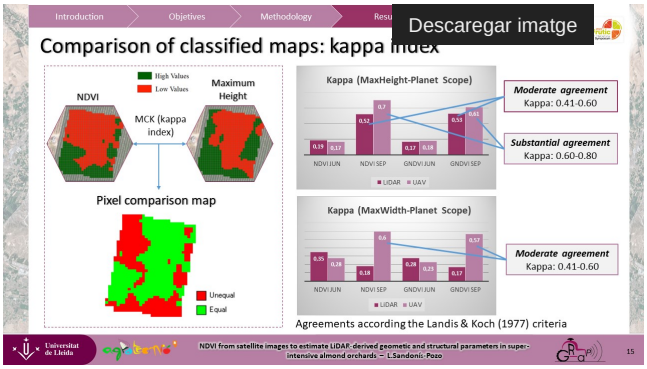
Friday, 15 July de 2022

Participation in Participation in FRUTIC 2022 (June 29 – July 1, 2022, Valencia): PlanetScope Vegetation Indices to Estimate UAV-and LiDAR-derived Canopy Parameters in a Super-Intensive Almond Orchard



Leire Sandonís-Pozo, PhD Student and member of the working group of the PAgFRUIT project, participated in FRUTIC 2022 (https://www.frutic2022.com [https://www.frutic2022.com/]/), organized by the Instituto Valenciano de Investigaciones Agrarias (IVIA). In this event, L. Sandonís-Pozo presented an oral communication in the Precision Diagnosis session, titled: ***PlanetScope Vegetation Indices to Estimate UAV and LiDAR-derived Canopy Parameters in a Super-Intensive Almond Orchard***. In this work, detailed satellite images are tested for continuous monitoring of geometric and structural parameters, as a key aspect in sustainable and accurate orchard management. Although LiDAR and UAV photogrammetry are widely used to measure canopy architecture, there is still a gap to bridge in the development of software to process this information. In this line, this work tries to estimate the maximum height and width in a hedgerow fruit tree orchard from PlanetScope vegetation indices (NDVI and GNDVI). To analyze the correspondence between geometric parameters and the vegetation indices, LiDAR and UAV point clouds were acquired on two 2021 dates in a super-intensive almond orchard: after mechanical pruning (June) and before harvesting (September). The 3D point clouds were summarized every 0.5 m and the maximum width and height along the rows were calculated and interpolated by means of block kriging to the pixel centroids of the PlanetScope image. These maps were later classified using a k means algorithm in two classes. Results indicate that the NDVI was the best performing index in estimation of maximum height and width on the two analyzed dates. GNDVI obtained its best results in September, when vegetation was fully developed. In conclusion, these vegetation indices could be useful for monitoring canopy geometry in this type of orchard, in particular to decide about pruning intensity.