared to the standard application Exp 1 + PQ mix alone.

Experimental 1 label does suggest that tank mixing with glyphosate can reduce glyphosate efficacy (this was not tested in this trial). In previous GOA trials[2] there has been some evidence that tank mixing with glyphosate has reduced efficacy of Exp 1 + PQ. While this was not noted here, it remains not recommended.

This trial has tested the impact that some alternate herbicides might have on the efficacy of Exp 1 + PQ on WMG only when added to the mix. It remains unknown what impact any of these herbicide combinations may have on other targeted weeds. It is possible/likely that especially the Paraquat component, with its rapid effect on plant processes, could have a detrimental effect on effectiveness of many translocated herbicides. This research aspect is a possible avenue for further investigations.

Conclusion

This research highlights a number of potential tank mixing partners to combine with Exp 1 + PQ, to broaden weed control spectrum, while at the same time not adversely impacting on final control of WMG.

In previous trials there has been some indication that inclusion of glyphosate, one of the most logical and desirable herbicides for such a tank mix, may reduce efficacy of Exp 1 + PQ on WMG control. However, it is also foreseeable that the paraquat component would also reduce translocation of glyphosate, most likely severely limiting its effectiveness.

[2] http://grainorana.com.au/documents?download=61 and http://grainorana.com.au/documents?download=60

Despite indications of little altered effect on WMG control with addition of other herbicides, impact of their efficacy on other target weeds it has not been assessed and deserves further investigation.

Acknowledgements

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Appendix

Detailed results

Product 1	Product 2	Estimated plant regrowth (%)	Subscript
UTC		98.3	a
UnReg1+PQ		28.3	b
UnReg1+PQ+	Ally	11.7	b
	LV Ester 680	10.0	b
	Hotshot	11.7	b
	Garlon	15.0	b
	Roundup CT	18.3	b
	Starane Advanced	23.3	b
	Valor	25.0	b
	Amicide Advance	26.7	b
	Sharpen	26.7	b
	Tordon Fallow Boss	30.0	b
Estimated lsd		25.1	