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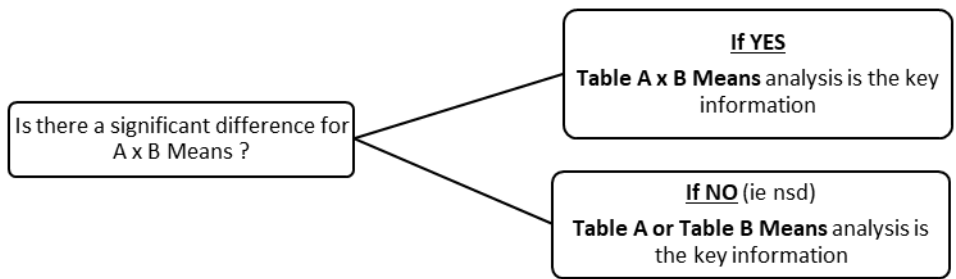
## Knockdown Control of Common Sowthistle

Trial ID: **BD1905**                      Location: **Croppa Creek**                      Trial Year: **2019**  
Investigator: **Branko Duric**

<b>Objective:</b>	<b>To evaluate alternatives to glyphosate for the knockdown control of common sowthistle</b>	
<b>Situation:</b>	<b>Fallow</b>	
<b>Application:</b>	<b>A</b>	<b>B</b>
	<b>First Knock</b>	<b>Second Knock</b>
<b>Application Date:</b>	<b>23/05/2019</b>	<b>05/06/2019</b>
<b>Application Timing:</b>	<b>Late post emergent</b>	<b>13 days after Application A</b>
<b>Nozzles:</b>	<b>AIXR 110015</b>	
<b>Volume:</b>	<b>100L/ha</b>	
<b>Weed:</b>	<b>Common Sowthistle</b>	
<b>Weed Stage at Application:</b>	<b>60% population at 20 cm diameter rosette with 6 true leaves</b>	
<b>Weed Population at Application:</b>	<b>2.2 plants/m<sup>2</sup></b>	
<b>Keywords:</b>	<b>Common sowthistle, knockdown, double knock, fallow</b>	

Trial designed and analysed as a Strip Plot

	<b>In Simple Terms</b>
Table of A Means:	Mean of 'First knock' performance with <b>ALL</b> 'Second knock' treatments
Table of B Means:	Mean of 'Second knock' performance with <b>ALL</b> 'First knock' treatments
Table of A x B Means:	'First knock' performance with <b>EACH</b> 'Second knock' treatment



## Knockdown Control of Common Sowthistle

Trial ID: **BD1905**Location: **Croppa Creek**Trial Year: **2019****Table 1 - First Knock Burndown Assessment**

Pest Scientific Name				<i>Sonchus oleraceus</i>
Pest Name				Common Sowthistle
Assessment Date				5/06/2019
Assessment Type				BURNDOWN
Assessment Unit				%
Treatment-Evaluation Interval				13 DAA
ARM Action Codes				AA
Trt No.	Treatment	Product Rate	Appln. Code	
1	Roundup CT	1000ml/ha	A	2g
2	Roundup CT	2000ml/ha	A	16ef
3	Roundup CT	2000ml/ha	A	33e
	Amicide 700	1600ml/ha	A	
	Hasten	1% v/v	A	
4	Amicide 700	1600ml/ha	A	57d
	Hasten	1% v/v	A	
5	Tordon 75-D	1000ml/ha	A	1g
6	Roundup CT	2000ml/ha	A	100a
	Sharpen	17g/ha	A	
	Hasten	1% v/v	A	
7	Amicide 700	1600ml/ha	A	100a
	Sharpen	9g/ha	A	
	Hasten	1% v/v	A	
8	Group HC V	600ml/ha	A	89bc
	Hasten	1% v/v	A	
9	Gramoxone	1600ml/ha	A	100a
10	Paradigm	25g/ha	A	0g
	Agritone	200ml/ha	A	
11	Group C A	2500g/ha	A	78c
	Group R R	3500ml/ha	A	
	Hasten	1% v/v	A	
12	Experimental	4000ml/ha	A	81c
	Uptake	0.5% v/v	A	
13	Pixxaro	400ml/ha	A	13f
14	Basta	3750ml/ha	A	97ab
15	Basta	5000ml/ha	A	98ab
16	Basta	3750ml/ha	A	89bc
	Amicide 700	1600ml/ha	A	
LSD P=.05				12.3t
Treatment Prob.(F)=				0.0001

Means followed by same letter do not significantly differ (P=.05, LSD)

t=Mean descriptions are reported in transformed data units, and are not de-transformed.

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

## Knockdown Control of Common Sowthistle

Trial ID: BD1905

Location: Croppa Creek

Trial Year: 2019

Table 2 – Surviving Common Sowthistle Count

Pest Scientific Name				<i>Sonchus oleraceus</i>
Pest Name				Common Sowthistle
Crop Name				Fallow
Assessment Date				3/07/2019
Assessment Type				COUNT
Assessment Unit				/m <sup>2</sup>
Treatment-Evaluation Interval				41 DAA/ 28 DAB
Trt No.	Treatment	Product Rate	Appln. Code	
<b>TABLE OF A MEANS (First Knock)</b>				
1	Roundup CT	1000ml/ha	A	0.10cde
2	Roundup CT	2000ml/ha	A	0.00e
3	Roundup CT	2000ml/ha	A	0.06de
	Amicide 700	1600ml/ha	A	
	Hasten	1% v/v	A	
4	Amicide 700	1600ml/ha	A	0.10cde
	Hasten	1% v/v	A	
5	Tordon 75-D	1000ml/ha	A	0.31b
6	Roundup CT	2000ml/ha	A	0.00e
	Sharpen	17g/ha	A	
	Hasten	1% v/v	A	
7	Amicide 700	1600ml/ha	A	0.02de
	Sharpen	9g/ha	A	
	Hasten	1% v/v	A	
8	Group HC V	600ml/ha	A	0.00e
	Hasten	1% v/v	A	
9	Gramoxone	1600ml/ha	A	0.00e
10	Paradigm	25g/ha	A	0.76a
	Agritone	200ml/ha	A	
11	Group C A	2500g/ha	A	0.20c
	Group R R	3500ml/ha	A	
	Hasten	1% v/v	A	
12	Experimental 2	4000ml/ha	A	0.13cd
	Uptake	0.5% v/v	A	
13	Pixxaro	400ml/ha	A	0.08de
14	Basta	3750ml/ha	A	0.02de
15	Basta	5000ml/ha	A	0.00e
16	Basta	3750ml/ha	A	0.01e
	Amicide 700	1600ml/ha	A	
<b>TABLE OF B MEANS (Second Knock)</b>				
1	First knock only			0.22a
2	Gramoxone	1600ml/ha	B	0.00b
	Sharpen	9g/ha	B	
	Hasten	1% v/v	B	
<b>TABLE OF A x B MEANS (First Knock x Second Knock)</b>				
1	Roundup CT	1000ml/ha	A	0.21cd
1b	Roundup CT	1000ml/ha	A	0.00f
	Gramoxone	1600ml/ha	B	
	Sharpen	9g/ha	B	
	Hasten	1% v/v	B	
2	Roundup CT	2000ml/ha	A	0.00f
2b	Roundup CT	2000ml/ha	A	0.00f
	Gramoxone	1600ml/ha	B	
	Sharpen	9g/ha	B	
	Hasten	1% v/v	B	

Means followed by same letter do not significantly differ (P=.05, LSD)

## Knockdown Control of Common Sowthistle

Trial ID: **BD1905**Location: **Croppa Creek**Trial Year: **2019**

Pest Scientific Name				<i>Sonchus oleraceus</i> Common Sowthistle 3/07/2019 COUNT /m <sup>2</sup> 41 DAA/ 28 DAB
Pest Name				
Assessment Date				
Assessment Type				
Assessment Unit				
Treatment-Evaluation Interval				
Trt No.	Treatment	Product Rate	Appln. Code	
3	Roundup CT Amicide 700 Hasten	2000ml/ha 1600ml/ha 1% v/v	A A A	0.13def
3b	Roundup CT Amicide 700 Hasten Gramoxone Sharpen Hasten	2000ml/ha 1600ml/ha 1% v/v 1600ml/ha 9g/ha 1% v/v	A A A B B B	0.00f
4	Amicide 700 Hasten	1600ml/ha 1% v/v	A A	0.21cd
4b	Amicide 700 Hasten Gramoxone Sharpen Hasten	1600ml/ha 1% v/v 1600ml/ha 9g/ha 1% v/v	A A B B B	0.00f
5	Tordon 75-D	1000ml/ha	A	0.63b
5b	Tordon 75-D Gramoxone Sharpen Hasten	1000ml/ha 1600ml/ha 9g/ha 1% v/v	A B B B	0.00f
6	Roundup CT Sharpen Hasten	2000ml/ha 17g/ha 1% v/v	A A A	0.00f
6b	Roundup CT Sharpen Hasten Gramoxone Sharpen Hasten	2000ml/ha 17g/ha 1% v/v 1600ml/ha 9g/ha 1% v/v	A A A B B B	0.00f
7	Amicide 700 Sharpen Hasten	1600ml/ha 9g/ha 1% v/v	A A A	0.04ef
7b	Amicide 700 Sharpen Hasten Gramoxone Sharpen Hasten	1600ml/ha 9g/ha 1% v/v 1600ml/ha 9g/ha 1% v/v	A A A B B B	0.00f
8	Group HC V Hasten	600ml/ha 1% v/v	A A	0.00f
8b	Group HC V Hasten Gramoxone Sharpen Hasten	600ml/ha 1% v/v 1600ml/ha 9g/ha 1% v/v	A A B B B	0.00f

## Knockdown Control of Common Sowthistle

Trial ID: BD1905

Location: Croppa Creek

Trial Year: 2019

Pest Scientific Name				<i>Sonchus oleraceus</i> Common Sowthistle 3/07/2019 COUNT /m <sup>2</sup> 41 DAA/ 28 DAB
Pest Name				
Assessment Date				
Assessment Type				
Assessment Unit				
Treatment-Evaluation Interval				
Trt No.	Treatment	Product Rate	Appl. Code	
9	Gramoxone	1600ml/ha	A	0.00f
9b	Gramoxone	1600ml/ha	A	0.00f
	Gramoxone	1600ml/ha	B	
	Sharpen	9g/ha	B	
	Hasten	1% v/v	B	
10	Paradigm	25g/ha	A	1.50a
	Agritone	200ml/ha	A	
10b	Paradigm	25g/ha	A	0.02ef
	Agritone	200ml/ha	A	
	Gramoxone	1600ml/ha	B	
	Sharpen	9g/ha	B	
	Hasten	1% v/v	B	
11	Group C A	2500g/ha	A	0.35c
	Group R R	3500ml/ha	A	
	Hasten	1% v/v	A	
11b	Group C A	2500g/ha	A	0.04ef
	Group R R	3500ml/ha	A	
	Hasten	1% v/v	A	
	Gramoxone	1600ml/ha	B	
	Sharpen	9g/ha	B	
	Hasten	1% v/v	B	
12	Experimental	4000ml/ha	A	0.25cd
	Uptake	0.5% v/v	A	
12b	Experimental	4000ml/ha	A	0.00f
	Uptake	0.5% v/v	A	
	Gramoxone	1600ml/ha	B	
	Sharpen	9g/ha	B	
	Hasten	1% v/v	B	
13	Pixxaro	400ml/ha	A	0.17de
13b	Pixxaro	400ml/ha	A	0.00f
	Gramoxone	1600ml/ha	B	
	Sharpen	9g/ha	B	
	Hasten	1% v/v	B	
14	Basta	3750ml/ha	A	0.04ef
14b	Basta	3750ml/ha	A	0.00f
	Gramoxone	1600ml/ha	B	
	Sharpen	9g/ha	B	
	Hasten	1% v/v	B	
15	Basta	5000ml/ha	A	0.00f
15b	Basta	5000ml/ha	A	0.00f
	Gramoxone	1600ml/ha	B	
	Sharpen	9g/ha	B	
	Hasten	1% v/v	B	
16	Basta	3750ml/ha	A	0.02ef
	Amicide 700	1600ml/ha	A	
16b	Basta	3750ml/ha	A	0.00f
	Amicide 700	1600ml/ha	A	
	Gramoxone	1600ml/ha	B	
	Sharpen	9g/ha	B	
	Hasten	1% v/v	B	

## Knockdown Control of Common Sowthistle

Trial ID: BD1905

Location: Croppa Creek

Trial Year: 2019

Assessment Type

BURNDOWN = % Burndown/brown out

ARM Action Codes

AA = Automatic arcsine square root % transformation

DAA = Days after Application A

DAB = Days after Application B

COMPLETE STRIP-BLOCK AOV						
<i>Sonchus oleraceus</i> - Common Sowthistle						
3/07/2019						
COUNT /m <sup>2</sup> DAA 41 DAB 28						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	95	8.372030				
R	2	0.053060	0.026530	2.717	0.0823	
A	15	3.367472	0.224498	23.919	0.0001	0.11
RA	30	0.281576	0.009386			
B	1	1.134806	1.134806	33.520	0.0286	0.16
RB	2	0.067708	0.033854			
AB	15	3.174438	0.211629	21.671	0.0001	0.16
RAB	30	0.292969	0.009766			

**Conclusions:**

This trial was conducted to evaluate alternatives to glyphosate for the knockdown control of common sowthistle. First knock treatments were applied to a population of ~2.2/m<sup>2</sup> common sowthistle at the 6 leaf stage (~20cm diameter) with a second knock of Gramoxone 1600 mL/ha + Sharpen 9 g/ha + Hasten 1%, applied 13 days later.

A burndown assessment was done just before second knock. Roundup CT 2000 mL/ha + Sharpen 17 g/ha, Amicide 700 1600 mL/ha + Sharpen 9 g/ha and Gramoxone 1600 mL/ha all provided 100% burndown but were not significantly different to Basta alone.

Surviving counts were made 28 days after the second knock application. Complete control was provided by first knock treatments of Roundup CT 2000 mL/ha, Roundup CT 2000 mL/ha + Sharpen 17 g/ha, Group HC V 600 mL/ha, Gramoxone 1600 mL/ha and Basta 5000 mL/ha. All double knocked treatments provided >98% control of common sowthistle.

In this situation, a large number of non-glyphosate options provided complete control of common sowthistle at the 6 leaf stage when followed by a second knock of Gramoxone + Sharpen + Hasten. Only Gramoxone 1600 mL/ha and Basta 5000 mL/ha provided complete control as a single knock option.

## Knockdown Control of Common Sowthistle

Trial ID: BD1905

Location: Croppa Creek

Trial Year: 2019

Application Description		
	A	B
Application Date:	23/05/2019	5/06/2019
Application Start Time:	12:30 PM	11:30 AM
Application Stop Time:	3:00 PM	1:30 PM
Application Method:	SPRAY	
Application Placement:	FOLIAR	
Air Temperature, Unit:	26 C	19 C
% Relative Humidity:	38	45
Wind Velocity, Unit:	0.9 m/s	3.5 m/s
Wind Direction:	SE	SW
Dew Presence (Y/N):	No	No
% Cloud Cover:	5	0

Pest Stage at Each Application				
	A		B	
Pest:	<i>Sonchus oleraceus</i> Common Sowthistle			
Stage Majority, %:	16	60%	16	60%
Stage Minimum, %:	12	10%	12	10%
Stage Maximum, %:	18	30%	18	30%
Diameter, Unit:	20 cm		20 cm	
Density, Unit:	2.2 m <sup>2</sup>		2.2 m <sup>2</sup>	

Application Equipment		
	A	B
Application Equipment:	Polaris	
Equipment Type:	BOOM	
Operation Pressure, Unit:	300 kPa	
Nozzle Type:	AIXR	
Nozzle Size:	110015	
Nozzle Spacing, Unit:	50 cm	
Boom Length, Unit:	4 m	
Boom Height, Unit:	50 cm	
Ground Speed, Unit:	7.2 km/h	
Carrier:	WATER	
Spray Volume, Unit:	100 L/ha	