



## MED-Amin Bulletin 2022 – 3

### Winter crops outlook at 31 May 2022

The cereal campaign in the MED-Amin area was influenced this season by long-lasting droughts and exceptional heatwaves. Severe drought condition took place from the beginning of the cropping season up to flowering in western Maghreb, severely impacting cereal growth in Morocco, Portugal and western Algeria. In the May-June period, unusual rainfall shortages and unexpected heatwaves across grain filling led to a marked deterioration of winter cereals in Spain, Italy and France. Despite the occurrence of abiotic stressors and unusual weather events cropping systems toward Eastern Mediterranean countries (Tunisia, Egypt, Albania, Greece, Turkey) showed more resilience and, except for Lebanon, performed in-line with the average season. Overall, the cereals outlook for the Med-Amin area is quite negative for Barley and Durum Wheat with half or more of the production in poor conditions. Soft Wheat crops performed better with 2/3 of MED-Amin areas in line with the average.

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 third and last outlook reviews crop conditions from the sowing up to 31 May 2022, with a specific focus on the 1 May-31 May period, which is close to the harvest in several Mediterranean countries.

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**.<sup>1</sup>

**N E W** In a context of rising already high prices on global market, boosted by the war in Ukraine, a featured box was added to give insight on the possible impacts of soaring input prices (of which fertilizers) in the Mediterranean region (see Box 1). Thanks to the collaboration with FAO and IFPRI, it examines and gauges the possible impacts on current and future campaign for cereals production. As changes are already reported on the field of the Mediterranean countries (and elsewhere), a new driver 'low input' can be displayed among the other abiotic drivers of future production.

## Regional outlook summary

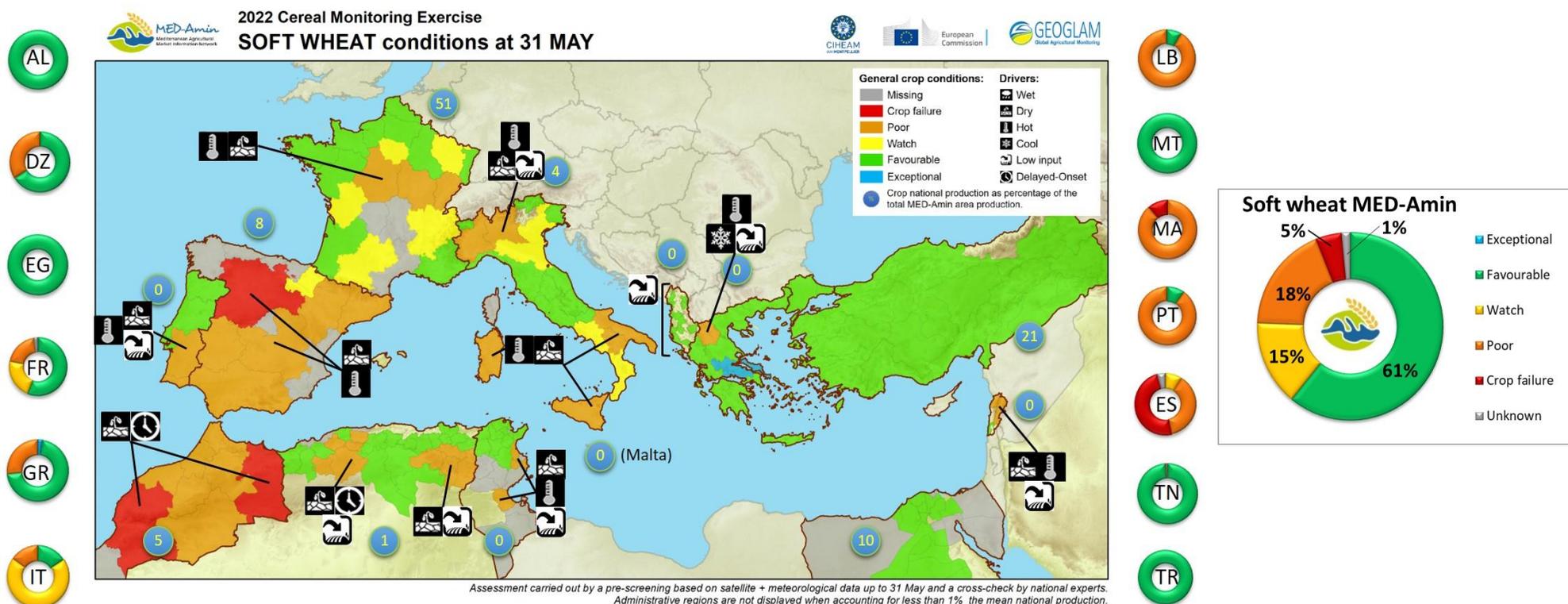
At 31 May 2022, the outlook for winter **crops across the Mediterranean countries is mixed with big differences between the regions**. The Western regions of the Mediterranean basin continue being affected by dry conditions since the beginning of the campaign, hampering early in the campaign the harvest in **Morocco, western Algeria and Portugal**. Dry conditions prevailed in May, in addition to very hot temperatures, which ended in cutting prospects in **Spain, Italy, Algeria** and parts of **France**. On the contrary, conditions improved in Eastern Mediterranean regions such as **central Tunisia, Albania, Turkey** and **Greece**, however still poor in **Lebanon**.

---

<sup>1</sup> 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>

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. A 2/3 of the MED-Amin planted area under ‘favourable’ conditions (61% of the monitored area vs 77% one month ago, see pie chart below). However, 1/3 are either in crop failure, poor or still ‘watch’ conditions, a ratio that doubled from last monitoring of the end of April 2022.

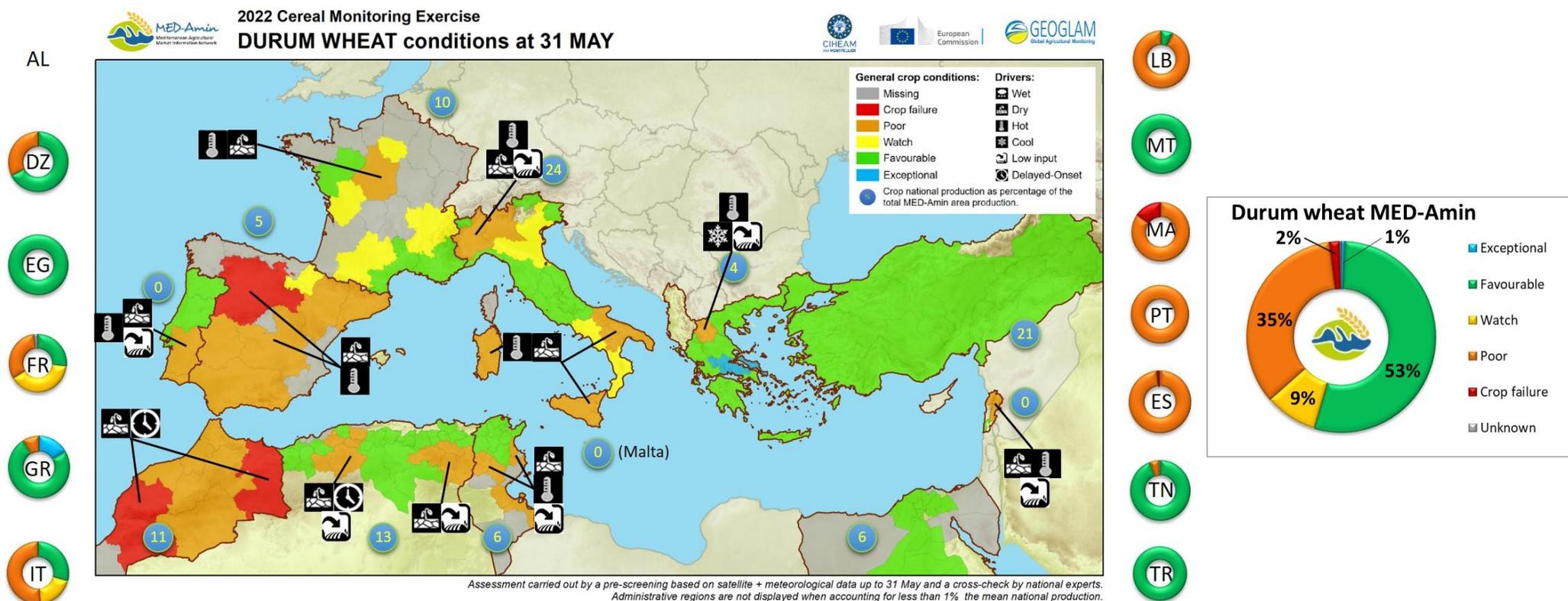
Soft wheat is growing well and progress toward maturity in **Turkey (TR)**, whereas in France (FR) (accounting for 51% of MED-Amin production<sup>2</sup>), some concern raised in the month in central-eastern regions affected by dry and hot anomalies. In **Morocco (5% of MED-Amin production)**, the outlook for soft wheat is very negative, with all planted areas under ‘poor’ conditions or ‘crop failure’ leading to significant decrease in 2022 production (see pie charts on the map). Please see the National Highlights section of this bulletin.



<sup>2</sup> Calculated on the basis of the 2017-2021 average of national productions (source MED-Amin).

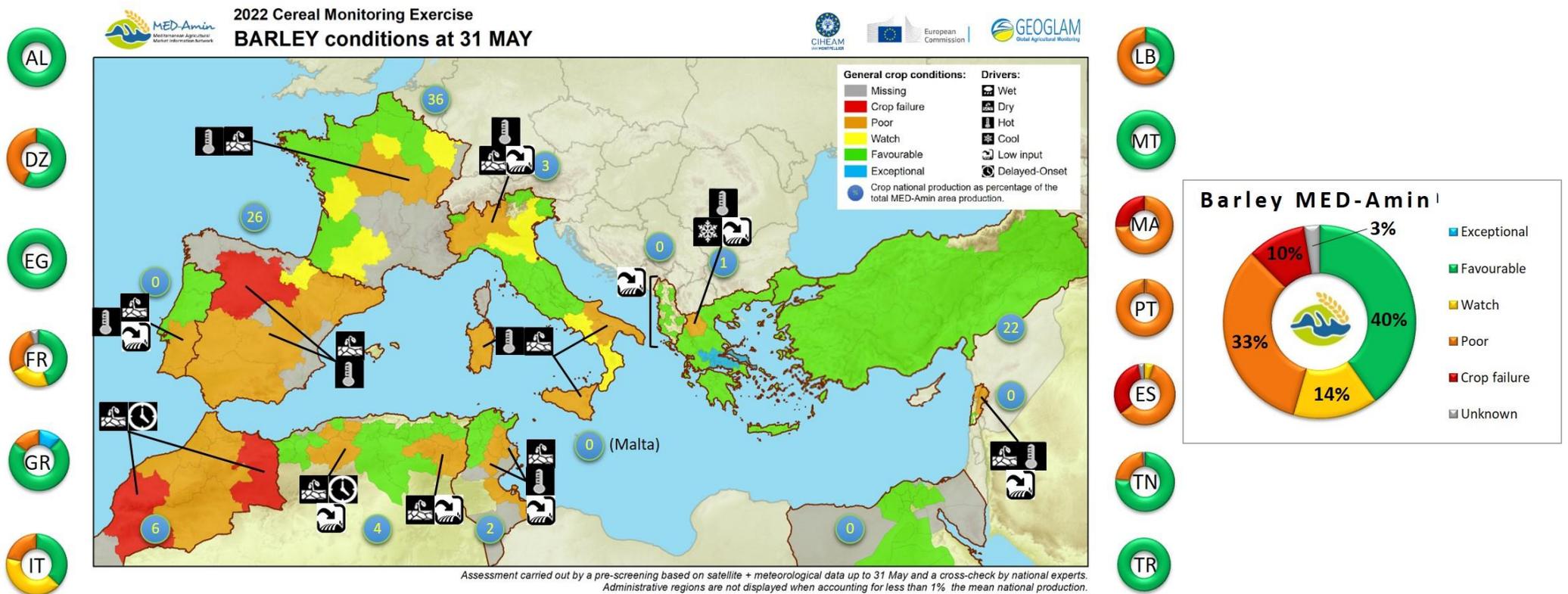
**Durum Wheat** is a typical Mediterranean commodity and crop (47% of World production). **Half of the Durum wheat area planted in the MED-Amin region is developing under 'favourable' conditions only** (53%, it was 63% one month ago at the last monitoring), in particular in **Turkey (TR)** which accounts for 21% of the MED-Amin production. However, 37% of crops are developing under 'poor' conditions up to 'crop failure' (35% and 2% respectively, 50% increase 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 both in the North and the South, with additional hot and dry anomalies in May and beginning of June, leading to 'poor' conditions for future harvest in half of the national crops and 20% in 'watch' status. Please refer to the National Highlights section of this bulletin.



**Barley** crops conditions deteriorated significantly in May: Almost half of the MED-Amin planted area is hampered in ‘poor’ conditions or ‘crop failure’ (33% of the monitored areas and 10% respectively, a bump from the last monitoring of May), whereas 14% are under scrutiny (‘watch’ status) (see pie-chart below on the right). In several countries, barley is the winter crop most affected by weather anomalies (dry, hot) of the campaign.

For instance, in **Algeria** (DZ) accounting for 4% of MED-Amin area barley supply (based on the last 5-Y average), more than 1/3 of planted areas are ‘poor’, in particular in eastern and centre-western wilayas (see pie chart on the left side of the map below). Please refer also to the National Highlights section.



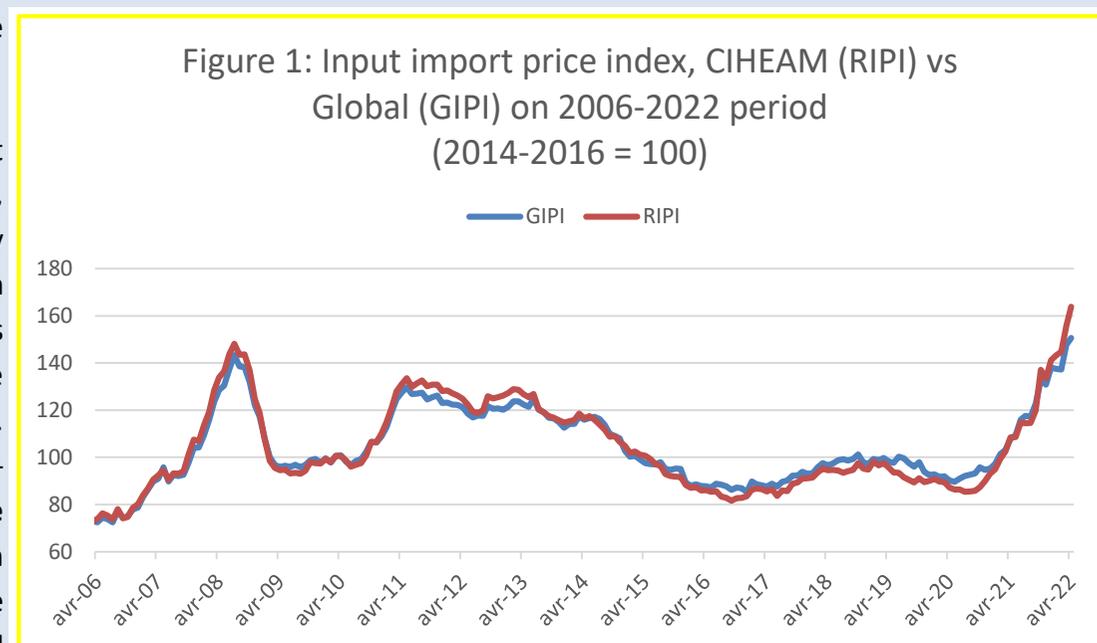
### BOX 1: Soaring input and fertilizer prices in CIHEAM Countries: Measuring their extent and gauging possible impacts

(by Josef Schmidhuber - Deputy Director, Trade and Markets Division, FAO)

The recent upsurge in agricultural input prices has triggered considerable alarm about rising costs of food production, which in a free-market economy will be typically passed onto consumers through higher food prices. This contribution to the present MED-Amin Bulletin **examines the extent and the speed of rising input prices**, offering a regional variant of FAO's newly constructed Global Input Price Index (GIPI); this regional input price index (CIHEAM-RIPI) combines prices for five major input categories (energy, fertilizers, feeds, seeds and pesticides) for 13 CIHEAM Member Countries into a single, trade-weighted regional aggregate.

Figure 1 presents the evolution until April 2022 of the CIHEAM-RIPI and juxtaposes it to the development of the GIPI, its counterpart at the global level. Figure 2 shows the evolution of each category of the input price index.

A number of fundamental features of agricultural input price developments emerge from Figures 1 and 2. Firstly, Figure 1 suggests that the swings in input prices faced by producers in the CIHEAM region, have so far, **evolved in sync with those at the global level**. This holds for the ups and downs of the past 15 years as well as much of the steep rise in input prices seen over the past 15 months. However, the intermediate agricultural costs in the MED-Amin area (RIPI) are **rising faster than the global average** (GIPI) since Oct.-21. and particularly since Feb.-22, when the war started. Secondly, and moving to Figure 2, the most notable input price increases have been registered

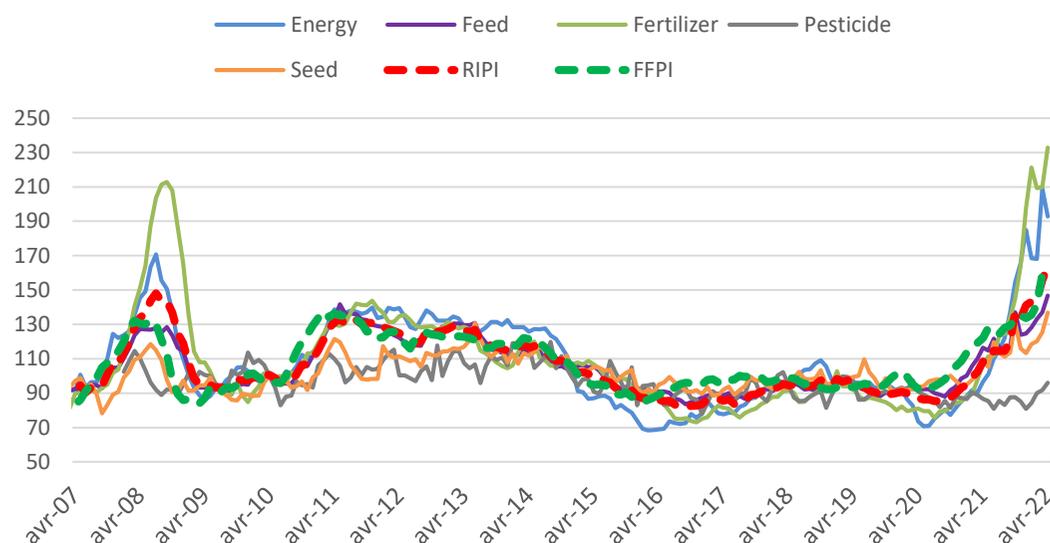


for fertilizers, with aggregate **price levels approaching their all-time highs of 2008**. At a more disaggregated level, prices for energy-intensive fertilizers such as urea or ammonium nitrate, have recently even exceeded their 2008 peaks, at least in nominal terms, i.e., without adjusting for inflation. We can note that other input compounds are evolving differently in face of global price highs (energy), for instance **pesticide prices** remain relatively stable in the monitoring period.

Thirdly, **input prices have risen even faster than output prices**. This means that input affordability and particularly **fertilizer affordability<sup>3</sup> has rapidly deteriorated** and, as a result, farmers find it increasingly onerous to pay for fertilizers, high output prices notwithstanding (Figure 3). Fertilizers affordability in the MED-Amin area decreased by almost 50% in the last 12-14 months!

Fourthly, declining fertilizer affordability could **result in the reduced use of fertilizers in the current (it is already reported in this seasonal Bulletin in several countries like Albania, Greece, Portugal, Italy) and the next crop season, weighing on yields and product quality** (e.g. compromising wheat protein content due to a limited application of N-fertilizers such as urea). Fifthly, and while the impacts on food markets are difficult to gauge at this early stage, lower food production could cause new upswings in food prices and **result in reduced food security**, particularly for those population segments that spend a large share of their incomes on food and energy products.

Figure 2: Main components of the CIHEAM regional input price index (2014-2016 = 100)



<sup>3</sup> Affordability here is defined as the ratio of output over input prices. For more detailed information: [https://www.fao.org/3/cb7491en/cb7491en\\_special\\_feature.pdf](https://www.fao.org/3/cb7491en/cb7491en_special_feature.pdf)

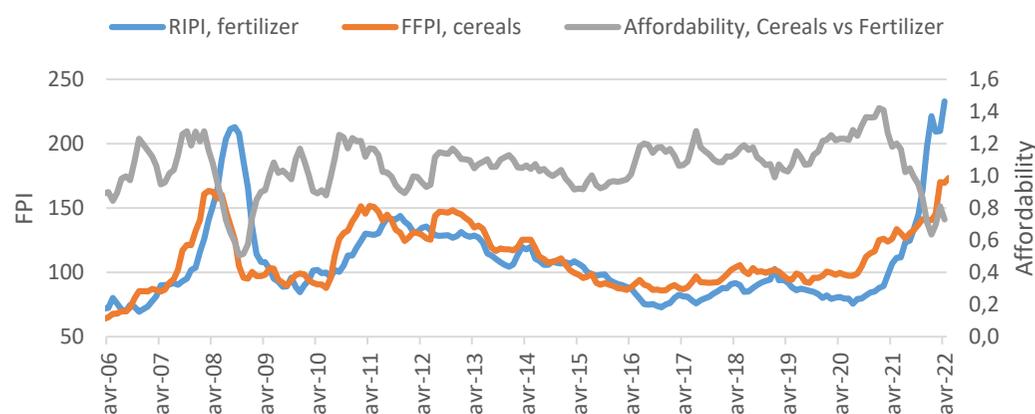
Finally, given the fact that the root causes of the input price boom lie in the energy sector and hence outside the internal forces of agricultural supply and demand, the ability of food markets to self-correct could be seriously compromised. This could portend that **high food and input prices will remain a defining feature of agricultural markets**, at least until energy prices equilibrate at a lower price level.

### Fertilizer Policies Update (IFPRI)

This bulletin gives insight on the probable impacts of soaring input prices (of which fertilizers) in the Mediterranean region's productive potential (see National highlights section)<sup>4</sup>. 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 nitrogenous fertilizers.

With the war, prices of all main fertilizers have spiked in view of limited supplies from **Russia** – the top fertilizer producer<sup>5</sup>. Prices for most fertilizers moderated in May but remain at high levels compared to last year. Fertilizer prices are likely to stay high in view of ongoing supply uncertainties associated with the Black Sea conflict, in particular in the Mediterranean countries (source IFPRI). In addition, export restrictions of **China** continue to limit global supplies, with implications in **Morocco**, an important producer of phosphates.

Figure 3: Fertilizer affordability for Cereals in the CIHEAM countries  
(2014-2016 = 100)



<sup>4</sup> 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.

<sup>5</sup> On 7 May, **Vietnam** proposed a 5% increase in the export tax rate of fertilizers, in an effort to reduce domestic fertilizer prices. 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).

## National highlights <sup>6</sup>



**Albania:** Cereal conditions **in the entire territory of the country is favourable**. This was the result of favourable temperatures and soil moisture all along the monitoring period. In the most productive regions (*Korça, Fier*), despite high temperatures in May and below-average rainfalls, the impact on production was limited and the estimated biomass accumulation is still slightly above the average. This was most likely due to beneficial rainfalls at beginning of June, which have significantly offset water stress. In *Korça*, the use of chemical fertilizers in wheat and barley this year decreased by nearly 15-20% compared to an average season (Ministry of Agriculture), as a consequence of the increase of their market price. In this region, the expected production for wheat and barley this year is estimated to decrease only by 5% compared to the last year. However, the impact will likely be greater in other regions: In *Vlora*, the expectations for cereals are good but reduction in the use of fertilizer (-9% according to the Ministry of agriculture) lead to downward seasonal yield expectations. In *Tiranë*, the overall production level is close to the average but in some plots as a result of hail there has been a yield decrease (without a significant impact in the total region production).



**Algeria:** In general **expectation for the cereal productions are moderately below-average**, as a result of mixed conditions throughout the country, from West to East. Climatic conditions at the beginning of the campaign were marked by a lack of rainfall in September and October, before sowing. A second period of drought was recorded in January and February 2022, this latter did not affect vegetation too much in eastern wilayas but hampered crop growth in central and western regions. The rainfall occurred in March coincided with the most sensitive phases of the cereal (flowering and heading) for early sowings, which made it possible to satisfy the high demand for water at this stage, as well as a good recovery of vegetation for late sowings to the eastern and central regions, with also a good recovery of nitrogenous fertilization and phytosanitary protection (fight against weeds and fungal diseases). At the end of the season, in some wilayas, crops performed well (e.g. *Medea*). Nevertheless, the south of the eastern highlands (north of *Tébessa, Khenchela* and *Batna*) and some western wilayas were not able to take benefit from the rainy events in March and showed only a partial crop biomass recovery after the drought of January and February. This campaign was also characterized by a lower fertilization application in reason of the raise in fertilizer prices, which will represent negative impact factor for the final yields (about -5%).

<sup>6</sup> 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 April 2022.**



**Egypt:** No extreme events were monitored this season. **The cereal production outlook is in line with an average season**, even a bit greater due to extension in the planted area in wheat (in particular in the western side of Nile Delta). Crops are faring well thanks to the predominately irrigated arable land. Harvest is wrapping up, made over 3.6 million acres cultivated area of wheat <sup>7</sup>. The expected grain production exceeds 10 Mt.



**France:** The **outlook for winter crops has deteriorated in May, as a result of a water deficit, combined with high temperatures**. The lack of water continues to be a problem for some crops across France. Although a significant proportion of wheat and barley are in a rather favourable state, significant surfaces are in poor conditions due to the persistent water deficit and the anomalous heatwaves occurring in the first half of June. Some regions are particularly at stake, showing negative perspectives (e.g. *Centre Val de Loire, Bourgogne, Ile de France*). The impact on yields will remain heterogeneous depending on the soils and the available water resources in these affected regions. No impact is expected from a change in the fertiliser application as the fertilizer coverage of farms was sufficient and anticipated to preserve quality grains. Planted areas decreased of 1.2% in winter wheat compared to the five-year average, and of 0.4% with reference to winter barley.



**Greece:** This end of campaign shows **generally favourable conditions with positive prospects for the upcoming harvest**. Quantity of 2022 winter cereals production is estimated to be slightly above the previous season and grains quality in-line with the average. In *Central Makedonia*, the most productive region in Greece, the campaign was characterized by optimal conditions (dry weather with mild weather conditions). The potential production might be cut by the lower application of fertilizers this year compared to average. At the sub-regional level, there are mixed conditions: in *Pieria*, where in this campaign the planted area bumped, dry and warm conditions will lead to a cut in production up to 30%; whereas in *Kilkis*, the expectations for the final production are good and even exceptional for barley (shorter cycle of development than wheat). In *Western Makedonia*, unfavourable weather conditions due to heatwaves and localised hail events, delayed and hampered the cereals cultivation (with the only exception in the area of *Grevena*). In *Western Makedonia*, a rise of +300% in fertilizer prices prevented farmers from applying appropriate quantities of inputs, which will contribute in cutting the regional cereals expectations. In *Eastern Makedonia and Thraki*, conditions were favourable for all winter crops and in *Stereia Ellada* crop benefitted from warm conditions almost all long the season, especially durum wheat.

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



**Italy:** **Crop conditions for durum wheat deteriorated** due to the drought in April and the very hot temperatures in May in the main cultivation area (*Sicilia, Puglia, Basilicata*). The yield forecast of durum wheat is negative. Cut by nearly 30% are foreseen, with a direct impact on the weight of grains (CREA). Concerning northern regions, the precipitation deficit here continued to be around 50% below LTA since the first of May. Crop development accelerated and winter crop storage organs were negatively affected in terms of incomplete filling and reduced grain numbers. There was no rain until mid-June and very high temperature, not common in this period of the year, cut harvest prospects for winter crops (e.g. *Lombardia, Piemonte*) as barley harvest is over (below-average) and soft wheat one has just started. Winter crops output is also impacted by reduced nitrogen use.



**Lebanon:** For most of the cultivated areas in Lebanon crop growth was delayed by scarce seasonal precipitation since beginning of campaign. Moreover, flowering and grain filling took place under hot-and-dry conditions. The resulting biomass accumulation for this season appears below-average in *Beqaa-Baalbek, North Lebanon* and *Mount Lebanon* regions, while in South Lebanon and *Nabatieh* the cereal campaign was in-line-with an average season. Overall, **expectation for the cereals campaign is below the last 5-years average**.



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



**Morocco:** Dry and hot conditions prevailed during the 2021/2022 cereal campaign in Morocco, irreparably hampering crop growth and development since beginning-of-season. The most severe and widespread drought period occurred from 10 December to 15 February. During this period, accumulated rainfall in the key-producing region of *Casablanca* was 25 mm against 98 mm of the LTA; in *Fès-Meknès* it was 52 mm against an LTA of 134 mm; and in the region of *Rabat*, which accounts for nearly 25% of the national soft wheat production, it was 58 mm compared with an LTA of 156 mm. Almost 55% of the cumulative rainfall occurred in March and April (too late for crop to recover). Rainy events in May were scarce coupled with daily temperature above-average, **adding on the early warning of negative production outlook emitted since April** (and extended all the regions of the kingdom, including *Fès-Meknès* and *Tanger Tétouan Al Hoceima*). As the phenological cycle has ended at the end of May, well below-average biomass accumulation levels (similar to 2015-2016 crop year, the worst in 15 years) anticipates the very poor production this year, significantly below the long-term average and the previous season. The production of cereals for the 2021/2022 campaign will most likely be even

below the first estimate made by the Ministry of agriculture of 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**) from the 3.6 million hectares.



**Portugal:** The previous outlook is confirmed: rain arrived too late to fully restore yield potentials in the Alentejo and Algarve and caused some physical **damage to plants and significant losses for 2022 cereals harvest**. Water levels in most reservoirs are at 50% of capacity. Adverse weather conditions (hot and dry), combined with a significant increase in production costs contributed to the reduction of the planted area (-10%) and to a generalized decrease in yield. Compared to the previous season, the decrease in productivity is estimated at -15% for durum wheat and -10% for common wheat and barley. In *Alentejo* (the main productive region for cereals), May was hot and dry, with almost no rains. The grain filling phase has been ruined. In central and northern regions, dry conditions did not prevent crop in performing well (e.g. *Trás-os-Montes, Entre Douro e Minho*).



**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 abundant rains in March and April have improved the situation. The lack of rain and the exceptional heat in May and beginning of June was fatal to most of the cereal growing areas, triggering quite pessimistic and **negative outlook for the upcoming harvest/production, especially in the late growing areas** (e.g. *Castilla y Leon*) although some areas keep an average development. Referring to the 2015-2021 average, a drop of 15% is expected for winter cereals production, i.e. 20% less than in 2021 and 25-30% less than in 2020. The 2022 harvest will not cover the domestic consumption and the import needs are expected to increase, in particular to supply the livestock sector. Adverse weather conditions this season overtake the effect of reduced fertilizer use.<sup>8</sup>



**Tunisia:** May was characterized by warmer-than-usual daily temperature and poor rainfalls. Above-average biomass accumulation levels in most of the (northern) littoral and central regions were observed, together with a crop delay of 10-20 days compared to the average season. At the national level, expectations for the **final production are positive and estimated to be from slightly below (barley, soft wheat) to slightly above (durum**

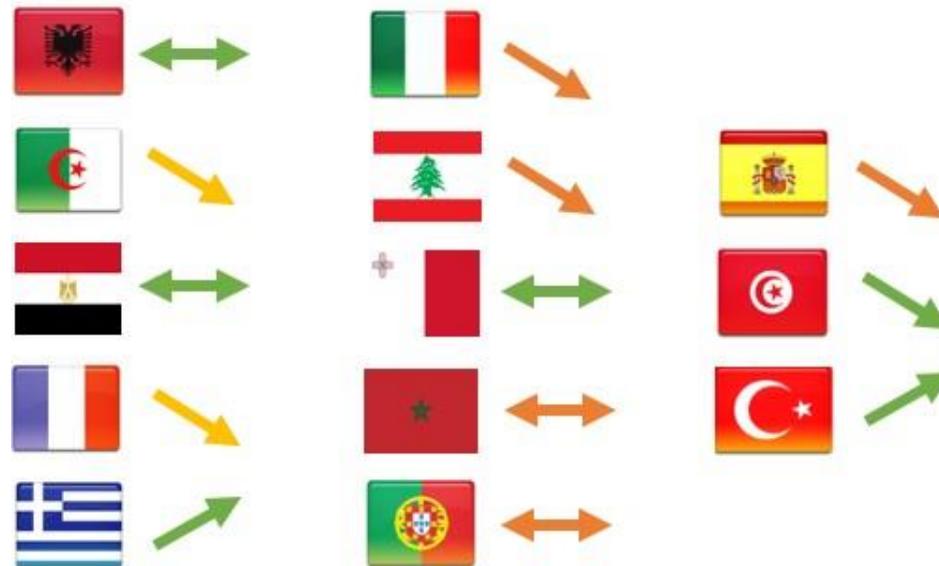
<sup>8</sup> Mainly because of the war in Ukraine and high prices, sunflower area (the spring crop that can benefit the most from the CAP flexibilities) has risen by 8% in the Spanish average according to the latest report (MAPA).

wheat) the 5-year average. A positive outlook is expected in the Northern governorates of *Jendouba*, *Beja*, and *Bizerte* where harvest has started at mid-June. Crops conditions in the inland regions of *Kasserine*, *Siliana* and *Kairouan* (accounting for 80% of national barley production) recovered up to average levels, supported as well by irrigation systems when available. The expected impact of drought on seasonal barley production is now limited. In *Kef*, a fairly good yield is expected relative to its bioclimatic stage, especially in the south of the governorate, in line with average.



**Turkey:** The condition of crop development is mostly favourable in Turkey. Precipitation in May and early June, helped crop development at the stage of heading (especially for wheat), partly recovering the accumulated delay. A large-scale and significant decrease in yield is not expected anymore. Yields are expected to be higher than previous year, but slightly below the last 5-year average. In the Central Anatolia (*Konya*, *Kayseri*), the most productive area, May precipitation was 37.5 mm, less than the normal of 50.2 mm but +100% vs May 2021. In the South-eastern Anatolia, May precipitation was 56.6 mm, a good level compared to the long-term average and the last year, in particular in *Sanliurfa*. For this reason, the outlook at the end of May is more positive than from the last monitoring according to these significant rainfalls combined to favourable temperatures. The first estimate of Turkstat gives a cereals production increase by % 15.7 in 2022 compared to 2021 and to reach approximately 36.9 Mt. For wheat, 2022 production is projected higher with an increase by 10.5% to 19.5 Mt compared to 2021, +47.8% to 8.5 Mt for barley. The estimate may still evolve until the end of the campaign. Bigger areas planted by farmers, themselves motivated by international high prices of grains commodities and government support, have also contributed to this bigger production in 2022.

Summary of national crop outlook evolution from the previous assessment carried out at the beginning of May, i.e. one month ago <sup>9</sup>



<sup>9</sup> A symbol indicates whether the situation has improved ↗, deteriorated ↘ or is similar ↔ with respect to the outlook of end of April 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.

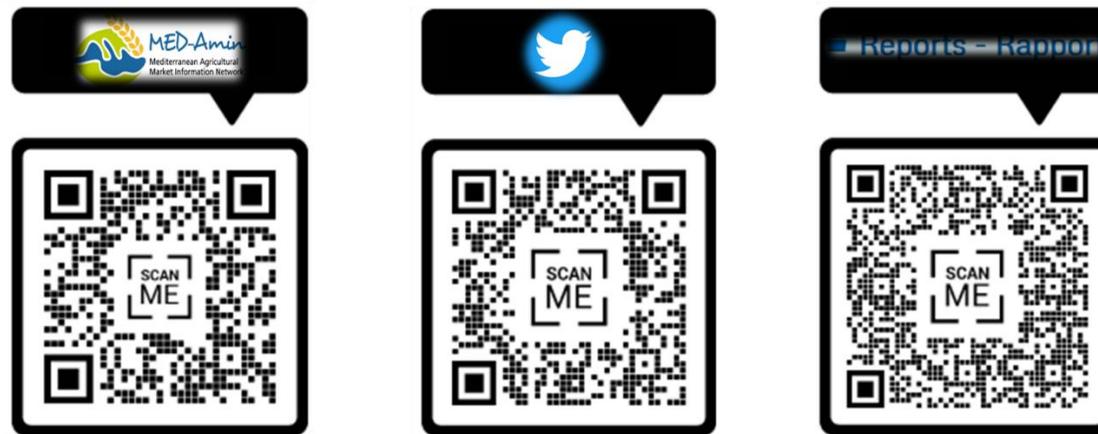
**Crop conditions Drivers (adapted from GEOGLAM nomenclature):**

- **Wet:** Above-average accumulated total precipitation;
- **Dry:** Little or no rainfall period;
- **Hot:** Unusually above-average temperatures;
- **Cold:** Unusually below-average temperatures;
- **Extreme events:** Occurrence of extreme weather events;
- **Delayed onset:** Delayed onset and operations of the crop year;
- **Biotic stress:** Crop impact caused by living organisms, specifically viruses, bacteria, fungi, nematodes, insects, and weeds;
- **Low Input:** limited use of inputs (fertilizers, pesticides, etc.) that could end in moving the outlook for the future harvest (yield, quality).

**Disclaimer**

The geographic borders in the present bulletin are purely a graphical representation and are only intended to be indicative. The boundaries do not necessarily reflect the official position of CIHEAM Montpellier and of the European Commission.

Follow the evolution of the harvest forecasting throughout the campaign:



<https://www.med-amin.org/fr> and [https://twitter.com/MEDAmin\\_network](https://twitter.com/MEDAmin_network).

**Authors:**

David GASC (CIHEAM Montpellier)

[gasc@iamm.fr](mailto:gasc@iamm.fr)

Giacinto MANFRON (EC-JRC, Ispra)

[giacinto.manfron@ec.europa.eu](mailto:giacinto.manfron@ec.europa.eu)



**CIHEAM**

International Center for Advanced  
Mediterranean Agronomic Studies

**MED-Amin**

**Coordination**

CIHEAM at CIHEAM Montpellier

↳ [contact@med-amin.org](mailto:contact@med-amin.org)

**Site Web**

↳ <http://www.med-amin.org>