Olive tree canopy assessment based on UAV multispectral images

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**Abstract.**

Unmanned Aerial Vehicle (UAV) is widely used to acquire data on the biometric and spectral characteristics of olive trees through multispectral cameras. Several flight parameters and image processing techniques can be applied in order to obtain this information. The aim of this work was to study the variability of the main biometric parameters and multispectral characteristics of olive trees through multispectral images acquired from a remote platform (UAV) at three different flight altitudes (30m, 50m and 70m), in two acquisition periods, with and without the use of differential coordinate correction (RTK), also applying different image segmentation techniques. Phantom 4 Multispectral UAV platform was used for the two flight campaigns. The photogrammetric processing was carried out using the software Agisoft Photoscan Professional, version 1.2.6. The biometric and multispectral data extraction processing was carried out through the software Qgis, version 3.2. Different segmentation techniques were applied on the acquired images, starting from the main vegetation indices maps as Normalized Difference Vegetation Index (NDVI), Normalized Difference Red-Edge Index (NDRE) and Modified Soil Adjust Index (MSAVI). The results showed that the olive tree canopy can be accurately studied using the crown spectral information obtained by the UAV multispectral system.