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Sampling

Very little information is available on chestnuts nutrient requirements. Data presented here is from some Japanese research, from published Australian guidelines, and from survey work of New Zealand orchards from 1990 to 1996.

Leaf

Sampling Time: January and February.

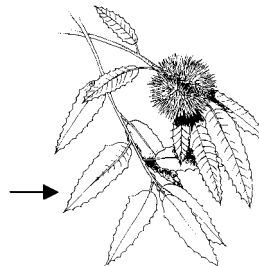
Plant Part: Youngest mature leaf (blade & petiole).

Collect From: Current season's non-fruiting shoots.

Quantity per Sample: 2-3 representative leaves from each of 30 trees.

Recommended Tests: Basic Plant (BP).

Comments: Although non-fruiting shoots are the recommended leaf sampling portion, New Zealand research has shown little difference in mineral levels from that of fruiting shoots.



Soil

Sampling Time: Prior to crop establishment and annually at any time of the year, although autumn to early winter is recommended.

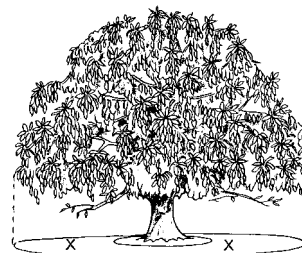
Core Depth: 15 cm.

Collect From: From the drip zone of the trees.

Quantity per Sample: 12 - 20 cores.

Recommended Tests: Basic Soil (BS).

Comments: Separate samples should be taken from blocks that differ in age, cultivar types, tree performance, soil types, topography and fertiliser history.



Where fertiliser has been broadcast, sample from the drip zone of the trees. Where fertiliser has been banded, samples should only be taken from areas under the drip zone which have previously received fertiliser.

If the orchard has herbicide treated strips, then it is best if these are sampled separately from the grassed areas between rows. Quite different nutrient levels may exist between these two areas.

When sampling prior to orchard establishment, a 15 - 40 cm depth sample should also be taken, primarily to check the sub-soil pH. Sample depths of 40 - 60 cm have also been suggested.

Interpretation

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

Very little data is available to interpret chestnut nutrient levels. The normal range levels shown below should be regarded as tentative.

Leaf			Soil		
Element	Unit	Normal Range	Element	Unit	Normal Range
Nitrogen	(%)	2.4 - 2.9	pH	-	5.0 - 6.0
Phosphorus	(%)	0.14 - 0.30	Olsen P	(ug/ml)	15 - 50
Potassium	(%)	0.8 - 1.6	Potassium	(me/100g)	0.50 - 1.20
Sulphur	(%)	0.15 - 0.25	Calcium	(me/100g)	6.0 - 12.0
Calcium	(%)	0.60 - 1.40	Magnesium	(me/100g)	1.00 - 3.00
Magnesium	(%)	0.25 - 0.70	Sodium	(me/100g)	0.00 - 0.50
Sodium	(%)	0.00 - 0.10	CEC	(me/100g)	12.0 - 25.0
Iron	(ug/g)	10 - 150	Volume Weight	(g/ml)	0.60 - 1.00
Manganese	(ug/g)	50 - 700			
Zinc	(ug/g)	17 - 100			
Copper	(ug/g)	4 - 20			
Boron	(ug/g)	30 - 80			

Comments:

Although Japan is recognised as a major area for chestnut growing, there is little research data that can be adopted for New Zealand conditions. In the absence of extensive trials, it is recommended that growers keep good records of yields, fertiliser applications and other management practices, and use regular soil and plant analysis to build up a knowledge of their crop.

Soils to be used for chestnut growing should be free draining, allowing unrestricted root development in the top 60 cm of the soil.

Soil testing on its own will always be of limited value for such a deep rooting tree crop. Better information can be obtained if done together with plant analysis.

Extremely high manganese levels have been observed in New Zealand crops. This may be due to acidic and poorly aerated sub-soils where these trees are grown. It is uncertain at this time whether these high levels are having any adverse effects.

References

- Reuter, D. J. and Robinson, J. B. (Eds) 1997. Plant analysis. An interpretation manual. Second edition.
- Robinson, P.G. 1997. Waikato Chestnut Growers Association. Pers. Comm.
- Clark, C.J. 1987. Assessing the fertiliser needs of chestnuts. Growing Today, Aug/Sept, pp 8-11.
- Weir, R.G. and Cresswell, G.C. 1995. Plant nutrient disorders 1. Temperate and subtropical fruit and nut crops. Inkata Press.
- 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.

Disclaimer:

Normal Range levels quotes 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.