MANAGING FLEABANE IN THE COTTON SYSTEM

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Summary

Fleabane has become increasingly problematic in the farming system due to its prolific seeding rate, ability to emerge in different seasons and tolerance to glyphosate. It is a major weed of rotations crops, fallows, channels, roads and even cotton.

Diuron has become the herbicide of choice for controlling fleabane in the cotton system, but it is only a matter of time before resistance to diuron develops.

A long term, whole farm integrated approach is needed to manage fleabane, effectively controlling it in all parts of the farming system with a range of tactics, not just relying on one herbicide.

Introduction

Flaxleaf fleabane (*Conyza bonariensis*) is an introduced weed from South America and has been a minor weed of cultivation and pastures for many years. However, more recently it has become increasingly problematic in the farming system due to:

- Its prolific seeding rate. A single plant can produce more than 100 000 seeds,
- Its seed dispersal mechanism, producing small, hairy-topped seeds that can spread kilometres in strong winds,
- Its ability to emerge in different seasons, with emergence most commonly from autumn through spring, but plants can emerge over summer,
- Its ability to germinate from the soil surface, making it ideally suited to zero-tillage situations, and
- Its tolerance to glyphosate. Most fleabane plants in cultivation appear to be around 10 times more tolerant of glyphosate than populations not previously exposed to glyphosate.

Interestingly, there are two other fleabane species commonly found around the cropping areas, Canadian fleabane (*C. canadensis*) and tall fleabane (*C. sumatrensis*). Neither of these species is an important weed in the farming system at present even though Canadian fleabane is a major weed that has developed herbicide resistance in North America (including glyphosate resistance).

Fleabane in the farming system

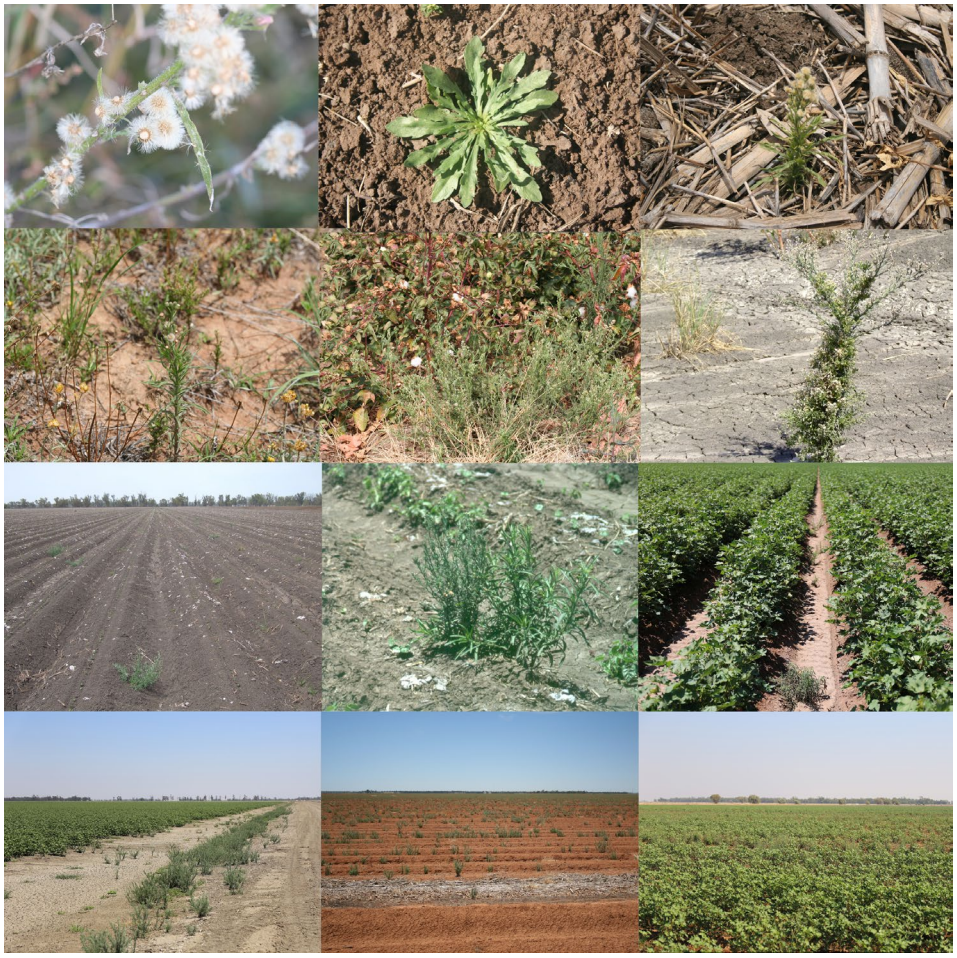
Fleabane seedlings most commonly emerge in autumn and spring, forming

FLEABANE is increasingly becoming an issue in cotton crops. Mature plants are difficult to control with cultivation or chipping – the secret is to control them while they are still young.

small rosette plants that develop deep tap roots. Plant rapidly enter the reproductive phase as temperatures increase in spring and summer, producing masses of seed as they progressively grow in size.

Fleabane plants often go largely unnoticed until they elongate during the reproductive phase. However, they are difficult to control with most herbicides once they enter the reproductive stage and their deep taproot makes them difficult to control with light cultivation. Fleabane plants should never be ignored in a cereal crop as they will be very difficult to control with herbicides post-harvest.

It is essential that fleabane plants are also managed in the other parts of the farming system, including fallows, roadsides, channels and waste areas as these are a ready source of seed to reinfest farmed areas.



FLEABANE is well adapted to minimum tillage and stubble retention situations. Small fleabane plants can produce masses of seed that infest crops, ditches, roadways and fallows.

Managing fleabane

The key focus for managing fleabane must be to control plants while they are still small. Herbicide options for managing fleabane are discussed in "*Managing fleabane in cotton*" in **WEEDpak** on the internet. Just type "**WEEDpak**" and "**Fleabane**" into Google (or another) and follow the links.

Tactics for controlling fleabane should include ensuring that:

- No fleabane seedlings are present when a crop is planted. This can be done by either a complete cultivation pass at planting or using knock-down herbicides prior to planting.
- A residual herbicide should also be included in the system if heavy infestations of fleabane are expected, provided a residual can be selected which will not cause plant-back issues for following crops.

Additionally, in fallows:

- Glyphosate alone will not be enough to control fleabane, even fleabane seedlings, so plan to use a double knock tactic of either two herbicides or a herbicide followed by a cultivation, and
- Don't hesitate to use cultivation as required, it is probably the cheapest herbicide resistance management tool in the tool box.

In cereal crops:

- Seedlings that emerge over winter and spring are controlled with a broad-leaf herbicide before they become reproductive (before harvest).

In summer rotations (sorghum or maize):

- Use a double-knock with a shielded sprayer or inter-row cultivation to remove fleabane seedlings that emerge after the crop,

In cotton:

- Use a residual herbicide before planting, at planting, or as an early lay-by if heavy infestations of fleabane are expected,
- Use a double-knock with a shielded sprayer or inter-row cultivation to remove fleabane seedlings that emerge after the cotton,
- Use chipping or spot spraying to remove escapes, and
- Use a layby at canopy closure to prevent fleabane establishing later in the season .

It is unwise to plant other broadleaf crops such as chickpeas or faba beans in fields where heavy populations of fleabane are expected as it will be very difficult to control fleabane in these crops.

Avoiding the next round of resistance

Fleabane seedlings can be managed fairly easily by using either contact herbicides, residual herbicides or cultivation. However, as with most glyphosate resistant weeds, the trap of using an alternative herbicide to control fleabane is to ensure that control doesn't rely too heavily on a single herbicide or herbicide group.

Diuron has become the herbicide of choice for many growers for controlling fleabane in the cotton system. It is effective, is relatively inexpensive and can be applied prior to crop planting, at-planting or post-planting. However, unless diuron is used as part of an integrated weed management system (including other tactics such as other residuals, knock down herbicides, cultivation and chipping) it is only a matter of time before resistance to diuron develops.

This is the trap that many farmers have fallen into in the US and elsewhere. They used a glyphosate-only approach to weed control until glyphosate resistance became a huge problem. They then changed to the next best herbicide, and found resistance developed to the new herbicide in only a few years. They then move on to another new herbicide to which resistance again developed, and so on until they ended up with weeds resistant to 4 or 6 or more modes of action that can only be effectively controlled with huge inputs of herbicide, cultivation and chipping. This situation is likely to evolve very quickly with wind dispersed weeds such as fleabane and sowthistle, where the rapid and widespread seed movement means that even if diuron (for example) has not previously been used in a field, the chances are that some fleabane plants in the field have blown in from another field or property where there is a history of diuron use and resistance may already have developed.

So, while diuron or atrazine (for example) may be valuable tools for managing glyphosate resistant fleabane, resistance to these herbicides is likely to develop within only a few years unless these weeds are managed in an integrated approach including multiple tactics such as residual and contact herbicides, cultivation and chipping or spot-spraying of escapes.

Conclusion

Fleabane has already developed resistance to glyphosate and is likely to develop resistance to other modes of herbicidal action within the next few years. To manage fleabane, it is essential that a whole farm integrated approach is developed, targeting fleabane seedlings and effectively controlling fleabane in all parts of the farming system with a range of tactics, not just relying on one herbicide or one mode of herbicidal action group.

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