

# Herbicide Control of Mature Caltrop

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## Key Messages

- Bipyridyls provide 100% brownout of caltrop.
- The addition of Sharpen (saflufenacil) to Paraquat will provide quicker brownout than Paraquat but an equivalent kill rate.

## Aim

To investigate the response of caltrop to single knock post emergent sprays in the summer period.

## Background

Caltrop (*Tribulus terrestris*) also known as bindii, goats head, yellow vine and cat's eye, cat head and puncture vine is a summer annual herb, it has a sprawling flat habit and extensive tap root system. The seed that is produced by caltrop is formed continually in the summer months and one plant can produce upward of 20,000 seeds per plant (Department of Primary Industries, 2010) that will remain viable in the soil for five years (Wilén, 2006). The seeds are easily picked up by shoes, paws, wools and vehicles helping it get dispersed over wide areas. It is a problem in agricultural areas as it extracts soil moisture and can thrive in very dry conditions making it hard to kill. Wheat emergence was reduced by 22% in 2003 and subsequently reduced wheat grain yield by up to 40% in two out of three years when caltrop was the dominant summer weed species. This means caltrop may have a strong allelopathic effect on wheat emergence (Hashem et al 2006).

## Method

The Liebe Group and Imtrade Australia ran a trial at the Carter's property in east Wubin to test single knock post emergent sprays on well established caltrop in a summer fallow situation. The chemistries used were bipyridyls (Paraquat 250, Spray.Seed, Para-Trooper) and glyphosate with and without group I or G additives as 'spikes'.

## Trial Details

<b>Property</b>	KL Carter and Co, east Wubin
<b>Plot size &amp; replication</b>	8m x 2m x 3 replicates
<b>Soil type</b>	Red loam
<b>Spray timing</b>	17/03/2015
<b>Soil pH (CaCl<sub>2</sub>)</b>	0-10cm: 4.8
<b>Paddock rotation</b>	2012: pasture, 2013: canola, 2014: wheat
<b>Summer Rainfall (Jan-April)</b>	188mm

## Chemistries Used

<b>Trade Name</b>	<b>Constituent</b>	<b>Comparison Products</b>	<b>Chemical Group</b>
Imtrade Eradicator 450	450g/L Glyphosate	Various	M
Imtrade Paraquat 250	250g/L Paraquat	Gramoxone	L
Spray.Seed	135g/L Paraquat + 115g/L Diquat	Various	L
Imtrade Para-Trooper	250g/L Paraquat + 10g/L Amitrole	None	L
Sharpen	700g/kg Saflufenacil	None	G
Imtrade Oxen	240g/L Oxyfluorfen	Goal	G
LV Ester 680	680g/L 2,4-D Ester	Various	I
Imtrade Hurricane 600	600g/L Triclopyr	Garlon	I

## Results

**Table 1:** Effect of treatments on the brownout of caltrop (mean percentage days after treatment (DAT)).

Treatment	Application rate (mL/ha)	7 DAT		11 DAT		22 DAT		31 DAT	
		23/03/2015		27/03/2015		7/04/2015		16/04/2015	
1. Untreated	--	0.0	c	0.0	f	0.0	c	0.0	d
2. Imtrade Eradicator 450	1500	18.3	bc	26.7	ef	21.7	bc	23.3	cd
3. Imtrade Paraquat 250	1200	86.7	a	86.7	abc	76.7	a	96.7	a
4. Spray.Seed	1200	93.3	a	85.0	abc	76.7	a	100.0	a
5. Imtrade Para-Trooper	1200	86.7	a	91.7	ab	71.7	a	100.0	a
6. Sharpen	20g	36.7	b	43.3	de	16.7	bc	30.0	c
7. Paraquat 250 + Sharpen	1200 + 20	88.3	a	95.3	a	83.3	a	96.7	a
8. Eradicator 450 + Sharpen	1500 + 20	25.0	bc	33.3	de	6.7	c	23.3	cd
9. Eradicator 450 + Imtrade Oxen	1500 + 75	43.3	b	56.7	cde	35.0	b	60.0	b
10. Eradicator 450 + LV Ester 680	1500 + 300	43.3	b	60.0	bcd	73.3	a	90.0	a
11. Eradicator 450 + Hurricane 600	1500 + 120	30.0	b	48.3	de	35.0	b	36.7	bc
P value		<0.001		<0.001		<0.001		<0.001	
LSD		26.94		32.06		27.92		25.63	

Means with the same letter within a column are not significantly different ( $P>0.05$ )

**Table 2:** Comparison of treatment means. Mean number of caltrop plants per square meter

Treatment	Application rate (mL/ha)	Plants per square meter	
1. Untreated	--	14.4	d
2. Imtrade Eradicator 450	1500	11.1	cd
3. Imtrade Paraquat 250	1200	0.7	a
4. Spray.Seed	1200	0.0	a
5. Imtrade Para-Trooper	1200	0.0	a
6. Sharpen	20g	11.1	cd
7. Paraquat 250 + Sharpen	1200 + 20	0.4	a
8. Eradicator 450 + Sharpen	1500 + 20	9.3	bc
9. Eradicator 450 + Imtrade Oxen	1500 + 75	5.2	b
10. Eradicator 450 + LV Ester 680	1500 + 300	0.7	a
11. Eradicator 450 + Hurricane 600	1500 + 120	6.3	b
P value		<0.001	
LSD		4.09	

Means within the same cell with a letter in common are not significantly different ( $P>0.05$ )

## Comments

The bipyridyl herbicides (treatments 3, 4, 5) provided complete control. The addition of Sharpen (saflufenacil) to Paraquat provided faster brownout, but equivalent control to Paraquat alone. Glyphosate 450 at 1.5 L/ha did not provide acceptable levels of control however, the addition of 2,4-D LV Ester provided equivalent control to that of the bipyridyl chemistries. Sharpen (Saflufenacil) as a standalone was not effective.

**Acknowledgements**

The Carter family for hosting the trial.

**Paper reviewed by:** Dr Abul Hashem, DAFWA.

**References:**

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