Piyanuch Orpong 2015: Effects of Micronutrient Concentration and Electrical Conductivity Pattern of Nutrient Solution in Hydroponic Production of Butterhead Lettuce under Tropical Condition Master of Science (Horticulture), Major Field: Horticulture, Department of Horticulture. Thesis Advisor: Associate Professor Surawit Wannakrairoj, Ph.D. 157 pages.

A study on effects of micronutrient concentration, electrical conductivity pattern of nutrient solution and *Trichoderma harzianum* (CB-Pin-01) on hydroponic production of Butterhead lettuce grown in nutrient film technique (NFT) system was investigated at Department of Horticulture, Faculty of Agriculture, Kasetsart University, Bangkok during April 2014 to April 2015. The results showed that lettuce grown in modified Cooper nutrient solution with 0.71 mg/l iron and manganese 13.73 mg/l, 13.71 mg/l iron and 0.24 mg/l manganese, 13.48 mg/l iron or 0.49 mg/l manganese and 0.24 mg/l iron and 0.24 mg/l manganese gave the highest growth in term of fresh weight, dry weight, leaf number, leaf area and canopy width. Lettuce grown in modified Cooper nutrient solution with 13.48 mg/l iron and 0.49 mg/l manganese had the highest vitamin C content of 1,070 mg/kg fresh weight. Its nitrate content did not exceed the EU's regulation maximum value for nitrate residue. Increasing of copper concentration reduced growth of lettuce in contrast to the effect of zinc and boron. Cooper nutrient solution with 1.04 mg/l copper, 1.90 mg/l zinc, 2.71 mg/l boron and 0.003 mg/l molybdenum gave the highest growth with safe level of nitrate content. Electrical conductivity pattern of nutrient solution that led to the highest growth was 1.8 mS/cm in the first week after transplanting, 1.5 mS/cm in the second week after transplanting and 1.2 mS/cm in the last 2 weeks before harvesting. The addition of 10 g/ 40 l *T. harzianum* (CB-Pin-01) resulted in insignificant difference in growth. The nutrient solution resulted from this study without *T. harzianum* (CB-Pin-01) yielded the highest growth in term of leaf greenness, height, leaf dry weight and nutrient content but no statistical difference with the same nutrient solution with *T. harzianum* (CB-Pin-01). While the use of *T. harzianum* (CB-Pin-01) could reduce the nitrate content found in the lettuce.

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