

Nutrient Regime for Hydroponic Production of Bibb (Butterhead) Lettuce in Saskatchewan Greenhouses

Lettuce has excellent potential as a greenhouse crop in Saskatchewan. This project evaluated the potential to produce bibb-type lettuce in a nutrient film technique hydroponic production system. Over the course of 25 production cycles which ran from January 2012 through June 2014, the temperature, depth, speed of flow and mineral composition of the nutrient solution running through the NFT system were altered in an effort to optimize crop growth and quality. **Eventually it was determined that a mixture providing 200 ppm N, with 46% of the N coming from calcium nitrate (CaNO₃), 46% from 7-11-27 + micros (HydroVeg Plant-Prod) and the remaining 8% of the N coming from ammonium sulfate (NH₄SO₄) resulted in excellent growth and quality.** To prepare 100 L of nutrient solution, 100g of CaNO₃ was dissolved in 50L of water and this was added to another 50L of water containing 75g of 7-11-27 and 7g of NH₄SO₄. The three fertilizer sources required in this regime were affordable (\$0.63 to prepare 100L of nutrient solution), easy to obtain and fully water soluble. The resulting nutrient solution had a relatively low EC of 1.8 dS/m – this level of salinity is easily tolerated by lettuce.

Table 1: Recommended fertility regime for hydroponic lettuce (from Resh) and regime achieved using just three fertilizer sources (NH₄SO₄, CaNO₃, and 7-11-27 + micros).

Element	Target (ppm)	Actual (ppm)
NO ₃	185	171
NH ₄	15	15
P	50	82
K	210	204
Mg	45	45
Ca	190	210
S	75	76
Fe	4	4
Zn	0.1	0.2
B	0.5	0.6
Mn	0.5	0.6
Cu	0.02	0.03
Mo	0.05	0.06

For more detail see the full report on the Evaluation of Bibb Lettuce for Hydroponic Production in Saskatchewan Greenhouses:

<http://veg.usask.ca/wp-content/uploads/Evaluation-of-Greenhouse-Bibb-Lettuce-Full-Report-2014.pdf>

This project was supported by the ADOPT Program of Saskatchewan Agriculture in collaboration with the Saskatchewan Greenhouse Growers Association and the Department of Plant Sciences at the University of Saskatchewan

