Version 2021

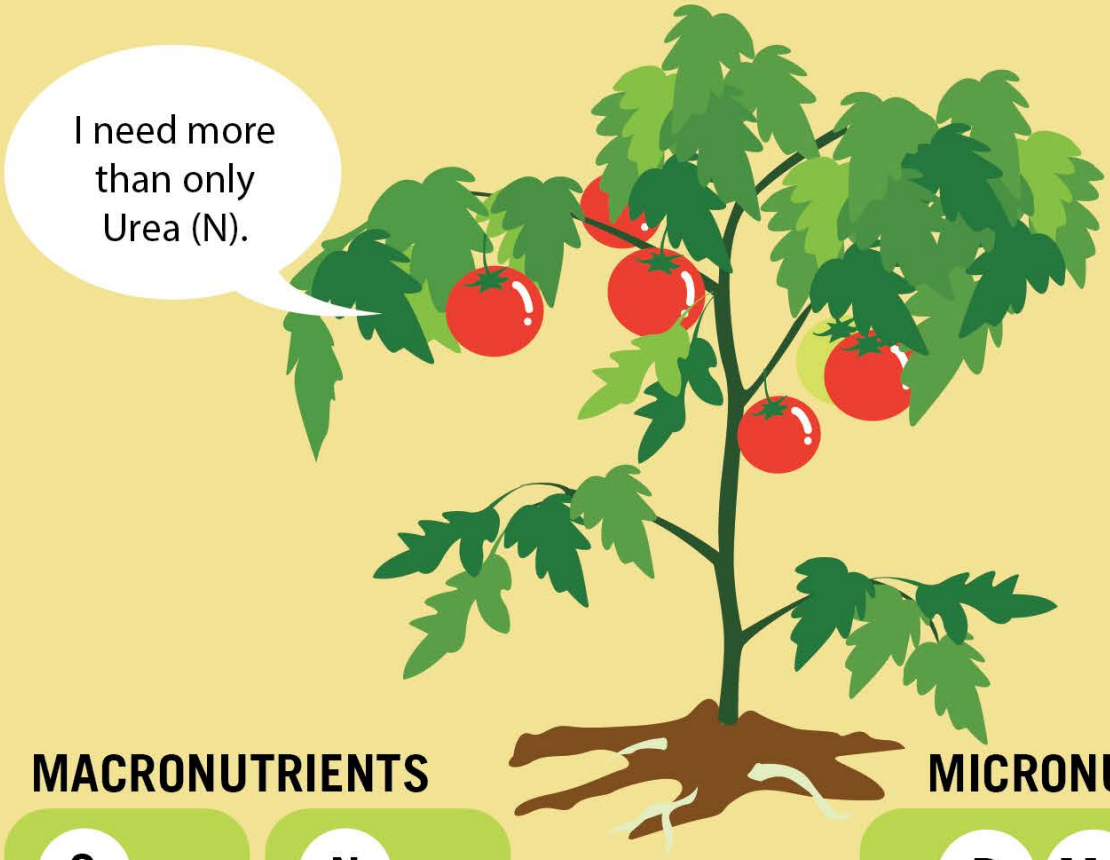
EAST-WEST SEED FOUNDATION | KNOWLEDGE TRANSFER

MACRONUTRIENTS
Technical Guide

What are macronutrients?

* **Elements required in relatively large amount for plant growth.**

ENGLISH



From the Air (Structural Elements)

C O H

MACRONUTRIENTS

S Ca Mg

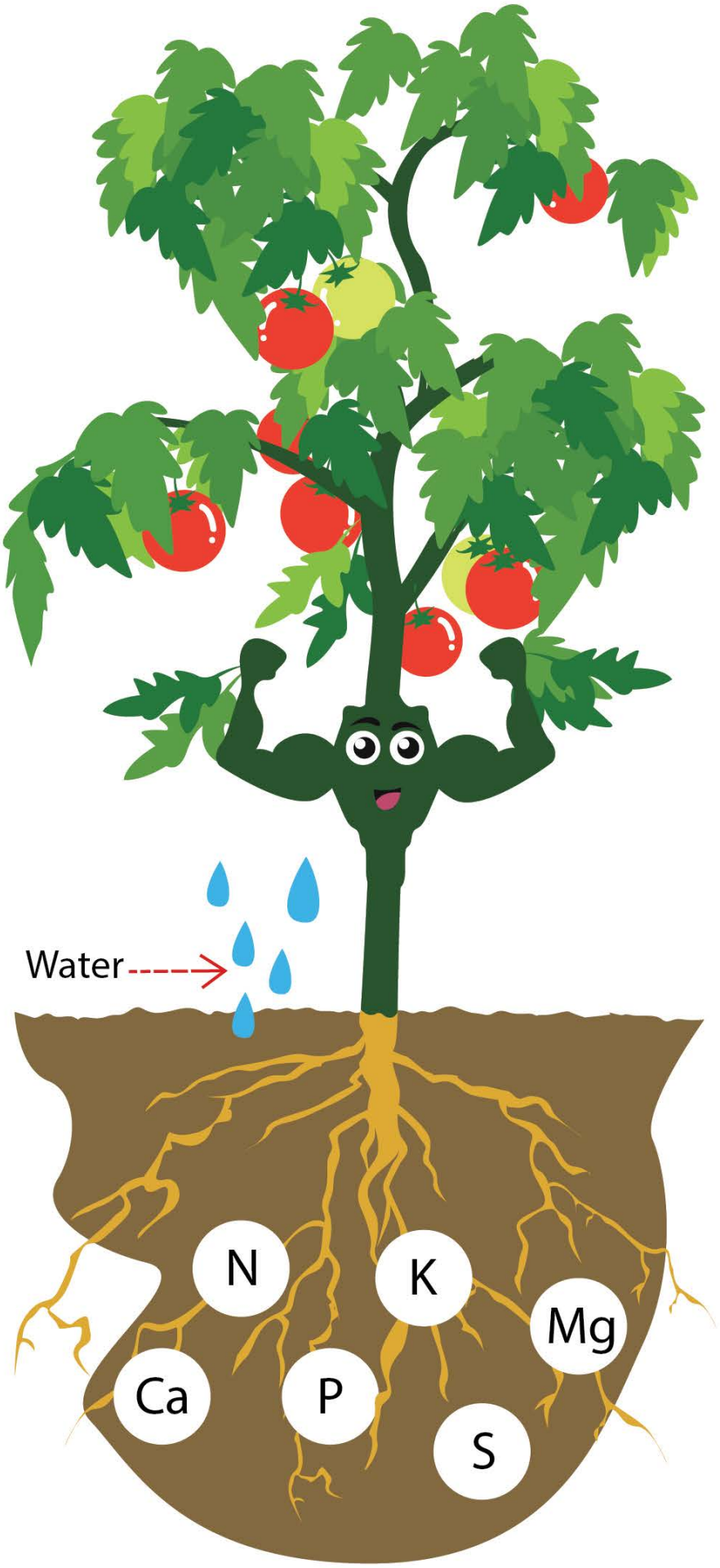
N P K

MICRONUTRIENTS

B Mo Cl Co Mn Zn Cu Fe Ni

18 Essential Nutrients for Plants

• Functions of macronutrients



NITROGEN (N)
* Involved in photosynthesis
* Promotes vegetative growth

PHOSPHORUS (P)
* Stimulates root development
* Promotes maturity

POTASSIUM (K)
* Improves quality of fruits
* Increases disease resistance

MAGNESIUM (Mg)
* Regulates uptake of other nutrients
* Key nutrient in chlorophyll production (green plants)

SULFUR (S)
* Promotes nodule formation on legumes
* Aids in root growth and seed formation

CALCIUM (Ca)
* Increases fruit setting
* Increases disease resistance

TIP BOX:

GOOD WATER MANAGEMENT ensures **GOOD PLANT NUTRITION.**

• Deficiency symptoms

TIP BOX:

Symptoms may overlap with drought, chemical injury or diseases. If unsure, check with the experts.

UPPER/YOUNGER LEAVES AND FRUITS

Sulfur: Yellowing like in Nitrogen, but starts in younger leaves

Calcium: Blossom-end rot; necrosis on leaf edges; distorted new leaves

LOWER/OLDER LEAVES

Potassium: Yellowing starts on the edges

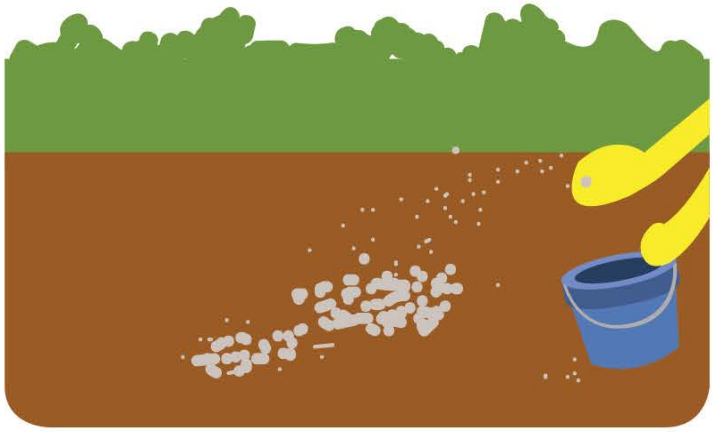
Nitrogen: Yellowing of the leaves

Magnesium: Yellowing between the veins (interveinal)

Phosphorus: Purpling of the leaves

• Deficiency management

Do regular soil test. Test N before each cropping season. Test P, K, Ca, S, Mg and pH every 5-6 years.



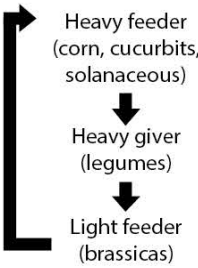
Apply fertilizers. Add lime, if soil pH is acidic. Consult an expert.

Sample of available inorganic and organic fertilizers

Inorganic Fertilizers *		N	P_2O_5	K_2O
Compound	NPK 15-15-15	15	15	15
	NPK 20-20-15	20	20	15
	NPK 10-26-26	10	26	26
Binary	Diammonium Phosphate (DAP)	18	46	0
	Ammonium Phosphate	16	20	0
	Mono-Potassium Phosphate	0	52	34
Single	Urea	46	0	0
	Muriate of Potash (MOP)	0	0	60
	Phosphate	0	36	0

* 100 kg DAP is not equal to 100 kg Urea
* 100 kg DAP has 18 kg N (Nitrogen) and 46 kg P_2O_5 (Phosphate)
* 100 kg Urea has 46 kg N (Nitrogen)

Organic Fertilizers	
Animal Manure	Cow dung Guano Chicken dung
Crop Residues	Rice straw Legumes Maize stalks
Others	Vermicompost Bokashi CalPhos (Eggshells/Bones) Fish Amino Acid (FAA) Fermented Fruit Juice (FFJ) Fermented Plant Juice (FPJ) Seaweed Extract



http://growhow.eastwestseed.com

Agrochemical recommendations have been developed in cooperation with Wageningen University & Research

WAGENINGEN UNIVERSITY & RESEARCH