Forecast crop yields

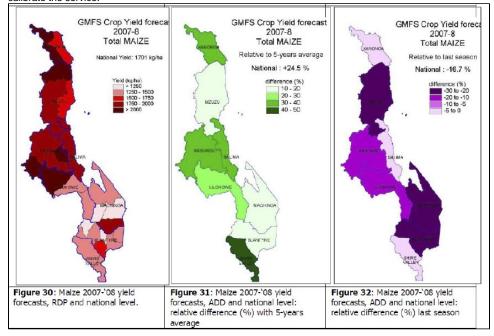
Applications

Yield Assessment

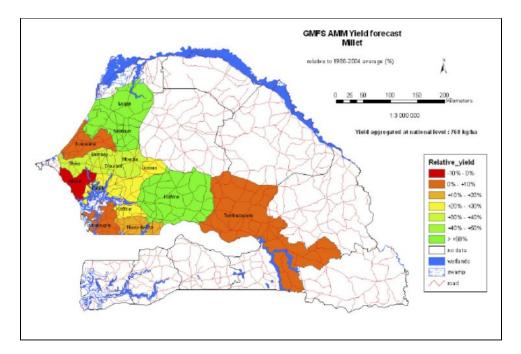
Operational crop yield estimates are multiplied by the cultivated area, providing the crop production estimate at national/regional level. This service uses medium resolution optical satellite data. Agricultural yields are traditionally estimated using Crop Growth Models or Agro-Meteorological Models (AMM) with different levels of complexity, using several data sources. Today, these crop growth models can be improved and also simplified by using EO data that can be input to various stages of the modeling process (parameters, input or driving variable).

Yield values for each crop are provided at sub-national level and then aggregated at country level, either post-harvest or a forecast during the growing season.

The model makes use of several input variables (e.g. phenological, meteorological), not all derived from EO sources. Availability of local data might differ among countries. Similarly to the Early Warning service, another constraint is associated, in some countries, with reliability of historical yield values provided by public authorities in charge of collecting such data. Such yield values are in fact used to calibrate the service.



Extract of MARS bulletin Vol 20 No 9 (European Union 2012). A pan-European crop monitoring and yield forecasting service based on satellite observations.



Relative yield forecast for millet in Senegal. Credits: University of Liége Transparent and homogeneous data on agricultural production and estimates of agricultural output growth at production and estimates or agricultural output growth at country level are essential inputs to National Agricultural Statistics and Crop and Food Security Assessment Missions by the international donor community. Timely forecasted yield values are one of the key variables in early warning for food security. Moreover, they can assist agricultural subsidies control.

Yield forecast cost for 2-3 main crops over a 100.000 km² area ranges between 70 and 100 kEuro.

References:

ESA 2013, Earth Observation for Green Growth: An overview of European and Canadian Industrial Capability

Products

Products	Ext. Source	Descriptions	Product Standards	Ref. Project	
crop forecast	crop forecaster	Median Planting Date Planting Progress At-Planting Acreage Median Crop Stage Crop Condition Apparent Yield At-Harvest Acreage At-Harvest Yield			
crop health (disease and stress)		Monitor crop disease and stress			
crop acreage and yield harvest (inventories / statistics)		Assess crop acreage and yield harvest			
crop types (extent, growth, health, stress)		Monitor specific crop types			
Application: crop yields		Forecast crop yields			

crop indicator	crop area estimates crop yield forecast	ISAC
crop indicator	agriculture sustainable management precision farming & farming planification fertilizers industry phytosanitary industry	geoland

Success Stories



References

Topic	Description	Key words	References
Studying crops, from outer space	The work is based on a breakthrough in the capacity to use satellite technology to measure light that is emitted by plant leaves as a byproduct of photosynthesis.	crops, photosynthesis	Spacedaily