

## **A new mode of action (MOA) pre-emergence herbicide for the control of annual ryegrass (*Lolium rigidum* Gaud.) and other monocotyledon weeds in cereals in Australia**

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**Summary** With many weeds resistant to common herbicide active ingredients (PSII-, ALS- and ACCase-inhibitors), farmers around the world are seeking new weed management options. In Australian winter cereals there has been a shift away from reliance on post-emergence graminicides to an increased emphasis on pre-emergence applications. Cinmethylin currently belongs to the cluster of herbicides with an unknown mode of action (HRAC Group Z). However, new research from BASF has identified this molecule to act *via* a totally new mode of action. Cinmethylin was tested as a pre-emergence herbicide in Australia during the 2014–2017 growing seasons. Its efficacy and crop safety was evaluated at different application timings: incorporated by sowing (IBS), post-sowing pre-emergence (PSPE) and early post-emergence (EPE). Field trials were conducted at various rates across the main cereal growing regions of Australia,

targeting a number of monocotyledon weeds. Compared, primarily, to pyroxasulfone and S-metolachlor + prosulfocarb, cinmethylin demonstrated effective control of annual ryegrass (*Lolium rigidum* Gaud.) including resistant biotypes. Furthermore, good activity was displayed against other cool season grasses such as wild oat (*Avena* spp.), brome grass (*Bromus* spp.) and barley grass (*Hordeum* spp.). Different crops showed variable level of tolerance to cinmethylin, which was related to parameters such as soil application timing, conditions at sowing, sowing depth and rainfall patterns after sowing. Furthermore, cinmethylin was screened in the laboratory to determinate efficacy on annual ryegrass (*L. rigidum* Gaud.) resistant to other modes of action, showing high levels of control on all tested biotypes.

**Keywords** Cinmethylin, pre-emergence, cereals, annual ryegrass.