



The use of PROBA-V data for Global Agricultural Monitoring

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Land conversion, forest cutting, urban growth, agricultural expansion, take place at an unprecedented rate and scale such that they have a strong economic and environmental impact. Understanding and measuring dynamics becomes a prerequisite for companies, governments, agencies, NGO's, research institutes and society in general. In many cases the temporal frequency of the information is a requirement to detect phenomena that can occur within a few days and at a certain geographic scale. For example frequent updates on crop condition and projected production are needed to stabilise agricultural markets. Large initiatives such as the GEOGLAM AMIS (Group on Earth Observations Global Agricultural Monitoring - Agricultural Market Information System) respond to this increased need.

Observations over large areas are available through satellites, however, the following challenges remain:

- obtaining frequent and consistent observations at sufficient level of detail to identify spatial phenomena. At present, no single mission is capable of providing near daily information of any place in the world at scales appropriate to detect land cover/use changes in a consistent manner.
- the need for a historical reference. For agricultural monitoring and early warning purposes the comparison of the actual data with a historical reference is of the utmost importance.

The PROBA-V mission is an important attempt to overcome these challenges. From its design and within the GIO-Global Land component a lot of work has been done to ensure the consistency between the PROBA-V data and the 15 years historical archive of SPOT-VEGETATION. In this respect PROBA-V observations are comparable with the SPOT-VEGETATION historical baseline and will therefore ensure the continuation of the standard agricultural monitoring products. Next to this integration with the historical archive, PROBA -V also provides an increase in spatial resolution from 1km to 300m and even 100m. The latter ensures a global coverage every 5 days, while daily global coverage is provided at 1 km and 300 m.

Within the framework of the FP7 SIGMA project (Stimulating Innovation for Global Monitoring of Agriculture), currently Europe's largest contribution to the abovementioned GEOGLAM initiative, the use of the 100m data set for agricultural monitoring is investigated. To overcome the problem of the reduced revisit time of the 100 m data, the SIGMA projects foresees in a data assimilation of the 100 m and 300 m products. The data assimilation is based on a Kalman filter approach developed by Sedano et al. (2014). As an output, a cloud free composite is produced every ten days at a spatial resolution of 100 m.

References

Sedano, Fernando, Pieter Kempeneers, and George Hurr. "A Kalman Filter-Based Method to Generate Continuous Time Series of Medium-Resolution NDVI Images." *Remote Sensing* 6.12 (2014): 12381-12408.

<http://proba-v.vgt.vito.be/>

<http://www.geoglam-sigma.info/>