

## Cereal whole tops plant analysis - methods used by CSBP

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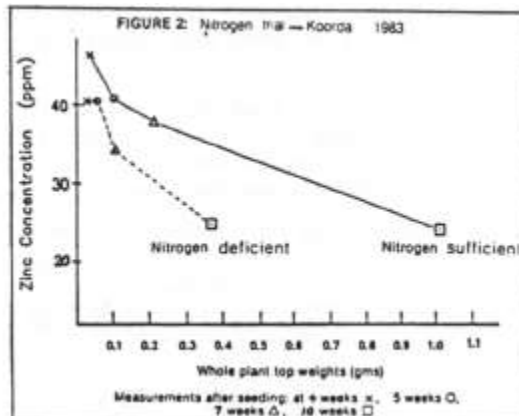
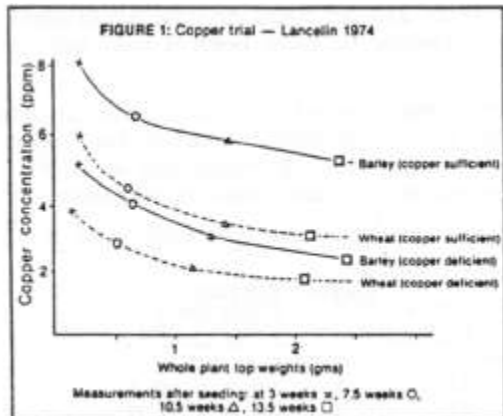
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Analysis of plant tissue is a practical way of monitoring nutrient uptake and is a powerful complement to soil analysis for farmers seeking to optimise crop nutrition and production.

In Western Australia (WA) there is a strong preference among researchers to use the youngest fully-emerged leaf blade for the diagnosis of trace element deficiencies in cereals (1). The interpretation is relatively simple. However, this method has a number of disadvantages; not all nutrients can be diagnosed using the same plant part; reliable collection of a young tissue sample requires some skill and practice, making the method less suitable for collection by the farmer; analysis of young tissue samples can define the trace element status of cereals only at the time of sampling; and young tissues provide less reliable samples than whole tops when determining a paddock's requirement for reapplication of trace element fertilisers.

The service provided by CSBP in WA involves the farmer collecting whole cereal-plant tops and forwarding them to the laboratory where they are dried, weighed and analysed for nitrogen, phosphorus, potassium, sodium, calcium, magnesium, chloride, copper, zinc, manganese, iron and nitrate-nitrogen.

Initial trials to establish critical nutrient levels revealed a number of important points in relation to the decline in nutrient concentration with the age of the plant (Figure 1). We need plant weight to interpret nutrient concentration. Difficulty in interpretation from whole-top analyses due to the influence of nitrogen nutrition on trace element concentration was revealed (Figure 2). To accommodate these effects nitrogen concentration is taken into account when defining the nutrient status of whole-top samples.



The plant analysis service for cereals offered to farmers by CSBP has the following features: it provides a means of determining trace element supply and the need for reapplication rather than merely defining the status of crops at the time of sampling; it provides a measurement of the growth of plants to the time of sampling; it avoids the need to contract trained samplers as the samples required can be readily and reliably collected by farmers; it reveals the relative supply of the different nutrients allowing identification of those most likely to limit growth.

1. Robson A.D. and Reuter D.J. 1981 in "Copper in Soil and Plants" (eds) Longergan J.F., Robson A.D. and Graham R.D. Academic Press Sydney.