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Estimation of olive grove surface area as a tool to identify the presence of vegetation cover

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Abstract:

In the last decade, the use of vegetation covers on olive groves has been extended as a cultural practice. The use of vegetation cover in this cultivation is associated with a multitude of positive environmental effects, such as the reduction of soil erosion, the increase in biodiversity, the decrease in net greenhouse gas emissions and an improvement in the landscape aesthetic quality. In order to reward farmers who adopt vegetation covers, the public administration need to identify the olive plots where this cultural practice is used. In this context, due the huge extension of olive groves in Spain, the use of information from remote sensors may be a viable alternative, due to its wide spatio-temporal scope and low costs. A necessary previous step for the correct estimation of the presence of vegetation cover is the quantification of the olive crown area, since the spectral information of the olive canopies from remote sensors can be confused with the spectral information of the vegetation cover. The objective of this work is to present a methodology for the quantification of the crown area in a set of 31 olive groves. Data from drones, Laser Image Detection And ranging (LIDAR) and Sentinel 2 images have been used carrying out the analyzes in Qgis v. 3.10. Results show that the average percentage classification error is 4% either in the case of Sentinel 2 or LIDAR data. These reduced errors permit to withdraw the impact of olive trees from the multitemporal spectral curves of olive grove with vegetation cover, and thus to identify its presence and possibly quantify its amount.

Key Words: Urban Growth, Land use/ change and Agricultural

Biography:

Research activity of Dr. Sergio Colombo started about 20 years ago and has been carried out in several research centres such as university of Milán, University of Granada, University of Glasgow, University of Stirling and Centre of Choice Modelling in Sydney. Currently, Dr. Colombo is senior researcher at IFAPA, Junta de Andalusia, Spain. He has published more than 40 papers in reputed journals in the environmental and resource economics and agricultural policy fields. The use of GIS has been an overarching tool in his research to link results from the environmental economics field to policy making. Currently he is leading a project to identify vegetation cover in olive grove to be used in the forthcoming commong agricultural policy.

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