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Affect of Unbalanced Nutrient Solution on Changes of Ascorbic acid and Nitrate content in Lettuce (*Lactuca sativa* L.)

National Institute of Agricultural Science and Technology : Yang-Ho Park*, So-Hyeon Park, Ju-Yong Lee, Byoung-Choon Jang and Ki-Sang Lee

Objectives

This study is to compare and to analyze of Ascorbic acid(AsA) and nitrate content for study to change of physiology factors by unbalance nutrient solution in lettuce.

Materials and Methods

○ Plant

Lettuce seeds (*Lactuca sativa* L.) were purchased from Danong Co. and germinated in bed soil which was Baroker(Seoul Agricultural materials Co. Ltd) at green house. Lettuce was transferred after 20 days and was grown in pots (10cm(D) X 10cm(H)) which were filled with vermiculites and perlite (1:1). Nutrient solution was given 300mL every 2 to 3 days. The general nutrient solution contained macro-nutrients as mM, $Ca(NO_3)_2 \cdot 4H_2O$, 1.5; $NH_4H_2PO_4$, 0.5 NH_4Cl, 1.5; KCl, 4 $MgSO_4 \cdot 7H_2O$, 0.5; and micro-nutrients as μM, H_3BO_3, 20.6; $CuSO_4 \cdot 5H_2O$, 0.16; $MnSO_4 \cdot 2H_2O$, 4.5; $ZnSO_4 \cdot 7H_2O$, 0.34; Fe-chelate, 0.34 (Yamazaki 1978) and shifted to unbalanced nutrient solution after 10days. Unbalanced nutrient solutions were 6N-0K-1P, and 6N-2K-1P.

○ Measurement of Ascorbic acid and Nitrate content

They were analyzed by divided to upper leaf(1-4), middle leaf(5-8), and root. And used only leaf blade.

Ascorbic acid content : Based on Ko O. (1982) Method of Food Analysis.

Nitrate Content : Based on Y.H Park (2005) Continuous-flow Analysis for Determination of Nitrate Using Hydrazine-coppermethod in Plant.

Results and Discussion

○ Ascorbic content : AsA content of upper leaf was higher than that of middle leaf and that of root. AsA content of OK fertilization was higher than that of 2K fertilization both of upper leaf and middle leaf but AsA content of root was not different by different K fertilization.

○ Nitrate content : We could obtain results which Nitrate content of middle leaf higher than that of higher leaf and root. And nitrate content of 2K higher than that of 0K. This situation can explain that nitrogen absorption was to inhibit by potassium.

* *Corresponding author*: (Phone) 031-290-0329 (E-mail) pl23pyh@rda.go.kr

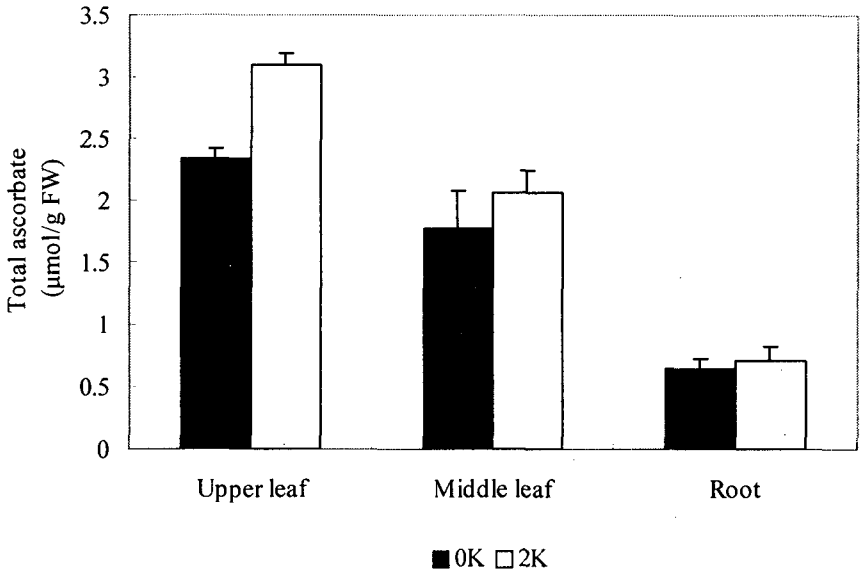

Fig. 1. Change of AsA content by different K fertilization.

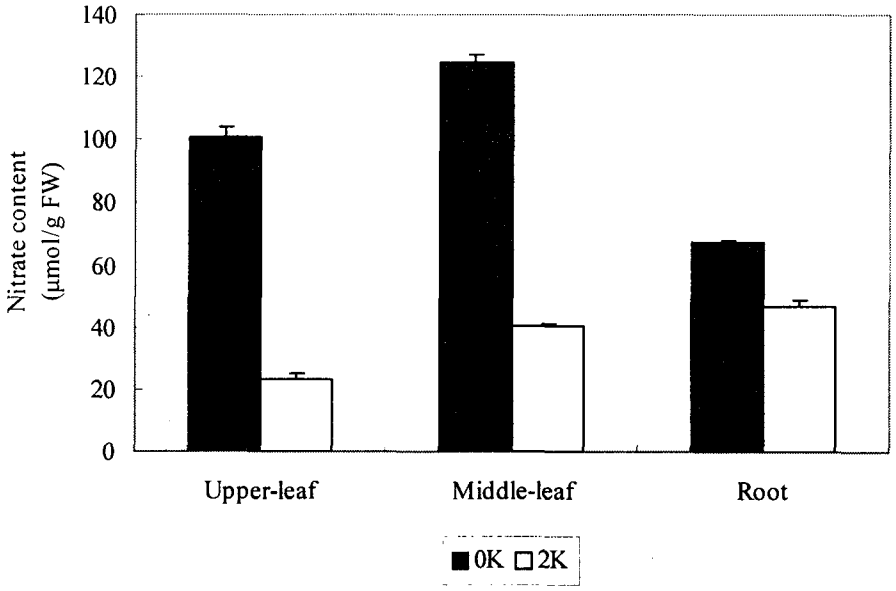

Fig. 2. Change of Nitrate content by different K fertilization.