TABLE 9-7. A Modified Nutrient Solution for Use in Hydroponic Plant Production

HOAGLAND'S NUTRIENT SOLUTION

Salt	Stock Solution (g to make 1 liter)	Final Solution (ml to make 1 liter)
	Solution 1	
$Ca(NO_3)_2 \cdot 4H_2O$	236.2	5
KNO_3	101.1	5
KH_2PO_4	136.1	1
$MgSO_4 \cdot 7H_2O$	246.5	2
	Solution 2	
$Ca(NO_3)_2 \cdot 4H_2O$	236.2	4
KNO_3	101.1	6
$NH_4H_2PO_4$	115.0	1
$MgSO_4 \cdot 7H_2O$	246.5	2

Micronutrient Solution

Compound	Amount (g) Dissolved in 1 liter of Water
H_3BO_3	2.86
$MnCl_2 \cdot 4H_2O$	1.81
$ZnSO_4 \cdot 7H_2O$	0.22
$CuSO_4 \cdot 5H_2O$	0.08
$H_2MoO_4 \cdot H_2O$	0.02

Iron Solution

Iron chelate, such as Sequestrene 330, made to stock solution containing 1 g actual iron/liter. Sequestrene 330 is 10 percent iron, thus 10 g/liter are required. The amounts of other chelates will have to be adjusted on the basis of their iron content.

Procedure: To make 1 liter of Solution 1, add 5 ml $Ca(NO_3)_2.4H_2O$ stock solution, 5 of KNO_3, 1 of KH_2PO_4, 2 of $MgSO_4.7H_2O$, 1 of micronutrient solution, and 1 of iron solution to 800 ml distilled water. Make up to 1 liter. Some plants grow better on Solution 2, which is prepared in the same way.

Source: Adapted from D. R. Hoagland, and D. I. Arnon, *The Water-Culture Method for Growing Plants Without Soil*. California Agricultural Experiment Station Circular 347 (1950).