

Plant Nutrition

Plant Protection

Essential Nutrients For Plants - **Macronutrients**

- Macronutrients are needed in relatively large amounts by plants.

<i>Element</i>	<i>Symbol</i>	<i>Source</i>
Oxygen	O	Air/Water
Hydrogen	H	Air/Water
Carbon	C	Air/Water
Nitrogen	N	Soil
Phosphorus	P	Soil
Sulfur	S	Soil
Potassium	K	Soil
Calcium	Ca	Soil
Magnesium	Mg	Soil



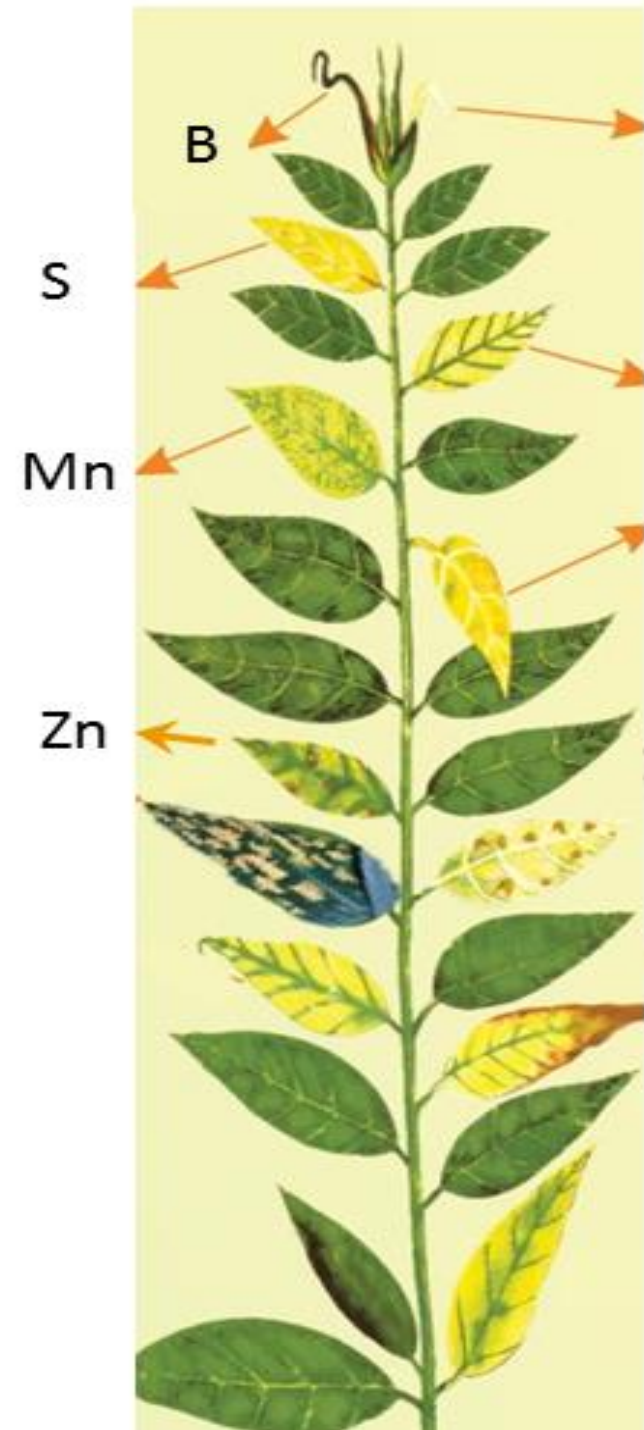
Micronutrients

- Micronutrients are needed in relatively small amounts by plants.
- They are usually supplied by fertilizers.

<i>Element</i>	<i>Symbol</i>	<i>Source</i>
Iron	Fe	Soil
Manganese	Mn	Soil
Boron	B	Soil
Molybdenum	Mo	Soil
Copper	Cu	Soil
Zinc	Zn	Soil
Chlorine	Cl	Soil



Nutrient Deficiency in Plants



Types Of Deficiency

- Hidden Hunger
- Normal Deficiency
- Moderate Deficiency
- Severe Deficiency



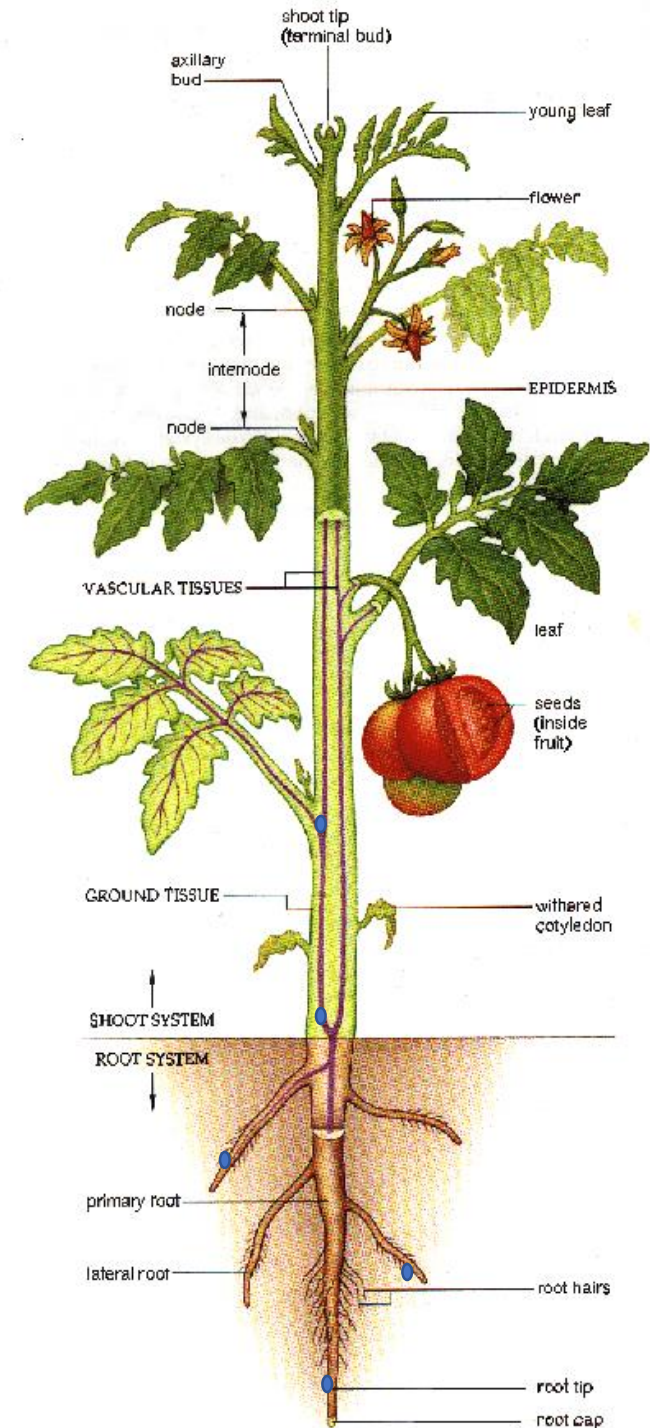
Nutrient Mobility In The Plant

Mobile Nutrient :

The Nutrients which are transported from one part of the plant to another part of plant.

- Nitrogen
- Phosphorous
- Potassium
- Magnesium
- Chlorine

Symptoms appear in older leaves first.



Immobile Nutrient :

The Nutrients which are not easily transported from one part of the plant to another part of plant.

- sulphur
- Calcium
- Boron
- Iron
- Manganese
- Zinc
- Copper
- Molybdenum.

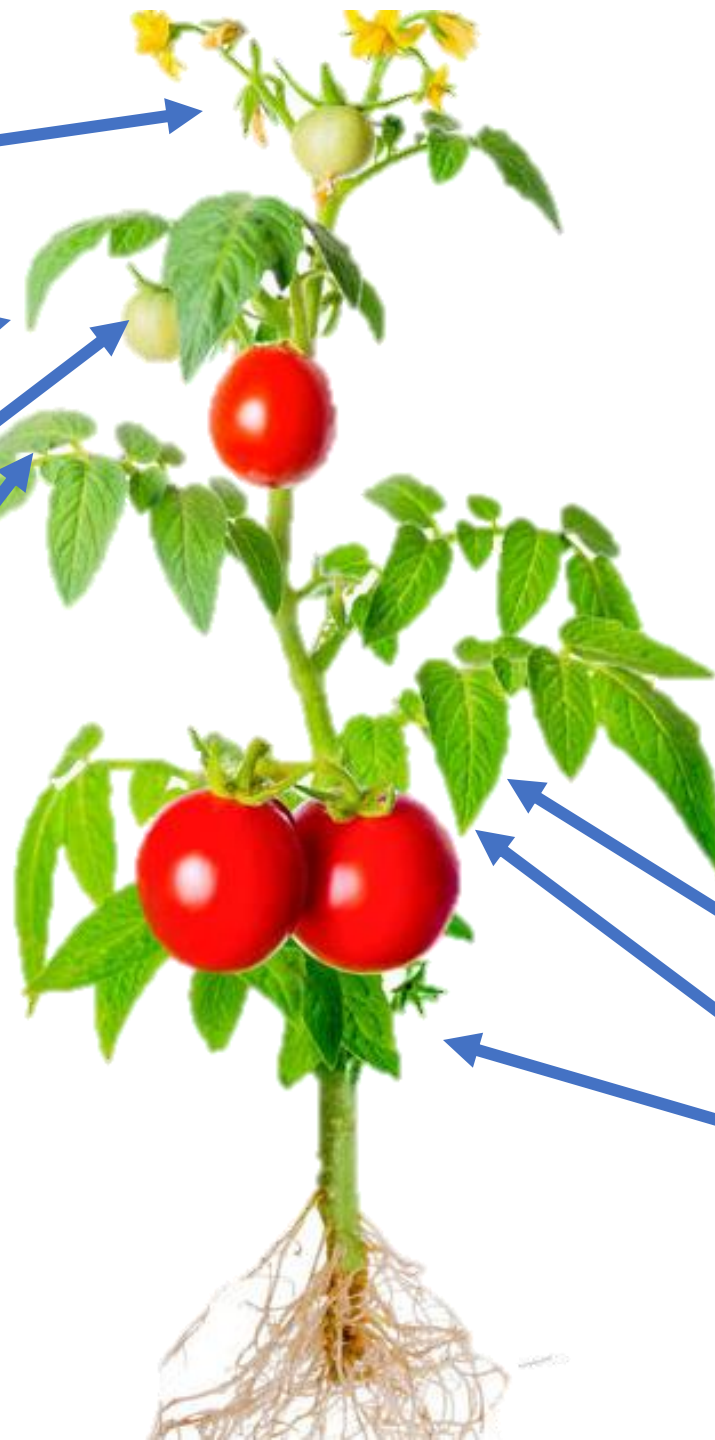
Symptoms appear in younger leaves first



YOUNGER LEAVES

Immobile Nutrient :

- sulphur
- Calcium
- Boron
- Iron
- Manganese
- Zinc
- Copper
- Molybdenum.



OLDER LEAVES

Mobile Nutrient :

- Nitrogen
- Phosphorous
- Potassium
- Magnesium
- Chlorine



Environmental stress factors

- Types of environmental factors

- Biotic – जैविक (Biotic stresses cause damage to plants via living organisms, including fungi, bacteria, insects, and weeds.)
- Abiotic – अजैविक (Abiotic stresses affect the plant cells in the same manner as do water stress and temperature stress. Wind stress can either directly damage the plant through sheer force)

Nutrient stresses come under abiotic factor.



Several factors can affect occurrence of deficiency symptoms

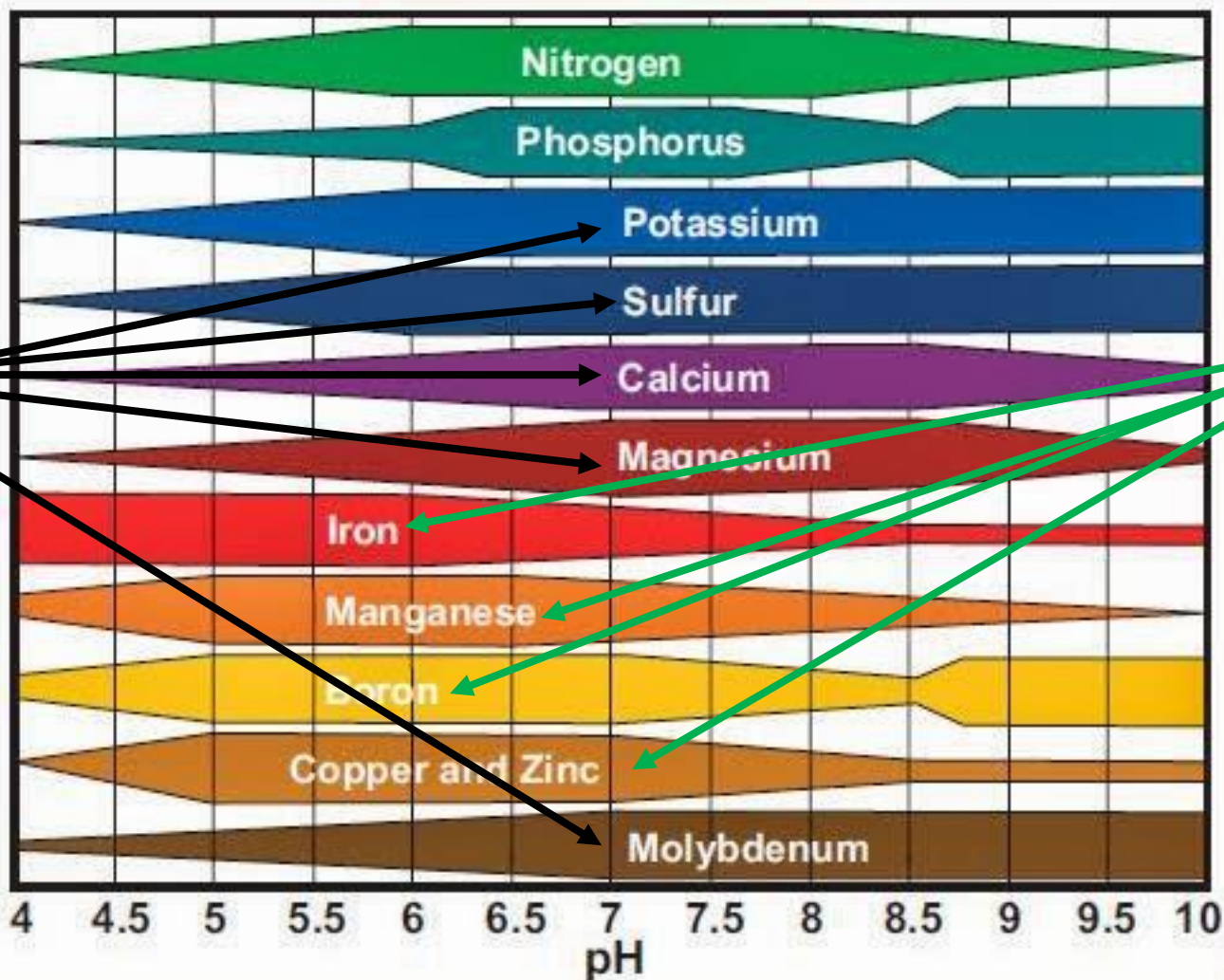
- Soil test level – also consider texture, EC, OM, pH, etc.
- Soil conditions:-
 - Temperature – तापमान
 - Compaction – संघनन
 - Moisture – नमी
 - Salinity - खारापन
 - Tillage practices – जुताई की प्रथाएँ
 - Herbicide, disease, or insect damage



Soil pH influences – solubility of compounds, hence nutrient availability.

• Common deficiencies on acid soils – K,S,Ca,Mg,Mo

Common deficiencies on alkaline soils – Fe, Mn,B,Cu, Zn



Deficiency Symptoms – Nitrogen

- Chlorosis progresses from light green to yellow.
- Entire plant becomes yellow under prolonged stress.
- Growth is immediately restricted and plants soon become spindly and drop older leaves.

- Urea – 5 to 10 kg per acre through drip irrigation or for broadcast – 50 kg per acre

For spray

- 19:19:19 – 10 gm per ltr of water



Deficiency Symptoms - Phosphorus

- Leaves appear dull, dark green, blue green, or red-purple, especially on the underside, and especially at the midrib and vein.
- Petioles may also exhibit purpling. Restriction in growth may be noticed.
- 00:52:34 – 5 gm per ltr of water for spray
- Through drip irrigation or drenching – 5 kg per acre.



Deficiency Symptoms - Potassium

- Leaf margins tanned, scorched, or have necrotic spots (may be small black spots *which* later coalesce).
- Margins become brown and cup downward.
- Growth is restricted and die back may occur.
- Deficiency symptoms of potassium develop first on older leaves.
- 00:00:50 – 5 gm per ltr of water for spray
- Through drip irrigation or drenching – 5 kg per acre.



Deficiency Symptoms – Calcium

- Growing points usually damaged or dead (die back).
- Margins of leaves developing from the growing point are first to turn brown.

- Harit Sanjivani Stage-2,3,4- 1 gm + Chelated Calcium – 1 gm + Spraymax-85 -1 ml per ltr For spray .



- Harit Sanjivani Fruit Special -1 gm + Chelated Calcium – 1 gm + Spraymax-85 -1 ml per ltr For spray .



Deficiency Symptoms – Magnesium

- Leaves show yellow chlorotic interveinal tissue on some species, reddish purple progressing to necrosis on others.
- Younger leaves affected with continued stress.
- Chlorotic areas may become necrotic, brittle, and curl upward.
- Symptoms usually occur late in the growing season.



• Harit Sanjivani Stage-2,3,4- 1 gm + Chelated Magnesium – 1 gm + Spraymax-85 -1 ml per ltr For spray .

• Harit Sanjivani Fruit Special -1 gm + Chelated Magnesium – 1 gm + Spraymax-85 -1 ml per ltr For spray .

Deficiency Symptoms – Sulphur

- Leaves uniformly light green, followed by yellowing and poor spindly growth.
- Uniform chlorosis does not occur

For Spray

- Sulphur 80% - 2 gm per ltr + Spraymax-85-1 ml per ltr.

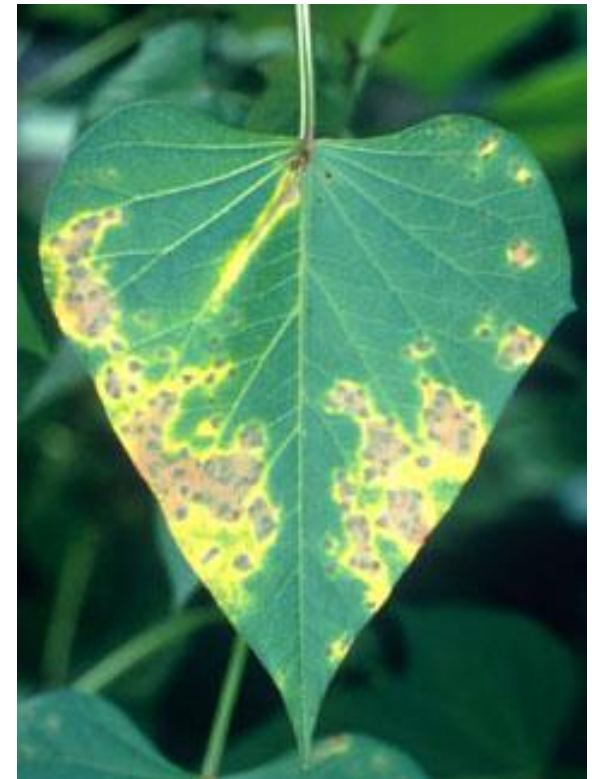
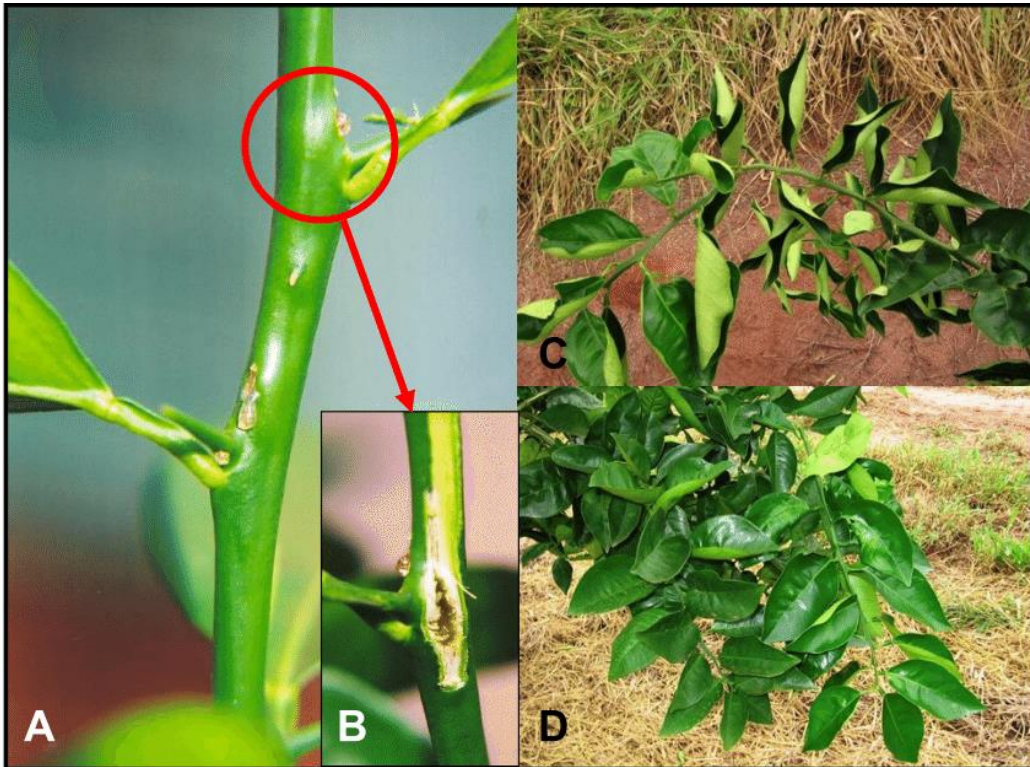
For Drenching or through drip irrigation

- Sulphur 90 % - 3 kg per acre.



Deficiency Symptoms – Copper

- Leaves wilt, become chlorotic, then necrotic.
- Wilting and necrosis are not dominant symptoms.



Deficiency Symptoms – Ferrous (Iron)

- Distinct yellow or white areas appear between veins, and veins eventually become chlorotic.
 - Symptoms are rare on mature leaves.
- Harit Sanjivani Stage-2,3,4- 1 gm + Chelated Ferrous – 1 gm + Spraymax-85 -1 ml per ltr For spray .
- Harit Sanjivani Fruit Special -1 gm + Chelated Ferrous – 1 gm + Spraymax-85 -1 ml per ltr For spray .



Deficiency Symptoms – Manganese

- Chlorosis is less marked near veins.
- Some mottling occurs in interveinal areas.
- Chlorotic areas eventually become brown, transparent, or necrotic.
- Symptoms may appear later on older leaves.



Deficiency Symptoms – Zinc

- Leaves may be abnormally small and necrotic.
 - Internodes are shortened.
- Harit Sanjivani Stage-2,3,4- 1 gm + Chelated Zinc – 1 gm + Spraymax-85 -1 ml per ltr For spray .
- Harit Sanjivani Fruit Special -1 gm + Chelated Zinc – 1 gm + Spraymax-85 -1 ml per ltr For spray .



Deficiency Symptoms – Boron

- Young, expanding leaves may be necrotic or distorted followed by death of growing points.
- Internodes may be short, especially at shoot terminals.
- Stems may be rough, cracked, or split along the vascular bundles.



- Harit Sanjivani Stage-2,3,4- 1 gm + Chelated Boron – 1 gm + Spraymax-85 -1 ml per ltr For spray .

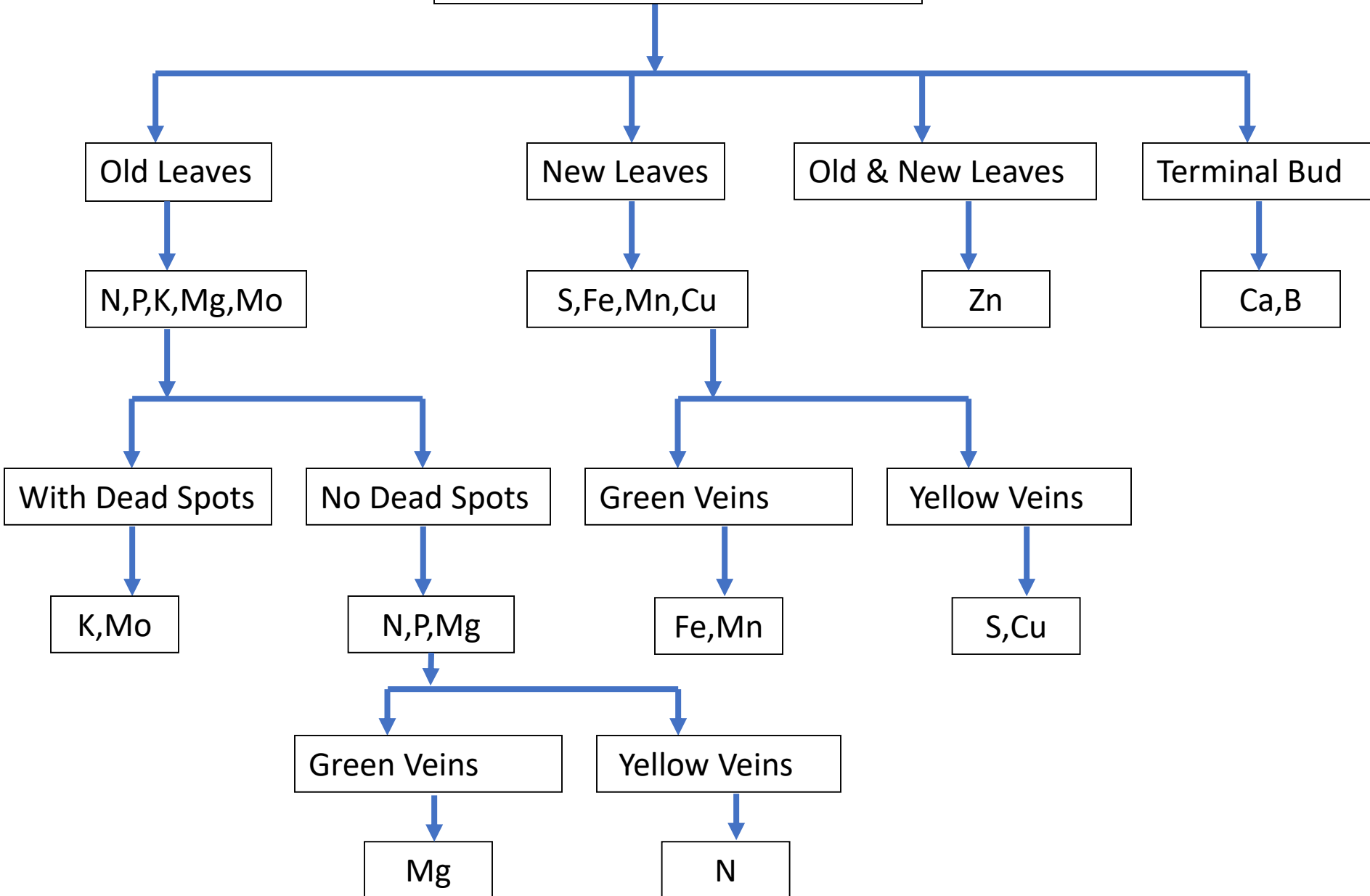


- Harit Sanjivani Fruit Special -1 gm + Chelated Boron – 1 gm + Spraymax-85 -1 ml per ltr For spray .

Crops Highly Susceptible to Deficiencies

<i>Element</i>	<i>Crops</i>
Mn (Manganese)	Soybean, Peanuts
Cu (Copper)	Wheat & Corn, onion
Zn (Zinc)	Corn,paddy,turmeric,
Mo (Molybdenum)	Soybeans & Cauliflower
B (Boron)	Alfalfa, Apples, Peanuts, Tobacco & Tomatoes
Fe (Iron)	Ornamentals, Fruit Trees, Soybeans & pulses, Grain Sorghum & Some Grasses

Deficiency Symptoms



Plant Protection

Some Commonly Found Diseases & insect in important crops

महत्वपूर्ण फसलों में कुछ सामान्य रूप से पाए जाने
वाले रोग और कीट

**Downy mildew
(डाऊनि मिल्ड्यू)**

Grapes, Cucurbits,(वेल वर्गीय),



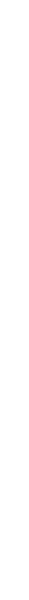
**Powdery mildew
(पाउडरी मिल्ड्यू)**

**Mango, Chilli,grapes,cucurbits,
pulses,roses flower**



Early blight (अर्ली ब्लाइट)

Tomato, brinjal, chilli,
potato



late blight (लेट ब्लाइट)

Tomato, potato



**Anthracnose
(अंतराकनोस)**

**Citrus, cotton,
pomegranate**



wilt (विल्ट)

**Tomato, chilli, brinjal
capcicum, cotton,**



Phytophthora
(फयातोपथोरा)

**Citrus,arecanut,brinjal,
Tomato,potato,**



Pythium (पिथियम)

**Tomato,chilli,brinjal,
groundnut**



Leaf Blight
(लीफ ब्लाइट)

Turmaric,ginger,onion,



- **Phosphonic acid (Nutrifight/Phosphonic)– 2 ml / gm per Ltr.**
- **Mancozeb (M-45)-2 gm per Ltr.**
- **Mancozeb + carbendazim (Saff)- 2 gm per Ltr.**
- **Mancozeb+Metalaxyle(Ridomil Gold)-2 gm per Ltr.**
- **Captan 50% (Captaf/captan) – 2 gm per Ltr**
- **Hexaconazole 5% + captan 50% - (Taqat) – 2 gm per Ltr.**
- **Cabriotop –3 gm per Ltr.**
- **Nativo – ½ gm per Ltr.**
- **Custodia -2 ml per Ltr.**

Bacterial (बैक्टेरियल)

Canker (कैंकर)

Citrus, (leamon, orange, mosambi)



Bacterial Blight (बैक्टेरियल ब्लाइट)

Tomato, chilli, paddy, pomogranet



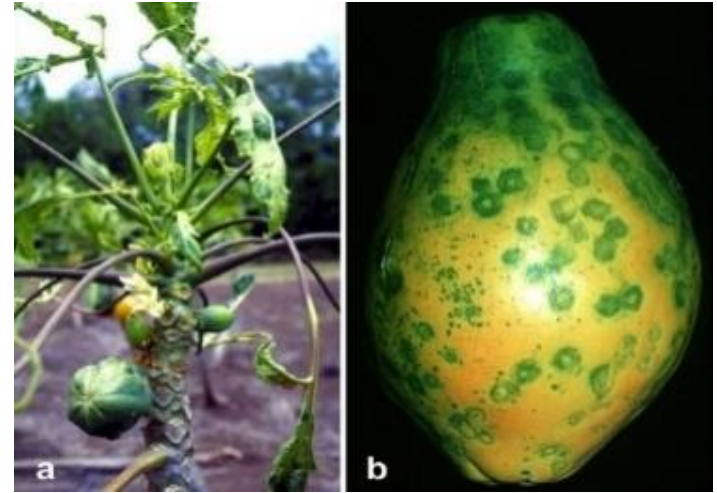
Xanthomonas (झान्तोमोनस)

Grapes, pomogranets,
Tomato,



- **Phosphonic acid (Nutrifight/Phosphonic)– 2 ml / gm per Ltr.** +
- **Captan 50% (Captaf/captan) – 2 gm per Ltr**
- **Hexaconazole 5% + captan 50% - (Taqat) – 2 gm per Ltr.** +
- **Streptocycline (Streptocycline)- 6 gm per 50 Ltr of water.**
- **Validamycine (Validamycine)-2 ml per Ltr of water.** +
- **Coper oxychloride (Blue Coper / Blitox)-2 gm per Ltr.**

Papaya ring spot virus
(पपाया रिंग स्पॉट वायरस)



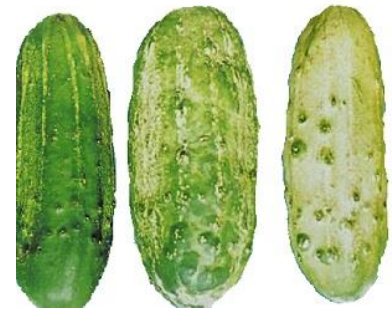
Yellow vein mosaic
(येलो व्हेन मोससिक)



Chilli leaf curl (चिली लीफ कर्ल)



Cucumber mosaic virus ---- cucumber, banana



For Viral Disease preventive treatment

1.Sucking Pest Management

Rapid -2ml per Ltr of water

2.Nutrition Management

Harit Sanjivani / Harit sanjivani Fruit Special

Root Knot Nematodes (रूट नोट नेम्यातोद)

All vegetables,

Per Acre Drenching Or Through Drip Irrigation

- Black Jaggery (काला गुड़) 1 kg + Dahi Or Tak – 2 Ltr + Trichoderma – 1 Ltr or 1 kg + Pasalomysis-1 Ltr or 1 kg -- 100 ते 200 लिटर पानी में घोल बनाकर 1 एकड़ को जमीन में देना है।



PESTS

Leaf eating Caterpillar (लीफ इटिंग कैतेर्फिलर)



Fruit & Shoot Borer (फ्रूट & शूट बोरर) /



Stem borer (खोड किड)

Sugar cane, paddy,



Biological Product for spray

- Biveria – 5 ml/gm per ltr of water
- +
- Bacilus Subtilis – 5 gm per Ltr of water
- Chlorpyriphos 50 % + Cypermethrin 5% (Hamala/Ant 505)-
2 ml Per ltr of water
- Coragen 0.3 ml + Dichlorvos (Nuvan)-1 ml per ltr of water.
- Emamectine Benzoate -0.5 gm + Dichlorvos (Nuvan)-1 ml
per ltr of water.
- Alfamethrin – 1 ml + Monocrotophose – 1 ml per ltr of
water.

Sucking pest (रस चुसक किड) insects

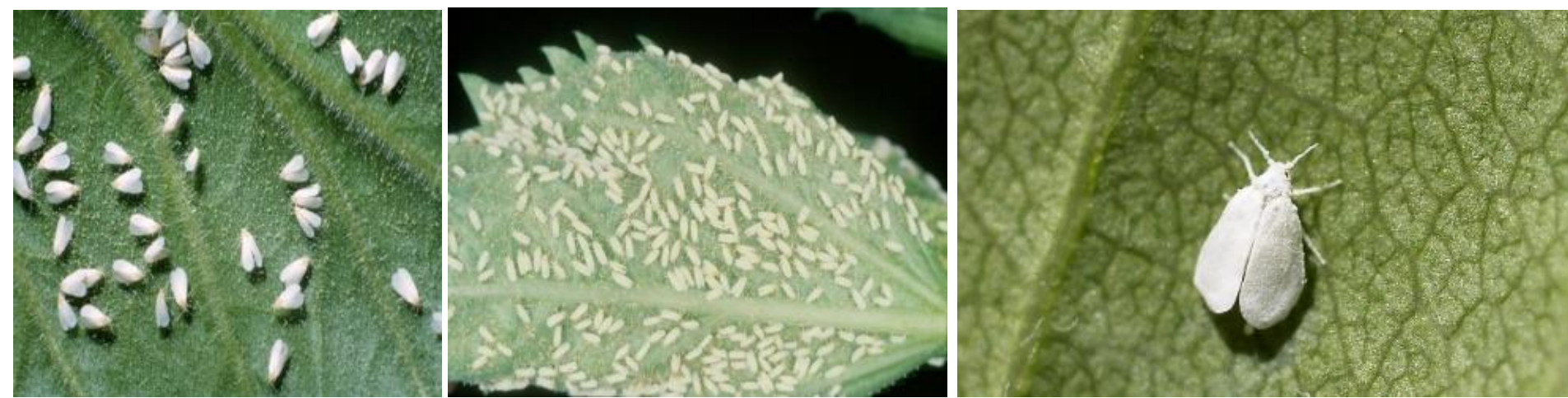
Thrips (थ्रिप्स)



Aphids (अफिड्स)



White Fly (व्हाइट फ्लाई)



Jassids (जसिड्स)



Mites (मैट्स)



- **Rapid – 2ml per ltr of water.**
- **Rapid – 2ml + Monocrotophose – 1 ml per ltr of water.**
- **Rapid – 2ml + Acetamipride – 0.5 gm per ltr of water.**
- **Rapid – 2ml Acephate- 1.5 gm per ltr of water.**