BACK PADDOCK NUTRIFACT

Guidelines for Sampling Plant Tissue for Temperate Tree Crops and Vines

Why Measure Nutrients In Plant Tissue?

Of the many factors affecting crop quality and yield, soil fertility is one of the most important. It is fortunate that producers can manage fertility by measuring the plant's nutritional status. Nutrient status is an unseen factor in plant growth, except when imbalances become so severe that visual symptoms appear on the plant.

The only way to know whether a crop is adequately nourished is to have the plant tissue analysed during the growing season.

What Plant Tissue Analysis Shows

Plant tissue analysis shows the nutrient status of plants at the time of sampling. This, in turn, shows whether soil nutrient supplies are adequate. In addition, plant tissue analysis will detect unseen deficiencies and may confirm visual symptoms of deficiencies. Toxic levels also may be detected. Though usually used as a diagnostic tool for future correction of nutrient problems, plant tissue analysis from young plants will allow a corrective fertiliser application that same season.

A plant tissue analysis can pinpoint the cause, if it is nutritional. A plant analysis is of little value if the plants come from fields that are infested with weeds, insects, and disease organisms; if the plants are stressed for moisture; or if plants have some mechanical injury.

The most important use of plant analysis is as a monitoring tool for determining the adequacy of current fertiliser practices. Sampling a crop periodically during the season or once each year provides a record of its nutrient content that can be used through the growing season or from year to year. With soil test information and a plant analysis report, a producer can closely tailor fertiliser practices to specific soil-plant needs.

DOs AND DON'Ts OF PLANT TISSUE SAMPLING

DOs

- Sample the correct plant part at the specified time or growth stage.
- Use clean plastic disposable gloves to sample to avoid contamination.
- Sample tissue (e.g. entire leaves) from vigorously growing plants unless otherwise specified in the sampling strategy.
- Take sufficiently large sample quantity (adhere to guidelines for each species provided)
- When troubleshooting, take separate samples from good and poor growth areas.
- Wash samples while fresh where necessary to remove dust and foliar sprays.
- Keep samples cool, after collection.
- Refrigerate or dry if samples can't be despatched to the laboratory immediately, to arrive before the week-end.
- Generally sample in the morning while plants are actively transpiring.

DON'Ts

- Avoid spoiled, damaged, dead or dying plant tissue.
- Don't sample plants stressed by environmental conditions.
- Don't sample plants affected by disease, insects or other organisms.
- Don't sample soon after applying fertiliser to the soil or foliage.
- Avoid sample contamination from dust, fertilisers, chemical sprays as well as perspiration and sunscreen from hands.
- Avoid atypical areas of the paddock, e.g. poorly drained areas.
- Don’t sample plants of different vigour, size and age.
- Don’t sample from different cultivars (varieties) to make one sample.
- Don't collect samples into plastic bags as this will cause the sample to sweat and hasten its decomposition.
- Don't sample in the heat of the day, i.e. when plants are moisture stressed.
- Don't mix leaves of different ages

Reference - Standard sampling procedures and interpretation criteria are based on the guidelines provided in “Plant Analysis – An Interpretation Manual” Reuter and Robinson, CSIRO Publishing 1997.

BACK PADDOCK SoilMate

Phone: **1800 557 166** • Email: **info@backpaddock.com.au** • Web: **www.backpaddock.com.au**

Postal: **PO Box 823 Cleveland, QLD 4163**

- For each soil or plant tissue sample in the kit you will find:
- 1 sample bag labeled with a barcode
- 1 Sample Order Form (SOF)
- 1 Prepaid Express Post satchel – addressed
- 1 Sample Information Form(SIF)

Collect samples according to the instructions below for Soil or Plant Tissue and place in the sample bag provided.

Place the filled sample bag and the completed SOF (Sample Order Form) in the satchel provided and dispatch by normal Express Post arrangements.

Complete the SIF (Sample Information Form) and FAX or post to the adviser shown.

It may be beneficial to draw and retain a rough sketch of the farm or paddock marking each sample area with the barcode number/s assigned to the samples.

Sampling Instructions

Soil

Correct sampling is absolutely critical for meaningful analysis

Taking the Sample

Ensure your hands and equipment are clean before commencing sampling.

Divide the area to be sampled into relatively uniform soil types, cropping and fertiliser history. One sample is required from each of these uniform areas. Consult your adviser on where to sample.

If you do not have a soil probe use a shovel or spade to dig a hole to the sample depth. Then cut a 2cm slice of soil from one side of the hole and place this soil in a plastic bucket.

Repeat this 20 times, sampling at regular intervals over the block to be sampled.

Depth of sampling

Surface samples are taken to a depth of 0-10 cm for cereals, oilseeds, grain legumes, forages and summer grains.

Sampling – Where NOT to sample

- Unusual areas, e.g. stock camps, dam sites,
- Within 10 to 20 m of current and old fence lines, timber burns, headlands,
- Poorly drained areas, gilgais or melon holes, etc
- Areas of poor growth or excessively good growth, e.g. dung and urine patches in crops or pastures
- Areas of differing soil type, drainage patterns, and cut and fill areas
- Areas of differing fertilizer usage including in the fertilizer band, particularly in no till or row crop situations
- Sample high and low yield areas separately
- Where different soil types occur within the same paddock, sample each separately

Areas of different farming history should be sampled separately.

Crop	Growth Stage To sample	Plant Part	Number Required
Barley	Seedling to early tillering (GS 14 -21)	Whole tops cut off 1cm above ground	40
	Early tillering to 1st node (GS 23 - 31)	Whole tops cut off 1cm above ground	25
	Emergence of head from boot (GS 50 – 51)	Whole tops cut off 1 cm above ground	25
	Early tillering to 1st node (GS21-31)	Youngest expanded blade (YEB) plus next 2 lower blades,	40
Canola	6 leaf to rosette	Whole tops	25
	Prior to flowering	Youngest mature leaf	40
Chick Peas	Pre-flowering	Whole tops	25-40
Faba beans	Vegetative pre-flowering	Whole tops	20
	Early flowering	Recently mature leaf	75-100
Lentils	Pre-flowering	Whole tops	25-40
Lupins	Pre-flowering	Recently mature leaf	50 -75
Linseed	Immediately pre-flowering	Upper fully expanded leaves FEL stripped from stem	100s
	63 days after sowing DAS	Whole shoot cut 2 cm above ground level	30
Oats	Seedling to early tillering (GS 14 -21)	Whole tops cut off 1cm above ground	40
	Early tillering to 1st node (GS 23 - 31)	Whole tops cut off 1cm above ground	25
	Emergence of head from boot (GS 50 – 51)	Whole tops cut off 1 cm above ground	25
	Early tillering to 1st node (GS21-31)	Youngest expanded blade (YEB) plus next 2 lower blades,	40
Peas (field peas)	Pre-flowering	Youngest mature compound leaf (leaves from 3rd to 5th nodes from top)	60 - 80
Wheat / Triticale	Seedling to early tillering (GS 14 -21)	Whole tops cut off 1cm above ground	40
	Early tillering to 1st node (GS 23 - 31)	Whole tops cut off 1cm above ground	25
	Flag leaf ligule just visible to boots swollen (GS 39 – 45)	Whole tops cut off 1cm above ground	25
	Early tillering to 1st node (GS21-31)	Youngest expanded blade (YEB) plus next 2 lower blades,	40

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Crop	Time Of Year or Growth Stage	Plant Part	Leaves or Petioles
Almond	Mid to late January	Normal sized leaves, shoulder-high from non-fruiting spurs on spur bearing cultivars or mid-shoot on the current season's extension growth on non-spurring varieties. Take at least 4-5 leaves from the periphery of each of 20-30 similar trees of a single cultivar and rootstock.	150
Apple	Late January to mid February	Entire leaf (including petiole) from mid-shoot position on current season's growth. Take at least 4 leaves from the periphery of each of 20-30 similar trees of a single cultivar and rootstock.	120
Apricot	January and February	Mid shoot leaves from current seasons flush. Take at least 4 leaves form the periphery of each of 20-30 similar trees of a single cultivar and rootstock.	120
Blueberry	mid January to mid February	Sample most recently fully expanded leaves from fruiting shoots (4th to 6th nodes from shoot tip). Pick leaves so that the petiole remains with the leaf. Do not take leaves from whips.	80 – 100
Cherry	January and February	Mid shoot leaves from current seasons flush. Take at least 4 leaves from the periphery of each of 20-30 similar trees of a single cultivar and rootstock.	120
Citrus – Qld	February- March	Healthy, mature leaves from middle of non-fruiting terminals of previous spring flush 5-7 months old. Take leaves at shoulder height at various positions around the trees. Avoid sampling spring flush terminal that have reflushed.	200
Citrus – Riverland, Sunraysia	Leaves are six months old	Most recent fully expanded leaf on a non-fruiting terminal otherwise as for Qld.	200
Fig	January (mid summer)	First full-sized basal leaf from moderately vigorous shoots.	40
GRAPES - Petiole	2 to 3 weeks before 70 – 80% capfall	Sample petiole from leaf at the base of cane when leaves are fully developed or at least two-thirds fully developed.	100
Grapes - Petiole	70 – 80% capfall	Petioles from leaves opposite bunch at base of shoot at full bloom (80% cap fall). One petiole per vine from a planting. Sample from minimally shaded, normal growing shoots on both sides of the vine canopy.	100
Grapes - Petiole	Veraison	Sample petioles from mature, fully expanded leaves located 5 to 7 leaves from the shoot tip at veraison (fruit softening). Collect one or two petioles per vine. Sample from minimally shaded, normal growing shoots on both sides of the vine canopy.	100
Grape – Leaf blade	Veraison	Leaf blades (lamina only) from leaves opposite bunch at base of shoot. One leaf per vine from a single variety x rootstock planting.	50
Kiwifruit	4 weeks after budburst and 6 weeks after budburst	Sample YFEL youngest fully expanded leaf on current season canes. Sample at least 20 vines (two to three leaves per vine) should be collected.	40 – 60
Kiwifruit	February (about 18 weeks after budburst)	First or second leaf (plus petiole) past the final fruit cluster on a fruiting lateral, towards the growing point. Leaves from at least 20 vines (two to three leaves per vine) should be collected.	40 - 60
Olive	Late December – late February	Latest mature leaves just prior to flowering. 5 – 10 leaves each from 20 – 30 trees from a single planting and variety.	150
Peach & Nectarine - Low Chill	Sample in the 2 weeks after harvest; before summer pruning or fertilizer application	Sample mature leaves from midpoint of exposed shoots from current season's terminal growth. . Take at least 4 leaves from the periphery of each of 20-30 similar trees of a single cultivar and rootstock.	150
Peach & Nectarine - High Chill	Mid January – Mid February	Sample mature leaves from midpoint of exposed shoots from current season's terminal growth. . Take at least 4 leaves from the periphery of each of 20-30 similar trees of a single cultivar and rootstock.	150
Pear	Late January – Mid February	Sample mature leaves from midpoint of exposed shoots from current season's terminal growth. . Take at least 4 leaves from the periphery of each of 20-30 similar trees of a single cultivar and rootstock.	150
Plum	JAN- FEB (d'Agen) , DEC-JAN (Japanese)	Sample mature leaves from midpoint of exposed shoots from current season's terminal growth. . Take at least 4 leaves from the periphery of each of 20-30 similar trees of a single cultivar and rootstock.	150
Raspberry	Late Summer - Autumn	Sample 5th - 12th leaves from the terminal 150 mm of the new canes (primocanes, that is non-fruiting) 2 - 3 weeks after final pick.	60