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:	GOWE04716-2
Season/Year:	Summer 2015/16
Location:	'Glenlossie', Kickabil (20 km South of Collie)
Trial Co-operator:	Ben Shanks and the Shanks Family

Keywords

GOWE04716-2, windmill grass, tank mixes, herbicide, resistance, paraquat, *Chloris truncata,* Collie

Take home message

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

A number of tested herbicides (with the exception of glyphosate) can be tank mixed with Exp 1 + PQ to increase the weed control spectrum with potentially no antagonistic impacts on the control of WG.

The impact that Exp 1 + PQ may have on the effectiveness of the potential tank mix partners is unknown and may require further investigations.

Background

Previous trials by GOA have found that a mixture of Exp 1 + PQ can provide very effective knockdown control for WG when used as a single pass, stand-alone treatment. However, the relative narrow weed control spectrum of the Exp 1 + PQ mix highlights a possible shortcoming in control of a broader range of weeds which are often present in fallow situations alongside WG.

One possible way to address this short coming is to tank mix Exp 1 + PQ with herbicides targeting other weeds applied as a single pass. Another alternative is to use the Exp 1 + PQ as a double knock treatment following more conventional weed control options. This trial aims to investigate the former.

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 for unregistered herbicide use.

[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)

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Aims

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

Method

The trial used a small plot, randomised complete block design and was established in an existing population of mature WG.

All the treatments were tank mixed with Exp 1 + PQ (except the untreated control (UTC) and Exp 1 + PQ) and applied in a single pass.

At the time of application on the 10th February 2016, seed heads had emerged on the WG, however, it was still actively growing following good rainfall on the 28th of January. After treatment application the weather turned hot and dry causing the WG to mature rapidly.

All treatments were applied in a total spray volume of 100 L/ha through an ATV mounted boom fitted with AIXR110-015 nozzles at 3 bar pressure delivering coarse droplets.

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	X + 2000
Experimental 1 + paraquat + Hasten®	X + 2000
Experimental 1 + paraquat + Ally®	X + 2000 + 7
Experimental 1 + paraquat + LV Ester 680	X + 2000 + 800
Experimental 1 + paraquat + Tordon Fallow Boss®	X + 2000 + 1000
Experimental 1 + paraquat + glyphosate 450	X + 2000 + 2000
Experimental 1 + paraquat + Amicide® Advance	X + 2000 + 1600
Experimental 1 + paraquat + Valor®	X + 2000 + 90
Experimental 1 + paraquat + Sharpen®	X + 2000 + 26
Experimental 1 + paraquat + Starane® Advanced	X + 2000 + 900
Experimental 1 + paraquat + Hotshot®	X + 2000 + 500

Results

In this trial, all treatments performed better than the UTC when assessed for brownout 29 days after treatment (DAT).

The addition of the tank mix herbicides to the base treatment of Exp 1 + P, did not result in any impact on the level of control by Exp + PQ alone, as shown in Figure 1.

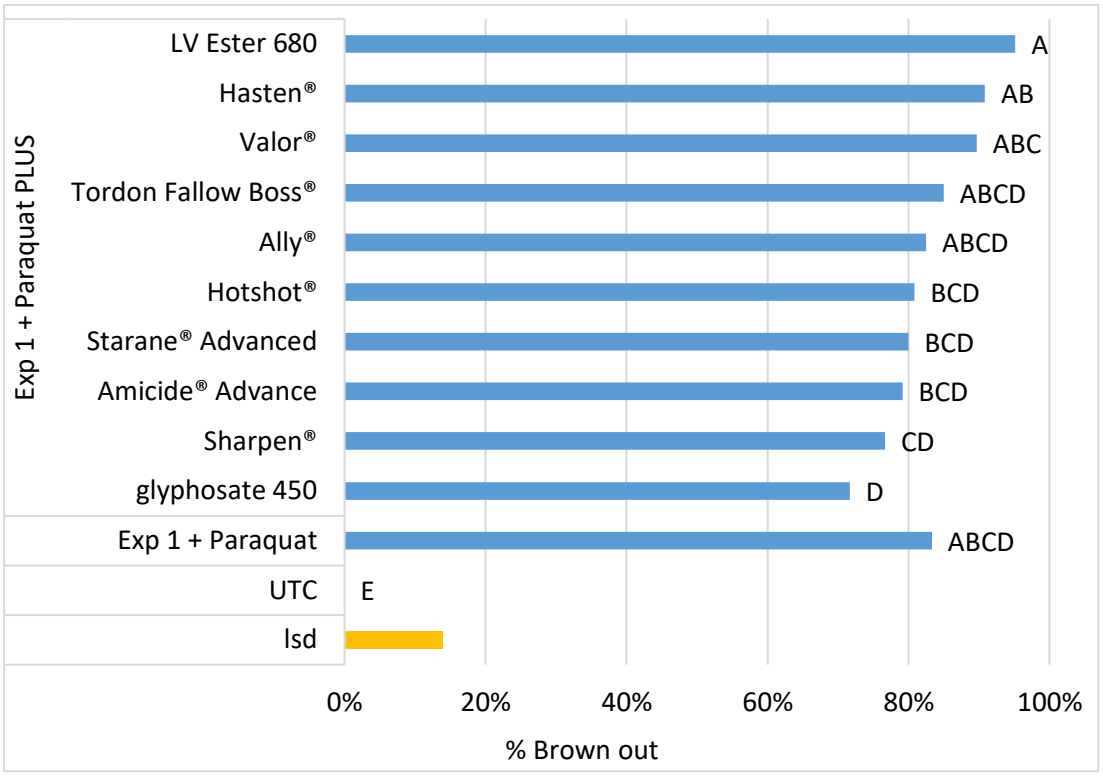

Figure 1 Percentage brown out of windmill grass, 29 DAA

A 'late' assessment was conducted after the autumn break to assess regrowth 96 DAT. After good rain all treatments showed less visible regrowth compared to the vigorously regrowing UTC as illustrated in Figure 2Figure 2 below. However, the glyphosate tank mix had more regrowth than the Exp 1 + PQ standard treatment.

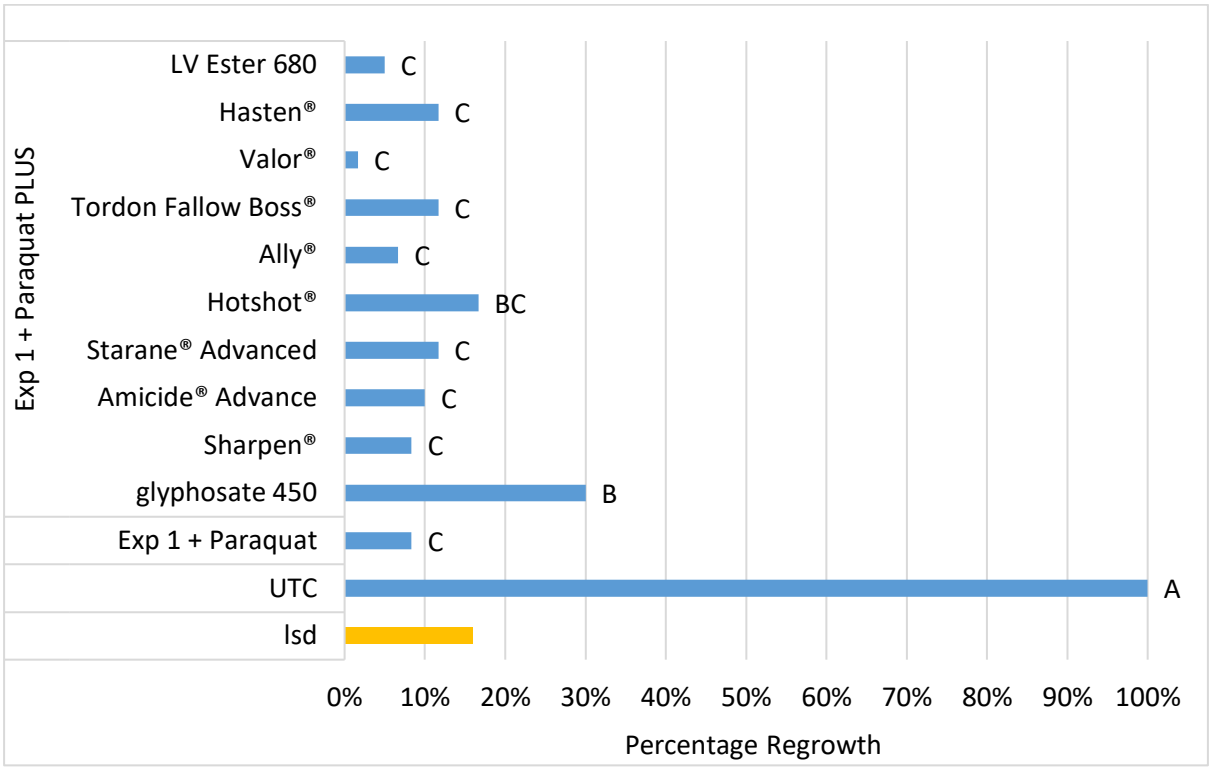

Figure 2 Percentage of windmill grass plants regrowing 96 DAA

Discussion

Within this trial there did not appear to be any reduction in the level of control achieved as a result of the tank mixes tested compared to the standard application Exp 1 + PQ mix at the earlier assessment. This result was also reflected in the later assessment of regrowth with the exception of the glyphosate tank mix.

The mix with glyphosate still resulted in the lowest level of brownout and the highest level of regrowth indicating some possible level of antagonism when mixed with Exp 1 + PQ.

The addition of Hasten™, a spray adjuvant (oil) was tested to see if it improved control over just Exp 1 + PQ, however, in this trial provided no incremental benefits.

It should be noted that this trial has tested the impact that these alternate herbicides might have on the efficacy of Exp 1 + PQ on WG only. It is unknown what impact the Exp 1 + PQ mix might have on the efficacy of the tested tank mix herbicides on other targeted weeds. The paraquat component particularly, with its rapid effect on plant processes could foreseeably have a detrimental effect on the effectiveness of many translocated herbicides. This aspect may deserve further investigations.

In this trial button grass and barnyard grass was present but not uniformly distributed, however, it was observed that the Exp 1 + PQ alone provided acceptable levels of control and would indicate further investigation of it efficacy on other grass weeds may be worthwhile.

Conclusion

This trial has highlighted a number of potential tank mixing partners to broaden the weed control spectrum, that did not impact on the final control of WG when mixing with Exp 1 + PQ

Unfortunately, there is some indication that the inclusion of glyphosate, one of the most logical and desirable herbicides to tank mix, may reduce the efficacy of the Exp 1 + PQ on WG control. However, it is foreseeable that the paraquat component would also reduce the translocation of glyphosate severely, most likely limiting its effectiveness in any case.

Despite the indications of little effect on the resultant WG control with these tank mixes, the impact on efficacy of the tank mix partners and their target weeds is not known and deserves further investigation.

Acknowledgements

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