

Managing resistance in pre-emergent herbicides

Pre-emergent herbicides in cereals have become the most important weed management tool in broadacre cropping.

As always, the herbicides we rely on the most are the ones most likely to encounter increasing resistance. The greatest use creates the greatest risk.

Pre-emergents under pressure

Twenty-five years ago, the key herbicides in broadacre cropping were all sprayed in-crop for post-emergence control.

Group 1 and 2 (then Group A and B) were used so widely and so often on annual ryegrass (ARG) that – as the graph below shows – resistance to them has now been recorded at over 20,000 sites.

If they were still the only modes of action we had to control ARG, cropping would not be economic in most areas.

Now that the focus has shifted so strongly to the pre-emergence window, we need to manage the pre-em herbicides from each mode of action group to make sure they don't become equally ineffective.

There is already resistance recorded to every pre-emergent grass herbicide Mode of Action except Group 30.

Group 15 chemistry at risk

Resistance develops at different rates to different modes of action.

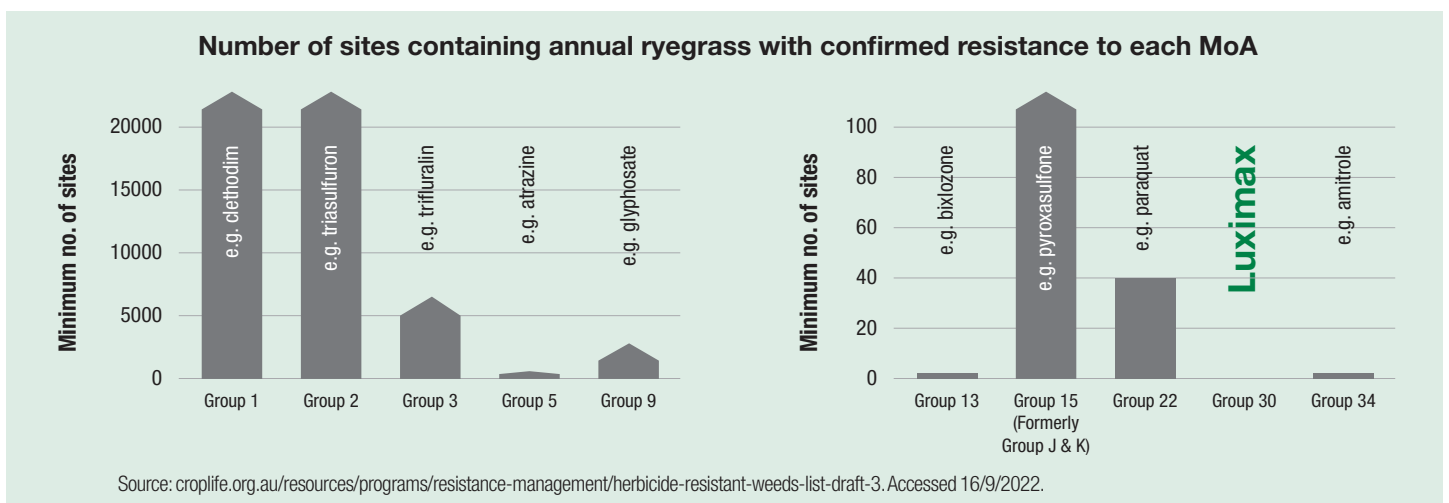
Trifluralin (Group 3) has been around for decades, but resistant ARG populations only became widespread once it became a mainstay of the program.

2020 modelling of inadequate chemical rotation by Busi et al. showed the time taken to develop resistance in trifluralin is unusually long.¹ We cannot expect Group 15 herbicides like Sakura* and Boxer Gold* to last as long if we use them as intensively.

In 2015, only 7 years after it was launched, the regular GRDC/AHRI random resistance survey in WA found 11% resistance to one of Boxer Gold's two active ingredients.²

Group 15 chemistry has now been used in Australia for 14 years.

We need to act to protect Group 15's long-term effectiveness now.



Maintain the highest levels of grass-weed control. Visit crop-solutions.basf.com.au or call 1800 558 399



Extending the rotation

There are now two more highly effective pre-emergent herbicides wheat growers can use to control ARG and other grass weeds instead of or as well as Sakura and Boxer Gold: Luximax® (Group 30) and Overwatch* (Group 13).

The slight drawback with Overwatch is that there is already some resistance to its MoA, which is classified as Moderate risk.³

Trifluralin still also has a role as a tank-mix partner or even as a standalone treatment in seasons when ARG has been previously so effectively controlled that pressure is low.

An ideal complex rotation that takes maximum advantage of all the modes of action available could look something like this:

■ Group 3 ■ Group 13 ■ Group 15 ■ Group 30

Paddock	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
1	Luximax	Trifluralin	Overwatch	Sakura	Trifluralin	Boxer Gold
2	Trifluralin	Luximax	Sakura	Overwatch	Boxer Gold	Trifluralin
3	Luximax	Trifluralin	Luximax	Sakura	Trifluralin	Overwatch
4	Trifluralin	Luximax	Boxer Gold	Luximax	Overwatch	Sakura
5	Luximax	Sakura	Luximax	Trifluralin	Boxer Gold	Trifluralin
6	Sakura	Luximax	Trifluralin	Luximax	Trifluralin	Luximax
7	Boxer Gold	Trifluralin	Luximax	Trifluralin	Luximax	Trifluralin
8	Overwatch	Trifluralin	Boxer Gold	Luximax	Sakura	Luximax
9	Trifluralin	Overwatch	Trifluralin	Boxer Gold	Luximax	Trifluralin
10	Trifluralin	Boxer Gold	Trifluralin	Sakura	Trifluralin	Luximax

Example of herbicide rotation plan, should not be considered a recommendation.

The 30/30 Plan

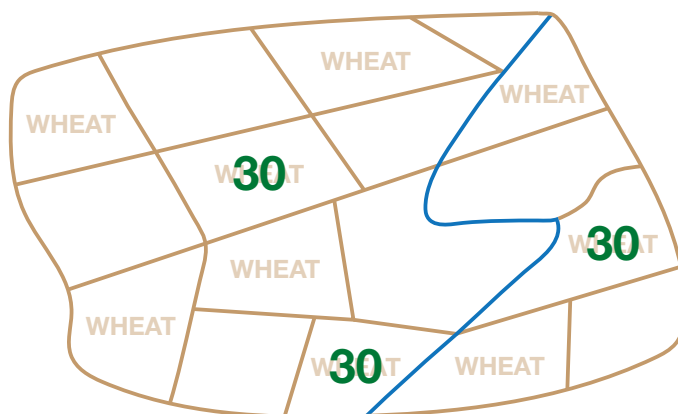


Not all growers will be happy to manage a rotation quite that complex. That's why BASF are proposing a simpler rule of thumb: **just apply Luximax's Group 30 chemistry to at least 30% of the wheat crop[^] each year.**

There is no recorded resistance to Luximax and it is not at the same level of cross-resistance risk as chemicals in other MoA groups.³ So it is the key product for resistance management.

In summary, adopting the 30/30 plan will enable you to:

- maintain the highest levels of grass-weed control
- control annual ryegrass with resistance to other modes of action
- keep other products like Sakura, Overwatch, Boxer Gold and even trifluralin in the program while easing the resistance pressure on them.



Find out more about **Luximax** and the 30/30 Plan by scanning this QR code or visit crop-solutions.basf.com.au

References: 1. Busi R et al. *Pest Manag Sci* 2020 76(2): 487–96. 2. AHRI Resistance Surveys summary April 2022 (<https://www.ahri.uwa.edu.au/wp-content/uploads/2022/03/Herbicide-Resistance-Surveys-summary-April-2022.pdf>). 3. croplife.org.au/resources/programs/resistance-management/herbicide-resistance-management-strategies-2-draft/ accessed 11/10/2022.

ALWAYS READ AND FOLLOW LABEL DIRECTIONS BEFORE USING ANY PRODUCT IN THIS TECHNOTE.

This technote is intended as general advice. The information submitted in this publication is based on current BASF knowledge and experience. © Copyright BASF 2022 © Registered trademark of BASF.

* Registered trademarks. ^ Not Durum. 212791 10.2022

BASF
We create chemistry