

## Controlling Windmill Grass (*Chloris truncata*)- the impact of tank mixing other herbicides on the efficacy of Experimental<sup>1</sup> 1 + paraquat

**Trial Code:** GOWE04716-1  
**Season/Year:** Summer 2015/16  
**Location:** 'NDF', Narromine  
**Trial Co-operator:** Dale Foster

### Keywords

GOWE04716-1, Windmill grass, tank mixes, herbicide, resistance, paraquat, *Chloris truncata*, Narromine

### 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.

---

<sup>1</sup> 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)

## Aims

Assess the impact on efficacy of Exp 1 + PQ on WG 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, the WG was actively growing with seed heads emerged following good recent rainfall. Following application growing conditions declined sharply with no decent follow up rainfall and 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.

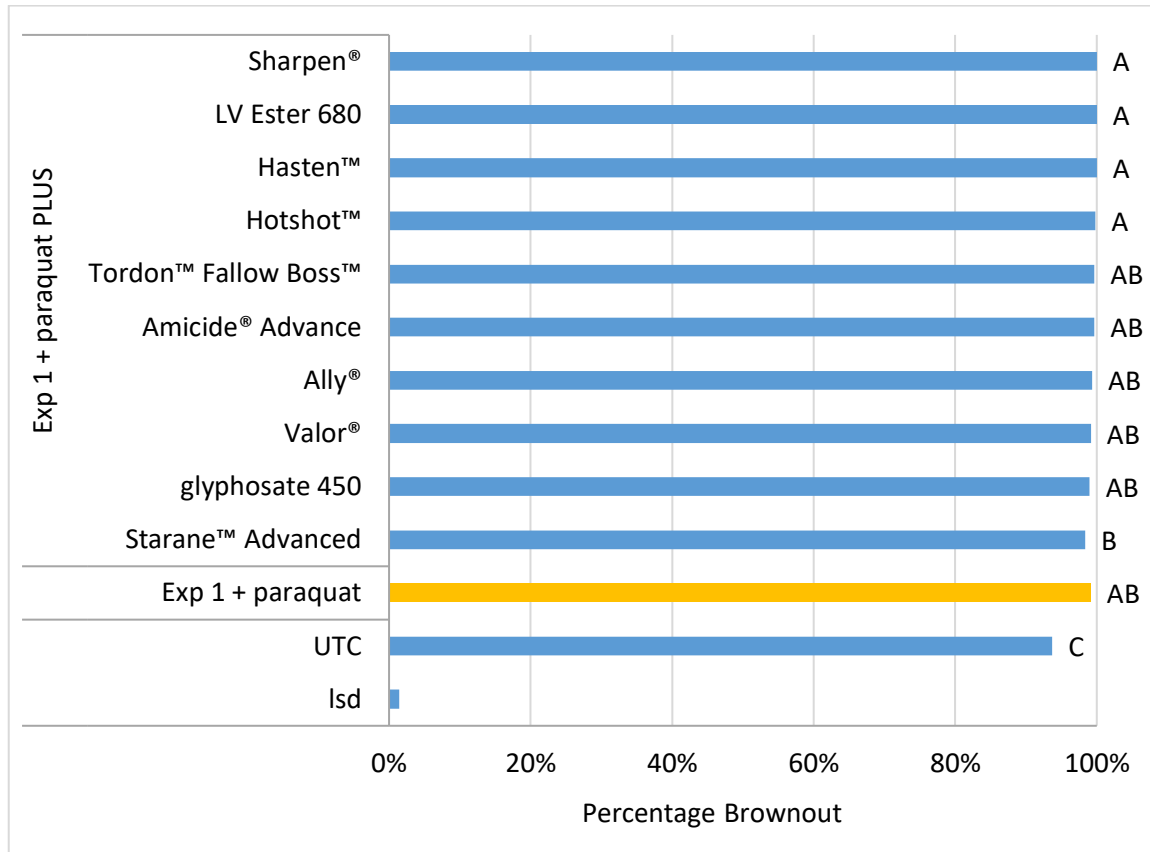
Results were analysed using ANOVA for the analysis of variance and results compared by using a least significant difference (LSD) method with a 95% confidence interval. Any references to differences between treatments should be assumed to be statistically different unless otherwise stated.

**Table 1 Herbicide Treatments**

| Treatment                                       | Rate (mL or g/ha) |
|---|-------------------|
| Untreated Control (UTC)                         | n/a               |
| Experimental 1 + paraquat                       | 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    |

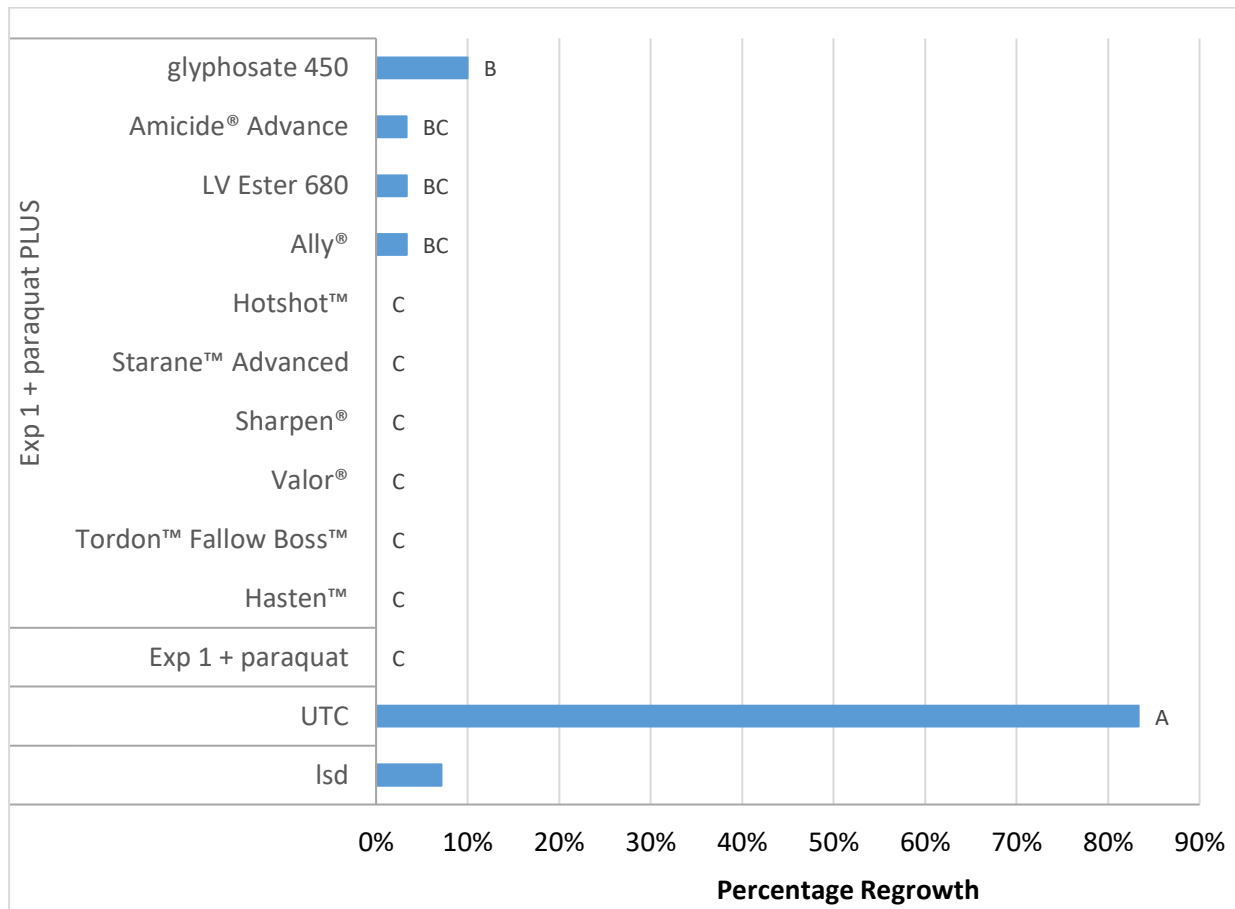
## Results

In this trial all treatments performed better than the UTC when rated for brownout 30 DAA. Of the remaining treatments, none were significantly different to the base treatment of Exp 1 +PQ.



**Figure 1 Percentage brown out of windmill grass 30 DAA**

A 'late' assessment was conducted after the autumn break to assess regrowth 99DAA. After good rain all treatments showed less visible regrowth compared to the vigorously regrowing UTC, as illustrated in Figure 2 below. In this trial the glyphosate tank mix although showing less regrowth than the UTC, had greater regrowth than the Exp 1 + PQ standard treatment.



**Figure 2 Percentage of population of windmill grass regrowing 99DAA**

## Discussion

In this trial the WG was rapidly approaching maturity when the treatments were applied and hot and dry conditions continued post application. This is suggested to explain why the UTC also showed significant browning out despite no herbicide treatment at all at the first assessment.

However, once significant rain had occurred to facilitate any potential regrowth from plants not completely controlled most tank mix options appeared to provide adequate control as measured 99 DAA. 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 alone with the exception of the glyphosate tank mix.

The mix with glyphosate still resulted in some level of control but less than what was achieved by the Exp 1 + PQ alone, indicating some level of antagonism. The Exp 1 label does suggest that tank mixing with glyphosate can reduce the glyphosate efficacy, however, this would not necessarily explain why the Exp 1 + PQ component has not worked as effectively.

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 benefit as 100% was achieved without any adjuvants.

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.

## 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.

However, despite the indications of little effect on the resultant WG control with the addition of other herbicides the impact the efficacy of those herbicides on their target weeds is not known and deserves further investigation.

## Acknowledgements

The research undertaken as part of this project is made possible by the significant contributions of growers through both trial cooperation and the support of the GRDC, the authors would like to thank them for their continued support. Special thanks goes out to Dale Foster of Narromine who hosted this trial.