



R J Hill Laboratories Ltd  
1 Clyde St, Private Bag 3205, HAMILTON  
tel: 07 8582000  
fax: 07 8582001  
email: S&P@hill-labs.co.nz  
internet: www.hill-labs.co.nz



## Sampling

This is a general guide that applies to brassica crops, including cabbage, broccoli, brussel sprouts, cauliflower and choumoellier.

### Leaf

**Sampling Time:** Mid-growth, or when the plant is starting to head.

**Plant Part:** For cabbages and cauliflower beginning to head, sample the wrapper leaf; for all other brassica crops sample recently matured leaves.

**Collect From:** -

**Quantity per Sample:** 20 - 30 leaves.

**Recommended Tests:** Basic Plant (BP), Molybdenum (MO).

**Comments:** To help diagnose an obvious problem, leaves showing the first signs of the distinctive symptoms should be collected as soon as abnormalities appear. If sampling outside the normal sampling time it is useful to take a second sample of similar, healthy leaves from nearby unaffected plants for analysis as a comparative standard.

### Soil

**Sampling Time:** Prior to crop establishment.

**Core Depth:** 15 cm.

**Collect From:** Randomly throughout the area to be planted.

**Quantity per Sample:** 12 - 20 cores.

**Recommended Tests:** Basic Soil (BS).

**Comments:** If a problem is suspected during the growing season, then a sample should be taken from the rooting zone immediately adjacent to the plant. Collecting a second sample from an unaffected area may help identify the cause of the problem.

## 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.

Leaf			Soil		
<i>Element</i>	<i>Unit</i>	<i>Normal Range</i>	<i>Element</i>	<i>Unit</i>	<i>Normal Range</i>
Nitrogen	(%)	3.0 - 5.5	pH	-	6.0 - 6.8
Phosphorus	(%)	0.26 - 0.70	Olsen P	(ug/ml)	30 - 80
Potassium	(%)	2.0 - 5.0	Potassium	(me/100g)	0.50 - 1.00
Sulphur	(%)	0.30 - 0.80	Calcium	(me/100g)	6.0 - 12.0
Calcium	(%)	0.50 - 4.00	Magnesium	(me/100g)	1.00 - 3.00
Magnesium	(%)	0.20 - 0.70	Sodium	(me/100g)	0.00 - 0.50
Sodium	(%)	0.00 - 1.00	CEC	(me/100g)	12.0 - 25.0
Iron	(ug/g)	50 - 200	Volume Weight	(g/ml)	0.60 - 1.00
Manganese	(ug/g)	25 - 300			
Zinc	(ug/g)	20 - 200			
Copper	(ug/g)	5 - 25			
Boron	(ug/g)	25 - 150			

### Comments:

Brassica are noted for their deficiencies of boron (club roots, hollow stem) and molybdenum (whiptail in cauliflower). Other deficiencies that occasionally occur are of nitrogen, sulphur and zinc.

Nitrogen deficiency will appear as a purple pink coloration in the foliage. This symptom can also be induced by other factors such as cold weather, root damage from nematodes, drought stress and water logging.

Results for copper, zinc and manganese in leaves sprayed with fungicides will not be reliable due to adhering spray residues on the leaves.

Iron deficiency symptoms may exist even when leaf levels appear satisfactory. This may be due to the presence of physiologically inactive forms of iron within the tissue. Also, soil contamination of leaves growing near the ground may elevate total iron results.

### References

Scaife, A. and Turner, M. 1983. Diagnosis of mineral disorders in plants. Volume 2, Vegetables. MAFF/ARC London.

Weir, R.G. and Cresswell, G.C. 1995. Plant nutrient disorders 3. Vegetable 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. Fertiliser recommendation for horticultural crops. HortResearch HortNET, 1997.

### 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.*