Combining optical remote sensing, agricultural statistics and field observations for culture recognition over a peri-urban region

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This study explores the potential of multi-temporal optical remote sensing, with high revisit frequency, to derive missing information on agricultural calendar and crop types over the agricultural lands in the Versailles plain in the western Paris suburbs. This study comes besides past and ongoing studies on the use of radar and high spatial resolution optical remote sensing to monitor agricultural practices in this study area (e.g. Vaudour et al. 2014).

Agricultural statistics, such as the Land Parcel Identification System (LPIS) for France, permit to know the nature of annual crops for each digitized declared field of this land parcel registry. However, within each declared field several cropped plots and a diversity of practices may exist, being marked by agricultural rotations which vary both spatially and temporally within it and differ from one year to the other. Even though the new LPIS to be released in 2016 is expected to describe individual plots within declared fields, its attributes may not enable to discriminate between winter and spring crops.

Here we evaluate the potential of high observation frequency remote sensing to differentiate seasonal crops based essentially on the seasonality of the spectral properties. In particular, we use the Landsat data to spatially disaggregate the LPIS statistical data, on the basis of the analysis of the remote sensing spectral seasonality measured on a number of selected ground-observed fields.