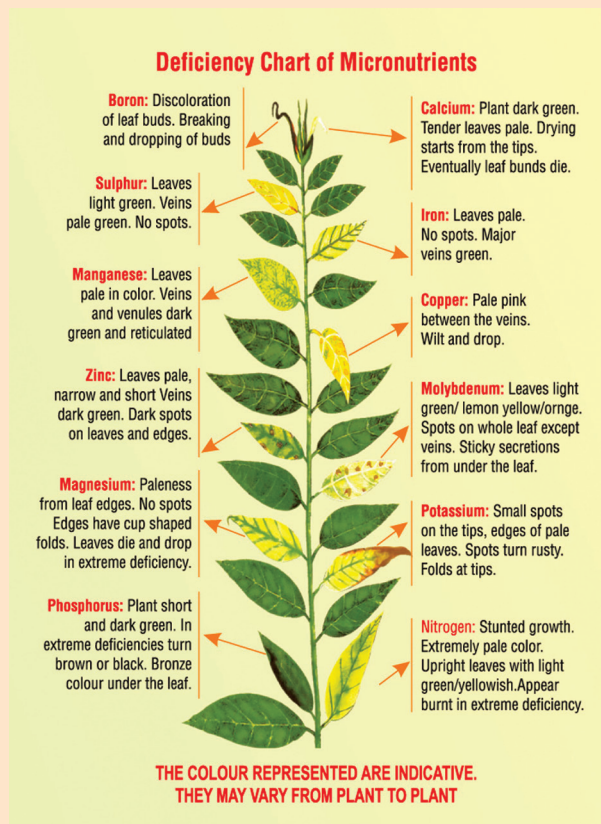


Deficiency symptoms of nutrients and corrective measures of coffee

Nutrient	Deficiency Symptoms	Corrective measures
Nitrogen (N)	Yellowing of older leave, defoliation and die-back in severe cases. Poor, stunted growth	Foliar spray of Urea alone @ 0.5 - 2.0% [compatible with Bordeaux mixture]
Phosphorus (P)	- Irregular patches of yellow colour and mottled appearance in older leaves. - Leaf turns red or violet and drops under severe condition	Foliar spray of SSP @ 0.5% (or) DAP @ 1% [not compatible with Bordeaux mixture]
Potassium (K)	Necrosis or scorching of leaf tip and margins of older leaves	Foliar spray of MOP alone @ 0.1% [compatible with Bordeaux mixture]
Calcium (Ca)	- Death of growing tip. - Brittle leaves with yellowish appearance	Liming of soil using calcitic lime (Agricultural lime)
Magnesium (Mg)	- Yellowing of older leaves between the lateral veins on either side of mid rib. - Yellow area surrounded usually by green lines	Foliar spray of Magnesium sulphate @ 0.1% (or) soil application of dolomite
Sulphur (S)	Yellowing of young leaves and stunted shoot	Soil application of S containing fertilizer
Copper (Cu)	Young leaves die back, chlorosis sets in, leaves curl and roll. Shoots are weak and restricted, may be rosette	Foliar spray of Copper sulphate @ 0.5% (properly neutralized)
Zinc (Zn)	- Short internodes stunted and chlorotic small, elongated leaves. - Rosette shaped leaf bunch	Foliar spray of Zinc sulphate @ 0.25% (properly neutralized)
Boron (B)	Death of terminal shoot, leathery leaves with malformation of small leaves	Foliar spray of Boric acid @ 0.05%
Molybdenum (Mo)	Downward bending of the lamina along the mid-rib; large brown, yellow spots	Foliar spray of Ammonium molybdate @ 0.025%
Iron (Fe)	Chlorosis of leaves	Provide good drainage



* * *

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NUTRIENT DEFICIENCY SYMPTOMS OF COFFEE AND CORRECTIVE MEASURES



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A deficiency (or) toxicity of a nutrient in soil is manifested in the leaf in different ways such as discolouration and deformation. These symptoms can occur when balanced fertilizers are not applied or when there is inadequate nutrient supply. However, deficiency symptoms are rarely seen in coffee plantations. Each nutrient has a characteristic feature of expressing its deficiency (or) toxicity which is reflected in the leaves.

The micronutrients essential for coffee include Iron, Manganese, Copper, Zinc, Molybdenum, Boron, Sodium and Chlorine

Coffee-growing soils are slightly to highly acidic and have medium to high organic carbon.

Generally most of the micronutrient requirement of coffee plants is met by the release of micronutrients on decomposition of organic matter.

However, in some cases, deficiency symptoms of zinc and boron may be

observed in the coffee plants which are often due to high levels of phosphorus (or) potassium in the acidic soil.

In such cases, foliar sprays of micronutrients can be provided especially to high-yielding blocks.

It is important to note that excessive use of chemical fertilizers, lack of recycling farm waste and removal of shade trees have negatively impacted soil health.

Micronutrients though required in small quantities are essential for plant growth and performance. Therefore, it is crucial to supply all essential nutrients in adequate quantities for balanced fertilization.

Deficiencies of zinc, boron and molybdenum determined by soil analysis (or) when deficiency symptoms are observed on leaves can be addressed through foliar spray of these deficient elements.

Typically foliar spray solutions contain Zinc Sulphate, Ammonium Molybdate, Borax(or) Boric acid and spray lime for neutralization. These solutions are sprayed preferably during the post-

monsoon period at 500 to 600 litres per acre.

However it is important to note that foliar sprays alone would not sustain plant growth and yield.

Soil application of nutrients especially major nutrients remains an essential part of a plant nutrition program.

DEFICIENCIES OF NUTRIENT ELEMENTS													
Symptoms	Suspected Element												
	N	P	K	Mg	Fe	Cu	Zn	B	Mo	Mn	OF		
Yellowing of Younger Leaves					✓						✓		
Yellowing of Middle Leaves										✓			
Yellowing of Older Leaves	✓		✓	✓			✓						
Yellowing Between Veins				✓							✓		
Old Leaves Drop	✓												
Leaves Curl Over				✓									
Leaves Curl Under			✓			✓						✓	
Younger Leaf Tips Burn								✓					
Older Leaf Tips Burn	✓						✓						
Young Leaves Wrinkle/Curl			✓				✓	✓	✓	✓			
Necrosis			✓	✓	✓						✓		
Leaf Growth Stunted	✓	✓											
Dark Green/Purple Leaf & Stems		✓											
Pale Green Leaf Color	✓									✓			
Molting							✓						
Spindly	✓												
Soft Stems	✓		✓										
Hard/Brittle Stems		✓	✓										
Growing Tips Die			✓					✓					
Stunted Root Growth		✓											
Wilting						✓							

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