

No. 05B5 - 07B5

## Application of Concentrated Deep Seawater for Multi-Truss and Year-Round Production of High Quality Tomato

Masaharu Kitano<sup>1</sup>, Takahisa Matsuoka<sup>2</sup>, Naotaka Matsuzoe<sup>3</sup>,  
Kazuhumi Zushi<sup>4</sup>, Takahiro Wajima<sup>3</sup> and Kota Hidaka<sup>1</sup>

<sup>1</sup>The Graduate School of Agricultural Science, Kyushu University

<sup>2</sup>The United Graduate School of Agricultural Science, Ehime University

<sup>3</sup>Faculty of Environmental and Symbiotic Sciences, Prefectural University of Kumamoto

<sup>4</sup>Shokei University Junior College

### Summary

The concentrated deep seawater has been discharged abundantly in the processes manufacturing many kinds of goods from the deep seawater. In this study, a suitable application of the concentrated deep seawater for the high quality tomato production was examined by analyzing effects of the short-term salt stress treatment with the concentrated deep seawater on plant physiological functions and fruit quality with special reference to osmotic adjustment, antioxidation and sensory properties of fruits. Tomato plants (*Lycopersicon esculentum* Mill.) with four fruit trusses were grown in the NFT system with the intermittent applications of the short-term salt stress and the continuous application of the long-term salt stress, where the concentrated deep seawater was applied to the standard nutrient solution. The short-term (one week) salt stress was applied three times to the respective fruit trusses of 1<sup>st</sup> to 4<sup>th</sup> at one-week intervals. This three times intermittent applications the short-term salt stress to each fruit truss significantly affected osmotic adjustment and antioxidation in tomato plants and brought the value-added high quality tomatoes enriched in sugar, minerals, antioxidants and flavor etc. Furthermore, the intermittent applications of the short-term salt stress showed the possibility to improve the extreme depression of fruit growth, the higher incidence of blossom-end rot and the depression in plant vigor which were caused by the continuous long-term salt stress treatment. In this study, a new methodology to produce value-added vegetables was demonstrated by applying the natural resource, the environmental stress and plant adaptive functions.