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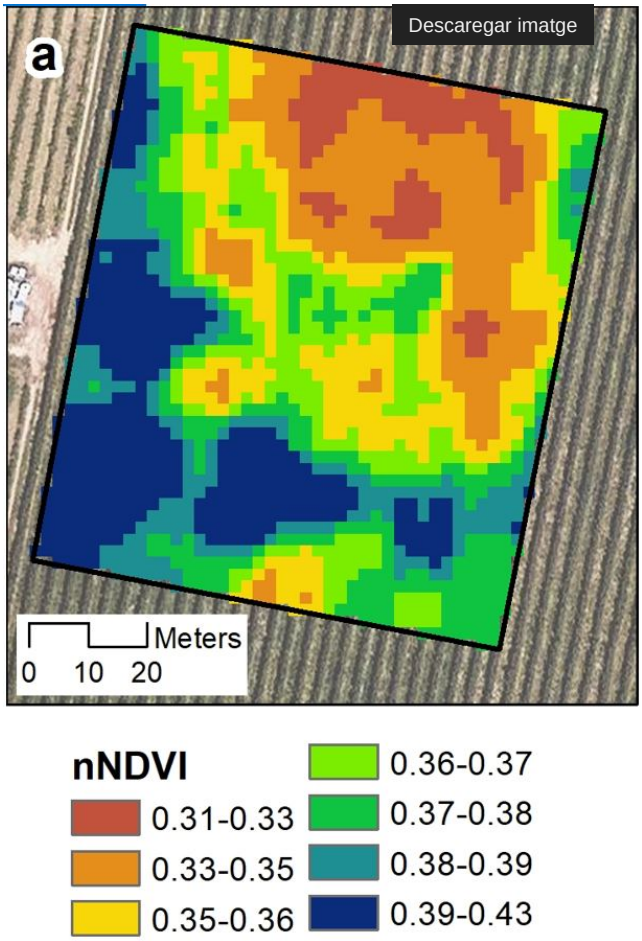
Delineation of management zones in super-intensive almond orchards based on vegetation indices from UAV images validated by LiDAR-derived canopy parameters



A research article by Martínez-Casasnovas et al. (2022) has been published in Agronomy [https://www.mdpi.com/2073-4395/12/1/102/htm]-MDPI with the title **Delineation of management zones in super-intensive almond orchards based on vegetation indices from UAV images validated by LiDAR-derived canopy parameters** (https://doi.org/10.3390/agronomy12010102 [https://www.mdpi.com/2073-4395/12/1/102/htm]). This article addresses one of the challenges in orchard management, in particular of hedgerow tree plantations, such as the delineation of management zones on the basis of high-precision data. Along this line, the present study analyses the applicability of vegetation indices derived from UAV images to estimate the key structural and geometric canopy parameters of an almond orchard. In addition, the classes created on the basis of the vegetation indices were assessed to delineate potential management zones. The structural and geometric orchard parameters (width, height, cross-sectional area and porosity) were characterized by means of a LiDAR sensor, and the vegetation indices were derived from a UAV-acquired multispectral image. Both datasets summarized every 0.5 m along the almond tree rows and were used to interpolate continuous representations of the variables by means of geostatistical analysis. Linear and canonical correlation analyses were carried out to select the best performing vegetation index to estimate the structural and geometric orchard parameters in each cross-section of the tree rows. The results showed that NDVI averaged in each cross-section and normalized by its projected area achieved the highest correlations and served to define potential management zones. These findings expand the possibilities of using multispectral images in orchard management, particularly in hedgerow plantations.

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