

<Hydroponic nutrient solution recipes as indicated on [USU Crop Physiology Lab](#) website>

SINGLE-BOTTLE NUTRIENT SOLUTION

| SALT | STOCK CONCENTRATION | mL PER 100 L | FINAL CONCENTRATION |
|---|---------------------|--------------|---------------------|
| Ca(NO ₃) ₂ | 1 M | 200 | 2 mM |
| K(NO ₃) | 2 M | 150 | 3 mM |
| KH ₂ PO ₄ | 0.5 M | 100 | 0.5 mM |
| MgSO ₄ | 1 M | 100 | 1.0 mM |
| K ₂ SiO ₃ | 0.1 M | 100 | 0.1 mM |
| | | | |
| EDDHA (red) | 100 mM | 25 | 25 µM |
| MnCl ₂ | 60 mM | 10 | 6 µM |
| ZnSO ₄ | 20 mM | 30 | 6 µM |
| H ₃ BO ₃ | 40 mM | 50 | 20 µM |
| CuSO ₄ | 2 mM | 100 | 2 µM |
| Na ₂ MoO ₄ | 0.6 mM | 15 | 0.09 µM |
| Always add acid or base as needed to control pH at 5.5 to 5.8 | | | |

MONOCOT NUTRIENT SOLUTION

| | | STARTER | | PRE-ANTHESIS | | POST-ANTHESIS | |
|-----------------------------------|-------------|--------------|-------------|--------------|-------------|---------------|-------------|
| SALT | STOCK CONC. | mL PER 100 L | FINAL CONC. | mL PER 100 L | FINAL CONC. | mL PER 100 L | FINAL CONC. |
| Ca(NO ₃) ₂ | 1 M | 100 | 1 mM | 100 | 1 mM | 50 | 0.5 mM |
| K(NO ₃) | 2 M | 50 | 1 mM | 200 | 4 mM | 100 | 2 mM |
| KH ₂ PO ₄ | 0.5 M | 100 | 0.5 mM | 100 | 0.5 mM | 100 | 0.5 mM |
| MgSO ₄ | 1 M | 50 | 0.5 mM | 50 | 0.5 mM | 25 | 0.25 mM |
| K ₂ SiO ₃ | 0.1 M | 100 | 0.1 mM | 100 | 0.1 mM | 0 | 0 mM |
| | | | | | | | |
| FeCl ₃ | 50 mM | 20 | 10 µM | 5 | 2.5 µM | 5 | 2.5 µM |
| Fe-HEDTA | 100 mM | 25 | 25 µM | 5 | 5 µM | 5 | 5 µM |
| MnCl ₂ | 60 mM | 5 | 3 µM | 10 | 6 µM | 5 | 3 µM |
| ZnCl ₂ | 20 mM | 30 | 6 µM | 15 | 3 µM | 15 | 3 µM |
| H ₃ BO ₃ | 40 mM | 5 | 2 µM | 2.5 | 1 µM | 1 | 0.2 µM |
| CuCl ₂ | 20 mM | 15 | 3 µM | 10 | 2 µM | 10 | 2 µM |
| Na ₂ MoO ₄ | 1 mM | 10 | 0.1 µM | 5 | 0.05 µM | 5 | 0.05 µM |
| HNO ₃ | 1 M | 5 | 50 µM | 5 | 50 µM | 5 | 50 µM |

Add HNO₃ as needed to control pH to about 5.6

CHANGES MADE ON 21 JUNE 99:

COPPER TRIPLED IN STARTER SOLUTION;

ZINC INCREASED BY 50%;

NaMo STOCK SOLUTION INCREASED FROM 0.6 TO 1 mM TO MAKE IT ROUND NUMBER

CHANGES MADE 01 SEPT 00:

DOUBLED THE STOCK CONCENTRATION OF H₃BO₃;

QUADRUPLED MgSO₄

DICOT NUTRIENT SOLUTION

| | | STARTER | | VEGETATIVE GROWTH | |
|-----------------------------------|---------------------|----------------|---------------------|-------------------|---------------------|
| SALT | STOCK CONCENTRATION | mL PER 100 L | FINAL CONCENTRATION | mL PER 100 L | FINAL CONCENTRATION |
| Ca(NO ₃) ₂ | 1 M | 100 | 1mM | 200 | 2 mM |
| K(NO ₃) | 2 M | 50 | 1 mM | 150 | 3 mM |
| KH ₂ PO ₄ | 0.5 M | 100 | 0.5 mM | 250 | 1.25 mM |
| MgSO ₄ | 1 M | 50 | 0.5 mM | 150 | 1.5 mM |
| K ₂ SiO ₃ | 0.1 M | 100 | 0.1 mM | 100 | 0.1 mM |
| K ₂ SO ₄ | 0.5 M | 0 (do not add) | 0 mM | 0 (do not add) | 0 mM |
| | | | | | |
| FeCl ₃ | 50 mM | 10 | 5 µM | 3 | 1.5 µM |
| EDDHA (red) | 100 mM | 40 | 40 µM | 10 | 10 µM |
| MnCl ₂ | 60 mM | 10 | 6 µM | 15 | 9 µM |
| ZnCl ₂ | 20 mM | 30 | 6 µM | 20 | 4 µM |
| H ₃ BO ₃ | 40 mM | 100 | 40 µM | 100 | 40 µM |
| CuCl ₂ | 20 mM | 20 | 4 µM | 20 | 4 µM |
| Na ₂ MoO ₄ | 1 mM | 10 | 0.1 µM | 10 | 0.1 µM |

Always add acid or base as needed to adjust initial pH to 5.6

CHANGES SEPT '00:

DOUBLED THE STOCK CONCENTRATION H₃BO₃;
 QUADRUPLED MgSO₄;
 REDUCED THE FINAL CONCENTRATION OF H₃BO₃ TO 40 µM

CHANGES NOV '01:

REDUCED KNO₃ FROM 5 TO 3 mM;
 INCREASED CaNO₃ FROM 1 TO 2 mM.