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Knockdown Control of Flaxleaf Fleabane in Fallow

Trial ID: NGA2402**Location:** Narrabri
Investigator: Kalyx Narrabri**Trial Year:** 2024

An NGA trial in 2022 showed a double knock of glufosinate (e.g. Biffo) followed by either picloram + 2,4 D (Tordon 75-D) or aminopyralid + metsulfuron-methyl (Stinger) significantly improved knockdown control of tall fleabane compared to glufosinate alone. Trials in 2023 indicated that it was the picloram (Group 4 pyridine carboxylic acid) that was providing the herbicide activity, rather than the 2,4-D. Additional trials in 2023 indicated tank mixtures may provide efficacy and management benefits compared to double knocks.

This protocol was designed to evaluate the impact of two common pyridine carboxylic acid active ingredients (picloram (Picoflex) and aminopyralid (Grindstone)) when used as tank mixtures with two rates of glufosinate. Three rates of glufosinate were included as efficacy benchmarks.

Objective:	To evaluate the efficacy of tank mixtures of pyridines and glufosinate
Situation:	Fallow
Application Date:	17/10/2024
Weed:	Flaxleaf fleabane
Weed Stage at Application:	40% at start of elongation, 40% 8-10 leaf, diameter ~5 cm, height 5-12 cm
Weed Density at Application:	30 plant/m²
Nozzles:	AVI 110-010 FLAFAI
Volume:	100 L/ha
Trial Design:	Randomized complete block with 16 treatments x 3 replicates
Plot Size:	2 m x 12 m
Keywords:	Flaxleaf fleabane, knockdown, fallow

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NB: Picoflex (picloram) is registered for fallow use in mixtures but not as a standalone option for flaxleaf fleabane
Grindstone (aminopyralid) is registered for fallow use in mixtures but not as a standalone option for flaxleaf fleabane

Pest Scientific Name Pest Name Assessment Date Assessment Type Assessment Unit Sample Area Treatment/Evaluation Interval			<i>Conyza bonariensis</i> Flaxleaf Fleabane			
			4/11/2024 BURNDOWN % Plot 18 DAA	2/12/2024 VISUAL CONTROL % Plot 46 DAA	2/12/2024 SURVIVING COUNT /m ² 4 x 0.25 m ² 46 DAA	2/12/2024 CONTROL % 4 x 0.25 m ² 46 DAA
Trt No.	Treatment	Product Rate				
16	Untreated	-	0f	0i	32.3a	-
1	Biffo	2l/ha	40de	42fg	13.0bcd	60
2	Biffo	3.75l/ha	73abc	73bcd	4.7cd	85
3	Biffo	10l/ha	95a	92a	0.0d	100
4	Picoflex	157ml/ha	7f	22h	22.3ab	31
5	Picoflex	315ml/ha	5f	30gh	19.7abc	39
6	Biffo Picoflex	2l/ha 157ml/ha	82ab	65cde	3.3cd	90
7	Biffo Picoflex	2l/ha 315ml/ha	62bcd	72b-e	2.7d	92
8	Biffo Picoflex	3.75l/ha 157ml/ha	95a	80abc	0.3d	99
9	Biffo Picoflex	3.75l/ha 315ml/ha	90a	88ab	0.3d	99
10	Grindstone	16ml/ha	0f	15hi	33.7a	0
11	Grindstone	24ml/ha	2f	18h	34.0a	0
12	Biffo Grindstone	2l/ha 16ml/ha	27ef	55ef	7.0bcd	78
13	Biffo Grindstone	2l/ha 24ml/ha	53cde	57def	5.7bcd	82
14	Biffo Grindstone	3.75l/ha 16ml/ha	93a	73bcd	2.0d	94
15	Biffo Grindstone	3.75l/ha 24ml/ha	87ab	75abc	2.7d	92
		LSD P=.05 Treatment Prob.(F)=	27.3 0.0001	17.6 0.0001	16.8 0.0001	n/a n/a

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

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

Assessment Type

BURNDOWN = % Burndown/brown out

DAA = Days after Application

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Trial Year: 2024

Conclusions:

This trial was conducted near Narrabri in October 2024, with treatments applied to a population of ~ 30 elongating flaxleaf fleabane plants/m².

An initial burndown assessment was conducted at 18 DAA (18 days after application). Biffo at 10 and 3.75 L/ha both provided significantly greater burndown (95 and 73 % respectively) than the 2 L/ha rate (40%). Mixtures of Picoflex with Biffo trended to improved burndown ratings than the same rate of Biffo alone but with no clear Picoflex rate response. Picoflex with Biffo 3.75 L/ha provided equivalent burndown ratings to Biffo 10 L/ha alone. Mixtures of Grindstone with Biffo 2 L/ha did not provide a consistent improvement in burndown compared to Biffo 2 L/ha alone, although Grindstone with Biffo 3.75 L/ha provided equivalent burndown ratings to Biffo 10 L/ha alone. Picoflex or Grindstone alone provided negligible burndown.

A visual estimate of % control was made at 46 DAA. There was a significant rate response to Biffo with Biffo at 10 L/ha rated at 92% control. Mixtures of Picoflex with Biffo 2 L/ha significantly increased control compared to Biffo 2 L/ha alone. There was a trend to improved control when Picoflex was mixed with Biffo 3.75 L/ha. Mixtures of Grindstone with Biffo provided less benefit than Picoflex with no clear impact when mixed with Biffo 3.75 L/ha. Picoflex or Grindstone alone provided negligible control.

Surviving weed counts were conducted at the same assessment but the sample size was marginal for the weed distribution. All treatments other than Picoflex and Grindstone alone significantly reduced surviving fleabane counts. There was a non-significant dose response to Biffo with no surviving weeds at the 10 L/ha rate. Mixtures of Picoflex with Biffo 2 L/ha provided 90-92% control and were similar to Biffo 3.75 L/ha alone. Mixtures of Picoflex with Biffo 3.75 L/ha provided 99% control and were similar to Biffo 10 L/ha alone. Mixtures of Grindstone with Biffo provided less benefit than Picoflex. There was no indication of a dose rate response to either Picoflex or Grindstone in surviving weed counts. Picoflex or Grindstone alone provided negligible control.

In this situation, Picoflex mixtures with Biffo provided a useful level of benefit compared to Biffo alone. The benefit from Grindstone mixtures with Biffo appeared marginal. Additional research into the impact of picloram mixtures with glufosinate appears warranted on a wider range of weeds and under varied conditions. This data indicates that mixtures of picloram and glufosinate may provide improved control than glufosinate alone.

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Pest Stage at Application	
Pest:	Flaxleaf Fleabane
Stage Majority, %:	31, 40%
Stage Minimum, %:	19, 40%
Stage Maximum, %:	33, 10%
Diameter Average:	5 cm
Diameter Min/Max:	3, 6
Height Average:	7 cm
Height Min/Max:	5, 12
Density Average:	30 m ²

Application Description	
Application Date:	17/10/2024
Application Start Time:	12:05 PM
Application Stop Time:	1:28 PM
Application Timing:	LATE POST EM
Application Placement:	FOLIAR
Applied By:	Liam Donaldson
Air Temperature Start, Stop:	25.1, 25.1 C
% Relative Humidity Start, Stop:	55, 55
Wind Velocity & Direction Start:	11.1 km/h, ENE
Wind Velocity & Direction Stop:	11.1 km/h, ENE
Wet Leaves (Y/N):	No
Soil Moisture:	SLIGHTLY WET

Application Equipment	
Application Equipment:	HBM 094
Equipment Type:	SPRAYER
Operation Pressure:	300 kPa
Nozzle Model:	AVI 110-010
Nozzle Type:	FLAFAI
Nozzle Spacing:	50 cm
Boom Length:	2 m
Boom Height:	50 cm
Ground Speed:	4.7 km/h
Application Amount:	100 L/ha

Rainfall:

Closest Weather Station:	Silo weather
Distance:	2 km

Date	Amount	Unit	Comments
16/10/2024	6.8	mm	
17/10/2024	3.5	mm	
18/10/2024	0.2	mm	
19/10/2024	17.4	mm	
20/10/2024	0.5	mm	
14/11/2024	1.6	mm	
18/11/2024	10	mm	
19/11/2024	0.3	mm	
20/11/2024	36.7	mm	
28/11/2024	2.3	mm	
29/11/2024	20.7	mm	
30/11/2024	19.1	mm	
1/12/2024	51.5	mm	