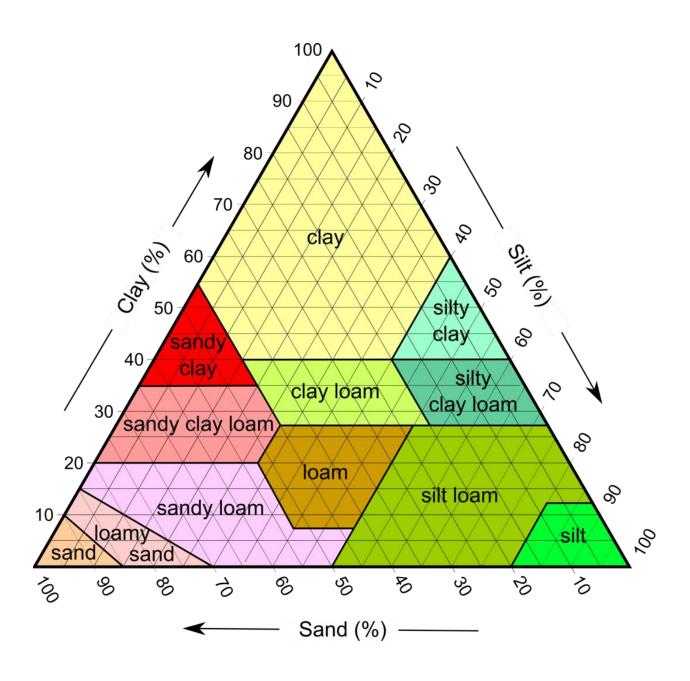
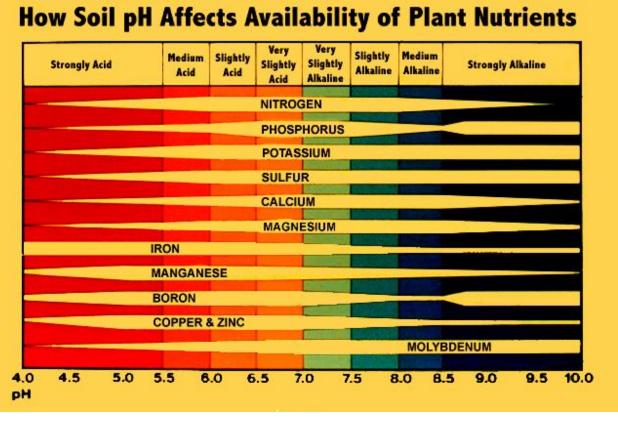
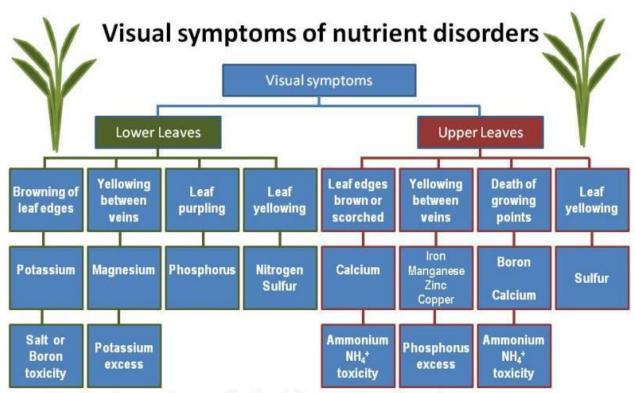
# **Soil Triangle:**



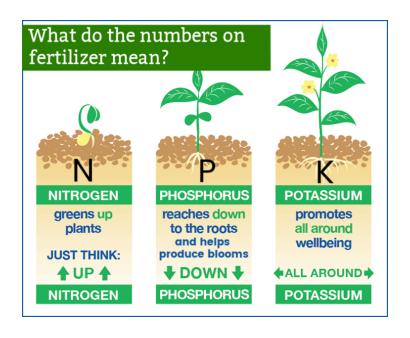


Name/per plant req.	Symbol
Primary Nutrients:	
Nitrogen 1 - 4%	N
Phosphorus 0.1 - 0.3%	Р
Potassium 0.5 - 4%	K
Secondary Nutrients:	
Sulfur 0.15 - 0.3%	S
Calcium 0.1 - 0.2%	Ca
Magnesium 0.05 - 0.15%	Mg
Micronutrients:	
Zinc 10 - 30 ppm	Zn
Iron 10 - 75 ppm	Fe
Copper 2 - 10 ppm	Cu
Manganese 10 - 20 ppm	Mn
Boron 1 - 10 ppm	В
Molybdenum 0.1 - 0.7 ppm	Мо
Chlorine 25 - 1,000 ppm	CI
Nickel trace amounts	Ni

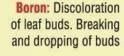


**Note:** Symptoms can be caused by other factors – e.g., drought can also cause browning of leaf edges

Source: Modified from T.H. Fairhurst, C. Witt, R.J. Buresh, and A. Dobermann (eds). 2007. Rice: A Practical Guide to Nutrient Management (2nd edition). IRRI, IPNI and IPI, Singapore.



# **Deficiency Chart of Micronutrients**



Sulphur: Leaves light green. Veins pale green. No spots.

Manganese: Leaves pale in color. Veins and venules dark green and reticulated

Zinc: Leaves pale, narrow and short Veins dark green. Dark spots on leaves and edges.

Magnesium: Paleness from leaf edges. No spots Edges have cup shaped folds. Leaves die and drop in extreme deficiency.

Phosphorus: Plant short and dark green. In extreme deficiencies turn brown or black. Bronze colour under the leaf. Calcium: Plant dark green. Tender leaves pale. Drying starts from the tips. Eventually leaf bunds die.

Iron: Leaves pale. No spots. Major veins green.

Copper: Pale pink between the veins. Wilt and drop.

Molybdenum: Leaves light green/ lemon yellow/ornge. Spots on whole leaf except veins. Sticky secretions from under the leaf.

Potassium: Small spots on the tips, edges of pale leaves. Spots turn rusty. Folds at tips.

Nitrogen: Stunted growth. Extremely pale color. Upright leaves with light green/yellowish.Appear burnt in extreme deficiency.

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

Average nutrient concentrations and rates of availability for various organic materials:							
Material	% N	% P	% K	Availability	Notes		
Alfalfa hay	2 – 3	0.5 – 1	1-2	Moderate			
Bone meal	1 - 6	11 – 30	0	Moderate	alkaline		
Blood meal	12	1 – 2	0 – 1	Rapid	acidic		
Canola meal	6	2	1				
Cottonseed meal	6	3	1	Slow	acidic		
Composts	1-3	1-2	1 – 2	Moderate	alkaline		
Crab shell meal	4	1.5	0				
Feather meal	12	0	0	Moderate			
Fish emulsion	3 – 5	1	1				
Fish meal	6 – 12	3 – 7	2 – 5	Rapid	acidic		
Grass clippings	1 - 2	0 – 0.5	1-2	Moderate			
Green sand	0	0	3.7				
Hoof/horn meal	12 – 14	1.5 – 2	0	Moderate	alkaline		
Kelp	1 – 1.5	0.5 – 1	5 – 10	Moderate	zinc, iron		
Leaves	1	0 – 0.5	0 – 0.5	Slow			
Legumes	2 – 4	0 – 0.5	2 - 3	Moderate			
Manures: cattle horse swine poultry sheep	2-3 1-3 2-3 3-4 3-4	0.5 - 1 $0.5 - 1$ $0.5 - 1$ $1 - 2$ $0.5 - 1$	1-2 1-2 1-2 1-2 2-3	Moderate Slow Rapid Rapid Moderate	weedy weedy high in salts weedy		
Pine needles	0.5	0	1	Slow	acidic		
Rock phosphate	0	25 – 30	0	Very slow	use only in acidic soils		
Sawdust	0-1	0 – 0.5	0-1	Very slow	Ties up N		
Sewer sludge	2 – 6	1 – 4	0-1	Moderate	zinc, iron		
Seaweed extract	1	2	5	Rapid	zinc, iron		
Straw/corn stalks	0-0.5	0 – 0.5	1	Very slow	ties up N		
Wood ashes	0	1-2	3 – 7	Rapid	high in salts		

#### **References:**

### WSU:

- https://today.oregonstate.edu/news/know-what-your-plants-need-fertilizing
- https://s3.wp.wsu.edu/uploads/sites/2071/2014/04/Home-Vegetable-Gardening-in-WA-EM057E.pdf
- https://www.co.thurston.wa.us/health/ehcsg/pdf/CSG VegeGarden sglpg.pdf
- WSU Master Gardener Training Manual

## **Oregon State University:**

- https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/ec871.pdf
- **DIY Tests:** https://extension.oregonstate.edu/gardening/techniques/mechanical-analysis-soils-jar-test

#### Texas A&M:

https://agrilifeextension.tamu.edu/library/gardening/fertilizing/

#### **Tennessee State University:**

DIY Tests:

https://extension.tennessee.edu/Williamson/Horticulture/Consumer%20Horticulture/DIY%20Soil%20Drainage%20Perk%20Test%20for%20Your%20Yard%20(2016).pdf

Tuesdays at Noon		Wednesday at 6 P.M.		
3 - 09	Raspberries	3 - 10	Rain Barrels	
3 - 16	Strawberries	3 - 17	Right Plant, Right Place	
3 - 23	Who Gets Grandma's Yellow Plate	3 - 24	Choosing Fruit Varieties for West WA	
3 - 30	Composting	3 - 31	Worm Composting	
4 - 6	April Garden Tasks	4 - 7	Advanced Composting	
4 - 13	Beneficial Insects	4 -14	Rejuvenating your Lawn	
4 - 20	Preparing & Sharpening Tools	4 - 21	Weed Control for Lawn/Landscape	
4 - 27	Seed Saving Starting the Journey	4 - 28	4 - 28 Preparing the Garden for Planting	

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