

## Sampling Notes

The nutritional status of this vegetable crop is monitored using soil tests and plant analysis. Monitoring regularly is important to help sustain optimum levels and avoid nutritional disorders. If disorders do occur, rapid diagnosis is necessary to assist correction.

Leaf - (1) Seedling	
<b>Sampling Time:</b>	4 leaf stage.
<b>Plant Part</b>	Whole above ground shoot.
<b>Collect From:</b>	-
<b>Quantity per Sample:</b>	20 plants.
<b>Recommended Tests:</b>	Basic Plant (BP).
<b>Comments:</b>	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.
Leaf - (2) Mid Growth	
<b>Sampling Time:</b>	Mid-growth.
<b>Plant Part</b>	Youngest mature leaf.
<b>Collect From:</b>	-
<b>Quantity per Sample:</b>	30-50 leaves.
<b>Recommended Tests:</b>	Basic Plant (BP).
<b>Comments:</b>	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	
<b>Sampling Time:</b>	Prior to crop establishment.
<b>Core Depth</b>	15cm.
<b>Collect From:</b>	Randomly throughout the area to be planted.
<b>Quantity per Sample:</b>	12 - 20 cores.
<b>Recommended Tests:</b>	Basic Soil (BS), Sulphate Sulphur (SO <sub>4</sub> ), Available Nitrogen (AN)
<b>Comments:</b>	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 is based on the best information available and relate specifically to the sampling instructions given.

Leaf - (1) Seedling			Leaf - (2) Mid Growth			Soil		
Analyte	Unit	Range	Analyte	Unit	Range	Analyte	Unit	Range
Nitrogen	%	3.5 - 5.5	Nitrogen	%	2.5 - 4.0	pH	pH	5.6 - 7.0
Phosphorus	%	0.28 - 0.35	Phosphorus	%	0.25 - 0.40	Olsen Phosphorus	mg/L	45 - 90
Potassium	%	4.0 - 5.0	Potassium	%	2.5 - 5.0	Potassium	me/100	0.70 - 1.1
Sulphur	%	0.60 - 0.90	Sulphur	%	0.50 - 1.0	Calcium	me/100	6.0 - 12
Calcium	%	1.0 - 2.0	Calcium	%	1.0 - 2.5	Magnesium	me/100	1.0 - 3.0
Magnesium	%	0.25 - 0.35	Magnesium	%	0.30 - 0.50	Sodium	me/100	0.0 - 0.50
Sodium	%	0.050 - 0.10	Sodium	%	0.0 - 0.40	CEC	me/100	12 - 25
Iron	mg/kg	50 - 150	Iron	mg/kg	60 - 300	Volume Weight	g/mL	0.60 - 1.0
Manganese	mg/kg	50 - 150	Manganese	mg/kg	30 - 300	Sulphate Sulphur	mg/kg	20 - 50
Zinc	mg/kg	18 - 30	Zinc	mg/kg	25 - 100	Available Nitrogen	kg/ha	100 - 150
Copper	mg/kg	8.0 - 15	Copper	mg/kg	6.0 - 20			
Boron	mg/kg	20 - 30	Boron	mg/kg	25 - 50			

## Comments

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

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.  
Weir, R.G. and Cresswell, G.C. 1995. Plant nutrient disorders 3. Vegetable crops. Inkata Press.

## 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.