



Columbia Nursery

Soil Elements and Amendments

Primary Elements

Element/Symbol	Function	Signs of Deficiency	Signs of Excess	Sources
Nitrogen (N)	Dark green color, leafy growth, crispness of leaf crops, early growth stimulation	Light green to yellow leaves, stunted growth	Deep green, excessive growth, delayed maturity, loss of buds/fruit	Cottonseed meal, blood meal, manure, grass clippings, urea, ammonia, nitrates
Phosphorus (P)	Root growth, rapid start, seed formation, hardiness in fall	Red or purple leaves, tie-up of other nutrients (hard to diagnose directly)	Possible imbalance with other nutrients	Bone meal, apple & citrus waste, blood meal, wood ashes, fish waste, super phosphate, rock phosphate
Potassium (K)	Disease resistance, strong stalks, production of sugars, starches, oils, improves crop quality	Reduced vigor, disease susceptibility, thin skin/small fruit	Coarse, poor-colored fruit, reduced magnesium & calcium absorption	Greensand, granite dust, wood ashes, hay & leaves, muriate/sulfate of potash

Common Organic Amendments and N-P-K Values

Amendment	N	P	K
Blood Meal	13	0	0
Bone Meal	3	15	0
Rock Phosphate	0	3	0



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Super Phosphate	0	45	0
Cottonseed Meal	6	2	1
Greensand	0	0	3
Kelp Meal	1	0.1	2
Alfalfa Meal	2	0.5	2

Secondary Elements

Element/Symbol	Function	Signs of Deficiency	Signs of Excess	Sources
Magnesium (Mg)	Overall plant health	Chlorosis of old leaves, yield loss	Reduced calcium & potassium absorption	Magnesium sulfate (Epsom salts), dolomite
Manganese (Mn)	Overall health	Mottled chlorosis, stunted growth, dead spots on leaves with yellow borders	None noted	Manganese sulfate
Copper (Cu)	Overall health	Multiple budding, prevents iron uptake, stunted roots	None noted	Copper sulfate, neutral copper
Zinc (Zn)	Overall health	Small, thin, yellow leaves, low yields	None noted	Zinc sulfate
Iron (Fe)	Vital for chlorophyll	Yellowing leaves with green veins (common issue)	None noted	Iron sulfate, chelated iron



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Sulfur (S)	Overall health	Yellowing similar to nitrogen deficiency	Sulfur burn from low pH	Sulfur, super phosphate
Calcium (Ca)	Strengthens cell walls, root health	Stops growing point, reduces potassium & magnesium uptake	None noted	Lime, basic slag, gypsum
Molybdenum (Mo)	Various plant processes	Varies by plant	Toxic to livestock if overused	Sodium molybdate
Boron (B)	Cell wall formation	Small leaves, heart rot, corkiness, yellowish-red leaves	None noted	Borax

Need Help?

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