

# Controlling sowthistle (*Sonchus oleraceus*): an emerging summer/winter weed in the Western Australian Wheatbelt

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## Key messages

- Changes in farming systems, farm management practice and climate are resulting in changes in the summer weed spectrum including increasing infestations of sowthistle in the cropping regions of Western Australia.
- Several herbicides were applied alone, as a tank mix or in sequence at flowering stage of sowthistle at Geraldton in August 2015.
- Single application of glyphosate as well as double knockdown of glyphosate followed by Para-Trooper® or Spray.Seed® provided up to 100% control of sowthistle. However, double knockdown is preferred to single knockdown to minimise risks of herbicide resistance development.
- Double knockdowns of glyphosate followed by Para-Trooper® or Spray.Seed® were also effective on most of the other weed species such as capeweed, ryegrass, blue lupin, wild turnip, doublegee, fleabane, flatweed and couch.

## Aims

Sowthistle (*Sonchus oleraceus*) is an emerging weed and is spreading throughout the wheatbelt of Western Australia (WA). This weed can emerge in spring, summer or autumn and can survive through summer and winter crops, suggesting that the adaptation of this weed is quite diverse. Germination of sowthistle is generally dependent more on soil moisture than temperature. Several populations of this weed have developed resistance to Group B herbicides such as chlorsulfuron and Group M herbicide across the grain growing regions of southern Queensland and northern NSW. The aim of the trial was to examine the efficacy of herbicides to control sowthistle during winter season in WA.

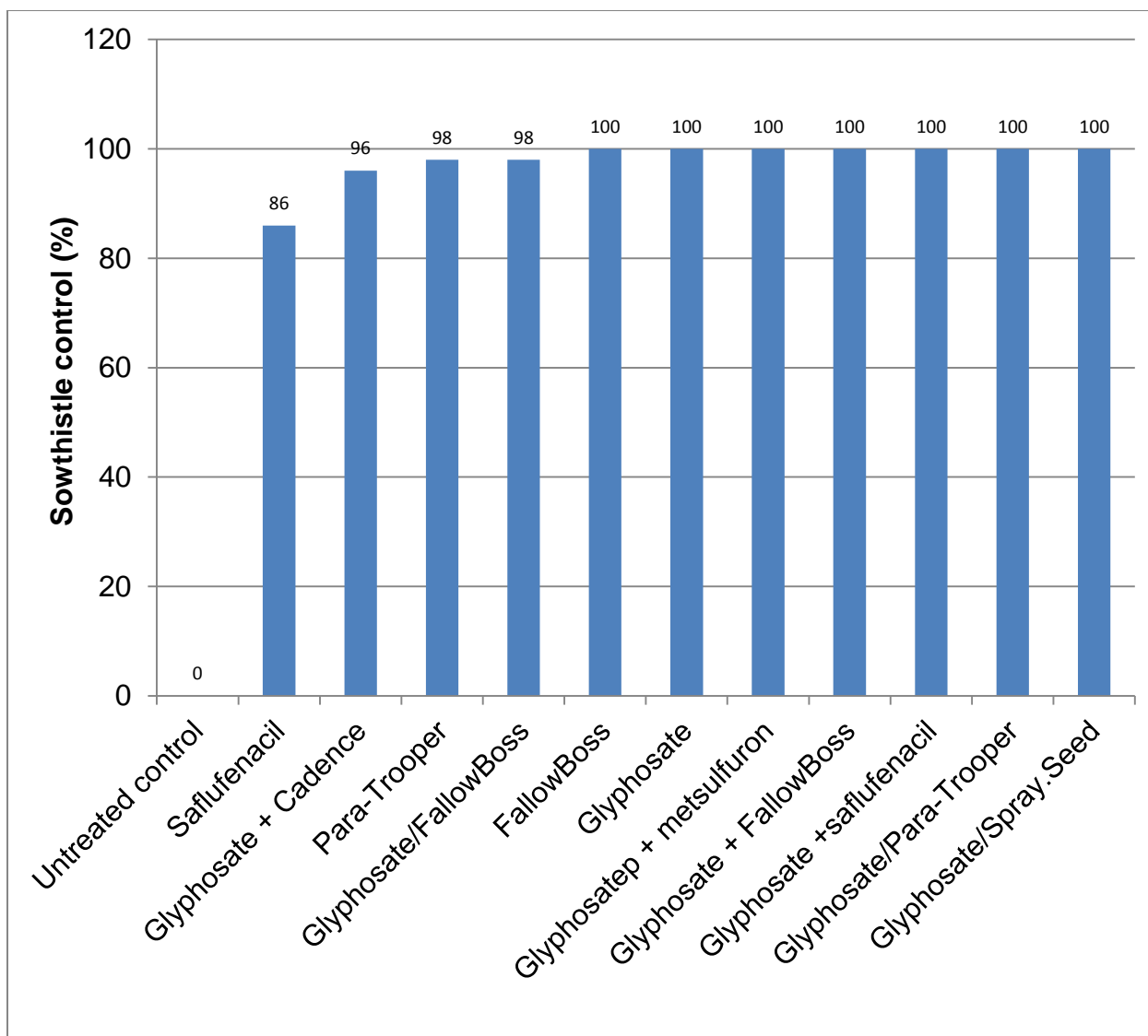
## Method

One site with sowthistle infestation was treated with 12 herbicides either alone, as a tank mix or in sequence during the winter of 2015 at Geraldton. The herbicide treatments were applied on 3 August 2015 with the second herbicide in sequential treatments (double knock treatments) applied on 10 August 2015 (Figure 1 and Table 1). The site was not sown to crops in 2014 or 2015. Other weeds such as capeweed (*Arctotheca calendula*), ryegrass (*Lolium rigidum*), blue lupin (*Lupinus cosentinii*), wild turnip (*Brassica tournefortii*), doublegee (*Emex australis*), flaxleaf fleabane (*Conyza bonariensis*), flatweed (*Hypochaeris glabra*) and couch (*Cynodon dactylon*) were also present at this site at variable densities. Assessment on the treatments was performed on 19 August 2015. Weed control was expressed as the per cent of the untreated control treatment.

## Results

All the herbicides applied alone, as tank mixes or in sequence (such as double knockdowns) at the flowering stage of sowthistle, controlled 96 to 100% of sowthistle with the exception of saflufenacil (Figure 1). When saflufenacil was applied on its own, it controlled sowthistle by 86%.

Herbicides had variable levels of effects on other weed species in this trial (Table 1). Glyphosate alone was highly effective on ryegrass, blue lupin (some narrow-leaf lupins), doublegee, fleabane and flatweed. Tank mixes of glyphosate with metsulfuron, FallowBoss® or saflufenacil did not improve the efficacy of glyphosate on these weed species. However, double knockdown of glyphosate and Para-Trooper® or glyphosate and Spray.Seed® had significantly greater efficacy on most of these weed species (Table 1). Despite severe effects of the double knockdown herbicides on most of the other weed species, some weed species such as flatweed and couch exhibited regrowth 2-3 weeks after spraying.



**Figure 1.** Effect of herbicides applied alone, as tank mix or in sequence on the control of sowthistle during winter season of 2015 at Geraldton, Western Australia. Active ingredients: Glyphosate (540 g/L), Spray.Seed® (paraquat 135 g/L + diquat 115 g/L), saflufenacil (700 g/kg), Para-Trooper® (paraquat 250 g/L + amitrole 10 g/L), metsulfuron (600 g/kg), FallowBoss® (2,4-D 300 g/L + 75 g/L picloram), Cadence® (dicamba 700 g/kg); '+' indicates tank mix and '/' indicates herbicides applied in sequence. P-value = <0.001, LSD(5%) = 5.57.

## Conclusions

Glyphosate followed by Para-Trooper® or glyphosate followed by Spray.Seed® provided 100% control of sowthistle in the Geraldton area. Although glyphosate, FallowBoss® or glyphosate + metsulfuron tank mix also provided comparable control of most of this weed species, it is important to use a double knockdown strategy to minimise the risk of herbicide resistance development. Double knockdown of glyphosate and Para-Trooper® or glyphosate and Spray.Seed® were also highly effective on most of the other weed species (Table 2). These results are based on one trial during the winter of 2015. Therefore, caution is needed in interpreting the results for wider applications across regions and seasons.

**Table 1.** Effect of herbicides applied alone, as a tank mix or in sequence on the control of capeweed, ryegrass, blue lupin, wild turnip, doublegee, fleabane, flatweed and couch during winter season of 2015 at Geraldton, Western Australia<sup>1</sup>.

Treatments	Capeweed	Ryegrass	Blue lupin	Wild turnip	Doublegee	Fleabane	Flatweed	Couch
Untreated control	0	0	0	0	0	0	0	0
Saflufenacil	43	10	11	11	3	69	59	0
Glyphosate + Cadence®	74	99	91	68	74	99	90	55
Para-trooper®	9	98	95	89	81	100	66	85
Glyphosate / FallowBoss®	80	100	89	55	77	99	91	50
FallowBoss®	50	21	53	39	67	69	64	20
Glyphosate	64	100	94	75	93	94	91	70
Glyphosate + Metsulfuron	46	100	79	64	81	94	84	25
Glyphosate + FallowBoss®	76	100	84	53	87	94	90	70
Glyphosate + saflufenacil®	86	100	94	69	86	99	91	55
Glyphosate / Para-Trooper®	75	100	98	84	100	99	91	99
Glyphosate / Spray.Seed®	92	100	95	94	95	99	91	99
P-value	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
LSD.05	19.26	14.4	13.46	24.27	24.27	27.97	18.1	29.9

<sup>1</sup> '+' indicates tank mixes, '/' indicates herbicides were applied in sequence; Active ingredients of herbicides in these products are same as in Figure 1

## Key words

Sowthistle, double knockdowns, tank mixes, summer weed control, capeweed, wild turnip, doublegee, fleabane, flatweed, couch

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