



Kingdom of Morocco



National Direction of Meteorology

Agro-meteorological crop monitoring bulletin for the 2012-2013 cropping season

Crop Growth Monitoring System - Morocco

Highlights

During the 2012-2013 cropping season, cumulated rainfall was high, as compared to long term average (>30%), in most of the main agricultural areas. However, rainfall was average along the coast, in Essaouira, Safi, Agadir, Tangier and Tetouan provinces and, slightly lower than the average in Al Hoceima and Nador provinces. Cumulated rainfall at national level, from September 1st 2012 to April 30th 2013, was high (551mm), which is 61% more than the long term average. Temperatures during this cropping season were as average compared to historical data. The vegetation, as monitored by remote sensing (NDVI), was good in the main cereal (soft wheat, durum wheat and barley) growing areas. In the North of the country, in Tangier, Tetouan, Larache, Kénitra and Sidi Kacem provinces the vegetation was close to average. However, in Safi, El Kalâa des Sraghna, Chichaoua and Marrakech provinces, vegetation was below average. At national level, the total area of cereal was 5,129 million hectares, as estimated from field surveys.

This bulletin is jointly published by the National Institute for Agronomic Research ([INRA](#)), the National Direction of Meteorology ([DMN](#)) and the Direction of Strategy and Statistics ([DSS](#)). It has been achieved thanks to the National crop monitoring and forecasting system, called « **CGMS-MAROC** » (www.cgms-maroc.ma). This system was initiated by [INRA](#), in the framework of **E-AGRI** project (<http://www.e-agri.info/>). CGMS-MAROC is jointly managed by [INRA](#), [DMN](#) and [DSS](#).

CLIMATIC ANALYSIS

Rainfall

During the 2012-2013 cropping season, cumulated rainfall was high in most of the main agricultural areas, exceeding long term average by 20 to 30%, depending on the zones (Figure 1). However, rainfall was normal along the coast, in Essaouira, Safi, Agadir, Tangier and Tetouan provinces and, slightly below average in Al Hoceima and Nador provinces.

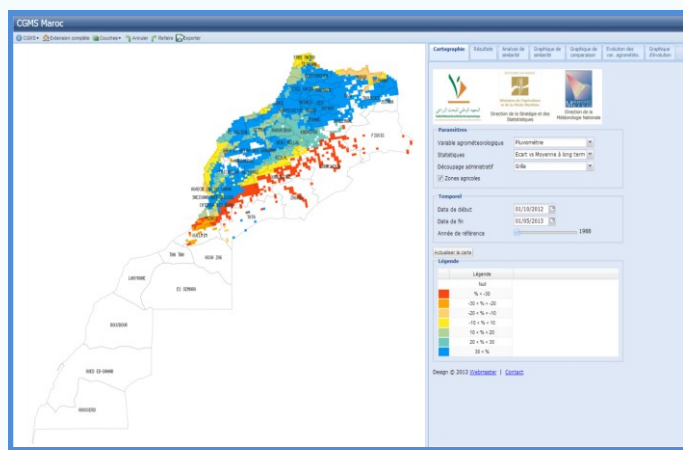


Figure 1 : Cumulated rainfall during the 2012-2013 cropping season, from September 1st 2012 to April 30th 2013, as compared (%) to the long term average (only agricultural areas are displayed).

Cumulated rainfall from September 1st 2012 to April 30th 2013 in the agricultural areas was high, equal to 551mm at national level, which is 61% more than the long term average (342mm, from 1988 to 2012) (Figure 2). In terms of total rainfall over this period, the season is close to the cropping season 1996-1997 (531mm).

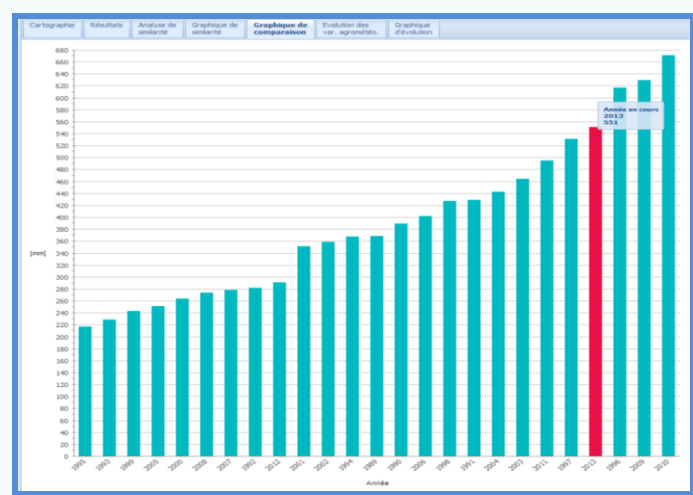


Figure 2 : Ranking of the historical cropping seasons since 1988, in terms of cumulated rainfall from September 1st 2012 to April 30th 2013, at national level over the agricultural areas.

However, the similarity analysis (since 1988) shows that, in terms of intra-annual distribution of the rainfall during the growing season, the current cropping season is similar to the two cropping seasons: 2002-2003 (464mm) and 2010-2011 (495mm) (Figure 3).

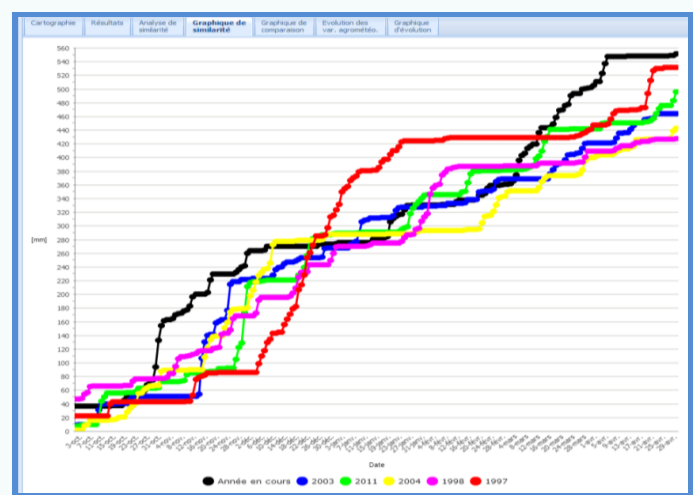


Figure 3 : Similarity analysis of the 2012-2013 cropping season, in terms of the distribution of daily rainfall from September 1st 2012 to April 30th 2013, at the national level over the agricultural areas.

Temperatures

Temperatures during the 2012-2013 cropping season were about average compared to historical values (Figure 4).

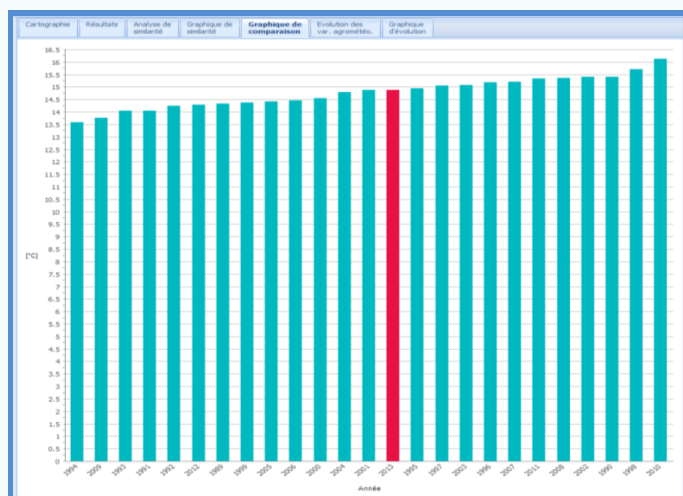


Figure 4: Ranking of the historical cropping seasons since 1988, in terms of average temperature over the period from September 1st 2012 to April 30th 2013, at the national level over the agricultural areas.

Temperatures were fluctuating during this crop year (Figure 5). They were also very low during the months of December 2012 and February 2013.

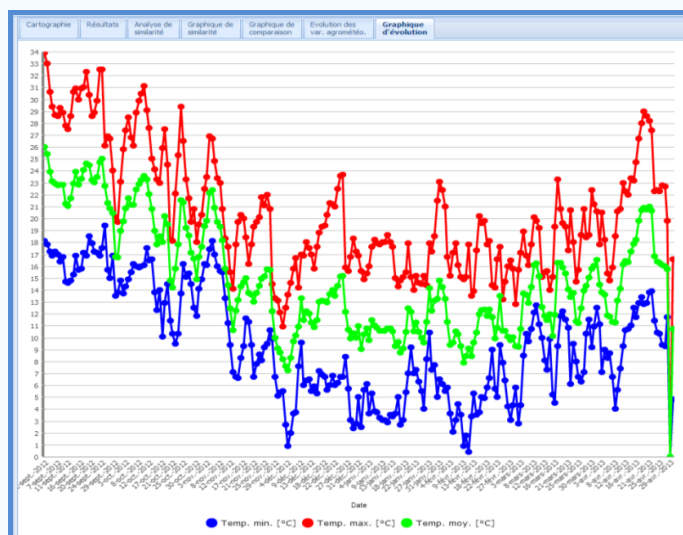


Figure 5: Daily temperatures from September 1st 2012 to April 30th 2013, at the national level over the agricultural areas.

VEGETATION ANALYSIS

The vegetation, as monitored by remote sensing (NDVI), was good, from February to April, in the main cereal (soft wheat, durum wheat and barley) growing areas

(Figure 6). In the North of the country, in Tangier, Tetouan, Larache, Kénitra and Sidi Kacem provinces the vegetation was close to average. However, in Safi, El Kalâa des Sraghna, Chichaoua and Marrakech provinces, vegetation was below average.

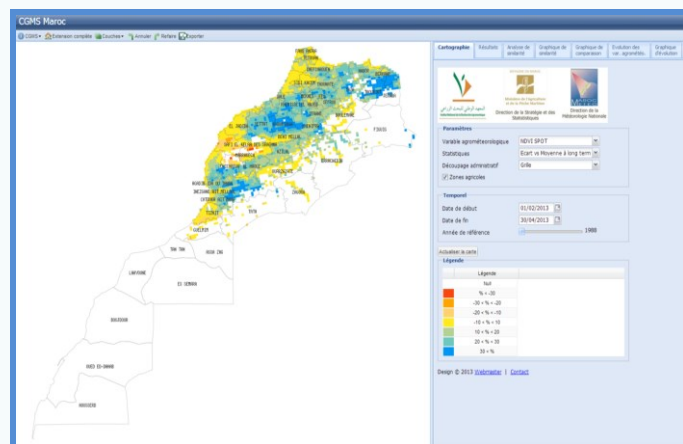


Figure 6: Normalized Difference vegetation Index (NDVI) during the 2012-2013 cropping season, from February 1st 2013 to the second dekad of April 30th 2013, as compared (%) to long term average (only agricultural areas are displayed).

The vegetation (NDVI from SPOT VEGETATION) during the 2012-2013 cropping season, over the period from early February to April 2013, is higher than those of the very good cropping seasons: 2008-2009, 2009-2010 and 2010-2011 (Figure 7).

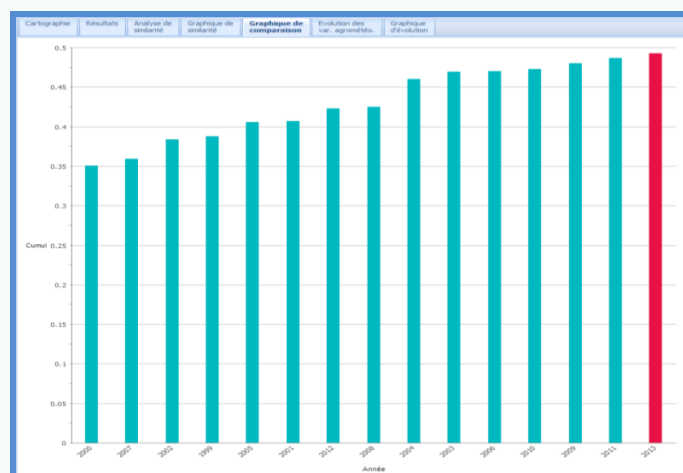


Figure 7: Ranking of the historical cropping seasons since 1999, in terms of average NDVI (SPOT-VEGETATION) over the period from early February to the second dekad of April 2013, at national level and over the agricultural areas.

The similarity analysis of the distribution of the dekadal NDVI from early February to April 2013 shows that the current season is close to the 2010-2011 cropping

season (**Figure 8**) but is characterized by a longer season.

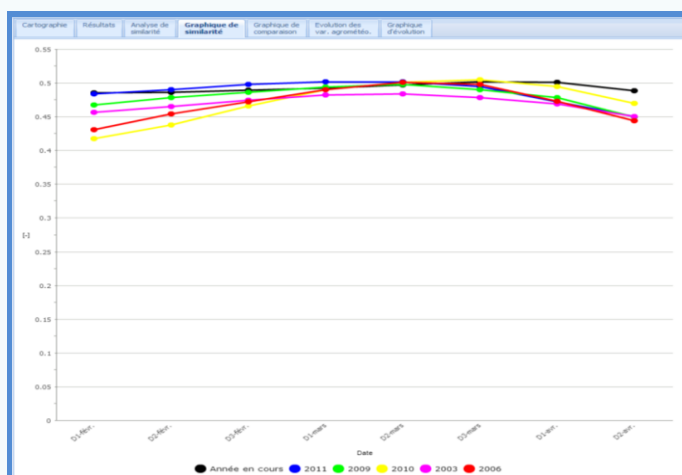


Figure 8: Similarity analysis of the 2012-2013 cropping season, in terms of the distribution of dekadal NDVI (SPOT-VEGETATION), from early February to the second dekade of April 2013, at the national level over the agricultural areas.

METHODOLOGY

The agrometeorological crop monitoring of the 2012-2013 cropping season has been achieved thanks to the CGMS-MOROCCO Web application (www.cgms-maroc.ma). This application was developed by the consortium between [INRA](#), [DMN](#) and [DSS](#) through a technology collaboration with international research and technology institutions, namely the Flemish Institute for Technology and Research ([VITO](#)), the Joint Research Centre of the EU ([JRC](#)), the Research Institute of the University of Wageningen ([Alterra](#)) and the University of Milan ([UNIMI](#)). CGMS-MOROCCO is the first and only operating crop monitoring and forecasting system existing in Morocco, institutionalized by a strategic partnership that allows its development and sustainability. CGMS-MOROCCO monitors the development of the three cereals (soft wheat, durum wheat and barley) based on weather, soil characteristics, crop parameters and Normalized Difference Vegetation Index (NDVI).

The areas of the three cereals were estimated by [DSS](#) based on field surveys

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