**TITLE: Assessment of nutrient removal in bearing peach trees (*Prunus persica* L. Batsch) based on whole tree analysis.**

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ABSTRACT: In this study, the amounts of macro- (N, P, K, Ca and Mg) and microelements (Fe, Mn, Cu and Zn) lost by peach trees (*Prunus persica* L. Batsch) in all the nutrient removal events (pruning, flower abscission, fruit thinning, fruit harvest and leaf fall), as well as those stored in the permanent structures of the tree, have been quantified in three fruit tree bearing cultivars. Peach trees were selected in two orchards, a commercial, highly productive one (20 trees of the 'Calanda' cv.) and a local grower owned, low productive one (9 trees of the 'Catherina' cv. and 11 trees of the 'Babygold5' cv.). The experiment lasted three years. The biomass lost by trees during winter pruning, flower abscission, fruit thinning, summer pruning, fruit harvest and leaf fall was measured, and all tissues were analyzed. The biomass of permanent structures (roots, trunk and main branches) was also measured after full tree excavation in two trees per cultivar and year, and these materials were also analyzed. Winter pruning and leaf fall were the events where most nutrients were removed. Nutrient losses and requirements are given as amounts of nutrients needed per tree and also as amounts necessary to produce a t of fresh fruit. Yearly peach tree nutrient losses were (in g/tree, for 'Calanda/Catherina/Babygold5') 340/103/98, 53/10/9, 518/21/21, 74/104/89 and 425/149/141 for N, P, Ca, Mg and K, respectively, and (in mg/tree) 4074/1126/933, 821/233/217, 824/724/216 and 875/169/155 for Fe, Mn, Cu and Zn, respectively. The allocation of all nutrients analyzed in the different plant parts was similar in different types of peach trees, with each element having a typical "fingerprint" allocation pattern. This suggests that the nutrient allocations found could be used as a guide for the estimation of nutrient requirements in other cultivars. Peach tree materials removed at tree pruning and leaf fall include substantial amounts of nutrients that could be recycled to improve soil fertility and tree nutrition. Poorly known tree materials such as flowers and fruit stones contain significant amounts of nutrients.

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