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Nutrient Deficiency – Types, Diagnosis, Indicator plants and Major Disorder

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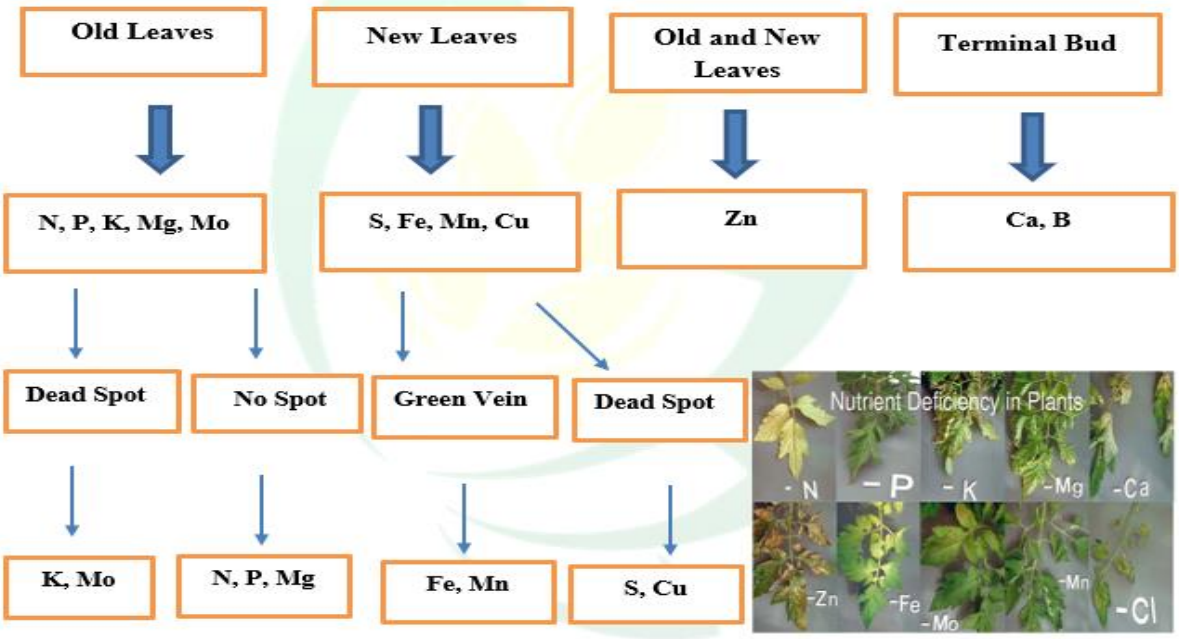
Introduction

Similar to humans, plants also require 17 essential nutrients to complete their life cycle as stated by Arnon and Stout (1939). Nutrient deficiency in plant is a major problem in crop production. Different nutrient deficiencies have characteristic symptoms and appear on different parts of plant. Deficiencies produce certain deformity in normal plant structure having major impacts on leaves. So, timely and accurate diagnosis of deficiency of certain nutrient is must needed to reduce crop yield and better management practices. Proper understanding required for correction of deficiency and recommendation of needful ameliorants and nutrients. Hereby, discussed the different types of nutrient deficiency, their diagnostic symptoms, indicator plants and major disease or disorders coming due to nutrient deficiency.

A. Based on Types, location and diagnostic on Leaves



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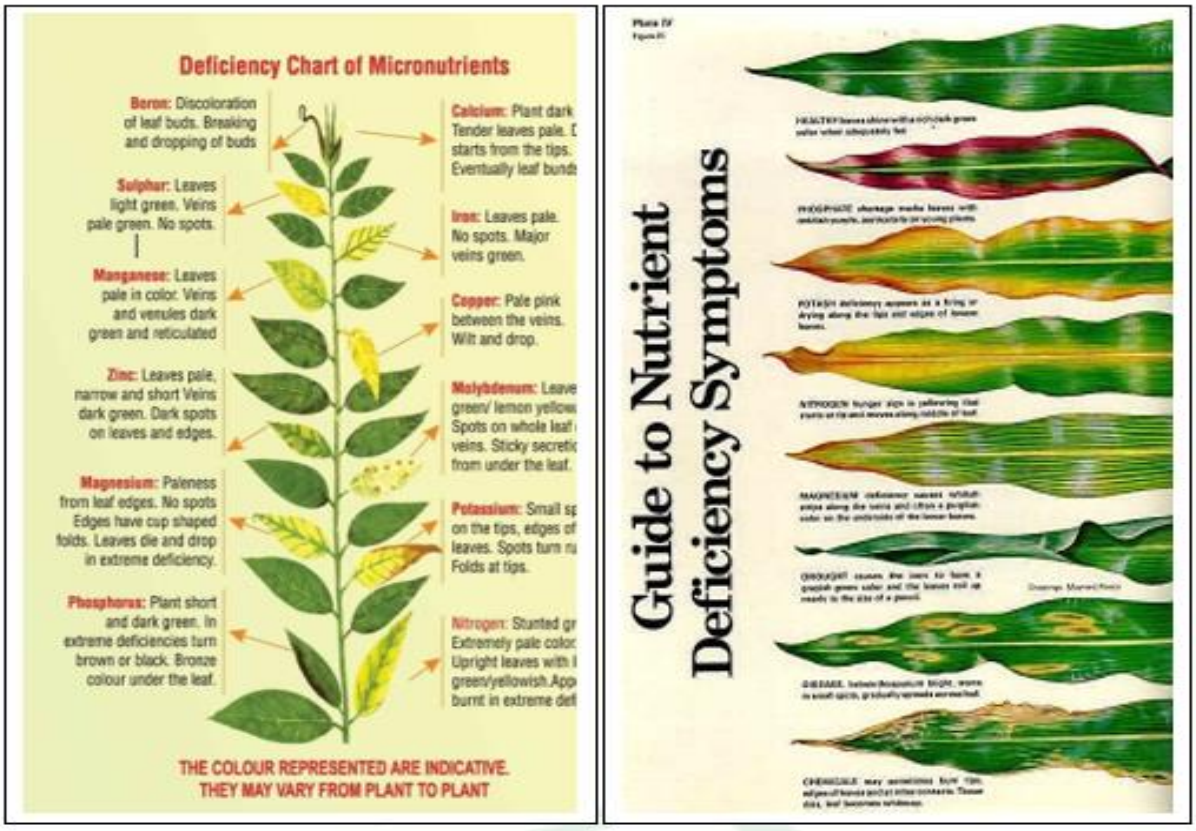
Based on Symptoms:



B. Based on deficiency symptoms on leaves:

• V-shaped yellowing at tip of lower leaves • Plant loose leaves	• Dark Green leaves • Greenish red, Purplish tinge	• Curling Inward • Tip Burn, Margin scorching, Brown spot near margin
Nitrogen N	**Phosphorus P**	**Potassium K**
•Light green, yellow or brown •Chlorotic mottling between vein of middle leaves •Resinous Gum	•Chlorosis start from base of leaf •First yellowing then tending towards whiteness	•Intervienal portion yellowish not tending towards whiteness •Complete interveinal chlorosis
Molybdenum Mo	Iron Fe	Mangnese Mn

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- Veins paler than interveinal portion
- Vegetable leaves yellow green and become thick and firm

Sulphur **S**

- Chlorosis among margin towards base
- Multiple bud formation in leaf axils

Copper **Cu**

- Plant become bushy
- Reduced internodal elongation

Zinc **Zn**

Calcium
Ca

Bud Leaf- chlorotic white
Tip drying and base remains green

Boron
B

Yellowing from base to tip
Whip like structure
Upward rolling of leaves

C. Indicator Plants: Highly susceptible plants show deficiency of particular element quickly that's why known as indicator plants. Used for early diagnosis of particular element deficiency.

N	Cauliflower	Cabbage
P	Rapeseed	Mustard
K	Potato	
Fe	Sorghum	

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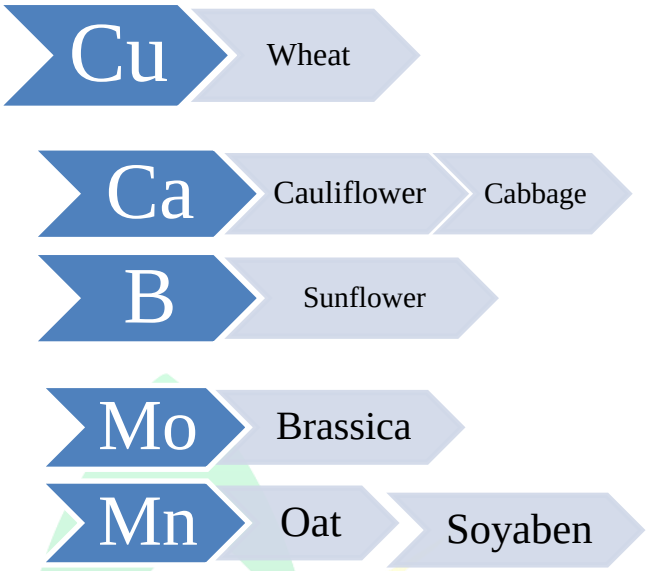

D. Major deficiency disorder:

N	Buttoning in cauliflower
P	Sickle leaf disease
K	Dark green color followed by browning in Potato
Mo	Yellow spot of citrus, whiptail of cauliflower
Mn	Grey speck of Oat, Pahala blight of sugarcane, Marsh spot of Pea
Cu	Rosetting and excess gumming of Citrus, Male flower sterility
Ca	Hollow stem and browning of cauliflower, Top sickness of tobacco, Hard fruits of citrus, Blossom end rot of Tomato
Zn	Khaira disease of Rice, White bud of Maize
Mg	Grass tetany (hypomagnesaemia)

Conclusion

Overall nutrient deficiency in plants is said to affect their growth, quality, impact in developmental stages and eventually compromising the overall health. Essential nutrients *viz.*, Nitrogen, Phosphorus and Potassium play critical roles in regulating and moderating various growth and developmental processes in plants. On the other hand, micronutrients *viz.*, Iron, Copper, Zinc and Magnesium influence the physiological processes in plants. It can be concluded that lacking of these nutrients (macro& micro), plants may exhibit symptoms such

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as stunted growth, chlorosis, poor fruit development, and increased susceptibility to diseases (discussed in the article) hence, this article may serve as a ready guide to the reader.