

# K – ANNUAL RYEGRASS CONTROL WITH NEW PRE-EMERGENT HERBICIDES AND MIXTURES

**AUTHORS:** Chris Preston, University of Adelaide and Rebekah Allen, Hart Field-Site Group

## BACKGROUND

Herbicide resistance in grass weeds is a major constraint to crop production. Due to resistance to post-emergent herbicides, the main control tactics used in wheat for annual ryegrass control are now pre-emergent herbicides. It is important that pre-emergent herbicides are used as effectively as possible. New mode of action herbicides are being developed for annual ryegrass; however, there is limited information about the efficacy of mixtures of these new herbicides with existing herbicides to obtain higher levels of annual ryegrass control in wheat.

**Trial aim:** to evaluate the effects of new pre-emergent herbicides Luximax (active ingredient cinmethylin) and Overwatch (active ingredient bixlozone) alone or in mixtures with existing pre-emergent herbicides on annual ryegrass control.

## TRIAL DETAILS

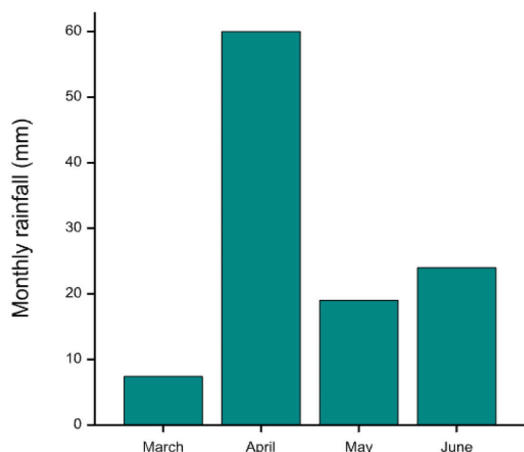
*Location – Hart field site, SA*

Ryegrass seed was broadcast at 5 kg/ha on May 19. Herbicides were applied IBS on May 20 prior to Scepter wheat sown with a standard knife-point press wheel system 22.5 cm (9") row spacing with 80 kg/ha DAP. Herbicides used are listed in Table 1.

**Table 1. Pre-emergent herbicide treatments applied for the management of ryegrass in wheat at Hart in 2020.**

Herbicide treatment	Rate of product (xx/ha)
1. Nil	-
2. Arcade	3 L
3. Avadex Xtra	2 L
4. Sakura	118 g
5. Sakura Flow	210 mL
6. Sakura + Avadex Xtra	118 g + 2 L
7. Arcade + TriflurX	3 L + 1.5 L
8. Luximax	500 mL
9. Luximax + Sakura	500 mL + 118 g
10. Luximax + Avadex Xtra	500 mL + 2 L
11. Luximax + Arcade	500 mL + 3 L
12. Overwatch	1.25 L
13. Overwatch +Sakura	1.25 L + 118 g
14. Overwatch + Avadex Xtra	1.25 L + 2 L
15. Overwatch + Arcade	1.25 L + 3 L

Excellent rains occurred in early autumn leading to a moist soil profile at sowing (Figure 1). However, rainfall during May and June was below average. This likely influenced the ability of Sakura to be activated and control annual ryegrass.



**Figure 1. Monthly rainfall at Hart in 2020.**

There was no significant effect of herbicide treatment on crop emergence in 2020 (Table 2). Most pre-emergent herbicides are safe on wheat when used with a knife-point press wheel seeding configuration. However, damage can occur with some pre-emergent herbicides if the furrow wall collapses or herbicide-treated soil is moved into the crop row.

Overwatch often produces crop effect on wheat as bleaching of young leaves. Crops grow out of this effect and in our trials, there has been no effect on crop yield to date. Mixtures of Group K herbicides with Luximax can result in crop yield loss and are not recommended. The mixture with Sakura used here can be particularly problematic. While the crop establishes normally, growth is affected leading to yield loss.

Both Luximax and Overwatch provided good control of annual ryegrass. Control was improved with these herbicides when compared to existing pre-emergent herbicides. The rate of Avadex Xtra used in this trial is too low when used as a stand-alone product for the control of annual ryegrass.

Luximax is the most soluble of the herbicides used in this trial and would have been least affected by the relatively dry conditions after sowing. Overwatch is a little more soluble than both Sakura or Arcade and this would have helped its performance in the drier conditions after sowing in 2020. While pre-emergent herbicides have generally worked well in 2020, situations with low rainfall after sowing, such as at Hart, have seen reduced performance of Sakura, while Overwatch and Luximax have performed well.

**Table 2. Effect of different pre-emergent herbicides on wheat establishment and annual ryegrass plant numbers 4 WAS at Hart in 2020.**

Herbicide treatment	Crop establishment (plants/m <sup>2</sup> )	Annual ryegrass (plants/m <sup>2</sup> )
1. Nil	164	183 f
2. Arcade	174	123 e
3. Avadex Xtra	165	120 e
4. Sakura	158	85 de
5. Sakura Flow	168	70 bcde
6. Sakura + Avadex Xtra	165	48 abcd
7. Arcade + TriflurX	174	82 cde
8. Luximax	144	10 a
9. Luximax + Sakura	160	11 a
10. Luximax + Avadex Xtra	145	11 a
11. Luximax + Arcade	161	16 ab
12. Overwatch	188	26 abc
13. Overwatch + Sakura	156	20 ab
14. Overwatch + Avadex Xtra	171	20 ab
15. Overwatch + Arcade	158	12 a

Mean values within column followed by different letters are significantly different.

#### ACKNOWLEDGEMENTS

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## New pre-emergent herbicides for grass and broadleaf weed control trial plan

B	Buffer	Buffer	Buffer
1	Untreated control	Avadex Xtra (trilalate) 2.0L/ha	Luximax 500 ml/ha
2	Sakura 118 g/ha	Sakura 118 g/ha	Luximax 500 ml/ha + Sakura 118 g/ha
3	Sakura Flow 210 ml/ha	Luximax 500 ml/ha + Arcade (prosulfo carb) 3.0 L/ha	Avadex Xtra (trilalate) 2.0L/ha
4	Sakura 118 g/ha + Avadex Xtra (trilalate) 2.0 L/ha	Luximax 500 ml/ha + Avadex Xtra (trilalate) 2.0 L/ha	Sakura 118 g/ha + Avadex Xtra (trilalate) 2.0 L/ha
5	Arcade (prosulfo carb) 3.0 L/ha	Overwatch 1250 ml/ha	Overwatch 1250 ml/ha + Sakura 118 g/ha
6	Avadex Xtra (trilalate) 2.0L/ha	Luximax 500 ml/ha + Sakura 118 g/ha	Arcade (prosulfo carb) 3.0 L/ha
7	Luximax 500 ml/ha	Sakura Flow 210 ml/ha	Untreated control
8	Luximax 500 ml/ha + Avadex Xtra (trilalate) 2.0 L/ha	Overwatch 1250 ml/ha + Sakura 118 g/ha	Sakura 118 g/ha
9	Luximax 500 ml/ha + Arcade (prosulfo carb) 3.0 L/ha	Arcade 3.0 L/ha + 1.5L Trifluralin	Luximax 500 ml/ha + Avadex Xtra (trilalate) 2.0 L/ha
10	Luximax 500 ml/ha + Sakura 118 g/ha	Overwatch 1250 ml/ha + Avadex Xtra (trilalate) 2.0 L/ha	Overwatch 1250 ml/ha
11	Overwatch 1250 ml/ha	Arcade (prosulfo carb) 3.0 L/ha	Overwatch 1250 ml/ha + Avadex Xtra (trilalate) 2.0 L/ha
12	Overwatch 1250 ml/ha + Avadex Xtra (trilalate) 2.0 L/ha	Overwatch 1250 ml/ha + Arcade (prosulfo carb) 3.0 L/ha	Arcade 3.0 L/ha + 1.5L Trifluralin
13	Overwatch 1250 ml/ha + Arcade (prosulfo carb) 3.0 L/ha	Luximax 500 ml/ha	Overwatch 1250 ml/ha + Arcade (prosulfo carb) 3.0 L/ha
14	Overwatch 1250 ml/ha + Sakura 118 g/ha	Untreated control	Luximax 500 ml/ha + Arcade (prosulfo carb) 3.0 L/ha
15	Arcade 3.0 L/ha + 1.5L Trifluralin	Sakura 118 g/ha + Avadex Xtra (trilalate) 2.0 L/ha	Sakura Flow 210 ml/ha
16	Untreated control	Voraxor @ 200 mL/ha + Luximax @ 500 mL/ha	Voraxor @ 200 mL/ha
17	Callisto @ 200 mL/ha	Voraxor @ 200 mL/ha	Callisto @ 200 mL/ha + Boxer Gold @ 2.5 L/ha
18	Callisto @ 200 mL/ha + Boxer Gold @ 2.5 L/ha	Callisto @ 200 mL/ha	Voraxor @ 200 mL/ha + Luximax @ 500 mL/ha
19	Voraxor @ 200 mL/ha	Callisto @ 200 mL/ha + Boxer Gold @ 2.5 L/ha	Untreated control
20	Voraxor @ 200 mL/ha + Luximax @ 500 mL/ha	Untreated control	Callisto @ 200 mL/ha

B Buffer Buffer Buffer

**N** → **Seeding date:** Weeds hand spread May 19. Treatments and wheat sown May 20.

**Fertiliser:** DAP + Impact **Fertiliser rate:** 80 kg/ha



**Treatment list:**

Grass herbicides	
1	Untreated control
2	Sakura 118 g/ha
3	Sakura Flow 210 ml/ha
4	Sakura 118 g/ha + Avadex Xtra (triallate) 2.0 L/ha
5	Arcade (pro sulfocarb) 3.0 L/ha
6	Avadex Xtra (triallate) 2.0L/ha
7	Luximax 500 ml/ha
8	Luximax 500 ml/ha + Avadex Xtra (triallate) 2.0 L/ha
9	Luximax 500 ml/ha + Arcade (pro sulfocarb) 3.0 L/ha
10	Luximax 500 ml/ha + Sakura 118 g/ha
11	Overwatch 1250 ml/ha
12	Overwatch 1250 ml/ha + Avadex Xtra (triallate) 2.0 L/ha
13	Overwatch 1250 ml/ha + Arcade (pro sulfocarb) 3.0 L/ha
14	Overwatch 1250 ml/ha + Sakura 118 g/ha
15	Arcade 3.0 L/ha + 1.5L Trifluralin

Broadleaf Herbicides	
1	Untreated control
2	Callisto @ 200 mL/ha
3	Callisto @ 200 mL/ha + Boxer Gold @ 2.5 L/ha
4	Voraxor @ 200 mL/ha
5	Voraxor @ 200 mL/ha + Luximax @ 500 mL/ha