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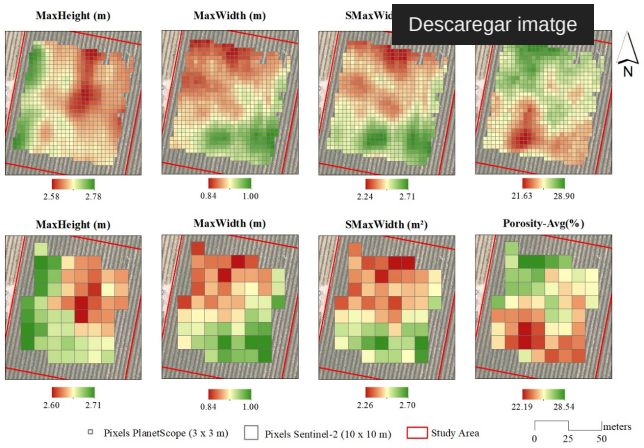
# Satellite multispectral indices to estimate canopy parameters and within-field management zones in super-intensive almond orchards

A research article by Sandonís-Pozo et al. (2022) has been published in Pecision Agriculture [




https://link.springer.com/article/10.1007/s11119-022-09956-6#citeas ] (Springer Nature) in Open Access with the title **Satellite multispectral indices to estimate canopy parameters and within-field management zones in super-intensive almond orchards** (https://doi.org/10.1007/s11119-022-09956-6 [ https://doi.org/10.1007/s11119-022-09956-6 ]). This work proposes the use of multispectral vegetation indices to estimate geometric and structural orchard parameters from remote sensing images (high temporal and spatial resolution) as an alternative to more time-consuming processing techniques, such as LiDAR surveys or UAV photogrammetry. A super-intensive almond (*Prunus dulcis*) orchard was scanned using a mobile terrestrial laser (LiDAR) in two different vegetative stages (after spring pruning and before harvesting). From the LiDAR point cloud, canopy orchard parameters, including maximum height and width, cross-sectional area and porosity, were summarized every 0.5 m along the rows and interpolated using block kriging to the pixel centroids of PlanetScope (3×3 m) and Sentinel-2 (10×10 m) image grids. To study the association between the LiDAR-derived parameters and 4 different vegetation indices. A canonical correlation analysis was carried out, showing the normalized difference vegetation index (NDVI) and the green normalized difference vegetation index (GNDVI) to have the best correlations. A cluster analysis was also performed. Results can be considered optimistic both for PlanetScope and Sentinel-2 images to delimit within-field management zones, being supported by significant differences in LiDAR-derived canopy parameters.