Title Effects of culture methods on the quality characteristics of "Traditional vegetables in Osaka"

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Abstract

In Japan, people grow unique vegetables suited to the climate and soil. Recently, some of the traditional vegetables, which are closely linked to the local climate and unique food, have regained popularity in Osaka. The cucumber (*Cucumis sativus* L. cv. Kema), which is one of the traditional vegetable cultivars in Osaka have strong bitterness. To establish an efficient cultivation system for producing high quality with weak bitterness, comparison of fruits grown in various culture methods were investigated. First we investigated comparison of cucumber fruits grown in soil culture and hydroponic solution culture with different nutrient levels. The hydroponically grown fruits were bitter as compared to the grown fruits in soil. The most cucumber fruits were bitter in taste when they were grown in high nutrient levels. Fruits had low concentration of nitrate ion in the low nutrient levels and high concentration of nitrate ion in the high nutrient levels in hydroponic culture solution. Next we investigated comparison of cucumber fruits grown in hydroponic solution culture with different fertilizer application and nutrient medium were investigated. In hydroponics, the cucumber fruits growing with the chemical fertilizer were stronger in bitterness than the cucumber fruit growing with the organic fertilizer. The fruits grown with deep flow technique were bitter as compared to the fruits grown *with* solid substrate with the chemical fertilizer. Nitrate ion may cause bitterness in fruit by promoting nitrogen metabolism, which in turn favors the enzymatic synthesis of cucurbitacin C. From these results, we conclude that bitter cucumber fruits can be reduced by growing them in soil culture rather than in hydroponic solution culture and in low nutrient level in hydroponic system and with the organic fertilizer and solid substrate.