

Landsat Data from Pre Crop Season to Estimate the Area to Be Planted with Summer Crops

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Abstract : The estimate of the Area of Land to be planted with annual crops and its stratification by the municipality are important variables in crop forecast. Nowadays in Brazil, these information's are obtained by the Brazilian Institute of Geography and Statistics (IBGE) and published under the report Assessment of the Agricultural Production. Due to the high cloud cover in the main crop growing season (October to March) it is difficult to acquire good orbital images. Thus, one alternative is to work with remote sensing data from dates before the crop growing season. This work presents the use of multitemporal Landsat data gathered on July and September (before the summer growing season) in order to estimate the area of land to be planted with summer crops in an area of São Paulo State, Brazil. Geographic Information Systems (GIS) and digital image processing techniques were applied for the treatment of the available data. Supervised and non-supervised classifications were used for data in digital number and reflectance formats and the multitemporal Normalized Difference Vegetation Index (NDVI) images. The objective was to discriminate the tracts with higher probability to become planted with summer crops. Classification accuracies were evaluated using a sampling system developed basically for this study region. The estimated areas were corrected using the error matrix derived from these evaluations. The classification techniques presented an excellent level according to the kappa index. The proportion of crops stratified by municipalities was derived by a field work during the crop growing season. These proportion coefficients were applied onto the area of land to be planted with summer crops (derived from Landsat data). Thus, it was possible to derive the area of each summer crop by the municipality. The discrepancies between official statistics and our results were attributed to the sampling and the stratification procedures. Nevertheless, this methodology can be improved in order to provide good crop area estimates using remote sensing data, despite the cloud cover during the growing season.

Keywords : area intended for summer culture, estimated area planted, agriculture, Landsat, planting schedule

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