NUTRIBULLETS
SYNERGY WITH SCIENCE

THE IMPORTANCE OF LEAF AND SOIL SAMPLING

By Kenny Beeton

Monitoring nutrient levels in agriculture using leaf and soil analysis, has become a standard practice with a variety of laboratories offering the analysis and interpretation of results to farmers throughout South Africa.

Annual sampling plays a vital role in the compilation of a database of fields and orchards. The data accumulated over time can be a very useful tool, not only when designing a fertilization programme for a specific season, but it can also serve as an indicator highlighting early warning signs of poor management practices or in some cases the excessive use of certain nutrients, over-fertilization can lead to toxicity in the foliage of plants and the soil. Toxicity and its effects on the plant and soil can in fact be harder to reverse than a nutrient deficiency.

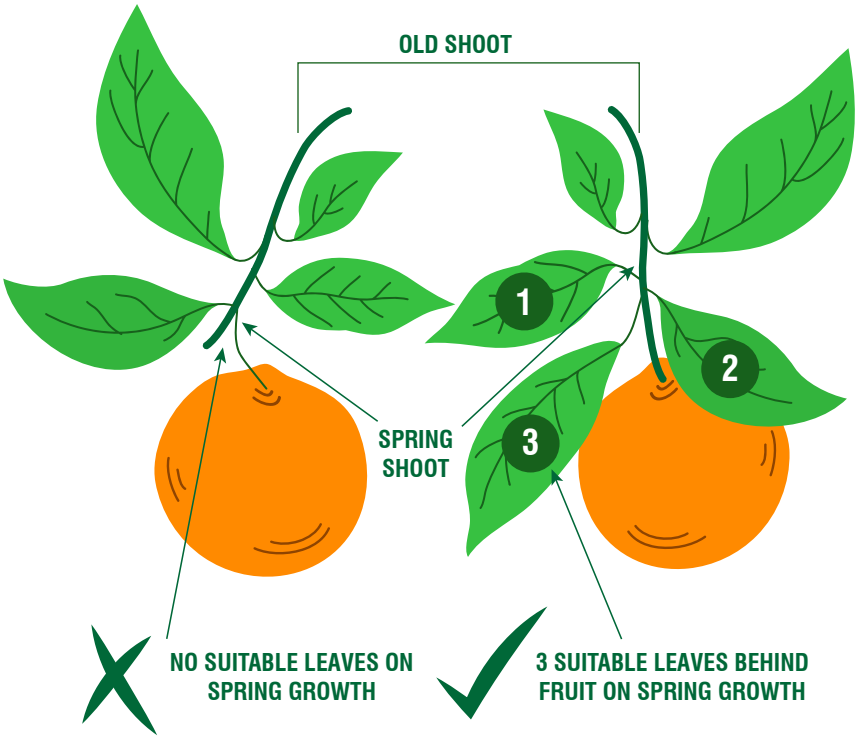
With the mounting pressure for financial returns per hectare it is easy to understand why seeking maximum tonnage per hectare is paramount to the survival and success of farms. To produce maximum tonnage per hectare, it is easy to fall into a trap of over-fertilization, leading to possible toxicity and excessive leaching of nutrients into the soil.

Soil and leaf analysis provides agronomists with detailed information required to compile the specific nutrient requirements for a specific production unit. The leaf and soil analysis provides detailed information on the uptake and utilization of nutrients over the previous season.

The primary objective when taking leaf and soil samples is to detect nutrient imbalances, deficiencies and toxicity levels in plants and soil. The information collected is used to ensure that corrective nutrient applications can be made prior to flower induction phase which takes place in May/June in citrus.

LEAF SAMPLING BEST PRACTICES

- A mistake often made in practice is inconsistency in sampling techniques. In tree crops it is essential that leaf samples are taken from the same data rows year on year and preferably from the same row from which the soil sample was taken.
- In citrus the initial sampling is done from February to March however samples can be taken periodically throughout the year. It is important to pay special attention to the leaves sampled.
- Leaves selected from fruit bearing terminal shoots where leaves are present behind the fruit are ideal for sampling.
- Sample size should comprise 50 to 100 leaves from different sides of selected sample trees, it is advisable to mark the rows used for sampling.
- Clear and correct marking of sample bags and laboratory sample submission forms is essential.



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As in the case of leaf samples, soil samples collected should be representative of a specific orchard or field. It is important that samples are collected from the same rows year on year within the drip area or feeder rootzone of plants to determine a realistic picture of available nutrients and nutrient withdrawal during the previous season.

Soil sampling should be done at least every second year in permanent crops, especially in cases where soil structure is poor and leaching or poor drainage can affect the availability of nutrients to the crop.

TIPS FOR EFFECTIVE SOIL SAMPLING

- Soil sample size should comprise 500g - 1000g of soil per sample made up from several subsamples. Avoid including any plant debris and stones in the sample as this will affect the sample analysis. Samples should be taken within the top 300mm of soil.
- When sampling careful attention must be paid to the irrigation system used in that specific field or orchard, as this will determine where the sample is taken for that specific orchard.
- In the case of micro-irrigation, sampling is preferable within the drip zone of the tree under the canopy of the tree where feeder roots are present.
- In drip irrigation, orchard samples should be taken within the wetting zone of the dripper under the canopy.
- In cases where recommendations are required it is important to supply the previous season's production records including aspects such as crop load per hectare, fruit size and fruit quality. This information is used to determine nutrient withdrawal of nutrients per ton of fruit per ha over the previous season to make adjustments for the following season.

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