

JRC MARS Bulletin - Global outlook

Crop monitoring European neighbourhood

Morocco, Algeria, Tunisia, Libya and Egypt

February 2023

Negative outlook in the Maghreb due to drought

In large parts of the Maghreb, cereal yield potentials have been negatively impacted by drought. An overall delay in crop development and below-average crop biomass accumulation were recorded in most of the main cereal-growing regions of Morocco, a wide belt across Algeria, and the northern-eastern and central regions of Tunisia. Rain is urgently needed to avoid further losses. In Libya, at country level, the positive yield expectations in Cyrenaica are expected to compensate for the moderately below-average expectations in Tripolitania. Favourable growing conditions have prevailed in the main cereal-producing regions of Egypt. Our yield forecasts for wheat in the Maghreb area are -15% to -24% compared with the 5-year average, while they range from -10% to -30% for barley.

Morocco (MA): Drought conditions caused delays to planting, a reduction in sown area, and below-average biomass accumulation in most agricultural areas. Cereals are in advanced vegetative stages.

Algeria (DZ): Almost all major production areas are performing below average. Sowings were delayed by 2-3 weeks in the eastern regions and by almost 10 days in the central and western regions. Cereals are in the vegetative stage.

Tunisia (TN): Biomass accumulation is below to well below average in many important cereal-producing regions, with significant possibility of crop failure in the

regions of *Siliana* and *Zaghuan*. Cereals are in the late vegetative stages.

Libya (LY): Crops are in fair condition overall. The flowering period is about to begin in western coastal regions, while cereals are at the beginning of flowering in eastern coastal regions.

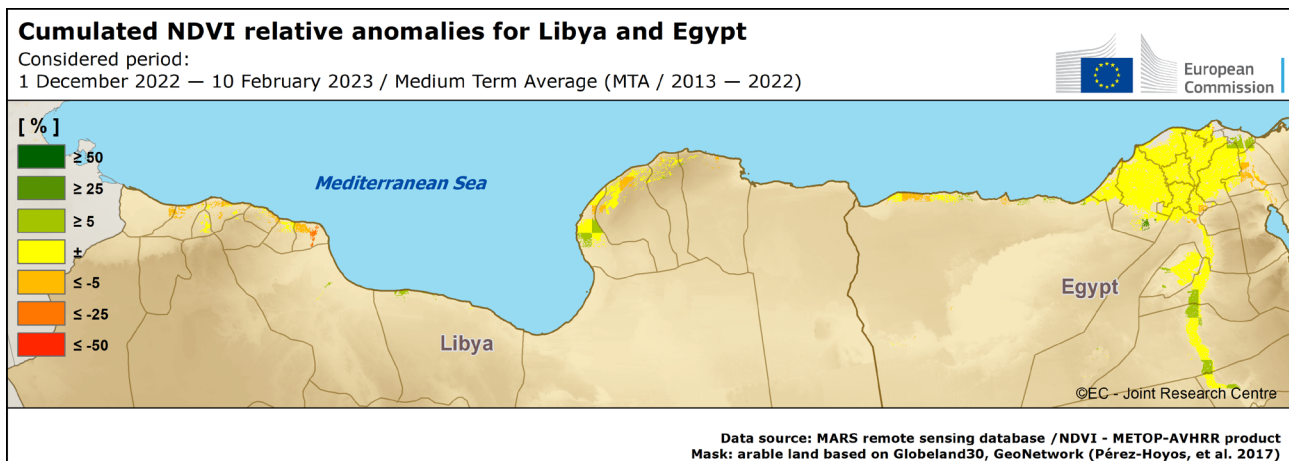
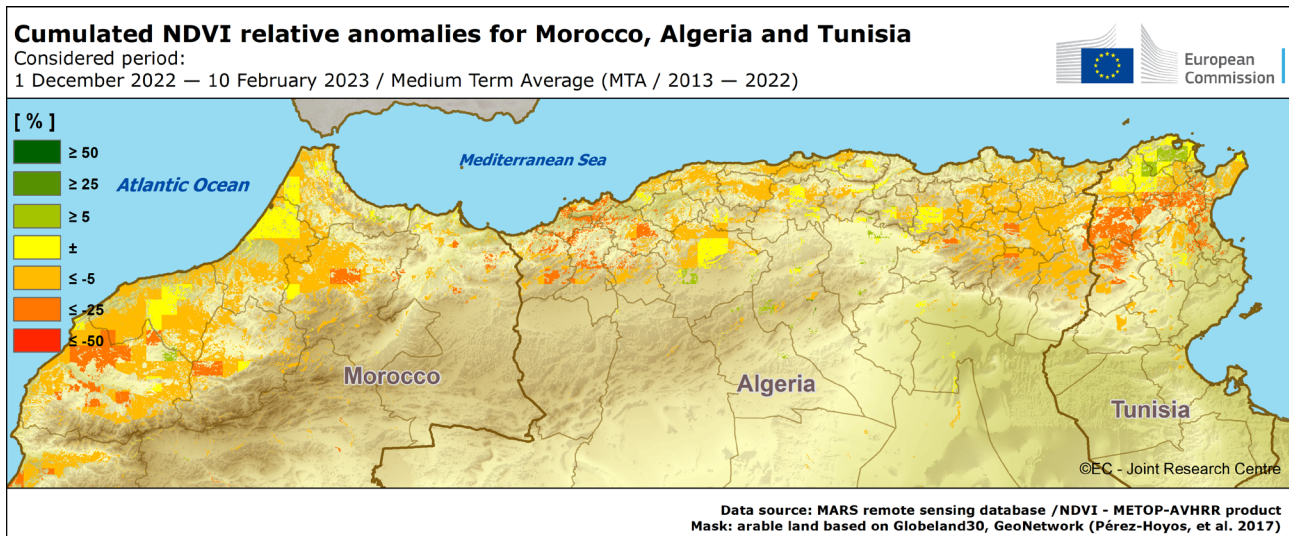
Egypt (EG): At the flowering period, biomass accumulation is above average in all the main cereal-producing regions, thanks to favourable weather conditions and predominantly irrigated arable land.

North-Africa yield forecasts - February 2023 Bulletin

Country	Crop	Yield (t/ha)				
		Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22
DZ	wheat	1,70	N/A	1,30	- 24	N/A
	barley	1,22	N/A	1,10	- 10	N/A
EG	wheat	6,53	N/A	6,80	+ 4	N/A
	barley	3,79	N/A	3,91	+ 3	N/A
LY	wheat	0,77	N/A	0,76	- 1	N/A
	barley	0,51	N/A	0,51	- 1	N/A
MA	wheat	1,94	N/A	1,49	- 23	N/A
	barley	1,33	N/A	0,93	- 30	N/A
TN	wheat	1,91	N/A	1,62	- 15	N/A
	barley	0,96	N/A	0,72	- 25	N/A

NB: Yields are forecast for crops with more than 10000 ha/country. **Sources:** 2018-2022 data come from FAO, INRA Maroc, ONICL Maroc, Ministère de l'agriculture des ressources hydrauliques et de la pêche Tunisie, MED-Amin baseline DB, DSASI-MADR Algeria and the Egyptian Arab Republic - Ministry of Agriculture and Land Reclamation. The column header '%23/5yrs' stands for the 2023 change with respect to the 5-year average (%). Similarly, '%23/22' stands for the 2023 change with respect to 2022 (%). N/A = Data not available.

Country highlights



The maps display – for arable land – the relative differences between the Normalized Difference Vegetation Index (NDVI) computed from remote sensing imagery between 1 December 2022 and 10 February 2023, and the medium-term average (MTA, 2013–2022) for the same period. Positive anomalies (in green) reflect above-average canopy density or early crop development while negative anomalies (in red) reflect below-average canopy density or late crop development.

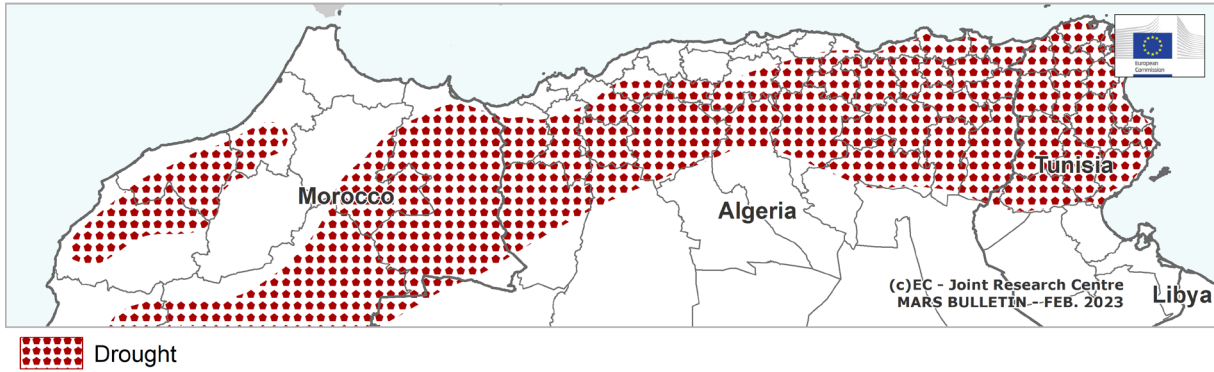
The review period (1 December to 10 February) was marked by drought conditions in large parts of the Maghreb. In **Morocco**, the most distinct negative anomalies in the NDVI indicator are observed in the regions of *Marrakech*, *Daraa* and *Fès*. Adverse growing conditions had already started in autumn. Rainfall is needed in the coming weeks to sustain crops during the flowering period and avoid a very negative season. In **Algeria**, a belt of negative NDVI anomalies can be detected across the inland regions from west to east. Persistent drought conditions hampered the start to the season and slowed crop biomass accumulation during the early vegetative stages. **Tunisia** was the country most impacted by drought during the review period. A negative

hotspot for biomass production can clearly be observed in the central regions. Exceptions are some northern regions (*Beja*, *Jendouba* and *Bizerte*), which benefit from irrigation.

There is a mix of average NDVI values and negative anomalies in north-western **Libya** (*Tripolitania*). In this region, crops experienced above-average temperatures in December and January and below-average precipitation. Favourable growing conditions prevailed along the north-eastern coast (*Cyrenaica*), thanks to above-average rainfall in January. In **Egypt**, favourable conditions for crop growth prevailed, reflected in the yellow-coloured inner areas of the Nile Delta and along the Nile Valley.

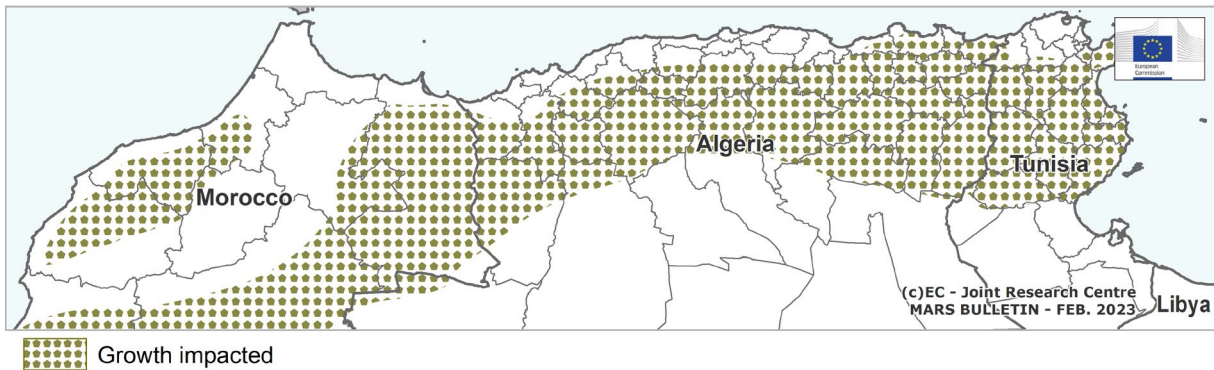
AREAS OF CONCERN - EXTREME WEATHER EVENTS

Based on observed data from 01 December 2022 until 10 February 2023



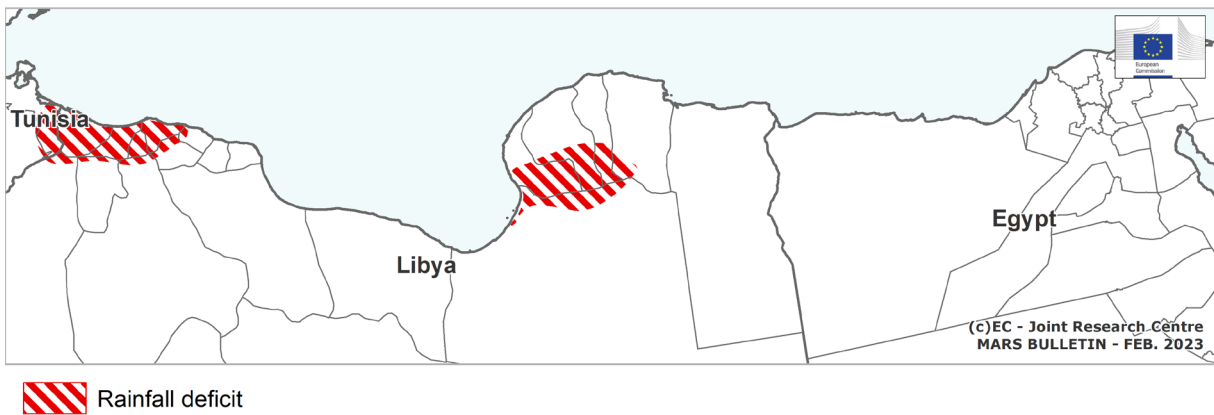
AREAS OF CONCERN - CROP IMPACT

Based on observed data from 01 December 2022 until 10 February 2023



AREAS OF CONCERN - EXTREME WEATHER EVENTS

Based on observed data from 01 December 2022 until 10 February 2023



AREAS OF CONCERN - CROP IMPACT

Based on observed data from 01 December 2022 until 10 February 2023



Morocco (MA)

Negative yield outlook due to drought conditions

Delay in planting due to drought conditions, and below-average biomass accumulation, leave little room for good yield expectations for cereals in Morocco. The season will be further compromised if rains do not arrive in the coming weeks.

Cumulative rainfall in the period prior to sowing of winter crops (1 September to 30 November) was 50% to 80% below the long-term average (LTA) in most agricultural areas – an anomaly of -30 mm to -75 mm. This is similar to the negative 2021/2022 season. As a result, the sowing campaign was delayed by 20-30 days compared with an average season, and recent official estimates¹ for area sown with winter crops are the lowest for the past 10 years when compared with our statistical archives.

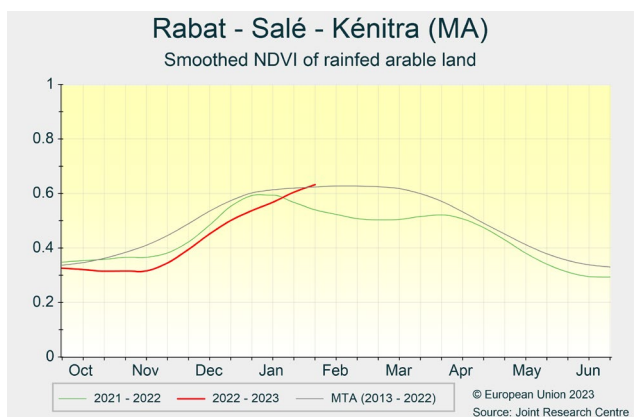
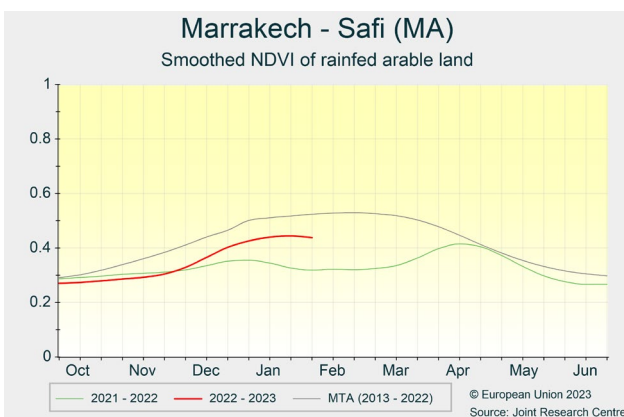
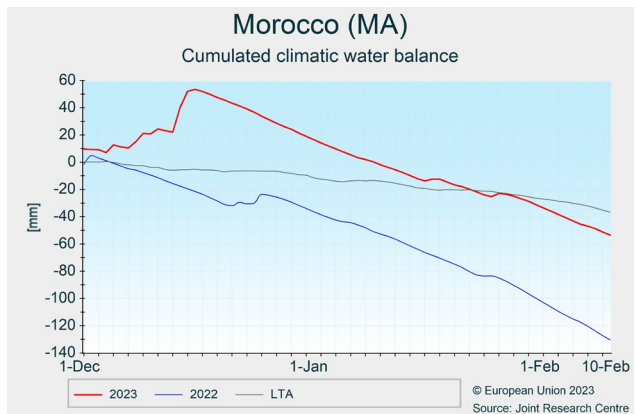
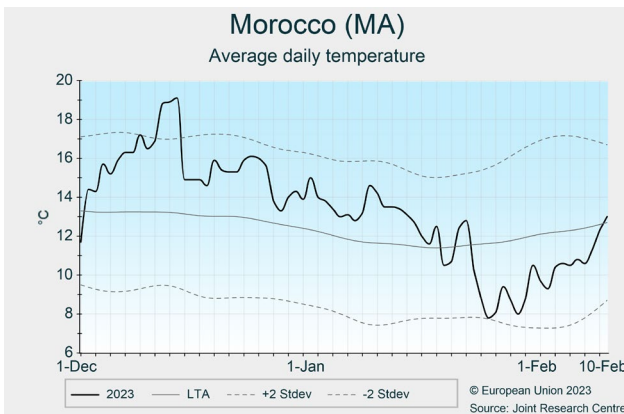
The first half of December saw frequent rain events and above-average rainfall in all cultivated areas, especially to the north (e.g. *Tanger*). Consequently, soil moisture

conditions improved and winter cereals partly recovered. Satellite observations indicate that crops recovered particularly quickly and were close to average levels in the regions of *Casablanca*, *Rabat* and *Tanger*. However, there was inadequate recovery in *Oriental*, *Fès*, *Marrakech* and *Beni Mellal*, where the autumn drought had been more severe.

Since January, a rain deficit has been recorded in most of the country.

Concerning phenological development, cereals in Morocco are now in advanced vegetative stages and the flowering period is about to begin.

Overall, yield prospects at country level are below average, albeit above last year's levels. Substantial rainfall is needed in the coming weeks to sustain the crops during the flowering and grain-filling periods and to avoid a very negative season.



¹ <https://maroc-diplomatique.net/campagne-2023-sadiki-rassure-sur-le-choix-des-politiques-agricoles/>

Algeria (DZ)

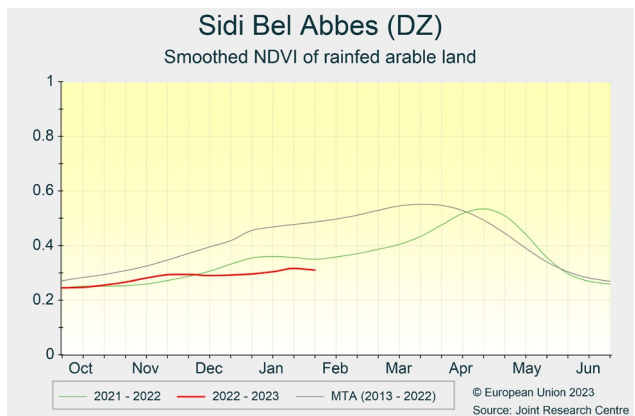
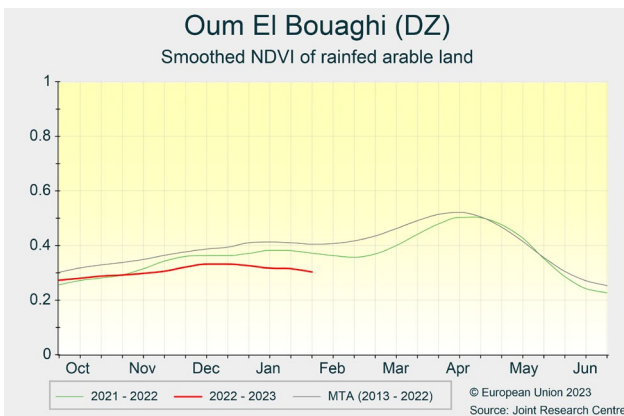
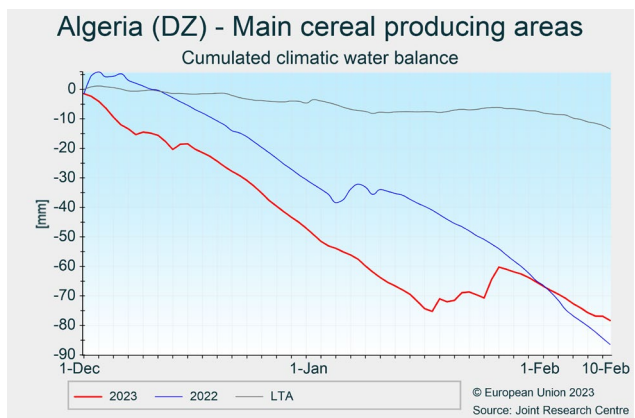
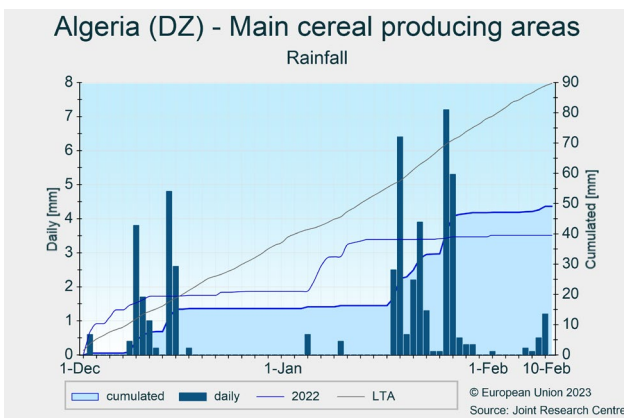
Drought causes difficult start to the cropping season

Persistent dry conditions hampered the start of the cropping season and slowed crop biomass accumulation during early vegetative stages. Rain is needed to sustain crops and avoid further losses in production potential. Our yield outlook is distinctly below the 5-year average.

The cereal campaign in Algeria is facing many difficulties due to extended drought conditions. In the period September–November, the country experienced severe rainfall deficits, especially in the north-western regions of the country (e.g. *Tlemcen*, *Sidi Bel Abbes* and *Mascara*). Sowings were delayed by 2-3 weeks in the eastern regions (e.g. *Mila*) and by almost 10 days in the central and western regions. Crop emergence (end of November) and establishment (December) were also distinctly delayed. During the review period (1 December to 10 February), the drought worsened and expanded to the central and particularly to the eastern regions of the country. To date, in many important agricultural regions (such as *Tiaret*,

M'sila, *Setif*, *Batna*, *Mila*, *Constantine* and *Tebessa*), rainfall cumulates have set the lowest records in our archives (since 1979). Temperature sums were 10% to 15% above the LTA in most agricultural areas and the average daily temperature was 1 °C to 2 °C above the LTA. Analyses of satellite imagery and crop model results suggest particularly low levels of biomass accumulation (with low potential for crops to recover) in the north-western regions of the country (except *Tiaret*). Conditions in north-eastern regions appear to be less severe and there is some potential for crops to recover. Cereals in the main agricultural regions of Algeria are in the mid-vegetative phases, still far from entering the flowering phase.

Crop growth in Algeria is being closely monitored: rain is urgently needed to sustain crops and avoid further losses in crop production. Our yield forecast for all winter cereals in Algeria is set below the 5-year-average.



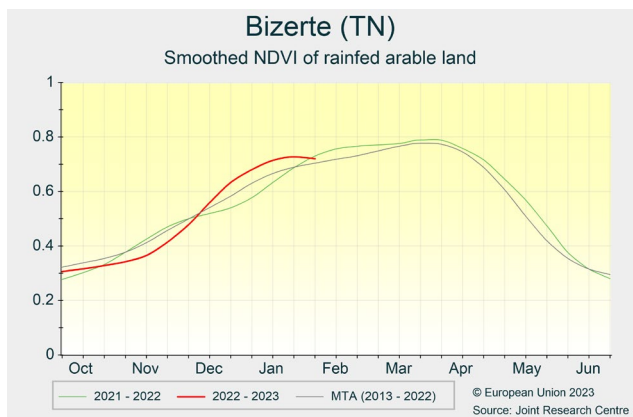
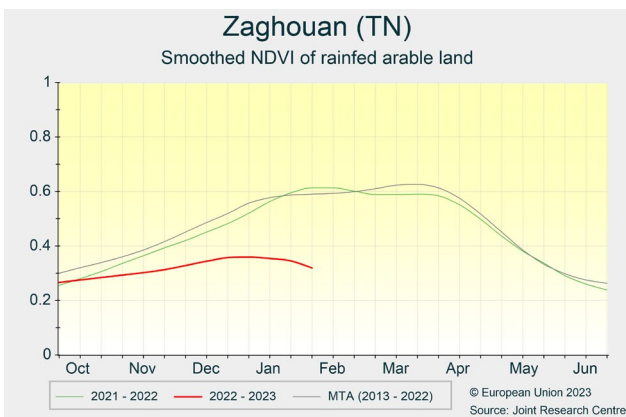
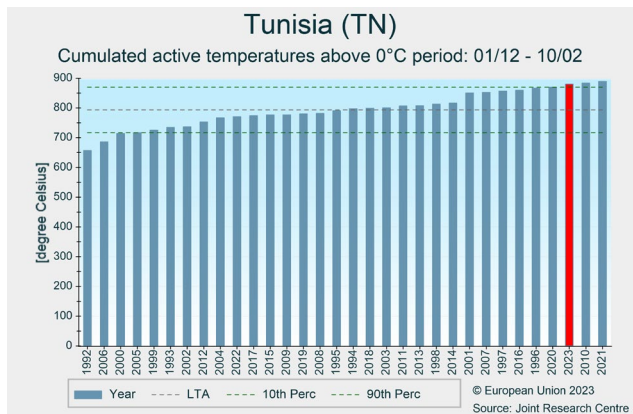
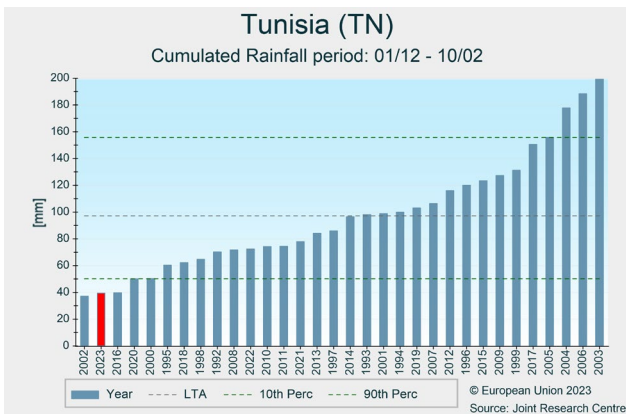
Tunisia (TN)

Rain is urgently needed to avoid further losses

The precipitation deficit led to drought conditions during most of the review period. Continued water shortages could further compromise the cereal season. Rain is urgently needed in the coming days.

The warm and dry conditions that marked the beginning of the cereal season in the Maghreb area were particularly pronounced in Tunisia. Warmer-than-usual conditions were recorded throughout the period 1 December to 20 January, with daily mean temperatures steadily exceeding the LTA by 2-4 °C. During the review period (1 December to 10 February), Tunisia experienced severe drought conditions, with almost no rain events from the beginning of December to the first dekad of January. Sporadic rain events occurred in the second half of January, while frequent (but low-intensity) rains occurred during the first dekad of February. As a result, rainfall cumulates in the main agricultural regions ranged between 10 mm and 40 mm, against LTA references of 50 mm to 150 mm. In the important wheat and barley

producing regions of *Le Kef, Siliana, Zaghouan, Manouba, Kasserine* and *Kairouan*, this period ranks as the driest in our archive (since 1979). The progressive soil moisture deficit constrained the growth of cereals in most of the agricultural areas. Crop biomass accumulation, depicted by the NDVI remote sensing indicator, suggests below-average to well below-average biomass accumulation in the regions of *Kef, Manouba, Nabeul, Kairouan* and *Kasserine*, and significant possibility of crop failure in the regions of *Siliana* and *Zaghouan*. Exceptions to this negative picture are the regions of *Beja, Jendouba* and *Bizerte*, where – thanks to widespread irrigation – crops have (so far) been less exposed to drought and have accumulated average to above-average biomass. However, water reserves are emptying, which may soon lead to water use restrictions ². At country level, expectations for final production are negative and our yield forecasts are well below the last 5-year average. Cereals are still in the vegetative phase of development. Rain is urgently needed to avoid further damage.



² <https://www.reuters.com/world/africa/dangerous-tunisian-droughts-threaten-food-security-2023-01-11/>

Libya (LY)

Average to above-average yield outlook

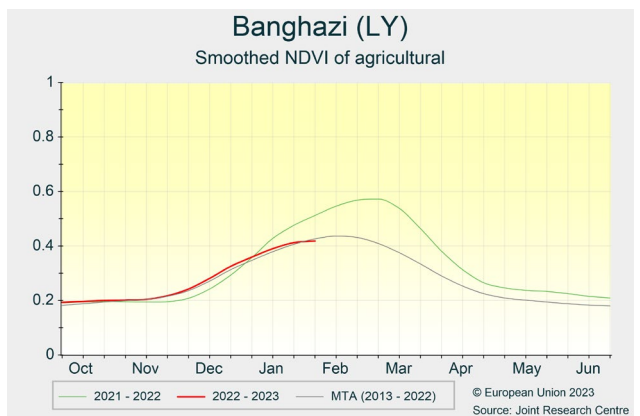
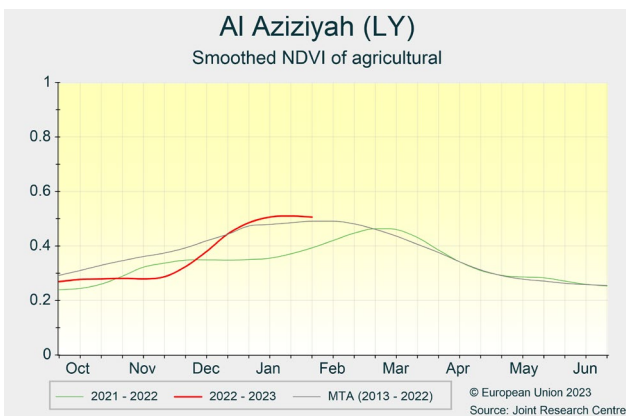
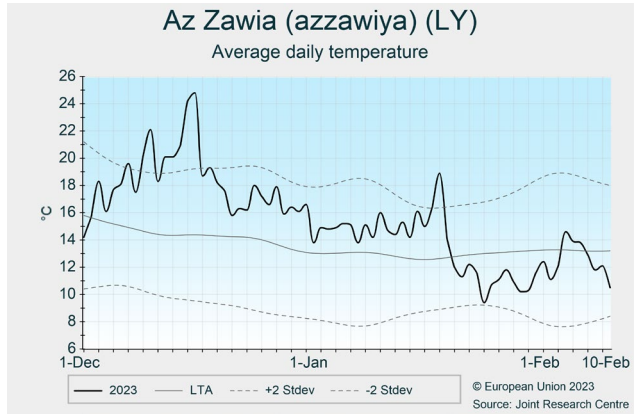
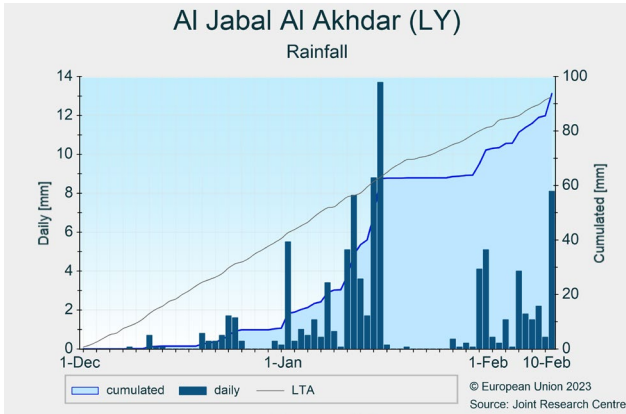
So far, the growing season has been characterised by above-average temperatures. Rainfall was below average in December, but beneficial rains have improved growing conditions since mid-January. Average to above-average yields are expected.

In the agricultural regions of *Tripolitania* (north-western coastline), the review period was marked by above-average temperatures in December and January, with an exceptional peak in mid-December when average daily temperatures exceeded the LTA by nearly 10 °C (26 °C compared with 16 °C, e.g. *Az Zawia*). By contrast, temperatures in February have been somewhat below average. Cumulative precipitation was 40% to 60% below the LTA, except for the agricultural districts of *Zeleitin* and *Misurata* where rainfall was around average. After dry weather conditions in autumn had delayed sowings by 10 to 20 days and provoked a slowdown in biomass accumulation, winter cereals recovered quickly in

December and progressed well in the late vegetative stages (e.g. *Al Aziziyah*). The flowering period is about to begin in western coastal regions.

In the agricultural regions of *Cyrenaica* (north-eastern coastline), average daily temperatures followed a similar pattern to Tripolitania. After a dry start to the season in December, frequent and evenly distributed rainfall events in the first and second dekads of January benefited crops and replenished soil moisture reserves. Satellite information indicates above-average crop growth in the regions of *Damah* and *Al Jabal Al Akhdar* and average growth in the regions of *Banghazi* and *Al Fatah*. Cereals in eastern coastal regions are currently at the beginning of the flowering stage.

Overall, at country level, yield expectations are in line with an average season. Our yield forecasts are close to the historical trend.



Egypt (EG)

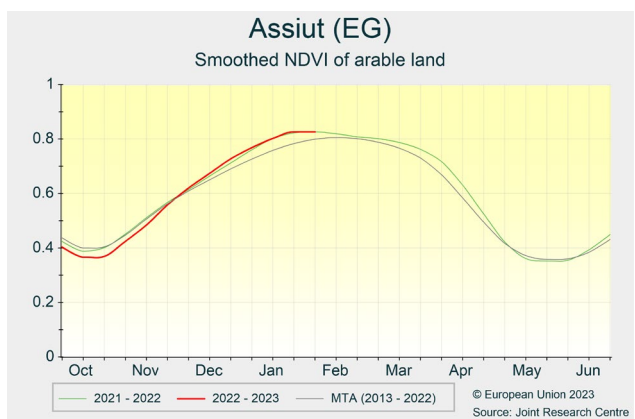
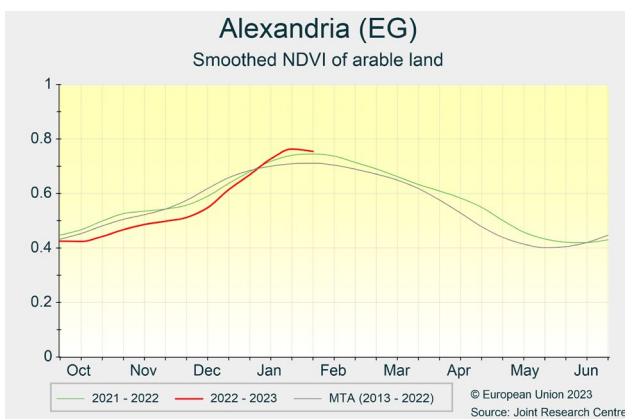
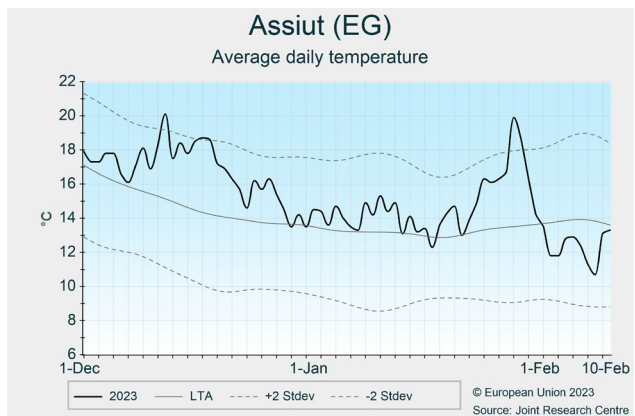
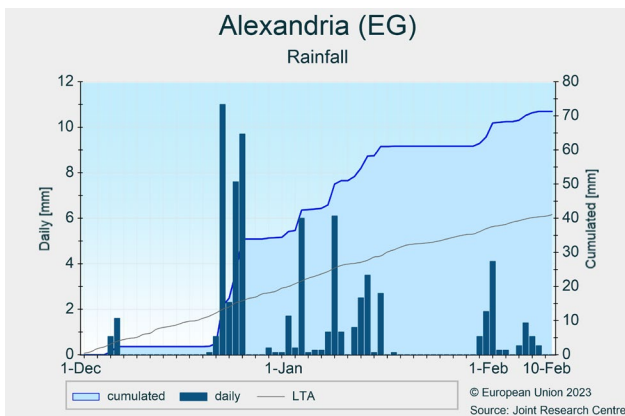
Above-average expectations for the cereal season

Favourable growing conditions, in terms of water supply and temperatures, have prevailed across the major cereal-producing regions of Egypt. Winter crops have entered the flowering stage. Yield forecasts are above the 5-year average.

In Egypt, thermal conditions have been moderately warmer than usual: average daily temperatures were 1-2 °C above the LTA, and temperature sums ($T_{base} = 0\text{ °C}$) were 5-10% above the LTA. The northernmost regions and the outskirts of the Nile Delta (e.g. *Alexandria*), where cereal cultivation is typically rainfed, benefited from above-average rainfall. However, most of the cereal production in the country is not influenced by variations in rainfall, as it comes from the irrigated fields of the Nile Valley and Nile Delta regions.

Analysis of satellite imagery suggests a delay in sowing of almost 10 days for most of the country, compared to an average season; this is most likely due to the anomalous heatwave that occurred in the last dekad of September. The resulting delay in crop growth is observed until the end of December, after which biomass accumulation reached above-average levels. In the southernmost regions (e.g. *Fayoum* and *Assuit*), sowing took place on time and crop biomass accumulation also reached above-average levels.

At the time of analysis, cereals are in the flowering phase. Overall, agro-meteorological conditions allowed a good start to the cropping season in Egypt and no stress conditions were observed for crops at the onset of flowering (in February). Our yield forecasts are above the 5-year average.



Crop yield forecast

North-Africa yield forecasts for wheat - February 2023 Bulletin

Country	Area (x 1000 ha)					Yield (t/ha)					Production (x 1000 t)				
	Avg 5yrs	2022	2023	%23/5yrs	%23/22	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22	Avg 5yrs	2022	2023	%23/5yrs	%23/22
DZ	1 805	1 389	1 389	-23	+0.0	1.70	N/A	1.30	-24	N/A	3 245	N/A	1 798	-45	N/A
EG	1 321	1 339	1 339	+1	+0.0	6.53	N/A	6.80	+4	N/A	8 605	N/A	9 102	+6	N/A
LY	190	169	169	-11	+0.0	0.77	N/A	0.76	-1	N/A	150	N/A	128	-14	N/A
MA	2 683	2 380	2 380	-11	+0.0	1.94	N/A	1.49	-23	N/A	5 363	N/A	3 557	-34	N/A
TN	604	610	610	+1	+0.0	1.91	N/A	1.62	-15	N/A	1 150	N/A	991	-14	N/A

North-Africa yield forecasts for barley - February 2023 Bulletin

Country	Area (x 1000 ha)					Yield (t/ha)					Production (x 1000 t)				
	Avg 5yrs	2022	2023	%23/5yrs	%23/22	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22	Avg 5yrs	2022	2023	%23/5yrs	%23/22
DZ	1 179	1 076	1 076	-9	+0.0	1.22	N/A	1.10	-10	N/A	1 473	N/A	1 187	-19	N/A
EG	25	22	22	-10	+0.0	3.79	N/A	3.91	+3	N/A	97	N/A	87	-10	N/A
LY	137	136	136	-0	+0.0	0.51	N/A	0.51	-1	N/A	70	N/A	69	-1	N/A
MA	1 344	1 120	1 120	-17	+0.0	1.33	N/A	0.93	-30	N/A	1 859	N/A	1 040	-44	N/A
TN	530	512	512	-3	+0.0	0.96	N/A	0.72	-25	N/A	512	N/A	366	-29	N/A

North-Africa yield forecasts for soft wheat - February 2023 Bulletin

Country	Area (x 1000 ha)					Yield (t/ha)					Production (x 1000 t)				
	Avg 5yrs	2022	2023	%23/5yrs	%23/22	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22	Avg 5yrs	2022	2023	%23/5yrs	%23/22
DZ	355	241	241	-32	+0.0	1.51	N/A	1.20	-20	N/A	578	N/A	289	-50	N/A
EG	1 139	1 148	1 148	+1	+0.0	6.50	N/A	6.77	+4	N/A	7 392	N/A	7 770	+5	N/A
LY	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MA	1 763	1 540	1 540	-13	+0.0	1.98	N/A	1.55	-22	N/A	3 600	N/A	2 381	-34	N/A
TN	71	65	65	-9	+0.0	1.71	N/A	1.43	-16	N/A	124	N/A	93	-25	N/A

North-Africa yield forecasts for durum wheat - February 2023 Bulletin

Country	Area (x 1000 ha)					Yield (t/ha)					Production (x 1000 t)				
	Avg 5yrs	2022	2023	%23/5yrs	%23/22	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22	Avg 5yrs	2022	2023	%23/5yrs	%23/22
DZ	1 450	1 148	1 148	-21	+0.0	1.75	N/A	1.32	-25	N/A	2 666	N/A	1 510	-43	N/A
EG	182	190	190	+4	+0.0	6.73	N/A	7.00	+4	N/A	1 212	N/A	1 332	+10	N/A
LY	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MA	919	840	840	-9	+0.0	1.88	N/A	1.40	-25	N/A	1 763	N/A	1 176	-33	N/A
TN	533	545	545	+2	+0.0	1.94	N/A	1.65	-15	N/A	1 025	N/A	898	-12	N/A

NB: Yields are forecast for crops with more than 10000 ha per country.

Sources: 2018-2022 data come from FAO, INRA Maroc, ONICL Maroc, Ministère de l'agriculture des ressources hydrauliques et de la pêche Tunisie, MED-Amin baseline DB, DSASI-MADR Algeria and the Egyptian Arab Republic - Ministry of Agriculture and Land Reclamation.

2023 yields come from MARS Crop Yield Forecasting System (output up to 10.02.2023).

The column header '%23/5yrs' stands for the 2023 change with respect to the 5-year average (%). Similarly, '%23/22' stands for the 2023 change with respect to 2022 (%).

N/A = Data not available.

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Technical note

The long-term average (LTA) used within this Bulletin as a reference is based on an archive of data covering 1991-2022. The medium-term average (MTA) used within this Bulletin as a reference is based on an archive of data covering 2013-2022.

Acknowledgement

We would like to thank MED-Amin partners for the provision of statistical data. MARS stands for Monitoring Agricultural Resources.

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