

Advancing Agricultural monitoring with Improved Yield Estimation Using SPOT VEGETATION Type Remotely Sensed Data

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Global trends such as food prices increase, climate change, natural disasters heavily affect food and agricultural policy and their implementation. Thus governments, NGO's and international agencies are challenged to define an effective strategy and implement control measures to deal with these agricultural risks. Remote sensing is an effective tool to collect correct and on-time information on agriculture and associated risks. SPOT-VEGETATION is the core remote sensing information source of this system. However, SPOT VGT will be available until 2013. Sentinel 3 satellites built by ESA will contribute to continue of the availability of VEGETATION type data. Sentinel 3 will be launched in 2014 and later. In order to fill the time gap for the data continuity, Belgium has built a satellite called PROBA-V which will have all of the specifications as asked by the VEGETATION user community. In short, the scientific world will continue to get data for the land applications which is crucial for environmental and agricultural monitoring. Identifying important crops and yield estimation early in the growing season are two essential needs of agricultural monitoring. Although various crop forecasting systems have been developed, remote sensing techniques are open for improvement in order to provide more adequate information for early warning purposes. There is a need for better yield and area estimations.

In order to satisfy this need, in the framework of this project, three main objectives are defined. First of all, time series data based on sensors should be used. For the continuity of the data of the new sensors such as PROBA-V and Sentinel-3 should be translated into the current one, for instance SPOT VEGETATION. Secondly, Dry Matter Productivity (DMP) should be improved. DMP is generally accepted as the best indicator for crop yield, since production capacity of the crop is calculated by means of this indicator. Although water stress is the main limiting factor in the growth process of the vegetation, current DMP is a non-water limited version. Thus it is an indicator for "potential" production. This means that it is important to take into account actual evapotranspiration (ET) data for DMP calculation. Finally, making/utilising crop suitability maps might be an important step to assure accurate yield estimations.