



DEPARTMENT OF BOTANY

GOVERNMENT DEGREE COLLEGE FOR MEN
SRIKAKULAM

(AFFILIATED TO Dr. BRAU, SRIKAKULAM, AP)

(2022-2023)

Project work

ON

Mineral deficiency
Symptoms in plants



**Government Degree college for Men
Srikakulam**

(Affiliated to Dr BR Ambedkar University, Srikakulam. AP)

**DEPARTMENT OF BOTANY
CERTIFICATE**

This is to certify that
Mr/Kumari _____ of II BSc,
Group _____ has done the project work on
“Mineral deficiency symptoms in plants”
with the Registered No _____
of Sem-IV, Paper-IV during the academic
year 2022-2023.

Signature of the Lecturer

Signature of the HOD

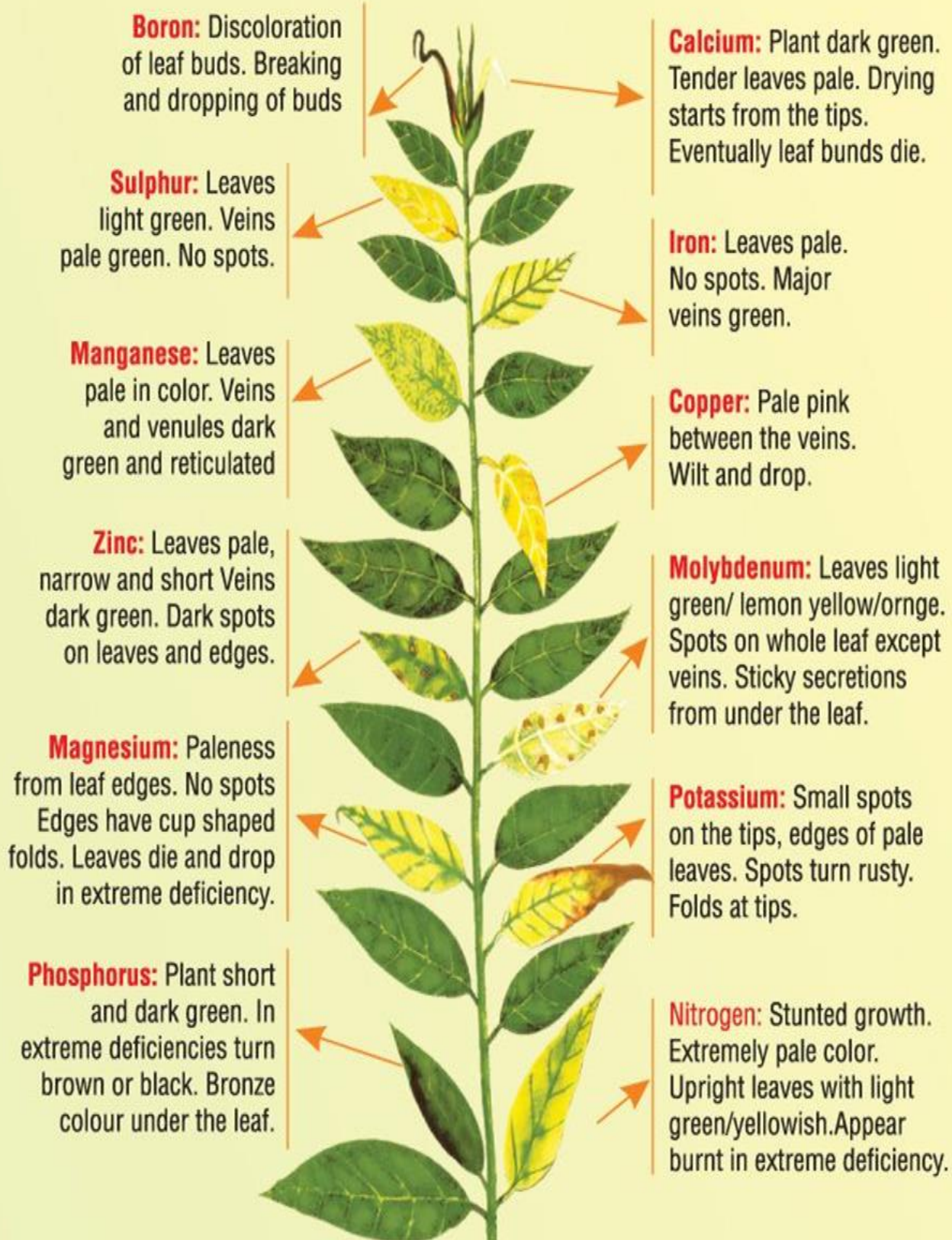
Submitted for the exam on- _____

Examiner

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• Deficiency Chart of Micronutrients



**THE COLOUR REPRESENTED ARE INDICATIVE.
THEY MAY VARY FROM PLANT TO PLANT**

2.Nitrogen(N) deficiency symptoms in plants:

- * Nitrogen deficient plants produce smaller Shoot, (Stunted Growth) leaves, fruits.**
- * Whole plant looks like yellow colour (Chlorosis).**
- * Early senescence of older leaves.**
- * Necrosis of older leaves in severe cases.**
- * Premature fall of leaves.**
- * Less tillering & Low yielding.**



Hibiscus cannabis



Maize

3. Phosphorus(P) deficiency symptoms in plants: -

- * **Stunted growth with poor vascular tissues.**
- * **Chlorosis of leaves & leaves turn into purple.**
- * **Necrosis of Older leaves.**
- * **Premature abscission of leaves.**
- * **Delay in flowering & Seed germination.**



Phosphorus deficiencies will first appear in older growth. Leaf damage initially appears as dark green to bluish green patches. At times when the deficiency is severe foliage turns a red - purple hue. ^



< New growth leaves when lacking in phosphorous will display dark green veins.



Leaf tips curling downwards are another symptom of phosphorous deficiency.

<



< Necrotic spots occur on leaf margins - advanced stages



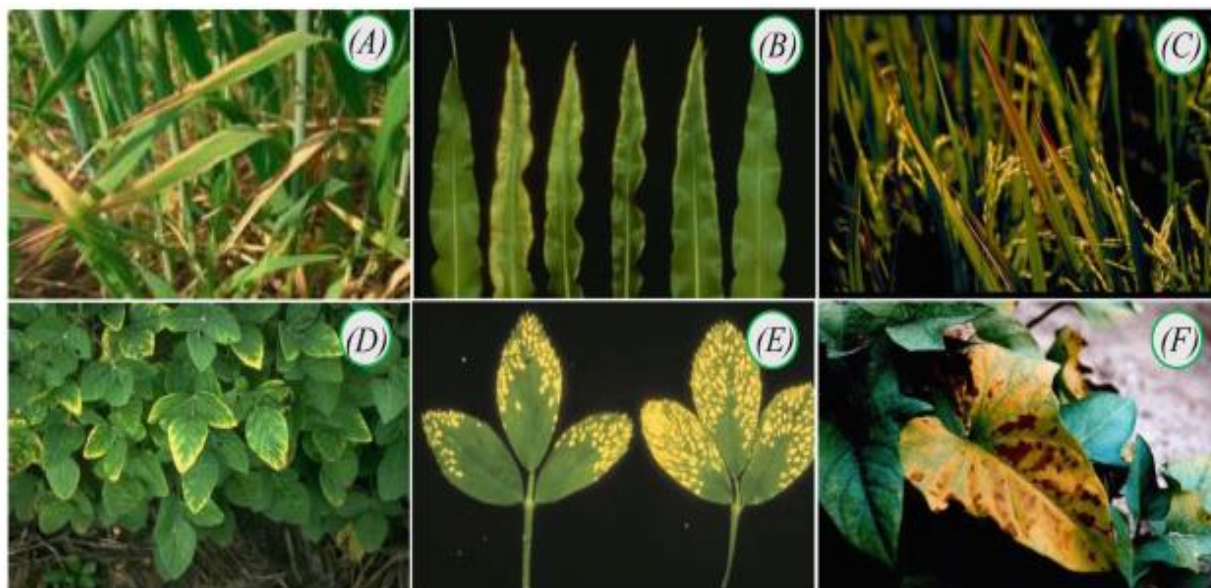
< Leaf tip burn >



4. Potassium(K) deficiency symptoms in plants: -

- * **Shorter internodes, Stunted growth.**
- * **Loss of apical dominance, Bushy habit.**
- * **Loss of cambial activity.**
- * **Curling & premature abscission of leaves.**
- * **Increase in rate of respiration.**

Arable Crops



Fruits

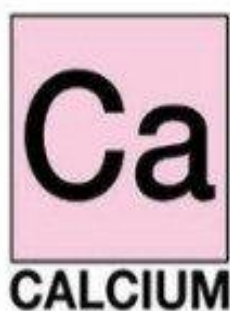


Vegetables

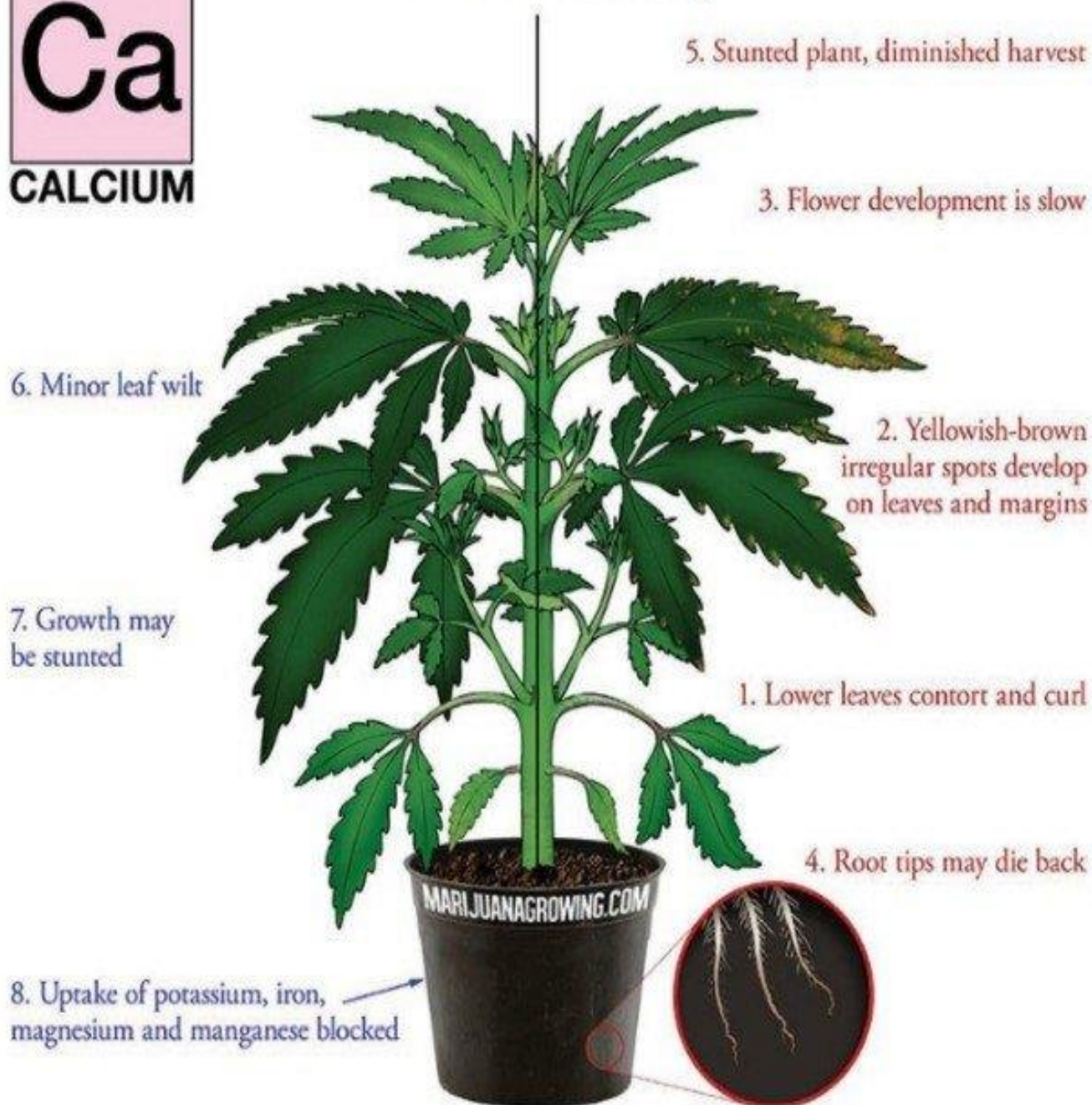


5. Calcium(Ca) deficiency symptoms in plants:

- * Stunted growth due to degeneration of meristems
- * Curling of young leaves.
- * Chlorosis of younger leaves.
- * Premature abscission of flowers.
- * Necrosis of older leaves.
- * Die back of root system.

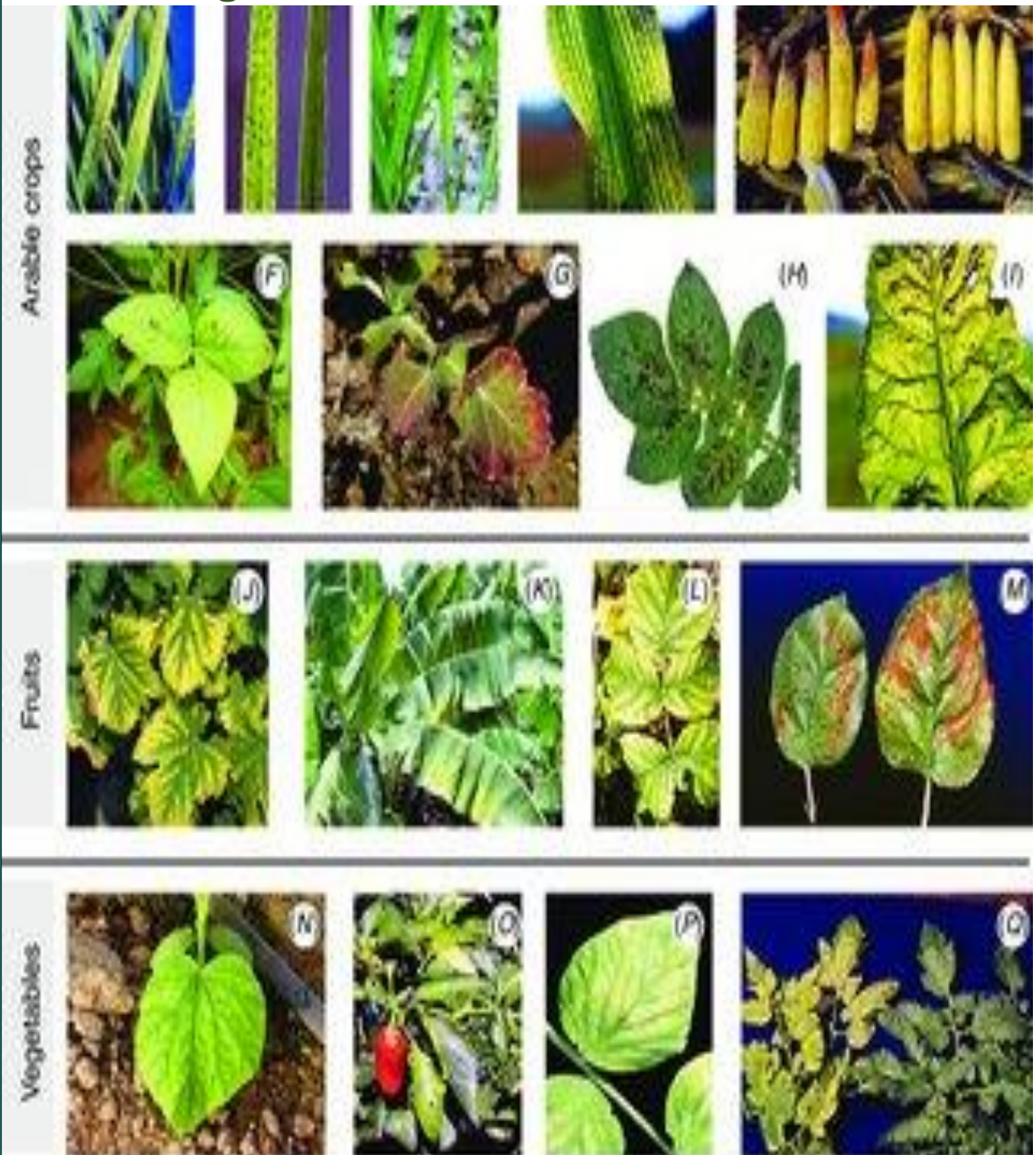


Excess / Deficiency



6. **Magnesium(Mg)** deficiency symptoms in plants:

- * **Marginal curling of leaves.**
- * **Inter-veinal chlorosis with Anthocyanin pigment.**
- * **Premature leaf abscission.**
- * **Poorly developed phloem.**
- * **Stunted growth.**



7. Sulphur(S) deficiency symptoms in plants:

- * Chlorosis & Leaf curl in young leaves.**
- * Less juice content in Citrus.**
- * Reduced nodulation in Legumes.**
- * Defoliation in tea.**
- * Accumulation of Anthocyanin in leaves.**



8. Iron(Fe) deficiency symptoms in plants:

- * Interveinal chlorosis of younger leaves.**
- * On prolonged deficiency Veins also become chlorotic.**
- * Stunted growth of plant.**
- * Respiration decreases.**
- * Photosynthesis also decreases.**



Figure 7. Iron deficiency on rice



Figure 8. Iron deficiency on wheat



Figure 9. Iron deficiency on potato and tomato



Figure 10. Iron deficiency on beans, cowpea and guava

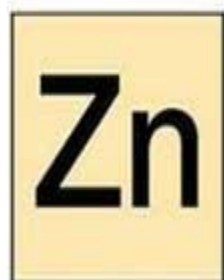
9. Manganese(Mn) deficiency symptoms in plants:

- * **Interveinal chlorosis of younger leaves.**
- * **Grey spots or stripes on leaves.**
- * **Brown spots on Cotyledons of legumes.**
- * **Flowers become sterile.**
- * **Photosynthesis decreases.**



10. Zinc (Zn) deficiency symptoms in plants:

- * **Leaf malformations like little leaf, leaf rosette.**
- * **Interveinal chlorosis of younger leaves.**
- * **Stunted growth of plant.**
- * **White bud disease may appear.**



ZINC

Excess / Deficiency

5. Zinc overload is very rare but extremely toxic. Severely toxic plants die quickly

6. Excess zinc interferes with iron's ability to function properly and causes an iron deficiency

1. New and young leaves exhibit interveinal chlorosis, develop small, thin blades that contort and wrinkle

2. Often stem tips fail to elongate and growing shoots/tips become "bunched up."

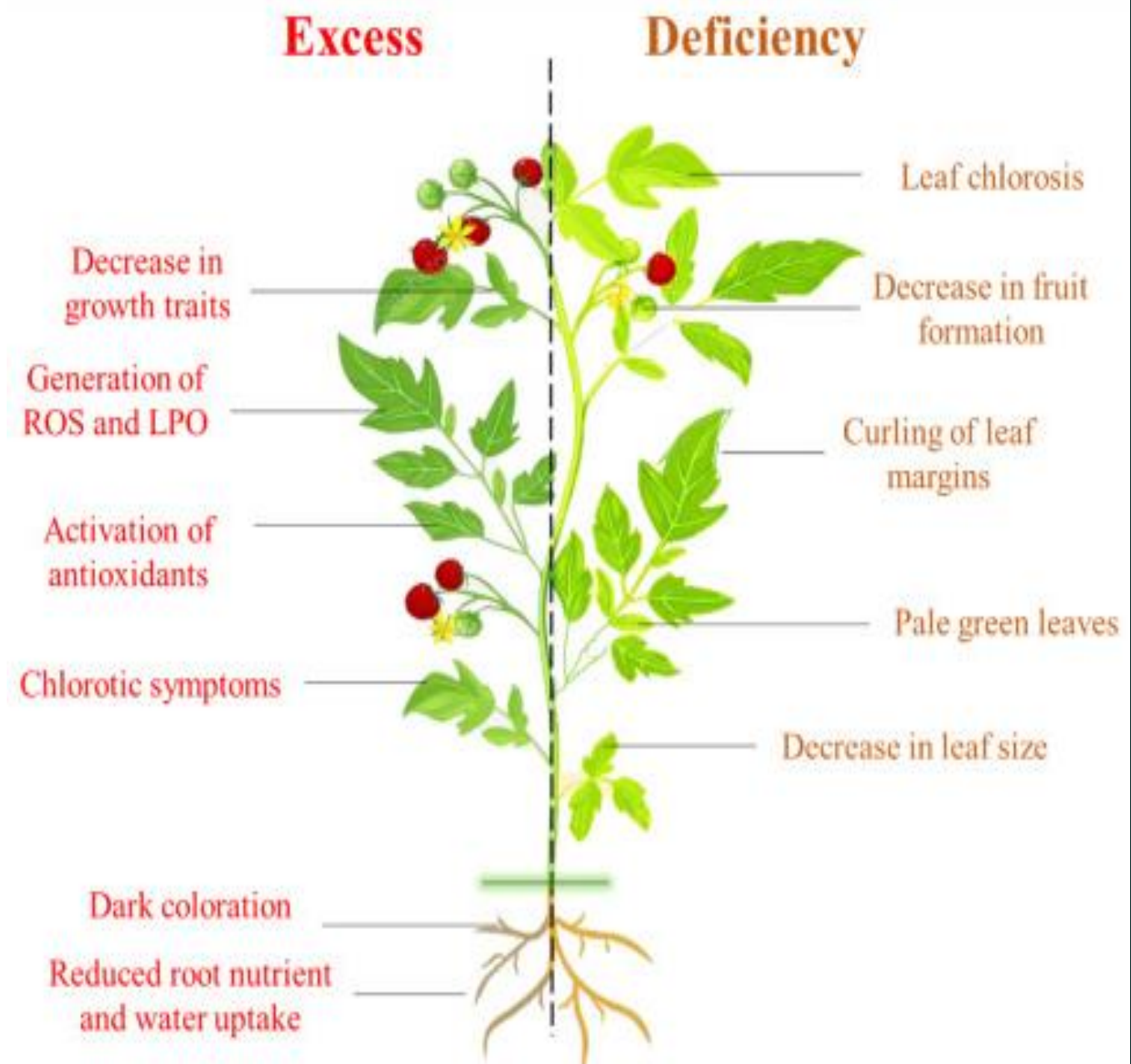
3. The leaf tips, and later the margins, discolor and burn

4. reduces internode spacing, stunts new growth, including buds, and can severely diminish yield



11. Copper(Cu) deficiency symptoms in plants:

- * **Die back in Citrus.**
- * **Exanthema in Plants.**
- * **Necrosis of Leaf tip.**
- * **Blackening of Potato tubers.**
- * **Chlorosis of leaves.**



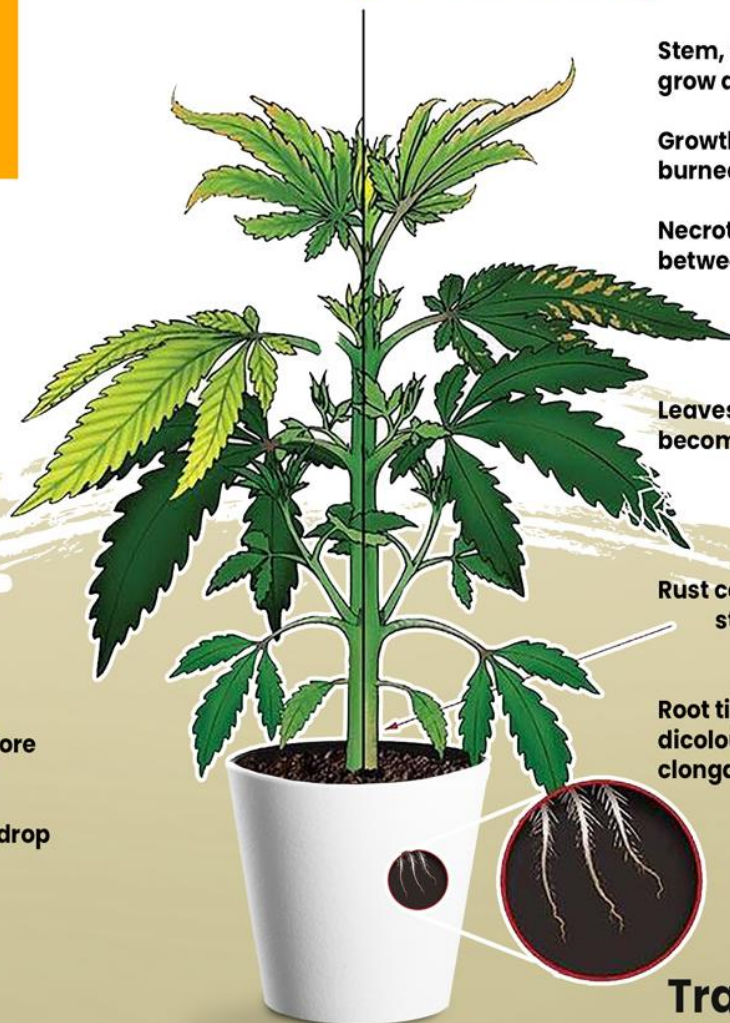
12. Boron(B) deficiency symptoms in plants:

- * **Loss of apical dominance, Stunted growth.**
- * **Abscission of flowers, Small sized fruits.**
- * **Absence of root nodules in legumes.**
- * **Heart root of Beet root.**
- * **Browning of Cauliflower.**
- * **Die back in plants.**



BORON

Excess / Deficiency



Stem, tip and roots grow abnormally

Growth shoots appear burned and may contort

Necrotic spots develop between leaf veins

Leaves thicken and become brittle

Rust coloured corky stems develop

Root tips often swell discolour and stop elongating

Leaf tips yellow before appearing burned

Leaves yellow and drop



Trace Elements

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13. Molybdenum(Mo) deficiency symptoms in plants:

- * **Whip tail in cauliflower.**
- * **Mottled chlorosis with marginal necrosis.**
- * **Stunted plant growth.**
- * **Meristematic activity decreases.**
- * **Chlorosis & Necrosis are common.**
- * **Decreased tasselling in maize.**



6. Causes a deficiency of iron

5. Leaves discolor



14.Chlorine(Cl)deficiency symptoms in plants:

- * Bronzing of leaves, Wilting of leaves.**
- * Chlorosis & Necrosis.**
- * Swollen root tips.**
- * Abscission of flowers.**
- * Stunted root growth, Reduced fruiting.**



Wheat



Wheat

15. Nickel(Ni) deficiency symptoms in plants:

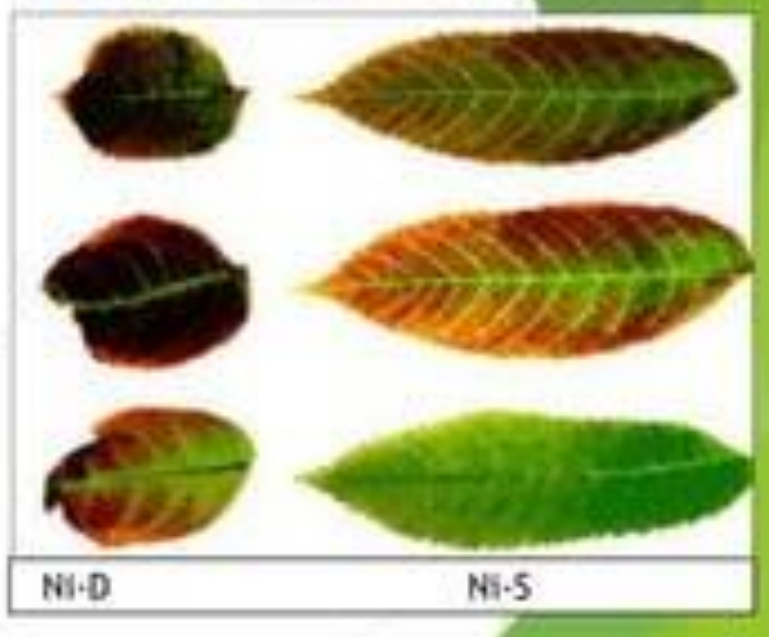
- * **Accumulation of Urea to toxic Concentrations.**
- * **Necrosis of leaf tips.**
- * **Chlorosis of young leaves.**
- * **Reduced leaf size.**
- * **Premature abscission of leaves.**

Mouse ear in Pecan



Deficiency symptoms of nickel

- ❑ More damage by root knot nematodes;
- ❑ Accumulation of ureids in leaves (leaf tip necrosis)
- ❑ Mouse ear disease (little leaf disease) reported by Marz in 1918.





THE END

