



## **Guidelines for minimising the development of glyphosate resistance in weeds in arable and vegetable crops**

### **KEY POINTS**

- The risk of glyphosate resistance developing on New Zealand arable farms is generally low because most paddocks are treated with herbicides from different mode of action groups during the growing season.
- Exceptions to this could be growers using direct drilling or stale seed bed methods who have a heavy reliance on glyphosate for weed control.
- Fence lines and field margins have a much higher risk than crop paddocks, and as such, have their own guidelines.
- Avoidance strategies for arable growers are based on controlling any weeds that escape from a glyphosate application, by other means. These include cultural controls or the use of a herbicide with a different mode of action.

### **BACKGROUND**

Glyphosate-resistant biotypes of weed species have developed in cropping land in many parts of the world in recent years. This has happened due to the exclusive and repeated use of glyphosate causing selection pressure for individual plants with mutations that allow them to survive exposure to glyphosate. Continuing to apply glyphosate allows such plants to thrive without competition, multiply up and become the dominant vegetation in these sprayed areas. These survivors then set seed, ensuring a high proportion of resistant individuals in the next generation, leading to large population of resistant weeds.

Glyphosate resistance overseas has mostly occurred where glyphosate has been repeatedly used to maintain a fallow or in 'Roundup Ready' genetically modified crops. Neither of these practices are currently used in New Zealand. However, growers with a heavy reliance on glyphosate, such as those using direct drilling or stale seedbed methods could experience some weeds developing resistance to glyphosate if appropriate steps are not taken.

### **MANAGEMENT OPTIONS**

Most problem cropping weeds rely on the establishment of a seed bank to ensure their ongoing survival. During the growing season as well as between seasons, using a range of weed control methods is also key to prevent the development of glyphosate resistance in weeds. Options include:

- Targeting weed seed production and preventing viable seed from being added to the seed bank. Many problem weeds, particularly grass weeds, have seeds that are short-lived in the soil. Australian experience has shown that a few years of preventing seed-set can reduce the seed bank of these weeds by up to 99 percent.
- Having a diverse cropping rotation that allows the use of herbicides with different mode of actions is an important tool for minimising the risk of glyphosate resistance developing in weeds.

- Strategic cultivation can provide control of resistant surface germinating summer weeds and those that have escaped other weed control tactics.
- Target small (pre- to early-tillering/small rosette) actively growing weeds when spraying.
- Use the right dose with correctly calibrated equipment. In some instances water conditioners might be necessary to improve efficacy.
- Monitor paddocks post-spraying and clean up any survivors.
- Headlands and paddock margins are often sprayed repeatedly with glyphosate to keep them weed free. These can be a major source of glyphosate resistance developing. It is important to clean these areas by cultivation, mowing or judicious use of herbicides.

### **Further information**

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

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

[www.far.org.nz](http://www.far.org.nz)

<http://resistance.nzpps.org/>

<https://eatsafe.nzfsa.govt.nz/web/public/acvm-register>

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