FOLIAR POTASSIUM FERTILIZATION OF MUSKMELONS: EFFECTS ON FRUIT QUALITY AND YIELD

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ABSTRACT

Sugar content, aroma and texture are key quality traits that influence consumer preference of many fruits and vegetables such as muskmelon [*Cucumis melo* L. (Reticulatus Group)]. These quality traits are directly related to potassium (K)-mediated processes. However, soil-derived K alone is seldom adequate to satisfy these fruit quality processes. Controlled environment studies have shown that supplemental foliar K applications can overcome this apparent deficiency. However, the suitability of potential K salts as foliar sources is still uncertain. We evaluated six foliar K sources (potassium chloride - KCl, potassium nitrate - KNO_3, monopotassium phosphate – MKP, potassium sulfate - K_2SO_4, potassium thiosulfate - KTS, and a glycine amino acid-complexed K- Potassium Metalosate, KM) for effects on fruit quality parameters of field-grown muskmelon 'Cruiser' over two growing seasons, 2006 and 2007 in Weslaco, south Texas. Weekly foliar K applications were initiated at fruit set and continued to fruit maturity. Although soil K concentrations were very high, supplemental foliar K treatments resulted in higher K concentrations in plant tissues, suggesting that plant K uptake from the soil solution was not sufficient to saturate tissue K accumulation. In 2006, fruit yields were not affected by supplemental foliar K spray but in 2007, yields differed significantly among the foliar K sources with treated plots generally having higher yields than the control plots. Fruit from plots receiving supplemental foliar K had higher external and internal fruit tissue firmness than control fruit and this was associated with generally higher soluble solids concentrations (SSC) in both years. All the foliar K sources studied had positive effects on fruit quality parameters except for KNO_3 which tended to result in less firm fruit with lower SSC values. These results demonstrate that the apparent K deficiency caused by inadequate uptake can be alleviated by supplemental foliar K applications and that the effectiveness of foliar K fertilization will depend not only on source of fertilizer K, but also on environmental conditions affecting overall plant growth and development. The results are consistent with previous controlled environment findings that supplementing soil K supply with foliar K applications during fruit development and maturation can improve muskmelon fruit quality by increasing SSC, firmness, and sugar contents.