Issued: 20 March 2023
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European Commission

JRC MARS Bulletin

Crop monitoring in Europe

March 2023

Winter cereals in fair to good condition

Increasing concern about dry conditions in the south

After the mild winter, winter crops entered spring in fair to good condition in most parts of Europe. However, partially expanding and intensifying dry conditions in the south raise increasing concerns. As it is still early in the season, the crop yield forecasts reported here are – with a few exceptions - based on historical trends.

A severe rain deficit is observed in southern Spain and Portugal. Soil moisture levels are very low and rainfall is urgently needed. Moreover, water reservoirs for irrigation in most of southern Spain remain at a very low level, which may also have an impact on crop choice for spring sowings. In northern and central Italy, the prolonged precipitation deficit has strongly reduced the water level in reservoirs (including in the form of snow packs in the mountains) and is causing concern about water availability for irrigation during late spring and summer.

Winter crops in Hungary, Austria, Romania, Bulgaria, Greece and Cyprus are in good condition, but soil moisture levels are low and more rain is needed to meet increasing crop water demands as spring progresses.

The prolonged drought in the Maghreb region has already caused significant negative impacts on crops.

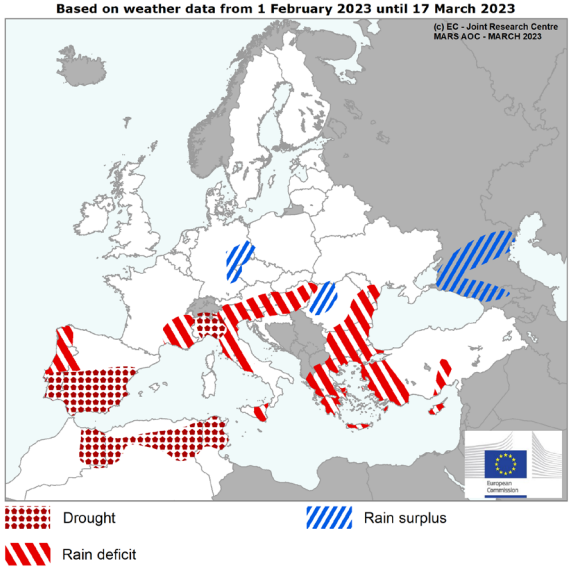
In Türkiye, only western regions remain dry, after recent abundant - locally damaging - rain mitigated the dry conditions in other parts of the country.

Contents:

Covers the period from 1 December until 13 March 2023

AREAS OF CONCERN - EXTREME WEATHER EVENTS

Based on weather data from 1 February 2023 until 17 March 2023



Crop	Yield t/ha				
	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22
Cereals*	5.42	5.47	**5.60**	+ 3	+ 2
Total wheat	5.59	5.57	**5.77**	+ 3	+ 4
Soft wheat	5.81	5.80	**5.99**	+ 3	+ 3
Durum wheat	3.50	3.26	**3.53**	+ 1	+ 9
Winter barley	5.77	5.92	**5.91**	+ 2	– 0
Rye	3.97	4.30	**4.20**	+ 6	– 2
Triticale	4.22	4.42	**4.38**	+ 4	– 1
Rape and turnip rape	3.10	3.33	**3.29**	+ 6	– 1

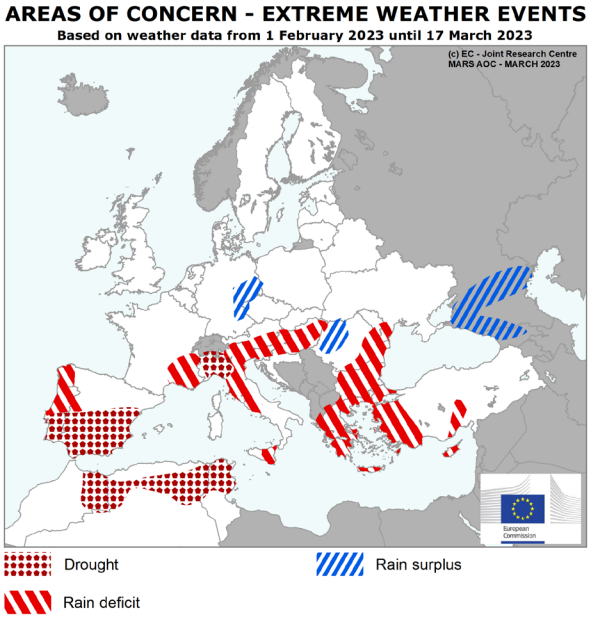
Issued: 17 March 2023

* Only the cereals specified in the table are included

Joint Research Centre

1. Agrometeorological overview

1.1. Areas of concern



The map above considers weather events relevant to agriculture from 1 February to 17 March, while it does not repeat events presented in the February issue of the Bulletin.

A severe rain deficit is observed in southern Spain and Portugal. Soil moisture levels are very low and rainfall is urgently needed. Moreover, water reservoirs for irrigation in most of southern Spain remain at a very low level, which may also have an impact on crop choice for spring sowings; maize and rice may be partly replaced by sunflowers.

In northern and central Italy, a persistent precipitation deficit is observed, most notably in north-western Italy. Despite such conditions, winter crops are still progressing well, but rainfall is urgently needed. The prolonged precipitation deficit has strongly reduced the water level in reservoirs (including in the form of snow packs in the mountains) and is causing concern about water availability for irrigation during late spring and summer.

Distinct rainfall deficits are also observed in Hungary, Austria, Romania, Bulgaria, Greece and Cyprus. In these countries the rainfall deficit is less critical and winter crops are in good condition. However, soil moisture levels are below average and more rainfall is needed to meet the increasing crop water demands as spring progresses.

In most of France, Southern Germany and the United Kingdom, the rainfall deficit observed since mid-January has been mitigated by well distributed precipitation in March and more rain is expected in the next 10 days. As a consequence those regions are not marked on the map.

Rainfall surplus, so far mostly beneficial, is observed in eastern Germany, western Romania and southern Russia.

In Türkiye recent rains, locally very intensive and damaging, have mitigated the dry conditions in large parts of Anatolia and south-eastern provinces. Only western Türkiye remains dry.

Prolonged drought conditions in the Maghreb region, have already caused significant negative impact on crops.

A multi-sectoral analysis of the dry conditions and their impacts can be found in the recent JRC Report *Drought in Europe*[1].

[1] https://publications.jrc.ec.europa.eu/repository/handle/JRC133025

1.2. Meteorological review (1 February –13 March 2023)

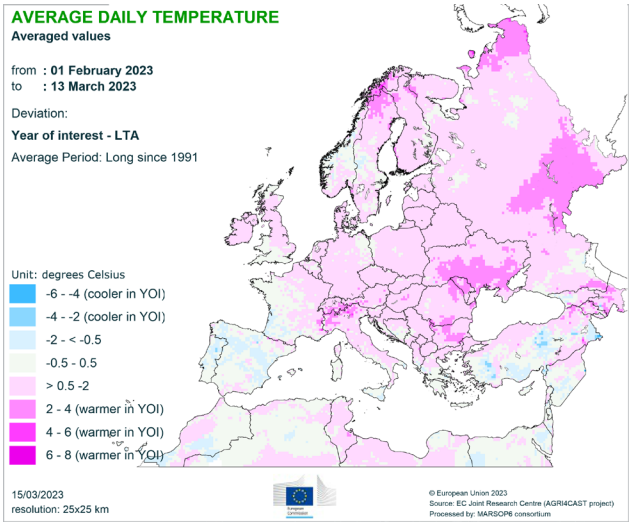
Warmer-than-usual conditions were observed in most of Europe, with drier-than-usual conditions in southern and western parts and wetter-than-usual conditions in most northern parts of the continent.

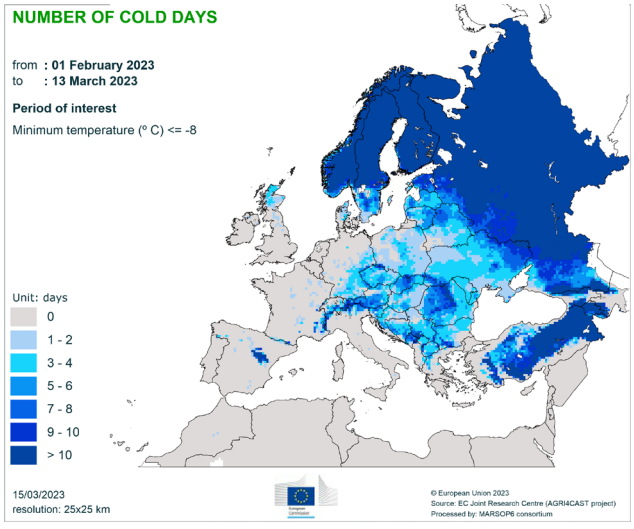
Warmer-than-usual conditions, with daily mean temperatures between 0.5 °C and 2 °C above the 1991-2022 long-term average (LTA), were observed in most of Europe. Temperature anomalies of +2 °C to +4 °C occurred in northern Scandinavia, northernmost and eastern central European Russia, Ukraine, Moldova, northern and southern Romania, central and western Bulgaria, and northern Italy. The number of severe cold events (days with minimum temperature below -8 °C) was lower than usual in most of central and eastern Europe, and their occurrence in central and south-eastern Europe was mostly confined to the first half of February.

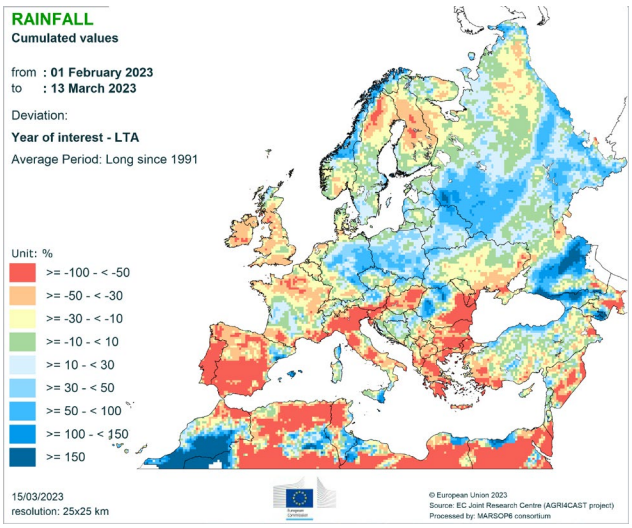
Slightly colder-than-usual conditions, with temperature anomalies of -0.5 °C to -2 °C compared with the LTA, were observed in most of the Iberian Peninsula, south-western France and parts of Türkiye, while temperature anomalies between -2 °C and -4 °C were observed locally in parts of central and western Türkiye. More than 10 days with temperatures below -8 °C were observed in most of Scandinavia and European Russia, as well as in large parts of Türkiye, the Carpathian Mountains and the Alps region.

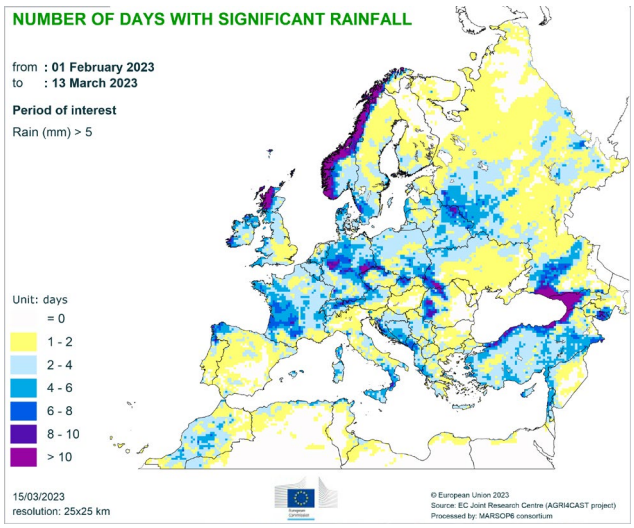
Drier-than-usual conditions, with precipitation anomalies of -50% or less (with respect to the LTA), were observed in most of the Iberian Peninsula, southernmost parts of France, northern and central Italy, southern Austria, Slovenia, Hungary, eastern Romania, Bulgaria, Greece, southern Ukraine and parts of Türkiye, as well as in parts of northern France, Ireland, the United Kingdom and Scandinavia.

Wetter-than-usual conditions (+30% or more with respect to the LTA) were observed in coastal Norway, across the North European Plain and the East European Plain, and in western Romania and southernmost European Russia. In many of these regions, rainfall exceeding the LTA accumulated over 10 or more days that were above the 5 mm threshold.









1.3. Winter review (December, January, February)

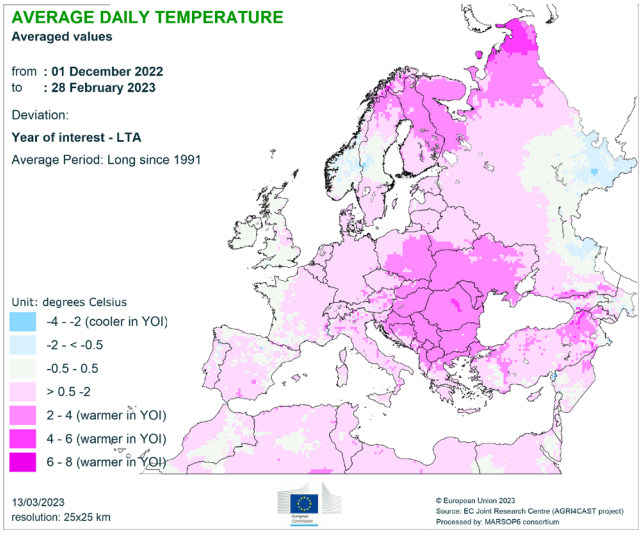
Winter was characterised by persistent warmer-than-usual conditions across most of Europe; drier-than-usual conditions prevailed in most of western and south-eastern Europe, while central and northern Europe were predominantly wetter than usual.

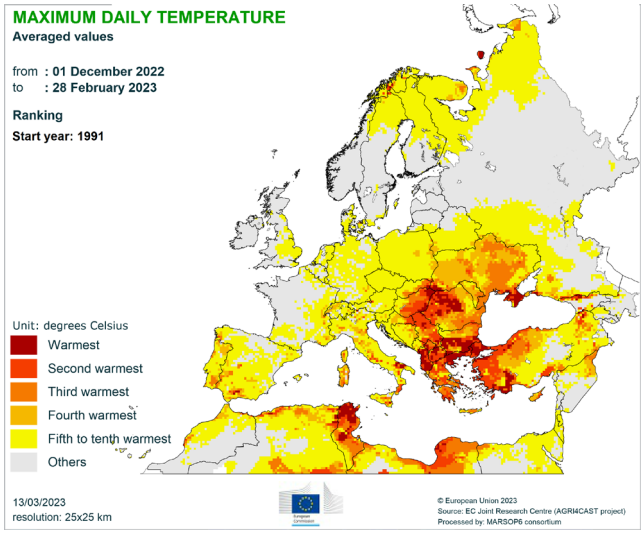
Warmer-than-usual conditions with respect to the 1991-2022 long-term average (LTA) were observed in almost all parts of Europe. Average daily temperature anomalies with respect to the LTA ranged between 2 °C and 4 °C above the LTA in most of the Balkan region, Hungary, Slovakia, Poland, Ukraine, and parts of Türkiye, as well as in northern Scandinavia and European Russia. More distinct positive temperature anomalies (up to 6 °C above the LTA) were observed locally in Romania and northernmost European Russia. Maximum daily temperatures were among the three highest on record since 1991 in most of the Balkan region, western Türkiye, and large parts of Ukraine, as well as locally in Portugal, Spain and Italy. The **number of cold days** (with daily minimum temperature below 0 °C) was less than 40% compared to the LTA in parts of the Iberian Peninsula, large parts of Italy, and small parts of south-eastern Europe and Türkiye. The **number of severe cold events** (with daily minimum temperature below -8 °C) was less than 40% of the LTA in large parts of western, central and south-eastern Europe, parts of Türkiye, and western Ukraine.

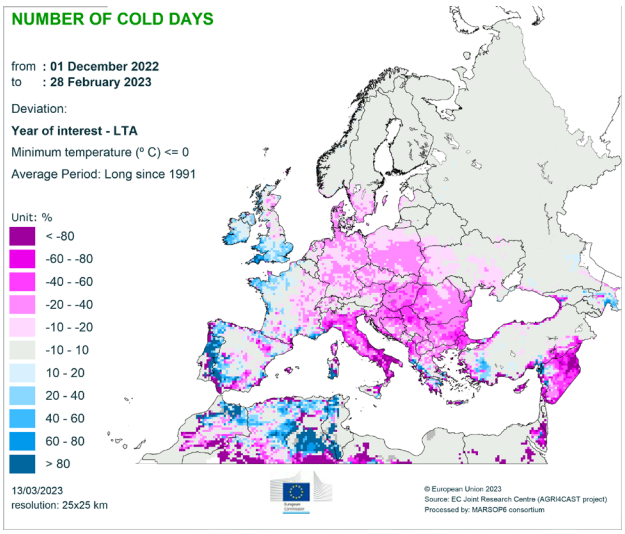
Colder-than-usual conditions, with temperature anomalies between -2 °C and -0.5 °C below the LTA, were observed in parts of Norway and Sweden, and in eastern European Russia. The **number of cold days** (with daily minimum temperature below 0 °C) exceeded the LTA by more than 40% in parts of the United Kingdom and Ireland, in the western Iberian Peninsula, and parts of France, as well as in parts of Greece, Albania and western Türkiye. The **number of severe cold events** (with daily minimum temperature below -8 °C) exceeded the LTA by more than 40% in parts of the United Kingdom, Spain, France, western Türkiye and eastern European Russia. Cold periods occurred mainly at the start of the winter in December in the United Kingdom, and in January and February in the other regions.

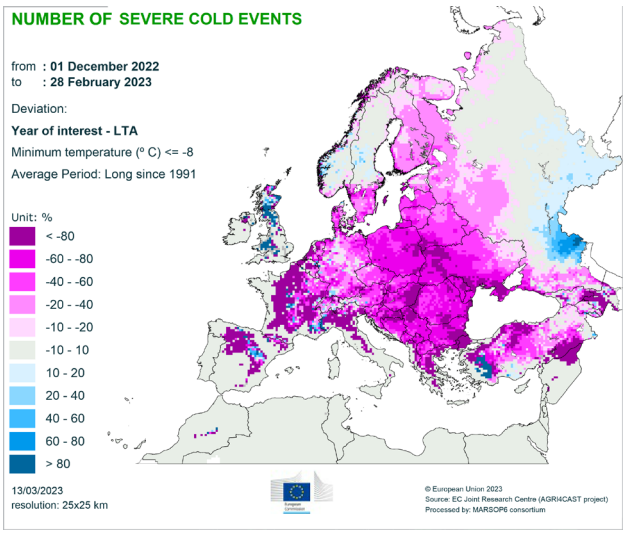
Drier-than-usual conditions were observed in coastal Mediterranean Spain, most of France and the United Kingdom, southern Germany, the Alps region, and northern and southern Italy, as well as in parts of Bulgaria and Greece, most of Türkiye, southern European Russia, parts of Ukraine, Moldova, and along the Black Sea coast in Romania. Precipitation anomalies of -30% or more negative (with respect to the LTA) were observed in substantial parts of these regions. This is reflected in the climatic water balance with most of these regions ranked in the driest years since 1991.

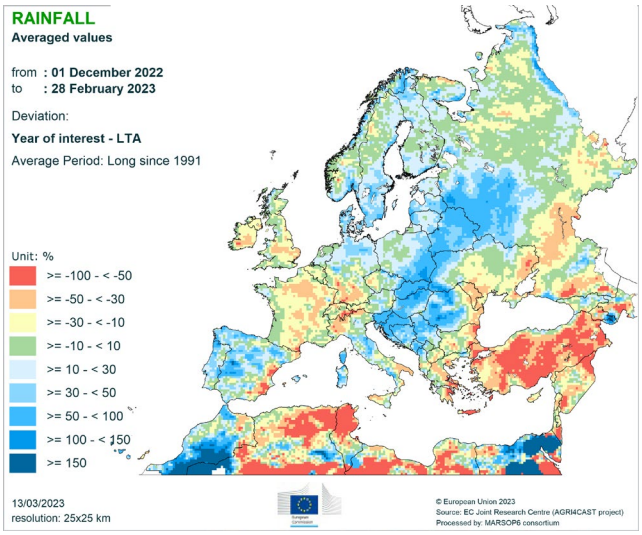
Wetter-than-usual conditions (50% or more rainfall with respect to the LTA) were observed in a region extending north-east from the Adriatic coast of the Balkans through Hungary, Slovakia, most of Romania, eastern Poland, western Ukraine, Belarus, and into parts of central European Russia, as well as in the Ural Mountains region, parts of Scandinavia, northern Germany, the Iberian Peninsula, and parts of Italy. This is reflected in the climatic water balance with most of these regions ranked in the wettest three years since 1991.

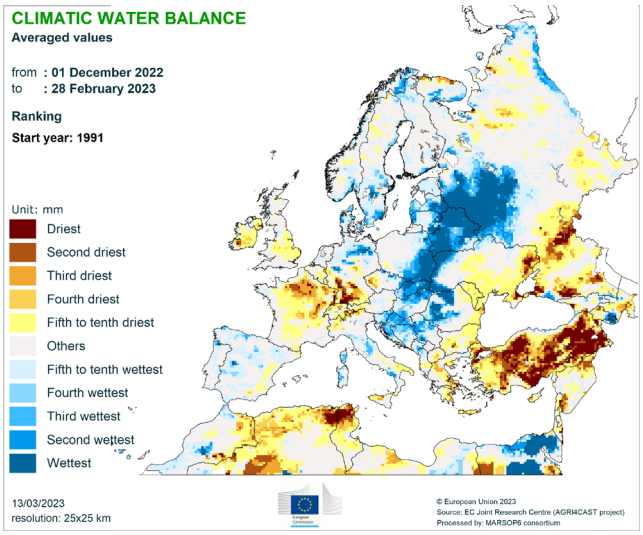




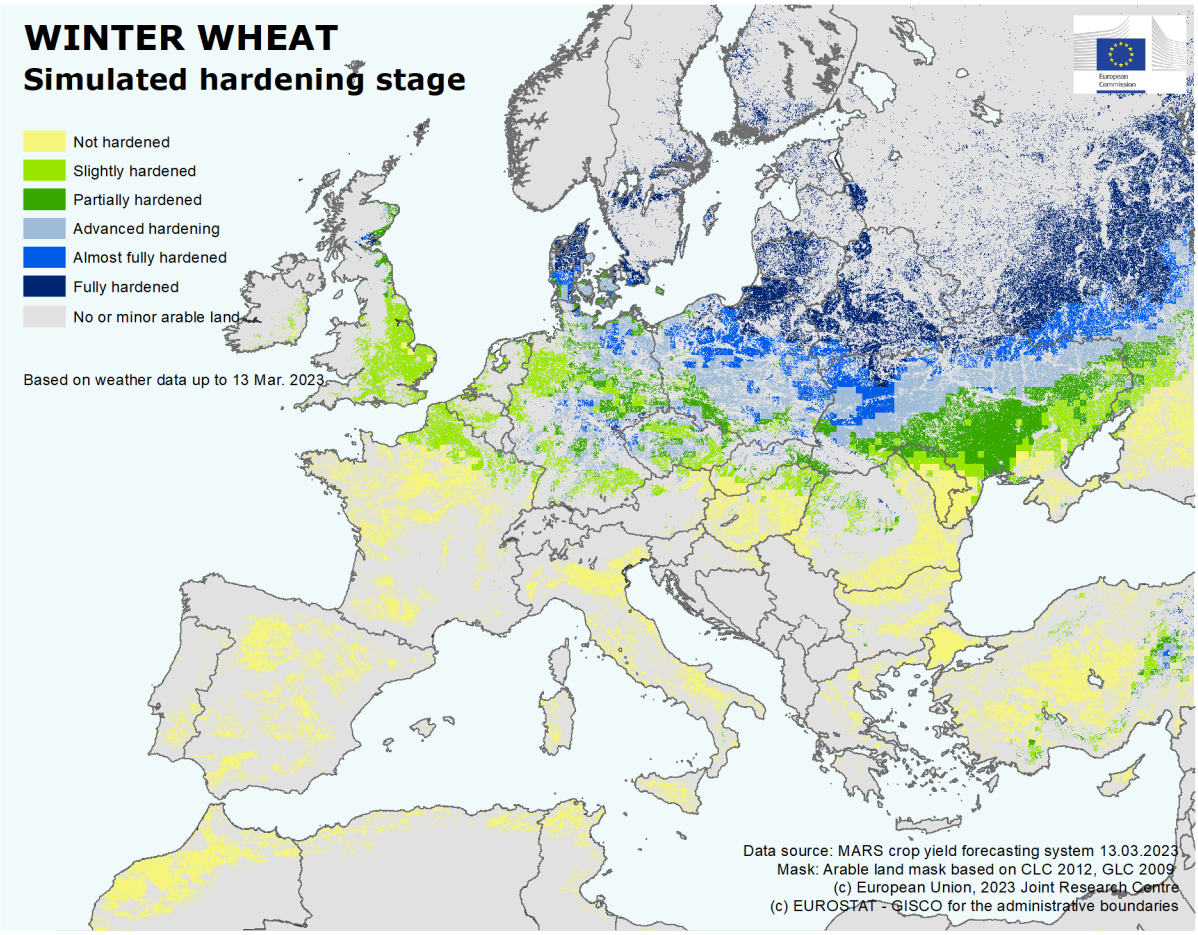

NUMBER OF COLD DAYS
from : 01 December 2022
to : 28 February 2023
Deviation:
Year of interest - LTA
Minimum temperature (° C) <= 0
Average Period: Long since 1991
Unit: %
< -80
-60 - -80
-40 - -60
-20 - -40
-10 - -20
-10 - 10
10 - 20
20 - 40
40 - 60
60 - 80
> 80
13/03/2023
resolution: 25x25 km
© European Union 2023
Source: EC Joint Research Centre (AGRI4CAST project)
Processed by: MARSOP6 consortium


NUMBER OF SEVERE COLD EVENTS
from : 01 December 2022
to : 28 February 2023
Deviation:
Year of interest - LTA
Minimum temperature (° C) <= -8
Average Period: Long since 1991
Unit: %
< -80
-60 - -80
-40 - -60
-20 - -40
-10 - -20
-10 - 10
10 - 20
20 - 40
40 - 60
60 - 80
> 80
13/03/2023
resolution: 25x25 km
© European Union 2023
Source: EC Joint Research Centre (AGRI4CAST project)
Processed by: MARSOP6 consortium


RAINFALL
Averaged values
from : 01 December 2022
to : 28 February 2023
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Unit: %
>= -100 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 100
>= 100 - < 150
>= 150
13/03/2023
resolution: 25x25 km
© European Union 2023
Source: EC Joint Research Centre (AGRI4CAST project)
Processed by: MARSOP6 consortium


CLIMATIC WATER BALANCE
Averaged values
from : 01 December 2022
to : 28 February 2023
Ranking
Start year: 1991
Unit: mm
Driest
Second driest
Third driest
Fourth driest
Fifth to tenth driest
Others
Fifth to tenth wettest
Fourth wettest
Third wettest
Second wettest
Wettest
13/03/2023
resolution: 25x25 km
© European Union 2023
Source: EC Joint Research Centre (AGRI4CAST project)
Processed by: MARSOP6 consortium

1.4. Winter hardening and frost-kill analysis



Hardening is the bio-physiological process whereby winter cereals gain low-temperature tolerance to withstand freezing conditions that occur during the winter dormancy period.

After favourable conditions for hardening during the first dekad of February, above-average temperatures prevailed during the review period, resulting in a de-hardening process in large parts of Europe. As of 13 March, winter cereals have de-hardened entirely in southern Europe and in the Black Sea region (Bulgaria, eastern Romania, southern Ukraine and south-western Russia), which is approximately 2-3 weeks earlier than last year. In western parts of central Europe, winter cereals are predominantly slightly to partially hardened, while simulations of the hardening stage in the northernmost regions suggest that crops still have good frost resistance.

According to our models, no substantial frost damage occurred during the reporting period due to the predominantly mild temperatures. Minor damage may have occurred in the *Aragon* region in Spain, which experienced severe frosts from 27 February to 2 March. However, this area is not subject to intensive agricultural use and thus, no significant area or yield losses are expected at national level.

Weather forecasts until 23 March suggest continued above-average temperatures across Europe, which would further accelerate de-hardening. This would increase the vulnerability of winter cereals in the event of late cold spells, which are however not currently forecast.

1.5. Weather forecast (17-26 March)

Warmer-than-usual temperatures are forecast for most of Europe, while colder-than-usual conditions are expected in northern Scandinavia. Drier-than-usual conditions are forecast for most of central and eastern Europe and parts of southern Europe, while wet spells are expected in western Europe, the Alps, most of Scandinavia, northern European Russia and parts of Türkiye.

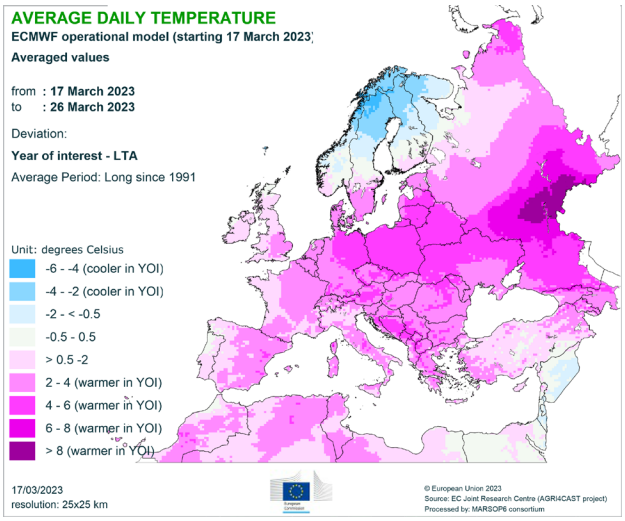
Warmer-than-usual conditions, with average daily temperatures up to 4 °C above the LTA, are forecast in most of Europe. More distinct positive temperature anomalies are forecast in the North European Plain and large parts of the East European Plain. Minimum daily temperatures will remain above 0 °C in most of the Iberian Peninsula, western Europe, Germany, and Italy, as well as in most of Greece, parts of Türkiye, Bulgaria, Romania, and south-eastern Ukraine, and in southern European Russia.

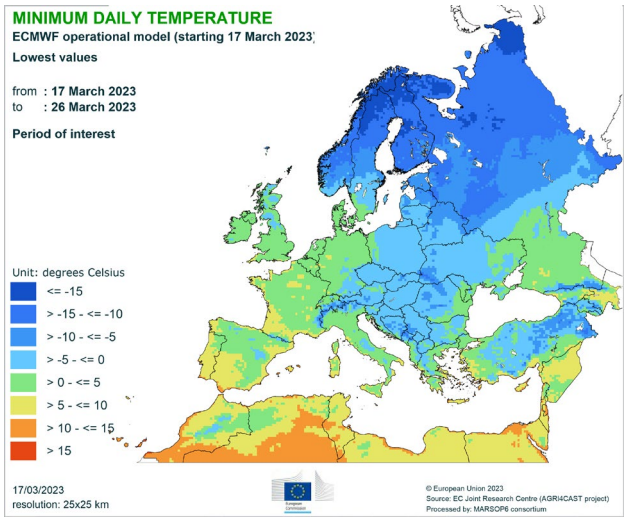
Colder-than-usual conditions, with temperature anomalies down to 6 °C below the LTA, are forecast for northern Scandinavia. In parts of Scandinavia and northernmost European Russia, minimum daily temperatures are expected to stay below -15 °C, while in most of central and eastern Europe, parts of the Balkans, and most of Türkiye, minimum daily temperatures between -5 °C and -10 °C are forecast. In some of these regions, 9-10 days with minimum temperatures below 0 °C are forecast.

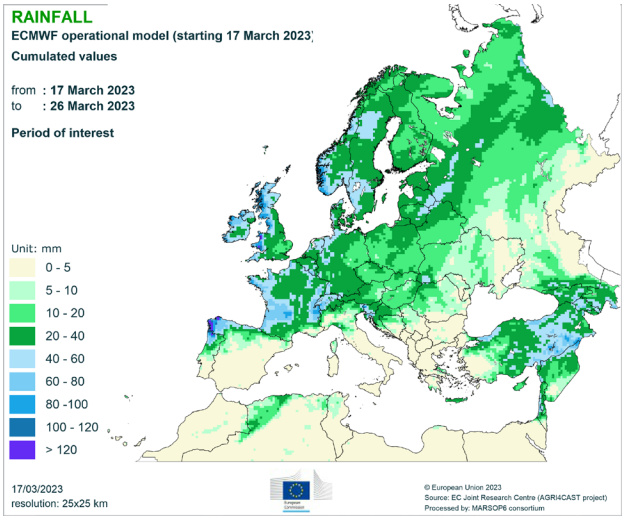
Dry conditions (rainfall below 5 mm) are expected in southern Portugal, most of Spain, southernmost France, most of Italy, most of the Balkans, parts of Romania, eastern Ukraine, and parts of central European Russia.

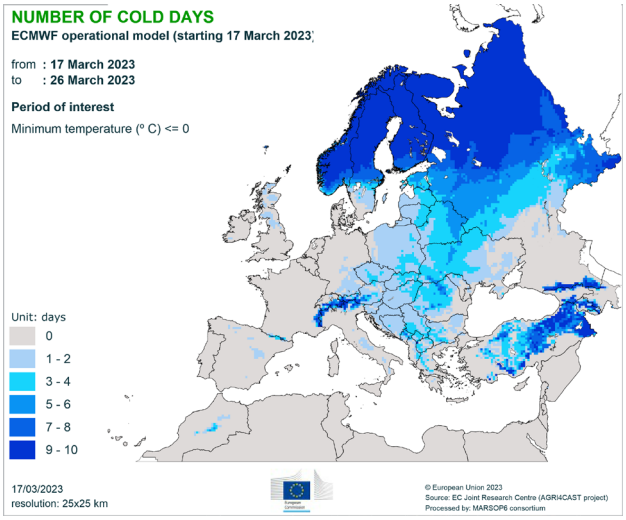
Wet conditions (rainfall up to 40 mm) are forecast for most other parts of Europe. Coastal United Kingdom and Ireland, as well as the north-western Iberian Peninsula, western France, the North Sea coastal regions, and parts of Türkiye are forecast to receive up to 120-150 mm of rainfall.

The **seasonal forecast** is for very likely warmer-than-usual conditions (high probability of exceeding median air temperatures) during April and May in parts of central Europe, southern Italy, most of the Balkan region and Türkiye. In June, in addition to these regions, there will also be a high likelihood of exceeding median air temperatures in the Iberian Peninsula, parts of France, the United Kingdom and southern Scandinavia. The likelihood of wetter-than-usual conditions in April-May-June is relatively low in most of Europe.






RAINFALL
ECMWF operational model (starting 17 March 2023)
Cumulated values
from : 17 March 2023
to : 26 March 2023
Period of interest
Unit: mm
0 - 5
5 - 10
10 - 20
20 - 40
40 - 60
60 - 80
80 -100
100 - 120
> 120
17/03/2023
resolution: 25x25 km
© European Union 2023
Source: EC Joint Research Centre (AGRI4CAST project)
Processed by: MARSOP6 consortium


NUMBER OF COLD DAYS
ECMWF operational model (starting 17 March 2023)
from : 17 March 2023
to : 26 March 2023
Period of interest
Minimum temperature (° C) <= 0
Unit: days
0
1 - 2
3 - 4
5 - 6
7 - 8
9 - 10
17/03/2023
resolution: 25x25 km
© European Union 2023
Source: EC Joint Research Centre (AGRI4CAST project)
Processed by: MARSOP6 consortium

2. Grassland and fodder in Europe – regional monitoring

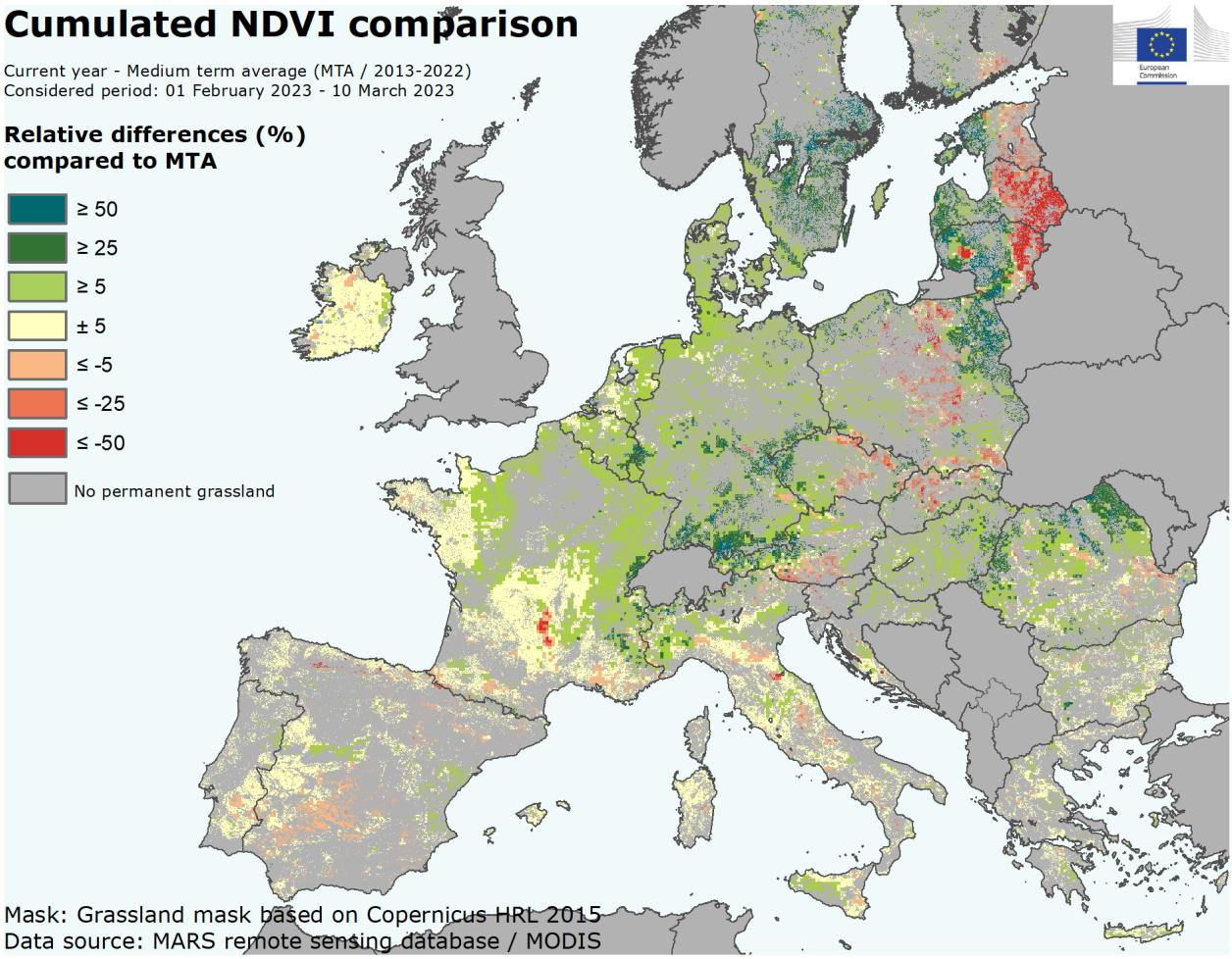
Favourable conditions in the north but southern regions under stress

The map below displays the differences between the cumulative Normalized Difference Vegetation Index (NDVI) from 1 February to 10 March 2023 and the medium-term average (MTA, 2013-2022) for the same period. Positive anomalies (in green) in this period reflect above-average surface greenness representing early regrowth, while negative anomalies (in red) reflect below-average surface greenness or delayed regrowth. At this stage of the year, the status of fodder crops cannot yet be assessed.

In large parts of Europe, mild winter weather conditions with frequent rainfall events have been favourable for grasslands, as reflected by the light green colours on the map such as in northern **Germany**, **Denmark**, southern **Sweden**, western **Poland** and **Hungary**. Average conditions (light yellow) are found in large parts of **Ireland, Benelux, France, Spain, Portugal, Italy, Croatia, Greece, Bulgaria** and central **Romania.**

Below-average photosynthetic activity and biomass accumulation can be inferred from the light red areas in large parts of **Spain** and **Portugal**, along the Po Valley in **Italy**, in eastern **Romania** and southern **France**. This is mostly attributed to lack of rain during the observation period. Rainfall deficits in other regions (see p.2 Areas of Concern) have not yet had a clear visible impact on grasslands.

Many of the areas marked by very dark green colours in mountainous regions, eastern **Poland**, the Baltic Sea region and Scandinavian countries are areas that in average years would still be covered by snow and/or clouds during most of the observation period. Many of the red and dark red areas are associated with continued snowy conditions during most of the review period, such as in the **Baltic Sea** region, **Poland**, **Austria**, **Slovakia, Czechia** and the departments of *Lozère* and *Cantal* in southern **France**. In these areas, the status of grassland cannot be correctly assessed at this early stage of the year.



3. Country headlines

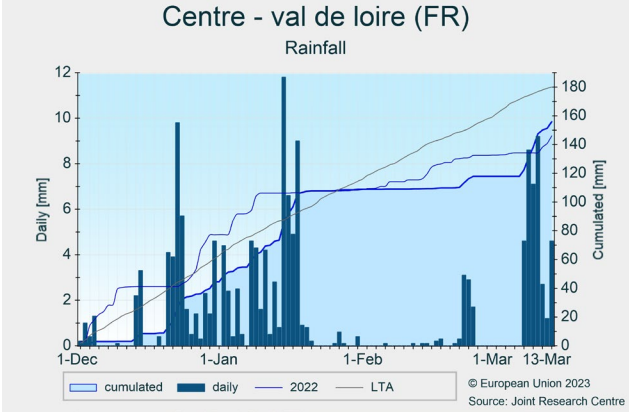
3.1. European Union

France

February drought raised doubts about the favourable early winter conditions

Until early December, temperatures and precipitation were in line with the LTA. The country was then hit by a strong cold wave that lasted until 17 December. This was followed by a sudden rise in temperatures until mid-January, with a national average temperature of 9.7 °C, almost 5 °C above the LTA. Since then, temperatures have fluctuated around the LTA. Rainfall was below average. At national level, we recorded the longest period without significant rainfall (from 21 January to 21 February). As a result, soils are drier than usual and water tables are still low.

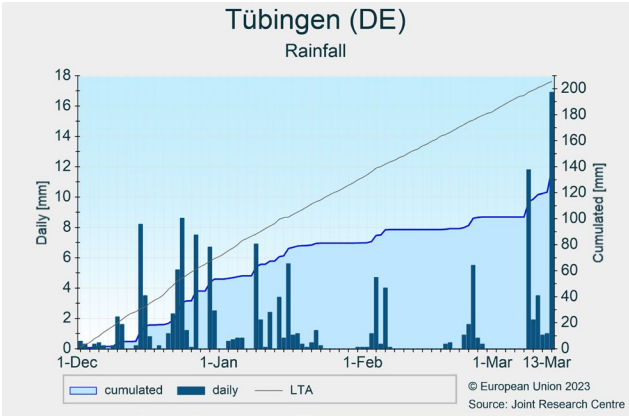
Despite the rain deficit, winter crops were in good condition by the end of the meteorological winter[2] and March rainfall partially compensated for the accumulated deficit. However, more rainfall will be needed to sustain the crops as water demands increase. The lack of winter moisture has also caused delays in the spring cereal sowing campaign. Ground water tables remain below average, with 80% of levels moderately low to very low[3], especially in the large south-eastern part of the country.



Germany

Mild winter with rainfall deficit in the south

Early December was characterised by a cold spell with minimum temperatures as low as -15 °C, followed by mild temperatures from 19 December to 15 January, with record-high peaks of 19 °C on New Year's Eve. From 17 January, temperatures around the long-term average (LTA) restored winter crop hardening to normal levels and left the crops in good shape. Another warm spell at the end of February and some colder-than-average days in early March concluded the review period without affecting the overall crop conditions. Rainfall totals have been above average in the north, but remained well below the LTA in the south. While large parts of Germany received around 50-70 mm in December, the discrepancy between north and south increased from January onward. Rainfall in January and February further improved soil water conditions in northern Germany, whereas the south (especially Baden-Württemberg) has been suffering an increasing precipitation deficit, with dry conditions persisting throughout February and rainfall totals regionally less than 60% of the LTA.



[2] https://cereobs.franceagrimer.fr/cereobs-sp/#/publications

[3] https://www.brgm.fr/fr/actualite/communique-presse/nappes-eau-souterraine-au-1er-mars-2023

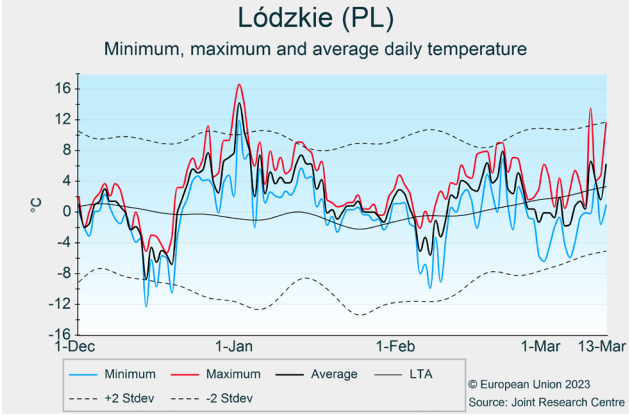
Poland

Winter crops are in fair condition

December was partially colder than usual with temperature minima generally below -10 °C, with local exceptions falling below -17 °C. This was followed by a very mild January, with temperature anomalies exceeding the LTA by more than 4 °C. A much colder-than-usual first dekad of February, with local temperature minima below -10 °C was followed by temperatures above the LTA prevailing until the end of the month. In March temperatures shifted dynamically from colder to warmer than usual.

Frequent precipitation during the period of review resulted in precipitation totals ranging from slightly (NW) to significantly (SE) above average and generated adequate soil water reserves for the start of the growing season.

There are currently no major concerns related to the condition of winter crops. As indicated by our model, the above mentioned cold spells did not cause serious frost damage to adequately hardened winter crops. The early season yield outlook is in line with the historical trends.

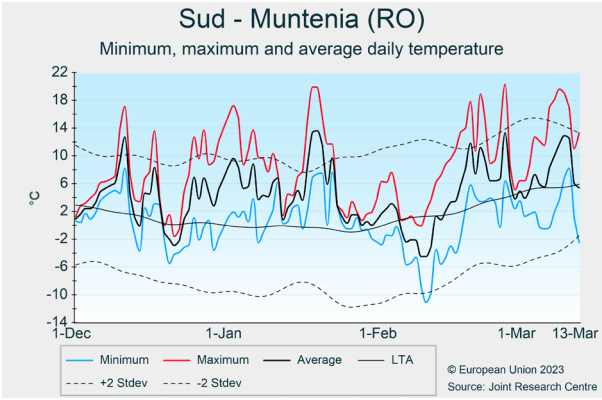


Romania

Rainfall needed to sustain fair crop condition

Favourable conditions continued in Romania during winter. The country experienced exceptionally mild conditions from December 2022 until February 2023, with temperatures 2 °C to 4 °C above the LTA. A short cold spell around 10 February did not cause any frost-kill damage. Warmer-than-usual conditions continued during the first half of March, resulting in an early restart of vegetative growth.

In most regions, winter rainfall was 30% to 50% above the LTA. Drier-than-usual conditions were observed only in the south-eastern parts of the country, along the borders with Bulgaria, Ukraine and Moldova, with rainfall locally up to 50% below the LTA. The first half of March was significantly drier than usual in all regions, most distinctly in the eastern half of the country. Hence, rainfall is needed to avoid further depletion of soil moisture, especially in the south-east, where also water reserves for irrigation during spring are currently low. Our current yield forecasts are based on historical trends.



Spain and Portugal

Southern and central regions under stress

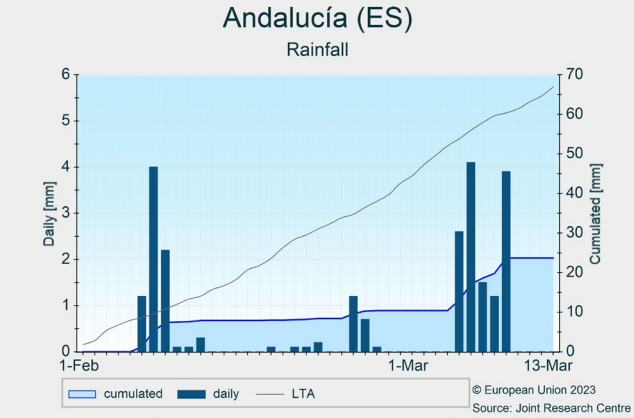
December started with 2 dekads of regular rainfall throughout the Peninsula, which was very beneficial to crop emergence and early development. In January and February there was a large deficit of rainfall in central and southern parts of the peninsula.

The December rainfall was not sufficient to fully replenish soil moisture in the deeper root zone. Some crops may already have lagged behind in growth. There is a pressing need for regular significant rainfall.

Reservoirs in southern Spain have remained at a very low level, with the relative exception of *Extremadura* where the average water level is at 51.9% of capacity[4]. In Portugal, water levels are close to capacity, with some noteworthy exceptions, e.g. 11% in *Monte de Rocha*, 13% in *Bravura* (*Algarve*)[5].

The dry conditions and low levels of water reserves for irrigation may also have an impact on spring sowings in the southern provinces of Spain, where maize and rice may be partly replaced by sunflowers.

Most of our current yield forecasts are near the 5-year average and partially based on historical trends. The forecasts for durum wheat, rye and triticale in Spain and soft wheat and winter barley in Portugal are below the 5-year average.

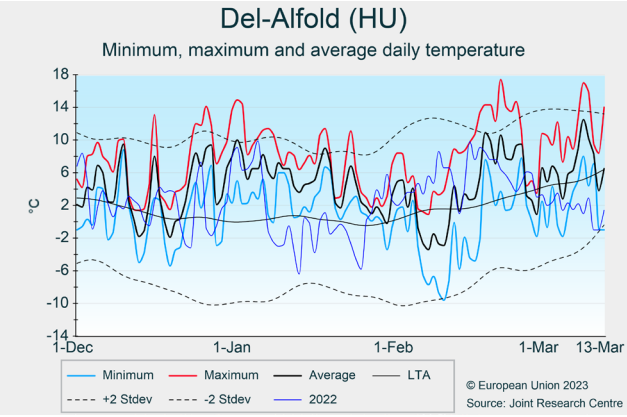


Hungary

Rain required to maintain favourable post-winter conditions

Since early December, the country has experienced warmer and wetter weather than usual. Temperatures were 2 °C to 5 °C above the LTA between 1 December and 10 March, except for a short cold spell in early February. Rainfall exceeded the LTA by up to 100% in large parts of the country; only the far west and south-east recorded average rainfall. Soil moisture had recovered to higher-than-usual levels by January, thanks to precipitation in early autumn and winter that helped to recover from the extremely dry summer of 2022. Since February, rainfall has been below the LTA across the country, with about 20 mm less precipitation than in an average year.

Conditions since December have been advantageous, with no frost-kill damage reported, for winter crops that finished dormancy by February, when the sowing campaign for spring crops also started. The remote sensing vegetation index indicates that biomass at the end of winter is higher than usual, especially in the eastern part of the country, due to higher rainfall and cumulative temperature since the autumn. The start of re-growth requires water that can currently be supplied by replenished soil moisture reserves. Nevertheless, more rainfall is desirable in the coming month to maintain the good yield potential, especially in the northern part of the country. The spring cereal sowing campaign has benefited from adequate soil water supply since early February. However, the weather outlook for the coming week does not predict any rain. Overall, we maintain our yield forecast for a positive trend.



[4] www.embalses.net, 13 March 2023
[5] https://sir.dgadr.gov.pt/reservas, 3 March 2023

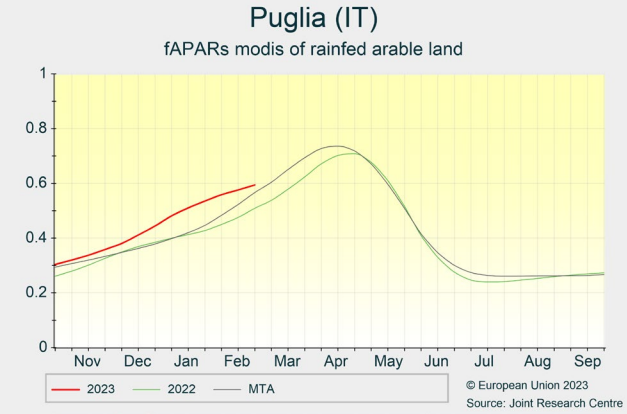
Italy

Winter crops are in good shape but soil moisture is low

In Italy, the phenological cycle of winter crops is advanced, compared with an average season and crops are in good condition. However, there are increasing concerns about low soil moisture content and water availability for irrigation during spring and summer.

In northern Italy, the winter was marked by very warm temperatures, with the period 1 December – 13 March ranking among the top three warmest in our records. Very dry conditions are observed in north-western regions, notably in *Piemonte*. Alpine snow accumulation is lower than last year and water reservoirs already present very low levels. Concerns about water availability for irrigation in spring and summer have already had an impact: the rice area planted will be further reduced compared to last year.

In southern and central Italy, the warm temperatures and close-to-average precipitation led to favourable development of winter crops, resulting in good prospects especially for durum wheat yields.

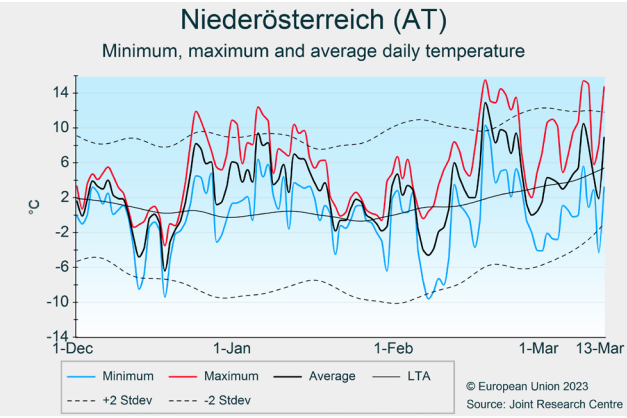


Czechia, Austria and Slovakia

Crops in fair condition after mild winter

Overall, the reporting period was mild, with temperatures predominantly above normal, especially from the last dekad of December until the second dekad of January, and since mid-February. Only during two cold spells in the second dekad of December and the first dekad of February did temperatures fall below -10 °C.

Cumulative precipitation for the period of review has been around the LTA, except in north-eastern Czechia and in Slovakia, where rainfall totals reached significantly above the LTA (>30% and >67%, respectively) thanks to abundant rain in December and January. As a result, soil moisture reserves are generally adequate at the onset of the growing season. According to our model, winter crops were not seriously damaged by the cold spells, and the current yield outlook for winter crops is in line with the long-term trend.



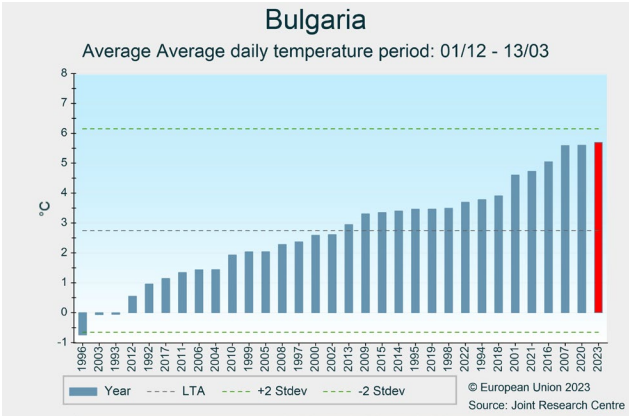
Bulgaria

More rain needed to sustain good condition of winter crops

Bulgaria experienced an unusually mild winter, the warmest at national level in our database (since 1991). Only the first half of February was significantly colder than usual, but minimum temperatures remained above critical levels and no frost damage to crops is expected to have occurred.

After the unusually dry autumn, rainfall in north-western regions has been average, while in other regions (most distinctly in the east) rainfall remained 50-70 mm below the LTA. Over the period since the end of summer, the accumulated rain deficit in eastern and central Bulgaria is up to 150 mm, which means that ground water tables and soil moisture in deeper soil layers have not been restored to normal post-winter levels.

Winter crops benefited from the predominantly favourable temperatures, which allowed winter crops to establish and develop well despite the delayed sowings in autumn. Canopy expansion has been above-average as inferred from satellite imagery. Rainfall has been sufficient to sustain the good growth so far, but considering the relatively dry soils, particularly in the east, more spring precipitation is needed to maintain the positive picture.



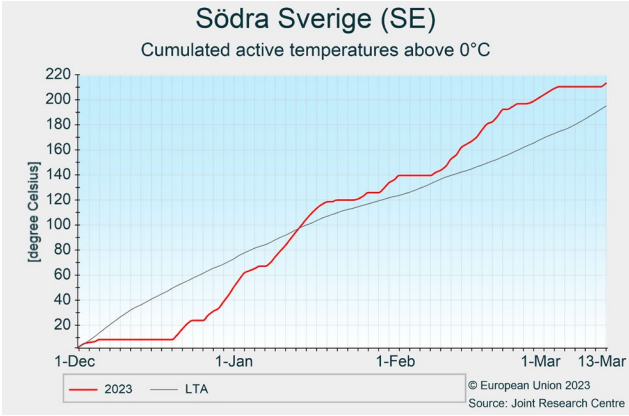
Denmark and Sweden

Winter crops in fair condition

Warmer-than-usual winter temperatures prevailed during the review period in Denmark and southern Sweden, except for short cold snaps during the first half of December and in mid-March, and closer-to-average conditions during the second half of January and at the beginning of March. Significant rainfall was registered until the second dekad of January, while precipitation has been slightly below average since mid-February. Rainfall totals for the review period as a whole are well above the LTA in both countries thanks to the abundant January rainfall.

Winter cereals are expected to be in good condition. The situation is more contrasted for rapeseed, as the December cold snap may have affected plants locally in southern Sweden, although no major concern is to be expected. Sowing of spring crops could start soon if temperatures rise again, thus benefiting from adequate soil moisture conditions.

Historical trends were used to forecast crop yields.

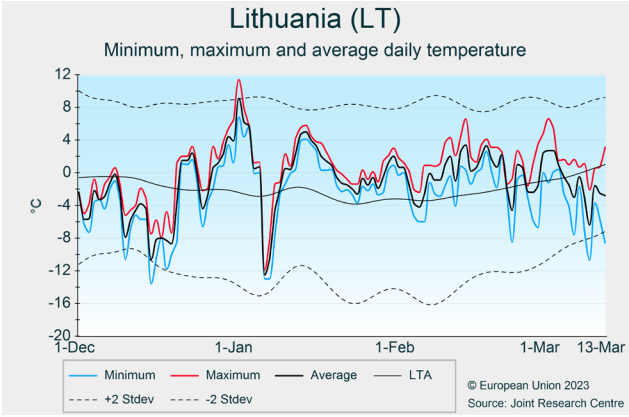


Estonia, Latvia, Lithuania, Finland

Winter crops generally in good condition

In general, prevailing winter temperatures were above the LTA, while some colder-than-average temperatures were experienced in early December, early January and early March. Cumulative precipitation was above or close to average during the review period.

Crops passed the winter period in good condition. Re-growth after winter dormancy has not yet started; neither has sowing of spring crops. However, the forecast increase in temperatures in the coming week should be beneficial for the re-start of growth in the southern areas of the Baltic countries. Current yield forecasts are based on historical trends.



Greece and Cyprus

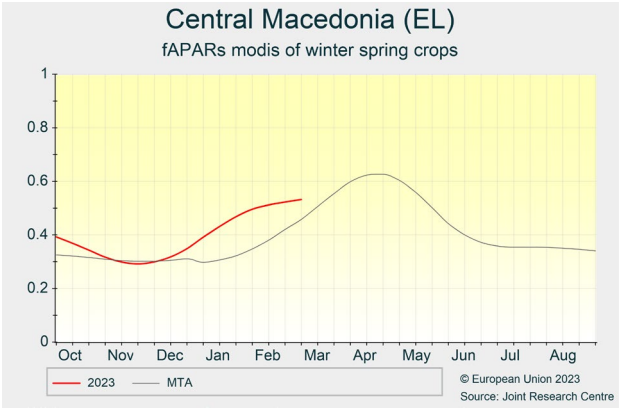
Advanced crop development in Greece despite the late sowing

In Greece, the sowing of winter cereals started with a delay of around two weeks[6].

During the period under review crops benefitted from normal to slightly warmer-than-usual temperature regime and from fairly well distributed rainfall, even though cumulated rainfall fell by about 10% to 30% compared to the long-term average for the same period in the breadbasket regions of the country: *Central Macedonia, Thessaly, West Macedonia, East Macedonia and Thrace.* These beneficial conditions accelerated the development of cereals, which are now vulnerable to late frosts and probably also already have a higher water consumption rate; hence rain is needed in the coming weeks to sustain steady growth.

By contrast, Cyprus is facing an important rain deficit since early February. This is reflected in lower-than-usual biomass accumulation levels.

Our March forecasts are close to the last 5-year average in both countries and in line with the historical trends.

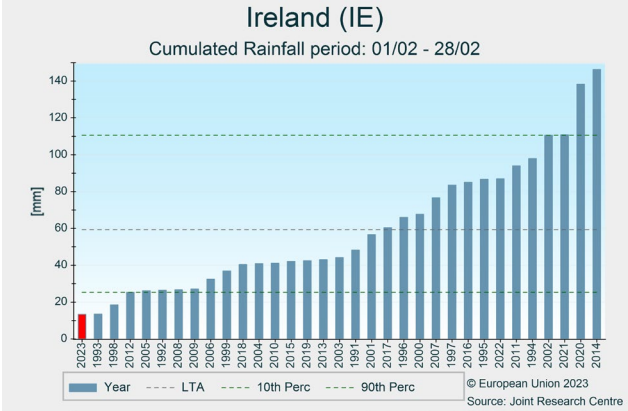


[6] https://joint-research-centre.ec.europa.eu/jrc-news/normal-autumn-weather-allows-good-progress-harvesting-and-sowing-2022-10-24_en

Ireland

Dry conditions facilitate spring field operations

Overall thermal conditions during winter have been close to average or slightly above, with warmer periods alternating with colder-than-usual days. Precipitation remained below seasonal levels, aside from close-to-average levels in the first two dekads of January, after which rainfall remained below the LTA. February was the driest of the past 30 years. Dry weather created optimal terrain conditions to start winter crop field operations such as the application of fertilisers and pesticides. Spring sowing only made a weak start, but is expected to accelerate in the coming weeks, if current favourable conditions continue. The above-average rainfall expected in the coming days will limit field works, but will improve soil moisture levels in the top soil. The overall outlook for winter crops is positive. The forecasts for all crops are based on the historical trend.

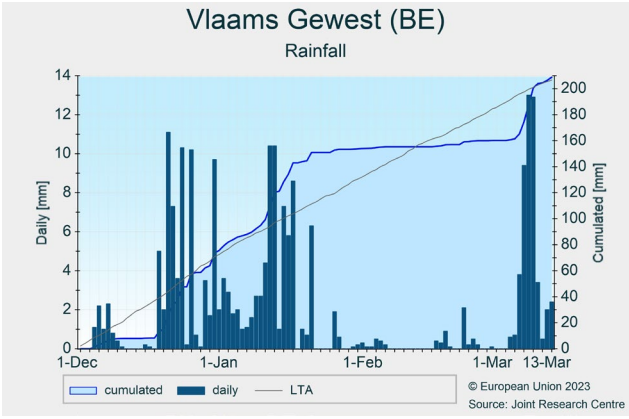


Belgium, Luxembourg and the Netherlands

Fair start to spring

The review period started cold and almost dry up until 19 December, followed by a distinctly warmer and wetter-than-usual period until 20 January. From mid-January, a dry period continued until early March, with temperatures around average. The last week of the review period was then rainy again. It resulted in close-to-average rainfall for Belgium, Luxembourg and the northern Netherlands, while the central and southern Netherlands received 20-30% more rainfall for the entire review period. Throughout the Benelux, temperature accumulation was slightly higher than LTA, indicating at a slightly warmer-than-average winter as a whole. Minimum temperatures during the coldest days remained above -8 °C in most regions.

Winter crops – particularly the early-sown ones - are generally in good condition. The warmer-than-usual autumn allowed the crops to establish well before winter, and little or no damage was incurred during winter. Therefore, growth is expected to take off as soon as temperatures increase (as forecast for the coming days). The current crop yield forecasts are based on historical trends.

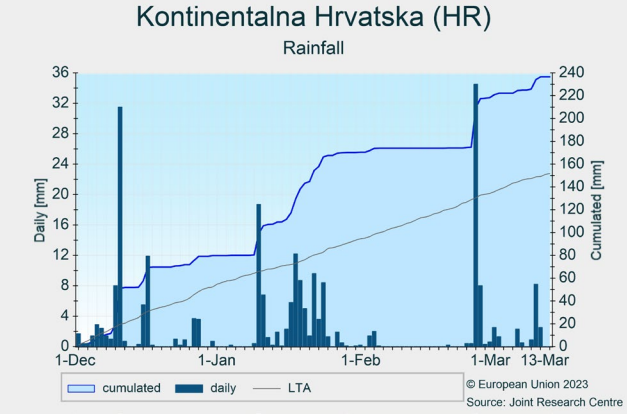


Slovenia and Croatia

Favourable outlook for winter crops

In both countries, the winter was warmer than average, except for brief cold spells in mid-December and early February when temperatures dropped to as low as -8 °C. The accumulated temperature (measured from 0 °C) was largely above the LTA. Significant rainfall events occurred in early December, late January and the first dekad of March, resulting in cumulative precipitation above the LTA for the review period as a whole, with rainfall totals up to 240 mm in eastern Croatia and south-eastern Slovenia. However, there was almost no rainfall recorded in February in either country.

Overall, the outlook is positive for winter crops. The warm winter weather was accompanied by relatively abundant rainfall during most of the review period, but there have been no reports of increased pest pressure so far. Nevertheless, additional rainfall will be necessary in the coming weeks to maintain good crop development, especially in Slovenia. Crop yield forecasts are based on trends.

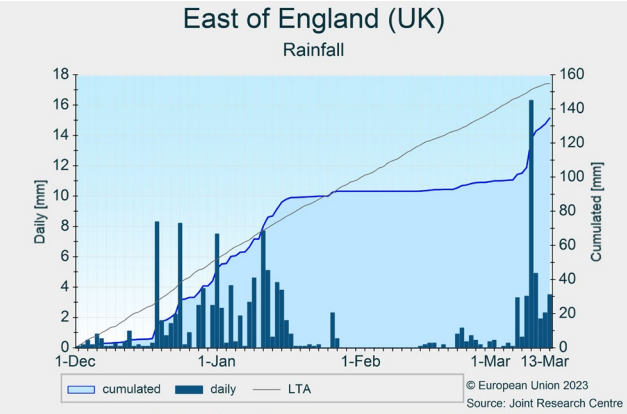


3.2 United Kingdom

Winter crops in fair condition after a dry late winter

The review period was characterised by several warm days that alternated with cold spells in mid-December and mid-January. Since early March, temperatures fell again below the LTA. Precipitation totals were around average until mid-January, but then remained below the LTA, with the driest February in our records (comprising the past 30 years) in many agricultural areas (South West, Wales, South East, East).

The warm and dry spell since the end of January permitted the first fertiliser applications and an early start to spring drilling. Winter crops are in good conditions. However, the mild weather also favoured disease development in winter cereals, which is currently being closely monitored. The overall outlook for winter crops is positive.



3.3 Black Sea Area

Ukraine

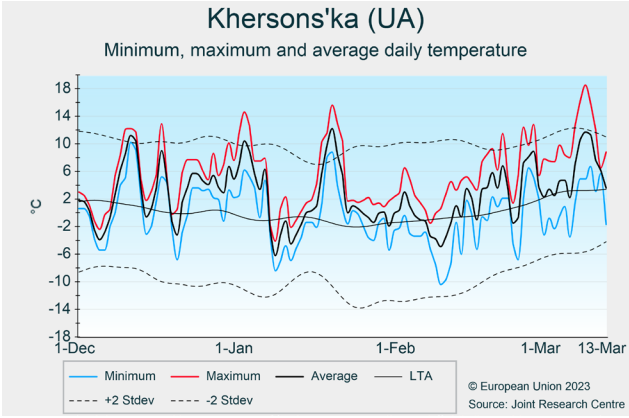
Winter crops in fair condition

Following the overall wetter-than-usual conditions during autumn, near seasonal precipitation prevailed in Ukraine during winter. A slight rain deficit with precipitation up to 30% below the LTA was recorded in parts of the southern (e.g. *Odes'ka*, *Mykolayivs'ka*) and eastern (e.g. *Luhans'ka*, *Donets'ka*) oblasts.

Exceptionally warmer-than-usual conditions prevailed from December 2022 until February 2023. In the eastern oblasts, daily average temperatures were 1 °C to 2 °C above the LTA. In the central and western oblasts, a positive anomaly of up to 4 °C was observed. Hence, winter crops passed the winter season without any exposure to severe cold spells.

During the first half of March, scattered but near-seasonal rainfall was registered in most regions, while temperatures stayed significantly above the LTA. These conditions allowed winter crops to enter spring under favourable condition. However, more rainfall is needed in the south to generate favourable spring-sowing conditions and improve water availability for irrigation.

A more detailed analysis with yield and production forecasts at oblast level will be provided in the upcoming edition of the Bulletin in the Global outlook series on Ukraine[7].

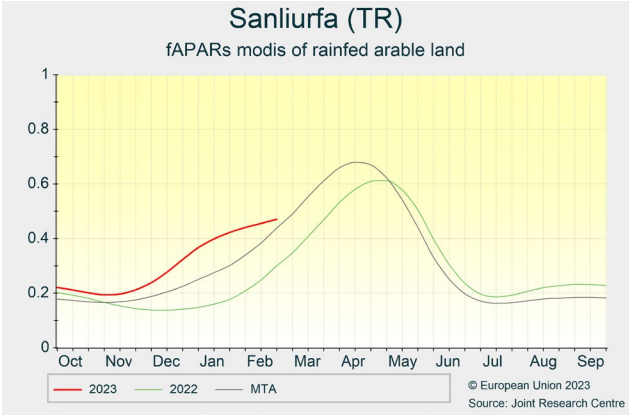


Türkiye

Fair current conditions; concerns for the future

In Anatolian regions, rainfall was scarce (50% of the LTA) and there were significant fluctuations in temperature, with a predominance of warm anomalies contrasted with two cold periods in January and February. In these regions, the development of winter cereals is delayed due to the combined effects of the cold spells, late sowings (from late autumn to beginning of winter) and low soil moisture levels. A precipitation deficit (-50% since December) and the resulting low levels of water reservoirs are creating concerns about effective water availability in the coming months.

In south-eastern regions, the season started very early (in November) thanks to well distributed precipitation. The very warm anomalies led to an early boost in biomass accumulation of winter crops. However, the two cold spells since January also slowed down phenological development of crops in these regions; it is now only 10 days ahead of average.



[7] https://publications.jrc.ec.europa.eu/repository/handle/JRC133091 To be published 3 April 2023

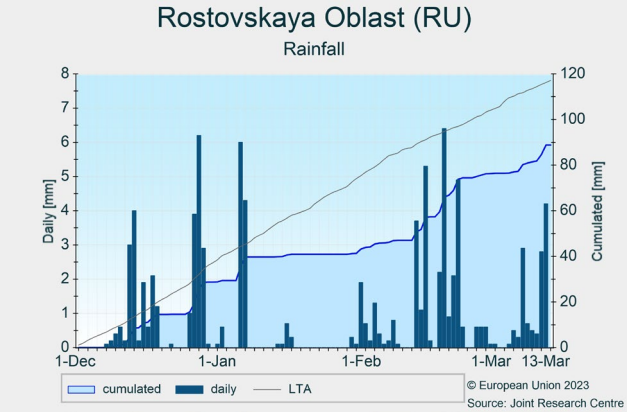
3.4 European Russia and Belarus

European Russia

More rainfall needed in the south-west

European Russia experienced mixed weather conditions during winter. Near-seasonal temperatures prevailed from December 2022 until February 2023 in the central and eastern oblasts, while slightly above-average temperatures were recorded in the western oblasts. The severe cold spell in the eastern parts of the Volga okrug from 7 until 13 January, with daily minima as low as --35 °C, is expected to have resulted in minor frost-kill damage. Since early March, significantly above-average temperatures in most winter-cereal-producing areas led to an acceleration of the snow melt.

After an overall wet autumn, wetter-than-usual conditions continued in the Central okrug during winter, while below-average rainfall was registered elsewhere. The most distinct deficit was registered in south-western regions, with precipitation up to 50% below the LTA. Since February, frequent precipitation led to improved soil moisture conditions in most regions, except in the Southern okrug where more rainfall is needed to sustain the early restart of winter crops' vegetative growth.



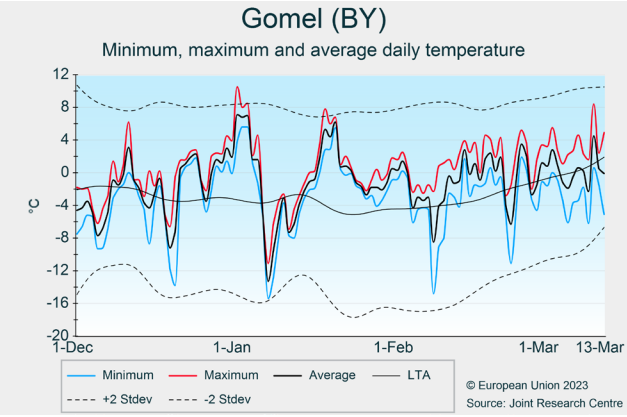
Belarus

Fair weather conditions for winter wheat

Temperatures for the period of review as a whole were slightly (>1 °C) warmer than average. December was partially colder-than-usual with temperature minima dropping below -15 °C, nonetheless snow cover was sufficient to protect winter crops from severe frost-kill damage. January and February were characterised by warmer-than-average conditions (with positive temperature anomalies of 2-4 °C) interrupted by brief cold spells. However these cold events generally posed no danger for adequately hardened winter wheat.

Precipitation totals for the period of review were significantly above average (and ranged from > 45% to > 70% above the LTA in *Gomel* and *Vitebsk*, respectively), and soil moisture reserves are generally satisfactory after the winter period.

There are currently no major concerns related to the condition of winter crops. The early season yield outlook is in line with the historical trends.



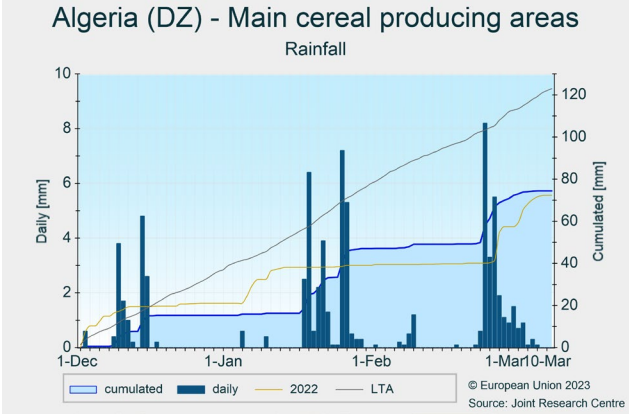
3.5 Maghreb

Morocco, Algeria and Tunisia

Negative outlook for cereals

In Morocco, the autumn drought caused sowing delays of nearly 20 days, a reduced sown area and below-average biomass accumulation. The first half of December saw frequent rain events, but since January a precipitation deficit has been recorded in most of the agricultural areas. Moderate-to-full crop recovery is registered in the regions of Casablanca, Rabat and Tanger, which benefited from the rainfall in December. However, below-average biomass accumulation is observed in all the other regions. In Algeria, almost all major production areas are experiencing drought, especially towards the north-west where sowings were delayed by 2-3 weeks. Biomass accumulation is generally below average. Rain is also urgently needed in central Tunisia, where biomass accumulation is below to well below average in many important cereal-producing regions. The northern regions of Beja, Jendouba and Bizerte have been less exposed to drought, thanks to widespread irrigation, and have accumulated average to above-average biomass.

Overall, crop phenology in the Maghreb varies from end of flowering (Morocco) to beginning of flowering (Algeria) or late vegetative stages (Tunisia). Our yield forecasts are below the 5-year average throughout the Maghreb.



4. Crop yield forecast

Country	Total wheat (t/ha)				
	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22
EU	5.59	5.57	**5.77**	+ 3	+ 4
AT	5.52	5.73	**5.44**	– 1	– 5
BE	8.77	9.30	**8.84**	+ 1	– 5
BG	4.99	5.17	**5.46**	+ 10	+ 6
CY	—	—	**—**	—	—
CZ	5.93	6.07	**6.27**	+ 6	+ 3
DE	7.35	7.58	**7.67**	+ 5	+ 1
DK	7.81	8.55	**7.97**	+ 2	– 7
EE	4.38	4.72	**4.76**	+ 9	+ 1
EL	2.93	2.72	**2.91**	– 1	+ 7
ES	3.52	2.79	**3.48**	– 1	+ 25
FI	3.56	3.76	**3.92**	+ 10	+ 4
FR	7.18	7.08	**7.11**	– 1	+ 0
HR	5.87	5.95	**6.01**	+ 2	+ 1
HU	5.23	4.40	**5.55**	+ 6	+ 26
IE	9.79	10.7	**10.2**	+ 4	– 5
IT	3.83	3.63	**4.00**	+ 5	+ 10
LT	4.54	4.74	**5.06**	+ 11	+ 7
LU	6.04	6.21	**6.07**	+ 1	– 2
LV	4.59	4.72	**4.93**	+ 7	+ 4
MT	—	—	**—**	—	—
NL	9.14	10.4	**9.06**	– 1	– 13
PL	4.84	5.34	**5.16**	+ 7	– 3
PT	2.35	1.82	**2.00**	– 15	+ 10
RO	4.30	4.18	**4.61**	+ 7	+ 11
SE	6.53	6.99	**6.73**	+ 3	– 4
SI	4.83	4.90	**5.26**	+ 9	+ 7
SK	5.06	4.69	**5.12**	+ 1	+ 9

Country	Soft wheat (t/ha)				
	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22
EU	5.81	5.80	**5.99**	+ 3	+ 3
AT	5.58	5.78	**5.51**	– 1	– 5
BE	8.77	9.30	**8.84**	+ 1	– 5
BG	4.99	5.17	**5.46**	+ 10	+ 6
CY	—	—	**—**	—	—
CZ	5.93	6.07	**6.27**	+ 6	+ 3
DE	7.37	7.61	**7.70**	+ 5	+ 1
DK	7.81	8.55	**7.97**	+ 2	– 7
EE	4.38	4.72	**4.76**	+ 9	+ 1
EL	2.98	3.01	**2.96**	– 1	– 2
ES	3.62	2.87	**3.64**	+ 1	+ 27
FI	3.56	3.76	**3.92**	+ 10	+ 4
FR	7.29	7.18	**7.18**	– 2	+ 0
HR	5.87	5.95	**6.01**	+ 2	+ 1
HU	5.26	4.43	**5.58**	+ 6	+ 26
IE	9.79	10.7	**10.2**	+ 4	– 5
IT	5.36	5.12	**5.50**	+ 3	+ 7
LT	4.54	4.74	**5.06**	+ 11	+ 7
LU	6.04	6.21	**6.07**	+ 1	– 2
LV	4.59	4.72	**4.93**	+ 7	+ 4
MT	—	—	**—**	—	—
NL	9.14	10.4	**9.06**	– 1	– 13
PL	4.84	5.34	**5.16**	+ 7	– 3
PT	2.35	1.82	**2.00**	– 15	+ 10
RO	4.30	4.18	**4.62**	+ 7	+ 11
SE	6.53	6.99	**6.73**	+ 3	– 4
SI	4.83	4.90	**5.26**	+ 9	+ 7
SK	5.07	4.65	**5.13**	+ 1	+ 10

Country	Durum wheat (t/ha)				
	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22
EU	3.50	3.26	**3.53**	+ 1	+ 9
AT	4.68	5.09	**4.71**	+ 1	– 8
BE	—	—	**—**	—	—
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	—	—	**—**	—	—
DE	5.18	5.35	**5.45**	+ 5	+ 2
DK	—	—	**—**	—	—
EE	—	—	**—**	—	—
EL	2.91	2.59	**2.89**	– 1	+ 11
ES	2.92	2.26	**2.47**	– 16	+ 9
FI	—	—	**—**	—	—
FR	5.41	5.30	**5.59**	+ 3	+ 6
HR	—	—	**—**	—	—
HU	4.53	3.72	**4.73**	+ 4	+ 27
IE	—	—	**—**	—	—
IT	3.18	2.98	**3.32**	+ 4	+ 11
LT	—	—	**—**	—	—
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	—	—	**—**	—	—
PT	—	—	**—**	—	—
RO	3.24	2.92	**3.63**	+ 12	+ 24
SE	—	—	**—**	—	—
SI	—	—	**—**	—	—
SK	5.00	4.90	**5.06**	+ 1	+ 3

Country	Winter barley (t/ha)				
	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22
EU	5.77	5.92	**5.91**	+ 2	– 0
AT	6.54	6.66	**6.65**	+ 2	– 0
BE	8.21	8.71	**8.51**	+ 4	– 2
BG	4.75	4.93	**5.11**	+ 8	+ 4
CY	1.84	2.26	**1.83**	– 1	– 19
CZ	5.82	6.11	**6.00**	+ 3	– 2
DE	6.96	7.62	**7.29**	+ 5	– 4
DK	6.64	7.23	**6.90**	+ 4	– 5
EE	4.89	4.68	**4.87**	– 1	+ 4
EL	2.82	2.44	**2.82**	– 0	+ 15
ES	2.86	2.41	**2.54**	– 11	+ 6
FI	—	—	**—**	—	—
FR	6.49	6.55	**6.48**	– 0	– 1
HR	5.04	5.10	**5.28**	+ 5	+ 4
HU	5.54	4.84	**5.95**	+ 7	+ 23
IE	8.98	8.68	**9.31**	+ 4	+ 7
IT	4.13	4.20	**4.17**	+ 1	– 1
LT	4.19	4.26	**4.20**	+ 0	– 2
LU	—	—	**—**	—	—
LV	4.81	4.85	**5.10**	+ 6	+ 5
MT	—	—	**—**	—	—
NL	8.41	9.80	**8.70**	+ 4	– 11
PL	4.65	4.95	**4.75**	+ 2	– 4
PT	2.97	2.47	**2.95**	– 1	+ 20
RO	4.27	4.43	**4.48**	+ 5	+ 1
SE	5.90	6.17	**6.11**	+ 4	– 1
SI	5.00	4.99	**5.24**	+ 5	+ 5
SK	5.30	5.32	**5.44**	+ 3	+ 2

Country	Rye (t/ha)				
	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22
EU	3.97	4.30	**4.20**	+ 6	– 2
AT	4.72	4.87	**4.75**	+ 1	– 3
BE	—	—	—	—	—
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	5.14	5.31	**5.14**	+ 0	– 3
DE	5.13	5.32	**5.35**	+ 4	+ 1
DK	6.09	6.60	**6.15**	+ 1	– 7
EE	3.75	3.85	**3.89**	+ 4	+ 1
EL	—	—	—	—	—
ES	2.42	1.87	**2.15**	– 11	+ 15
FI	3.84	3.35	**3.84**	+ 0	+ 15
FR	4.30	3.84	**4.43**	+ 3	+ 15
HR	—	—	—	—	—
HU	3.29	3.01	**3.45**	+ 5	+ 15
IE	—	—	—	—	—
IT	—	—	—	—	—
LT	2.56	2.41	**2.55**	– 1	+ 6
LU	—	—	—	—	—
LV	4.05	3.66	**4.24**	+ 5	+ 16
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	3.07	3.58	**3.47**	+ 13	– 3
PT	1.11	1.03	**1.15**	+ 4	+ 12
RO	2.72	2.58	**2.87**	+ 6	+ 12
SE	5.99	6.22	**6.27**	+ 5	+ 1
SI	—	—	—	—	—
SK	3.60	3.84	**3.78**	+ 5	– 1

Country	Triticale (t/ha)				
	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22
EU	4.22	4.42	**4.38**	+ 4	– 1
AT	5.44	5.62	**5.40**	– 1	– 4
BE	—	—	—	—	—
BG	2.98	3.06	**3.26**	+ 10	+ 7
CY	—	—	—	—	—
CZ	4.88	5.10	**5.01**	+ 3	– 2
DE	5.85	5.95	**6.24**	+ 7	+ 5
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	2.53	2.79	**2.49**	– 2	– 11
ES	2.64	2.18	**2.20**	– 17	+ 1
FI	—	—	—	—	—
FR	5.00	4.79	**4.99**	– 0	+ 4
HR	4.06	4.22	**4.13**	+ 2	– 2
HU	3.98	3.43	**4.25**	+ 7	+ 24
IE	—	—	—	—	—
IT	4.42	4.31	**4.37**	– 1	+ 1
LT	3.25	3.24	**3.25**	+ 0	+ 0
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	3.98	4.51	**4.28**	+ 8	– 5
PT	1.54	1.25	**1.49**	– 3	+ 20
RO	3.86	3.80	**4.08**	+ 6	+ 7
SE	5.55	5.68	**5.67**	+ 2	– 0
SI	—	—	—	—	—
SK	—	—	—	—	—

Country	Rape and turnip rape (t/ha)				
	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22
EU	3.10	3.33	**3.29**	+ 6	– 1
AT	3.06	3.21	**3.07**	+ 0	– 4
BE	—	—	—	—	—
BG	2.57	2.26	**2.77**	+ 8	+ 22
CY	—	—	—	—	—
CZ	3.25	3.36	**3.25**	+ 0	– 3
DE	3.47	3.95	**3.88**	+ 12	– 2
DK	4.08	4.52	**4.08**	– 0	– 10
EE	2.47	2.52	**2.52**	+ 2	– 0
EL	—	—	—	—	—
ES	2.33	2.10	**2.11**	– 9	+ 1
FI	1.31	1.37	**1.42**	+ 9	+ 4
FR	3.24	3.67	**3.37**	+ 4	– 8
HR	2.75	2.78	**2.83**	+ 3	+ 2
HU	2.82	2.16	**3.12**	+ 10	+ 44
IE	4.37	4.66	**4.46**	+ 2	– 4
IT	2.84	2.85	**3.18**	+ 12	+ 11
LT	2.97	3.23	**3.00**	+ 1	– 7
LU	—	—	—	—	—
LV	2.58	2.06	**2.92**	+ 13	+ 42
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	3.05	3.40	**3.22**	+ 6	– 5
PT	—	—	—	—	—
RO	2.52	2.41	**2.78**	+ 11	+ 15
SE	3.17	3.25	**3.34**	+ 5	+ 3
SI	—	—	—	—	—
SK	3.04	3.13	**3.22**	+ 6	+ 3

Country	Wheat (t/ha)				
	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22
BY	3.42	3.48	**3.66**	+ 7	+ 5
DZ	1.70	N/A	**1.37**	– 20	N/A
MA	1.94	N/A	**1.52**	– 22	N/A
TN	2.00	2.42	**1.62**	– 19	– 33
TR	2.83	2.99	**2.99**	+ 6	– 0
UK	8.10	8.60	**8.09**	– 0	– 6

Country	Barley (t/ha)				
	Avg 5yrs	2022	MARS 2023 forecasts	%23/5yrs	%23/22
BY	2.76	2.75	**3.03**	+ 10	+ 10
DZ	1.22	N/A	**1.10**	– 10	N/A
MA	1.33	N/A	**0.98**	– 27	N/A
TN	1.05	1.72	**0.82**	– 23	– 53
TR	2.48	2.63	**2.64**	+ 6	+ 1
UK	6.25	6.67	**6.47**	+ 3	– 3

NB: Yields are forecast for crops with more than 10 000 ha per country with sufficently long and coherent yield time series.

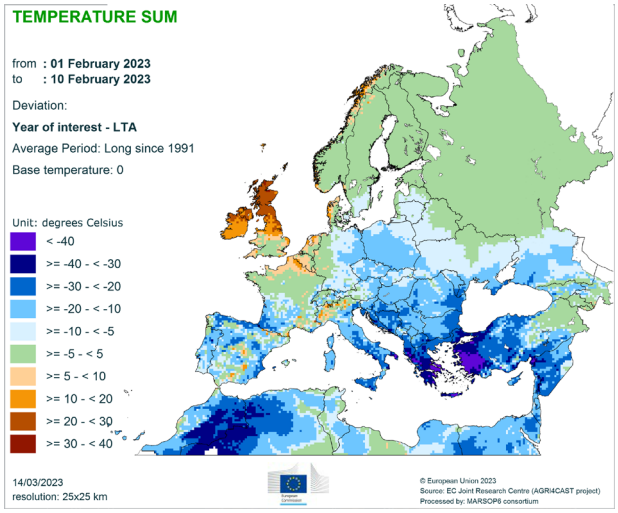
Sources: 2018-2022 data come from DG Agriculture and Rural Development short-term-outlook data (dated February 2023, received on 03.03.2023), Eurostat Eurobase (last update: 16.02.2023), ELSTAT and EES (last update: 15.11.2017).
Non-EU 2018-2022 data come from USDA, INRA Maroc, ONICL Maroc, Ministère de l'agriculture des ressources hydrauliques et de la pêche Tunisie, MED-Amin baseline DB, DSASI-MADR Algeria, Turkish Statistical Institute (TurkStat), Eurostat Eurobase (last update: 16.02.2023), Department for Environment, Food & Rural Affairs of UK (DEFRA), FAO and PSD-online.
2023 yields come from MARS Crop Yield Forecasting System (output up to 10.03.2023).
EU aggregate after 1.2.2020 is reported.
N/A = Data not available.
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(%).

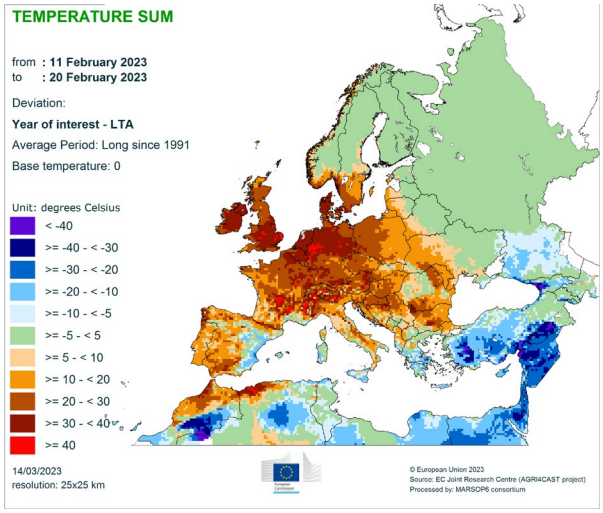
Cop name	Eurostat Crop name	Eurostat Crop Code	Official Eurostat Crop definition*
Total wheat	Wheat and spelt	C1100	Common wheat (*Triticum aestivum* L. emend. Fiori et Paol.), spelt (*Triticum spelta* L.), einkorn wheat (*Triticum monococcum* L.) and durum wheat (*Triticum durum* Desf.).
Total barley	Barley	C1300	Barley (*Hordeum vulgare* L.).
Soft wheat	Common wheat and spelt	C1110	Common wheat (*Triticum aestivum* L. emend. Fiori et Paol.), spelt (*Triticum spelta* L.) and einkorn wheat (*Triticum monococcum* L.).
Durum what	Durum wheat	C1120	*Triticum durum* Desf.
Spring barley	Spring barley	C1320	Barley (*Hordeum vulgare* L.) sown in the spring.
Winter barley	Winter barley	C1310	Barley (*Hordeum vulgare* L.) sown before or during winter.
Grain maize	Grain maize and corn-cob-mix	C1500	Maize (*Zea mays* L.) harvested for grain, as seed or as corn-cob-mix.
Green maize	Green maize	G3000	All forms of maize (*Zea mays* L.) grown mainly for silage (whole cob, parts of or whole plant) and not harvested for grain.
Rye	Rye and winter cereal mixtures (maslin)	C1200	Rye (*Secale cereale* L.) sown any time, mixtures of rye and other cereals and other cereal mixtures sown before or during the winter (maslin).
Triticale	Triticale	C1600	Triticale (x *Triticosecale* Wittmack).
Rape and turnip rape	Rape and turnip rape seeds	I1110	Rape (*Brassica napus* L.) and turnip rape (*Brassica rapa* L. var. oleifera (Lam.)) grown for the production of oil, harvested as dry grains.
Sugar beet	Sugar beet (excluding seed)	R2000	Sugar beet (*Beta vulgaris* L.) intended for the sugar industry, alcohol production or renewable energy production.
Potatoes	Potatoes (including seed potatoes)	R1000	Potatoes (*Solanum tuberosum* L.).
Sunflower	Sunflower seed	I1120	Sunflower (*Helianthus annuus* L.) harvested as dry grains.
Soybean	Soya	I1130	Soya (*Glycine max* L. Merril) harvested as dry grains.
Rice	Rice	C2000	Rice (*Oryza sativa*, L.).

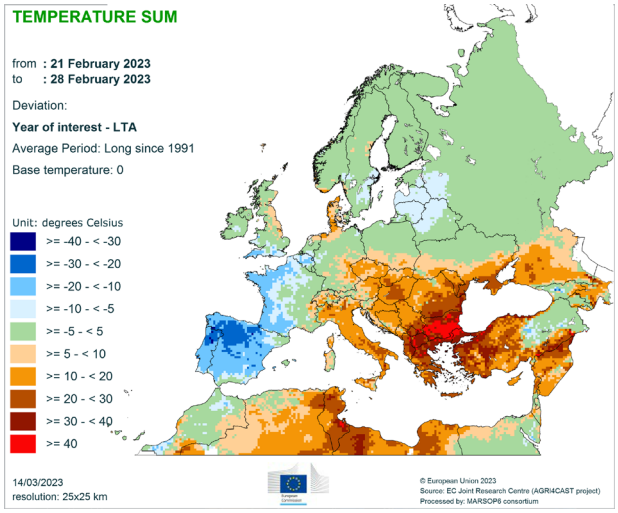
** Source:* Eurostat - Annual crop statistics (Handbook 2020 Edition)

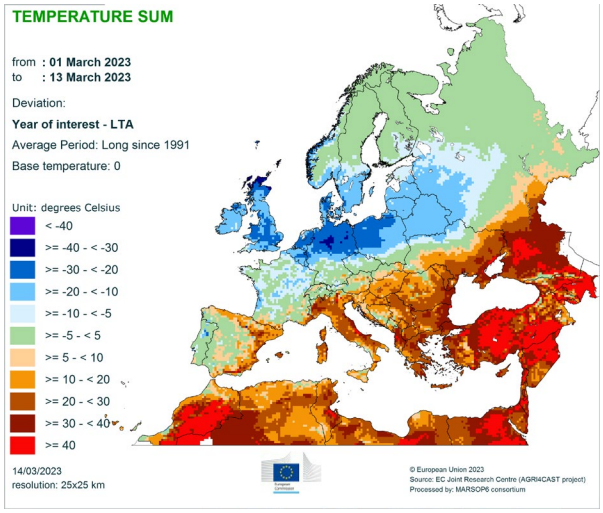
5. Atlas

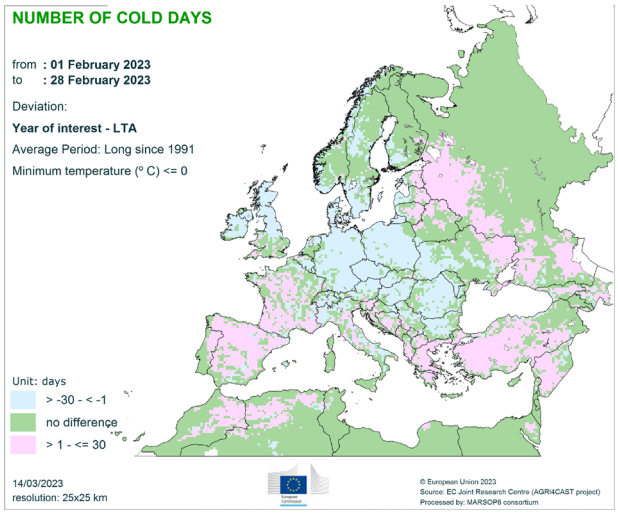
Temperature regime

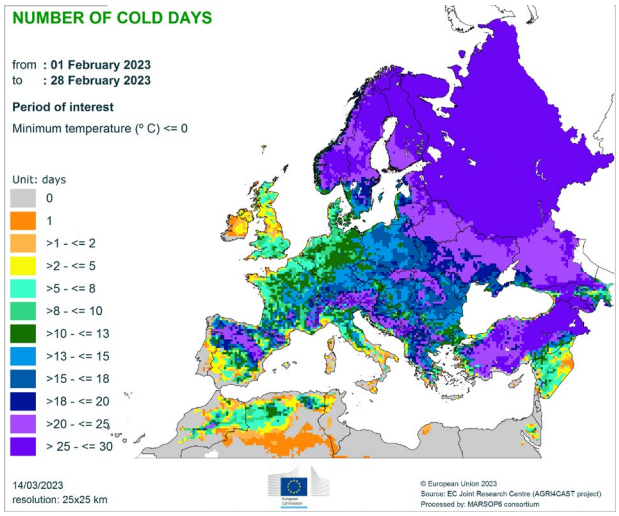


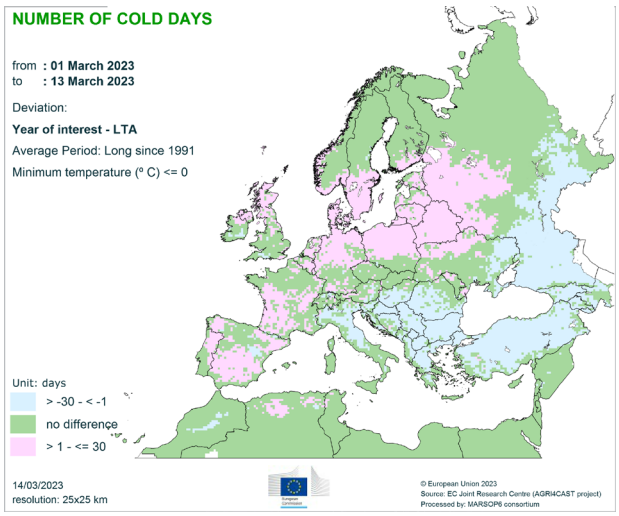


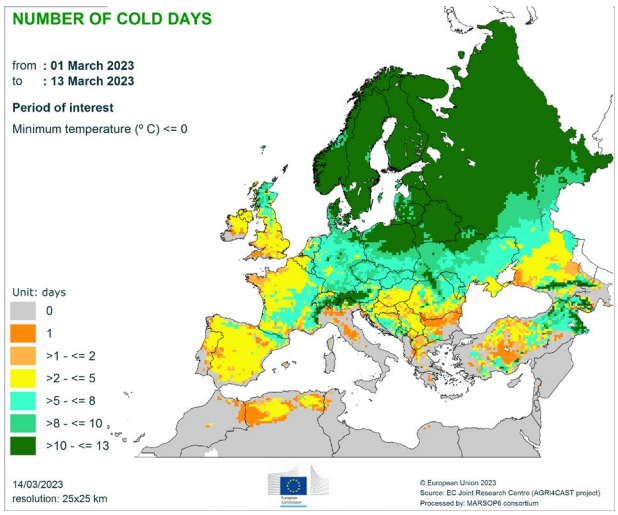












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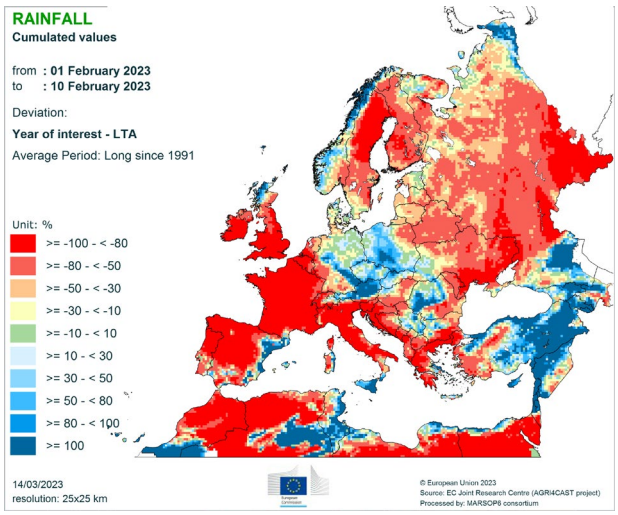

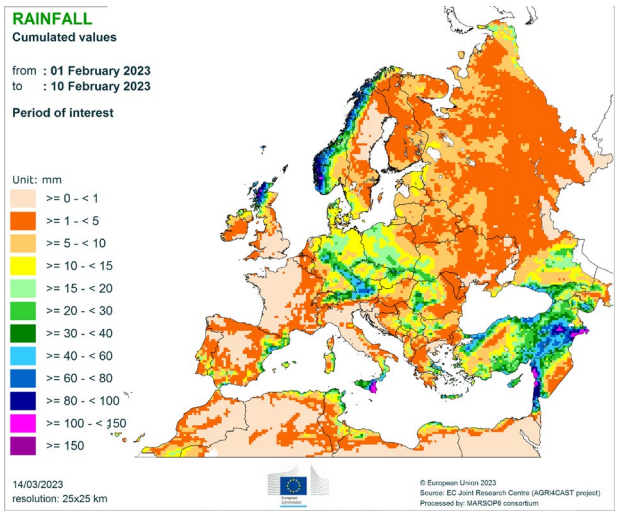

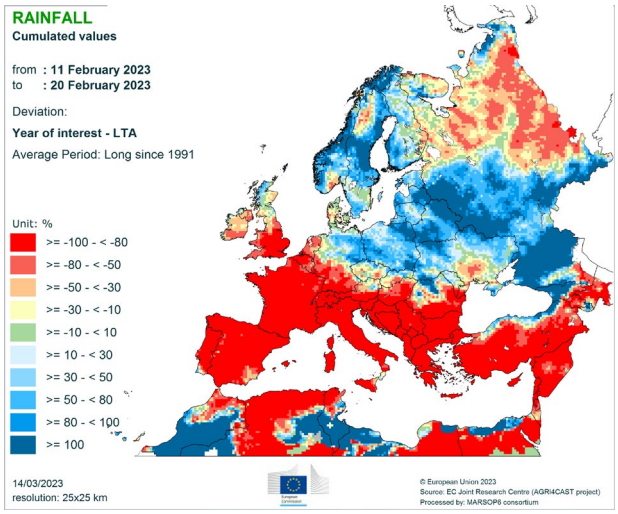

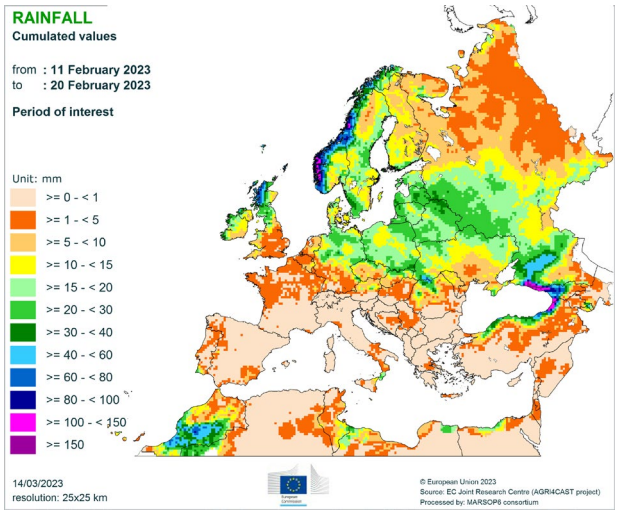

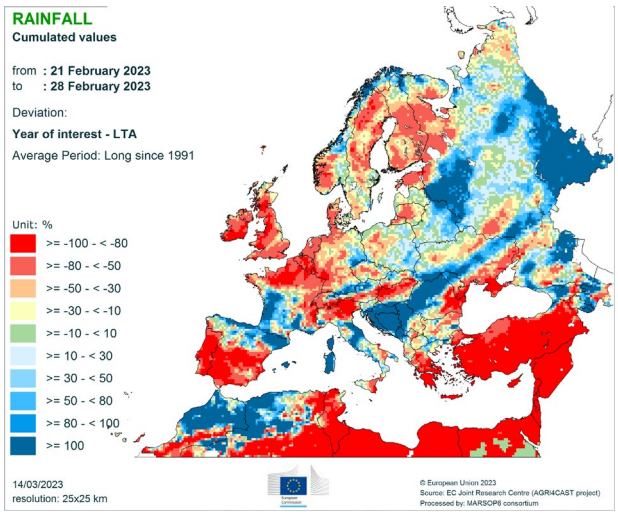
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to : 28 February 2023
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Average Period: Long since 1991
Unit: %
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>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
14/03/2023
resolution: 25x25 km
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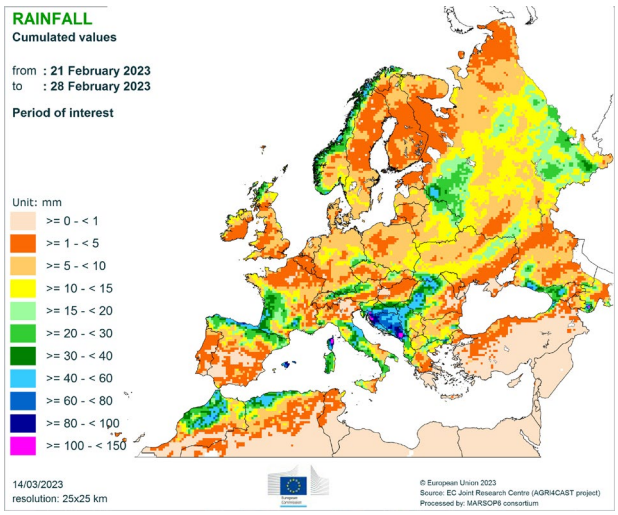
Source: EC Joint Research Centre (AGRI4CAST project)
Processed by: MARSOP6 consortium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to : 28 February 2023
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>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
14/03/2023
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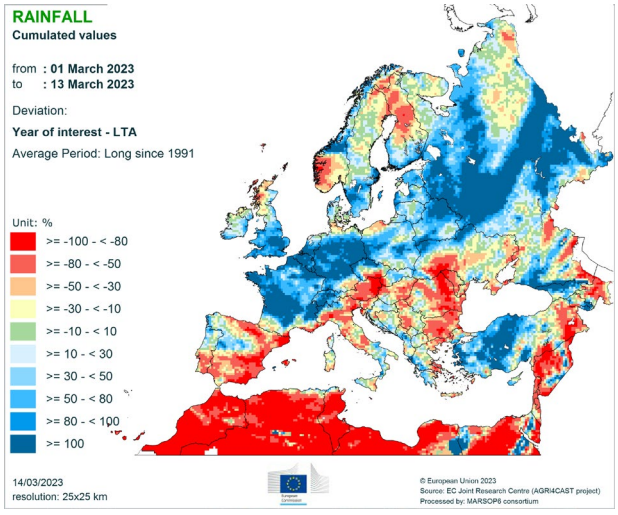
Processed by: MARSOP6 consortium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Average Period: Long since 1991
Unit: %
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>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
14/03/2023
resolution: 25x25 km
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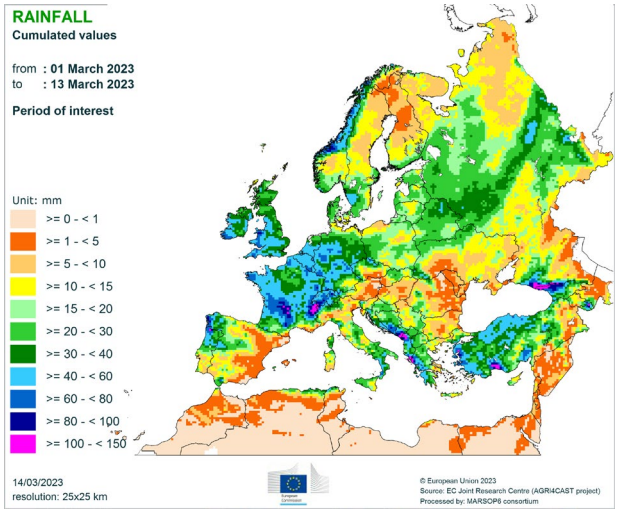
RAINFALL
Cumulated values
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to : 13 March 2023
Period of interest
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>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
14/03/2023
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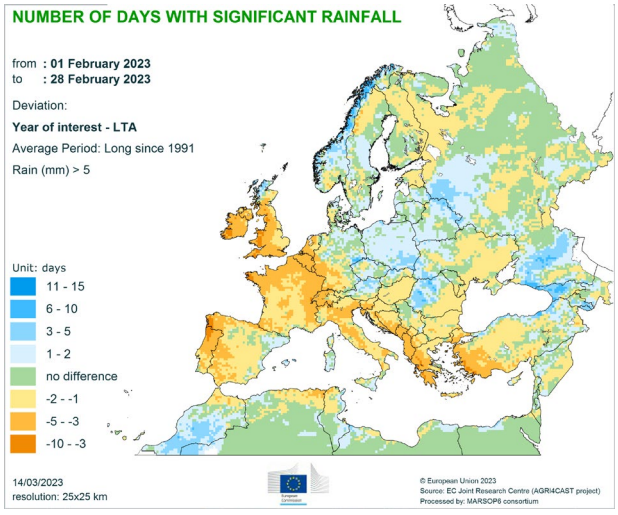
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to : 28 February 2023
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Rain (mm) > 5
Unit: days
11 - 15
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
-10 - -3
14/03/2023
resolution: 25x25 km
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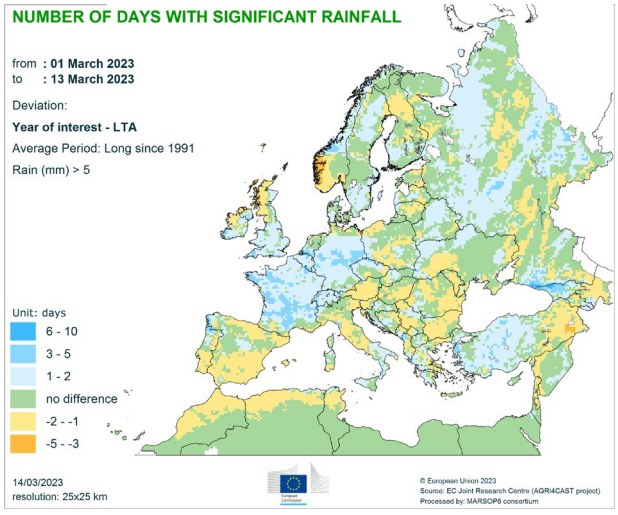
NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 March 2023
to : 13 March 2023
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Rain (mm) > 5
Unit: days
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
14/03/2023
resolution: 25x25 km
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Date	Publication	Reference
23 Jan	Agromet analysis	Vol. 31 No 1
20 Feb	Agromet analysis	Vol. 31 No 2
20 Mar	Agromet analysis, grasslands, yield forecast	Vol. 31 No 3
24 Apr	Agromet analysis, remote sensing, pasture analysis, sowing conditions, yield forecast	Vol. 31 No 4
22 May	Agromet analysis, remote sensing, pasture analysis, sowing update, yield forecast	Vol. 31 No 5
19 Jun	Agromet analysis, remote sensing, pasture analysis, rice analysis, yield forecast	Vol. 31 No 6
24 Jul	Agromet analysis, remote sensing, pasture analysis, harvesting conditions, yield forecast	Vol. 31 No 7
21 Aug	Agromet analysis, remote sensing, pasture update, harvesting update, yield forecast	Vol. 31 No 8
18 Sep	Agromet analysis, remote sensing, pasture analysis, rice analysis, harvesting update, yield forecast	Vol. 31 No 9
23 Oct	Agromet analysis, pasture update, sowing conditions, harvesting update, yield forecast	Vol. 31 No 10
27 Nov	Agromet analysis, sowing update, harvesting update	Vol. 31 No 11
18 Dec	Agromet analysis	Vol. 31 No 12

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Technical note
The long-term average (LTA) used within this Bulletin as a reference is calculated on the basis of weather data from 1991-2022.

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