Spraying young flaxleaf fleabane is the key for best control

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Flaxleaf fleabane is a major weed of cropping in southern Queensland and northern New South Wales, and is emerging as a problem in other cropping regions of Australia. In the northern grain region it is particularly difficult-to-control in zero-tilled fallows.

Many populations in this region have developed elevated levels of glyphosate tolerance, making it virtually impossible to control with field rates of glyphosate. In several overseas countries populations of flaxleaf fleabane, as well as some other fleabane species, have been classified as glyphosate resistant.

Although there are several fleabane species in Australia, the main species infesting cropping paddocks is flaxleaf fleabane (*Conyza bonariensis*).

Flaxleaf fleabane germination is favoured by the environments associated with conservation cropping systems. Seed germination is optimal under cool and moist conditions, and will only occur when seeds are on or close to the soil surface that stays moist for a prolonged period.

This means seedlings emerge abundantly in compacted soil, furrows and zero-tilled soils with high stubble levels.

This weed is one of the most prolific seed producers of our northern cropping weeds. One mature plant can produce over 100,000 seeds, which are air-borne, and so can infest large areas within a short period, particularly in zero-tilled glyphosate-based fallows.

Industry experiences

We recently surveyed agronomists for information on their herbicide recommendations for fleabane control in the different parts of common crop rotations and the factors affecting their efficacy. This feedback is being used to assist with herbicide registration and research direction.

KEY MESSAGES...

- Weed age had a large impact on herbicide efficacy for both fallow and in-crop weed control;
- Weed control (biomass reduction) with glyphosate mixes and double knock was reduced from an average of 91 per cent for one month old weeds to 75 per cent for three month old weeds;
- Best fallow control was achieved with double knock treatments, averaging 98 per cent control for one and two month old weeds, but less for three month old weeds;
- Weed control with Group I herbicides used in wheat was reduced from an average of 95 per cent to 57 per cent for one and two month old weeds respectively; and,
- Soil moisture stress also reduced herbicide efficacy but not as markedly as weed age.

TABLE 1: Fleabane control (% on untreated) in two pot experiments with plants growing in either 80–100 per cent of field capacity (optimal) or 20–40 per cent (stressed) at time of spraying

Soil moisture	Tamworth experiment		Toowoomba experiment		Mean
	Small rosette (5 cm diameter)	Medium rosette (10 cm diameter)	Young rosette (1 month old)	Older rosette (2 months old)	
Optimal moisture	97	91	95	57	85
Moisture stressed	89	78	87	57	78
Mean	93	84	91	57	

Fleabane seedlings emerging from under stubble.

Mature fleabane producing large amounts of seeds.

In fallows, small fleabane are generally well controlled, but not completely, with the standard fallow mix of glyphosate plus 2,4–D, provided there is good spray coverage and it is applied under good growing conditions.

A number of glyphosate mixes and sequential applications with paraquat products (known as double knock) are used on larger weeds. But control is variable. These treatments need good growing conditions and high water volumes for the paraquat application for good efficacy.

In wheat, a range of Group I herbicides are providing effective in-crop control provided they are used in combination with a competitive crop. They need good spray coverage and good growing conditions at the time of spraying. Herbicide effectiveness was reported as having decreased as the size of the rosettes increased.

Impact of weed age on efficacy of knockdowns

Last season we investigated the impact of different weed ages on the efficacy of registered herbicides for fleabane control compared with the industry standard for fallow broadleaf weed control. This research was undertaken near Dalby, Qld.

The site had a large infestation with over 250 seedlings per m^2 emerging in May. The same herbicide treatments were applied when the weeds were approximately one month old and predominantly small rosettes (less than five cm diameter), at two months old when the weeds were a mix of small and large rosettes (greater than 10 cm diameter), or at three months old when the weeds were large rosettes and beginning to elongate.

Glyphosate (CT 1.5 L/ha) mixed with 2,4–D (Surpass 475 1.0 L/ha) was compared with:

- Glyphosate + Tordon 75D (0.7 L/ha); and four double knocks (sequential applications seven days apart) of:
  - i) Glyphosate + 2,4–D followed by Sprayseed (2.0 L/ha);
  - ii) Glyphosate + 2,4–D followed by Alliance (2.0 L/ha);
  - iii) Glyphosate + Tordon 75D followed by Sprayseed; and,
  - iv) 2,4–D (Amicide 625 1.5 L/ha) alone followed by Sprayseed.

Overall, the best herbicide treatments across all weed ages were the following double knocks:

- Glyphosate + Tordon 75D followed by Sprayseed (96 per cent);
- Glyphosate + 2,4–D followed by Sprayseed (95 per cent); and,
- Glyphosate + 2,4–D followed by Alliance (92 per cent).

These were substantially better than the commonly used glyphosate + 2,4–D, which had an average of 67 per cent control.

Weed age had a large impact on herbicide efficacy, dropping from an average of 91 per cent for one month old weeds to 75 per cent for three month old weeds.

But some herbicide treatments were less affected by weed age (see Figure 1).

Efficacy of glyphosate + Tordon 75D followed by Sprayseed was not significantly different irrespective of weed age, although there was a small trend towards less control with increasing age (99 per cent to 92 per cent).

Efficacy of the other double knock treatments was significantly reduced with increasing weed age, with the greatest reduction for 2,4–D alone followed by Sprayseed (98 per cent to 68 per cent).

This research was duplicated at a Bellata (Northern NSW) site, which had less rainfall and only a low infestation – approximately 25 seedlings per m^2.

There were very similar results to those at the Dalby site, with all of the double knock treatments being highly effective on one and two month old plants, but efficacy was reduced on three month old weeds. This research will be investigated further this season.

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Impact of double knock on two month old fleabane (centre) compared to untreated.

Steve Walker checking on the contrasting effect of weed age in response to wheat selective herbicides, with one month old weeds treated in left rows and two month old weeds treated in right rows. A difference of only one month resulted in unsatisfactory levels of weed control.

◁5…FLAXLEAF FLEABANE

Impact of weed age on efficacy of selective herbicides

We also investigated the impact of soil moisture stress and weed age or size on the efficacy of Group B and Group I herbicides in two pot experiments conducted at Toowoomba and Tamworth. The herbicides represent those commonly used for broadleaf weed control in wheat.

The weed size and age treatments were achieved differently in the two experiments. At Tamworth, a large number of pots were sown on the same day, and the seedlings varied in their growth rate due to differences experienced in growing conditions. The pots were divided into those with small rosettes, an average of five cm diameter, and those with medium rosettes, an average of 10 cm diameter.

In contrast, half of the pots in the Toowoomba experiment were planted one month apart, resulting in one and two month old rosettes at time of spraying.

For the two weeks prior to and two weeks after spraying, the moisture levels of the soil were adjusted to either 20–40 per cent or 80–100 per cent of field capacity.

All Group I herbicides gave excellent control (95–100 per cent) in both experiments when small or young weeds were treated under optimal soil moisture conditions. Control with Group B herbicide varied between the two experiments.

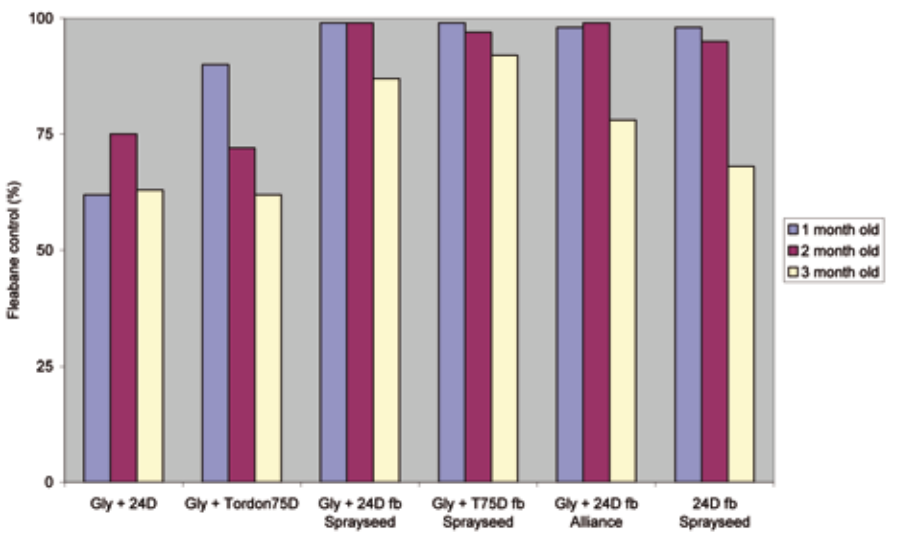
Fleabane control was reduced by an average of eight per cent when small (five cm diameter) or young weeds were moisture stressed at spraying (see Table 1), resulting in less than 90 per cent control.

Efficacy was further reduced when medium sized rosettes (10 cm rosettes) were treated, dropping to an average of 78 per cent in the Tamworth experiment.

More importantly, fleabane control was greatly reduced when older plants were sprayed irrespective of levels of moisture stress. A difference of only one month resulted in a 34 per cent reduction to an unsatisfactory 57 per cent control in the Toowoomba experiment.

The importance of weed age versus weed size will be investigated further in field experiments this season.

FIGURE 1: Control of fleabane when sprayed at three different ages in a fallow paddock near Dalby – assessment was done approximately six weeks after each treatment



Gly = Glyphosate CT; T75D = Tordon 75D; fb = followed by 7 days after first spraying.

Keep the pressure on!

There is no simple answer for reliable control of fleabane. But adopting an Integrated Weed Management strategy, using non-chemical tactics such as crop competition, and effective chemical tactics such as selective in-crop herbicides, residual herbicides, knockdown mixes and double knock, will substantially reduce this problem.

Also, areas adjacent to paddocks need to be kept free of fleabane to prevent new incursions.

The key is to treat small seedlings and prevent seed production on survivors to drive the seed-bank down to low numbers.

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