



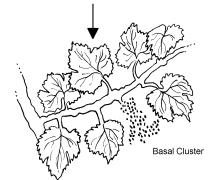
Sampling Notes

Two sampling periods recommended for grape leaf tissue analysis: At flowering, a petiole sample may be collected, or later in the season during fruit ripening, a leaf blade only sample can be taken. The earlier sampling time has the advantage that corrective actions are possible for the current season's crop. The later sample would better reflect the nutrient supply for a larger part of the season, and will be of value for planning the next season's fertiliser programme.

Also refer to Hill Laboratories Technical Note Grapevine Tissue Analysis (KBI 4494).

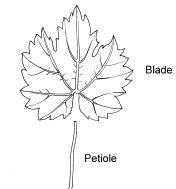
Blade - Ripening (Veraison)

Sampling Time:	During fruit ripening.
Plant Part	Leaf blades only. Remove petioles immediately after sampling.
Collect From:	Opposite the basal cluster, from exposed shoots on the outside of the vine, or leaves in good physical condition in close proximity to fruit clusters.
Quantity per Sample:	40 leaf blades.
Recommended Tests:	Basic Plant (BP).
Comments:	This sampling time is especially useful to diagnose problems later in the season.



Petiole - Flowering

Sampling Time:	During flowering at full bloom (November-December).
Plant Part	Leaf petioles only. Remove petioles immediately after sampling.
Collect From:	Opposite the basal cluster, from exposed shoots on the outside of the vine.
Quantity per Sample:	40 petioles.
Recommended Tests:	Basic Plant (BP), Nitrate-N (NO ₃)
Comments:	



Soil

Sampling Time:	Prior to crop establishment and annually at any time of the year, although autumn to early winter is recommended.
Core Depth	15 cm.
Collect From:	The root zone of the vines. Use a fixed distance of 1 m from the base of vines to ensure similar samples are collected each year.
Quantity per Sample:	15 - 20 cores.
Recommended Tests:	Basic Soil (BS).
Comments:	Grapes have a low fertiliser requirement, making soil tests of lesser value than leaf analysis in assessing the nutrient status of a vineyard. Plant analysis is recommended to identify any specific needs of the crop.
	Soil samples should be collected in the same manner and at the same time every year, so that the grower can monitor changes in the nutrient levels over a period of years. These changes, coupled with leaf analysis data, will demonstrate the adequacy, or otherwise, of the fertiliser programme.



Interpretation

Interpretation of the laboratory's results is possible by comparison with normal levels expected for the crop in question. The interpretation given is based on the best information available and relate specifically to the sampling instructions given.

Blade - Ripening (Veraison)			Petiole - Flowering			Soil		
Analyte	Unit	Range	Analyte	Unit	Range	Analyte	Unit	Range
Nitrogen	%	1.9 - 2.6	Nitrogen	%	0.80 - 1.5	pH	pH	5.8 - 6.8
Phosphorus	%	0.16 - 0.25	Nitrate-N	mg/kg	570 - 1,800	Olsen Phosphorus	mg/L	15 - 40
Potassium	%	1.0 - 1.5	Phosphorus	%	0.18 - 0.45	Potassium	me/100	0.40 - 0.80
Sulphur	%	0.20 - 0.35	Potassium	%	2.0 - 3.5	Calcium	me/100	6.0 - 12
Calcium	%	1.6 - 2.8	Sulphur	%	0.13 - 0.25	Magnesium	me/100	1.0 - 3.0
Magnesium	%	0.22 - 0.42	Calcium	%	1.3 - 2.1	Sodium	me/100	0.0 - 0.40
Sodium	%	0.0 - 0.10	Magnesium	%	0.30 - 0.60	CEC	me/100	12 - 25
Iron	mg/kg	40 - 200	Sodium	%	0.0 - 0.15	Volume Weight	g/mL	0.60 - 1.0
Manganese	mg/kg	40 - 200	Iron	mg/kg	20 - 50			
Zinc	mg/kg	26 - 40	Manganese	mg/kg	25 - 140			
Copper	mg/kg	10 - 40	Zinc	mg/kg	25 - 60			
Boron	mg/kg	25 - 35	Copper	mg/kg	5.0 - 20			
			Boron	mg/kg	28 - 45			
			Chloride	%	0.50 - 1.5			

Comments

Grapes are less likely to develop nutritional deficiencies than other horticultural crops in New Zealand. Other problems, such as diseases, waterlogged soils, drought stress and herbicide damage can produce symptoms that can be mistaken for nutrient disorders.

Deficiencies most likely to occur are nitrogen, potassium, magnesium and boron. Less common deficiencies are sulphur, manganese, zinc, phosphorus and iron. Deficiencies of calcium, copper and molybdenum are considered unlikely to occur.

Chloride toxicities have been reported overseas, but would only be likely to occur in New Zealand where high chloride irrigation waters are used. Aluminium and manganese toxicities may also occur on very acid soils with a pH less than 5.0.

High levels of manganese, zinc and copper may arise as a result of spray residues.

Grapes can be grown on a wide range of soil types, but nutritional problems are more likely to occur on sandy soils.

Nitrogen fertilisers should be used with caution, as excessive nitrogen promotes vigorous shoot growth to the detriment of grape quality.

Table grapes are often grown in glass or plastic houses. Soil fertility levels for this purpose will be much higher than those required for wine production.

References

Fertiliser recommendation for horticultural crops. HortResearch HortNET, 1997.

Blackmore, L.C; Searle, P.L and Daly, B.K. 1987. Methods for chemical analysis of soils. NZ Soil Bureau Scientific Report 80. NZ Soil Bureau, DSIR.

Christensen, P., Kasimatis, A., Jensen, F. 1978. Grapevine nutrition and fertilisation in the San Joaquin Valley. University of California, Priced Publication 4087, USA.

Disclaimer

Normal Range levels quoted relate specifically to the sampling procedure given. The Normal Range levels and Comments provided are the most up to date levels available, but may be altered without notification. Such alterations are implemented immediately in the laboratory histogram reports. It is recommended that a consultant or crop specialist be involved with interpretations and recommendations.