
*Figure 1. Mature fleabane with fluffy seeds ready for dispersal. Image: DPIRD.*

# Protecting WA Crops

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## Contents



## Controlling Flaxleaf Fleabane

### At a glance:

- Flaxleaf fleabane has low dormancy and emerges in favourable conditions.
- Seeds that are buried tend to persist longer in the soil compared to those left on the surface – an extra consideration in seeding practices and soil amelioration.
- Environmental stress reduces herbicide efficacy in controlling flaxleaf fleabane.
- There is likely increasing levels of glyphosate resistance in flaxleaf fleabane populations. Future work is required to confirm the resistance status.
- Summer weed control from appropriate herbicides at label rates is effective on small plants, but efficacy was reduced on more mature plants.
- Grazing can be effective at reducing fleabane seed set, although more research is required to confirm this.

Flaxleaf fleabane (*Conyza bonariensis*) is an increasingly problematic weed, particularly in spring – a trend likely intensified by climate change. Plants can grow up to 1 metre tall, with grey-green leaves and stems that branch from the base. The plant produces small whitish flowers and large numbers of seeds, which enable it to spread rapidly. Although plants are relatively uncompetitive during early growth stages, once established, fleabane becomes difficult to control due to its deep taproot and ability to reshoot after disturbance.

A national research initiative, led by the University of Queensland (UQ) in collaboration with the Department of Primary Industries and Regional Development (DPIRD) and the Grains Research and Development Corporation (GRDC), is investigating seed dormancy, germination ecology, seed bank longevity, and optimal control strategies for five emerging weed species, including flaxleaf fleabane. DPIRD is conducting the trials specific to the Western region.

## Seed dormancy and emergence

Understanding weed emergence patterns is vital for successful management. These patterns can vary due to genetic differences between populations, environmental conditions during seed development, and the conditions at the time of emergence. Glasshouse trials have been used to assess both short- and long-term dormancy, emergence behaviour across multiple fleabane populations, and seed bank persistence. Fleabane populations from Northam, Badgingarra, Scaddan, Albany and Ravensthorpe were assessed.

Fleabane seeds were monitored over a 12-week period to assess germination rates prior to the application of gibberellic acid, which was used to stimulate the germination of dormant seeds. Most seeds from all populations germinated within the first month, following exposure to moisture, indicating a low seed dormancy rate. Dormant seeds (those that only germinated following gibberellic acid treatment) ranged from 0–4% of seeds across the populations. However, significant differences were observed between seed origins with populations from Northam and Badgingarra showing the lowest germination rates, while those from Scaddan and Ravensthorpe had the highest.

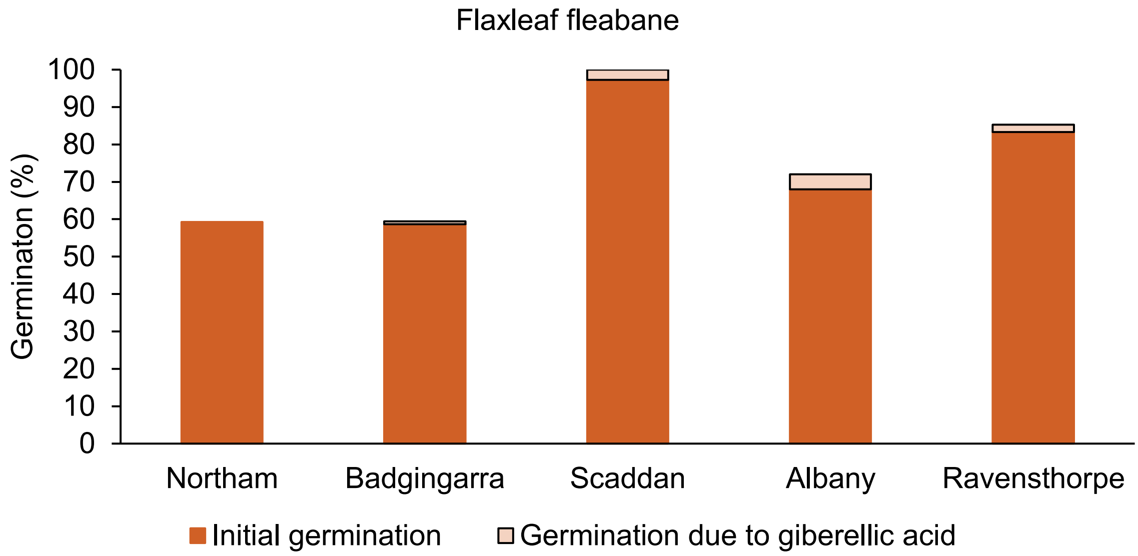



*Figure 2. Total germination of flaxleaf fleabane, consisting of initial germination over 12 weeks and additional germination following exposure to gibberellic acid (i.e. germination of dormant seeds). Image: DPIRD.*

With fleabanes high initial germination rates and low dormancy, most of the weed seed bank could be removed if good control is achieved in the first month before plants are established.

## Seed bank persistence

To date, only the first season of the three-year seed bank persistence trial has been completed. Early findings suggest that fleabane seeds buried at a depth of 2 cm had higher persistence compared to those left on the soil surface. This is likely because surface seeds either germinate or degrade more rapidly. Previous research supports this observation, showing that weed seed banks tend to break down faster on the soil surface, while burial can promote dormancy and prolong seed viability. These early results suggest that leaving seeds on the soil surface (i.e. using a disc sowing system rather than knife points) will allow the seed bank to degrade more rapidly.

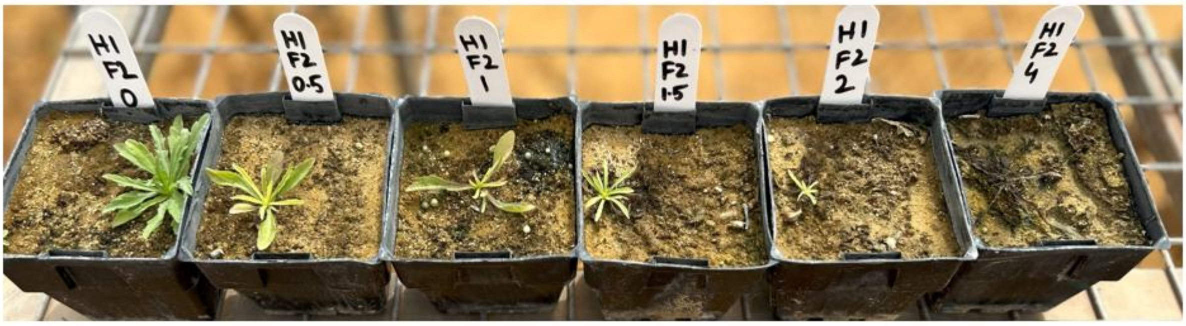
## Herbicides

Herbicide response in weeds can vary widely between populations, especially in summer-growing species under stress. While some differences may be due to herbicide resistance, they often reflect natural variation in how different populations tolerate herbicides. This tolerance can be genetic, triggered by environmental stress (like heat or drought), or influenced by conditions experienced by the parent plants. Understanding these differences is important for recommending the correct herbicide rates.

Pot trials were conducted on four populations of flaxleaf fleabane during the spring–summer period of 2024–2025, testing two herbicides: glyphosate at 741 g active ingredient (a.i.)/ha (Roundup UltraMAX® at 1.3 L/ha) and 2,4-D ester at 1156 g a.i./ha (2,4-D LV Ester 680 at 1.7 L/ha), each applied at six different rates. To support plant growth, pots were irrigated; however, water was limited to simulate typical summer conditions.

The results of this trial indicate that it is difficult to control flaxleaf fleabane at the label rate after exposure to environmental stress, with results varying for different populations. Logistically, it’s difficult to control summer weeds at the seedling stage, especially when the weeds emerge prior to or during harvest. Higher rates (where permissible on the label) are recommended for older weeds, or green-on-brown can be used detection to allow higher rates to a limited area

Additionally, the results indicate that some populations of fleabane are likely resistant to glyphosate, although little resistance testing has been done on this summer weed in WA.




**Glyphosate-susceptible fleabane**


**Glyphosate-resistant fleabane**

*Figure 3. Susceptible and resistant populations of fleabane at 0, 0.5, 1, 1.5, 2 and 4 times the label rate of glyphosate (Roundup UltraMAX® at 1.3 L/ha). Image: DPIRD.*

A previous DPIRD project, *Alternatives to Glyphosate*, identified several herbicides effective at controlling summer weeds during early growth stages. However, since it's not always feasible to target young, unstressed flaxleaf fleabane, a new trial was designed to investigate herbicide application timing. Treatments were applied either during the middle of the day – when plants are typically stressed – or at night, when conditions are cooler. A simulated grazing treatment (mowing) was also included to assess its impact on seed set.

The trial demonstrated that a range of herbicides can effectively control mature fleabane and significantly reduce the viability of remaining seed, however the spraying time (day vs night) made little difference to the herbicide efficacy. Mowing also proved highly effective in lowering seed viability. Although grazing is often overlooked as a weed management strategy due to the plant's ability to resprout and produce seed comparable to untreated areas, this research suggests that if grazing induces sufficient stress to reduce seed viability, it could become a valuable control method. For grazing to be effective, it must be performed consistently or at least every 20 days. Although further research is needed to confirm whether regular grazing reliably reduces seed viability over time.

For more information on fleabane refer to DPIRD's Fleabane and its management factsheet.

# Meet the Crop Protection Team – Dr Nazanin Nazeri

Dr. Nazanin Nazeri is a research scientist working with the Department of Primary Industries and Regional Development (DPIRD) virology team in Perth. Originally from Iran, she earned both her Bachelor and Master of Science degrees in plant pathology and plant virology from Ferdowsi University of Mashhad. It was during her postgraduate studies, that she discovered how much she loved research – the freedom to ask endless questions and chase down answers really sparked her curiosity and passion for science.

In 2008, Nazanin and her husband migrated to Australia to further their studies. She completed her PhD at the University of Western Australia in 2014, focusing on the interactions between plants and mycorrhizal fungi.

Nazanin began her career as a research officer at UWA for several years before joining DPIRD in 2021 as a technical officer. In 2023, she transitioned into her current role as a research scientist.

Outside of her professional life, Nazanin enjoys spending quality time with her family and reading.