

Evaluation of nutrient accumulation and translocation indices in three citrus rootstocks

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Abstract

Root systems in citrus trees develop from rootstocks. They have, thus, direct effects on water and nutrient uptake and translocation. The present study was conducted to evaluate the effects of three rootstocks common in northern Iran (i.e., sour orange, Swingle citrumelo, and Troyer citrange) on the nutrient uptake, translocation, and accumulation (NAI) as well as their translocation indices (NTI). For this purpose, one-year old seedlings of sour orange, Swingle citrumelo, and Troyer citrange were cultivated in a loamy soil under glasshouse conditions. After six months, the seedlings were harvested to measure their dry weights as well as their leaf, stem, and root concentrations of phosphorus, potassium, calcium, iron, manganese, zinc, and copper. Also, the rootstocks investigated were discriminated based on their nutrient accumulation and translocation indices as determined by factor analysis. Results showed the superiority of Troyer citrange in terms of phosphorus and iron uptake; citrumelo in terms of potassium and copper uptake; and common sour orange in terms of calcium and manganese uptake. The order recorded for the rootstocks in terms of their nutrient accumulation indices was sour orange > Troyer citrange ~ Swingle citrumelo. It was also found that the nutrient translocation indices of the three citrus rootstocks decreased in the following order: Swingle citrumelo > Troyer citrange > sour orange. Clearly, the citrus rootstocks investigated exhibited differential nutritional behaviors and different capacities with respect to utilizing plant nutrient elements.

Keywords: Citrange, Citrumelo, Macro- and micro-nutrients, Sour orange.

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