



# Impact of New Clonal Rootstocks on Fruit weight, yield, and Mineral Composition in Leaves and Fruits of European Plum (*Prunus domestica* L.), Assessed by Multivariate Analysis

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## Abstract

This study aimed to evaluate the influence of various rootstocks ('Wavit', 'Weiva', 'Docera 6', 'Dospina 235' and 'Myrobalan') on yield, fruit weight and the mineral composition of fruits and leaves in European plum (*Prunus domestica* L.) cultivars 'Čačanska Lepotica' and 'Jojo' over three growing seasons (2021–2023). Mineral content in fruit and leaves was analysed using standard procedures (Kjeldahl, colorimetric, flame photometry and atomic absorption methods) and the DOP index was calculated to assess nutrient status. Multivariate analysis was used to assess the relationships between rootstocks, yield, fruit weight and nutrient composition in fruits and leaves. Significant variations in yield and fruit weight and nutrient content were observed among rootstocks, cultivars and years with notable interactions. 'Myrobalan' and 'Dospina 235' enhanced yield, while 'Docera 6' produced the largest fruit but the lowest productivity. Rootstocks influenced the macro- and microelement composition, with 'Docera 6' increasing N and P content and 'Weiva' enhancing K and Cu levels. Multivariate analysis revealed distinct nutrient dynamics and productivity patterns, with 'Myrobalan' linked to high productivity and balanced macroelement levels. This study highlights the critical role of rootstocks in optimizing yield, fruit quality, and nutrient balance in European plum cultivars. 'Myrobalan' and 'Weiva' are suited for enhancing yield and fruit quality, while 'Docera 6' and 'Dospina 235' may require specific nutrient management for balanced productivity. Further research should explore the long-term effects of rootstock selection on tree performance, sustainability, and climate change adaptability.

**Keywords** *Prunus domestica* L. · Clonal rootstocks · Fruit macro- and micronutrients · Leaf macro- and micronutrients · DOP index

## Abbreviations

FW fruit weight  
Y yield per tree  
CY cumulative yield

$N_{\text{leaf}}$  nitrogen in leaf  
 $N_{\text{fruit}}$  nitrogen in fruit  
 $P_{\text{leaf}}$  phosphorus in leaf  
 $P_{\text{fruit}}$  phosphorus in fruit  
 $K_{\text{leaf}}$  potassium in leaf  
 $K_{\text{fruit}}$  potassium in fruit  
 $Ca_{\text{leaf}}$  calcium in leaf  
 $Ca_{\text{fruit}}$  calcium in fruit  
 $Mg_{\text{leaf}}$  magnesium in leaf  
 $Mg_{\text{fruit}}$  magnesium in fruit  
 $Fe_{\text{leaf}}$  iron in leaf  
 $Fe_{\text{fruit}}$  iron in fruit  
 $Mn_{\text{leaf}}$  manganese in leaf  
 $Mn_{\text{fruit}}$  manganese in fruit  
 $Cu_{\text{leaf}}$  copper in leaf

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