

Effects of calcium treatment applied around the root zone on nutrient concentrations and morphological traits of papaya seedlings (*Carica papaya* L. cv. Eksotika II)

ABSTRACT

A potculture experiment was carried out to study the effect of calcium applied to the root zone of papaya seedlings (*Carica papaya* L. cv. Eksotika II) on nutrient uptake and morphological traits during 2010-11 at Agro technology Unit, University Agriculture Park (TPU), Universiti Putra Malaysia, Serdang, Selangor. Papaya seedlings established in pots fertigated with different levels of concentrations of recommended nutrient solutions. Three different sources of calcium such as calcium chloride (CaCl_2), calcium nitrate $\text{Ca}(\text{NO}_3)_2$ and calcium propionate $\text{Ca}(\text{C}_2\text{H}_5\text{COO})_2$ in different six concentrations (0, 180, 240, 300, 360 and 420 mg L⁻¹) were added to the root zone at depth of 15 to 25 cm. The addition of calcium to the root zone was started one month after transplanting of seedlings and continued fortnightly for two months. The N, P, K, Ca and Cl content were measured from the leaves during the experiment. Similarly growth observations on stem height, stem diameter, root number, root length and average root diameter were measured one month after transplanting. The results indicate that the N content is higher under calcium nitrate and calcium propionate treatments. However application of calcium through calcium chloride decreased the N content. The potassium (P) content was not influenced under different sources of calcium instead the potassium content decreased with increasing calcium concentration. Furthermore, even though the calcium content in plant was not significantly affected by the different sources of calcium, there were significant differences between control and 300 mg L⁻¹ calcium containing nutrient solution. Among the growth parameters, stem diameter and root length were maximum under the application of 240 and 180 mg L⁻¹ nutrient solution, respectively. However, with the exception of control, the differences for other treatments could not reach the level of significance.

Keyword: Calcium sources; Morphology; Nutrient content; Papaya