Issued: 25 March 2024
JRC MARS Bulletin Vol. 32 No 3

European Commission

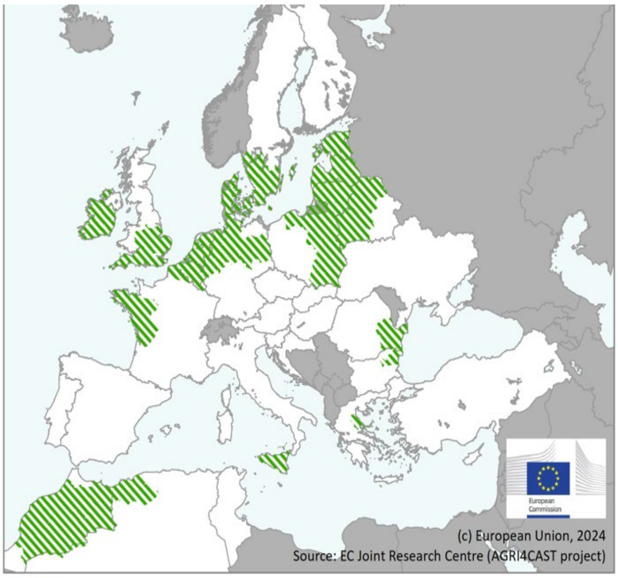
JRC MARS Bulletin
Crop monitoring in Europe
March 2024

Large areas face challenging start to the season
Winter crops in mediocre condition despite fair spring weather

Since the start to the season, winter crop areas in several parts of Europe have been negatively impacted by unfavourable weather conditions. In the north, the most severely affected fields are expected to be resown with spring or summer crops. In the south, the impacts are mainly reflected in a reduced yield potential. As it is still early in the season, the crop yield forecasts reported here are – with a few exceptions - based on historical trends

Since autumn, large parts of western, northern and eastern Europe, experienced excessively wet conditions, which negatively affected the sowing, emergence and development of winter crops. In northern and eastern Europe, additional damage to crops was caused by severe frost events. The persistent wetness also created challenging conditions for farmers to access and work the fields, which might affect the (re)sowing of spring cereals.

In eastern Romania and eastern Bulgaria, winter crops are suffering from a persistent rainfall deficit, particularly affecting winter rapeseed. In Sicily and the Maghreb, drought conditions during the winter led to low winter crop biomass accumulation. The situation is particularly serious in the western Maghreb, where ongoing hot and dry weather conditions have led to a situation in which crops are at imminent risk of failure.



Crop	Yield t/ha				
	Avg 5yrs	2023	MARS 2024 forecasts	%24/5yrs	%24/23
Cereals*	5.50	5.50	**5.57**	+ 1	+ 1
Total wheat	5.65	5.60	**5.70**	+ 1	+ 2
Soft wheat	5.87	5.82	**5.91**	+ 1	+ 2
Durum wheat	3.44	3.29	**3.44**	– 0	+ 5
Winter barley	5.91	6.05	**5.95**	+ 1	– 2
Rye	4.16	4.11	**4.30**	+ 3	+ 5
Triticale	4.34	4.37	**4.43**	+ 2	+ 1
Rape and turnip rape	3.18	3.20	**3.25**	+ 2	+ 2

Issued: 25 March 2024

* Only the cereals specified in the tables are included

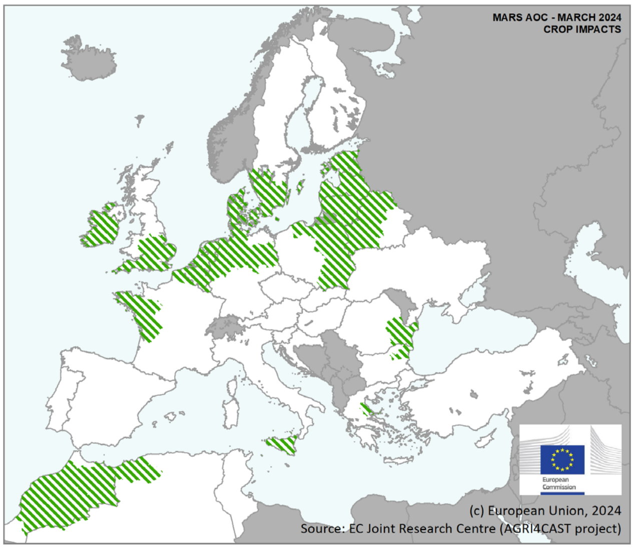
Contents:

Covers the period from 1 December 2023 until 16 March 2024

1. Agrometeorological overview

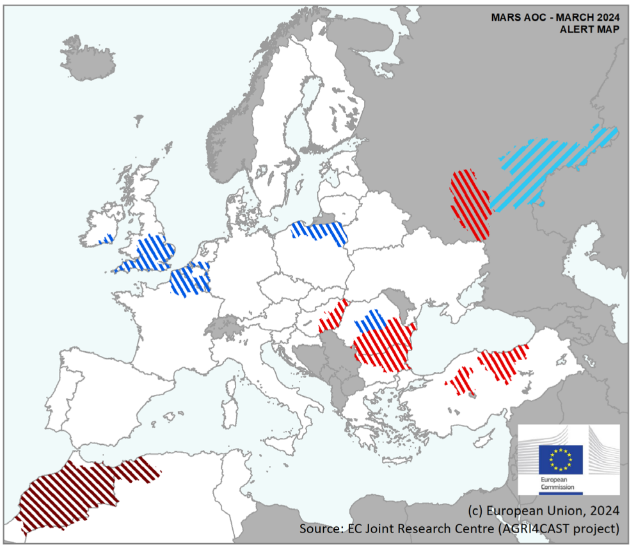
1.1. Areas of concern

CROP IMPACTS
Reference period: until 16 March 2024



Winter crops

ALERTS
Reference period: 1 February until 16 March 2024



Rain surplus
Freezing temperatures
Rain deficit
High temperature and dry conditions

The areas-of-concern analysis presented here follows a new approach compared with that used for previous MARS bulletins.

The crop impact map shows regions where crops (winter, spring or summer) have been negatively affected in terms of area or yield. This map shows **impacts that have occurred since the start of the season**. Most of the regions shown as affected on the map have experienced losses in areas of winter crops due to unfavourable conditions in late autumn and winter.

The alerts map shows unusual weather events with potential negative **impacts on crops that occurred during the analysis period from 1 February to 16 March**.

In large parts of western, northern and eastern Europe, excessively wet conditions since autumn have negatively affected the sowing, emergence and initial development of winter crops. In the north and east, additional damage to crops was caused by abrupt severe frost events in December and January. The persistent wetness also created challenging conditions for farmers to access and work the fields to apply fertilisers to and phytosanitary measures for winter crops, and for seedbed preparation and sowing of spring cereals. The issues regarding spring cereals are of particular concern in the western regions affected, where the optimal sowing window will close soon or has already closed. Consequently, in several regions where the sowing of winter crops could not be fully accomplished in autumn, or where area was lost during winter, the (re)sowing of spring crops may also not be fully accomplished.

In eastern Romania and eastern Bulgaria, winter crops are suffering from a persistent rainfall deficit, particularly affecting winter rapeseed, with minimal expectations of a recovery to average productivity. The area of crops affected may expand further to cover surrounding regions that are currently experiencing a precipitation deficit (see alert map). In contrast, central Romania has experienced excessively wet weather; which has also caused suboptimal conditions for crop growth.

In Sicily and in large areas of the Maghreb, drought conditions during the winter led to low winter crop biomass accumulation. The situation is particularly serious in the western Maghreb, where ongoing hot and dry weather conditions have led to a situation in which crops are at imminent risk of failure.

In southern European Russia, crops have been exposed to very low minimum temperatures, with shallow snow coverage, leading to a high risk of frost damage.

1.2. Winter review (December, January, February)

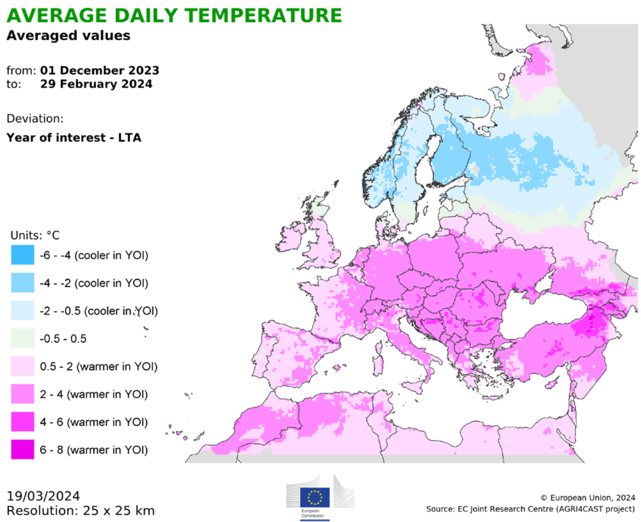
Winter was characterised by warmer-than-usual conditions in all parts of Europe, except the north. Wetter-than-usual conditions prevailed across the North and East European Plains, while dry conditions characterised parts of southern Europe.

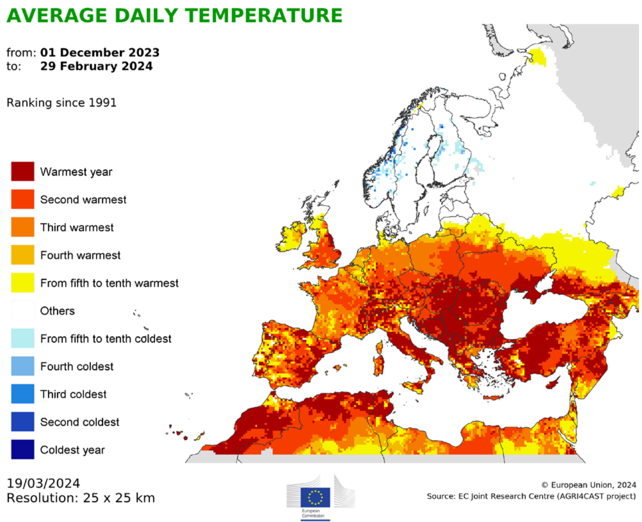
Warmer-than-usual conditions with respect to the 1991–2023 long-term average (LTA) were observed in almost all parts of Europe below 56° latitude. Average daily temperatures between 2 °C and 4 °C above the LTA were observed in most of central and south-eastern Europe, parts of the Iberian Peninsula, Italy, eastern France, as well as Ukraine, Türkiye and southern and northernmost European Russia. More distinct positive temperature anomalies (up to 6 °C above the LTA) were observed in some parts of central, eastern and south-eastern Europe, and central and eastern Türkiye. In many regions, the review period ranked among the three warmest since 1991. In vast regions of Europe, the **number of cold days** (with daily minimum temperatures below 0 °C) was below the LTA by more than 5 days.

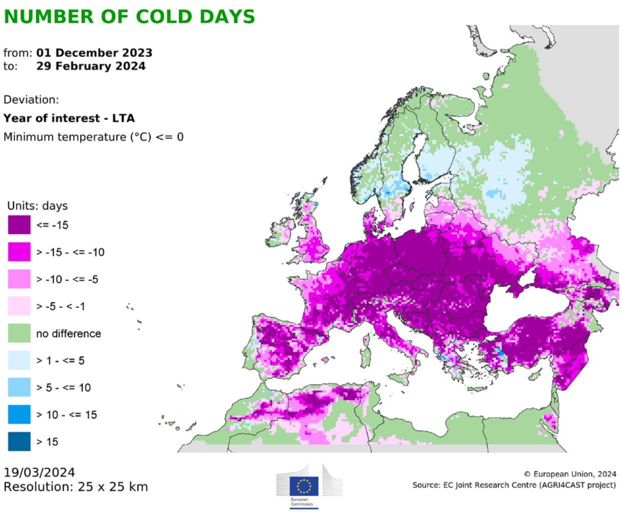
Colder-than-usual conditions, with temperature anomalies of between –2 °C and –0.5 °C relative to the LTA, were observed in most of Scandinavia and northern European Russia. More distinct negative anomalies (between –4 °C and –2 °C) were observed in parts of Norway and Sweden, most of Finland and parts of northern European Russia. In some of these regions, the review period ranked among the five coldest since 1991. In most of southern Scandinavia, locally in the Alps region and in southern Greece and western Türkiye, the **number of cold days** (with daily minimum temperatures below 0 °C) exceeded the LTA by more than 5 days.

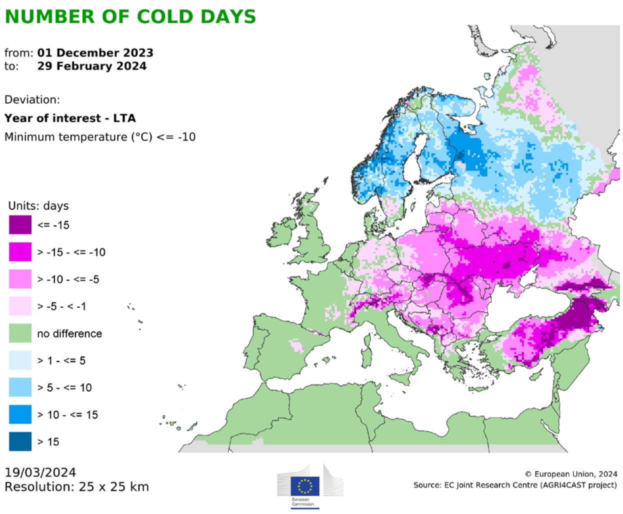
Drier-than-usual conditions (precipitation 50 % or more below the LTA) were observed in coastal Mediterranean Spain and parts of Italy, Romania, Bulgaria and Türkiye. In some of these regions, the number of days with precipitation above 15 mm was up to 10 days below the LTA.

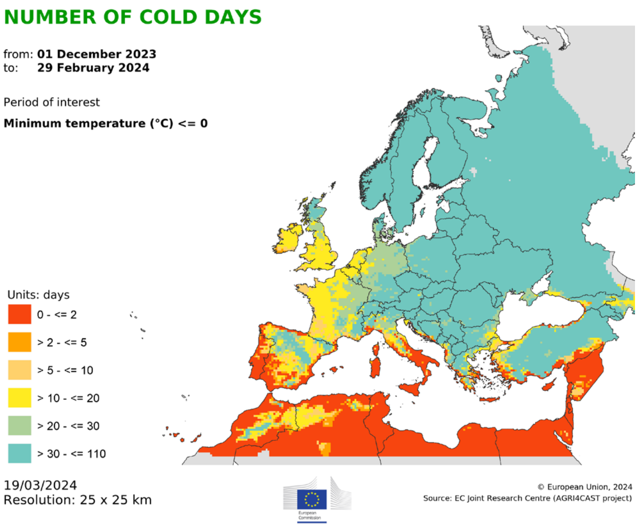
Wetter-than-usual conditions (50 % or more rainfall with respect to the LTA) were observed in most of the United Kingdom and the North and East European Plains, extending into central and southern European Russia. In many of these areas, the number of days with precipitation above 15 mm was between 3 and 15 days more than the LTA.

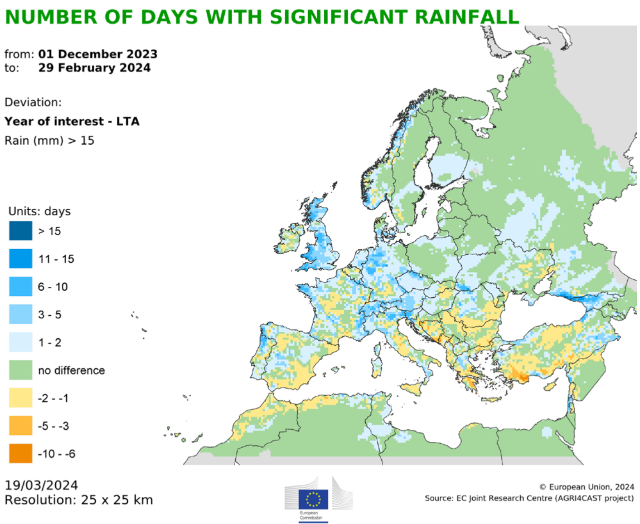


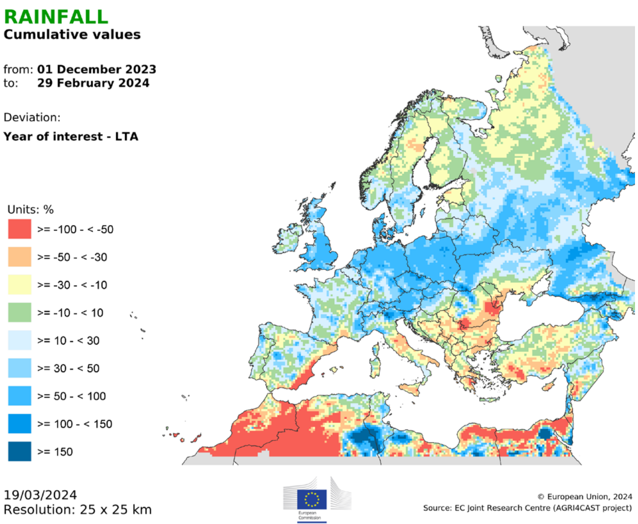


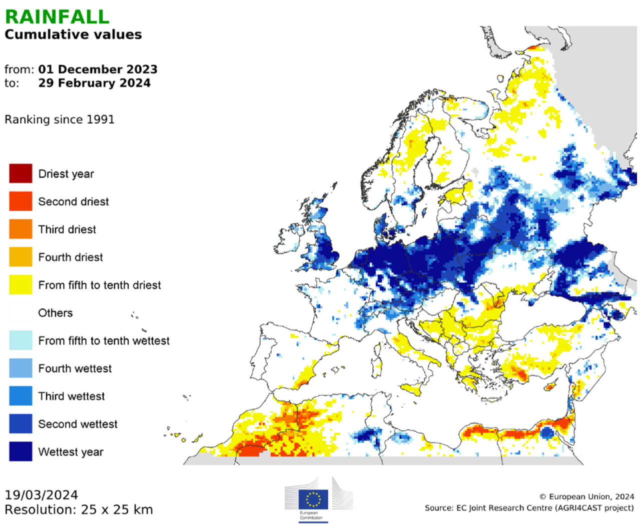

NUMBER OF COLD DAYS
from: 01 December 2023
to: 29 February 2024
Deviation:
Year of interest - LTA
Minimum temperature (°C) <= 0
Units: days
<= -15
> -15 - <= -10
> -10 - <= -5
> -5 - < -1
no difference
> 1 - <= 5
> 5 - <= 10
> 10 - <= 15
> 15
19/03/2024
Resolution: 25 x 25 km
© European Union, 2024
Source: EC Joint Research Centre (AGRI4CAST project)


NUMBER OF COLD DAYS
from: 01 December 2023
to: 29 February 2024
Deviation:
Year of interest - LTA
Minimum temperature (°C) <= -10
Units: days
<= -15
> -15 - <= -10
> -10 - <= -5
> -5 - < -1
no difference
> 1 - <= 5
> 5 - <= 10
> 10 - <= 15
> 15
19/03/2024
Resolution: 25 x 25 km
© European Union, 2024
Source: EC Joint Research Centre (AGRI4CAST project)


NUMBER OF COLD DAYS
from: 01 December 2023
to: 29 February 2024
Period of interest
Minimum temperature (°C) <= 0
Units: days
0 - <= 2
> 2 - <= 5
> 5 - <= 10
> 10 - <= 20
> 20 - <= 30
> 30 - <= 110
19/03/2024
Resolution: 25 x 25 km
© European Union, 2024
Source: EC Joint Research Centre (AGRI4CAST project)


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from: 01 December 2023
to: 29 February 2024
Deviation:
Year of interest - LTA
Rain (mm) > 15
Units: days
> 15
11 - 15
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
-10 - -6
19/03/2024
Resolution: 25 x 25 km
© European Union, 2024
Source: EC Joint Research Centre (AGRI4CAST project)


RAINFALL
Cumulative values
from: 01 December 2023
to: 29 February 2024
Deviation:
Year of interest - LTA
Units: %
>= -100 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 100
>= 100 - < 150
>= 150
19/03/2024
Resolution: 25 x 25 km
© European Union, 2024
Source: EC Joint Research Centre (AGRI4CAST project)


RAINFALL
Cumulative values
from: 01 December 2023
to: 29 February 2024
Ranking since 1991
Driest year
Second driest
Third driest
Fourth driest
From fifth to tenth driest
Others
From fifth to tenth wettest
Fourth wettest
Third wettest
Second wettest
Wettest year
19/03/2024
Resolution: 25 x 25 km
© European Union, 2024
Source: EC Joint Research Centre (AGRI4CAST project)

1.3. Meteorological review (1 February –16 March 2024)

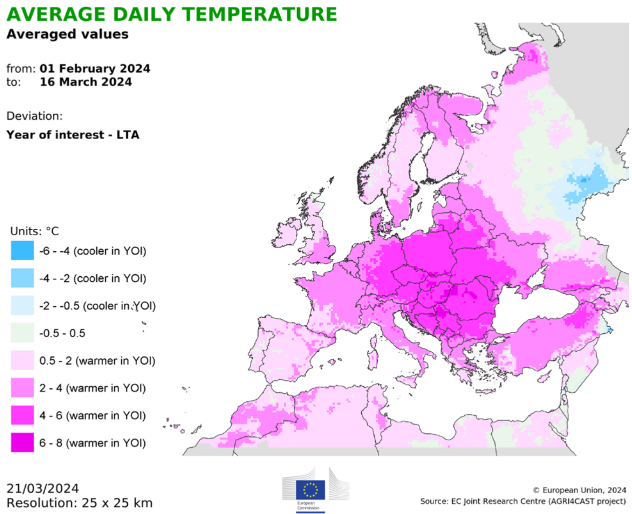
Warmer-than-usual conditions prevailed in almost all of Europe, except parts of European Russia. Wetter-than-usual conditions prevailed in western and northern central Europe, whereas the Spanish Mediterranean coast and significant parts of the Balkan peninsula and eastern Europe remained drier than usual.

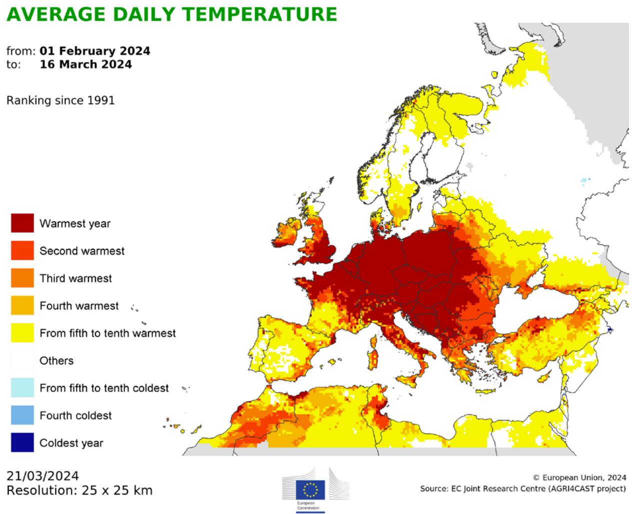
Warmer-than-usual conditions were observed in almost all of Europe. The most distinct positive temperature anomalies (4–6 °C above the 1991–2023 long-term average (LTA), locally up to 8 °C above the LTA) were observed in most of the Balkan peninsula, in parts of central and eastern Europe and in north-west Türkiye. Daily mean temperatures between 2 °C and 4 °C above the LTA were observed in the southern United Kingdom, most of France, Italy, the Benelux countries, northwest Germany, and Denmark, and also in Greece, most of Türkiye, eastern Ukraine, Latvia, Estonia, southern Sweden, northern parts of Finland, and north, south and central west parts of European Russia. In many of these regions, average daily temperatures ranked among the warmest three in our records since 1991 and the number of cold days was 60 % or more below the LTA.

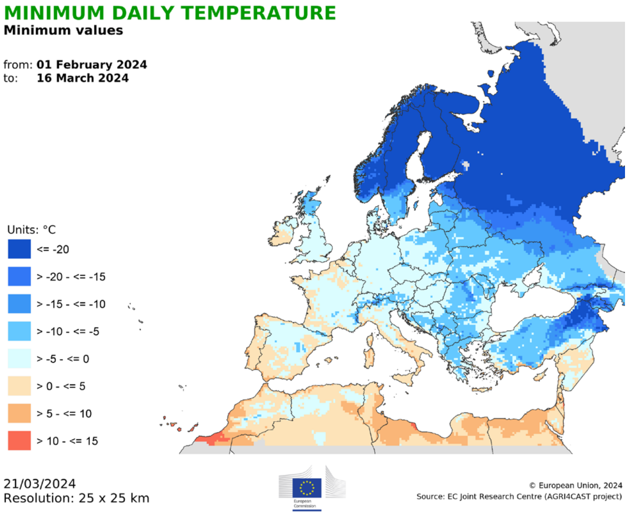
Colder-than-usual conditions, with temperature anomalies between 2 °C and 4 °C (and in some areas up to 6 °C) below the LTA, were observed in the southern parts of the Volga okrug of European Russia. In most of Europe, minimum daily temperatures remained above –5 °C, while in Norway, most of Sweden, Finland, north Estonia, north-east Türkiye and most of north and central European Russia minimum daily temperatures as low as –20 °C were observed.

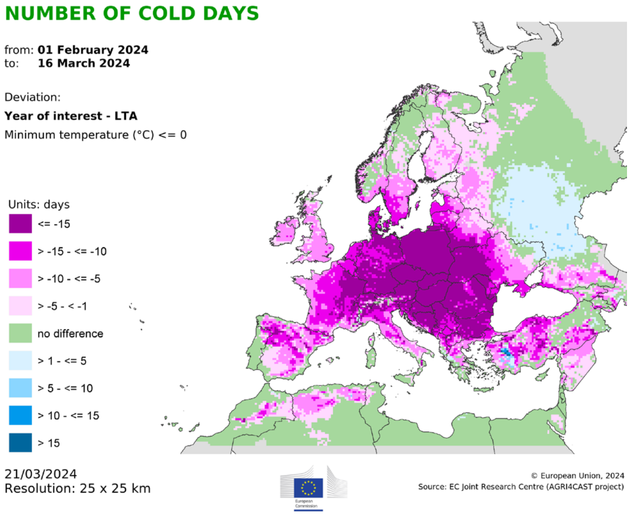
Much wetter-than-usual conditions (rainfall total of more than 100 % and in some regions more than 150 % above the LTA) were observed in parts of the Iberian peninsula, the southern United Kingdom, parts of France, most of northern Italy, and Czechia, locally in northern Poland, and in northern Greece, central Romania and the Caspian Depression and parts of the northern Ural Mountain region in European Russia. In many of these regions, the review period ranked among the three wettest in our records since 1991.

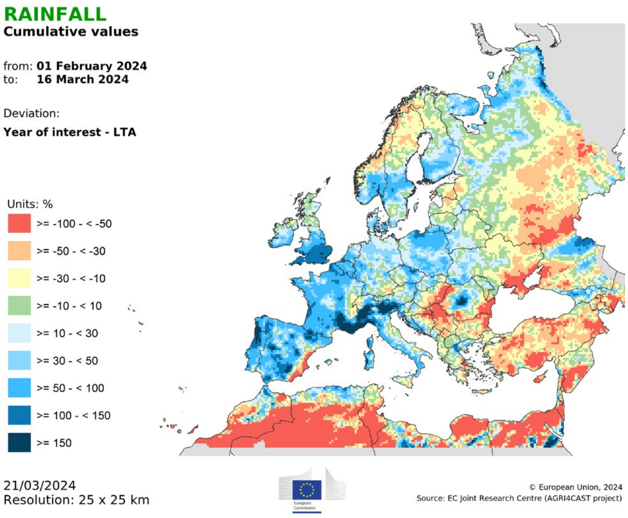
Drier-than-usual conditions (rainfall total between 50 % and 100 % below the LTA) were observed in parts of coastal Mediterranean Spain, south-east Hungary, east Croatia, Serbia, west, south and south-east Romania, eastern Bulgaria, many parts of Türkiye, south-east Ukraine, and parts of southern and central European Russia.

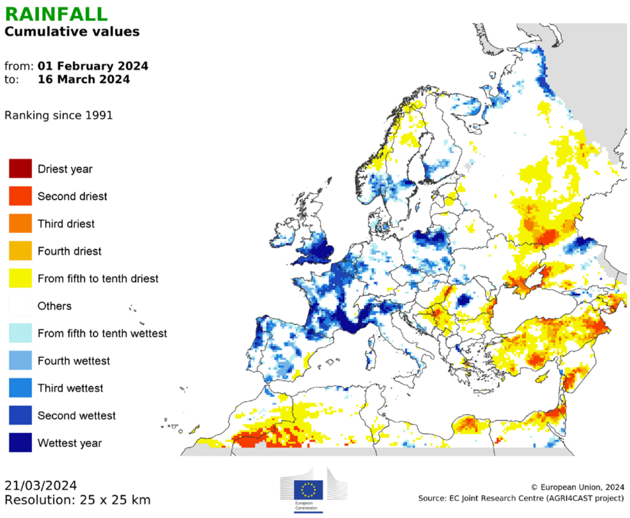




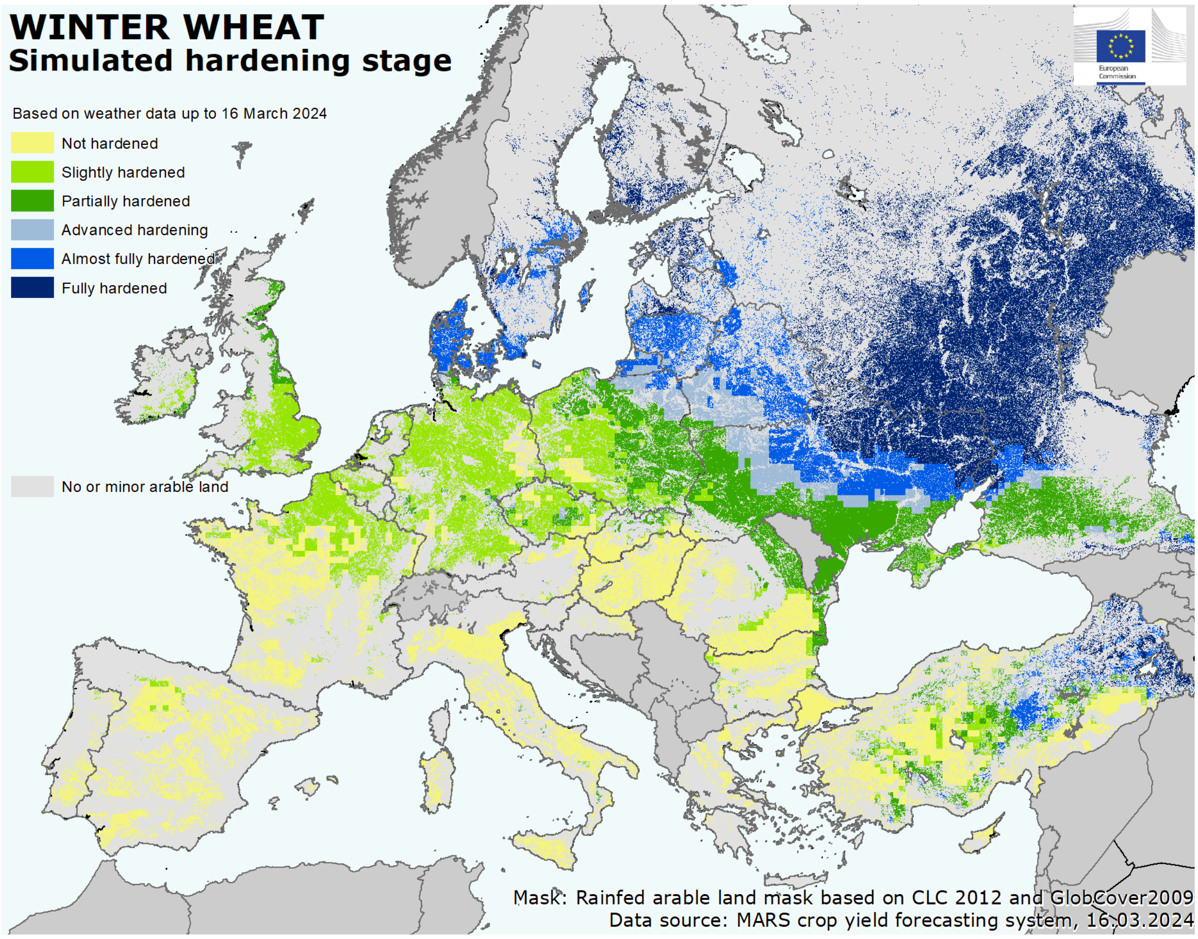

MINIMUM DAILY TEMPERATURE
Minimum values
from: 01 February 2024
to: 16 March 2024
Units: °C
<= -20
> -20 - <= -15
> -15 - <= -10
> -10 - <= -5
> -5 - <= 0
> 0 - <= 5
> 5 - <= 10
> 10 - <= 15
21/03/2024
Resolution: 25 x 25 km
© European Union, 2024
Source: EC Joint Research Centre (AGRI4CAST project)


NUMBER OF COLD DAYS
from: 01 February 2024
to: 16 March 2024
Deviation:
Year of interest - LTA
Minimum temperature (°C) <= 0
Units: days
<= -15
> -15 - <= -10
> -10 - <= -5
> -5 - < -1
no difference
> 1 - <= 5
> 5 - <= 10
> 10 - <= 15
> 15
21/03/2024
Resolution: 25 x 25 km
© European Union, 2024
Source: EC Joint Research Centre (AGRI4CAST project)


RAINFALL
Cumulative values
from: 01 February 2024
to: 16 March 2024
Deviation:
Year of interest - LTA
Units: %
>= -100 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 100
>= 100 - < 150
>= 150
21/03/2024
Resolution: 25 x 25 km
© European Union, 2024
Source: EC Joint Research Centre (AGRI4CAST project)


RAINFALL
Cumulative values
from: 01 February 2024
to: 16 March 2024
Ranking since 1991
Driest year
Second driest
Third driest
Fourth driest
From fifth to tenth driest
Others
From fifth to tenth wettest
Fourth wettest
Third wettest
Second wettest
Wettest year
21/03/2024
Resolution: 25 x 25 km
© European Union, 2024
Source: EC Joint Research Centre (AGRI4CAST project)

1.4. Winter hardening and frost-kill analysis



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

In February, temperatures were consistently and substantially above the LTA across Europe, with exceptions in parts of European Russia, where temperatures stayed close to or were below the LTA. In late February and the first week of March, a few colder days were recorded in western Europe, after which temperatures returned to above-average levels. The only region that presented below-average temperatures throughout the review period is the Volga okrug in Russia. According to our model-based analysis, the temperature regimes described above have not caused additional crop frost damage in Europe compared with the previous edition of the Bulletin, except in the Volga okrug, where minor damage is likely to have occurred in the second half of February. Winter cereals remain completely dehardened in southern Europe, and slightly hardened in the British Isles, northern France and the Benelux countries. Significant dehardening has occurred in central Europe, most notably in Germany, western Poland, Czechia, Slovakia, Austria, Slovenia, Croatia, Hungary and western Romania. Around the Black Sea, crops remain slightly to partially hardened. Dehardening has started in eastern Poland and Lithuania. Winter cereals in Scandinavia, Latvia, Estonia, Finland and Russia are still almost fully or fully hardened. Crops in central Europe face an increased risk of negative impacts if there are cold spells in late March or April. However, the current 10-day forecast indicates above-average temperatures in most of Europe, which will cause a further dehardening of winter crops.

1.5. Weather forecast (21-30 March)

A low-pressure system over the Atlantic pushes rain and wind into, while warm conditions are forecast for almost all of Europe, except some northern parts.

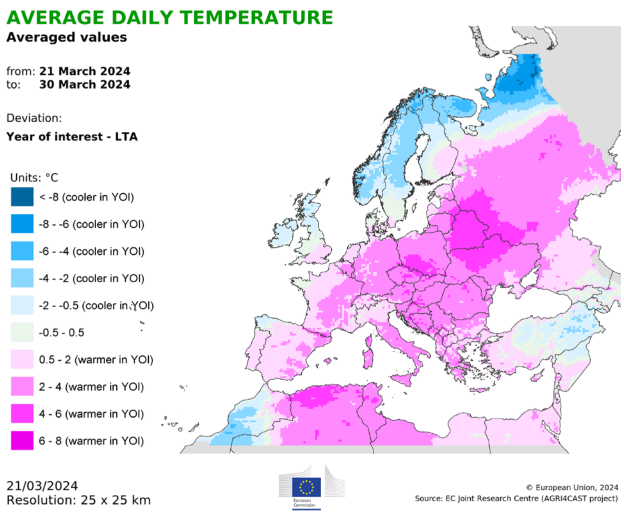
Colder-than-usual conditions, with average daily temperatures between 2 °C and 4 °C (locally up to 6 °C) below the LTA, are forecast for most of the Scandinavian peninsula, parts of eastern Türkiye and northern European Russia. In mountainous regions, most of Norway, Sweden and Finland, parts of Türkiye and most of European Russia, more than 6 days with temperatures below 0 °C are forecast.

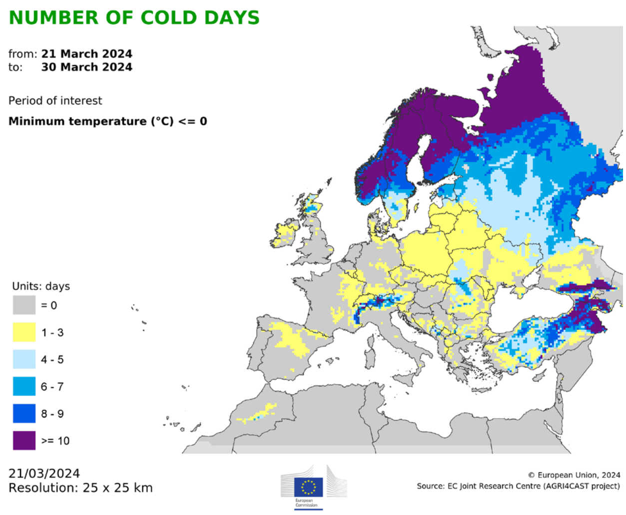
Much warmer-than-usual conditions are forecast for most of the rest of Europe. The most substantial positive anomalies (4–6 °C above the LTA) are forecast for southern Poland and locally in other parts of central Europe, and for northern Ukraine, easternmost Lithuania, Latvia, Belarus and bordering regions in European Russia.

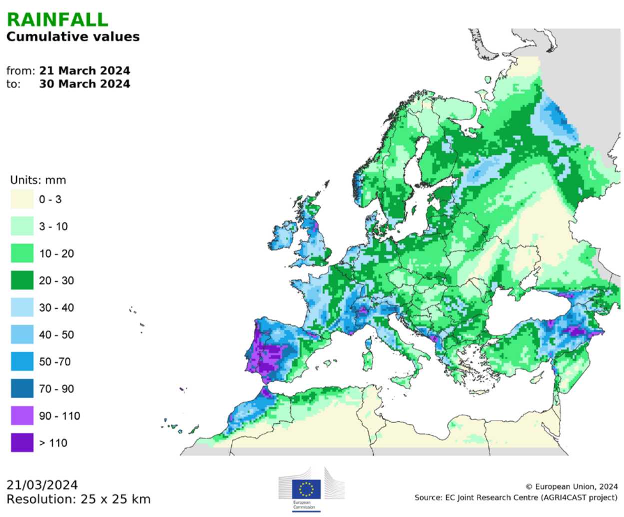
Dry conditions (total precipitation below 3 mm) are forecast for parts of central and eastern Ukraine and for central and northernmost European Russia.

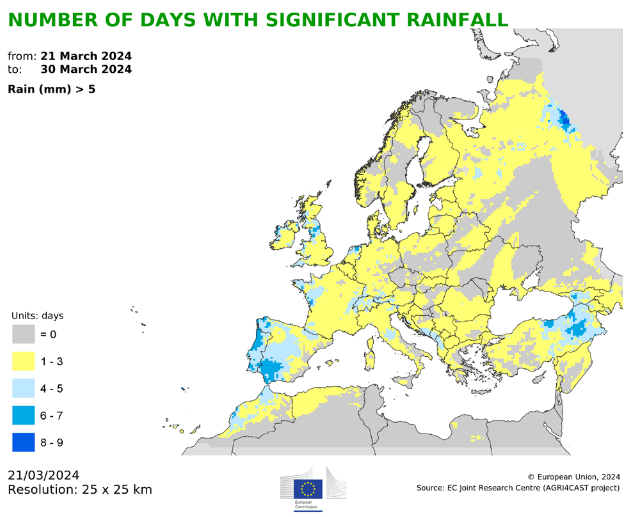
Very wet conditions (with precipitation of more than 90 mm) are forecast for western parts of the Iberian peninsula and parts of the Alps region, along the Adriatic coast of the Balkan peninsula and for parts of eastern Türkiye. In these regions and in the central Ural Mountain region of European Russia, more than 6 days with precipitation of more than 5 mm are forecast.

The long-range weather forecast for April, May and June points to a moderate to high likelihood of warm conditions, exceeding the 24-year climatological median by up to 1 °C in most of Europe (up to 2 °C in southern Europe), and precipitation ranging from up to 50 mm above the mean for Atlantic coastal regions in the Iberian Peninsula and France in April to below-average in the Iberian Peninsula, southern France, and parts of Italy by June.





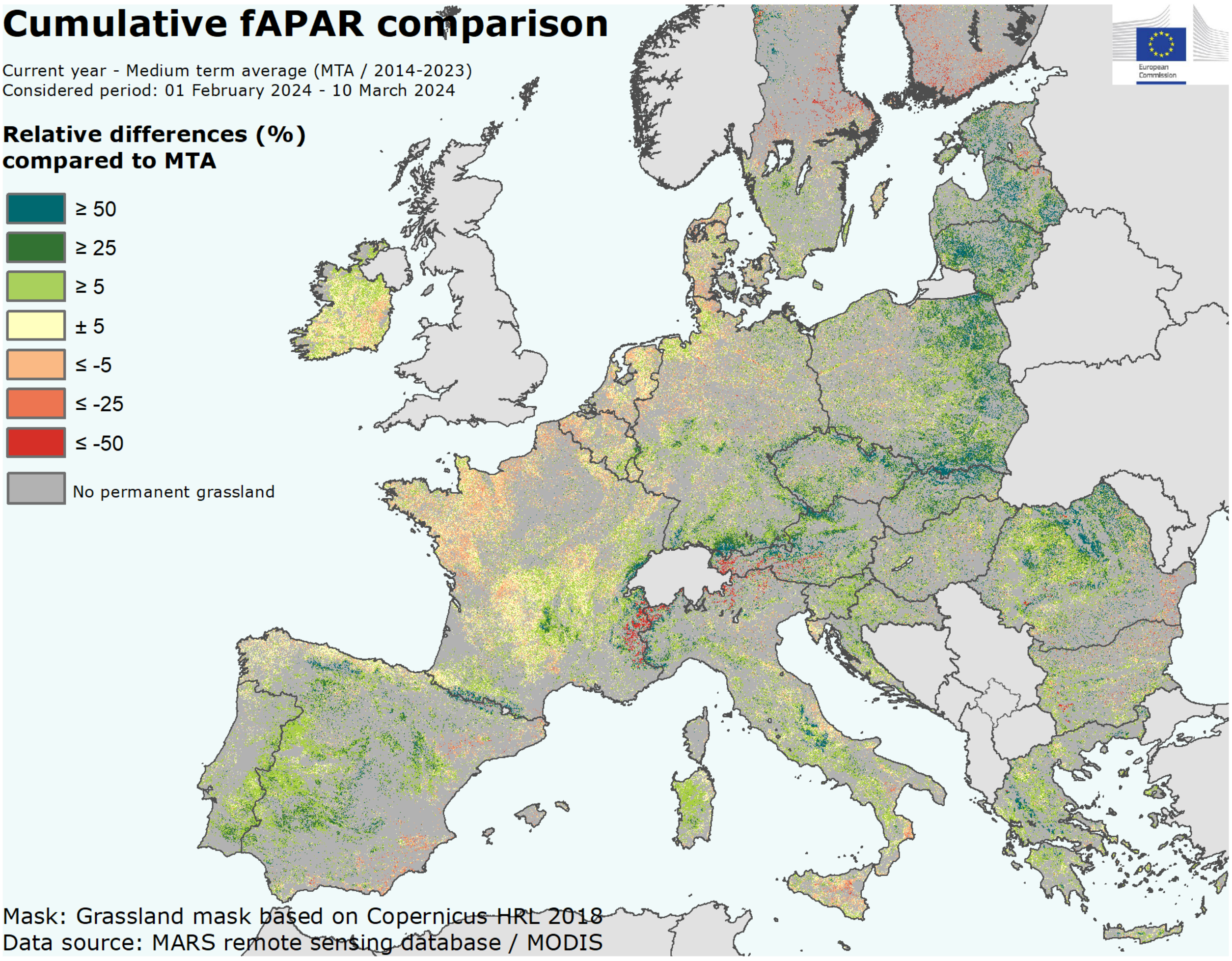




2. Grassland and fodder in Europe - regional monitoring

Warm temperatures trigger early regrowth, but excessive soil moisture delays field access in north-western Europe

The map below displays the differences between the fraction of absorbed photosynthetically active radiation (fAPAR) cumulated from 1 February to 10 March 2024 and the medium-term average (MTA, 2014-2023) for the same period. Positive anomalies (in green) in this period reflect surface greenness representing early regrowth or lack of snow cover, while negative anomalies (in red) reflect below-average surface greenness or snow presence. At this stage in the year, the status of fodder crops cannot be assessed yet.



In **Ireland**, **France**, the **Benelux** countries, northern **Germany**, **Denmark**, southern **Sweden** and western **Poland**, abundant rainfall characterised the winter period, causing soils to be overly wet, while the temperatures were beneficial. This excessive wetness is not expected to have compromised the growth potential but has complicated field works and delayed the start of grazing.

In northern parts of **Sweden** and in **Finland**, grassland growth has not resumed because of the relatively thick snow layer. In **southern Germany**, **Austria**, **Slovenia**, **Croatia**, **Hungary**, **Slovakia**, **Czechia**, **Poland** and the **Baltic countries**, warmer-than-usual temperatures have prevailed since late January, leading to the absence of a snow layer and an early start to the growth season, thus favouring biomass accumulation.

Conditions are more contrasting in eastern Europe: in west and central **Romania**, grassland benefited from the mild winter and adequate water supply, resulting in above-average growth. In the eastern and southern regions of **Romania** and in **Bulgaria**, biomass accumulation levels are close to average, but more precipitation is needed to improve the soil moisture content of the upper soil layers to secure adequate growth.

In **Greece** and **Cyprus**, warm weather and adequate precipitation and radiation boosted grassland growth, leading to higher-than-usual biomass levels. In northern and central **Italy**, rain in March sustained the initial development. Similarly, southern **Italy** benefitted from recent rainfall events, which sustained biomass accumulation, except for *Sicilia*, where the lack of rainfall limited growth. In central and northern **Spain** and in **Portugal**, adequate rainfall and warmer-than-usual temperatures have boosted grassland growth, while southern regions are recovering from winter dryness; however, in regions along the Mediterranean coast the precipitation deficit has hindered grass development.

3. Country headlines

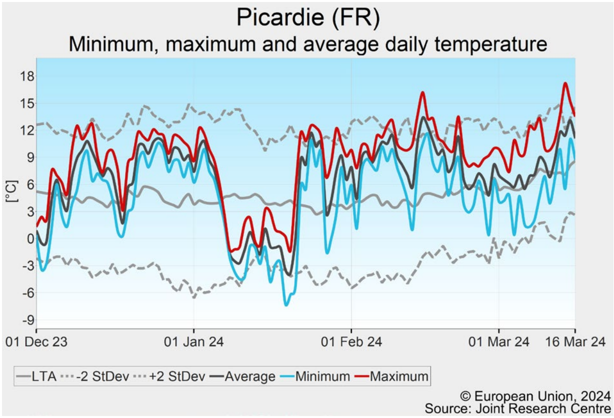
3.1. European Union

France

Winter and spring cereal areas affected by persistently wet conditions

After an abnormally wet autumn, the rainfall regime in December and January aligned with the long-term average (LTA), with periodic intense events. From 1 February, rainfall was nearly twice the LTA in northern, central and south-western regions, and up to three times the LTA in Mediterranean regions. Winter temperatures have been among the warmest on record, particularly in the eastern region, closely resembling the conditions observed in 2020 and 2016. A cold spell in mid January in the north of the country did not cause frost damage, as temperatures remained above -10 °C.

Despite an early onset of regrowth due to the warmth since the end of January, the overall condition of winter crops, particularly in the north and the west of France, has remained below average due to the wet conditions in late autumn, which disrupted the sowing campaign and hampered plant root development. The spring sowing campaign has also been noticeably disrupted due to waterlogged fields. The spring barley area is still uncertain: an increase would be expected due to the failed winter sowings, but the current problems may result in a decrease, which could eventually result in an increase of the area of summer crops. Our yield forecasts for winter and spring cereals are 1–2 % below the historical trend, while the forecast for rapeseed remains in line with the trend.

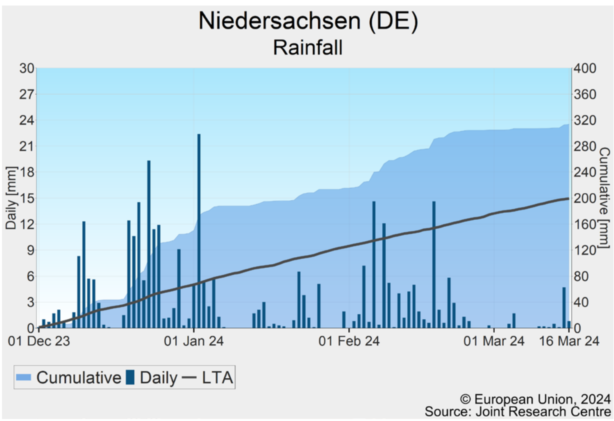


Germany

Heavy precipitation put pressure on winter crops

Temperatures in Germany were above average for most of the review period, with new temperature records being set in February, especially in the south. This phase was interrupted by two cold spells at the beginning of December and January, but without damage to winter crops. In northern Germany, record precipitation levels from November 2023 to mid February 2024 – resulting in local flooding – put serious stress on winter crops through waterlogging, leading to oxygen and nitrogen deficiency, which will necessitate resowing locally in spring. Rainfall was back to usual conditions in late February and March, but the fields remained overly wet or waterlogged, causing delays in the field maintenance, fertilisation and sowing of spring and summer crops. In addition, resowing of spring wheat and spring barley will be hampered by a shortage of high-quality seeds.

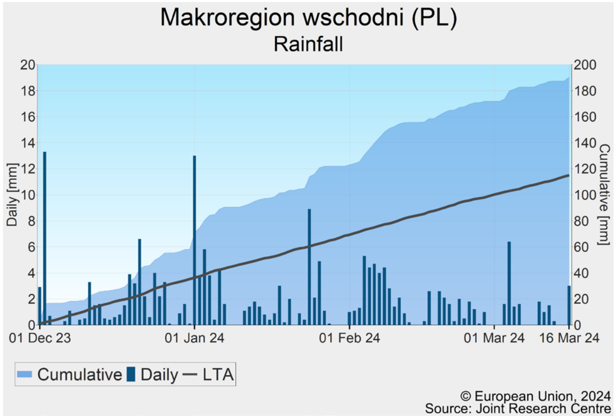
Currently, southern Germany profits from good growing conditions while the initial development of winter crops in northern Germany is disturbed. Nevertheless it is expected that the most impacted fields will be resown with spring cereals or summer crops. Therefore, the national yield forecasts for all crops are still based on historical trends.



Poland

Constant rainfall affects winter crop development

The 2023/2024 winter generally saw temperatures well above the LTA, despite a notable drop at the beginning of January, with daily minimum temperatures reaching –20 °C towards the north-east. This event might have led to minor crop damage considering that crops are less hardened than usual. Most notably, however, this winter saw very high and frequent precipitation throughout the country, especially in the east, with nearly double the usual winter rainfall total. While replenished soil moisture levels are considered favourable, the fields are partially above their maximum water saturation, exposing winter crops to prolonged stresses, such as oxygen and nutrient deficiency. In addition, it was difficult to fertilise crops, conduct field operations or plan the (re)sowing campaign. The period since mid February has brought some minor relief, with lower rainfall rates, but more cloud-free days will be necessary to conduct effective field operations. In this early stage of the season, our crop yield estimates are in line with historical trends.



Romania

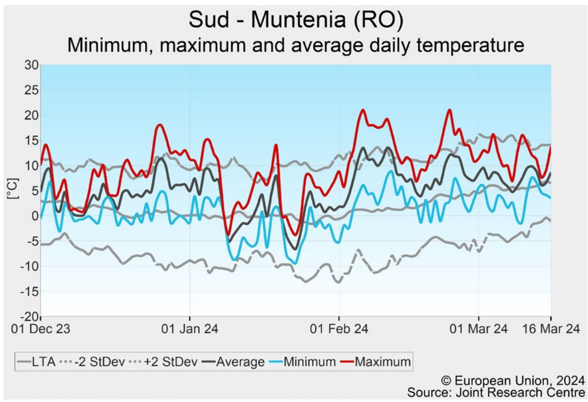
Rainfall deficit concerns in south-eastern Romania

Romania experienced the warmest winter in our records (since 1991), with exceptionally mild temperatures (3–4 °C above the LTA) from early December until mid March, with the exception of two short cold periods in January.

Winter precipitation on the arable lands of northern and central regions exceeded the LTA by up to 50 %. In contrast, southern Romania experienced drier-than-usual conditions. The most serious precipitation deficit (30–50 % below the LTA) prevailed along the border with Bulgaria and territories close to the Black Sea. February was significantly drier than usual everywhere except the *Centru* region.

The brief cold periods in January did not cause damage to winter cereals, and the exceptionally warmer-than-usual conditions since early February resulted in an early restart of vegetative growth (albeit accompanied by a significant decrease in frost tolerance). Soil moisture levels are mostly adequate but are below average in the south-eastern regions.

The area sown with winter cereals and rapeseed was negatively affected by the drought of last autumn. A further reduction in rapeseed area is expected, depending on if and how well weak stands recover in the coming weeks, particularly in the south-east.



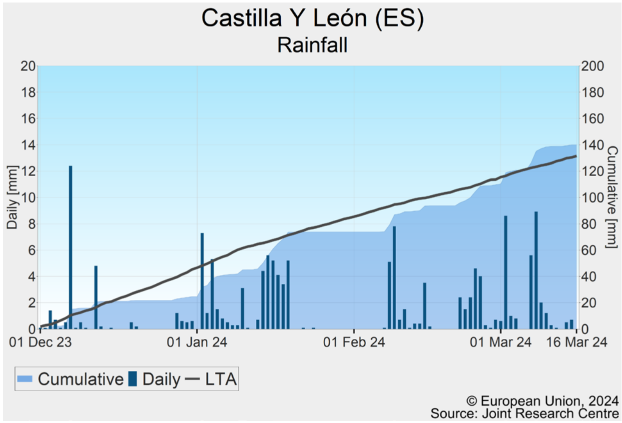
Spain and Portugal

The return of the rain marks the beginning of the season

Since December, most of the Iberian peninsula has experienced significant and well-distributed precipitation, reaching up to 40–60 % above the LTA in central and western areas. However, a lack of rainfall has persisted along the Mediterranean coast. In these areas, water levels in reservoirs ([1]) also remain very low (e.g. *Murcia*, 26 %; *Andalucía*, 29 %). In the rest of Spain, reservoir levels have recovered to levels above the 10-year average. In Portugal, water levels ([2]) are close to capacity, except for in the *Algarve*.

Average temperatures during December were followed by 2 months of temperatures 2–3 °C above the LTA, including the warmest January in our records (since 1991). Temperatures slightly below the LTA were recorded in early March, slowing down the advanced growth and development that crops had been experiencing.

While more rainfall will be needed to maintain favourable growth conditions for crops, current conditions are promising for winter cereals and adequate for planting the main spring crops. Our current yield forecasts are based on historical trends.

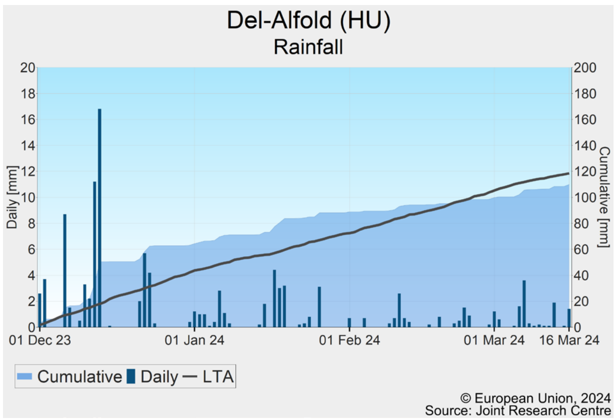


Hungary

Winter crops are in good condition

During our review period (1 December to 16 March), temperatures remained 2.5–4 °C above the LTA, except for two short colder spells in December and January; however, these spells did not cause significant damage. February and early March were exceptionally mild, reaching up to 6 °C above the LTA.

A wet November was followed by a very rainy December. Waterlogging and inland inundation problems occurred on heavy soils, resulting in patchy damage to winter crop stands, especially in the case of rapeseed, for which a reduction in sown area is expected. From January onwards, precipitation rates decreased. The rainfall total in the review period exceeded the LTA by up to 50 % in north-western Hungary, while remaining near or slightly below average in the south-east. Soil moisture is generally well replenished across the country; only in the south-east are the upper soil layers dry. Winter crops benefited from mild weather conditions and adequate soil water supply where flooding did not occur. The dormancy period ended in February and regreening started much earlier than normal; as a result, winter crops are currently advanced in phenological development. Pest pressure is higher than usual due to the mild winter and missed treatment in the rainy autumn. The sowing campaigns of peas and spring barley have started well. Our current yield forecasts follow historical trends.



([1]) www.embalses.net , 18 March 2024
([2]) https://sir.dgadr.gov.pt/reservas , 8 March 2024

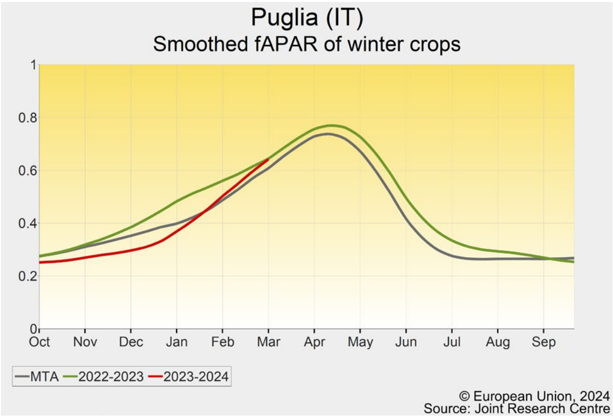
Italy

Recent rain mitigated the effects of the dry winter

In most Italian regions, the winter period from 1 December to 16 March was characterised by unusually warm conditions, marking the warmest winter since 1991.

Northern Italy experienced an unusually warm and dry winter. However, the situation has improved since the end of February. Since 20 February, intense rainfall in the north-west of up to 150 mm has raised soil moisture to above-average levels, sustaining the advanced growth and above-average biomass accumulation of winter crops. Central and southern Italy have experienced a similar weather pattern as the north, but with a pronounced rainfall deficit from December to February (– 75 %), reducing the biomass accumulation of winter crops. Since early March, frequent precipitation has improved growing conditions considerably, with biomass accumulation now above the average but similar to that of 2023, an average year for durum wheat productivity. In Sicily, limited rainfall has only partially mitigated the effects of poor winter conditions, resulting in below-average biomass accumulation so far.

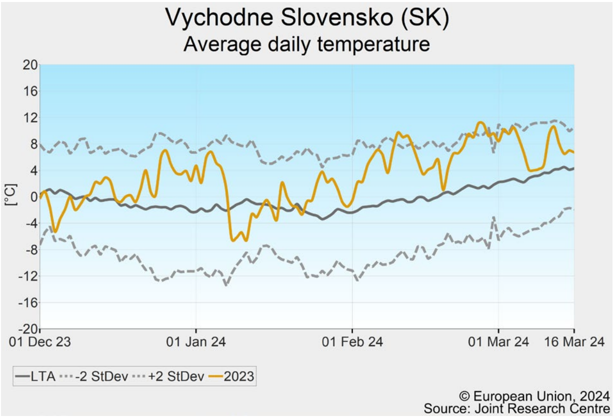
Overall, thanks to the rain since February, winter crops are in average to favourable condition, with yield expectations following historical trend.



Czechia, Austria and Slovakia

Warm temperatures induce early resumption of growth in winter crops

Winter crops are in good condition. The wet winter (especially in northern regions) has recharged soil water reserves. The exceptionally warmer-than-usual temperatures since the start of February, which are still prevailing across all these countries, have triggered an earlier- and faster-than-usual resumption of growth in winter crops. These crops are now at the end of the tillering phase. In most regions, with the exception of some in the north and the east of Czechia where the soil is still too wet, field operations are under way to support the growth of winter crops and prepare the soil for the sowing of spring crops, which should be able to take place as normal. The advanced crop development and well-filled soil water reserves suggest good prospects, provided that attention is paid to occurrences of pests and diseases, as prevailing conditions are also conducive to their proliferation.



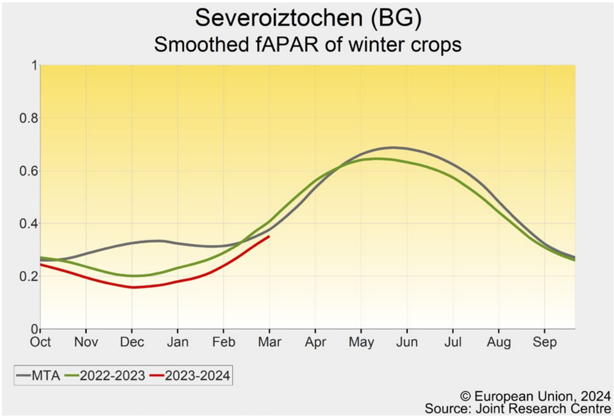
Bulgaria

More rain needed

Since 1 December, daily temperatures have highly exceeded the LTA (by 2.5–4.0 °C on average), with the exception of a cold spell in January.

Rainfall has been strongly variable. After an extremely dry sowing campaign of winter crops, abundant rains arrived in November. In December and January, precipitation was 10–40 % below the LTA, and it has been almost non-existent since then. The winter precipitation deficit is more serious (up to 95 mm) in eastern and south-eastern areas. Soil reserves in deeper layers are still replenished, but topsoil is dry.

After the difficult sowing campaign, winter cereals benefited from the predominantly favourable temperatures and soil moisture conditions in the western regions. In February, the particularly mild conditions induced an early break of winter dormancy and the regrowth of winter crops. Winter crop establishment is weak in central and eastern Bulgaria. The rapeseed area is considerably less than planned due to the poor conditions around sowing. Underdeveloped rapeseed stands suffered further damage locally from low temperatures during the cold spell in January and inadequate water supply later on. Here, substitution with summer crops is probable.

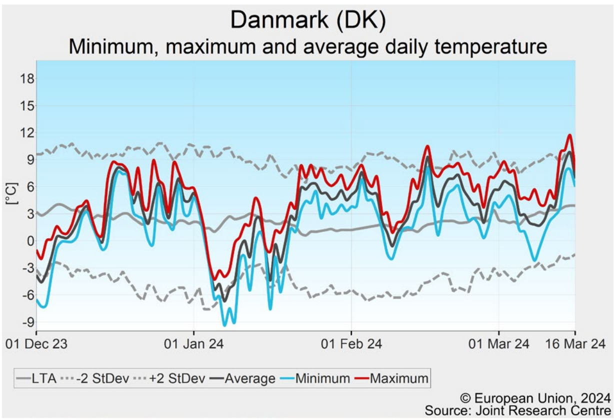


Denmark and Sweden

Continued wet conditions complicate field work

In Denmark and southern Sweden, warmer-than-usual winter temperatures prevailed during the review period, except for cold spells in early December and the second week of January. These cold intrusions, bringing temperatures down to around −10 °C, are expected to have caused limited crop damage, as reported in the February bulletin. Regular precipitation events occurred until late February, after which most regions received hardly any further rainfall. However, despite current dry conditions, our remote sensing data indicate that soils remain overly wet in some regions, which complicates field work and might require resowing locally in spring where plants did not survive a prolonged waterlogging.

Nevertheless, winter crops are still expected to be in decent condition. Continued dry conditions will be necessary in the coming weeks to ensure winter crop fertilisation and spring crop sowing. At this stage in the season, historical trends are being used to forecast crop yields.

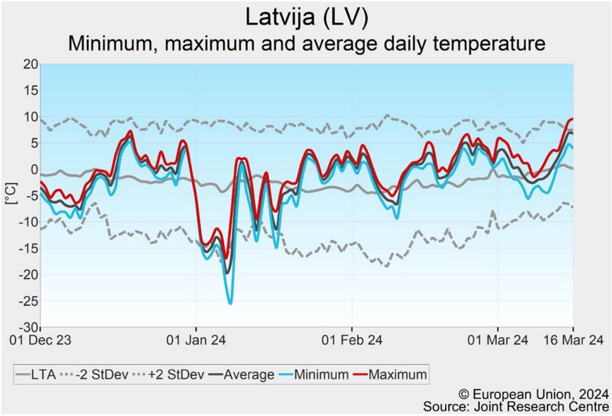


Estonia, Latvia, Lithuania, Finland

Winter crops in fair condition

Winter temperatures fluctuated above and below the LTA from December to mid February, before settling close to or above average. A significant cold spell occurred in the first week of January, with temperatures as low as −20 °C, as reported in the January edition of the bulletin. According to our models, this cold episode probably caused frost damage in Lithuania and Latvia. Total precipitation remained close to average in Finland, Lithuania and Latvia, but not Estonia, where a 20 % precipitation deficit was reported.

Despite the abovementioned cold spell, crops are expected to have wintered well. Post-dormancy regrowth has not started yet but might be triggered earlier than usual by the temperature increase forecast for the coming week. Our yield forecasts are based on historical trends.

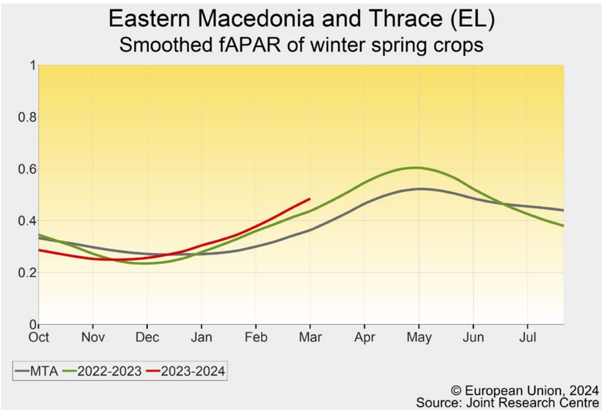


Greece and Cyprus

Crops thrive under record-breaking winter temperatures

Both Greece and Cyprus experienced their warmest December–February since 1991 ([3]), with average winter temperatures reaching nearly 14 °C in Cyprus and exceeding 9 °C in Greece, marking a rise to around 2 °C above the average for the past 30 years.

Both countries faced a rainfall deficit from December to January, followed by substantial rainfall in the first half of February in Cyprus, resulting in local flooding in the Famagusta and Paphos districts. Greece has also experienced well-distributed rainfall from around the second half of February. This recent weather pattern has bolstered winter crop growth, leading to higher-than-average biomass accumulation levels in both countries, as detected by our satellite imagery. However, due to the most recent dry spell, Cypriot farmers in the West Nicosia district are reported to be already irrigating barley, which is now in the flowering stage. Barley for silage is being harvested. Moreover, despite a promising yield development in Greece, crop production is expected to be lower than average due to the large areas of around 23 000 hectares that remain uncultivated in the southern Larissa Plain and north Magnesia ([4]) after the flood event in September ([5]). The prefecture of Magnesia alone accounts for 10 % of Greece's winter crop cultivated land; Larissa accounts for more than 20 %. In addition, the December rain deficit in Greece may have negatively affected the country's fruit trees.



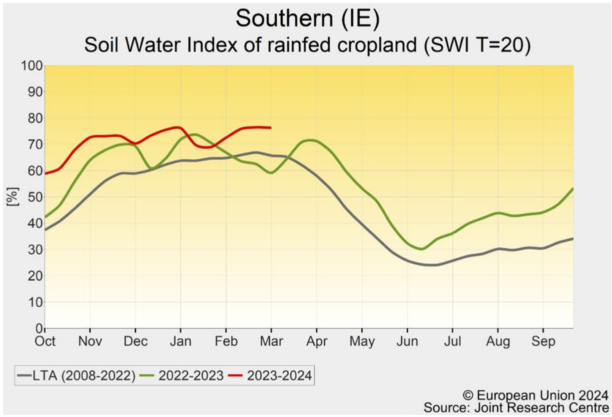
([3]) https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/continued-weather-contrasts-mixed-effects-crops-2024-02-26_en
([4]) https://rapidmapping.emergency.copernicus.eu/EMSR692/download
([5]) https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/below-average-maize-yield-expected-eu-2023-09-18_en

Ireland

Field operations complicated by wet conditions

Relatively mild conditions were recorded in winter, with temperatures predominantly close to or above the LTA, except for a few colder days in early December and during the second and third weeks of January. Rainfall occurred almost daily, although in small quantities, except for 2 drier weeks in early January. Overall, precipitation remained close to average, but the persistent wet conditions that had prevailed since early autumn resulted in locally overly wet soils, as monitored by our remote sensing data, hindering field operations and reducing the area that could be sown with winter crops.

Although no negative impacts are yet expected for winter crops, continued dry conditions will be needed to allow farmers to resume field work in the coming weeks, including spring barley sowing. Our crop yield forecasts are based on historical trends.



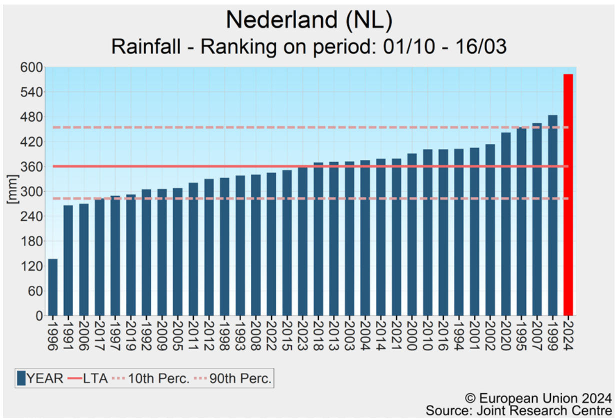
Belgium, Luxembourg and the Netherlands

Wet and warm winter presents challenges to crops and farmers

Across the Benelux, weather conditions since December have been among the warmest and wettest in our database (since 1991). Temperatures were almost constantly above the LTA, with the exception of two colder periods in the first week of December and the second and third weeks of January. The exceptionally wet conditions, which already started in October, brought significant challenges for crops and farmers. Many fields became water logged, because of which a substantial part of the fields destined for winter crops were sown under unfavourably wet or late conditions, or were not sown at all. Some farmers took advantage of the increased carrying capacity of frozen top soils to sow winter wheat during the cold spell in January. While prevailing temperatures were favourable for initial development of the crops, stands on prolonged water logged fields experienced oxygen deficiency with damaging effects. The most severely impacted fields will have to be resown to spring and summer crops.

Many fields, particularly those with clay soils in low lying areas, remained wet even during recent sunny days, thus inhibiting field operations such as the seed bed preparation for spring sowing.

The current crop yield forecasts are based on historical trends.



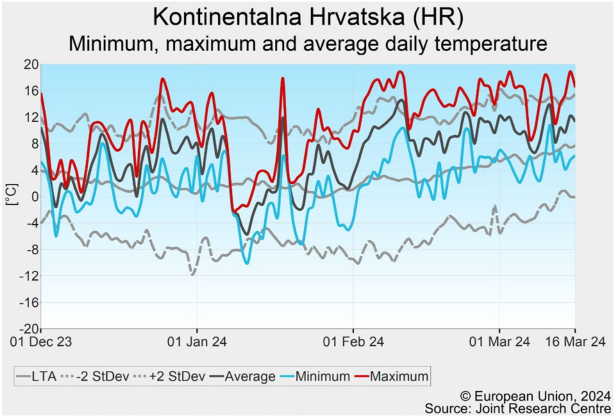
Slovenia and Croatia

Favourable conditions in general, with an exceptionally warm end to winter

During the winter, Slovenia and Croatia experienced warmer temperatures than usual, except for a brief cold period in mid-January. The daily average temperatures in December and the first half of March were 2 °C to 4 °C above the LTA. February was the warmest in our records since 1991 in both countries, with average temperatures exceeding the LTA by more than 6 °C in Eastern Croatia.

Precipitation levels during the review period have been average in the Adriatic coastal regions of Croatia as well as in the eastern part of the country, and slightly above average in northern Croatia and Central-Southern Slovenia. Northwest and northeast Slovenia experienced precipitation around 50-60% above the LTA.

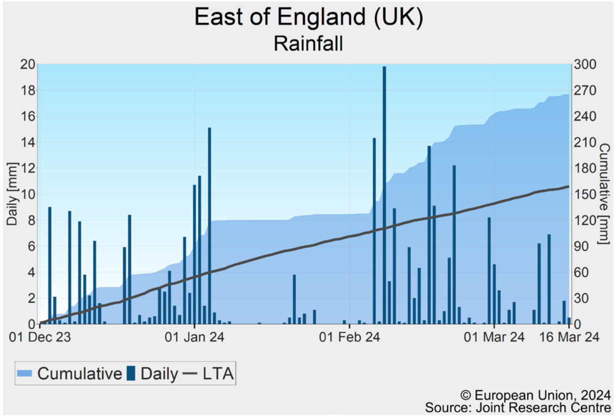
Overall, winter crops are in good condition and are advanced in phenological development due to the recent warm temperatures. The current crop yield forecasts are based on historical trends.



3.2 United Kingdom

Extreme winter rainfall endangers both winter and spring crops

In southern and eastern areas of the United Kingdom, the winter period (1 December to 16 March) was among the wettest in our records, with precipitation totals reaching up to 170 % above the LTA for the period since December. Since March, precipitation has been decreasing to near-usual levels. The overly wet winter heavily affected the growth of winter crops, with significant yield losses due to waterlogging or hypoxia, and increased the risk of disease development. A significant reduction in winter crop area is expected as a consequence, as many fields will have to be resown with spring crops. Currently, the overly wet soils in many areas do not allow for field operations such as fertilising or drilling. Dry weather in the coming weeks will be necessary for spring crop sowing, but more rain is forecast for next week, increasing the risk of delaying and shortening the suitable sowing window of spring crops. At this early stage in the season, our forecasts remain in line with the long-term trends.



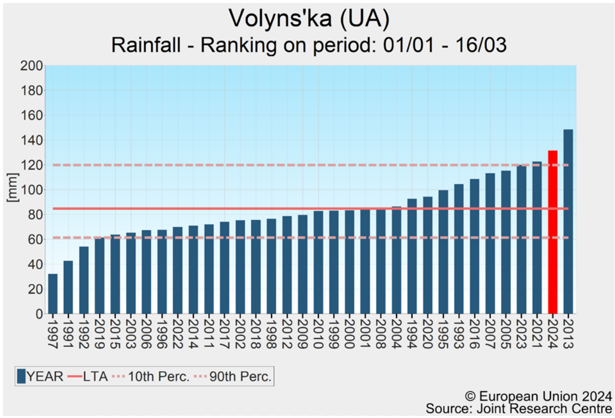
3.3 Black Sea Area

Ukraine

Overall favourable winter conditions for crops despite some overly wet regions

Western and northern regions of the country were affected by persistent rainfall from mid December to the end of February. In the western oblasts, rainfall in January and February was the highest in our records (since 1991). Conversely, the southern territories (including occupied areas and the Odesa oblast) have experienced dry conditions since 1 February. The winter has been exceptionally warm, reminiscent of the 2019/2020 season. Considering the period since 1 December, average temperature anomalies – compared with the LTA – range from 1.5 °C in the north-east to 3.8 °C in the south-west. This warmth has been particularly pronounced since late January in the western regions. In mid January, a cold spell hit the north of the country, with temperatures as low as – 17 °C, resulting in minor crop damage.

Despite these anomalies, overall conditions for winter crops have remained favourable. Conditions since mid February have also been favourable for the sowing of spring cereals in central regions, while the rainfall deficit in the south may pose additional challenges to farmers. The yield forecasts remain in line with the historical trends.



Türkiye

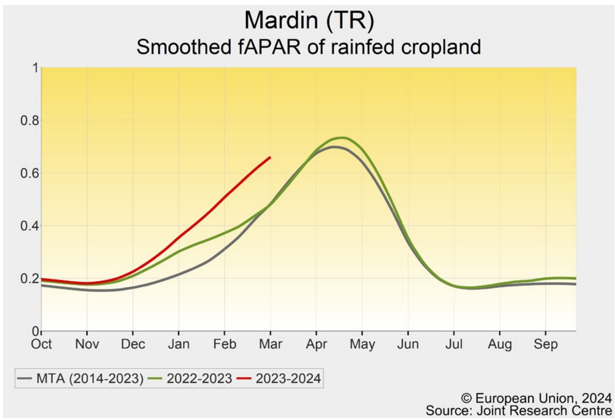
Very advanced winter crop growth

In most Turkish regions, this winter (1 December to 16 March) ranked among the three warmest since 1991.

In the central regions of Bati Anadolu and Orta Anadolu, the warm winter was accompanied by evenly distributed precipitation until early February, when precipitation became scarcer (−30 % to −50 %, 1 February to 16 March). The mild winter led to a significant advancement in the winter crop cycle, approximately 30 days ahead of the average, which typically indicates a favourable seasonal outcome.

In the south-eastern provinces of Mardin and Şanlıurfa, the winter was warmer and wetter than usual too, with regular precipitation leading to a slight accumulation surplus until 20 February. However, since then, rainfall has become less frequent. Winter crops, which emerged 2 months earlier than usual, are now approaching the flowering stage under favourable conditions.

Overall, winter crops are in advanced stages with favourable biomass accumulation; however, early in the season, our yield expectations still follow historical trends.



3.4 European Russia and Belarus

European Russia

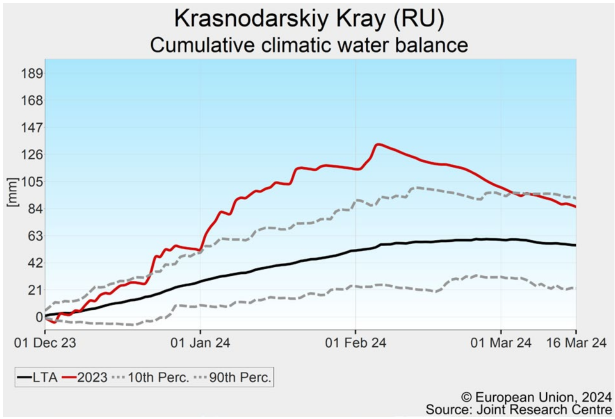
Wet winter, but successful wintering; winter crops are in fair condition

Southern European Russia and areas along the Ukrainian border predominantly experienced 1–2 °C warmer-than-usual conditions during winter. Areas close to the Caucasus presented an even higher (up to 5 °C) positive thermal anomaly. Below-average temperatures prevailed in central and eastern regions. A severe cold spell affected most of Russia between 3 and 23 January. Eastern parts of European Russia experienced additional cold spells in the first half of December and second half of February. In the Volga okrug, minimum temperatures during these periods reached –25 °C to –35 °C.

After a rainy November, precipitation continued to exceed the LTA (by 20–130 %) until late January, except in the northernmost regions. Thick snow cover formed in most of the Central and Volga okrugs, while the Southern okrug was affected by waterlogging, and even inundation in several areas with heavier soils. From February, precipitation tendency decreased, but soils are still well replenished.

Overall, the abovementioned weather conditions have been satisfactory for the wintering of winter cereals. Frost damage is expected to have been confined to areas along the Kazakhstani border in the Volga okrug, where a shallow snow layer did not provide adequate thermal insulation during the cold spells. Regrowth started in early or mid March in the southernmost areas.

In southern Russia, the spring sowing campaign has started and is progressing well thanks to the absence of snow and the adequate soil moisture conditions and seasonal temperatures.

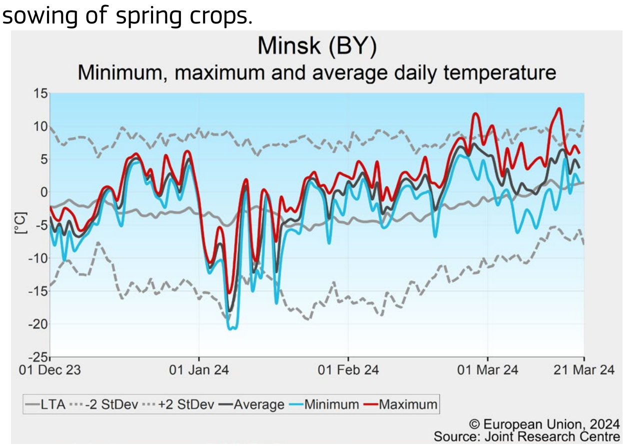


Belarus

Winter crops overall in fair shape

Temperatures predominantly exceeded the LTA from December until mid-March. However, the first and second dekads of January were much colder than usual. During this abrupt cold spell, daily minimum temperatures decreased to -20°C in the south-west, and reached values as low as -27°C in some eastern and northern regions. Precipitation totals remained close to average in *Vitebsk* and *Minsk* regions; elsewhere 20-60% rain surplus prevailed. In many places soils became saturated and water logging problems occurred, which eased in February with the arrival of higher temperatures and moderate precipitation.

The cold episode in January is expected to have caused some frost-kill damage to winter barley and late sown wheat stands in areas covered with shallow snow cover. In the east and north, snow mold damage may have occurred under thick and long lasting snow. Nevertheless, overall, winter crops are in fair shape thanks to the mostly mild temperatures. Current soil moisture and thermal conditions allowed the early start of soil preparation and sowing of spring crops.



3.5 Maghreb

Morocco, Algeria and Tunisia

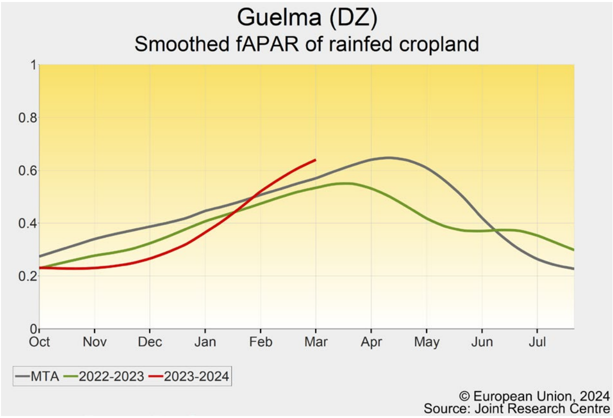
Negative outlook in Morocco and west Algeria; crop recovery in the rest of the Maghreb

Prolonged drought conditions since autumn have hampered crop growth during the vegetative phases in the main cereal-growing regions of Morocco and north-western Algeria, resulting in well-below-average levels of biomass accumulation and a risk of crop failure.

Persistent dry conditions also hampered crop growth in central and eastern Algeria. However, the rainfall that occurred in December to January and February to early March triggered a steep recovery of vegetative growth, resulting in moderately above-average biomass levels. This development is expected to partly compensate for, at the national level, the forecast negative yields in the north-western regions.

A rapid crop recovery up to above-average levels of biomass accumulation was also observed in the main cereal-producing regions of Tunisia, where crops are currently in the flowering stage.

Our forecast for winter cereals in the Maghreb ranges from well below average in Morocco to below average in Algeria and moderately above average in Tunisia.



4. Crop yield forecast

Country	Total wheat (t/ha)				
	Avg 5yrs	2023	MARS 2024 forecasts	%24/5yrs	%24/23
EU	5.65	5.60	**5.70**	+ 1	+ 2
AT	5.81	6.12	**5.67**	– 3	– 7
BE	8.80	8.91	**8.84**	+ 1	– 1
BG	5.14	5.43	**5.61**	+ 9	+ 3
CY	—	—	**—**	—	—
CZ	6.13	6.43	**6.36**	+ 4	– 1
DE	7.51	7.48	**7.64**	+ 2	+ 2
DK	7.98	7.41	**7.69**	– 4	+ 4
EE	4.57	4.00	**4.63**	+ 1	+ 16
EL	2.97	3.15	**3.05**	+ 3	– 3
ES	3.18	2.04	**3.38**	+ 6	+ 66
FI	3.61	3.19	**3.64**	+ 1	+ 14
FR	7.21	7.28	**7.01**	– 3	– 4
HR	5.71	4.78	**5.88**	+ 3	+ 23
HU	5.35	5.63	**5.66**	+ 6	+ 1
IE	9.91	9.33	**10.2**	+ 3	+ 9
IT	3.78	3.60	**3.89**	+ 3	+ 8
LT	4.73	4.74	**4.62**	– 2	– 3
LU	5.98	5.75	**6.04**	+ 1	+ 5
LV	4.67	4.07	**4.63**	– 1	+ 14
MT	—	—	**—**	—	—
NL	8.87	8.59	**8.95**	+ 1	+ 4
PL	5.10	5.38	**5.27**	+ 3	– 2
PT	2.18	1.38	**2.14**	– 2	+ 55
RO	4.22	4.55	**4.52**	+ 7	– 1
SE	6.65	5.46	**6.47**	– 3	+ 19
SI	5.47	5.07	**5.40**	– 1	+ 7
SK	5.41	6.16	**5.70**	+ 5	– 7

Country	Soft wheat (t/ha)				
	Avg 5yrs	2023	MARS 2024 forecasts	%24/5yrs	%24/23
EU	5.87	5.82	**5.91**	+ 1	+ 2
AT	5.87	6.14	**5.72**	– 3	– 7
BE	8.80	8.91	**8.84**	+ 1	– 1
BG	5.14	5.43	**5.61**	+ 9	+ 3
CY	—	—	**—**	—	—
CZ	6.13	6.43	**6.36**	+ 4	– 1
DE	7.54	7.51	**7.67**	+ 2	+ 2
DK	7.98	7.41	**7.69**	– 4	+ 4
EE	4.57	4.00	**4.63**	+ 1	+ 16
EL	2.94	2.86	**3.01**	+ 3	+ 5
ES	3.28	2.11	**3.49**	+ 6	+ 65
FI	3.61	3.19	**3.64**	+ 1	+ 14
FR	7.30	7.37	**7.08**	– 3	– 4
HR	5.71	4.78	**5.88**	+ 3	+ 23
HU	5.37	5.65	**5.69**	+ 6	+ 1
IE	9.91	9.33	**10.2**	+ 3	+ 9
IT	5.34	5.08	**5.41**	+ 1	+ 7
LT	4.73	4.74	**4.62**	– 2	– 3
LU	5.98	5.75	**6.04**	+ 1	+ 5
LV	4.67	4.07	**4.63**	– 1	+ 14
MT	—	—	**—**	—	—
NL	8.87	8.59	**8.95**	+ 1	+ 4
PL	5.10	5.38	**5.27**	+ 3	– 2
PT	2.18	1.38	**2.14**	– 2	+ 55
RO	4.22	4.55	**4.52**	+ 7	– 1
SE	6.65	5.46	**6.47**	– 3	+ 19
SI	5.47	5.07	**5.40**	– 1	+ 7
SK	5.42	6.16	**5.77**	+ 6	– 6

Country	Durum wheat (t/ha)				
	Avg 5yrs	2023	MARS 2024 forecasts	%24/5yrs	%24/23
EU	3.44	3.29	**3.44**	– 0	+ 5
AT	5.07	5.88	**5.10**	+ 1	– 13
BE	—	—	**—**	—	—
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	—	—	**—**	—	—
DE	5.40	5.74	**5.41**	+ 0	– 6
DK	—	—	**—**	—	—
EE	—	—	**—**	—	—
EL	2.98	3.31	**3.08**	+ 3	– 7
ES	2.54	1.61	**2.67**	+ 5	+ 66
FI	—	—	**—**	—	—
FR	5.53	5.44	**5.45**	– 2	+ 0
HR	—	—	**—**	—	—
HU	4.63	5.20	**4.87**	+ 5	– 6
IE	—	—	**—**	—	—
IT	3.11	2.91	**3.09**	– 1	+ 6
LT	—	—	**—**	—	—
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	—	—	**—**	—	—
PT	—	—	**—**	—	—
RO	—	—	**—**	—	—
SE	—	—	**—**	—	—
SI	—	—	**—**	—	—
SK	5.35	6.14	**5.22**	– 2	– 15

Country	Winter barley (t/ha)				
	Avg 5yrs	2023	MARS 2024 forecasts	%24/5yrs	%24/23
EU	5.91	6.05	**5.95**	+ 1	– 2
AT	6.69	6.55	**6.70**	+ 0	+ 2
BE	8.31	8.62	**8.56**	+ 3	– 1
BG	4.96	5.30	**5.27**	+ 6	– 1
CY	2.11	1.74	**2.18**	+ 3	+ 25
CZ	6.09	6.33	**6.14**	+ 1	– 3
DE	7.24	7.48	**7.32**	+ 1	– 2
DK	6.92	6.53	**6.74**	– 3	+ 3
EE	4.67	3.68	**4.67**	+ 0	+ 27
EL	2.83	2.55	**2.89**	+ 2	+ 13
ES	2.51	1.06	**2.61**	+ 4	+ 146
FI	—	—	**—**	—	—
FR	6.65	7.13	**6.50**	– 2	– 9
HR	4.89	4.00	**5.13**	+ 5	+ 28
HU	5.62	5.51	**5.88**	+ 5	+ 7
IE	8.97	8.72	**9.22**	+ 3	+ 6
IT	4.12	3.99	**4.17**	+ 1	+ 5
LT	4.17	3.98	**4.16**	– 0	+ 5
LU	—	—	**—**	—	—
LV	4.49	3.59	**4.38**	– 3	+ 22
MT	—	—	**—**	—	—
NL	8.42	8.91	**8.70**	+ 3	– 2
PL	4.87	5.07	**4.92**	+ 1	– 3
PT	2.71	1.56	**2.74**	+ 1	+ 75
RO	4.25	4.80	**4.60**	+ 8	– 4
SE	6.06	5.19	**5.76**	– 5	+ 11
SI	5.08	4.60	**5.14**	+ 1	+ 12
SK	5.54	5.55	**5.59**	+ 1	+ 1

Country	Rye (t/ha)				
	Avg 5yrs	2023	MARS 2024 forecasts	%24/5yrs	%24/23
EU	4.16	4.11	**4.30**	+ 3	+ 5
AT	4.76	4.54	**4.76**	+ 0	+ 5
BE	—	—	—	—	—
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	5.19	5.03	**5.32**	+ 3	+ 6
DE	5.26	5.01	**5.24**	– 0	+ 5
DK	6.12	5.67	**5.93**	– 3	+ 5
EE	3.86	3.66	**3.82**	– 1	+ 5
EL	—	—	—	—	—
ES	2.16	1.41	**2.07**	– 4	+ 47
FI	3.93	3.45	**3.87**	– 2	+ 12
FR	4.32	4.34	**4.44**	+ 3	+ 2
HR	—	—	—	—	—
HU	3.27	3.34	**3.49**	+ 7	+ 4
IE	—	—	—	—	—
IT	—	—	—	—	—
LT	2.59	2.36	**2.54**	– 2	+ 8
LU	—	—	—	—	—
LV	3.94	3.20	**4.04**	+ 3	+ 26
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	3.31	3.55	**3.59**	+ 9	+ 1
PT	1.06	0.90	**1.04**	– 2	+ 16
RO	—	—	—	—	—
SE	6.06	5.25	**5.91**	– 3	+ 13
SI	—	—	—	—	—
SK	—	—	—	—	—

Country	Triticale (t/ha)				
	Avg 5yrs	2023	MARS 2024 forecasts	%24/5yrs	%24/23
EU	4.34	4.37	**4.43**	+ 2	+ 1
AT	5.58	5.62	**5.64**	+ 1	+ 0
BE	—	—	—	—	—
BG	3.22	3.76	**3.38**	+ 5	– 10
CY	—	—	—	—	—
CZ	4.96	4.94	**5.06**	+ 2	+ 2
DE	5.94	5.85	**6.05**	+ 2	+ 4
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	2.36	1.80	**2.42**	+ 3	+ 35
ES	2.34	1.42	**2.60**	+ 11	+ 84
FI	—	—	—	—	—
FR	5.05	5.10	**5.08**	+ 1	– 1
HR	—	—	—	—	—
HU	4.07	4.26	**4.31**	+ 6	+ 1
IE	—	—	—	—	—
IT	4.44	4.54	**4.43**	– 0	– 2
LT	3.30	3.09	**3.25**	– 2	+ 5
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	4.23	4.48	**4.28**	+ 1	– 5
PT	1.33	0.75	**1.46**	+ 9	+ 95
RO	3.79	4.30	**4.19**	+ 11	– 3
SE	5.45	4.12	**5.36**	– 2	+ 30
SI	—	—	—	—	—
SK	—	—	—	—	—

Country	Rape and turnip rape (t/ha)				
	Avg 5yrs	2023	MARS 2024 forecasts	%24/5yrs	%24/23
EU	3.18	3.20	**3.25**	+ 2	+ 2
AT	3.11	3.23	**3.14**	+ 1	– 3
BE	3.70	3.61	**4.07**	+ 10	+ 13
BG	2.58	2.62	**2.69**	+ 4	+ 3
CY	—	—	—	—	—
CZ	3.24	3.40	**3.33**	+ 3	– 2
DE	3.63	3.63	**3.64**	+ 0	+ 0
DK	4.14	3.92	**4.05**	– 2	+ 3
EE	2.55	1.98	**2.50**	– 2	+ 26
EL	—	—	—	—	—
ES	2.12	1.62	**2.28**	+ 7	+ 40
FI	1.30	1.29	**1.31**	+ 1	+ 2
FR	3.26	3.17	**3.34**	+ 2	+ 6
HR	2.71	2.93	**2.78**	+ 3	– 5
HU	2.87	3.12	**3.22**	+ 12	+ 3
IE	4.50	4.32	**4.54**	+ 1	+ 5
IT	2.82	2.71	**2.80**	– 1	+ 3
LT	2.85	2.57	**2.83**	– 0	+ 10
LU	—	—	—	—	—
LV	2.67	2.30	**2.63**	– 2	+ 14
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	3.19	3.38	**3.28**	+ 3	– 3
PT	—	—	—	—	—
RO	2.69	3.01	**2.98**	+ 11	– 1
SE	3.20	2.45	**3.16**	– 1	+ 29
SI	—	—	—	—	—
SK	3.12	3.55	**3.32**	+ 6	– 7

Country	Wheat (t/ha)				
	Avg 5yrs	2023	MARS 2024 forecasts	%24/5yrs	%24/23
BY	3.54	3.38	**3.65**	+ 3	+ 8
DZ	1.64	N/A	**1.45**	– 11	N/A
MA	1.58	N/A	**1.32**	– 16	N/A
TN	2.07	N/A	**2.12**	+ 3	N/A
TR	2.93	3.22	**3.07**	+ 5	– 5
UA	4.22	4.63	**4.34**	+ 3	– 6
UK	8.17	8.10	**8.29**	+ 2	+ 2

Country	Barley (t/ha)				
	Avg 5yrs	2023	MARS 2024 forecasts	%24/5yrs	%24/23
BY	2.88	2.75	**3.03**	+ 5	+ 10
DZ	1.13	N/A	**1.04**	– 8	N/A
MA	1.02	N/A	**0.83**	– 19	N/A
TN	1.18	N/A	**1.20**	+ 2	N/A
TR	2.52	2.78	**2.68**	+ 7	– 4
UA	3.47	3.74	**3.57**	+ 3	– 5
UK	6.31	6.10	**6.47**	+ 3	+ 6

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

Sources: 2019-2024 data come from DG Agriculture and Rural Development short-term-outlook data (dated February 2024, received on 26.02.2024), Eurostat Eurobase (last update: 09.02.2024), ELSTAT, Statistics Netherlands (CBS) and EES (last update: 15.11.2017).

Non-EU 2019-2023 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: 09.02.2024), Department for Environment, Food & Rural Affairs of UK (DEFRA), Ministry for Development of Economy, Trade and

2024 yields come from MARS Crop Yield Forecasting System (output up to 20.03.2024).

EU aggregate after 1.2.2020 is reported.

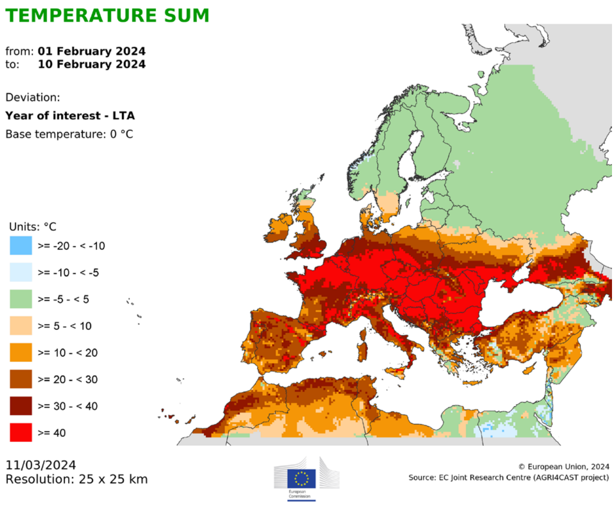
N/A = Data not available.

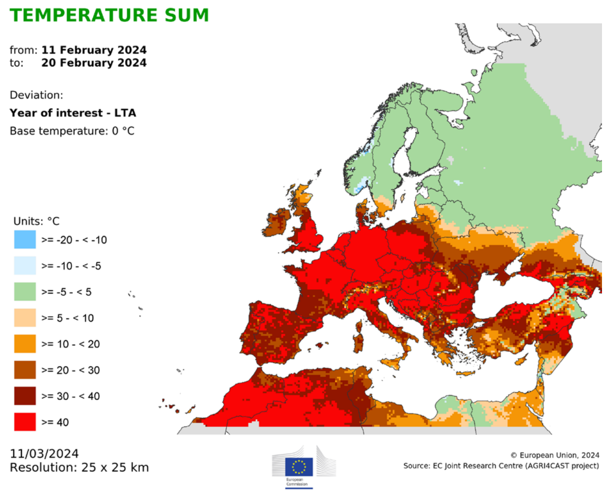
The column header '%24/5yrs' stands for the 2024 change with respect to the 5-year average(%). Similarly, '%24/23' stands for the 2024 change with respect to 2023(%).

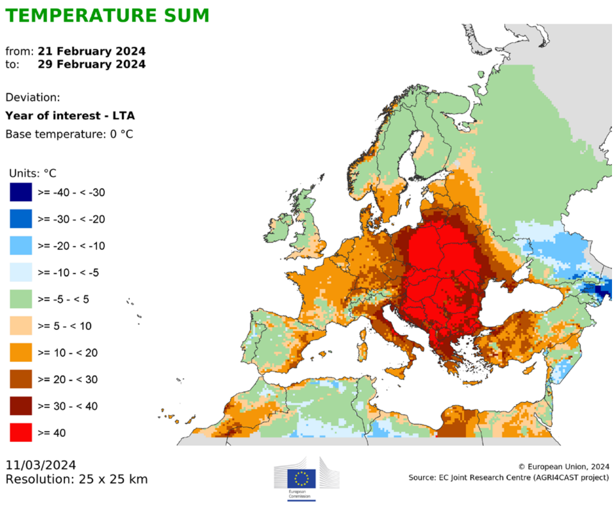
Cop name	Eurostat Crop name	Eurostat Crop Code	Official Eurostat Crop definition*
Total wheat	Wheat and spelt	C1100	Common wheat (*Triticum aestivum* L. emend. Fiori et Paol.), spelt (*Triticum spelta* L.), einkorn wheat (*Triticum monococcum* L.) and durum wheat (*Triticum durum* Desf.).
Total barley	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.
Soybeans	Soya	I1130	Soya (*Glycine max* L. Merril) harvested as dry grains.
Field beans	Broad and field beans	P1200	All varieties of broad and field beans (Faba vulgaris (Moench) syn. Vicia faba L. (partim)) harvested dry for grain, including seed.
Field peas	Field peas	P1100	All varieties of field peas (Pisum sativum L. convar. sativum or Pisum sativum L. convar. arvense L. or convar. speciosum) harvested dry for grain, including seed.
Rice	Rice	C2000	Rice (*Oryza sativa*, L.).
* *Source:*	Eurostat - Annual crop statistics (Handbook 2020 Edition)		

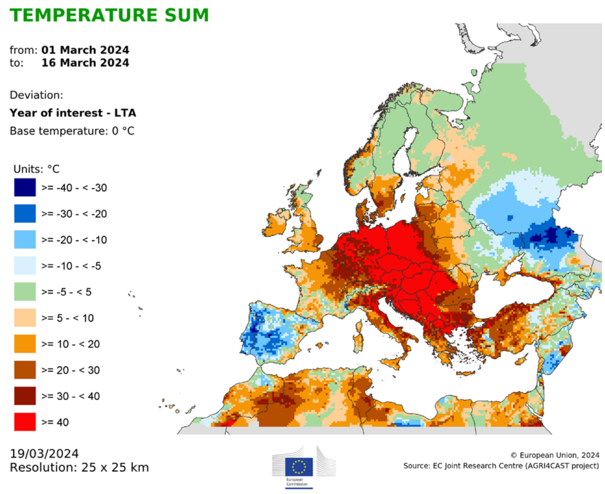
5. Atlas

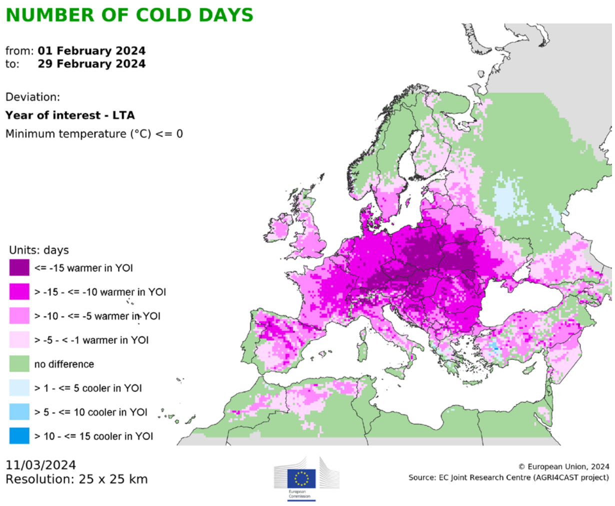
Temperature regime

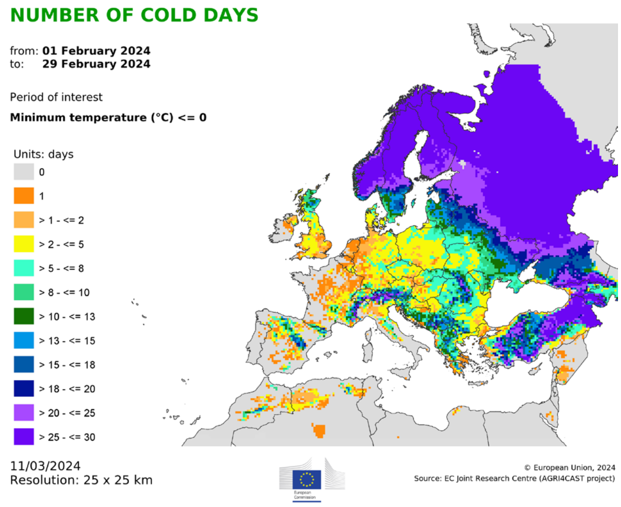


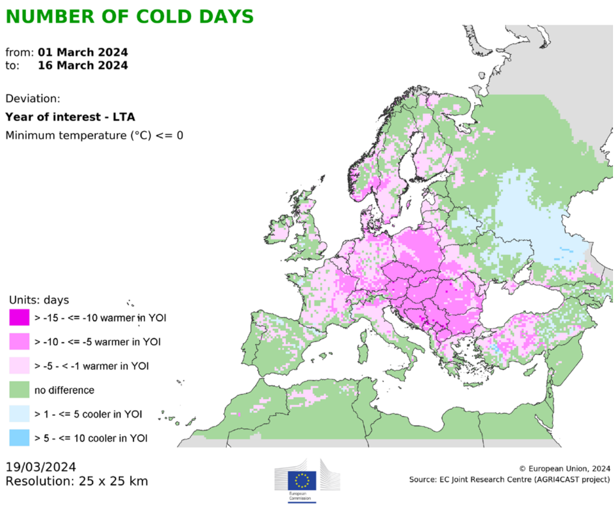


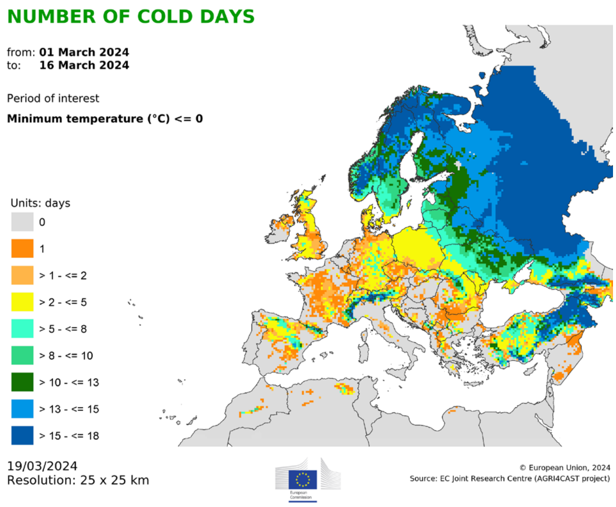




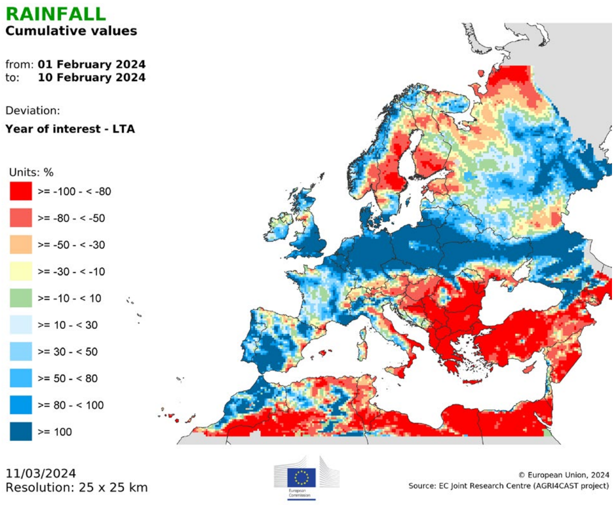


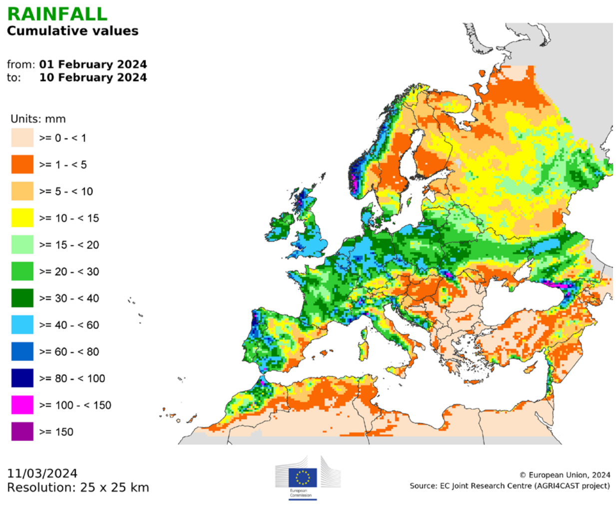


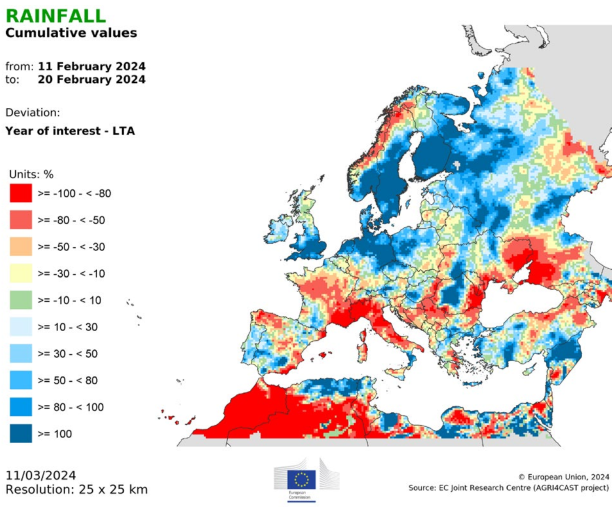


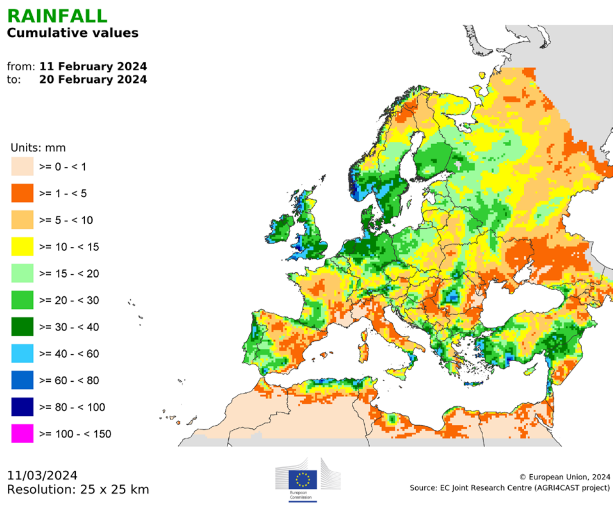


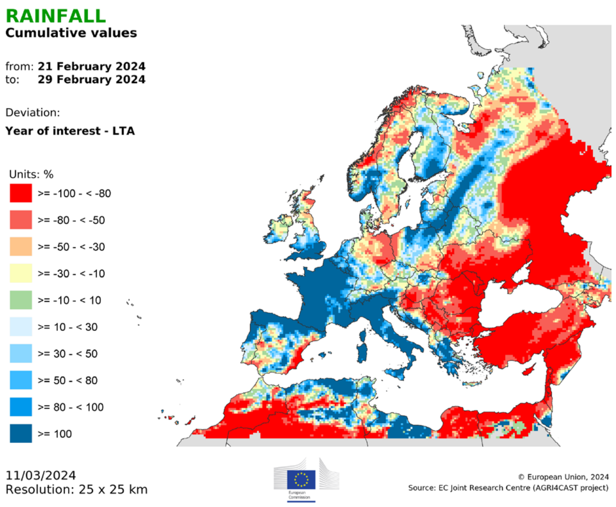
Precipitation







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to: 29 February 2024
Deviation:
Year of interest - LTA
Units: %
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>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
11/03/2024
Resolution: 25 x 25 km
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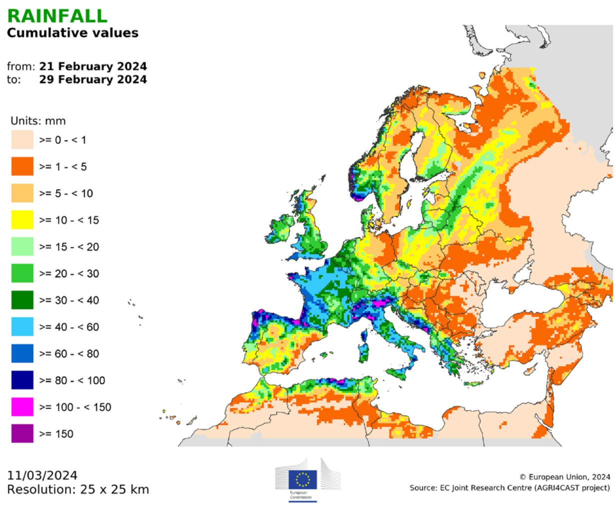
Source: EC Joint Research Centre (AGRI4CAST project)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Cumulative values
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to: 29 February 2024
Units: mm
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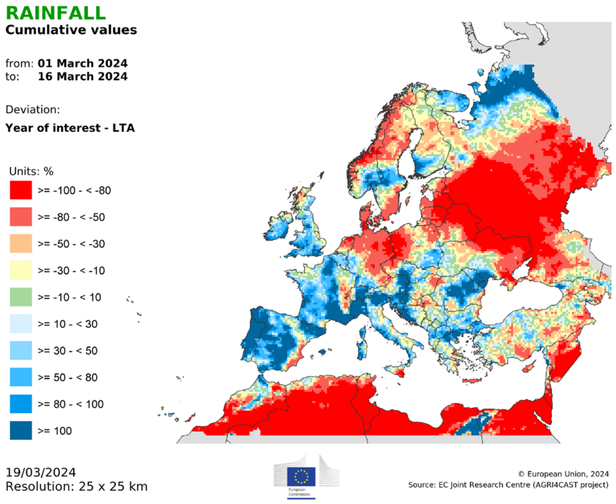
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
11/03/2024
Resolution: 25 x 25 km
© European Union, 2024
Source: EC Joint Research Centre (AGRI4CAST project)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to: 16 March 2024
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Year of interest - LTA
Units: %
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>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
19/03/2024
Resolution: 25 x 25 km
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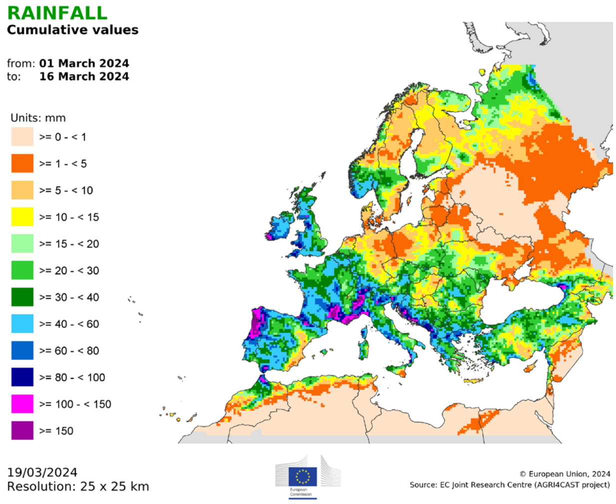
Source: EC Joint Research Centre (AGRI4CAST project)


RAINFALL
Cumulative values
from: 01 March 2024
to: 16 March 2024
Units: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
19/03/2024
Resolution: 25 x 25 km
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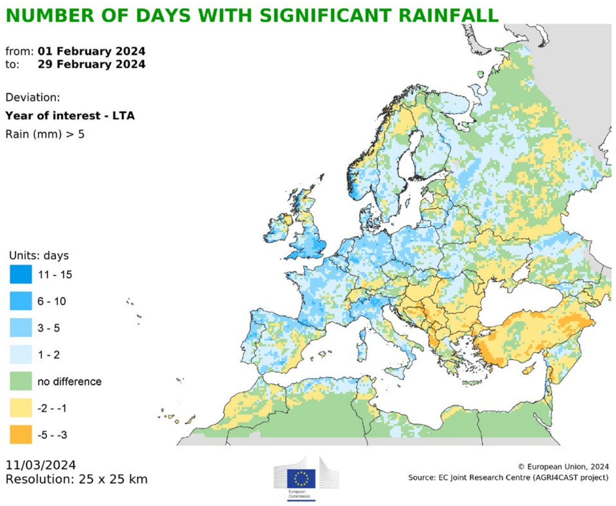
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to: 29 February 2024
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Year of interest - LTA
Rain (mm) > 5
Units: days
11 - 15
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
11/03/2024
Resolution: 25 x 25 km
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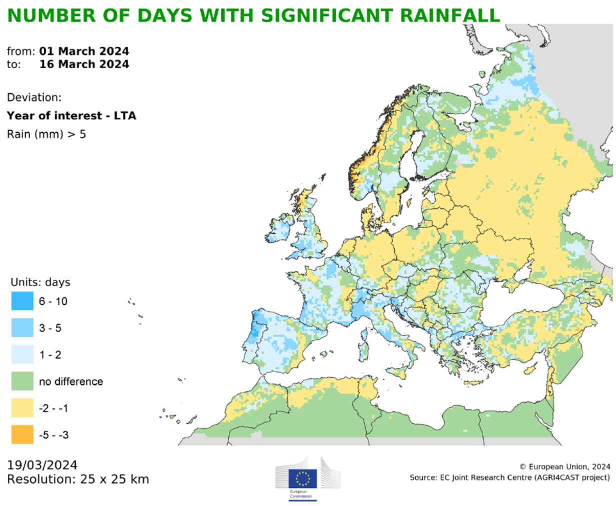
Source: EC Joint Research Centre (AGRI4CAST project)


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from: 01 March 2024
to: 16 March 2024
Deviation:
Year of interest - LTA
Rain (mm) > 5
Units: days
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
19/03/2024
Resolution: 25 x 25 km
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JRC MARS Bulletin 2024

Date	Publication	Reference
22 Jan	Agromet analysis	Vol. 32 No 1
26 Feb	Agromet analysis	Vol. 32 No 2
25 Mar	Agromet analysis, yield forecast	Vol. 32 No 3
22 Apr	Agromet analysis, remote sensing, grassland analysis, sowing conditions, yield forecast	Vol. 32 No 4
27 May	Agromet analysis, remote sensing, grassland analysis, sowing update, yield forecast	Vol. 32 No 5
24 Jun	Agromet analysis, remote sensing, grassland analysis, rice analysis, yield forecast	Vol. 32 No 6
22 Jul	Agromet analysis, remote sensing, grassland analysis, harvesting conditions, yield forecast	Vol. 32 No 7
26 Aug	Agromet analysis, remote sensing, grassland update, harvesting update, yield forecast	Vol. 32 No 8
23 Sep	Agromet analysis, remote sensing, grassland analysis, rice analysis, harvesting update, yield forecast	Vol. 32 No 9
28 Oct	Agromet analysis, grassland update, sowing conditions, harvesting update, yield forecast	Vol. 32 No 10
25 Nov	Agromet analysis, sowing update, harvesting update	Vol. 32 No 11
16 Dec	Agromet analysis	Vol. 32 No 12

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Reporting support
Prepress projects, I. Biavetti, G. Mulhern

Edition
M. van den Berg

Data production
AGRI4CAST (Food Security Unit JRC D5), MARSOP6 Consortium

Contact
JRC D5/MARS4CAST
JRCMARSBULLETIN@ec.europa.eu

Technical note
The long-term average (LTA) used within this Bulletin as a reference is calculated on the basis of weather data from 1991-2023.

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KJ-AW-24-003-EN-N ISSN 2443-8278 doi:10.2760/445518

Publications Office of the European Union