Chapter 7: References

Albright, L.D., deVilliers, D.S., Shelford, T.J., Johnson, C.J.2007. Root disease treatment methods for commercial production of hydroponic spinach. Final report for NYSERDA. 127 pp.

Appendix

Stock Solutions

Two stock solutions are prepared which will be added separately to RO water and will supply nutrients to the spinach plants while in the pond area. Two separate stock solutions are prepared to prevent certain chemical reactions. These chemical reactions will cause some of the chemicals to form a precipitate and become inactive. The precipitates will not form if mixed one after another with a large volume of RO water. Note: Some salts have different waters of hydration. If you do not plan to use the salt with the exact formula in this protocol, be sure to adjust the weight accordingly.

STOCK A	
These chemicals are added to 300 L of RO water	
Calcium Nitrate	29160.0 g
Potassium Nitrate	6132.0 g
Ammonium Nitrate	840.0 g
Sprint 330 Iron - DTPA (10% Iron)	562.0 g

STOCK B	
These chemicals are added to 300L of RO water	
Potassium Nitrate	20378.0 g
Monopotassium Phosphate	8160.0 g
Potassium Sulfate	655.0 g
Magnesium Sulfate	7380.0 g
Manganese Sulfate*H_2O (25% Mn)	25.6 g
Zinc Sulfate*H_2O (35% Zn)	34.4 g
Boric Acid (17.5% B)	55.8 g
Copper Sulfate*$5H_2O$ (25% Cu)	5.6 g
Sodium Molybdate*$2H_2O$ (39% Mo)	3.6 g

Final Fertilizer Solution Concentrations

Macro-nutrients:			Micro-nutrients:		
N	8.9 millimol l^{-1}	(125 ppm)	Fe	16.8 micromol l^{-1}	(0.94 ppm)
P	1.0 millimol l^{-1}	(31 ppm)	Mn	2.5 micromol l^{-1}	(0.14 ppm)
K	5.5 millimol l^{-1}	(215 ppm)	B	15.0 micromol l^{-1}	(0.16 ppm)
Ca	2.1 millimol l^{-1}	(84 ppm)	Cu	0.4 micromol l^{-1}	(0.03 ppm)
Mg	1.0 millimol l^{-1}	(24 ppm)	Zn	2.0 micromol l^{-1}	(0.13 ppm)
S	1.1 millimol l^{-1}	(35 ppm)	Mo	0.3 micromol l^{-1}	(0.03 ppm)