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SAMPLING INSTRUCTION FOR SOIL, LEAF, PETIOLE AND FRUIT ANALYSIS

THE IMPORTANCE OF CAREFUL SAMPLING

The reliability of the result and recommendations of analysis depends ultimately on the accuracy of the very first step, i.e. **sampling**.

Sampling can be considered in terms of three simple stages:

- Taking a representative sample of soil or plant parts.
- Supplying all the necessary field and background information for your samples on the Analysis Request forms (particularly for problem areas).
- Correct packing and immediate despatch to the laboratory. (See sample packaging available).

DO'S AND DON'TS

- **DO NOT** sample immediately after lime or fertiliser application. The best time for soil analysis is after harvesting of the previous crop.
- **DO NOT** allow soil contamination of plant parts when sampling.
- **DO NOT** despatch fresh plant material so that it will be in transit during a weekend or public holiday.
- **DO** clean tools and equipment before sampling a new area.
- **DO** provide the maximum amount of background information of problems with your soil or crop.
- Above all, **DO** make sure samples are clearly labelled.

SAMPLE PACKAGING AVAILABLE FROM THE LABORATORY

● Phosyn sample bags

Soil and plant sample bags are provided for your use and they are designed to hold the correct amount required for laboratory analysis. Carefully complete the details on the bag during the collection of samples.

● Analysis Request booklets

These enable all customer and sample details to be sent with the sample to enable the laboratory to log your request into our system. Carefully complete the details on the form during the collection of samples and remember to send the top WHITE copy with your samples.

IMPORTANT NOTE– The importance of plant and soil sampling should never be underestimated. The analysis and interpretation information you will receive is highly dependant on the sampling strategy used. The following information will assist you in collecting appropriate samples prior to submitting them for laboratory analysis.



Why Analysis?

A soil analysis program will provide important and essential information on the soils nutritional status, which enables decisions of fertiliser and micronutrient applications to maximise the quantity and quality of crop yields.

A comprehensive measurement of available levels of macro and

micronutrients such as nitrogen, calcium, magnesium, potassium, sodium, phosphorous, sulphur, iron, manganese, copper, zinc, boron and chloride in addition to pH, conductivity etc are available to assess the nutritional status of the soil. It is recommended that a comprehensive soil test regime be performed at least once every 3-4 years to determine your soils nutritional status.

SOIL SAMPLING INSTRUCTIONS

Designing your sampling plan

The degree of non-uniformity of soil type present in each paddock will influence your sampling strategy (i.e. sample numbers and locations), so it is important to consider these aspects when establishing your soil-sampling plan.

As a general rule

- Paddocks of up to 10ha in area can be sampled as one unit, providing each field is uniform in terms of soil type, topography, land use, crop variety and fertiliser history.
- Larger paddocks (i.e. greater than 10ha) will generally be less uniform and as such should be subdivided and each part sampled separately. You will need a clean auger, hand trowel or spade (preferably chromium plated or of stainless steel) and a plastic bucket.

NOTE – Do not collect samples immediately after lime, gypsum, fertiliser (or other chemical) applications to the soil. Also avoid collection of roots and leaves when collecting soil samples.

Individual soil samples should be taken along a carefully planned route across the paddock. The

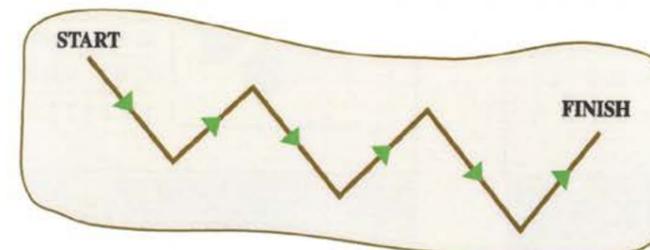
“W-pattern” sampling plan is adaptable to most shapes of field.

Identify a start position and move away from this point, avoiding all areas which are not representative of the paddock such as fences, hedges, tracks, dung/urine patches etc. We recommended at least 20 samples be taken at regular intervals along this sampling path. Around 20 samples are required even from small paddocks or areas.

At each of the 20 sampling points, take a sample to a depth of 10cm for pastures and most agricultural crops, and place in a bucket. Thoroughly mix all samples with your trowel, avoiding spillage. Fill the provided Phosyn sample bag with soil from the bucket, and seal securely. Label the bag.

Remember, that wholesale bulking of samples, especially of different soil types will not allow the identification of problems associated with more localised spots on the paddock. It is recommended that these areas be sampled separately.

NOTE – the sampling depths above are included only as a general guide and you may decide to sample at a deeper level as dictated by the crop root depth.



CROP & PASTURE TISSUE – SAMPLING INSTRUCTIONS

PASTURE SAMPLES

General sampling instructions

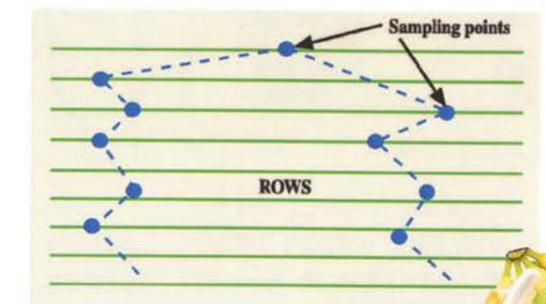
● Design your sampling plan similar to the W-sampling plan as detailed in the previous section and try to ensure that samples are representative of what your animals are consuming.

● Exclude dusty or soil contaminated plants and do not sample fields within 3-5 days after being sprayed with pesticides or foliar nutrients.

● Using a pair of clean rust-free shears, take around 15 to 20 small handfuls of grass (about 5cm from the ground) from sites throughout the sampling area and combine in the phosyn sample bag provided. Please avoid contaminating the sample with soil, dirt or chemical residue (drench etc) as this can lead to erroneous results.

NOTE – The optimum sampling time for pasture samples is generally during the active growing cycle i.e. **during the spring or autumn flush**.

IMPORTANT – UNLESS OTHERWISE ADVISED, PLEASE ENSURE THAT YOU SEND AT LEAST 200 GRAMS (APPROX. TWO HAND FULLS) OF FRESH PLANT MATERIAL FOR EACH SAMPLE REQUIRING LABORATORY ANALYSIS.



FRUIT & FRUITLET ANALYSIS

As a general rule we require approximately the following quantities of these samples for laboratory analysis:

- 30-50 fruitlets or,
- 15-20 mature fruit
- 300g when whole fruit is used (strawberry etc)

Fruitlet samples

Sampling time is very important. Send fruitlets as early as possible with a target weight of between 30-50g per fruitlet, though this will vary with variety. Select 20 trees/bushes along the sampling path and take one fruitlet from each of the north, south, east and west sides to give 4 fruitlets per tree. Mix the fruitlets thoroughly and take a

CROP SAMPLES

Given the diversity of plant types and varieties, it is not intended to outline a sampling guide for every specific crop but a sampling guide is detailed overleaf which provides advice for a broad range of crop types. If you crop is not listed, please contact your local distributor or Phosyn representative for more specific sampling instructions and advice. However, as a general rule you should collect the youngest fully expanded leaves available.

General sampling instruction

● In designing your sampling plan try to select trees/ bushes etc of the same variety and rootstock along the sampling path. A typical random sampling pattern is shown below.

● Exclude pollinators and diseased or otherwise abnormal trees and bushes.

● Exclude dusty or soil contaminated plants and do not sample fields within 3-5 days after being sprayed with pesticides or foliar nutrients.

random sub-sample of around 30-50. Place these in a phosyn sample bag, label the bag and submit these for nutrient analysis.

Fruit samples

Samples should be taken within a fortnight before harvest. Parts of the crop that are known to produce fruit of different storage quality should be sampled separately. Select 20 trees/bushes along the sampling path and take one undamaged average-sized piece of fruit from each tree. If the first fruit is taken from the north side, take one from the next tree on the east, then from the south and so on. Send all 15-20 fruit for chemical analysis.

←→ FOLD OUT TO DISPLAY SAMPLING INSTRUCTIONS

FRUITS, VINES AND NUT CROPS

Apple – Collect mid-shoot leaves on the current season's extension growth from late January to mid February (i.e. mid summer).



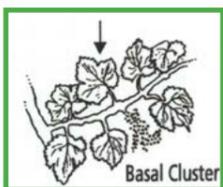
Banana – Select the third youngest fully emerged leaf from medium-sized suckers that can be reached from the ground. Take sample strips of lamina from at least 10 plants per block. Collect 20cm wide strips of leaf blade tissue at about half way along the leaf on each side of the midrib.

Cherry – Collect the youngest mature leaf from the mid section of current season's extension growth.

Citrus – Collect 5 to 7 one month old spring flush leaves from non-fruiting shoots in February.

Coffee – Sample the 4th pair of leaves from the tips of actively growing fruit branches.

Grapevine – Either the petiole (stem of the leaf) or the leaf blade opposite the bunch at the base of the shoot can be sampled, depending on the time of the year and your preference.



Leaf petiole – Collect leaf petioles from opposite the basal cluster from exposed shoots on the outside of

the vine. Petioles should be separated from the leaf blade immediately after sampling.

Leaf – Collect leaf blades only and remove petioles immediately. Sampling again should be from opposite the basal cluster from exposed shoots on the outside of the vine.

Note: Samples can be taken at pre-flowering, flowering and veraison.

Kiwifruit – Collect the first leaf above the fruit towards the growing point in February in the mid-summer growth stage.

Macadamia – Select the mature leaf from the second whorl of the current seasons growth, avoiding terminals carrying new flushes.

Mango – Collect the most recently mature leaf in early spring, just prior to flowering.

Nectarine – Collect the youngest mature leaf at the mid portion of the current seasons non-fruiting laterals (extension growth), taken at shoulder height.

Olives – as for Nectarine.

Passion fruit – Collect the youngest fully expanded leaf from well-developed actively growing laterals.

Peach – as for Nectarine.

Persimmon – Collect the youngest mature leaf from non-fruiting shoots. Sample during late February to early March.

VEGETABLE CROPS

Brassica – As a general rule, samples should be collected at the mid-growth stage or when the plant is starting to head. For cabbage & cauliflower, sample the youngest mature wrapper leaf from head maturity through to early harvest; For brussel sprout, collect the upper leaf at the mid-growth stage when the plants are beginning to head; For broccoli, collect the youngest mature leaf at the mid-growth stage when the curd is starting to form.

Cucurbits (Cucumber, Rockmelon, Pumpkin, Zucchini, Marrow, Squash etc) – Collect the youngest fully mature leaf with petiole at early flowering.

Garlic – Sample the youngest mature leaf (without the white) at the bulbing stage.

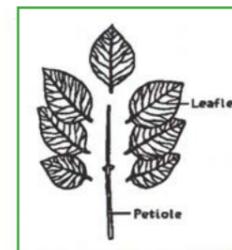
Legumes (Peas, Beans) – Collect the youngest fully expanded leaf (minus petiole) at the early vegetative growth stage prior to flowering. (i.e. 6-8 weeks from seeding).

Lettuce – Collect the wrapper leaf when the head is approximately half its final size.

Onion – Collect the youngest mature leaf at the mid-growth stage or 3 – 4 leaf stage.

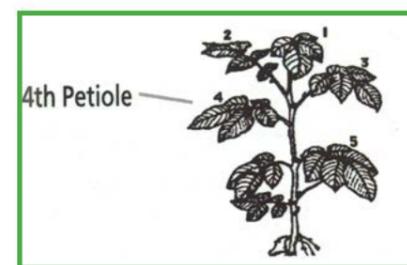
Potato – In order to monitor the availability of major nutrients i.e. NO₃ – N, P, K during the growing season, it is recommended that petiole samples are taken at regular intervals from the king tuber length 10mm – 150mm.

Critical Note: This dimension relates to the tuber length i.e. the distance



between the furthest 2 points on the tuber. Trace element analysis can be carried out at any plant stage, however, it is generally recommended from tuber initiation through to the early bulking stage (refer to individual trace element recommendations for optimum application timings).

To collect a petiole sample, select the 4th petiole from the growing point and immediately



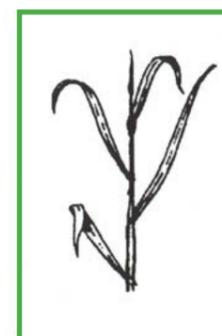
strip off the attached leaflets. Each individual sample should be made up of at least 40 individual petioles.

Tomato – Collect the youngest mature leaf including the petiole either when the first fruit is mature or at peak harvest.



TEMPERATE AND TROPICAL CROPS

Cereals (Canola, Wheat, Sorghum etc) – Sampling can be carried out at any growth stage, but generally the 4 - 5 leaf stage is recommended, in order that any desired nutritional application can be made at the optimum timing. Sampling of either the whole plant, or the youngest mature blades can be made, however for the majority of trace element analysis, i.e. Ca, Mg, Cu, Zn; analysis of the youngest mature blades is the more accurate method.



Please state clearly on the Analysis Request form which method of sampling has been used.

Canola – The Youngest mature leaf should preferably be collected at the 4-6 leaf stage and 6-9 leaf stage.

Note: If Mo deficiency is suspected (eg historical reasons etc) then it is advised that samples are collected at the 4-6 leaf stage.

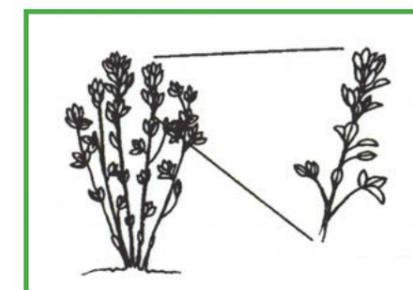
Cotton – Sampling at the three main growth stages is recommended; namely at the 4-6 leaf stage, at squaring and at flowering.

At each stage, collect two separate samples as follows:

Leaf – Collect the youngest fully unfolded leaf (100 leaves per sample).

Petiole – Detach petioles from the leaf immediately after sampling (200 petioles per sample).

Pasture (Lucerne/Alfalfa) – Sample at the vegetative growth stage. Collect plant tops from the top 15cm of the plant.



Lupin – Collect the youngest mature blade during the vegetative growth stage prior to flowering.

Soy Bean – Collect the youngest mature leaf at the early vegetative growth stage.

Sugarcane – A section around 20cm long of the TVD (top visible dewlap – this is approximately the third leaf from the shoot apex) should be collected during the boom phase of growth i.e. when stalk elongation is around 2cm per day.

Sunflower – Collect the youngest open leaf at the early vegetative growth stage (approximately 6 weeks from seeding).