

Institute for the Protection and Security of the Citizen (IPSC)
Agriculture & Fisheries Unit
MARS – FOOD sector

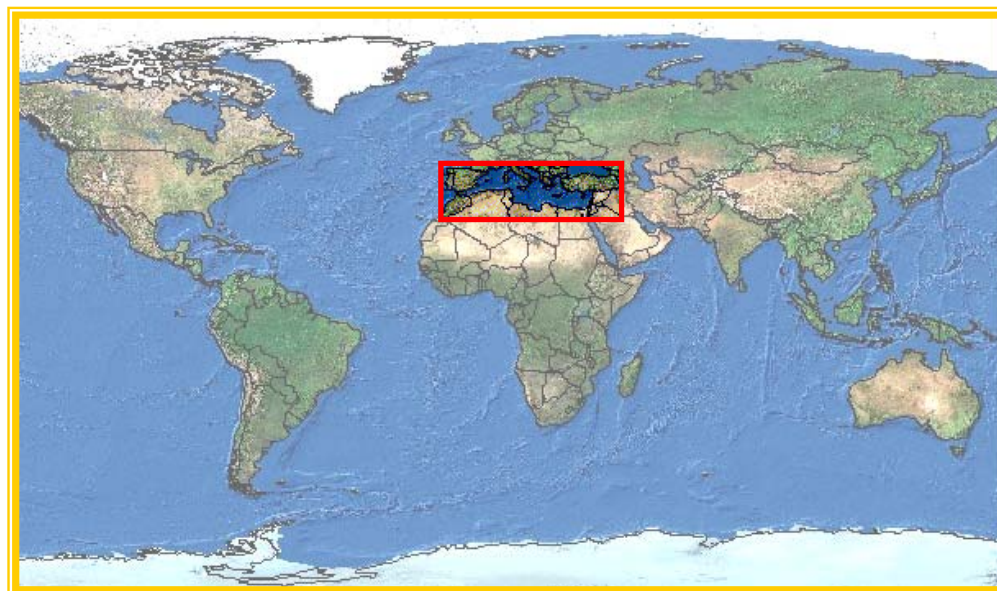
Bulletin № 3, 2004

CROP MONITORING for FOOD SECURITY

South and East Mediterranean Countries

Situation at the End of July 2004

Agro-meteorological overview for summer crops



Introduction

The present Bulletin is dedicated to the analysis of the agro-meteorological situation in the non-European countries of the Mediterranean basin during the period from the beginning of April to the end of July 2004. This is a period for summer crops development. Summer crops are irrigated practically everywhere. Fruit and citrus trees, vegetables, and potatoes are grown in irrigated conditions in all countries of the region. Dominant irrigated summer crops in Egypt are maize, rice and cotton. Potatoes are the dominant irrigated summer crop in Algeria, Tunisia, and Libya. In Morocco and Lebanon potatoes and sugar beet are dominant, as well as cotton and maize in Syria, barley and potatoes in Jordan, and sorghum in Saudi Arabia (see the Table).

The Bulletin is devoted to the analysis of the agro-meteorological conditions for the main summer irrigated field crops.

The monitoring of the agro-meteorological situation is based on the analysis of the following dekadal data: minimal, maximal and average air temperature, sums of precipitation and global radiation, dekadal values of the climatic water balance, dekadal maps of the Normalized Difference Vegetation Indexes (NDVI), dekadal maps of the Dry Matter Production. Meteorological data are derived from the outputs of the numerical meteorological model from ECMWF (UK), and were prepared for analysis by METEOCONSULT (NL). SPOT-VEGETATION data were used as a basis for calculation of the remote sensing indicators of crop growth. Data were preprocessed by VITO (BE). After that, dekadal maximal NDVI values were weighted for pixels, within which summer crops are cultivated, and then – were weighted again at country level. Thus, weighted NDVI values were used as an indicator of crop status. Dry Matter Production maps were calculated by VITO based on SPOT-VEGETATION data and information about global radiation, applying the Monteith approach.

The Bulletin has the following structure. The first pages contain the main results of the analysis. The following pages are dedicated to the analysis of separate indicators of the crop growth during the period of analysis.

Acknowledgements. The following organizations were involved in data supply: VITO (BE), METEOCONSULT (NL), ECMWF (UK).

Disclaimer. The geographical borders are purely a graphical representation and are only intended to be indicative. These boundaries do not necessarily reflect the official EC position.

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Contact: Jacques Delincé, Head of the Agriculture & Fisheries Unit, fax: +39-0332-789029
e-mail: thierry.negre@jrc.it, igor.savin@jrc.it












country	crop														
	maize	rice	barley	potatoes	sugar beet	sugar cane	pulses	vegetables	groundnut	sunflower	tobacco	cotton	rapeseed	sorghum	trees
Morocco	1	1	0	5	5	1	9	14	1	0	1	2	0	0	19
Algeria	0	0	0	10	0	0	0	24	0	0	1	0	1	0	23
Tunisia	0	0	0	3	1	0	6	23	0	0	1	0	0	0	35
Libya	0	0	0	8	0	0	3	13	0	0	0	0	0	0	30
Egypt	24	19	0	3	1	4	5	6	2	0	0	10	0	0	15
Syria	6	0	1	1	1	0	1	7	1	1	1	20	0	0	19
Lebanon	0	0	0	11	5	0	0	14	3	0	2	0	0	0	54
Israel	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Jordan	0	0	5	6	0	0	0	15	0	0	0	0	0	0	64
Palestine Auth.	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Saudi Arabia	0	0	0	1	0	0	0	6	0	0	0	0	0	10	7

Crop area as percentage of the total area equipped for irrigation for summer months,
 nd – no data
 (source FAO AQUASTAT (http://www.fao.org/ag/agl/aglw/aquastat/water_use/index.stm))

Highlights

In general, the main summer crops in the countries of the region are at the end of July in similar conditions as compared with the same date of the previous year. The summer crops status is likely to be better than in last year in Egypt, and slightly worse in Jordan and the Palestine Auth.

Country by Country

	Morocco	Status of maize and potatoes at the end of July is slightly better comparing with the previous year; status of rice is close to the previous year.
	Algeria	Status of maize and potatoes at the end of July is better comparing with the previous year; status of rice is close to the previous year.
	Tunisia	Status of potatoes at the end of July is better comparing with the previous year.
	Libya	Status of maize and potatoes at the end of July is close to the previous year.
	Egypt	Status of maize, potatoes and especially of rice at the end of July is better than in previous year.
	Syria	Status of maize and potatoes at the end of July is better comparing with the previous year.
	Lebanon	Status of potatoes at the end of July is close to the previous year, status of maize is slightly worse.
	Israel	Status of maize and potatoes at the end of July is close to the previous year.
	Jordan	Status of maize and potatoes at the end of July is slightly worse comparing with the previous year.
	Palestine Auth.	Status of maize and especially of potatoes at the end of July is slightly worse comparing with the previous year.
	Saudi Arabia	Status of maize at the end of July is slightly worse comparing with the previous year, and status of potatoes is close to the previous year.

The situation is detailed in the following pages.

Results of the analysis

Overall, the meteorological indicators, especially precipitation, are less important for summer crop growth monitoring than for winter crops due to regulation of water regime throughout irrigation. The results of the analysis are based primarily on the monitoring of radiation sum, air temperature, remote sensing indicators, and dry matter production modeling.

The radiation sum during the period April-July was close to the value of the previous year and to the normal practically in all countries of the region. Everywhere the amount of radiation was close to the optimum for summer crops development.

Very high air temperatures in June and July possible affect summer crop growth (especially broad-leaf crops) only in eastern Syria.

In general the situation of summer crops is not extreme. NDVI curves show that the rice status at the end of July 2004 was better than last year in Egypt and similar in Morocco and Algeria. The status of maize at the end of July was close to the previous year in Libya, slightly better in Morocco, Algeria, Egypt, and Syria, and slightly worse in other countries of the region. NDVI curves show better potatoes status comparing with the previous year in Maghreb countries, Egypt, and Syria, and slightly worse in Palestine Auth.. The situation with summer crops in Egypt is the best of the last 4 years.

The dry matter modeling results show that the amount of dry matter, which potentially can be produced in the current summer vegetative season was higher by 10-20% comparing with the previous year in Tunisia, and Algeria, and slightly lower in Libya, Jordan, and Palestine Auth. The situation in the other countries of the region was close to the previous year.

Based on analysis of all crop growth indicators it seems possible to conclude that in general the main summer crops are at the end of July in similar conditions as compared with the same date of the previous year. The summer crops status in Egypt is likely to be better than in the previous year, and slightly worse in Jordan and Palestine Auth.

A summary of the analysis of the main summer crop status by country is given in the Table.

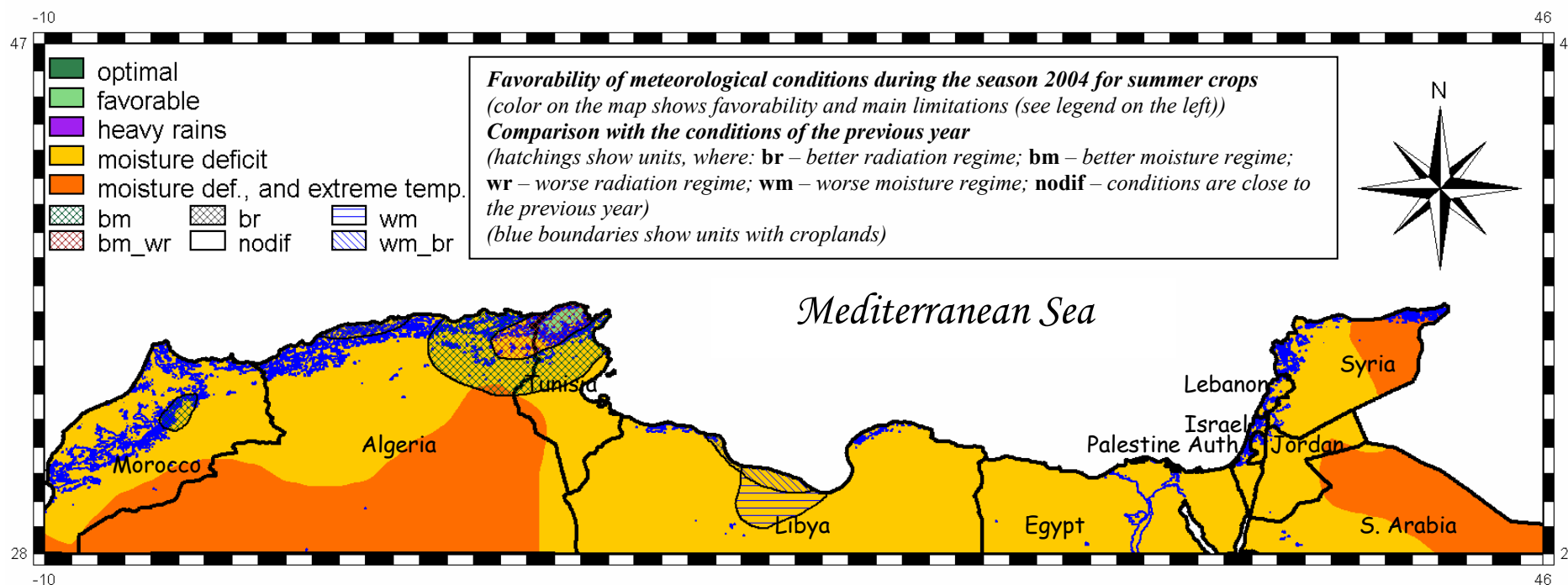
<i>Status of summer crops at the end of July</i>	<i>comparing with previous season</i>		
	rice	maize	potatoes
Morocco	=	= +	= +
Algeria	=	+	+ =
Tunisia	no crop	no crop	+
Libya	no crop	=	=
Egypt	+ +	+	+
Syria	no crop	+	+
Lebanon	no crop	= -	=
Israel	no crop	=	=
Jordan	no crop	= -	= -
Palestine Auth.	no crop	= -	-
Saudi Arabia	no crop	-	=

Meteorological Indicators

The meteorological conditions were favorable for summer crops only in northern Tunisia. The amount of radiation was close to optimal for summer crops development everywhere. Precipitation was not enough for crop cultivation without irrigation practically in all countries of the region. Additionally extremely high air temperatures were observed in eastern Syria. However meteorological conditions are close to normal for most countries of the region. Overall, meteorological conditions were better than during the previous season in Tunisia, and eastern Algeria, and were close to the previous season in other countries of the region.

Taking into consideration that summer crops in the region are irrigated it seems possible to conclude, that from all meteorological parameters only extreme air temperatures in eastern Syria are likely to have affected summer crop growth during the vegetative season. The summer crop status will mainly be determined by pests, diseases, and the regularity of water supply by the irrigation systems.

<i>Meteorological conditions for summer crops</i>	<i>Comparing with previous season (April-July)</i>
Morocco	=
Algeria	+
Tunisia	+
Libya	=
Egypt	=
Syria	=
Lebanon	=
Israel	=
Jordan	=
Palestine Auth.	=
Saudi Arabia	=

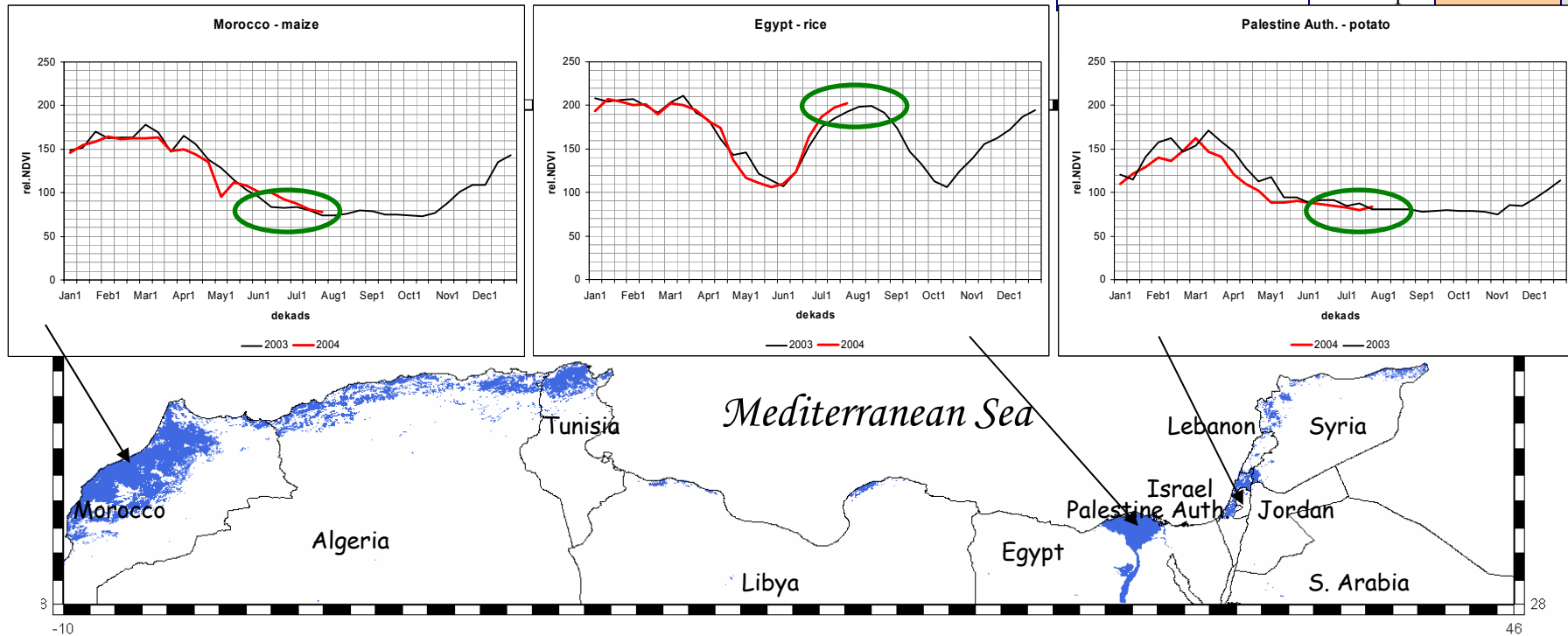


Remote Sensing Indicators

The NDVI curves show that the rice status at the end of July 2004 was better in the current season than in the previous in Egypt and close to the previous season in Morocco and Algeria. The status of maize at the end of July was close to the previous year in Libya, slightly better in Morocco, Algeria, Egypt, and Syria, and slightly worse in the other countries of the region. The NDVI curves show a better potatoes status comparing with the previous year in Maghreb countries, Egypt, and Syria. The status of potatoes in other countries of the region is close to the previous year, and slightly worse in the Palestine Auth. Thus in general the summer crops situation is likely to be not extreme comparing with the previous year. The situation with summer crops in Egypt is without doubt the best of the last 5 years.

Examples of NDVI behavior for Morocco, Egypt, and Palestine Auth. Values are aggregated at country level, only for summer crop areas (green circles indicate the part of the curves corresponding to the current crop development stage)

NDVI as an indicator of summer crops status	Comparing with previous year		
	rice	maize	potatoes
Morocco	=	+	+
Algeria	=	+	+
Tunisia	no crop	no crop	+
Libya	no crop	=	=
Egypt	+	+	+
Syria	no crop	+	+
Lebanon	no crop	-	=
Israel	no crop	-	=
Jordan	no crop	-	=
Palestine Auth.	no crop	-	-
Saudi Arabia	no crop	-	=



Dry Matter Production modeling

It is necessary to stress out that this indicator refers to all types of vegetation within the elementary unit of the analysis (pixel of the SPOT-Vegetation image (1*1 km), and thus does not concern a specific crop.

Dry matter production modeling shows that in general the dry matter accumulation in May was lower comparing with the previous season in all countries of the region. The situation was more positive during June and July. The amount of dry matter, which potentially can be produced in the current summer vegetative season, was higher at the end of July by 10-20% comparing with the previous year in Tunisia, and Algeria, and slightly lower in Libya, Jordan, and Palestine Auth.. The situation in other countries of the region was close to the previous year. The spatial and temporal variability of dry matter production was high in Morocco and Syria. The latter should lead to the high variability of the yield of summer crops in the mentioned above countries.

Region: Mediterranean basin

Period: July, 2004, Decade 3/3

Theme: Daily production of Dry Matter (DM)

Relative difference w.r.t. previous year: $100\% \times (\text{Act.} - \text{Prev.}) / \text{Prev.}$

Source: SPOT-VEGETATION

Dry matter production during April-July 2004	Comparing with previous year
Morocco	=
Algeria	+
Tunisia	+
Libya	-
Egypt	=
Syria	=
Lebanon	=
Israel	=
Jordan	-
Palestine Auth.	-
Saudi Arabia	=

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DM-Diff. %

