

Response of wheat to foliar applied copper on five Hamilton soil types

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Responses of wheat (*Triticum aestivum*) to copper were recorded in the Wimmera region of Victoria in 1984 (1). In the adjacent Hamilton district a research program was started in 1985 to determine if commercial wheat crops would respond to copper.

Materials and Methods

Five representative sites with no history of copper application were selected on each of five main soil types in the district. Four treatments (replicated 4 times) were established; Nil (T1) and 75 g/ha of foliar copper applied at Zadoks scale 23 (T2), 41 (T3) and 23 + 41 (T4). Anthesis and harvest dry matter production and grain yield were determined by quadrat cuts of 3mL /plot. A1, A2 and 81 horizon soil samples were taken for chemical analysis.

Results and discussion

Copper application resulted in a significant increase in grain yield on soil types 2 and 5, attributable to significant increases in grain weight on soil type 5, and grain number per head on soil type 2. These soils were geologically the oldest of the five tested and had the lowest average level of EDTA copper. Details are shown in Table 1.

Table 1. The effect of Copper on Wheat Yield on 5 Hamilton soil types.

SOIL TYPE	(Northcote classification)	TREATMENT YIELD (T/HA)				LSD (p=0.05)	SOIL CU (ppm)
		T1	T2	T3	T4		
1-Casterton clay (Ug 5.16)		2.02	2.22	2.26	2.30	0.38	2.1
2-Dundas loam duplex (Dy 3.42)		1.79	1.91	2.32*	1.98*	0.43	0.46
3-Monivae duplex (Dy 3.42, 1.22)		2.09	2.30	2.11	2.27	0.22	1.40
4-Hamilton clay (Ug 5.24)		3.23	3.19	3.32	3.26	0.23	1.54
5-Wickliffe duplex (Dy 3.42)		1.42	1.73*	1.77*	1.79*	0.26	0.78

* significantly different at p = 0.05

Time of application was not important and a second application did not increase yield further. There were no early symptoms of Cu deficiency on any sites and foliar application of copper at tillering (T2, 14) produced no change in either visual appearance or anthesis dry matter production. Deficiency symptoms only became apparent at stem elongation when two sites displayed minor wilting.

In addition to identifying the two soil types with suboptimal copper supply to wheat, this experiment highlights the pitfalls of relying on visual detection of copper deficiency. Areas of subliminal but significant copper deficiency may go undetected by farmers who rely on this method.

1. Flynn, A. (1985) Proc. Australian Soc. Soil Sci. (Vic. Branch) Conf. Longerenong. pp 16.