



MED-Amin Bulletin 2022 – 2

Winter crops early outlook at 30 April 2022

Winter crops in several Mediterranean growing regions are under scrutiny. An intense and long-lasting drought hampered winter crops' future harvest in Morocco, Portugal and parts of Italy and Algeria, and can potentially impact other producing regions if weather in May is not rainy and mild (e.g. France, Spain, Turkey). Ongoing vulnerable crop conditions are taking place in a context of high prices and trade tensions for the MED-Amin region. A lower use in N- and P-fertilizers is expected to yields and will likely fuel food insecurity.

The present bulletin gives an outlook about the progress of cereal crops in the Mediterranean region. It provides **early qualitative forecasting** of the 2021-2022 campaign, with particular focus on soft wheat, durum wheat and barley. This second outlook reviews crop conditions from the sowing up to 30 April 2022, with a specific focus on the 1 March-30 April period, and will be followed by a final report in June 2022.

This crop monitoring and early warning initiative was progressively developed since 2016 by the MED-Amin network in collaboration with the Joint Research Centre (JRC) of the European Commission, providing an **early qualitative** assessment of crop condition and yield potential of **three winter cereals** (soft wheat, durum wheat, barley) based on a GEOGLAM like approach but with a **two-steps methodology** using remote sensing and feedback from national Focal Points which enabled to identify **hot-spot** of concerns at **subnational** level using nomenclature and pie-charts similar to GEOGLAM for AMIS (Agricultural Market Information System) and to disseminate corresponding **warnings**.¹

Regional outlook summary

At 30 April 2022, the general outlook for winter **crops across the Mediterranean countries is rather positive despite mixed conditions illustrating differences between the regions**. The South-western regions of the Mediterranean basin continues being affected by dry conditions since the beginning of the campaign, which already hampered the harvest in **Morocco, Portugal** and parts of **Italy**. Late rainfalls permitted to recover the situation in **Tunisia** and **Spain** since the last monitoring. Barley crops are particularly affected by water stress as the development cycle is shorter than wheat. New concerns rise in **France** with unseasonal hot and dry conditions occurring at critical phenological stages of cereals development. Durum wheat regional outlook is the less positive of the three monitored winter crops, as the current most affected countries are also relevant producers of this cereal at the Mediterranean level (e.g. **Morocco**). In other Mediterranean regions, conditions are rather favourable (**Greece, Egypt...**). However, some important regions are still under watch in **Algeria, Italy, Lebanon, Turkey** and **Spain**.

Input Market: This bulletin gives insight on the **possible impacts of soaring input prices** (of which fertilizers) in the Mediterranean region's productive potential (see National highlights section)². Prices for fertilizers were already at extremely high levels before the war in **Ukraine** began, driven in part by strong demand and high prices for natural gas, a feedstock for nitrogen-based fertilizers such as urea and ammonia. With the war, prices of all main fertilizers have spiked in view of limited supplies from **Russia** – the top fertilizer producer³. A fertilizer export ban enacted in **China** last July keeps on having an impact on prices, with implications in **Morocco**, an important producer of phosphates. The continuation of the war and related ongoing high natural gas prices are likely to maintain high prices for fertilizers in the coming months in the Med region (source IFPRI).

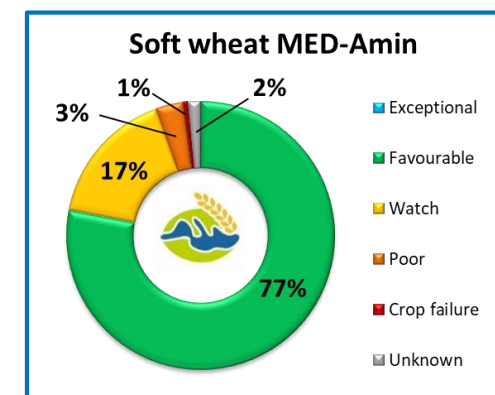
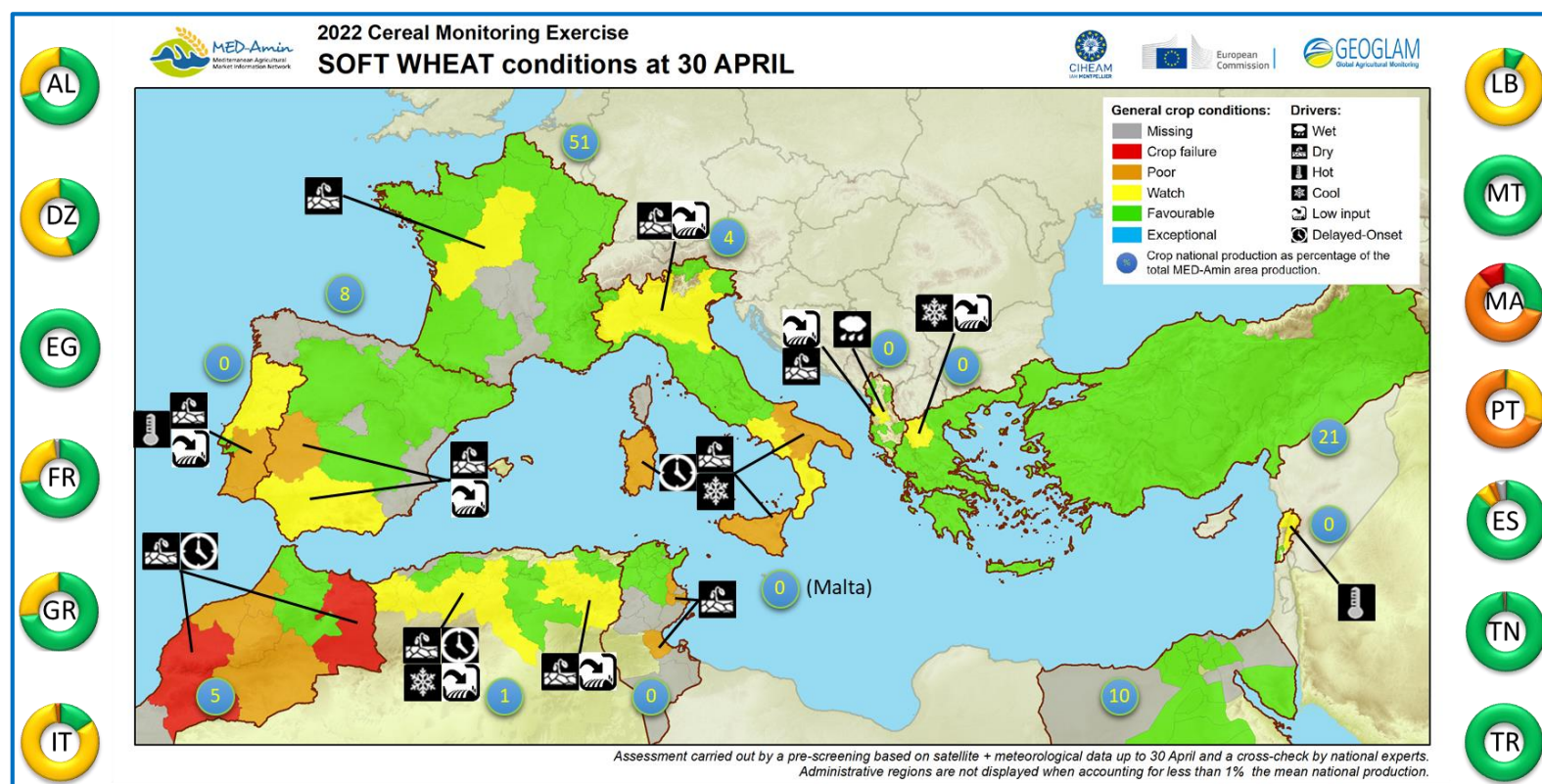
¹ MED-Amin network, gathering 13 Mediterranean countries and coordinated by the CIHEAM (International Centre for Advanced Mediterranean Agronomic Studies), aims to reduce prices volatility in agricultural markets. This initiative lays the foundation for an early warning system strengthening food security in the region. For more info: <http://www.med-amin.org>, <http://ec.europa.eu/jrc/en/mars> and <http://cropmonitor.org>

² A new driver 'low input' was added in order to give a more realistic view of the future harvest perspectives beyond the traditional abiotic factors.

³ On 8 April, as part of a broader package of economic sanctions, the EU banned the importation of fertilizers from **Russia** and **Belarus**. On 21 March, the Ministry of Agriculture, Fisheries and Food in **Spain** announced the allocation of EUR 64.5 million to the Crisis Reserve authorized by the EU Commission to help farmers cope with soaring prices of energy, fertilizers and raw materials. For more information on this issue, please refer to [fertilizer dashboard](#) and [food and fertilizer import restrictions tracker](#) (facilitated by IFPRI).

The regional outlook for **Soft Wheat** is overall positive **with crops developing under more favourable conditions** since the beginning of the campaign than durum wheat and barley, with a large majority of the MED-Amin planted area under ‘favourable’ conditions (77% of the monitored area, see pie chart below). However, the area in ‘watch’ doubled from last monitoring of the end of March 2022.

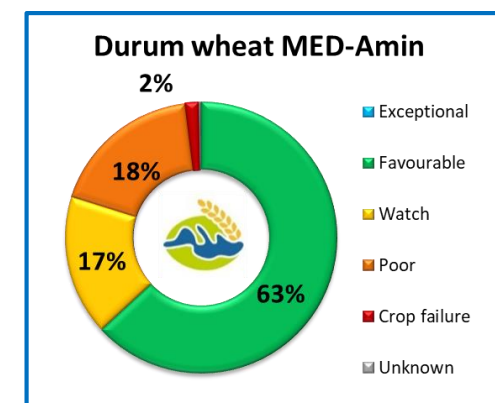
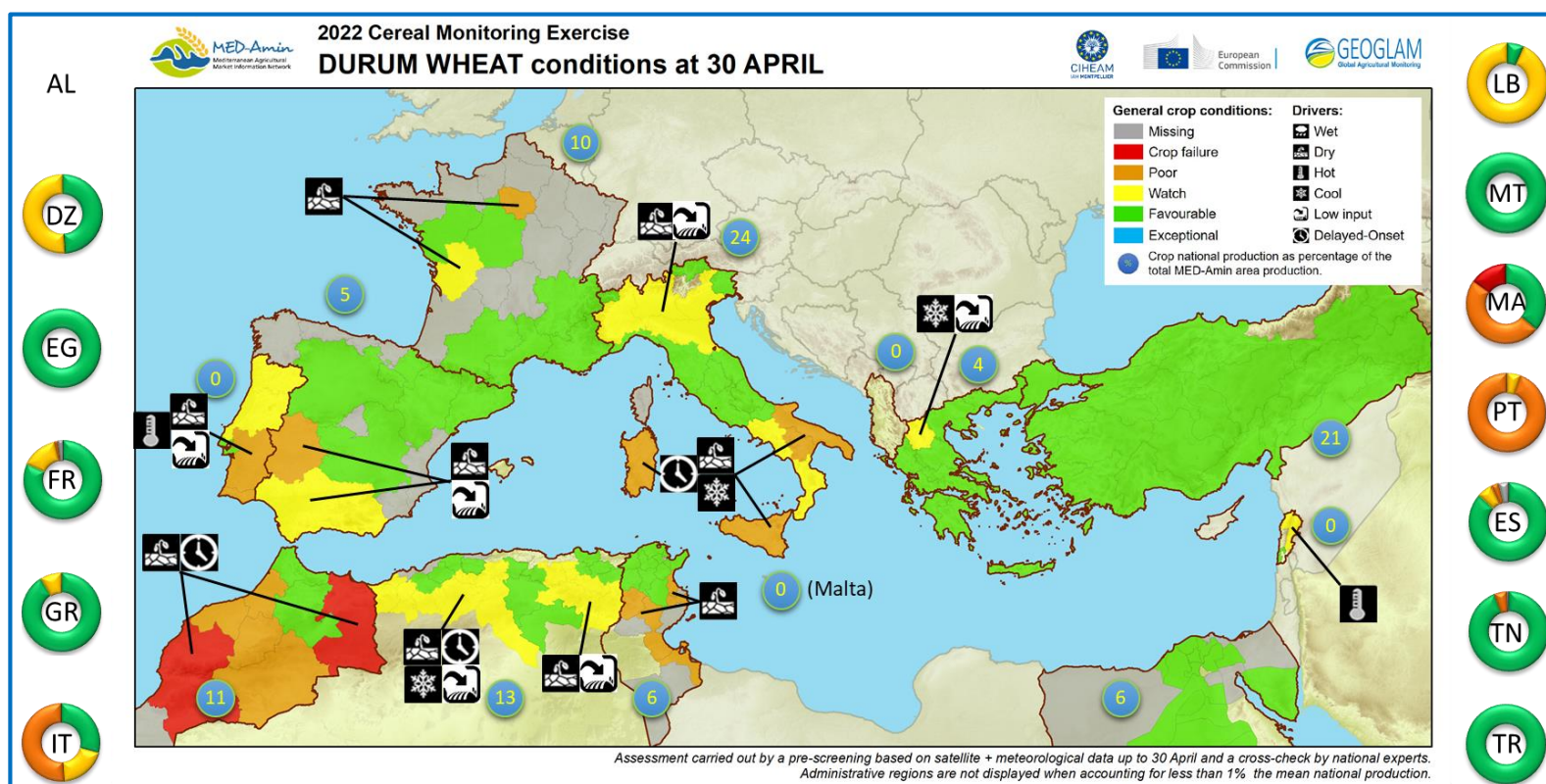
Soft wheat is growing well both in **France (FR)** and **Turkey (TR)**, the most productive countries of the region (accounting for 51% of MED-Amin production and 21% respectively⁴). In **Morocco** (5% of MED-Amin production), the outlook for soft wheat is negative, with 60% of crops under ‘poor’ conditions and 15% in ‘crop failure’ (see pie charts on the map). Please see the National Highlights section of this bulletin.



⁴ Calculated on the basis of the 2017-2021 average of national productions (source MED-Amin).

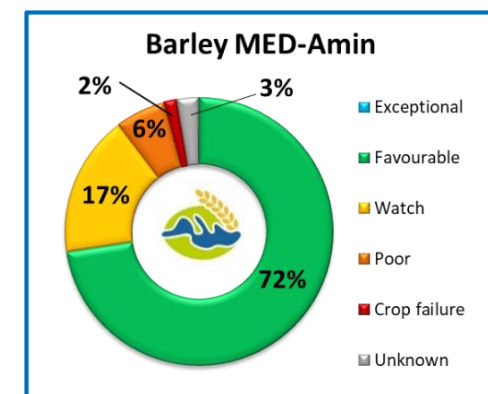
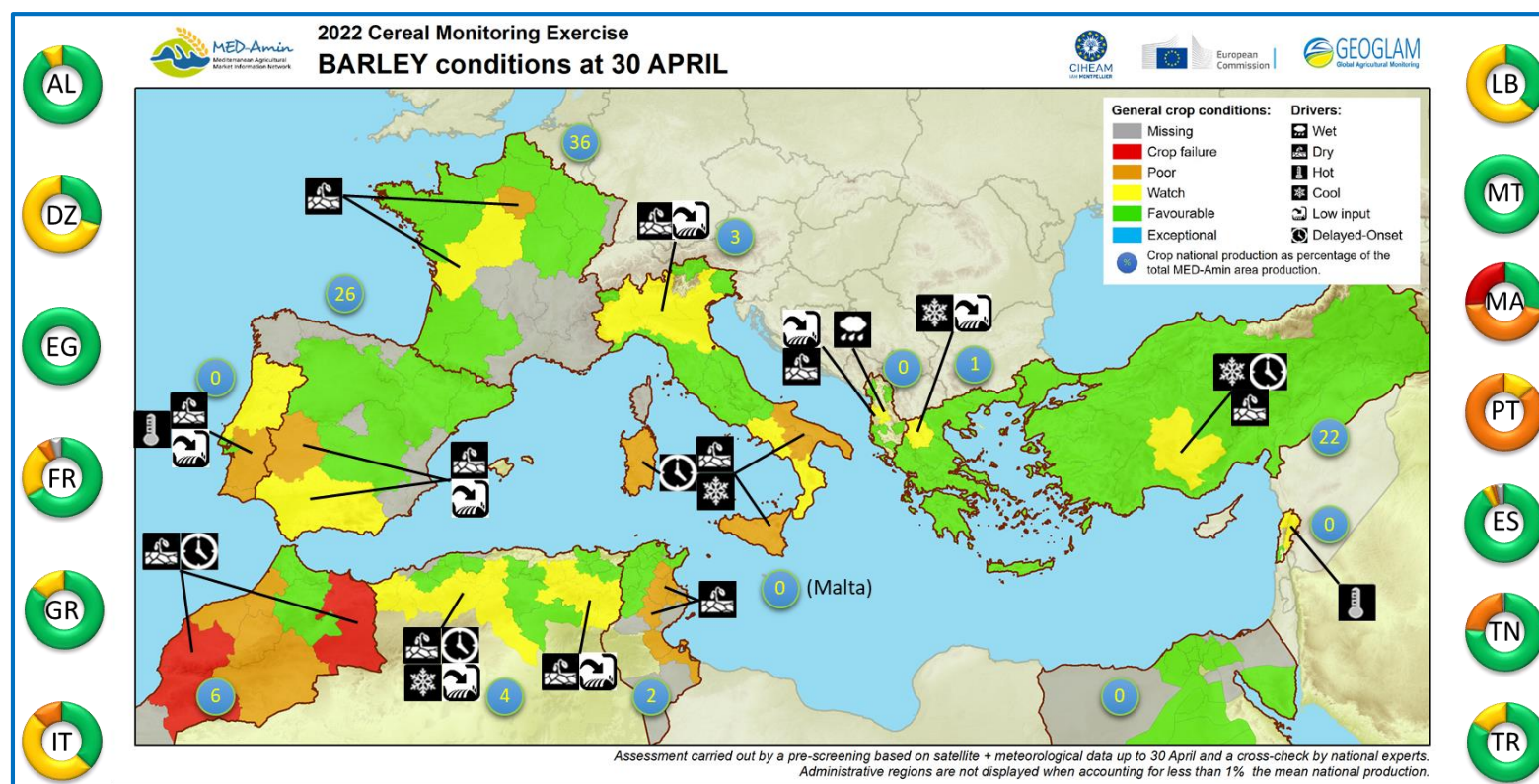
Durum Wheat is a typical Mediterranean commodity and crop (47% of World production). **2/3 of the Durum wheat planted area in the MED-Amin region is developing under 'favourable' conditions** (63% of the monitored areas), in particular in **Turkey (TR)** which accounts for 21% of the MED-Amin production. However, 20% of crops are developing under 'poor' conditions up to 'crop failure' (18% and 2% respectively, +3% vs last monitoring, see pie chart below).

Italy (IT) is accounting for 24% of the MED-Amin production. Adverse growing conditions are registered since the beginning of the campaign in particular in the South, where some regions in charge of half the national production share are under 'poor' conditions and 20% in 'watch' status. Please refer to the National Highlights section of this bulletin.



Barley crop season develops under **mixed conditions** in major productive regions of the Mediterranean area (see pie-chart below on the right). A quarter (25% of the monitored areas) of MED-Amin planted area is highlighted as 'watch', 'poor', or 'crop failure'. In several countries, barley is the winter crop most affected as latterly planted crops suffered more from drought.

For example, in **Algeria** (DZ) accounting for 4% of MED-Amin area barley supply (based on the last 5-Y average), 3/4 of planted areas are under 'watch' conditions waiting for favourable conditions in May, in particular in western and central wilayas (>60% of the Algerian production, see pie chart on the left side of the map below). Please refer also to the National Highlights section.



National highlights ⁵

Albania: The 2021-2022 campaign brought **favourable meteorological conditions for winter cereals** in the country, leading to a normal progress in growth and development during vegetative and reproductive stages. The general crop condition for almost the whole planted territory is under favourable condition. The main factors/drivers in this period have been the **favourable temperatures and humidity**. Only the exception of *Shijak* municipality (in the region of *Durrës*) due to the prolonged presence of the observed drought, and parts of *Elbasan* and *Tirane* where wetter-than-usual conditions might have affected the final production. Beside agrometeorological conditions, agronomic operations performed on time in most of the regions. However, the increase in the price of fuel, as well as the overall increase in fertilizer prices has indirectly **reduced the treated area**, for instance -5% in *Lezha*, -10% in *Berat* and -9% in *Vlora* regions.



Algeria: In general, weather conditions enabled a **fair outlook for winter cereals production**, as a result of mixed conditions throughout the country, from west to east. The climatic conditions at the beginning of the current campaign were marked by a **lack of rainfall** during the months of September and October 2021. The rainfall deficit caused a delay in the execution of soil preparation and cereal planting operations, particularly in the western and central areas of the country. An improvement in climatic conditions was noted with the return of rain in November, which enabled cereal growers to resume ploughing and sowing operations in good soil moisture conditions. January was characterised by low rainfall, particularly in the Western wilayas, which allowed sowing to continue in this area but had a negative impact on December sowing. For the other regions, this month was characterized by the continuation of late sowing. February showed an almost total absence of rainfall and huge **daily temperature amplitude** exceeding 15°C, which **delayed more** the vegetative development, especially for early sowings. Nevertheless, the **return of significant rains** during the months of March and April allowed a sharp recovery for winter crops, especially for central and Eastern regions, with good efficiency in term of nitrogen fertilizations and phytosanitary protection. In contrast, these rains did not really change the poor conditions in the Western wilayas (e.g. *Tiaret*, *Tlemcen*, *Oum El Bouaghi*), which failed to recover. This happened for early sowings (at end of tillering stage in delayed

⁵ Highlights relating to each country are detailed in a section using a coloured frame depending on the overall assessment of the situation: green if favourable, blue if exceptional, yellow if mixed, orange if poor. Also, to refer to the evolution of the situation compared to the previous assessment, a symbol indicates whether the situation has improved ↗, deteriorated ↘ or is similar ↔ vs the end of March 2022.

areas and at beginning of heading stage in early areas). This campaign was also characterised by a **lower fertilization application** than the previous seasons, in reason of the raise in fertilizer prices, which will represent negative impact factor for the final yields.



Egypt: No extreme events were monitored so far. **The cereal production outlook is in line with average.** Crops are faring well thanks to the predominately irrigated arable land.⁶ Harvest started in early April on the 3.6 million acres cultivated area of wheat ⁷. Most of these wheat crops turned ripe said Head of the Egyptian Farmers' Syndicate. The expected productivity exceeds 10 Mt.



France: The **outlook for winter crops is generally positive** as soil moisture levels are still above critical levels and given that winter cereals were not significantly affected by the cold events in early April. However, a real **lack of water** prevails throughout France, which starts impacting winter cereal crops (e.g. *Poitou-Charentes*, *Ile-de-France*, *Centre-Val de Loire*). In the coming weeks, rain events are expected to support crops during grain filling. For spring barley, the proportion of crops in poor condition is slightly higher than other crops. For winter barley, the heading is almost complete (only *Bretagne* is delayed), but their crop conditions must be monitored. Presence of yellow rust is observed in *Normandy*. Soft wheat is all in the heading phase at a more or less advanced stage depending on the regions (the most advanced are in *Poitou-Charentes*). Concerning durum wheat, their heading is well underway in most of France: only the *Centre Val de Loire* is delayed. Concerning the potential lower fertilizer application, most farmers had bought inputs well before the price surge, so that the impact on final harvest will be limited.



Greece: **Winter crops perform well during this campaign, with a positive outlook.** **Unseasonal dry-and-cold weather** conditions took place in the March-April period in *Central Macedonia*, *Western Macedonia* and *Thessaly*. Temperatures dropped down to more than -8 °C during the coldest nights, around mid-March. Wheat development is **delayed from 1 to 2 weeks** depending on the region, especially in *Western Makedonia* where plantings were delayed due to autumn rains and crop biomass accumulation is from in-line-with to slightly-below an average season. In *Eastern Macedonia and Thrace*, fertilizers were applied normally and high yields are expected on winter crops enter flowering ('exceptional' conditions), even if in *Thrace* sub-region rainfed crops suffered from low temperatures. The high prices of fertilizers (increase of 350% vs last year) and fuel led

⁶ These information on crop conditions in Egypt was made available from the latest JRC MARS Bulletins for North Africa: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC127969/JRC127969_01.pdf

⁷ <https://www.egypttoday.com/Article/1/115470/80-of-cultivated-area-of-wheat-to-be-harvested-in>

to a **general reduction of the quantities applied to the crops** (e.g. in *Central Macedonia*, *Western Makedonia* and *Stereia Ellada*), resulting likely in a negative effect on yield (qualitative and quantitative) of the final product. For instance, in *Kilkis (Central Macedonia)*, crop development is delayed and biomass accumulation is reduced mainly due to lower-than-usual temperatures in March and April and reduced fertilization evaluated at -100/150% vs usual. As far as the seed is concerned, the usual practice of reusing the harvested seed has been applied by almost all producers.



Italy: Crop conditions are mixed, with concerns in the Northern and Southern regions. In north-western and north-eastern regions (e.g. *Emilia-Romagna*, *Lombardia*, *Veneto*), crops are facing drought conditions. According to CREA experts, nitrogen fertilization in some areas is ineffective due to the poor solubilisation of the distributed granules that are often still in the soil after 20-30 days (especially for fertilizations carried out from mid-February). Barley performed better in March-April than wheat (vegetative growth). In the Southern regions (*Sicilia*, *Puglia*, *Basilicata*), strong thermal amplitude between night and day were observed in March-April, together with **colder-than-usual average daily temperature**. These conditions slowed down crop growth and in some cases slightly damaged some earlier varieties (the impact is only visible now). In *Sicilia*, particularly, these events plus the lasting dryness resulted in adverse crop conditions and a reduced final production. A **delay** in the phenological development of durum wheat (about 10 days) is more pronounced than barley. Due to the increase in the cost of agronomic input, and in particular of N fertilizers, many farmers have **reduced or even renounced to apply nitrogen** to the crop while affected by water stress in March-April that will impact durum wheat yields.



Lebanon: Winter crop conditions in Lebanon deteriorated in March-April 2022, leading to some concerns on the future harvest, particularly in *Beqaa*, by far the most productive region. **Hot temperatures** following abundant precipitations at the beginning of March did not allow an optimal biomass accumulation (still delayed compared to average), which is set moderately-below an average season (e.g. *North Lebanon* region).



Malta: No extreme events are noted so far. Crop conditions resulted in-line-with the average season.



Morocco: The 2021/22 crop year recorded 188 mm of accumulated rainfall in the October 2021-April 2022 period, **42% lower than the average for the last 30 years** (327 mm) and 35% lower than the previous year (289 mm). In addition to the low and delayed rainfall, the rainfall pattern was

also characterised by an inappropriate distribution. **Almost 55% of the cumulative rainfall occurred in March and April** (too late for crop to recover) and less than a third of the rainfall occurred in November and December. Well-below average rainfall (or the lack of it) in several key-productive regions during January and February, caused stress on plant cover and delayed the growth of autumn cereals. This period coincided with the tillering stage of cereals, a development stage that is crucial for crop yields. According to the Ministry of agriculture, this **drought** led to a more or less significant drop in yields depending on the region, even leading to crop failure in some areas (e.g. *Marrakech-Safi, Grand Casablanca-Settat*)⁸. It is in the more favourable areas of the north of the country where rainfed cereals crops recovered well in the spring after the rainfall of March and April, leading to a catching up in productivity (e.g. *Tanger-Tétouan-Al Hoceïma*). Satellite monitoring of vegetation cover shows vegetation profiles that are **broadly similar to 2015-2016 crop year**. The production of cereals for the 2021/2022 crop year is estimated at 3.2 Mt (1.76 Mt of soft wheat, 0.75 Mt of durum wheat and 0.69 Mt of barley), **down 69% from the previous year's record output**. This production is the result of an estimated sown area of 3.6 million hectares, for the three cereals.



Portugal: The **current campaign confirms significant losses for 2022 cereals harvest**. Adverse weather conditions (hot and dry), added to the significant **increase in the price of production** contributed to the **reduction of the planted area** (-6%) and a generalized **decrease in yield** (-15% in wheat vs 2021, -20% in *Alentejo*). In *Alentejo*, the main productive region for cereals, temperatures and rainfall in April contributed positively to the vegetative and reproductive phases of cereals. This comes after a **hot-and-dry period** lasting from December to February. The crops had a slightly advanced vegetative development for the season, being at spike/beginning of maturation stages. Therefore, the water availability in the month of May associated with temperatures will be decisive in the vegetative cycle, mainly because it will accompany the grain filling phase. In *Algarve* the average precipitation accumulated since the beginning of the agricultural year is much lower than the previous years. The first rain events, due to their intensity, gave rise to a **delay** in (some) sowings, which is now visible in their development. With the precipitation of April, even if plants partly recovered, the expected productivity is below-average. This is particularly true for late sowings. In *Entre-Douro e Minho*, plants developed fairly. Climatic conditions favoured tillering as well as vegetative development, and yields are expected to be very similar to those seen in the previous season. In *Trás-os-Montes*, the combination of variables such as drought, political instability and the exponential increase in production factors (energy and nitrogen fertilizers) led to a retraction of producers to apply necessary fertilization, which could compromise productivity. In *Centro*, most cereal crops recorded good vegetative growth, positively influenced by mild temperatures and improved soil moisture.

⁸ <https://www.agriculture.gov.ma/fr/actualites/production-previsionnelle-de-la-campagne-agricole-20212022>

In inland areas, lower fertilization application was observed that will have an impact on productivity. In *Lisboa e Vale do Tejo*, autumn-winter sowing cereals were generally in heading stage, with their vegetative development being lower than average.



Spain: The first half of the 2021-2022 crop campaign was characterized by a lack of rainfalls, which caused concerns especially in the Southern half of the Peninsula. The pattern of temperature and rains this campaign may have affected crops growth particularly with early cycle crops/late sowings (e.g. *Andalucía*). The abundant rains in March and April have improved the **drought** situation we have had since autumn, and if weather continues this way, an average to above-average harvest is expected. In any way, **rains of April in the majority of the Spain territory improved the national crop outlook**. In *Castilla y León* and *Castilla la Mancha*, it is foreseeable that winter cereals will fully recover from delayed growth and yields will be within the average. Another uncertainty comes from the **lower fertilizer input** due to high prices and farmers' affordability: there will be a drop in crops that lacked fertilization but it is still hard to estimate the impact on yields (significant differences in plant development were observed between fertilized/not fertilized crops).



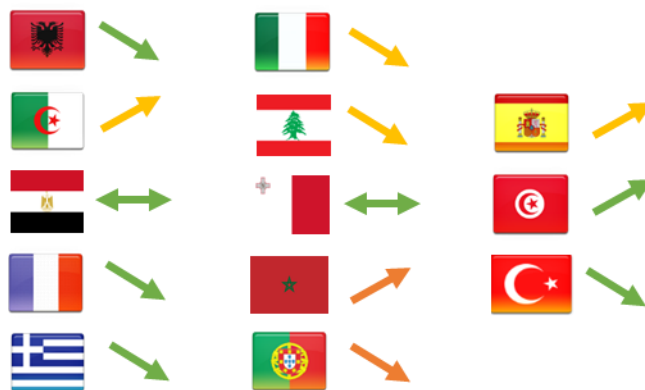
Tunisia: After a good start to the crop campaign, the national **cereals production outlook is in line or moderately-above average**. Cereals in Northern governorates are performing well. In the central regions, the **rains at the beginning of March** were beneficial following the drier-than-usual conditions, triggering a significant crop recovery. In *Kairouan*, the cereals performed well despite **dry conditions**, thanks to irrigation (soft wheat) in greater proportion than in *Kasserine*. In *Kef*, a fairly good yield is expected relative to its bioclimatic stage, especially in the south of the governorate, in line with average. Given that barley was sown first, a better yield is expected than for wheat.



Turkey: Cereals (wheat and barley) **plant development has been delayed** due to low temperatures significantly below the regional average as of March and April. While the long-term average temperature of the region in March was 5.5°C, it was 0.4°C in March 2022 according to Meteorological Services in Central Anatolia region including *Konya*. The lowest temperature in the region was -18.1°C and the highest temperature was found as 20.5°C. If this leads to a negative impact on reproductive organs as plants start filling, barley might be more **affected by the low temperatures** than wheat. In addition to temperature anomalies, it is also drier than usual until the end of April. Despite crop delays cumulated in some regions with unbalanced weather events, there is **no prediction of yield loss at the moment at national scale**, although under monitoring in

Central Anatolia (e.g. *Konya* with slightly below average conditions at the moment). Yield estimations will be made depending on the rainfall and temperature in May. In South-eastern regions (*Sanliuifa, Gaziantep...*), the situation **improved with rains** during the revised period, driving to quick biomass accumulation close to average. A **lower fertilizers application** may result in a potential impact on vegetative growth of wheat and barley crops.

→ Summary of developments since the previous assessment at the end of March 2022 ⁹



⁹ A symbol indicates whether the situation has improved ↗, deteriorated ↘ or is similar ↔ vs the end of March 2022.

General methodology: The forecasting methodology is based on the monitoring of crop conditions using indicators derived from Earth observation (e.g. NDVI), carried out jointly by the CIHEAM-IAMM and the Joint Research Centre of the European Commission (JRC). Reflecting out-of-average biomass accumulation vs the medium-term average (2012-2021) allows us detecting areas of concern, which are characterized using the GEOGLAM scale and nomenclature (see below). These pre-screened areas of concern, defined at a sub-national level, are then analyzed, validated or completed by each National Focal-points of the MED-Amin network, taking into account feedbacks from field observation and local experts.

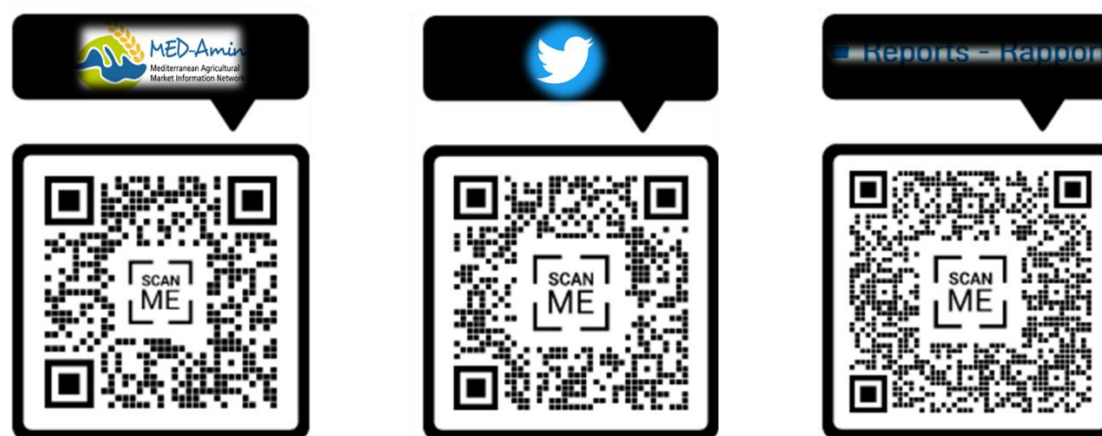
Crop conditions legend (GEOGLAM scale and nomenclature):

- **Exceptional:** Conditions are much better than average at the time of reporting. This label can only be used between the grain-filling stages to the harvest stage.
- **Favourable:** Conditions range from slightly below to slightly above average at the time of reporting.
- **Watch:** Conditions are not far from average but there is a potential risk to final production. However, at this time it is considered that crops might still recover if conditions improve. This label may only be used between planting/early-vegetative stage and vegetative/reproductive stages.
- **Poor:** Conditions are well below average and are very likely to impact production with a harvest clearly below average.
- **Crop failure:** Crops have been strongly damaged, low yield and area reduction will strongly impact the production.

Crop conditions Drivers (adapted from GEOGLAM nomenclature):

- **Wet:** Above average humidity;
- **Dry:** Above average drought;
- **Hot:** Above average temperatures;
- **Cold:** Below average temperatures;
- **Extreme events:** Presence of extreme events;
- **Delayed onset:** Delayed onset and operations of the crop year;
- **Biotic stress;**
- **Low Input:** limited use of inputs (fertilizers, pesticides, etc.) that could end in moving the outlook for the future harvest (yield, quality).

Follow the evolution of the harvest forecasting throughout the campaign:



<https://www.med-amin.org/fr/> et https://twitter.com/MEDAmin_network.

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