Nutrition

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PETIOLE SAMPLING & ANALYSES

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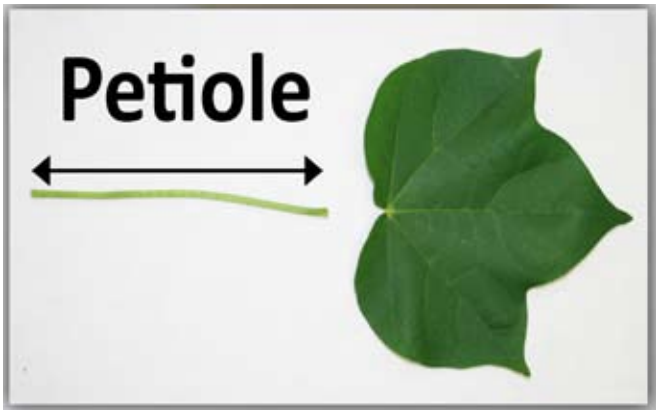
Petiole analysis is used early in a crops development (up to flowering) to monitor and determine the nitrogen status.

Results allow time to adjust nutrient management programs and correct deficiencies before crop development is substantially affected. Petiole analysis is not recommended for other nutrients.

1. Sampling

- petioles when the crop is not stressed (e.g. between irrigations)
- youngest mature leaf, normally 4th or 5th unfolded leaf from the top of the plant
- samples should be taken at the same time of the day
- systematically across field
- from average sized plants
- 50 petioles should supply sufficient fresh material for analysis
- leaf blades must be immediately removed from the petiole



- where a nutritional problem is suspected, sample healthy and unhealthy leaves separately to help identify the problem

Avoid

- stressed plants from either waterlogging or lack of water
- cloudy, cool weather. Petiole nitrate levels are dynamic and sensitive, any stress can alter the nitrate concentrations leading to inaccurate analysis.
- sampling where insects or disease problems are severe
- sampling if the crop has recently been sprayed with a pesticide or foliar fertiliser

2. Timing

- three samplings approximately 10 days apart are required to give a good indication of the rate of change in the nitrogen and potassium in the petioles
- best done at 600, 750 and 900 day degrees from planting
- similar soil moisture
- it is imperative that the stage of growth (days after sowing or more accurately, day degrees) is noted

3. Handling and Packing

- collect samples with clean, dry hands (or clean gloves)
- samples should be loosely packed in a paper bag and stored in a cool place (refrigerator) immediately after picking to prevent or reduce leaves from deteriorating.
- transport samples to laboratory as soon as possible using a next day delivery type service
- transport samples in a contaminant free container which keeps them cool
- samples not arriving the day after sampling should be dried. Best done in a convectional

oven, at low temperatures (less than 70° C) for 24 hours or until crisp. (microwave ovens are **not** suitable)

Avoid

- samples being contaminated i.e. salt from sweet, sunscreen products (zinc), transport containers containing contaminants
- plastic bags unless samples are kept cool
- samples arriving on weekends of holidays

4. Laboratory Selection

The choice of laboratory is very important in obtaining reliable, consistent results. When choosing a laboratory the following points should be considered

- use Australian standardised accepted laboratory methods
- involved in an accredited Proficiency Performance Program and results available
- external audited Quality Assurance program
- quality result reporting structure
- provide guidelines for sampling and sampling handling
- strive for best practice

Considerations

- variations in methodology and the type of analytical equipment used by different laboratories can cause results to differ.
- for accuracy of results and consistency it is best to use the same service provider

5. Interpretation

- interpretation of petiole test results is complex and depends on a number of influencing factors, most importantly crop stage of development
- NutriLOGIC is an on-line program that allows an independent interpretation of petiole test results. Reports from NutriLOGIC will indicate whether additional N fertilizer is required by comparing your petiole test results with the optimum amount need for that crop stage. These reports can be saved or printed.

http://cottassist.cottoncrc.org.au/NutriLOGIC/ – part of CottASSIST suite of tools.