Spatial Queries of Agricultural Areas Falling into Cadastral Parcels and Organizing and Analyzing Them with Python Programming Language

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SUMMARY

Turkey is the World's largest hazelnut producer and exporter in the world with approximately 79% of worldwide production. Turkey also takes the fifth place in production of tea after China, Kenya, India and Sri Lanka. Mainly, both hazelnut and tea are produced on the eastern Black Sea cost of Turkey, which has a mild climate with high precipitation and fertile soil. In this study, hazelnut and tea plantation areas, which were determined previously with multispectral image classification of WorldView-2 image data, are queried and analyzed with ArcGIS 10.2 software to create a Geographical Information System (GIS). Within created GIS, tea and hazelnut cultivated areas are categorized according to aspect and slope information of each cadastral parcel and quantitative results obtained as the result of queries and spatial analysis are displayed as thematic maps. In addition, created land use maps are intersected with up-to-date cadastral maps to determine the total area of each agricultural product in each cadastral block. It is observed that a specific agricultural product, e.g. tea, may not cover the entire cadastral parcel, but, it is scattered as small pieced polygons having different IDs over the cadastral parcel. To get the total area of each product on each cadastral parcel, IDs of the different polygons belonging to the same agricultural product are merged with a script written in Python programming language and the resultant maps are created and displayed with developed GIS.

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