August 2015

Guidelines for minimising the development of glyphosate resistance in weeds on dairy farms

KEY POINTS

- Glyphosate resistant weeds are more likely to occur along fence lines, access roads and buildings, drains and effluent ponds.
- Using glyphosate as the only method to control weeds in these areas may result in some developing resistance to glyphosate.
- Resistant weeds in these locations can set seed that spreads into nearby crops or paddocks.
- If glyphosate-resistant weeds are found to be present, seek professional help.

BACKGROUND

Fence lines, access roads, buildings, drains and effluent ponds are situations where cases of glyphosate resistance can evolve quickly. If not controlled, weeds grow freely in these areas. This can lead to weed infestations moving into cropped 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 a major cause of glyphosate resistance in weeds.

The main factors that contribute to glyphosate-resistant weeds include: repetitive use of glyphosate; lack of 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 the 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.

Overseas experiences with glyphosate resistance show that some weeds appear to be more prone to this than others. Weeds to watch out for include: fleabanes, annual poa, crowfoot grass, beggars' ticks and sow thistle. If glyphosate-resistant weeds are suspected to be present, seek professional help.

MANAGEMENT OPTIONS

As glyphosate-resistant weeds along fence lines and in paddock margins could occur mainly due to repetitive use of glyphosate, no 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.

- When cropping, leave a narrow strip of existing pasture, or introduce other suppressive species such as lucerne/clover, beside the fence and then cultivate the rest of the paddock.
- Mow or slash the weeds along the fence line and cultivate in the field margins. Ideally, herbicide should be used only in the area immediately under the wire.

OTHER HERBICIDE OPTIONS

Many landowners will continue to want a herbicide option to keep fence lines and paddock edges weed free. 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 could avoid the need for repeat applications during the year and minimise the chances of glyphosate resistance developing .
- The mixture of glyphosate with metsulfuron is one of the most cost-effective for controlling weeds along fence lines. It provides excellent initial and long residual activity against weeds. Terbuthylazine is useful alternative to metsulfuron.
- The product TAG^{TM}G2 (a mixture of four herbicides, three of which belong to groups completely different from glyphosate) showed good initial efficacy as well as residual activity and could be an acceptable alternative for rotating herbicides to avoid development of glyphosate resistance.
- Previously, glyphosate was one of the few herbicides allowed to be used on or close to water. However, with EPA permission, metsulfuron, haloxyfop, imazapyr isopropylamine and triclopyr triethylamine may also be used now. A wider selection of herbicides may be used if drains or ponds are dry.

Further information

Guidelines for minimising the development of glyphosate resistance along fence lines and field margins
Guidelines for minimising the development of glyphosate resistance in weeds in arable and vegetable crops

www.far.org.nz
http://resistance.nzpps.org/
https://eatsafe.nzfsa.govt.nz/web/public/acvm-register
http://www.epa.govt.nz/Publications/Using-herbicides-to-control-aquatic-pest-plants.pdf

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 Rahman1 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