

CHAPTER

Essential plant nutrients

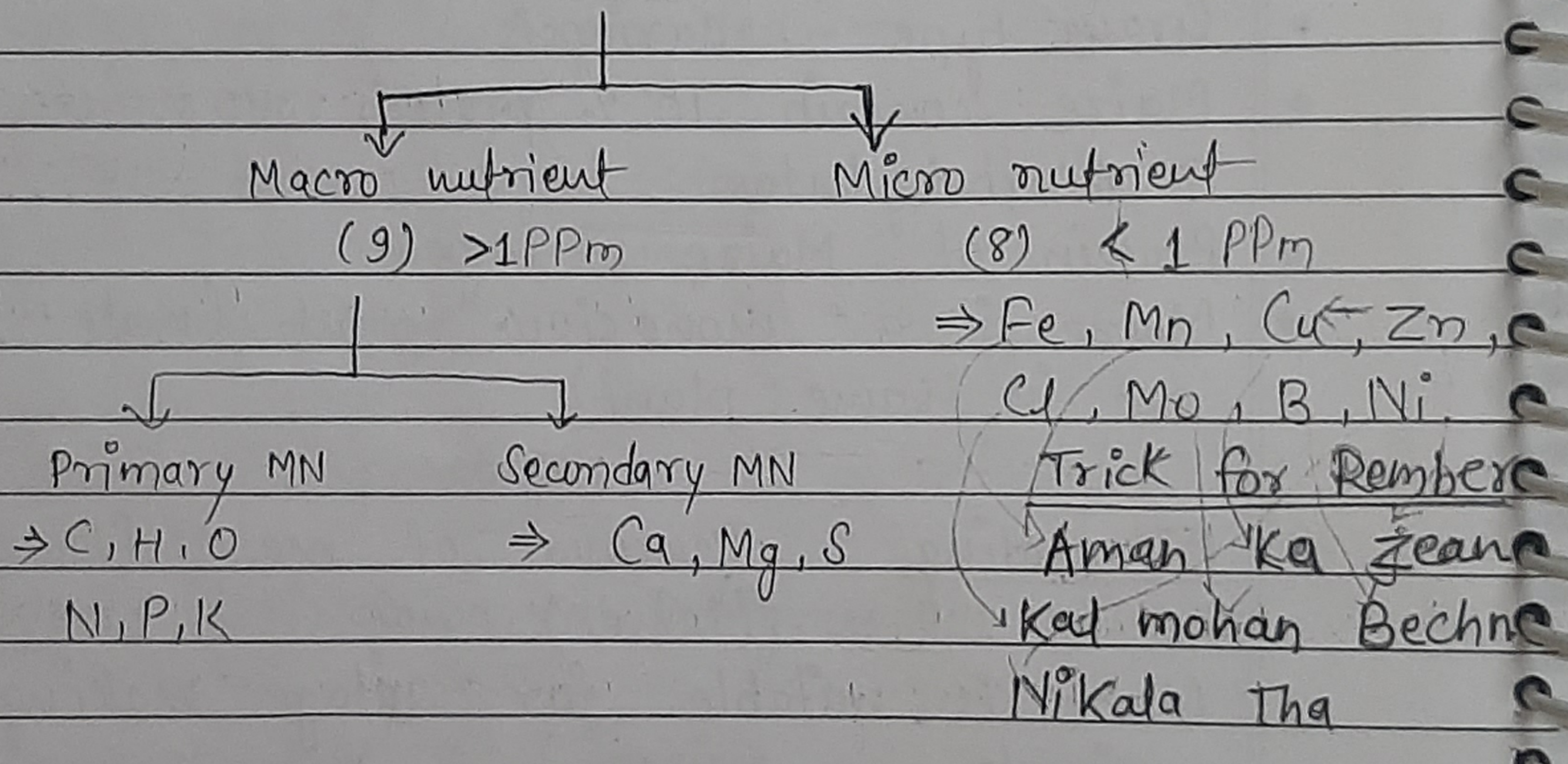
→ Element obtained by plant from the soil & air and without which plant can't be completed its lifecycle are called EPN.

In atmosphere = C = 0.03%, N₂ = 78% & O₂ = 21%
In soil = C = 0.25%

→ Criteria of essential Plant nutrient was given by Arnon & Stout in 1939.

→ No. of EPN is 17.

Classification of EPN



Macro nutrient : Those nutrient which are required more than 1 ppm. 1 ppm = 10⁶ parts.

Micro nutrient : Those nutrient which are required less than 1 ppm

→ They are also called trace/oligo nutrient.

* Basic nutrient : C, H, O
Becoz this are more imp. for every plant

* Beneficial nutrient :
 V, Si, Co, Na
It doesnot include in Macro nutrient
becoz ~~but~~ it is necessary in little / very less in amount.

• V - Nitrogen fixation in Rice field.
from diseases

* Si - Resistance capacity [↑] develop in Rice & Maize field.

* Functional nutrient :
Essential PN + Beneficial PN = Functional Plant nutrient

→ D. J. Nicolous in 1963 given Functional PN.

★ Macronutrient function

- Nitrogen :
- ~~function~~ Impart green colour to plant and
→ Encourages vegetative growth.
यह पौधे में हल्का लंबा आकार देता है जो पौधे में सहायक है।
 - Nitrogen is essential constitute of protein.
→ Chloroplast, protoplasm
 - Imp role in synthesis of Auxin.
 - Increase maturity duration.

Phosphorous:

- ✓ → Helps in root development.
- ✓ → Increase diseases & insect resistance capacity.
- ✓ → It helps root nodule formatⁿ in leguminous plant.
- It helps in grain formatⁿ & maturity.
- It helps in energy storage & transfer.

Potassium (Potas)

- It helps in drought tolerance capacity.
- It helps in formatⁿ of sucrose / sugar in sugarplant.
- Provide disease ~~resistance~~ and drought tolerance in plant.

Calcium

- It help in protein formatⁿ in leguminous plant (Dalhan)
- ✓ → It help in cell wall formatⁿ.

Magnesium

- ✓ → Essential constitute of chlorophyll.
- It help in oil synthesis in oil seed crop.

Sulphur

- It help increase oil contain in oil seed crop.
- It help to increase protein contained in Pulse crop.

Boron

- It helps in pollen grain germination/maturity.
- It help to give taste in vegetables.

Molibdenum

- It help in nitrogen fixation in leguminous plant.
- In carrot & Raddish sweetness due to presence of Molibdenum.

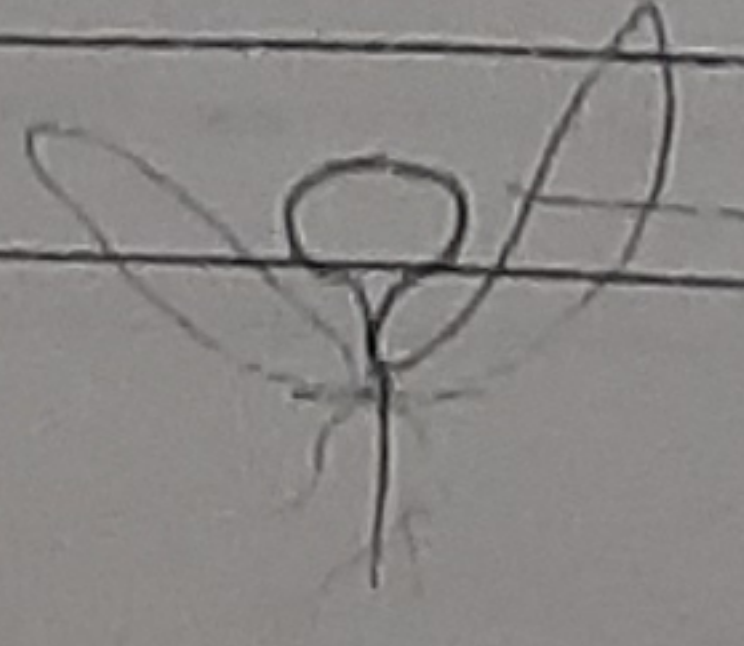
copper ★★

- It helps to control of fungal disease.

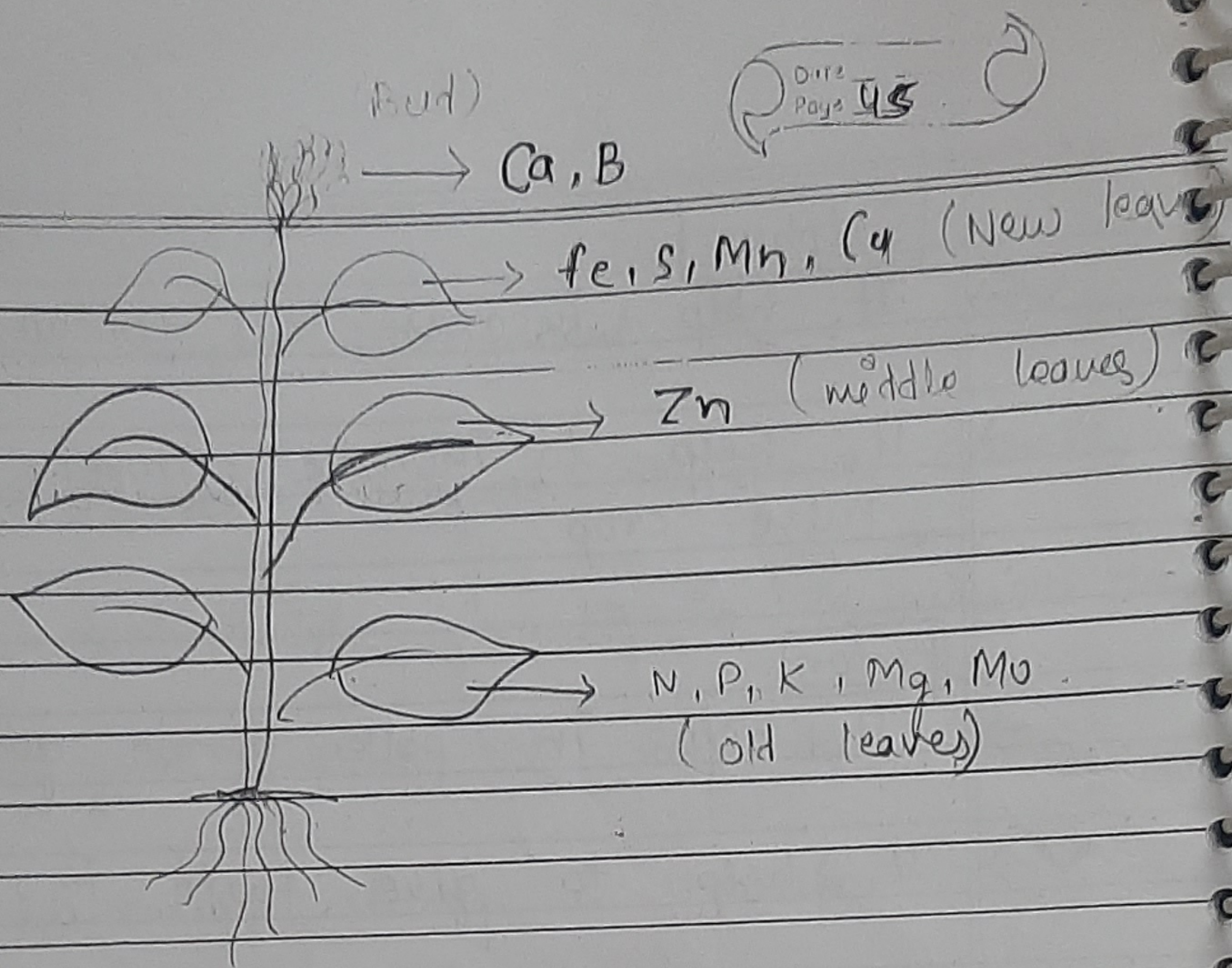
Deficiency of Plant nutrients

Nitrogen :

- Its deficiency causes lower/old leaves ~~are~~ is yellow / dry.
- Butting diseases in Cauliflower due to deficiency of N_2 .



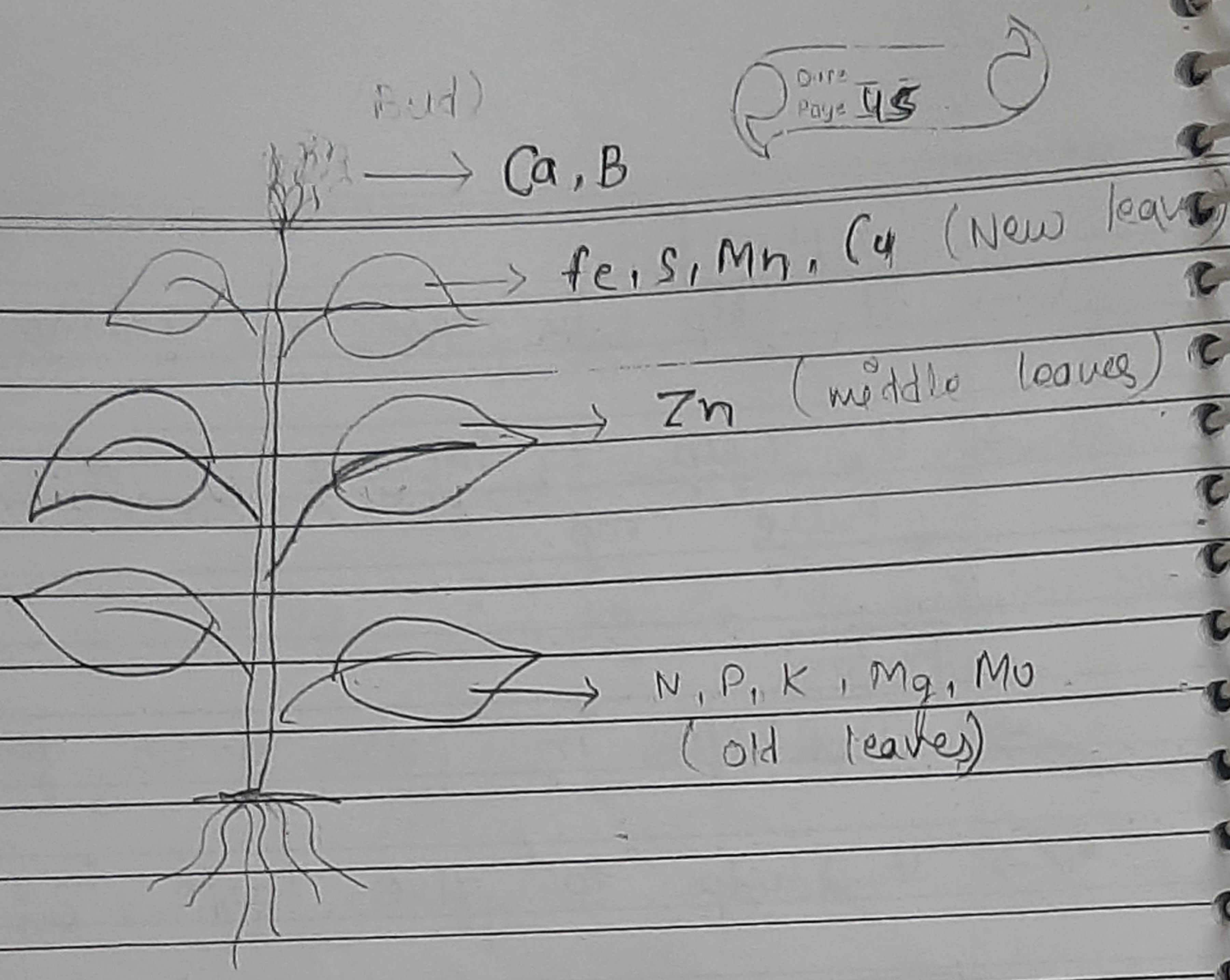
Butting diseases
(small in size)



→ Excess of N_2 causes hollow heart diseases in cauliflower.

Phosphorous

- Its deficiency causes leaf of dark green. then after this is converted into purple.
- Decrease in root development.
- Due to deficiency of P, the life cycle of plant can't be completed hence : P is called Key of life.
- Delay in crop maturity.
- Increase disease effect due deficiency of P



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Potassium

- ~~fruit drop~~ due to deficiency of potassium.
- Withering of grains & fruits.

Calcium

- Its deficiency is found in bud of plant.
- ~~causes~~ Blossom Rot end (BRE) in tomato & mango due to deficiency of Ca.
eg. Black colour seen in tomato

Magnesium

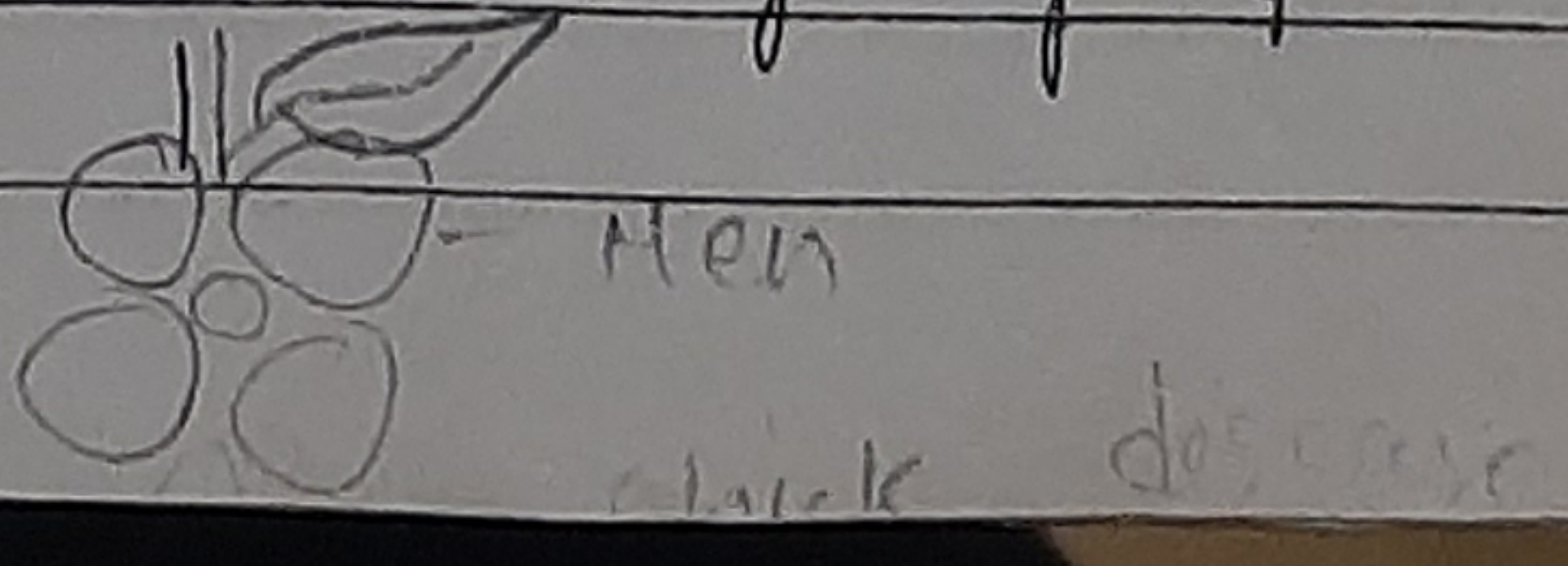
- Sand drop disease in tobacco.

Sulphur

- Excess of Sulphur causes Akiuchi disease in Rice. (H_2S)
- Decrease of oil content in oil crops.

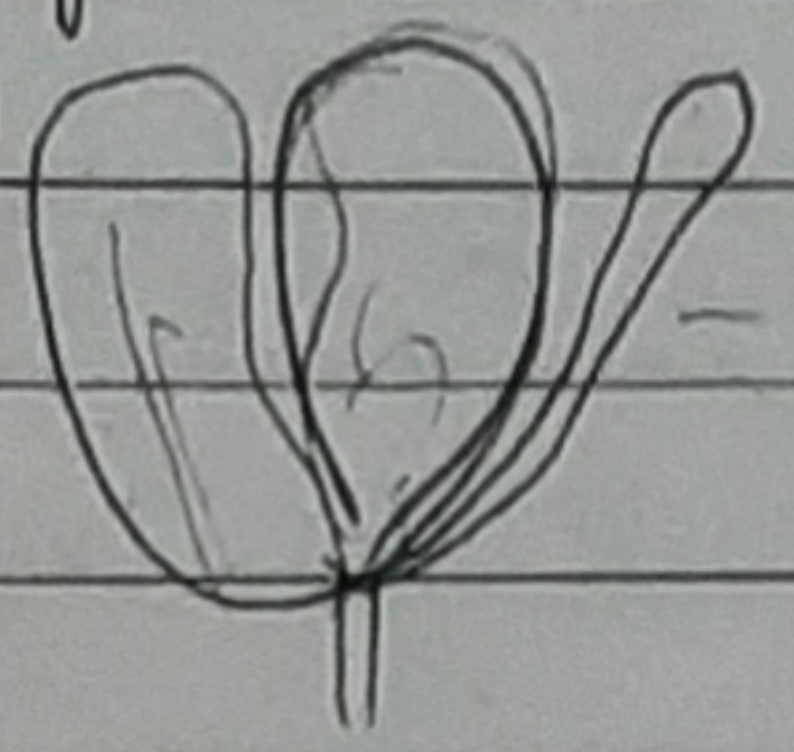
★ Boron

- Browning colour in cauliflower
- Fruit cracking (Tomato)
- Hardening of citrus fruit. (Lemon)
- Hen & chick disease of grapes



Moliderium

→ Whiptail of cauliflower due to deficiency of Moliderium



- thin leaf is called whiptail

Zinc

→ Khaira diseases in Rice

→ White bud in Maize.

→ Little leaves in citrous (Lemon), cotton, & Mango.

→ Browning of guavava.

Meganise

→ Grey spike of Barley.

Copper (Tip मडन)

→ Di-back in citrouse (Lemon) due to deficiency of copper.

* Structure element

CHONPS - it helps in formatⁿ of plant protein & protoplasm in a plant.