

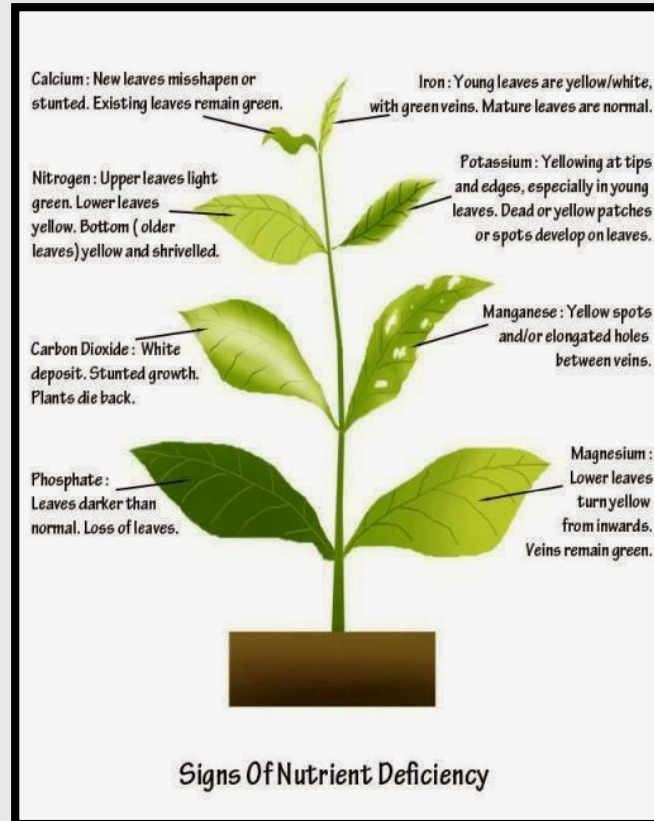


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# Center for Smart Agriculture

## Applied Hi-Tech Horticulture



## **Module 1: Introduction to Hi-Tech Horticulture**

### **Session 9: Fertilizers application scheduling**



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## **Factor of fertilizers application scheduling**

- Scheduling must be based on law of Minimum
- Essential elements for plant
- Crop growth stage
- Nutrients uptake by various crops
- Cation exchange capacity
- Soil fertility & texture
- Soil PH & EC
- Salt tolerance of crops
- Fertilizers compatibility
- Soil temperature

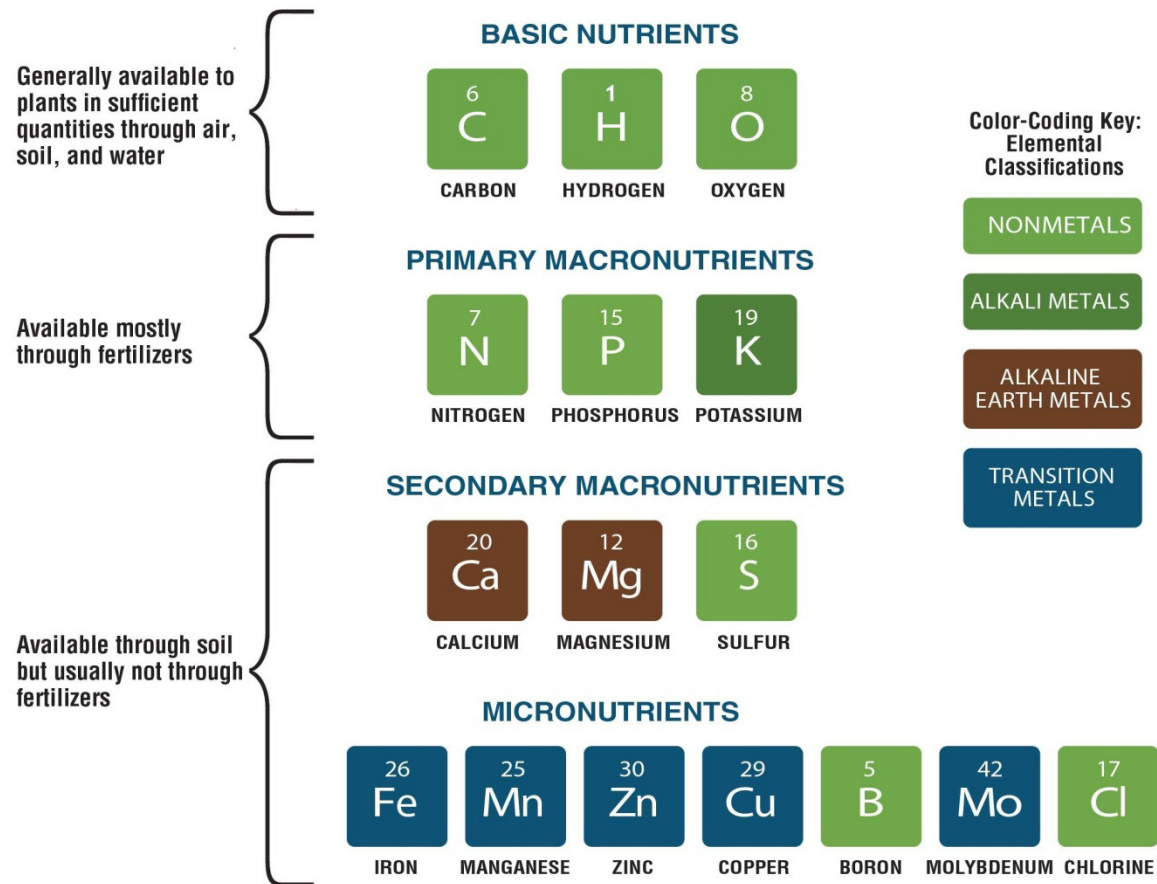


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# Essential elements for plant

## THE 16 ESSENTIAL ELEMENTS REQUIRED FOR PLANT LIFE





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# Nutrient Uptake by various crops

- ❖ Nutrient Uptake
- ❖ Soil analysis
- ❖ Available nutrients in soil
- ❖ LAI
- ❖ Plant density
- ❖ Crop growth phase
- ❖ Targeted yield/Variety
- ❖ Efficiency factors

**Nutrient Uptake by Various Crops**

CROP	YIELD (Tons/ha)	TOTAL UPTAKE (kg/ha)				
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	CaO	MgO
Tomatoes	90	350	80	500	140	30
Cucumbers	50	170	130	270	120	60
Capsicum	50	250	55	350	130	41
Brinjal	30	190	60	270	150	40
Onion	40	160	75	215	128	17
Lettuce	40	150	50	190	60	25
Potatoes	55	250	60	240	40	15
Beans	20	130	21	95	50	17
Carrots	80	170	75	230	300	50
Cotton	4	240	70	240	270	64
Sugarcane	175	198	67	389	75	61



## Fertilizer compatibility

Calcium nitrate + Sulfates  $\rightarrow$   $\text{CaSO}_4$  precipitate (gypsum)

Calcium nitrate + Phosphates  $\rightarrow$  Ca phosphate precipitate

Magnesium + di-or mono-ammonium phosphate  $\rightarrow$  Magnesium Phosphate precipitate

Ammonium sulfate + KCl or  $\text{KNO}_3$   $\rightarrow$   $\text{K}_2\text{SO}_4$  precipitate

Phosphorus + iron  $\rightarrow$  iron phosphates precipitate

Fertilizers mixtures in the tank which reduce the solubility of the mixture due to formation of precipitates



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**THANK YOU**