

Table 6. NCSU Phytotron Nutrient Solution.

Stock Solution (g)	Formula Weight	Grams/liter of stock solution
"A"		
Magnesium nitrate Mg(NO ₃) ₂ .6H ₂ O	256.41	26.0
Calcium nitrate Ca(NO ₃) ₂ .4H ₂ O	236.15	64.0
Sequestrene 330 Fe 10% Fe		10.0
"B"		
Potassium nitrate KNO ₃	101.11	40.44
Ammonium nitrate NH ₄ NO ₃	80.04	16.00
Potassium phosphate mono KH ₂ PO ₄	136.09	4.80
Potassium phosphate diabasic K ₂ HPO ₄	174.18	5.60
Potassium sulfate K ₂ SO ₄	174.27	6.00
Sodium sulfate Na ₂ SO ₄	142.04	6.80
Boric acid H ₃ BO ₃	61.83	0.28
Molybdic acid MoO ₃ .2H ₂ O	179.97	0.002
Zinc sulfate ZnSO ₄ .7H ₂ O	287.54	0.011
Manganous chloride MnCl ₂ .4H ₂ O	197.9	0.0816
Copper sulfate CuSO ₄ .5H ₂ O	249.7	0.004
Cobalt chloride CoCl ₂ .6H ₂ O	237.9	0.00024
Uranine		0.10

- The compounds containing the minor elements are dissolved together before being added to the "B" stock tank.
- Stock solutions are proportioned at the rate of 1 ml "A" + 1ml "B" per 200 ml RO purified H₂O.
- Phytotron nutrient pH values are:
RO purified H₂O 6.20
Stock Solution "A" 2.60
Stock Solution "B" 6.25
Nutrient Solution 6.25
- Uranine (sodium fluorescein) is added to Stock "B" to give the nutrient solution a green color so that it may be distinguished from H₂O.

*While useage of the unit 'grams/liter' is common laboratory practice, the correct but less familiar SI units would be kg m⁻³ or mg m⁻³

Table 7. Analysis of the Phytotron Nutrient Solution.

Element	Symbol	Source	Total ppm in the solution*
Nitrogen	N	Mg(NO ₃) ₂ .6H ₂ O Ca(NO ₃) ₂ .4H ₂ O NH ₄ NO ₃ KNO ₃	106.23
Phosphorus	P	KH ₂ PO ₄ , K ₂ HPO ₃	10.41
Potassium	K	KH ₂ PO ₄ , K ₂ HPO ₄ K ₂ SO ₄ , KNO ₃	111.03
Calcium	Ca	Ca(NO ₃) ₂ .4H ₂ O	54.40
Magnesium	Mg	Mg(NO ₃) ₂ .6H ₂ O	12.40
Iron	Fe	Sequestrene 330	5.00
Sulfur	S	K ₂ SO ₄ , Na ₂ SO ₄	13.19
Manganese	Mn	MnCl ₂ .4H ₂ O	0.113
Boron	B	H ₃ BO ₃	0.24
Zinc	Zn	ZnSO ₄ .7H ₂ O	0.013
Copper	Cu	CuSO ₄ .5H ₂ O	0.005
Cobalt	Co	CoCl ₂ .6H ₂ O	0.00003
Molybdenum	Mo	MoO ₃ .2H ₂ O	0.005
Sodium	Na	Na ₂ SO ₄	11.04

*While useage of the unit "ppm" is common laboratory practice, the corect but less familiar SI unit would be mol m⁻³.

Table 8. Waterholding capacity for selected values of substrate moisture tension for a typical batch of standard Phytotron substrate. Bulk density is about 1.2 g/cm³.

Substrate Moisture Tension		Water Content	
mm Hg	kPa	Weight Basis %	Volume Basis %
0	0	34.4	41.4
3.04	0.405	26.7	32.1
10.64	1.418	17.1	20.5
18.24	2.431	13.9	16.7
21.28	2.837	12.4	14.9
40.28	5.369	11.3	13.5
62.32	8.307	10.3	12.4
79.04	10.536	9.4	11.3
760.00	101.308	4.8	5.8
1140.00	1519.620	3.1	3.7

*Determined by D.K. Cassel, Department of Soil Science, NCSU.