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4. EFFECT OF ZINC ON BORON TOXICITY IN BARLEY
 - 87SG6/4864 EX

AIM: To examine the suggestion that adding zinc to the soil will lessen the severity of boron toxicity in barley.

METHOD: Rates of zinc were added to a soil that has naturally high levels of boron with either superphosphate (zinc contaminated) or aerophos (zinc free). Stirling barley was grown and assessed for leaf injury due to boron toxicity and final grain yield.

LOCATION: Salmon Gums Research Station.

SOIL: Kumarl - a yellow-brown calcareous earth with naturally high levels of boron.

RESULTS: Sown - June 3
 - Stirling barley at 45 kg/ha
 - Aerophos (23% P) and superphosphate (9.1% P) hand topdressed at 48 and 120 kg/ha respectively

Harvested - November 12.

Table 9. The effect of adding zinc to the soil on the concentrations of zinc and boron in the YEB during tillering, and on the final grain yields of Stirling barley

Phosphorus source	ZnO (kg/ha)	Concentration in YEB (ppm)		Grain yield (t/ha)
		Zn	B	
Aerophos	Nil	15	16	2.50
	1	18	15	2.52
	5	22	14	2.54
Superphosphate	Nil	16	17	2.37
	1	16	16	2.54
	5	20	16	2.45

YEB sampled July 22; Zadoks 15.5/24; a few spots beginning to appear.

Table 10. The effect of adding zinc to the soil on the ratings of injury due to boron toxicity on the leaves from the primary tillers of Stirling barley at anthesis

Phosphorus source	ZnO (kg/ha)	Ratings of leaf injury on primary tiller			
		YEB	YEB + 1	YEB + 2	YEB + 3
Aerophos	Nil	5	6	5	5
	1	5	6	5	4
	5	4	6	5	4
Superphosphate	Nil	5	6	6	4
	1	5	6	5	4
	5	5	6	5	4

Primary tillers sampled September 26, Zadoks 63, and rated in the laboratory.

RESULTS: Results of analyses of plant tissues for concentrations of boron and zinc have yet to be completed. Preliminary results indicate:

1. There was no grain yield response to the application of zinc.
2. Source of phosphorus did not affect grain yield.
3. The addition of zinc to the soil increased the concentration of zinc in the YEB, but did not markedly decrease the concentration of boron in the YEB. This suggests that the addition of zinc beyond levels required for the maximum growth of Stirling barley does not decrease the severity of boron toxicity.