



# SAP testing – an additional tool

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*SAP testing is another management tool for citrus growers to help determine a fertiliser program for their orchards and to measure the impact of fertiliser applications on their trees.*

The value of SAP testing was confirmed in a two year project undertaking testing in citrus orchards in Griffith and Leeton.

NU-test® (nutrient uptake analysis) is a measure of the nutrient element concentration and balance within the plant's sap stream. It gives a fast and accurate view of the nutritional status of the crop around the time the sample was taken. Combined with the fast turn around time for results, growers and consultants are able to make informed crop management decisions and monitor reaction to corrective nutrient application. Nutrient uptake ratios also give an insight into uptake conditions in the root zone. Consecutive sampling of the same block during the season allows trends in nutrition status to be followed.

Growers with fertigation systems are requesting greater information for specific nutrient use during different phenological stages of the citrus tree growth. The project utilised sap analysis to determine what nutrients are present at the different stages of tree growth and thus what nutrients need to be supplied and the most suitable time of application.

Four citrus growers in the MIA, two in Griffith and two in Leeton, were project cooperators. Each month two samples were collected from each of the growers – one from a Valencia tree, the other from a Navel tree. The project was conducted through some of the toughest seasonal conditions ever experienced. It was planned to take samples from the youngest newest shoots. However, the drought conditions and uncertainty of irrigation water meant that the project was unable to obtain continuous lines of data but enough samples were taken to show that NU-test will assist growers in planning their fertiliser program.

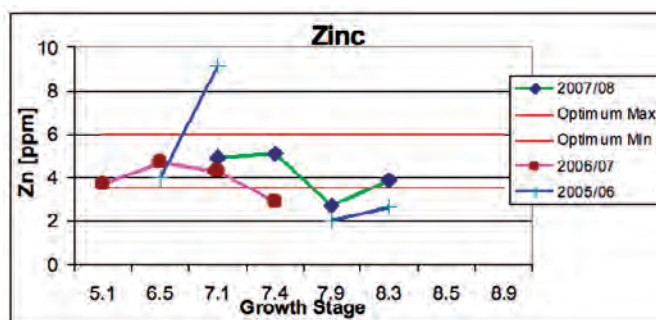
The sampling was conducted at key phenological stages of tree growth. Repeat visits or missed sampling also occurred due to growers irrigating or due to rainfall events. A number of nutrients were investigated including: nitrates, phosphorus, potassium, zinc, magnesium, calcium, sulphur, manganese, iron, boron, and copper. The growers' orchard activities over the month prior to sampling were regularly reported to project officers to assist in the analysis of the results obtained.

As the samples were collected and tested, a database was established to develop a guideline for growers of what nutrients

are required during the growing and harvesting seasons. The guidelines will provide extra detail of information for informed nutrient management decisions and can be used in conjunction with the current annual leaf analysis.

Figure 1 shows the variance in analysis results throughout a season and between seasons. The variance in the 2005–06 data was due to a waterlogging event because of rainfall. The results are from an orchard with the grower following his normal fertiliser program to establish a benchmark. Sap analysis results can be used subsequently to determine if changes to the fertiliser program are producing the required results.

It is important that sampling is conducted with limited variances in terms of the samples taken when the soil is not too wet, or too dry or during high or low temperatures during the day. 🌞



*Figure 1. Chart of zinc results from Washington Navel trees with guidelines*

## Acknowledgements

The project was managed by Riverina Citrus and funded by Horticulture Australia Limited (HAL) using voluntary contributions from Riverina Citrus and the Australian Government. It aimed to build the skills and knowledge of the regions citrus producers. Agribusiness company MIA Rural also participated through the collection of the samples from the orchards and analysis the results from the tests undertaken.

## Further information

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