

Identification of Nutrient Deficiencies



Younger plant organs

Nutrients remain primarily in old organs.
Limited mobile nutrients: S, Cu, Fe, Mn, Mo, Zn
Immobile nutrients: B, Ca

Which symptoms occur?

- Intervetinal chlorosis

Yes >

Narrow stripes full length of leaf = **Iron (Fe)**
Brown specs and bronzing = **Manganese (Mn)**
Bleached bands along mid-rip = **Zinc (Zn)**

No <
- Growing tips are dying

Yes >

Leaves curl and are yellow = **Calcium (Ca)**
Abnormal growth, pale leaves = **Boron (B)**

No <
- General yellowing

Yes >

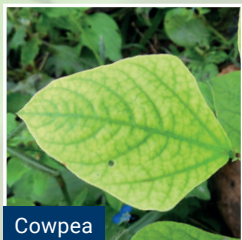
Leaves and veins pale = **Sulphur (S)**
Terminal dieback, leaves wilt = **Copper (Cu)**

No <
- Intervetinal mottling

Yes >

Leaves wilt and die along margin = **Molybdenum (Mo)**

No <



Fe deficiency
IPNI, A Boopathi Raja



Mn deficiency
Bergmann, Jena



Zn deficiency
IPNI, M.K. Sharma and P. Kumar



Ca deficiency
IPNI, M.K. Sharma and P. Kumar



B deficiency
Bussler, Berlin



S deficiency
IPNI, M.K. Sharma and P. Kumar



Cu deficiency
IPNI, M.K. Sharma and P. Kumar



Mo deficiency
Bergmann, Jena

Older plant organs

Nutrients can be translocated into young organs.
Mobile nutrients: N, P, K, Mg

Which symptoms occur?

- Chlorosis

Yes >

Mid-rib / Complete leaf = **Nitrogen (N)**
Along margin = **Potassium (K)**
Intervetinal = **Magnesium (Mg)**

No <
- Purpling

Yes >

Stunted growth = **Phosphorus (P)**

No <



N deficiency
IPNI, N. R. Usherwood



K deficiency
IPNI, Claudinei Kappes



Mg deficiency
IPNI, L. Prochnow



P deficiency
IPNI, U.K. Shanwad