

Moderate resistance risk

Globally, herbicide resistance to the Group 9 herbicide mode of action has been confirmed and documented in more than 50 weed species across more than 30 countries.

Resistance to Group 9 herbicides is significant given it is the most important and most widely used herbicide.

Group 9 resistance occurs in Australia in 20 weed species including more than 2,000 populations of annual ryegrass, more than 500 populations of awnless barnyard grass, brome grass, more than 100 populations of common sow thistle, 2000 populations of feathertop Rhodes grass, and more than 100 populations of flax-leaf fleabane.

The following factors are common to all cases of Group 9 resistance:

1. Lack of rotation with other herbicide modes of action;
2. A Group 9 herbicide has been used for 12 – 15 years or more; and
3. There has been minimal or no soil disturbance following application.

Given the very important role of glyphosate in Australian farming systems, the Australian agricultural industry has developed strategies for sustainable use of glyphosate. For more information refer to the Australian Glyphosate Sustainability Working Group website <https://webarchive.nla.gov.au/awa/20200113011304/http://pandora.nla.gov.au/pan/179386/20200109-1842/glyphosateresistance.org.au/index.html>.

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A number of these cases of resistance to glyphosate have occurred in horticultural (vines, tree crops, vegetables) and non-cropping situations (e.g. airstrips, railways, firebreaks, fencelines, roadsides, driveways, irrigation ditches, around sheds), with the balance occurring in no-till broadacre cropping systems.

To assist in delaying the onset of resistance, consider alternating Group 9 herbicides with herbicides from other modes of action, such as Group 22 (e.g. paraquat), Group 10 (e.g. glufosinate) or Group 34 (e.g. amitrole).

Given the demonstrated propensity of weeds to develop resistance to multiple herbicide classes, Integrated Weed Management principles should be incorporated wherever possible to minimise

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the risk of selecting for glyphosate resistance. Strategies may include the use of cultivation, the double knock technique¹, strategic herbicide rotation, grazing, baling etc.

For further information in canola: <http://www.roundupreadycanola.com.au/prod/media/3672/rr-canola-technologies-rmp.pdf>.

For further information in cotton: <http://www.cottoninfo.com.au/publications/herbicide-resistance-management-strategy> and http://www.bollgard3.com.au/prod/media/1708/m0074-weed-resistant-management-plan_v15.pdf.

The above recommendations should be incorporated into an Integrated Weed Management (IWM) program. In all cases try to ensure surviving weeds from any treatment do not set and shed viable seed. Keep to integrated strategies mentioned in this brochure including cultural weed control techniques to reduce the weed seedbank. Make sure you mix and rotate herbicides from different mode of action groups. Always consult the product label prior to use.

Chemical family	Active constituent (first registered trade name)
GROUP 9	
Inhibition of 5-enolpyruvyl shikimate-3 phosphate synthase (EPSP inhibition)	
Glycines	glyphosate (Arsenal Xpress®*, Bantox®, Broadway®*, Firestorm®*, Illico®*, Resolva®*, Roundup®, Sandoban®*, Tough Roundup® Weedkiller*, Trounce®*, Pathweeder®*)

* This product contains more than one active constituent

Notes:

1. The formatting lists chemical families, approved active constituents and, in parenthesis, the trade name of the first registered product or successor. Refer to the APVMA website (www.apvma.gov.au) to obtain a complete list of registered products from the PUBCRIS database.

¹ The double knock technique is defined as using a full cut cultivation OR the full label rate of a paraquat-based product (Group 22) following the glyphosate (Group 9) knockdown application.

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