

Crop topping cereals for annual ryegrass 2006

Funded by the GRDC in collaboration with the Birchip Cropping Group and the University of Adelaide.

Key Findings:

- Glyphosate at either 1.0 or 1.5L/ha applied at the flowering stage of ryegrass was very effective in reducing the viability of seed set.
- Herbicides applied to barley at the soft or firm dough stage of grain fill did not reduce individual grain weight, grain viability or early plant vigour.

Why do the trial?

To investigate the effect of crop topping cereals for annual ryegrass control with non-selective herbicides.

Crop topping is a highly successful and widely used practice for pulse crops, but little or no work has been done on wheat or barley. This strategy offers another tool for controlling annual ryegrass, while reducing the development of herbicide resistance particularly for early maturing varieties or seasons.

How was it done?

A site was selected within a commercial grower paddock of Keel barley. The area had an even distribution of annual ryegrass.

Herbicide treatments were applied by hand boom to 1.5 * 5m plots.

Herbicide treatments:

- | | |
|------------------------------------|------------------------------------|
| - Nil | - glyphosate 0.5L/ha + wetter 0.1% |
| - glyphosate 1.0L/ha + wetter 0.1% | - glyphosate 1.5L/ha + wetter 0.1 |
| - diquat 0.75L/ha + wetter 0.1% | - diquat 1.13L/ha + wetter 0.1% |
| - diquat 1.5L/ha + wetter 0.1% | |

Herbicide timings:

Ryegrass flowering - applied on the 9th October 2006. Temperature 21.5°C, Relative humidity 38%.

The barley was at soft dough (indent from a finger nail springs back), and the head was at 48% moisture. The awns had turned white.

The ryegrass was just out of the boot, some had flowered.

Ryegrass seed formed – applied on the 20th October 2006. Temperature 18°C, Relative humidity 42%.

The barley was at firm dough, some green on stem, grain still slightly green on underside.

The head was at 61% moisture.

The ryegrass seed was milky to soft dough.

Sampling and assessment – All plots were sampled at maturity. Random head samples were cut from 10 sites within each plot, such that at least 100 ryegrass and 20 barley heads were collected.

Ryegrass seed heads were threshed in a small thresher, cleaned/aspirated and prepared for germination. 50 ryegrass seeds were germinated per petri dish.

Barley samples were threshed using a small plot harvester. 50 seeds were germinated per petri dish. They were also grown in pots using UC soil mix and measured for early vigour.

Results

Glyphosate at either 1.0 or 1.5L/ha applied at the flowering stage of ryegrass was very effective in reducing the viability of seed set (Table 1). The lower rate of glyphosate (0.5L/ha) was ineffective when applied at the flowering stage. At the later timing of application glyphosate was not effective at any rate.

Diquat did not provide seed set control of ryegrass irrespective of the timing of application.

Herbicide treatments applied to barley at either the soft dough or firm dough stage of grain fill had no significant impact on individual grain weight, the viability of the grain or early plant vigour.

Table 1. The effect of herbicide treatments applied to flowering annual ryegrass on head number, seed emergence and viable seed per head.

FLOWERING Herbicide Treatment	Ryegrass		Barley		
	Germination (%)	Control (%)	Grain weight (mg)	Germination (%)	Dry weight (g)
Nil	65		40.1	96	0.23
glyphosate 0.5L/ha	61	7	37.6	89	0.23
glyphosate 1.0L/ha	11	84	37.6	91	0.23
glyphosate 1.5L/ha	2	97	38.4	95	0.14
diquat 0.75L/ha	61	7	38.3	91	0.23
diquat 1.13L/ha	70	-7	38.0	100	0.25
diquat 1.5L/ha	64	2	37.9	97	0.21
LSD (P<0.05)	0.19		ns	ns	ns

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