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Domain: Smart Agriculture

Course: Growing of Hydroponics Lettuce

Project topic: Nutrient solution





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Nutrient solutions

- There are numerous nutrient solution recipes available for hydroponic systems.
- Nutrients can be purchased as a ready-to-mix product or growers can prepare their own solutions based on a standard or modified formula.
- In most systems, two nutrient tanks are required: one to supply the calcium nitrate and the other for the remaining nutrients.
- These two solutions mix as they are injected into the irrigation line.
- Hydroponic nutrient solutions lack the buffering capacity of soil, so the solution pH can change during production.
- The pH, along with oxygen levels, soluble salts and temperature, need to be closely monitored.



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| Component | Stock Solution | mL Stock Solution/1 L |
|---|----------------|-----------------------|
| Macronutrients | | |
| 2M KNO ₃ | 202 g/L | 2.5 |
| 2M Ca(NO ₃) ₂ •4H ₂ O | 236 g/0.5 L | 2.5 |
| Iron (Sprint 138 iron chelate) | 15 g/L | 1.5 |
| 2M MgSO ₄ •7H ₂ O | 493 g/L | 1 |
| Micronutrients | | |
| H ₃ BO ₃ | 2.86 g/L | 1 |
| MnCl ₂ •4H ₂ O | 1.81 g/L | 1 |
| ZnSO ₄ •7H ₂ O | 0.22 g/L | 1 |
| CuSO ₄ •5H ₂ O | 0.08 g/L | 1 |
| H ₂ MoO ₄ •H ₂ O or | 0.09 g/L | 1 |
| Na ₂ MoO ₄ •2H ₂ O | 0.12 g/L | 1 |
| Phosphate | | |
| 1M KH ₂ PO ₄ | 136 g/L | 1 |



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pH and EC of nutrient solution

- pH determines the availability of essential plant elements
- Optimum pH range of nutrient solution for development of plants is **6.0 to 7.0**
- Higher EC will prevent nutrient absorption due to osmotic pressure and lower level severely affect plant health and yield.
- Appropriate management of EC in hydroponics technique can give effective tool for improving vegetable yield and quality
- EC(dSm⁻¹) between **1.2 to 1.8** is advised for lettuce



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Thank you...