

Plant Tissue Analysis

Plant analysis is used less as a nutritional management tool than soil testing.

It appears, more often than not, that plant sampling is used when problems are evident. Whilst this is quite reasonable, plant analysis can, and should, play a more significant role in ongoing “*Integrated Nutrition Management*”

Plant analysis can: -

- Confirm diagnosis made from visual symptoms.
- Identify ‘*hidden hunger*’ where there are no visual symptoms.
- Locate areas where deficiencies of one or more nutrients may occur.
- Determine whether the plant has taken up applied nutrients.

Soil testing and plant tissue analysis go hand in hand. One is not a substitute for the other. Both are useful tools in problem diagnosis, and many good farmers use both.

Taking both plant and soil samples routinely can provide a log of nutrient changes over a period of years. This can avoid fertility imbalances and can help maximise profits.



Plant analysis has some limitations in regard to nutrient uptake being affected with plant stress from seasonal conditions, pests, diseases, root pruning from chemicals and crop management activities. However plant analysis can be very useful in confirming trace element levels and indicating uptake of more mobile nutrients that may be below the 10cm soil test level.

There is no doubt that plant analysis is a valuable tool.

The questions are: -

○ **WHAT**

- issues can be dealt with in the short term?
- issues should be monitored for long term?

Plant analysis is a very good tool for identifying the cause of poor performing areas in a paddock. It is vital that comparative samples be taken between good areas and poor areas. Plant testing will identify nutrient deficiencies that occur in specific parts of the paddock due to soil type or cultural differences.

You can also monitor, over time, the effect of changing practices (e.g. No Till or deep banding)

○ **WHEN**

- does plant analysis fit into paddock nutrition management?
- is the right time(s) to sample?

Plant samples should not be taken when the plant is under environmental or cultural stress. Any external influence that affects the growth or activity of the roots will adversely affect the nutrient uptake in the plant.

Therefore, **do not** take samples when:

- Plants are moisture stressed – either waterlogged or droughted
- Chemical damage has occurred.
- Severe insect infestation has occurred.

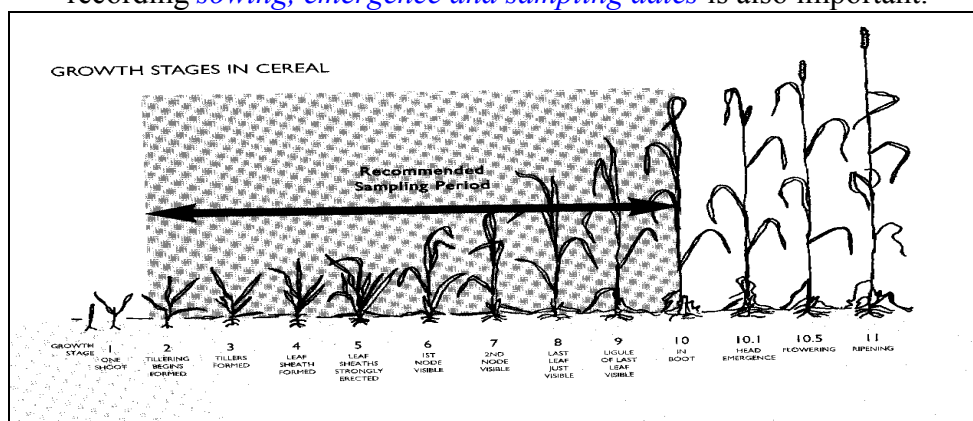
○ **WHERE**

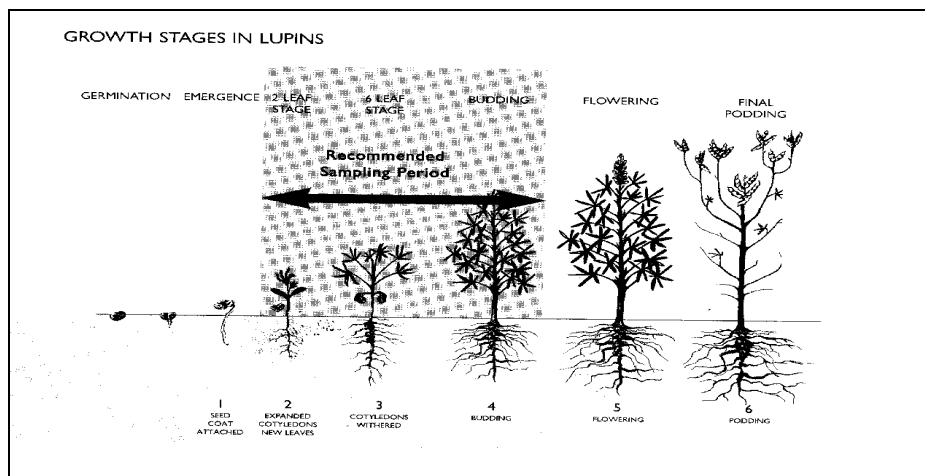
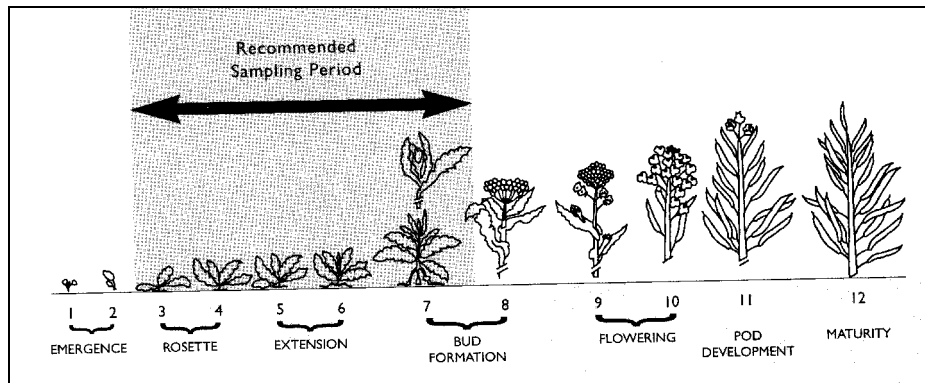
- should samples be collect from?
- What plant parts should be sampled.

Summit uses the whole top method for sampling cereals, canola, lupins and pulses. Whole tops are suitable for identifying major nutrient status as well as trace elements.

The other common method of sampling, **Youngest Open Blade**, (YOB, also known as Youngest Emerged Blade (YEB)) is suitable for a small range of trace element analysis only. Copper, Zinc and Molybdenum are the only significant nutrients that can be identified from YOB's.

WHOLE TOP SAMPLING: Samples should be taken by walking around a defined area, pulling the whole plant from the ground and removing the roots.(Use stainless steel scissors) It is very important that the *number of plants* be counted and recorded on the paddock information form as we need to work out the average weight of the plants for calibration purposes. We also need to know the age of the plant, so recording *sowing, emergence and sampling dates* is also important.





Lupin Stem Test. A sample can be taken to identify Manganese deficiency, which is responsible for the symptoms of split seed at harvest.

The main stem can be collected at mid-flowering. The whole stem needs to be collected and all leaves and branches and flowers removed. Collect 20 to 30 stems.

Levels below 20ppm would be considered critical and would require a foliar spray. At this stage of growth, aerial application is considered the only practical method of application.

○ **HOW**

- much yield is lost before problems can be seen?

Symptoms of nutrient deficiency are evidence of a reasonably severe deficiency. Some people estimate that by the time a deficiency is evident to the eye, *as much as 30%* of the yield has been lost.

Monitoring nutrient uptake then takes on a crucial role before the deficiency becomes visual. Best monitoring is done in seasons when the plants are growing strongly. Regular testing will indicate declining levels before the deficiency occurs.

○ **WHY**

- is plant sampling important?

Whilst soil testing can identify nutrients that are in deficient or high supply, many nutrients cannot be measured in the soil. An effective soil test needs to extract nutrients in the same way as the plant does, but this is not possible (yet) for nutrients such as Manganese and Molybdenum.

Soil tests for nutrients such as copper and zinc can give a good guide to supply, but are not as accurate as for nutrients such as Potassium and Phosphorus.

Climatic conditions and other factors can also affect nutrient uptake. For example in a cold and wet winter, Zinc will become less available to the plant, rendering an adequate supply measured in the soil, to an unavailable form to the plant.

In these instances, plant sampling becomes a much more important diagnostic tool.

Sampling Pastures.

Good standards exist for clovers and medics, so these should be the predominant species collected.

If possible, remove grazing stock for 2 to 3 weeks prior to sampling.

The youngest growing leaves and petioles are required, so just pluck the youngest leaves from the top of the plant.

Avoid dung and urine patches and stock camps.

Loosely fill the box in the kit.

General Instructions.

1. Always wear the gloves provided to avoid contamination. Items such as car keys contain copper, fencing wire is coated with zinc, so great care needs to be taken to not handle plants after these items.
2. Sample areas should be confined to about 1 hectare. If a wider sample is required, more samples should be taken.
3. Take several samples per paddock.
4. Take comparative samples – i.e. samples from areas growing well and poorer areas.
5. Avoid unrepresentative areas – waterlogging, stock camps, salt scalds etc.

For further information, contact your local Summit Area manager or call a summit Agronomist on 1800 198 224 (toll free) or (08) 9439 1844

