

Title Effect of two potassium fertilizer with balanced requirement of other nutrients on quantitative and qualitative characteristics of apple fruit trees (Red Delicious)

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Abstract

Apple (*Malus domestica* Borkh) is strategically one of the most important fruits of the country. Despite a lower-than-average yield and quality characteristics, it ranks first among the exported horticultural products in terms of tonnage. The experiment was carried out in the apple orchards of Padena region of Semirom township in Esfahan from 2000 to 2002. The experiment was a completely randomized block test with 11 treatments and 6 replications that included the evaluation of the effect of two potassium sources along with obtaining a balanced requirement of other nutrients on the yield and quality of Red Delicious apple fruit. Fertilizer treatments included potassium chloride or potassium sulfate at the rates of one or two kg/tree with N and P-fertilizers and micronutrients; and a control based on the farmers conventional fertilizer practice. The soil available potassium in the 0-60 cm layer was measured at 400 mg/kg. The results, though statistically insignificant at 5% level, showed yield improvements with the application of potassium fertilizers. Different levels of potassium treatment caused quality improvements such as higher specific weight, and more total soluble solids (TSS). Treatment 11 which included 4 foliar applications of a 0.5% solution of calcium chloride resulted in a harder texture; but the effect was not significant at 5% level by Duncan test. No obvious CI-hazards were seen on the apple trees and no adverse effects on yields either due to the CI- of potassium chloride as compared with potassium sulfate. There were no differences in yield or quality characteristics of the apple fruits between the first year and the second year of trials indicating a good mobility for applied potassium. Considering the fact that both the soil available potassium and the potassium content of the apple leaves in the control experiment were higher than the standards (1.70%), application of potassium fertilizers irrespective of their source would not be recommended here. The results of these experiment during the two year period showed that no potassium applications are recommended for soils where available potassium exceeds the critical level of 300 mg/kg or where the leaf potassium measures at 1.70%.