GOA trial site report

Investigating a range of residual herbicides on the effectiveness of control of sow thistle and other weeds in the summer fallow

Grain Orana Alliance

Trial code:	GGWE7824-3
GRDC code:	GOA2302-001SAX
Season/year:	Summer 2024-2025
Location:	Dunmuir, Narromine
Trial partners:	Simon Gill
Trial establishment date:	31/12/2024

Keywords

- GGWE782, sow thistle, summer fallows, residual activity, application timing, Dunmuir, Narromine

Take home messages

- Several of the treatments investigated in this trial offered significant reductions in sow thistle germination (*Sonchus oleraceus*) up to 101 days after application.
- Two options resulted in no sow thistle and if this was the only weed present, may offer growers opportunities to reduce fallow management costs significantly.
- Treatments that did not reduce the milk thistle population to zero would have required follow up control sprays within the 101 day period. These treatments may offer little cost savings unless spot spray technology can be utilised, which may reduce total herbicide usage.
- Even where sow thistle was reduced to zero, other weeds not controlled by the same herbicides, would still require follow-up sprays.

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Background

- At the 2022 Narromine GRDC National Grower Network (NGN) forum, growers identified summer fallow weed control as a significant and escalating input cost.
- Increasing herbicide costs, herbicide resistance and the increasing prevalence of harder to kill weeds have all contributed to this. Several specific weeds, sow thistle, fleabane and windmill grass, have arguably had the greatest impact on these rising costs of managing summer fallows.
- Sow thistle is characteristed by the ability to germinate all year around, high number of seeds/plant, quick growth rates and increasing tolerance or resistance to commonly used herbicides. As such, sow thistle is a dominant species in a weed population that germinates in fallow. It is often a key determinant of fallow spray frequency and the herbicide choice and rates employed.
- Given this, employing soil applied residual herbicides to prevent or limit the frequency of germination as well as the resultant population of sow thistle may offer some potential to reduce fallow management costs.
- To test the validity of this management approach to reduce costs a series of herbicide trials were established under an NGN project over the period of 2023 and 2024.

Aims

- To investigate a range of residual herbicides that could be applied at the first fallow spray timing for control of subsequent germinations of sow thistle and other weeds over the summer fallow period.
- Assess any herbicide residual impacts on the establishment of the subsequent crop.

Methodology

- The trials were a randomised and replicated design with the results statistically analysed by ANOVA
- This site was selected as it was suggested to have a history of sow thistle prominence
- Trials were established in a commercial fallow with a knockdown herbicide applied 31/12/2024, before the application of the trial treatments detailed in Table 1.
- This ensured the measured weed populations were a result of the residual capability of herbicides rather than any knockdown capacity.
- Sporadic rainfall fell across the summer fallow, sufficient rainfall was received during March (Table 2) and subsequently a population of sow thistle emerged which was counted on the 11/4/2025 (101 days after treatment application (DAA)).

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Table 1 Treatment list.

Description
Balance® 100 g/ha
Balance® 100 g/ha + Dual Gold® 2000 mL/ha
Balance® 100 g/ha + Terbyne® Xtreme® 1200 g/ha
Dual Gold® 2000 mL/ha
FallowBoss® Tordon® 1000 mL/ha
Impose® 200 mL/ha
Overwatch® 1250 mL/ha
Picoflex® 315 mL/ha
Reflex® 1250 mL/ha
Sakura® 118 g/ha
Terbyne® Xtreme® 1200 g/ha
Terbyne® Xtreme® 1200 g/ha + Impose® 200 mL/ha
Trezac® Arylex® 200 mL/ha
Valor® 280 mL/ha
Valor® 280 mL/ha + Dual Gold® 2000 mL/ha
Voraxor® 240 mL/ha
UTC

Table 2 Monthly rainfall (mm) and long-term average (LTA)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2024	79	42	71	67	108	48	48	45	17	42	59	83	**709**
2025	41	30	58	34	43	44	-	-	-	-	-	-	**250**
LTA	52	49	46	38	41	39	37	35	34	45	47	47	**510**

Results

- The site was checked frequently by GOA and by the grower, the first germination of weeds emerged from rain in March that was assessed in mid-April. The primary weed present was sow thistle, small numbers of other weeds were observed at very low populations and were not assessed.
- The untreated had an average of ~2 plants/m^2 of sow thistle (Figure 1)[1].
- All treatments other than Dual Gold®, Balance®, Trezac® and Sakura® resulted in lower sow thistle populations than the UTC.
- Valor® and Valor® + Dual Gold® resulted in Nil sow thistle observed
- Overwatch, Balance + Terbyne and FallowBoss® Tordon® resulted in ~1 plant/ 10m^2.

[1] note: there are suble differences between counts and control due to nonuniformity of weed distrubution and calculation of control using the UTC value in the same replication as the treatment.

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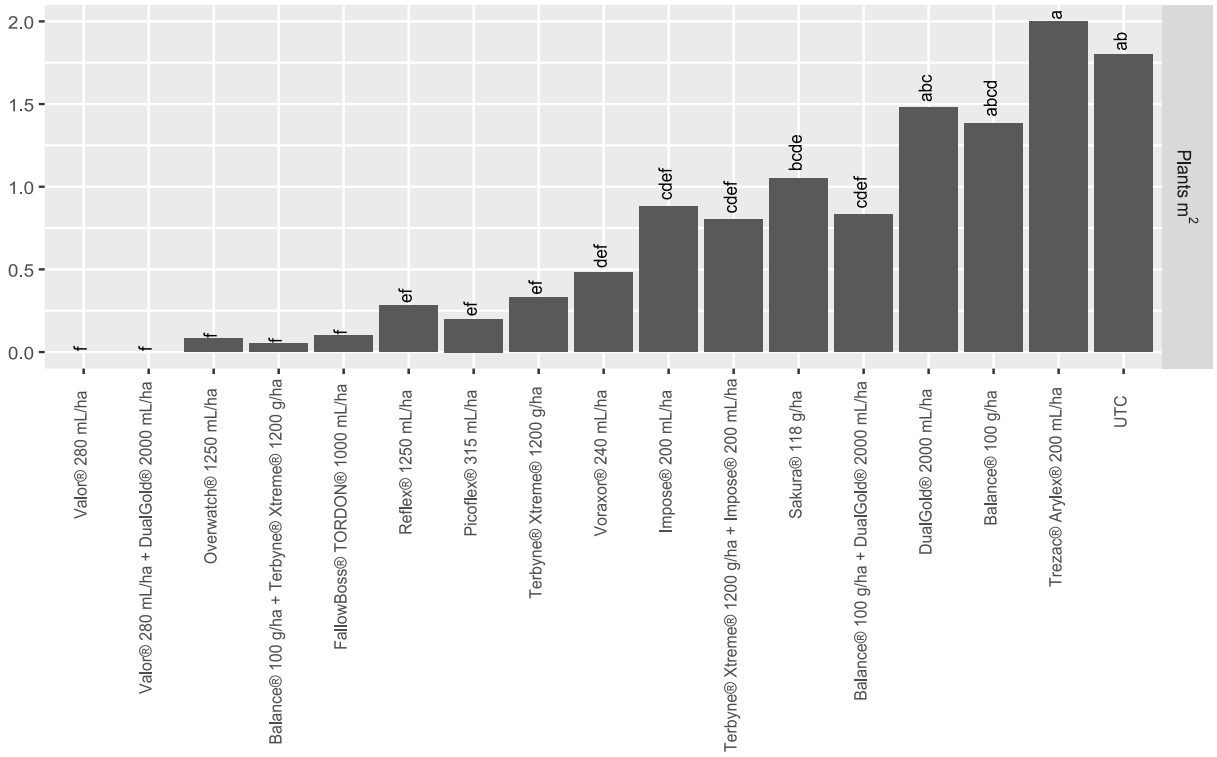

Figure 1: Weed counts and control of sow thistle assessed 106 days after herbicide application. Treatments with the same letter are not significantly different.

Establishment:

- At the time of writing a crop had not been planted, the grower reported that the paddock will be long fallowed (due to the dry conditions).

Discussion

Several of the herbicide options tested reduced sow thistle emergence for up to 101 days DAA. Only 2 treatments resulted in nil sow thistle in Valor® and Valor® + Dual Gold®. Following their use, if sow thistle was the sole species present, no follow up spraying would have been required. This would represent a financial saving to the grower. Three other treatments resulted in very low weed numbers but may still have required follow up weed control. The savings in this circumstance would have been reduced. If growers were able to utilise spot spraying technology such as Weedits or Weed Seekers overall chemical use could have been reduced leading to some savings for growers.

In the situation where spot spray technology could be used, it is possible that savings could still be made for some of the other less efficacious treatments though a reduction in sprayed area.

The effect on subsequent crop performance could not be assessed in this circumstance as the paddock was long fallowed for the 2025 winter period.

Conclusions

- There are residual herbicide options that can provide sow thistle control for up to 3 months post application in relatively dry conditions.
- Two treatments trialed proved very effective in sow thistle control and would have removed the need for follow up spraying.
- Follow up control to spray survivors may still be necessary and many of the other treatments tested. This would negate any saving in control of these weeds unless spot spraying technology could be employed.

Acknowledgements

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DISCLAIMER — TECHNICAL

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Appendix

Results

Product (rate)	Sow thistle 101DAA			
	(plants/m2)		(control %)	
Valor® 280 mL/ha	0.00	f	100	a
Valor® 280 mL/ha + Dual Gold® 2000 mL/ha	0.00	f	100	a
Overwatch® 1250 mL/ha	0.08	f	96	a
Balance® 100 g/ha + Terbyne® Xtreme® 1200 g/ha	0.05	f	94	a
FallowBoss® TORDON® 1000 mL/ha	0.10	f	93	a
Reflex® 1250 mL/ha	0.28	ef	85	ab
Picoflex® 315 mL/ha	0.20	ef	83	abc
Terbyne® Xtreme® 1200 g/ha	0.33	ef	79	abcd
Voraxor® 240 mL/ha	0.48	def	73	abcd
Impose® 200 mL/ha	0.88	cdef	55	bcde
Terbyne® Xtreme® 1200 g/ha + Impose® 200 mL/ha	0.80	cdef	50	cdef
Sakura® 118 g/ha	1.05	bcde	49	def
Balance® 100 g/ha + Dual Gold® 2000 mL/ha	0.83	cdef	46	def
Dual Gold® 2000 mL/ha	1.48	abc	27	efg
Balance® 100 g/ha	1.38	abcd	26	efg
Trezac® Arylex® 200 mL/ha	2.00	a	20	fg
UTC	1.80	ab	0	g

Herbicide details

Trade name	Active	Rate (mL or g/ha)	Registered fallow use	Registered for sow thistle control	Comment
Balance®	750g/kg Isoxaflutole	100	Yes	Residual	
Dual Gold®	960g/L S-Metolachlo	2,000	Yes	Residual	
FallowBoss® TORDON®	300g/L 2,4-D, 75g/L Picloram, 7.5g/L Aminopyralid	1,000	Yes	No	
Impose®	240g/L Imazapic	200	Yes	No	
Overwatch®	400g/L Bixozone	1,250	No	Residual	
Picoflex®	240g/L Picloram	315	Yes	Knockdown	
Reflex®	240g/L Fomesafen	1,250	Yes	Residual	
Sakura®	850g/kg Pyroxasulfone	118	No	Residual	
Terbyne® Xtreme®	875g/kg Terbuthylazine	1,200	Yes	Residual	
Trezac® Arylex®	25g/L Aminopyralid, 30g/L Halauxifen	200	Yes	Knockdown	
Valor®	500g/kg Flumioxazin	280	Yes	Residual + knockdown	
Voraxor®	250g/L Saflufenacil, 125g/L Trifludimoxazin	240	Yes	Residual + knockdown	Wetter required (Hasten)

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Spray application details

Spray Application	Narromine
Date applied	31/12/2024
Start time	12:20 PM
Finish time	1:20 PM
Water rate (l/ha)	100
Speed (km/hr)	5
Pressure (bar)	2
Equipment	Handboom
Nozzle	Airmix 11001
Boom height (cm)	50
Temp (oC)	35
Wind velocity (km/hr)	2.5
Wind direction	NW
Humidity (%)	32
Δt	13
Cloud cover (%)	30
Stubble cover (%)	60