GOA trial site report

Residual herbicides applied in wheat crops to reduce the incidence of fleabane and other weeds in subsequent summer fallows.

Grain Orana Alliance

Trial Code:	GGWE07724-2
Season/Year:	Winter 2024
Location:	Narromine
Collaborators:	Tim Roberts
Trial Establishment Date:	5/07/2024

Keywords

GGWE077, Fleabane, sow thistle, caltrop, fleabane, summer fallows, resistance, in-crop herbicides, residual activity, application timing, Narromine

Background

- At the 2022 Narromine 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 in ST, FB and windmill grass have arguably had the greatest impact on these rising costs of managing summer fallows.
- FB (*Conzya bonariensis*) often germinates during the spring period. Often not controlled by earlier in crop applications. Following crop harvest FB is already established and coupled with increased tolerances and/or resistances to a range of typically used fallow management herbicides, reliable control is often difficult and expensive. As such contributing significantly to the costs of managing summer fallows.
- Given the timing of the weeds germination and establishment it is hypothesised that being able to apply residual herbicides within the winter crop may prevent FB establishing and being present post-harvest, and if possible, indirectly reducing the higher fallow management costs associated with the weed.
- This approach has been previously identified utilising Lontrel Advance (Clopyralid) and has been widely adopted by industry. However, an improved understanding of how to finesse the use of this product including the timing of application, could be very beneficial. There is also suite of other products that

could also be utilised in this approach but have not been benchmarked to inform practices but also offer some alternate herbicide mode of action choice to growers.

- To test the validity of this management approach and compare products to reduce costs in managing fallows a series of herbicide trials were established under a NGN project over the period of 2023 and 2024.

Aims

- To investigate a range of residual herbicides that could be applied in wheat crops during the growing season for their impact on-
    - on FB germinations, establishment and growth in the subsequent fallow period
    - any other weeds over the summer fallow period.
- Assess if any of these residual herbicides may impacts on the establishment of the subsequent crop.

Methodology

- The trials were established as, randomised and replicated small plot trials.
- Potential herbicide treatments were applied to a commercially sown barley crop, in a paddock predicted to have a high FB seed bank.
- Herbicides were applied at predetermined growth stages of the crop. This was done as-
    - Some herbicides are only labelled to be applied within certain crop growth stages
    - Increasing crop canopies may intercept herbicide spray, preventing the product reaching the ground or resulting in uneven coverage of the ground thus potentially limiting the residual effectiveness to control emerging weeds
- At the timing of each herbicide timing, plots receiving residual treatments at that time were also treated with non-residual knockdown herbicides to control any preexisting germinations of FB as detailed below.
- Following each assessment during the fallow period all plots were sprayed out with a non-residual knockdown so that any subsequent count was a function of any ongoing residual effectiveness of the original treatments applied.
- Specific herbicides timing and the non-residual knockdowns used are detailed below-
    - Early-timing applied 5/7/2024:
        - Crop at Z14-20 growth stage
        - MCPA Amine® or Amicide Advance applied to remove plants present so residual effectiveness can be assessed.
    - Mid-timing (30/07/2024):
        - Crop at Z25-27 growth stage
        - Amicide Advance applied to remove plants present so residual effectiveness can be assessed.
    - Late-timing (28/08/2024):
        - Crop >Z32 stage

- Amicide Advance applied to remove plants present so residual effectiveness can be assessed.

The trial site was discontinued 02 the 20/02/2025 as the grower was to lime the paddock which involved offset ploughing.

Table 1Herbicdes tested and application rate/ha

Product and rates (mL/ha)	**Application timing**	**Target Zadok stage**
Amicide® Advance @ 1400	Early	Z14-Z20
Aptitude® @ 200 + MCPA Amine 750 @ 300	Early	Z14-Z20
Diuron WDG @ 280 + MCPA Amine 750 @ 330	Early	Z14-Z20
Mateno® Complete @ 1000	Early	Z14-Z20
Rexade® @ 100 + MCPA LVE 570 @ 400	Early	Z14-Z20
Amicide® Advance @ 1400 + Grindstone® @ 32	Mid	Z25-Z27
Amicide® Advance @ 1400 + Lontrel® Advanced @ 150	Mid	Z25-Z27
Amicide® Advance @ 1400 + Lontrel® Advanced @ 75	Mid	Z25-Z27
Amicide® Advance @1400 + Picoflex® @110	Mid	Z25-Z27
Amicide® Advance @ 1400 + Trezac® @ 200	Mid	Z25-Z27
Amicide® Advance @1400	Very late	>Z32
Amicide® Advance @1400 + Lontrel® Advanced @ 150	Very late	>Z32
Lontrel® Advanced @ 150	Very late	>Z32
UTC		

Table 2: Monthly rainfall[1] (mm) and long term average (LTA)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2024	114	45	64	82	59	49	45	52	9	41	75	69	**704**
2025	56	32	64	43	49	42							**286**
LTA	60	50	50	43	41	44	43	38	39	48	48	48	**552**

Site Selection: This site was selected because it has a long history of weed infestations.

Results

The site was checked frequently by GOA as follows:

- 2/12/2024 no fleabane was observed, and 3 spiny emex plants across the whole site
- 30/12/2024 no broadleaf weeds were observed, site was reset (Sprayseed)
- 20/02/2024 no broadleaf weeds were observed

Discussion

It was observed that only a small cohort of weeds were present immediately after harvest and in the 2 months that followed. It is unexplained the lack of weeds present but possible explanation could be that the site was inadvertently sprayed by the growers' spray applicator although nothing was reported by the grower.

If the trial was not over sprayed by the grower the lack of weeds present highlight one of the issues with the use of in-crop residual herbicides, in that there is a chance that the weeds either are not present or did not germinate (regardless of the herbicide program) making the application of the residual a waste of time and in fact would add unnecessarily to the management costs of the summer fallow rather than save them.

Conclusions

No clear conclusion can be drawn from this trial as it was unclear if the site was inadvertently sprayed by the grower or that there was a true lack of weeds germinating in the trial area whilst the trial was underway.

Acknowledgements

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[1] Gridded data from: Access Gridded Data | LongPaddock | Queensland Government

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Appendix

Spray application details

Spray Application	Early	Mid- Z25->Z27	Very Late >Z32
Date applied	5/07/2024	30/07/2024	28/08/2024
Start time	1:15pm	2:00pm	9:30am
Finish time	1:45pm	2:30pm	10:00am
Water rate (l/ha)	100	100	100
Speed (km/hr)	5	5	5
Pressure (bar)	2	2	2
Equipment	Brolga hand boom	Brolga hand boom	Brolga hand boom
Nozzle	Airmix 01	Airmix 01	Airmix 01
Boom height (cm)	50	50	100
Temp (oC)	17.1	14.1	19
Wind velocity (km/hr)	15	13	5
Wind direction	E	SSE	N
Humidity (%)	57	40	67
Δt			4
Cloud cover (%)	0	0	0