

CONTROL OF TAKE-ALL OF WHEAT WITH CHLORIDE, BREAK CROPS, FUNGICIDE, FUMIGATION AND MICRO-ORGANISMS

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Currently, break crops provide the only feasible method of control for Take-all of wheat but suitable species are not available for some wheat-growing regions and soils and they may deplete soil nitrogen required for wheat growth and protein. This study compares the use of break crops with control methods such as the application of chloride (Cl), fungicide, fumigation or micro-organisms. Application of Cl at the time of sowing has been found to control Take-all and increase wheat yields in North American studies. The effect of Cl on yield and Take-all infection was tested in eight field experiments in southern NSW.

RESULTS AND DISCUSSION

There was no significant yield response to Cl applied as KCl at any site. Across the 8 experiments there was a 4% non-significant yield increase. Fungicide-amended (triademethon 2 g a.i./kg) double superphosphate gave a non-significant 8% yield increase in five experiments and fumigation with methyl bromide gave a 5% non-significant yield increase in four experiments, however neither method is economically effective. Bacterial antagonists of Take-all, *Pseudomonas fluorescens* or *Bacillus sp.*, applied as a seed dressing in three experiments, gave a 0-8% non-significant yield increase but little reduction of root lesions. The break crop canola was grown at two sites in 1992 where it gave a 64% yield increase in the following 1993 wheat crops and reduced Take-all lesions to negligible levels.

Table 1. Soil Cl and Take-all infection levels and the wheat grain yields in 1992 and 1993.

1992 1993

Control Conditions	Junee	Dirnaseer	Temora	Harden	Temora4	Harden4	Coota - mundra A	Coota - mundra B
Soil Cl- (ppm) at 0-10 cm depth	10	4	20	8	57	27	14	na
Take-all (% of seedlings infected)	28	0	6	na	19	26	26	na
Grain Yield (t/ha)								
Control	6.5	4.4	5.9	6.9	4.1	2.6	5.7	2.7

Chloride (25-50 kg/ha)	6.4	4.8	6.7	7.0	4.4	2.2	5.9	3.0
Fungicide ³	7.0	4.9	6.4	7.3	4.8	2.6	6.0	-
Fumigation ³	6.3	5.6	7.0	5.9	3.6	2.2	-	-
Canola ³	-	-	-	-	6.0	5.0	-	-
<i>P. fluorescens</i>	6.6	4.9	-	-	-	-	5.6	-
<i>Bacillus sp.</i>	-	-	-	-	-	-	6.2	-
I.s.d. (P=0.05)	ns	0.5	ns	1.0	1.48	0.65	ns	ns

³ 1992 treatment only na = not assessed ns = non significant

⁴ The Temora and Harden experiments were repeated using the same plots but no treatments were applied to the wheat grown in 1993 except for the chloride application.

These results confirm the advantage of break-crops found in other studies. The other methods tested appear to have limited potential for Take-all control.

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