Effects of Soil Temperature on Mineral Nutrients Uptake and Fruit Quality of Papaya (*Carica papaya* L.cv. Tainung No.2)

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Abstract

The purposes of this study were to observe the effect of soil temperature changes on the papaya mineral nutrient uptake and fruit quality. The results were showed as follows: the highest temperatures in the screen house, indoor, outside and under the plastic sheet mulching 10 cm surface soil were showed 42.4℃, 36.8℃ and 36.1℃ respectively, while temperature difference between indoor and outside were ranged 5.3℃ to 6.0℃. Temperatures difference of indoor and surface soil of 10 cm depth was ranged 6.2℃ to 11.2℃. Results of soil fertility analysis showed that pH and EC of surface soil were very significant negative correlation. Between temperature changes and soil fertility, there was no significant correlation. Results of nutrient concentration of mid-leaf analysis showed very significant positive correlation between N nutrient concentrations with increasing temperature, while the nutrients concentration of Ca and Mg, showed very significant negative correlation. In terms of fruit quality, the average fruit length and width were showed the best in July and March. The average fruit weight was showed the best from three months in March, April and July. The total soluble solid of fruit was showed the best of 13.9 ^{o}Brix in May. The total soluble solids with N and K nutrient concentrations of mid-leaf were showed a significant negative correlation and positive correlation, respectively. Nutrient concentration of the pulp were showed higher total soluble solids from N/K ratio, which ranged from 0.43 to 0.44. In addition, the fertilization management of the farmers were found excessively fertilized, accelerates soil acidification, resulting in decreased the soil pH values and increased EC values gradually. There was still need to reduce fertilizer application for farmers.

Key words: papaya, soil temperature, nutrients uptake, total soluble solids

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