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7. THE EFFECT OF PATTERN OF SUPPLY ON BORON TOXICITY IN BARLEY
 - 87GL3b/4864 EX

AIM: To determine the effects of commencing boron toxicity of barley at different stages of plant growth on the final grain yield.

METHOD: Glasshouse experiment - Stirling barley grown in undrained pots of a Lancelin brown sand.

LOCATION: School of Agriculture, U.W.A.

TREATMENTS: Boron - 0, 1, 2, 4, 6 and 8 µg added/g soil.

Additions - T1, pre-sowing
 T2, beginning stem elongation
 T3, booting.

RESULTS: Sown - September 8

T2 addition - October 5-9
 T3 addition - October 26-30

Harvested - December 7.

Table 15. Effect of adding boron to the soil at different stages of plant growth on the dry weights of shoots at maturity and grain yields of Stirling barley

Addition stage	Boron added (µg/g)	Dry weight shoots (g/pot)	Grain yield (g/pot)	Harvest index	1,000 grain weight (g)
Nil	Nil	33.6	15.4	48	48
T1	1	33.7	16.2	50	47
	2	30.5	14.2	50	46
	4	27.6	12.5	48	43
	6	25.9	11.1	48	40
	8	24.0	9.5	45	35
T2	1	29.6	14.2	51	45
	2	26.8	12.8	53	45
	4	25.3	11.9	52	41
	6	23.2	10.3	50	38
	8	20.6	8.2	46	35
T3	1	33.7	15.6	48	47
	2	32.2	14.3	46	44
	4	33.2	14.1	45	41
	6	31.8	13.7	45	39
	8	30.1	12.8	45	39

Table 16. Effect of adding boron to the soil at different stages of plant growth on the injury to leaves from the primary tillers of Stirling barley at maturity

Addition stage	Boron added ($\mu\text{g/g}$)	*Percentage of leaf area with dark spots or lesions			
		YEB	YEB + 1	YEB + 2	YEB + 3
Nil	Nil	1	1	1	1
T1	1	10	5	5	5
	2	25	20	20	15
	4	40	45 (.5)	35 (.5)	25 (.5)
	6	45 (1)	45 (2)	45 (3)	30 (1)
	8	45 (3)	45 (3)	50 (5)	35 (3)
T2	1	20	20	20 (1)	25
	2	35 (1)	30 (2)	30 (2)	35 (1)
	4	45 (2)	45 (4)	50 (6)	45 (1)
	6	45 (3)	50 (5)	50 (7)	60 (1)
	8	45 (5)	50 (8)	60 (10)	70 (2)
T3	1	15	15	10	5
	2	20	25	15	5
	4	35	35	30	15
	6	45	45	35	15
	8	45	50	40	20

() = cm of bleached white tipping of leaves.

* = remainder of leaf.

- RESULTS:** Results of analyses of plant tissues for concentrations of boron have yet to be completed. Preliminary results indicate:
1. The addition of increasing amounts of boron to the soil decreased the dry weights of shoots at maturity and the grain yield and 1000 grain weights of Stirling barley.
 2. The addition of increasing amounts of boron to the soil increased the ratings of injury to the leaves from the primary tillers at maturity.
 3. The addition of increasing amounts of boron at the booting stage was less deleterious to the yield of Stirling barley than similar amounts added either pre-sowing or at the beginning of stem elongation - even though ratings of injury to the YEB were similar. This indicates that, with little affect on the harvest index, "flushes" of boron at the latter stages of barley growth (as occurs in the field) may produce high levels of leaf injury without markedly affecting grain yield.