

## Copper deficiency of meat in Victoria. I. cause

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Wheat grown on the lighter textured soils in the Southern Wimmera of Victoria has shown symptoms similar to copper deficiency. A project was initiated in 1984 to investigate copper deficiency in this Region.

### Methods

In 1984, 21 field trials were carried out across the Southern Wimmera. At 18 of these, treatments included 2 kg ha of copper applied to the soil as a spray and incorporated by sowing; copper applied as a spray to the foliage at 75 g Cu ha at late tillering and 150 g Cu ha at booting and a nil treatment. The other three trials investigated the correction of the deficiency (1). One of the most responsive sites in 1984 was reinvestigated in 1985 using similar treatments on an area which had not previously received copper. Grain yield was measured by harvesting whole plots. Leaf samples consisting of 100 youngest fully emerged leaves were analysed in the standard way (2).

### Results and discussion

**Table 1. 1984 Average grain yield (t ha<sup>-1</sup>).**

	DY	DR	UG	UC
NIL	2.52	3.97	2.35	1.93
Copper (Soil)	2.67	4.47	2.36	3.25
Copper (Foliar)	2.92	4.15	2.34	2.80
LSD 5%	0.31	N.S.	N.S.	1.05

In 1984 grain yield response to applied copper was 0.46 t ha<sup>-1</sup> for wheat grown on the Yellow Duplex (Dy) soils and 1.32 t ha for that grown on the Deep Sands (Uc), however, there was only one site on the latter. Neither the Red Duplex (Dr) soils nor the Non-Friable Clay (Ug) soils were deficient. The Yellow Duplex soils are the most important soil type cropped in the region. In 1985 responses on this soil were much smaller.

The region has an average annual rainfall of 450-650 mm and waterlogging of the Yellow Duplex soils is common. In 1984, a wet year, waterlogging was severe and so too was copper deficiency whereas, in 1935, which was dry in winter and spring, there was little deficiency. Leaf analysis showed that the concentration of copper in the leaves although initially sufficient fell below the critical minimum (3) after the onset of waterlogging and remained low until the soil dried out.

Nutrient uptake by roots is reduced by waterlogging and so in cases of marginal copper deficiency, as appears to be the case with the Uy soils, could be expected to induce or aggravate the deficiency. This could also account for the lower efficacy of copper when applied to the soil in these soil types.

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