Nutrition

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SOIL & PLANT ANALYSES

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Monitoring of soil and plant nutrient status is a fundamental requirement in managing soil fertility and meeting the nutritional demands of the crop.

Soil sampling and analysis provides quantitative measurements on soil nutrients and associated chemical and physical characteristics. The results can be used to make management decisions on crop nutrient and fertiliser programs and soil management practices.

Leaf tissue analysis provides analytical measurements on all nutrient levels through the crops life. It provides critical information that allows fine tuning of nutrient programs in particular on micro nutrients. Information can also be used to balance nutrient programs in future crops. Petiole testing provides specific measurements on nitrogen and potassium levels early within a crops life.

Soil Analyses

Benefits

- Monitor changes in soil fertility and soil properties (pH, salinity, sodicity etc.) over time
- assist in determining fertiliser strategies and application rates for macro nutrients i.e. nitrogen, phosphorous, potassium and sulphur.

Limitations

- Provides only a general indication of the status of micronutrients such as copper, zinc, iron, manganese and boron
- sample size, number, location and timing can all influence the results of the testing
- samples need to be handled and managed carefully
- testing laboratories need to be accredited and use standardised accepted methods.

Petiole Analysis

Benefits

- Measure and monitor nitrogen levels in the crop up to flowering
- early sampling allows response to crop needs, particularly nitrogen.

Limitations

- not recommended for other nutrients
- not reliable beyond flowering
- requires 3 consecutive samples 10 days apart (approximately 600, 750, 900 day degrees). Ideally soil moisture status should be noted for each sampling.
- leaf blades need to removed in the field

- weather conditions (cold weather, water logging, low radiation due to cloudy weather) affect nutrient levels
- water stress can influence results
- samples need to be handled and managed carefully
- testing laboratories need to be accredited and use standardised accepted methods.

Leaf Analysis

Benefits

- Monitor all nutrient levels in plant
- identify imbalances, deficiencies and toxicities
- can be more precise than soil testing in particular for micronutrients
- assist in optimising fertiliser programs for the following crop.

Limitations

- Can't be conducted until first mature leaf, which occurs around squaring. This means there is a very limited time to respond to in-crop nutritional demand
- weather conditions can influence testing results
- samples need to be handled and managed carefully
- testing laboratories need to be accredited and use standardised accepted methods.

Interpretation

- Interpretation of test results is complex and depends on a number of influencing factors, most importantly crop stage of development
- NutriLOGIC is an on-line tool that allows an independent interpretation of soil, leaf and petiole test results. http://cottassist.cottoncrc.org.au/NutriLOGIC/
- See: http://cottassist.cottoncrc.org.au/NutriLOGIC/ – part of CottASSIST suite of tools.

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