August 2015

Guidelines for minimising the development of glyphosate resistance along fence lines and field margins

KEY POINTS

- Using glyphosate as the only method to control weeds along fence lines and field margins can result in some weeds developing resistance to glyphosate.
- Resistant weeds in these locations can set seed that spreads into the crop or paddock.
- Integrated weed management practices need to be employed in these locations as with the rest of the paddock.
- Trials have identified alternative management options for fence lines and field margins.

BACKGROUND

Fence lines and field margins represent a large number of situations where cases of glyphosate resistance can evolve quickly. If not controlled, weeds grow freely in these areas, and this can lead to weed infestations moving into cropped fields or pasture paddocks. These weeds can also harbour pests and be a fire risk. Glyphosate is often the only herbicide used to control weeds in these areas. In Australia this practice has been found to be a major cause of glyphosate resistance in weeds..

The main factors that contribute to glyphosate-resistant weeds include: repetitive use of glyphosate; lack of plant competition; no other effective herbicides available or used; and little or no other weed control practices employed. Many fence lines and field margins fit all these criteria.

Many landowners prefer to use glyphosate alone for weed control on fence lines due to its wide spectrum and low cost. This practice is a major reason for glyphosate resistant weeds evolving overseas. The lack of competition from the crop or pasture in these areas means that any plant surviving treatment could produce a large amount of seed. If this plant happens to be resistant to glyphosate, then a considerable amount of glyphosate-resistant seed could enter the soil seed bank. The seed could also be easily moved into the field through farm operations or wind.

MANAGEMENT OPTIONS

As glyphosate-resistant weeds along fence lines and in field margins could occur mainly due to repetitive use of glyphosate, no plant competition and no other effective control measure, it should be possible to reduce the risk by changing these practices. Some changes in practice could include:

- Where fences are no longer useful, remove the fence and plant the area into the crop or pasture. This will provide both competition and a change in weed management practices.
- If possible, raise the bottom wire or do not electrify it, as livestock frequently graze pastures very hard under fence lines due to less dung and urine being deposited there.
- Leaving a narrow strip of existing pasture (or introducing other suppressive species such as lucerne/clover) beside the fence and then cultivating the rest of the paddock, is another option for controlling fence-line weeds without the continued use of glyphosate.

- Rather than using the herbicide, mow or slash the weeds along the fence line and cultivate in the field margins. Herbicide should be used only in the area immediately under the wire.
- Plant the crop or pasture as close to the fence line as possible and keep the waste area to a minimum.

OTHER HERBICIDE OPTIONS

Many landowners will continue to want a herbicide option to keep fence lines and field edges free of weeds. Our field trials investigating the herbicide strategies for managing weeds along fence lines have shown that:

- Glyphosate on its own is effective in controlling most weeds present along the fence lines, but new seedlings, mostly annual broadleaf weeds, and some re-growth of perennial weeds start within two months after treatment, requiring regular repeat sprayings.
- It is possible to add another herbicide with a different mode of action to glyphosate to increase the efficacy and more importantly the duration of residual weed control. This can avoid the need for repeat applications during the year and minimise the chances of glyphosate resistance developing. .
- Of the several herbicides and their combinations evaluated, mixtures of glyphosate with either metsulfuron, simazine or terbuthylazine were the most cost-effective. These mixtures provided excellent initial activity on weeds and provided some residual activity.
- The product TAG^{TM}G2 (a mixture of four herbicides, three of which belong to herbicide mode of action groups completely different from glyphosate) has shown good initial efficacy as well as residual activity and could be an acceptable alternative for rotating herbicides to avoid development of glyphosate resistance.

Further information

See also Guidelines for minimising the development of glyphosate-resistant weeds in amenity areas

www.far.org.nz
http://resistance.nzpps.org/
https://eatsafe.nzfsa.govt.nz/web/public/acvm-register

Acknowledgements

These guidelines have been developed as a result of funding from Ministry of Primary Industries Sustainable Farming Fund Project 12/14, *Avoiding Glyphosate Resistance*. This project was led by FAR with support from the Vegetable Research and Innovation Board, the Road Controlling Authority NZ, Dairy NZ, BASF and Nufarm and assistance from Waikato and Horizons Regional Councils.

Authors

Trevor James[1], Anis Rahman[1] and Mike Parker[2]

[1]AgResearch, Ruakura Research Centre, Private Bag 3123, Hamilton 3240, New Zealand

[2]Foundation for Arable Research, P.O. Box 23133, Templeton, Christchurch 8445