Issued: 23 May 2022
JRC MARS Bulletin Vol. 30 No 5

European Commission

# JRC MARS Bulletin

# Crop monitoring in Europe

*May 2022*

## Rain needed to sustain fair yield outlook

### Drier-than-usual conditions prevail throughout Europe

*The weather observed during this review period was marked by drier-than-usual conditions in most parts of Europe, with negative effects on the climatic water balance. Our yield forecasts for winter crops were revised slightly downwards at EU level, but remain above the 5-year average. Substantial rainfall in the coming weeks will be necessary to sustain the yield potential.*

A pronounced rain deficit, is observed in important parts of France, the Benelux countries, the United Kingdom, Denmark, Germany, Poland, Slovenia, Croatia, Romania, Bulgaria, Greece, Turkey and Ukraine. The resulting gradual depletion of soil moisture reserves has negative effects on winter crops. Regions where warm temperatures accelerated crop water use are most affected; notably central France, northern Bulgaria, southern and eastern Romania and western Ukraine.

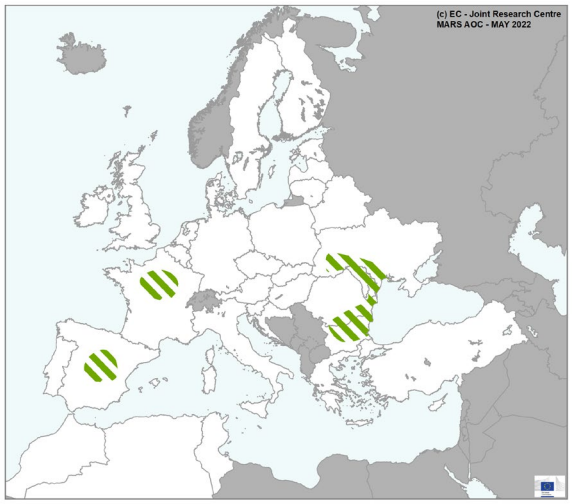
In Spain, central agricultural areas are affected by high temperatures, causing rapid depletion of soil moisture, with negative impacts on winter cereals and spring barley. Drought conditions in Italy were mitigated by significant precipitation around the end of April. Nonetheless, the high temperatures forecast from mid-May are expected to move those regions back under a harmful drought spell.

**Contents:**



Covers the period from 1 April until 15 May

**AREAS OF CONCERN - SUMMER/WINTER CROPS**




Winter crops impacted

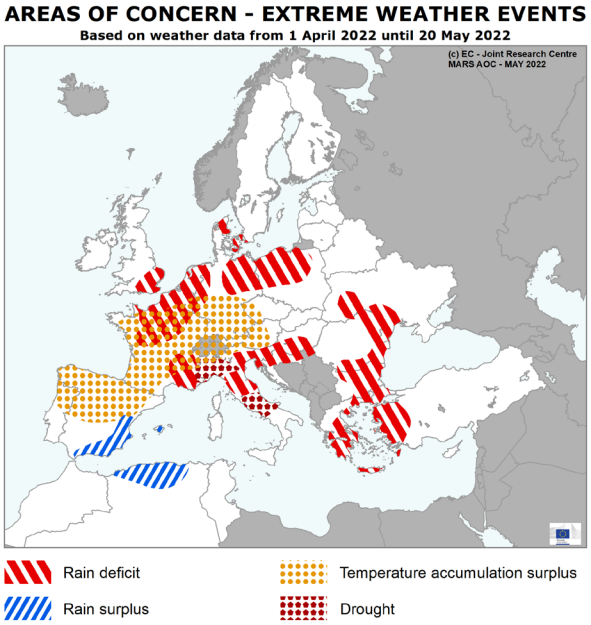
| Crop | Yield t/ha | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | April Bulletin | MARS 2022 forecasts | %22/5yrs | % Diff April |
| **Total cereals** | 5.49 | 5.63 | **5.58** | + 1.6 | - 0.9 |
| **Total wheat** | 5.62 | 5.74 | **5.69** | + 1.4 | - 0.9 |
| *Soft wheat* | 5.84 | 5.95 | **5.89** | + 0.9 | - 1.0 |
| *Durum wheat* | 3.52 | 3.55 | **3.61** | + 2.7 | + 1.7 |
| **Total barley** | 4.84 | 4.97 | **4.89** | + 1.0 | - 1.6 |
| *Spring barley* | 4.13 | 4.31 | **4.18** | + 1.2 | - 3.0 |
| *Winter barley* | 5.75 | 5.79 | **5.78** | + 0.5 | - 0.2 |
| **Grain maize** | 7.87 | 7.91 | **7.92** | + 0.6 | + 0.1 |
| **Rye** | 3.90 | 4.11 | **4.10** | + 5.3 | - 0.2 |
| **Triticale** | 4.19 | 4.34 | **4.29** | + 2.4 | - 1.2 |
| **Rape and turnip rape** | 3.07 | 3.19 | **3.17** | + 3.2 | - 0.6 |
| **Potato** | 33.9 | 34.4 | **35.9** | + 5.9 | + 4.2 |
| **Sugar beet** | 73.9 | 77.8 | **78.0** | + 5.4 | + 0.2 |
| **Sunflower** | 2.33 | 2.38 | **2.39** | + 2.5 | + 0.4 |
| **Soybean** | 2.89 | 2.99 | **2.99** | + 3.4 | + 0.0 |

Issued: 23 May 2022

Joint Research Centre

# 1. Agrometeorological overview

## 1.1. Areas of concern



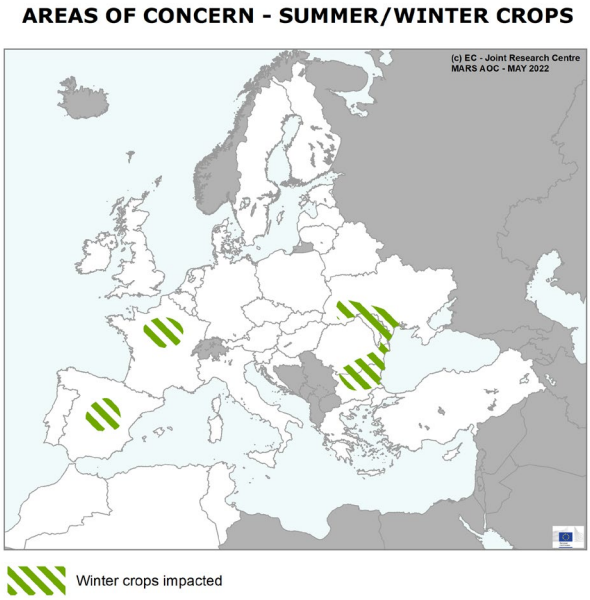

The map above only reflects the most distinct weather events (in terms of duration and/or severity) that occurred after the reporting period of the April Bulletin (18 April).

The weather observed during the current review period shows a transition from drier- and cooler-than-usual to drier- and warmer-than-usual conditions in most parts of Europe, with negative effects on the climatic water balance.

A pronounced rain deficit, is observed in important parts of France, the Benelux countries, the United Kingdom, Denmark, Germany, Poland, Slovenia, Croatia, Romania, Bulgaria, Greece, Ukraine and Turkey. The resulting gradual depletion of soil moisture reserves has negative effects on winter crops. In most cases, negative impacts on crops have been minor and reversible, so far. Regions where warm temperatures accelerated crop water use and where winter cereals are approaching (or have already reached) the flowering stage are most affected; notably central France, northern Bulgaria, southern and eastern Romania and western Ukraine.

South-eastern Spain and Algeria experienced a beneficial distinct precipitation surplus. Central agricultural areas in Spain also benefited from rainfall in April, but high temperatures in May caused a rapid depletion of soil moisture. Negative effects on winter cereals and spring barley are expected to be exacerbated by continued dry and hot conditions, according to the weather forecast until the end of May.

Drought conditions in Italy were mitigated by significant precipitation around the end of April. Nonetheless, the high temperatures forecast from mid-May are expected to move those regions back under a harmful drought spell



# 1.2. Meteorological review (1 April –15 May 2022)

**Slightly warmer-than-usual conditions** with respect to the 1991-2021 long-term average (LTA) were observed in France, the United Kingdom, Ireland and Portugal, as well as in most of Belgium, Spain, Switzerland and Turkey. Daily mean temperatures reached up to 2 °C above the LTA in these regions. More distinct positive temperature anomalies (up to 6 °C above the LTA) were observed in the southernmost part of European Russia, along the border with Georgia and Azerbaijan.

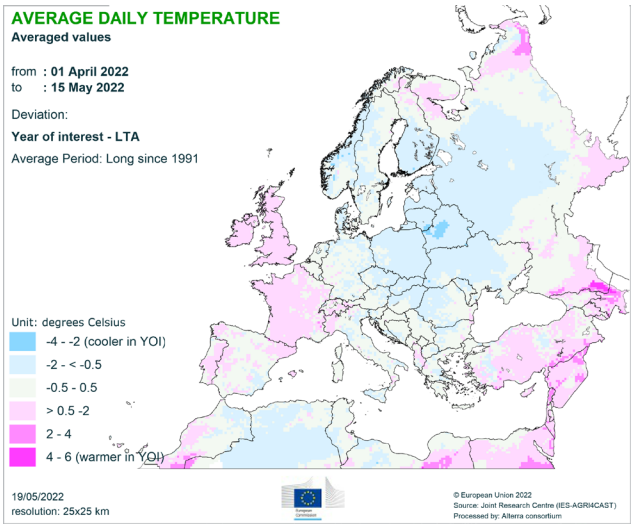
**Slightly colder-than-usual conditions**, with temperature anomalies between -2 °C and -0.5 °C, were observed from the Carpathians to the north-northeast of the Eastern European Plain. More distinct local negative temperature anomalies (down to -4 °C) were observed in west-central Belarus.

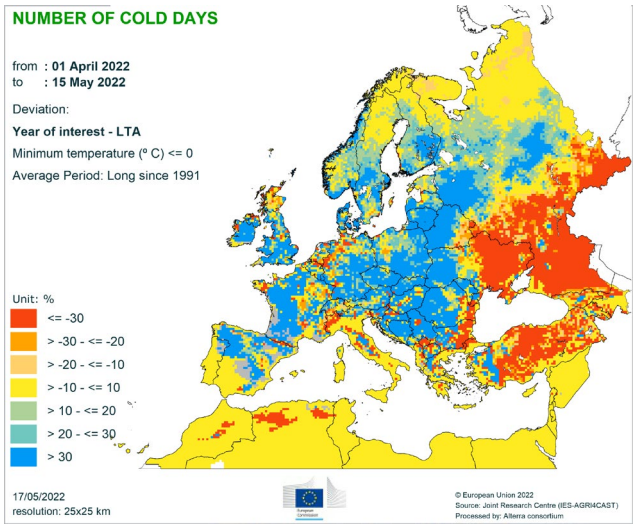
**The number of cold days** (having daily minimum temperature below 0 °C) exceeded the LTA by more than 30% in most of Europe. These anomalies were mainly caused by a cold spell evolving across Europe in April; whereas in the first half of May the number of cold days was close to the LTA. The number of cold days was substantially below the LTA along the Black Sea Coast in Bulgaria and Romania, as well as in the eastern half of Ukraine, southern European Russia, and large parts of Georgia and Turkey.

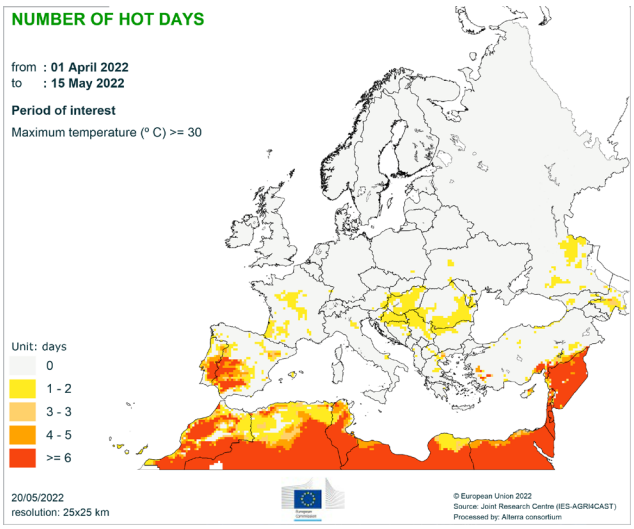
Over 6 days with **maximum temperature above 30 °C** were observed in the south-west of the Iberian Peninsula (Spain and Portugal), as well as locally in parts of western and southern Turkey. Between 4 and 5 days with temperatures above 30 °C were observed locally south of the Pyrenees.

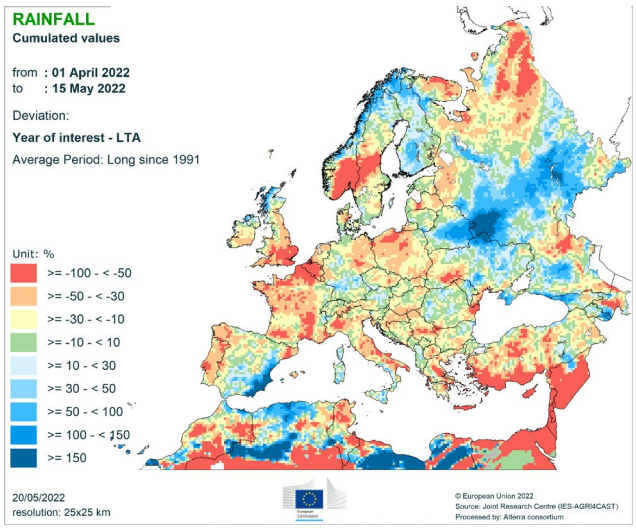
**Drier-than-usual conditions** were observed in most parts of Europe. Precipitation anomalies of -50% or more negative (with respect to the LTA) were observed in the south-east of the British Isles, Belgium, parts of France, Portugal, north-western Spain, and the eastern Pyrenees, as well as locally in eastern Germany, northern Poland, western Ukraine, along the Black Sea Coast in Romania, northern and central Italy, parts of the western Balkan region, large parts of Turkey and the southernmost and northernmost parts of European Russia, and southern Norway and Sweden. A distinctly negative anomaly of the climatic water balance (precipitation minus potential evapotranspiration) for the review period was observed in most of the British Isles, southern Norway, northernmost and southernmost European Russia, as well as across France, the Alps region, and the western Balkans.

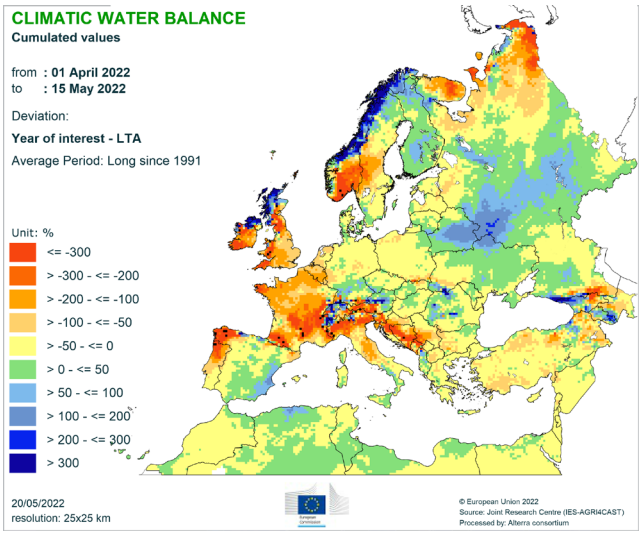
**Wetter-than-usual conditions** (50% or more with respect to the LTA) were observed locally along the Mediterranean coast in Spain, much of Belarus, northern Ukraine, central European Russia, parts of Finland, along the western coast of Scandinavia, and the northernmost United Kingdom.




NUMBER OF HOT DAYS
from : 01 April 2022
to : 15 May 2022
Period of interest
Maximum temperature (° C) >= 30
Unit: days
0
1 - 2
3 - 3
4 - 5
>= 6
20/05/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (IES-AGRI4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 April 2022
to : 15 May 2022
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
20/05/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (IES-AGRI4CAST)
Processed by: Alterra consortium


CLIMATIC WATER BALANCE
Cumulated values
from : 01 April 2022
to : 15 May 2022
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Unit: %
<= -300
> -300 - <= -200
> -200 - <= -100
> -100 - <= -50
> -50 - <= 0
> 0 - <= 50
> 50 - <= 100
> 100 - <= 200
> 200 - <= 300
> 300
20/05/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (IES-AGRI4CAST)
Processed by: Alterra consortium

# 1.3. Weather forecast (21 - 28 May)

**Warmer-than-usual conditions**, with average daily temperatures between 4 $^{0}$C and 6 $^{0}$C above the LTA, are forecast in northernmost parts of European Russia, as well as in southern Spain, parts of Italy, the western and central Balkan region, and western Turkey. Even higher temperature anomalies (up to +8 $^{0}$C) are forecast locally in the western Balkan region.

In parts of Spain and western Turkey, more than 6 days with maximum temperature exceeding 30 $^{0}$C are forecast in the upcoming period, while much of the Iberian Peninsula, locally in southern France, parts of northern and southern Italy, and western Turkey are predicted to experience 3 days with daily maximum temperature above 30 $^{0}$C.

**Slightly warmer-than-usual conditions,** with daily average temperature between 2. $^{0}$C and 4 $^{0}$C above the LTA, are predicted in Portugal, most of Spain, across the southern Mediterranean countries in Europe, the Balkan region, and western Turkey.

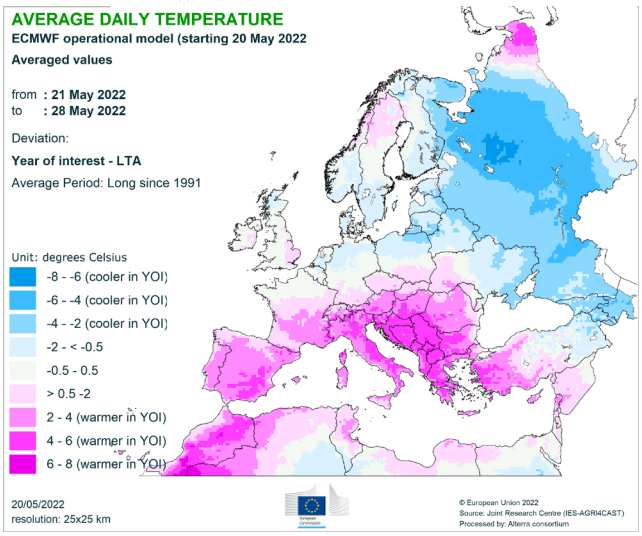
**Colder-than-usual conditions** are forecast for much of European Russia in the East European Plain, with temperatures between 4 $^{0}$C and 6 $^{0}$C (in some parts up to 8 $^{0}$C) below the LTA.

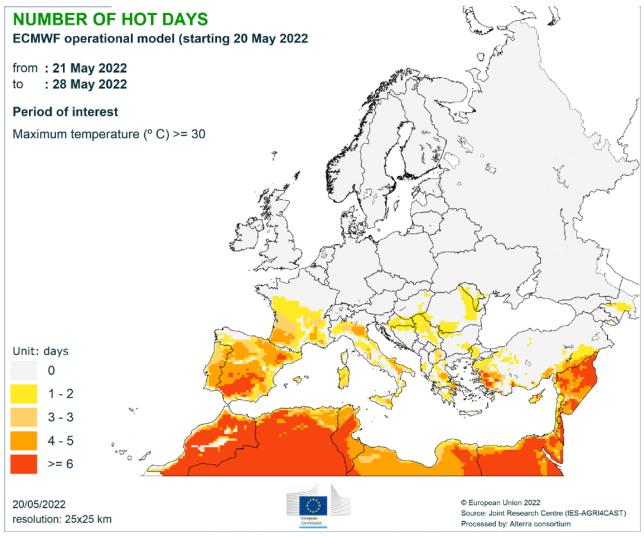
**Dry conditions** with less than 3 mm of accumulated precipitation are forecast over most of the Iberian Peninsula and southern France, the islands of Corsica, Sardinia and Sicily, parts of central and southern Italy, western Turkey, eastern Bulgaria and southern Ukraine, as well as the Scandinavian Peninsula and north-western and central European Russia.

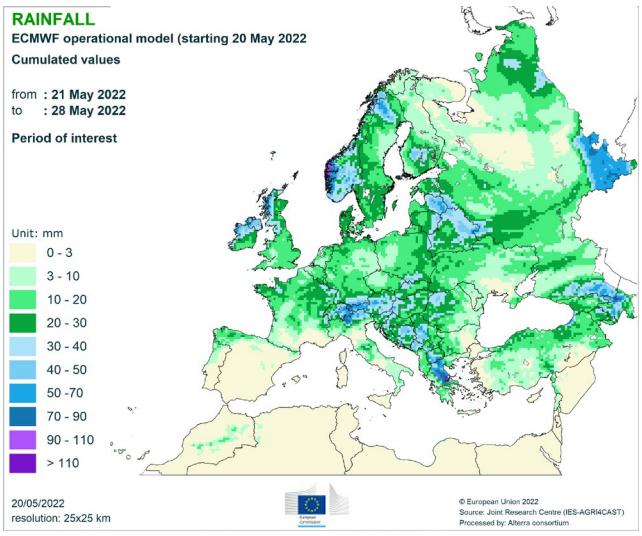
**Wet conditions** with accumulated precipitation between **40 and 90 mm** (locally, 100 mm and over) are forecast in the north-west British Isles, western Norway, northern Sweden, and locally in southern Finland, as well as western Latvia, eastern Belarus, eastern European Russia, the Caucasus mountains, the Alps region and parts of the western Balkans.

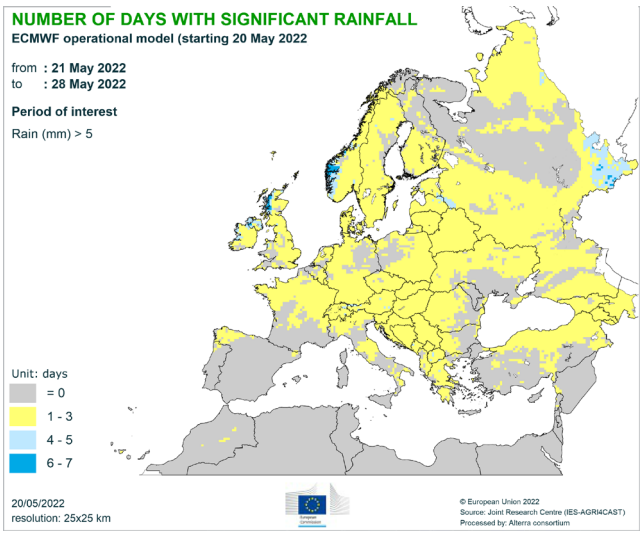
Fewer than 3 days with accumulated precipitation above 5 mm are forecast across Europe with the exception of **local wet conditions** in south-western Norway and eastern European Russia.

According to the **long-range weather forecast** for June, July and August, **warmer-than-usual conditions** are likely to persist over most of Europe and are likely to be accompanied by **drier-than-usual conditions**, potentially exacerbating the negative climatic water balance.

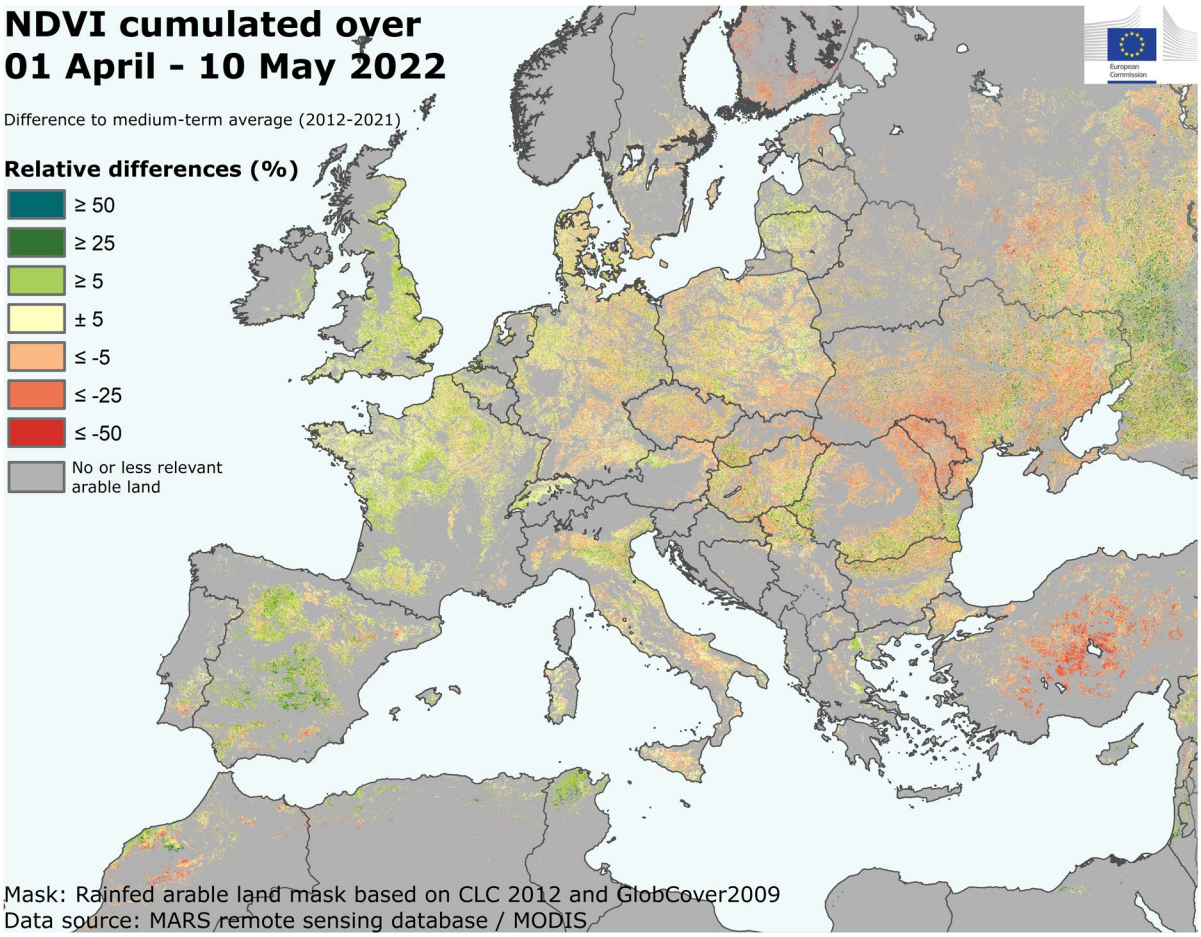



RAINFALL
ECMWF operational model (starting 20 May 2022
Cumulated values
from : 21 May 2022
to : 28 May 2022
Period of interest
Unit: mm
0 - 3
3 - 10
10 - 20
20 - 30
30 - 40
40 - 50
50 -70
70 - 90
90 - 110
> 110
20/05/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (IES-AGRI4CAST)
Processed by: Alterra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
ECMWF operational model (starting 20 May 2022
from : 21 May 2022
to : 28 May 2022
Period of interest
Rain (mm) > 5
Unit: days
= 0
1 - 3
4 - 5
6 - 7
20/05/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (IES-AGRI4CAST)
Processed by: Alterra consortium

# 2. Remote sensing – observed canopy conditions



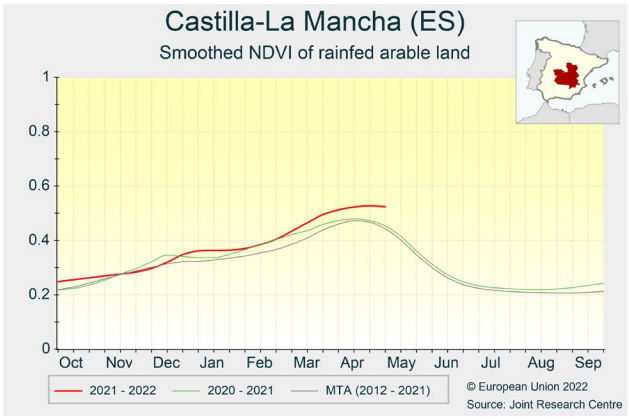

*The map displays the difference between the Normalised Difference Vegetation Index (NDVI) cumulated from 1 April to 10 May 2022 and the medium-term average (2012-2021) for the same period. Positive anomalies (in green) reflect above-average canopy density or early crop development, while negative anomalies (in red) reflect below-average biomass accumulation or late crop development.*

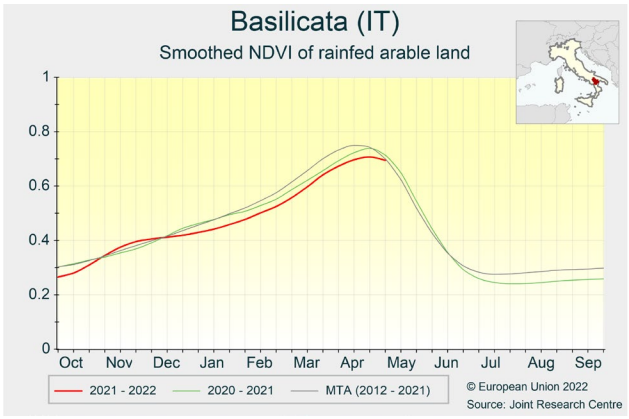
The map above displays predominately winter crop conditions, as the summer crop season has just started and contributes little to NDVI values. Negative anomalies are predominantly observed in central and eastern Europe, due to cold temperatures and/or dry soil conditions. Conversely, warm and sunny conditions accelerated biomass accumulation in France and the United Kingdom. Positive anomalies in northern Spain and eastern Maghreb reflect a recovery of crops thanks to the occurrence of precipitation.

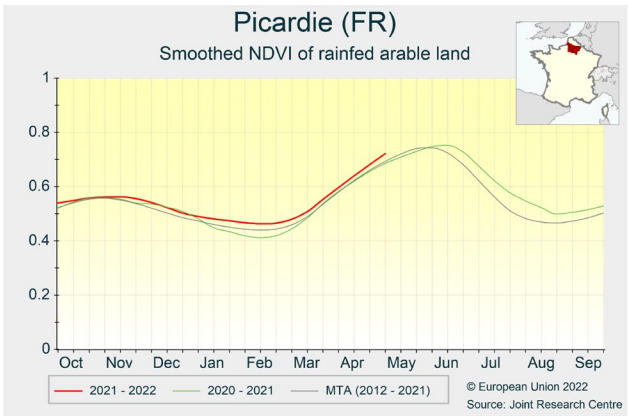
In the **Iberian Peninsula**, abundant rainfall favoured crop recovery, and biomass accumulation is now about average or above (e.g. *Castilla-La Mancha*). In **Italy**, dry and cold weather persisted in April, thus hampering crop biomass accumulation. In southern regions, winter crops are entering the flowering stage with below-average biomass accumulated (e.g. *Basilicata*). In **France**, after a cold spell in the first days of April, temperatures saw an above-average increase leading to an acceleration in crop development (e.g. *Picardie*). However, soil-water availability is becoming a limiting factor, given the lack of precipitation observed since the beginning of the spring.

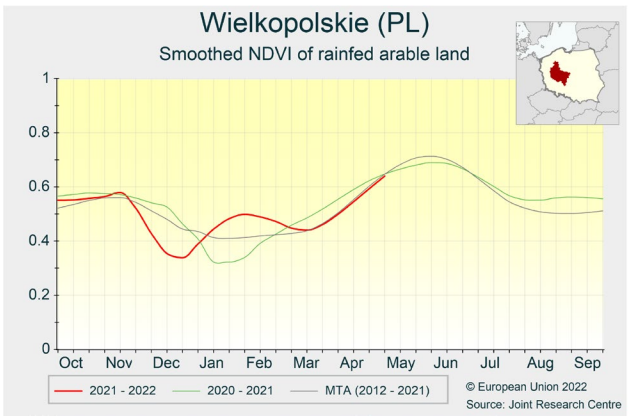
Colder-than-average conditions caused a slowdown in crop growth across northern Europe. In **Germany**, **western Poland**, **Denmark** and **Sweden**, the NDVI profiles show crop development with a slight delay with respect to the average (e.g. *Wielkopolskie*). In **eastern Poland**, **Lithuania** and **Latvia**, the map still displays positive anomalies (green colours), as winter crops moved from advanced to average stages. Below-average temperatures were also recorded in central European regions (including **Austria**, **Czechia**, **Slovakia** and

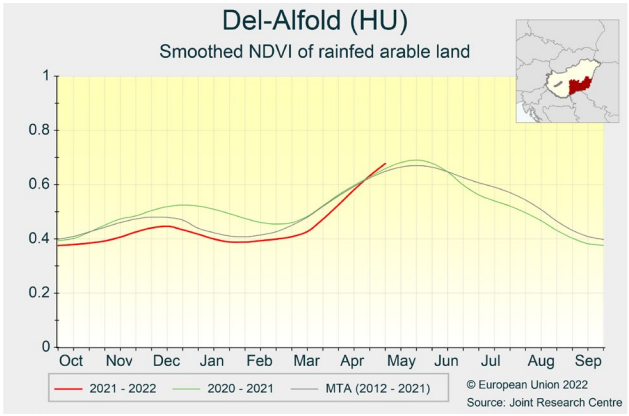
**Hungary**), which further delayed crop development. In part of these regions, crops benefited from well-distributed precipitation in April that favoured biomass accumulation, especially in Hungary where crops were suffering after a dry winter (e.g. *Del-Alfold*). In **Romania** and **Bulgaria**, the analysis period was characterised by unstable temperatures, but intense rainy events that occurred in the second half of April supported crop biomass accumulation (e.g. *Sud-Muntenia).* In **Greece**, crop development has an almost 20-day delay due to the cold start to the spring, but crops are in fair shape overall (e.g. *Thessaly*). Negative anomalies (red colours on the map) are predominant in **Ukraine**, particularly in southern regions with a prevalence of winter cereals, where crops experienced late development caused by below-average temperatures, while below-average rainfall also constrained growth. Conversely, in **European Russia**, the temperature increase in April favoured a positive start to the season. In the **United Kingdom**, conditions are similar to those described for France. The NDVI profiles show advanced crop development and positive biomass accumulation, but more rain is needed to restore soil moisture and provide adequate sustenance to crops (e.g. *Lincolnshire*). In the **Maghreb** region, a negative season characterised by drought is concluding in Morocco and western Algeria, whereas in Tunisia and eastern Algeria, winter cereals benefited from rainfall and seasonal temperatures in spring. In **Turkey**, despite warmer and drier-than-usual weather in April, delayed stages still prevail as a consequence of the cold and wet winter..

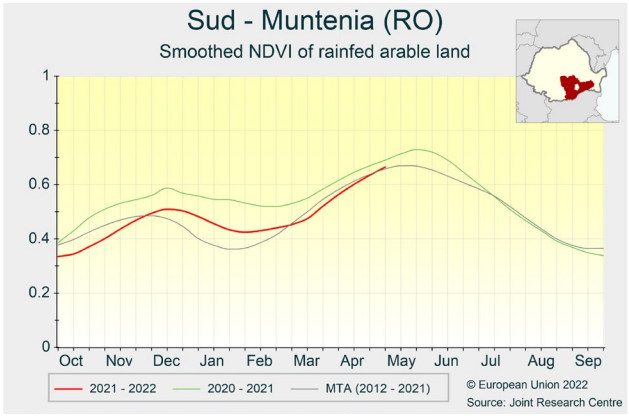


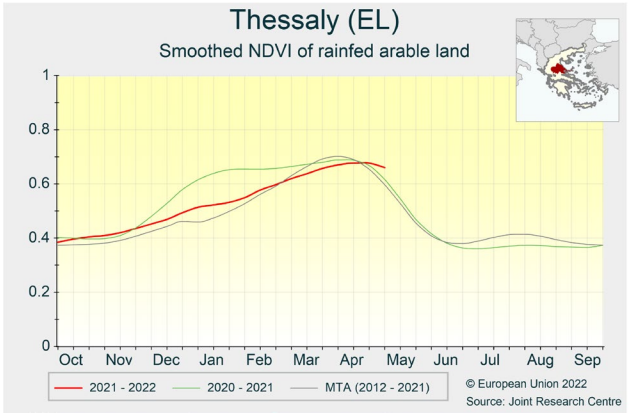



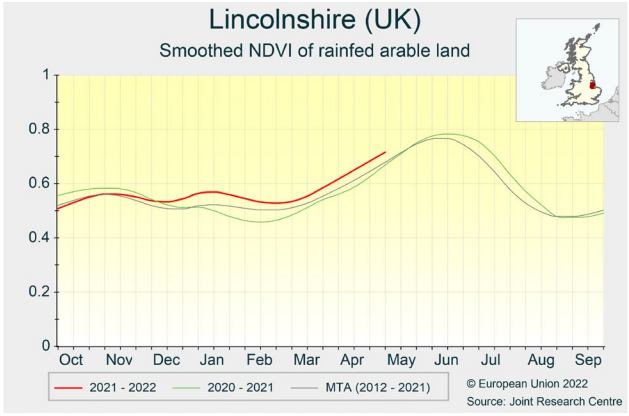




Del-Alfold (HU)
Smoothed NDVI of rainfed arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2021 - 2022
2020 - 2021
MTA (2012 - 2021)
© European Union 2022
Source: Joint Research Centre


Sud - Muntenia (RO)
Smoothed NDVI of rainfed arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2021 - 2022
2020 - 2021
MTA (2012 - 2021)
© European Union 2022
Source: Joint Research Centre

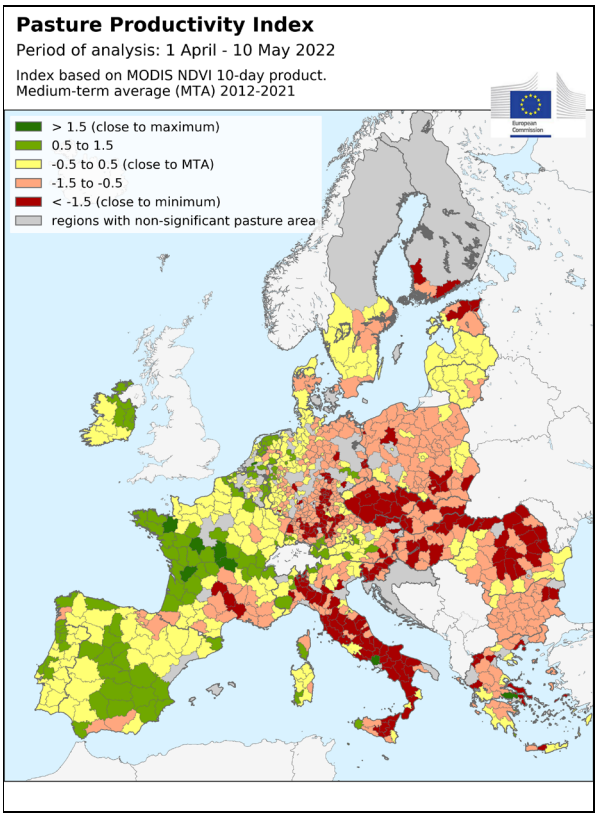

Thessaly (EL)
Smoothed NDVI of rainfed arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2021 - 2022
2020 - 2021
MTA (2012 - 2021)
© European Union 2022
Source: Joint Research Centre


Lincolnshire (UK)
Smoothed NDVI of rainfed arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2021 - 2022
2020 - 2021
MTA (2012 - 2021)
© European Union 2022
Source: Joint Research Centre

# 3. Pastures in Europe – regional monitoring

## Dry weather and cold spells negatively affect pasture biomass accumulation

*Considering the period of review, the European regions are mostly separated into a western part, where most pastures are in average to good condition, and an eastern part with predominantly below-average pasture performance, mainly linked to dry and/or cold conditions. However, pastures in significant parts of the western regions are also affected by a distinct rain deficit (see Areas of concern section), and rainfall is urgently needed to avoid more serious impacts on biomass accumulation of pasture and fodder crops.*




In northern Europe, the PPI[1] map suggests around average pasture conditions for the review period. In **Ireland**, **Denmark** and **Sweden**, dry conditions are not (yet) reflected in negative impacts. **Finland** and the **Baltic countries** witnessed below-average temperatures in their pasture areas.

In **France**, the situation was positive overall up to early-May, but the deficit of water has started to negatively affect the pasture productivity, especially in central France. High temperatures in the first half of May also contributed to stress on the canopy.

Likewise, in the **Benelux**, after a cold and wet start to April, pastures benefited from adequate temperatures and above-average radiation during the remainder of the review period. Most farmers finalised the first cut with satisfactory results. However, sparse rainfall since the first dekad of April caused a steep drop of soil moisture contents which has started to affect growth.

In northern **Germany**, dry conditions prevailed during the period of review, especially in eastern parts. In western parts, the condition of pastures is around average. Alternating cold and warm temperatures brought some temperature stress. The first cut is underway or already done.

In southern **Germany**, precipitation was somewhat more favourable than in the north. Biomass accumulation still lags behind due to earlier cold conditions, but recently accelerated thanks to higher temperatures during the first

[1] PPI: the relative index of pasture productivity is an indicator of biomass formation based on the integration of the NDVI remote sensing product of pasture areas (at NUTS3 level) over a period of interest. The index shows the relative position of the current season within the historical series from 2012 to 2021.

dekad of May. The first cut is underway or already completed.

Also in **Poland** the PPI is predominantly negative. The main reasons are that dry soils developed in most of the country since the end of April, while colder-than-usual temperatures in April and March caused delays to the recovery of pasture growth after winter.

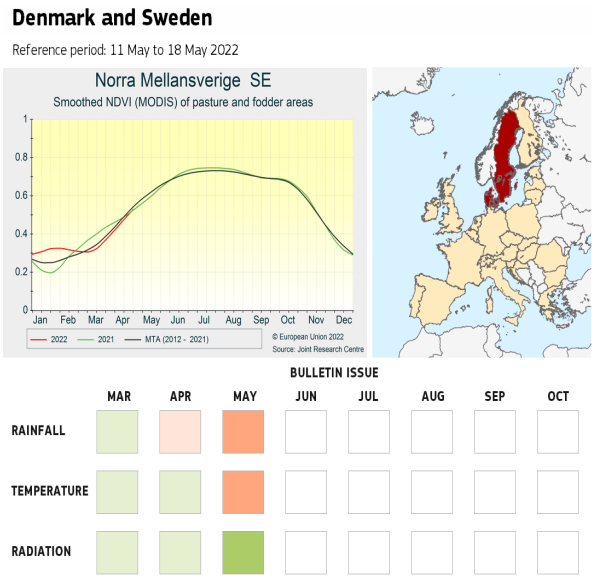
In **Hungary**, precipitation in April (after a dry March) benefited pastures in most regions, but biomass accumulation continued to lag behind due to colder-than-usual conditions. Nevertheless, pastures are in good condition, except in the south, where rainfall remained scarce. Likewise, April rainfall improved soil moisture conditions in **Austria**, but in **Czechia** and **Slovakia** regional deficits in water supply remained. Below-average temperatures until the end of April continued to limit biomass accumulation where soil moisture conditions where adequate. The situation is similar in **Slovenia**, with some cold spells in March and early April, which delayed development, and, most importantly, an ongoing rainfall deficit.

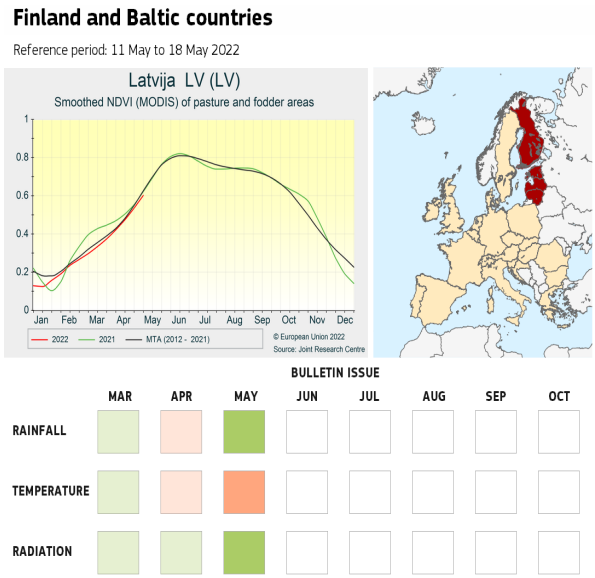
In **Bulgaria**, the biomass formation in grasslands is slightly delayed due to cold and dry conditions in March. Rainfall during the review period was around average, but almost no precipitation was observed since 20 April.

In **Greece**, daily temperatures during the review period oscillated around average values. Rainfall was 25% below the seasonal average and concentrated in the first half of April. Compared with an average season, biomass accumulation of pasture and fodder areas appears delayed by nearly two weeks due to well-below average minimum temperatures in the second half of March.

In **Italy**, pasture conditions are below MTA. Recent rainfall events brought relief from drought stress in northern and central regions. Pasture biomass accumulation in the south and islands was suboptimal due to cold spring conditions, and is currently more constrained due to below-average rainfall.

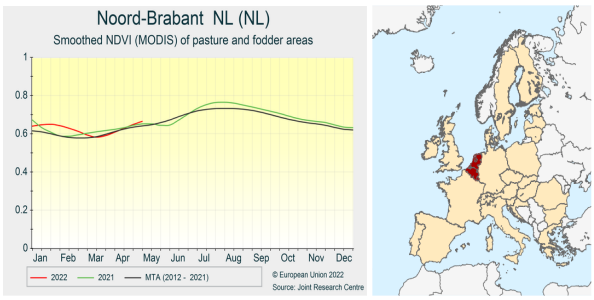
In **Spain** and **Portugal**, rainfall returned after a long dry winter and early spring. This permitted acceleration of pasture biomass accumulation across the Iberian Peninsula. Observed values are returning to the MTA averages. However, current and expected dry and hot conditions until the end of May, will be detrimental to pasture productivity.



## Benelux

Reference period: 11 May to 18 May 2022

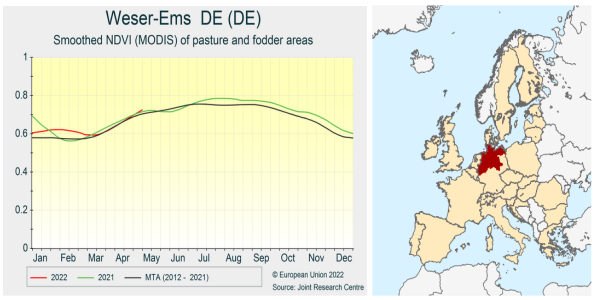



BULLETIN ISSUE

| | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT |
|---|---|---|---|---|---|---|---|---|
| RAINFALL | | | | | | | | |
| TEMPERATURE | | | | | | | | |
| RADIATION | | | | | | | | |

## Germany - North

Reference period: 11 May to 18 May 2022

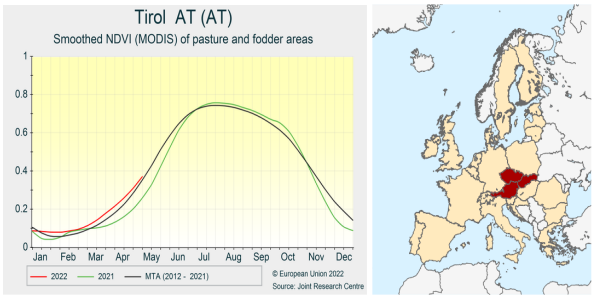



BULLETIN ISSUE

| | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT |
|---|---|---|---|---|---|---|---|---|
| RAINFALL | | | | | | | | |
| TEMPERATURE | | | | | | | | |
| RADIATION | | | | | | | | |

## Austria, Czechia and Slovakia

Reference period: 11 May to 18 May 2022

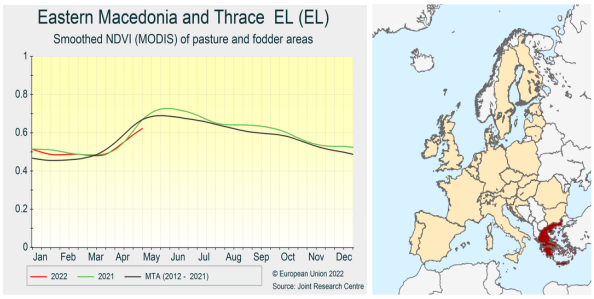



BULLETIN ISSUE

| | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT |
|---|---|---|---|---|---|---|---|---|
| RAINFALL | | | | | | | | |
| TEMPERATURE | | | | | | | | |
| RADIATION | | | | | | | | |

## Greece

Reference period: 11 May to 18 May 2022

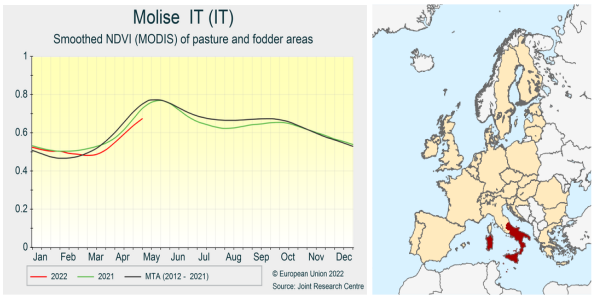



BULLETIN ISSUE

| | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT |
|---|---|---|---|---|---|---|---|---|
| RAINFALL | | | | | | | | |
| TEMPERATURE | | | | | | | | |
| RADIATION | | | | | | | | |

## Italy - South and islands

Reference period: 11 May to 18 May 2022

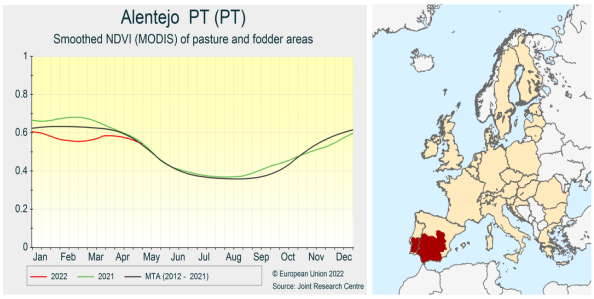



BULLETIN ISSUE

| | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT |
|---|---|---|---|---|---|---|---|---|
| RAINFALL | | | | | | | | |
| TEMPERATURE | | | | | | | | |
| RADIATION | | | | | | | | |

## Spain and Portugal - South

Reference period: 11 May to 18 May 2022




BULLETIN ISSUE

| | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT |
|---|---|---|---|---|---|---|---|---|
| RAINFALL | | | | | | | | |
| TEMPERATURE | | | | | | | | |
| RADIATION | | | | | | | | |

# 4. Sowing conditions

## Spring barley

### Cold and dry conditions affect emergence in central and eastern Europe

*Sowing was completed in good conditions with optimal crop establishment in most countries, but lower-than-usual temperatures and dry soils delayed germination and early growth in central and eastern Europe.*

In most western European countries (e.g. France, Benelux, Denmark, Germany, Ireland, UK), sowing was concluded in April under generally good conditions, when soil moisture levels were still adequate for sowing and optimal emergence, ensuring uniform crop establishment.

In Poland, Slovakia, Czechia, Romania, Hungary and Ukraine, sowing progressed well, but dry soils and cold conditions delayed germination, resulting in regionally uneven crop establishment. However, in these countries, weather conditions have been improving since the beginning of May and are likely to promote growth in the coming weeks. Notably in Ukraine, the achievement of sowing across all regions remains uncertain.

Sowing is progressing well in the Baltic Sea region with adequate germination, but in Finland, cold weather and persistent snow cover delayed sowing by around 1-2 weeks in many areas. Despite this, sowing continues within the normal window.

## Sugar beet and potatoes

### Difficult start to the season

*Colder-than-usual weather conditions slowed down germination and early development of sugar beet across Central Europe, but crops are generally in fair condition.*

Despite some delays due to low temperatures and a slower pace of field operations at the beginning of April (as described in the previous bulletin), the sugar beet sowing campaign was finalised within a normal time window, i.e. by the end of April in Germany, Poland and Benelux.

Weather coditions were generally not favourable for sugar beet germination and early development in the main producing regions of western and central Europe. Below-average daily temperatures and frost periods delayed the emergence and early development of seedlings. Notwithstanding frequent cold snaps in many regions, temperature minima rarely dropped below -3 °C and frost damage was generally minor. Notable exceptions were reported for France (as reported in the previous bulletin) and Germany (Hessen and Rheinland-Pfalz), where a maximum of 10% of the sown area required re-sowing after a cold spell at the beginning of April. Thermal conditions improved at the beginning of May and crop development should have gained speed. However, uneven distribution of precipitation and regional rain deficits may negatively impact the growing condition of sugar beet, where irrigation is not possible. Additionally, in several countries, field reports indicate a high incidence of aphids and a related risk of pest and disease damage.

Potatoes, of which the main production regions coincide with those of sugar beet, faced similar challenges. Most plantings of the main crop started in the second half of April (after the cold spells) and were finalised – or almost finalised – by the end of the review period. As top soils dried, many farmers with access to irrigation applied some irrigation water to soften the soils for seedbed preparation, and to facilitate sprouting and emergence.

# Maize

## Sowing campaign completed despite lack of precipitation

*The maize sowing campaign has been almost completed in most countries. Overall, conditions were favorable for emergence, although varying between regions. The absence of substantial precipitation across Europe since early May should not yet limit the yield potential, but will have to be monitored in the coming weeks, especially once maize reaches the flowering stage.*

In Poland and Hungary, sowing has been completed despite an initial delay due to cold weather in early April. The following rainfall was beneficial for emergence, but scarce precipitation since the beginning of May has led to a lack of moisture in the topsoil.

In south-west Europe, sowing has been completed. Maize has reached emergence in very good conditions in Italy, Spain and Portugal thanks to limited, but well distributed, precipitation in the second half of April and first half of May.

In France, the sowing campaign is almost concluded. Although crops reached emergence in fairly good conditions, there have been concerns related to the impact of low soil water reserves and dry conditions since the second half of April.

In Bulgaria and Romania, the sowing campaign has been delayed due to wet conditions in the second half of April, with approximately 75% of the planned area sown by early May. According to the Ukrainian Ministry of Agriculture[2], close to 15% of the projected area of grain maize remains to be sown. While the delayed start due to cold temperatures has been mostly recovered since early May, uncertainty remains if the sowing area objective can be fully reached.

# Sunflowers

## Some concerns in central and eastern Europe

*The sunflower sowing campaign has been completed in most European regions. Due to low soil moisture levels, sub-optimal emergence may create uneven stands in some central and eastern regions.*

In Romania, Hungary and Ukraine, the sowing campaign had a delayed start due to cold and dry conditions, and continued with dry soils, which caused sub-optimal emergence. Weather improved in April with some rainfall that was beneficial for crop establishment, although more rainfall is needed to sustain adequate development. In Bulgaria, sowing has been progressing well since the beginning of April, although substantial rainfall in mid-April caused some interruptions. In Greece, the sowing of sunflowers continued consistently in April, with rainfall that ensured adequate crop establishment. In France and Germany, the sowing campaign proceeded normally, but conditions for early crop development gradually worsened, as soils became progressively drier, which may lead to uneven stands. In Spain and Portugal, precipitation in March and early April increased the soil moisture content, which provided adequate conditions for sprouting and early crop development. In Italy, rainfall in April was beneficial for the sowing campaign, which has predominantly been concluded under adequate conditions with good emergence.

[2] https://minagro.gov.ua/news/v-ukrayini-zasiyali-1886-tis-ga-yaroyi-pshenici (Published 20 May 2022, 11:50 am)

# Soybean

## Soybean sowing campaign in full swing in central Europe, ending in France and Italy

*After delays due to the cold April, the sowing campaign is now ongoing in central Europe, profiting from higher temperatures since early May. However, in these countries rain is needed to ensure optimal plant establishment in the coming weeks.*

The sowing campaign is reaching an end in Italy and France where conditions are rather fair despite the rain deficit at the beginning of the growing season. Sowing operations are in full swing in the central European countries, benefiting from higher temperatures since the beginning of May. Nevertheless, most of central Europe will need to see rain during the coming weeks for optimal emergence and early development. In Romania, conditions for sowing were generally favourable thanks to April precipitation that alleviated soil moisture deficits experienced during winter. In Ukraine, the sowing campaign has intensified in May due to favourable dry conditions, and to date nearly 80% of the planned area has been sown, according to the Ukrainian Ministry of Agriculture[2].

# 5. Country analysis

## 5.1. European Union

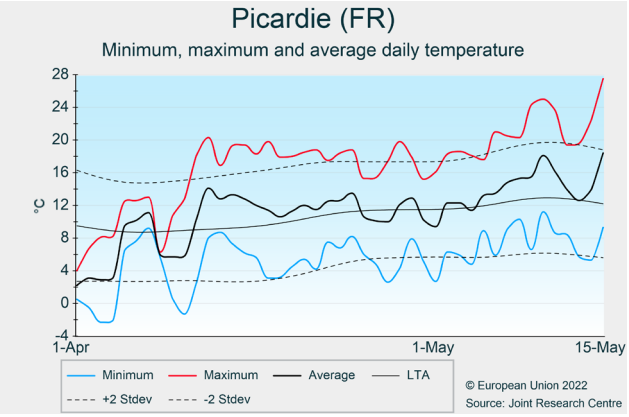
## France

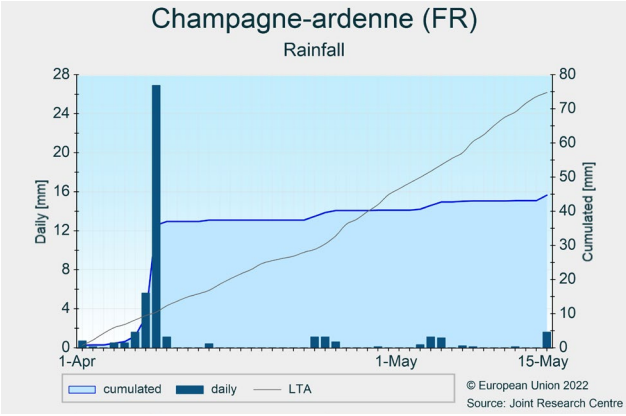
### Dry and hot conditions jeopardise high yield potential

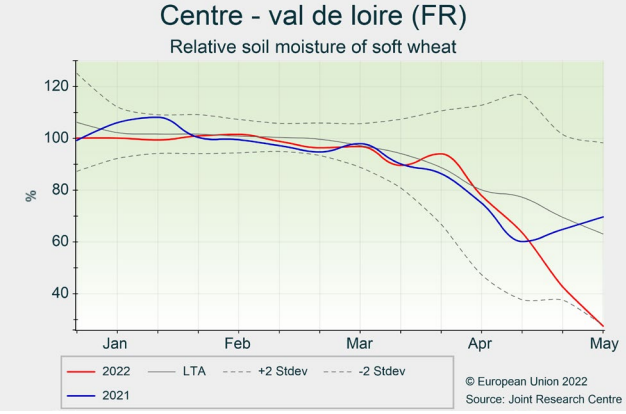
*Dry conditions have started to affect winter cereals (in flowering stage) and rapeseed crops. The outlook for summer crops will strongly depend on end-of-May rainfall.*

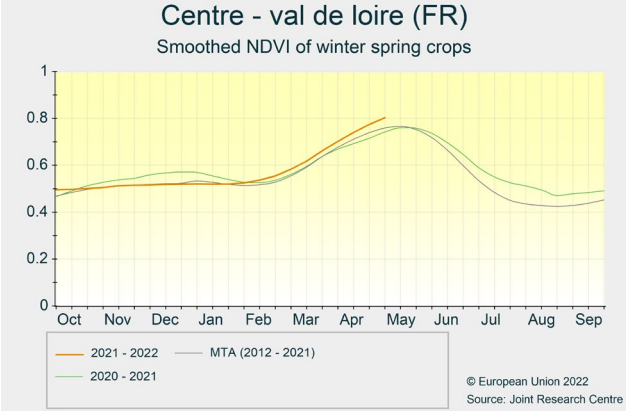
The review period was marked by dry conditions. In most of the arable land areas, the cumulated precipitation was 70% to 20% below the LTA. The deficit is also expressed in the modelled soil moisture, according to which 75% of the country's wheat areas present a deficit greater than 30% compared to the LTA. Temperatures were recorded above the LTA with a national average surplus of 1 °C during most of the review period, while above LTA-maximum temperatures were recorded mid-May.

As of early May, winter crops were in good condition, but the impacts of the dry conditions are already visible, especially in winter cereals, which are in the flowering stage (as indicated by the significant decrease in the notations of 12 and 19 May *Céré'Obs* reports[3]) and to a lesser extent in rapeseed. *Poitou-Charente* and *Centre-Val-de-Loire* are the most affected regions. Regarding summer crops, nearly 100% of the surface was sown, benefiting from sparse rainfall at the end of April. However, the persistently dry and hot conditions may affect vegetative growth, and more seriously emergence in late sown parcels in the north-west. Finally, some medium-term concerns were raised regarding the below-average groundwater tables, especially in the east of the country[4] due to the low level of precipitation since the beginning of the year; this may penalise irrigation locally. The yield forecasts have been revised downwards for winter crops and preserved at the trend level for summer and spring crops.




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

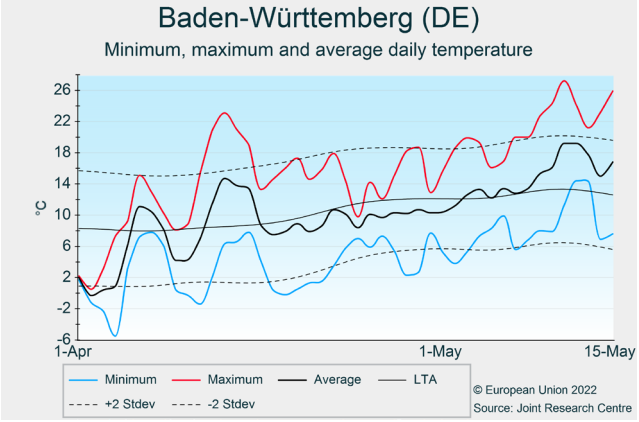
[4] https://www.brgm.fr/fr/actualite/communique-presse/nappes-eau-souterraine-au-1er-mai-2022

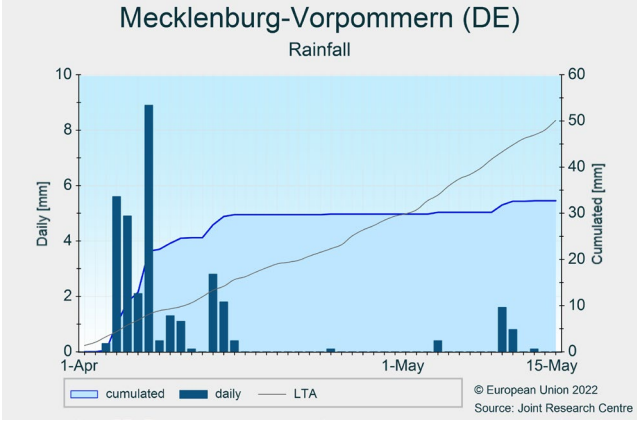
# Germany

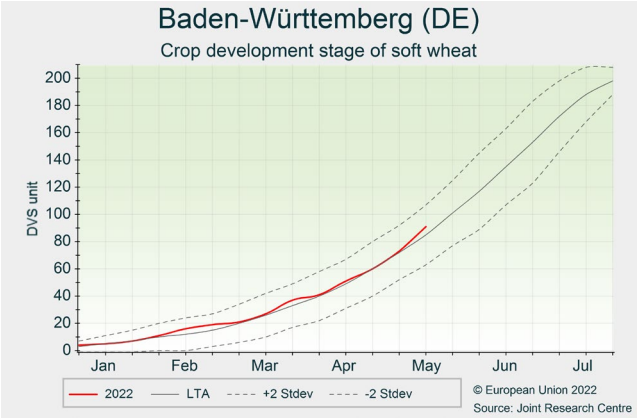
## Pronounced rain deficit in the East

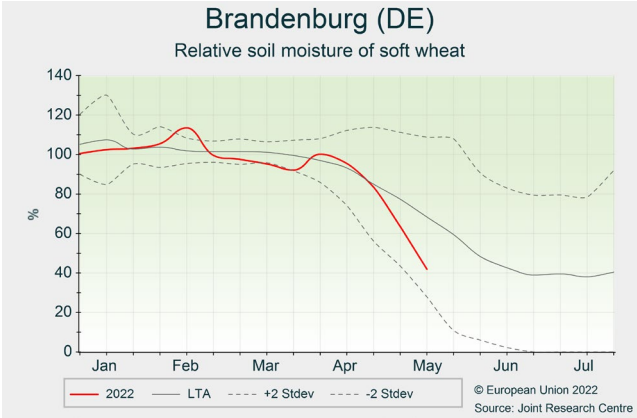
*Winter cereals are forecast above the 5-year average and, except winter barley, also above last year´s yield. The forecasts are now based on our crop model outputs whereas spring and summer crops still follow the trend. Rain is needed to sustain the current yield expectations.*

Temperature accumulation during the review period was close to normal with relatively high temperatures at the beginning of the second dekads of April and May. The period in between was characterised by lower-than-normal temperatures slowing down crop development as well as the emergence of spring crops. Late frosts occurred, but the impact on winter crops was very limited. The recent temperature rise in May (with maxima close to 30 °C) accelerated crop development, which is now slightly advanced. The increased water demand, which goes along with the higher temperatures and the gain in biomass, is already difficult to satisfy in eastern Germany where sometimes as little as 20 mm of rain was recorded during the review period; here, soil moisture levels are depleting rapidly. Although in the remaining part of the country precipitation totals were higher, often close to the LTA or even above as in northern Baden-Württemberg and Bayern, dryer zones are becoming evident also in western Nordrhein-Westfalen, Rheinland-Pfalz, and Saarland. At this stage, the impact on final yields seems still to be contained, but substantial rain is needed to sustain the current average-to-good yield expectations and to guarantee good summer crop growth for the completed sowings.



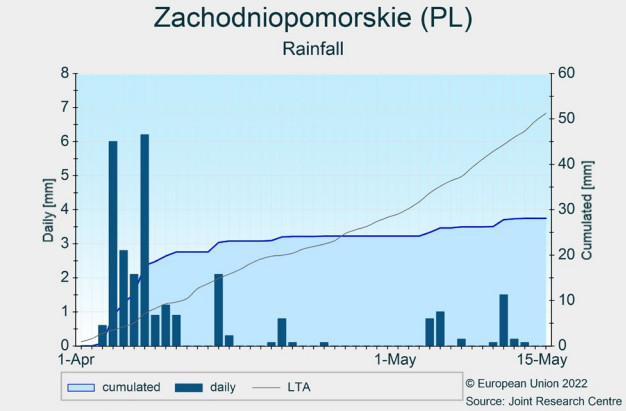



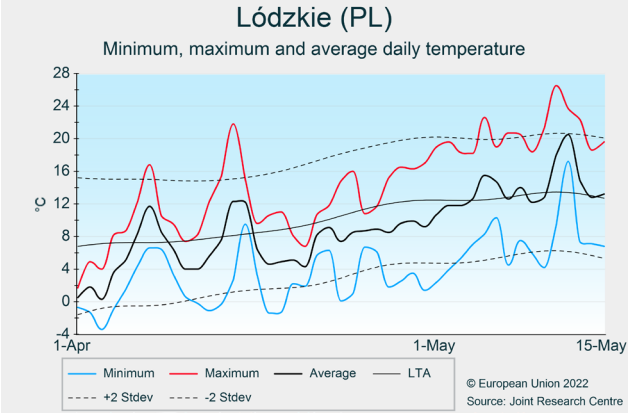
# Poland

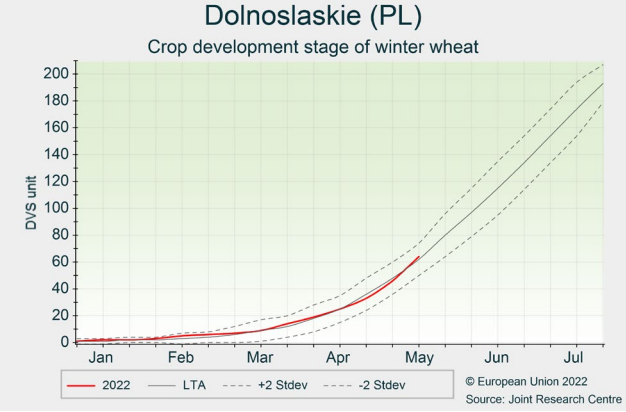
## Dry and warm May raises concerns for winter crops

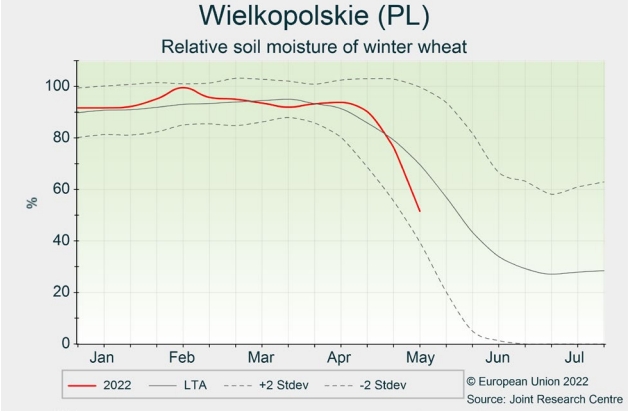
*April rains temporarily alleviated dry soil conditions after a very dry March. But May rainfall deficits combined with relatively warm temperatures resulted in the progressive drying of soils. Winter and spring crop development and biomass accumulation have gained speed with an onset of warmer May temperatures but dry soils raise concerns for yield potentials.*

Colder-than-usual conditions prevailed in April with frequent frosty night temperatures during the first half of the month. Following a colder-than-usual beginning of May, temperatures rose and oscillated around the average until the end of the review period, with temperature maxima frequently exceeding 20 °C. April precipitation was variable across the country, with above-average totals in parts of south-west and eastern regions, and below-average values in northern *Zachodniopomorskie, Pomorskie* and *Warminsko-Mazurskie* regions. In the first half of May rainfall was significantly below-average, which, in combination with warm temperatures, resulted in low soil moisture levels in most of the country (especially in north-western and central regions). Cumulated global radiation was slightly below the LTA. Development and biomass accumulation of winter and spring crops, delayed after the cold spring, have regained speed with an onset of warmer May temperatures and are now around seasonal average values. Soil moisture reserves have been constantly decreasing over the review period and are now significantly below the average seasonal levels. This could have negative impacts on vegetative growth of winter cereals, and further reduce their yield potentials should dry conditions prevail. Sowing of maize began during the last dekad of April, a slight delay due to cold April conditions, while sowing of sugar beet was finalized at the end of April. Thermal conditions for early development of summer crops were generally favourable, however rain is much needed during the coming weeks for good vegetative development. The yield forecast for winter wheat is slightly reduced compared to last month due to developing dry conditions. Rain is much needed during the coming weeks to sustain the current positive yield expectations for spring and summer crops



# Romania

## Deteriorated yield potential of winter crops

*The substantial rain deficit since the beginning of the spring negatively affected the yield potential of winter crops. Nevertheless, colder-than-usual conditions in the major producing areas are currently preventing more severe yield losses.*

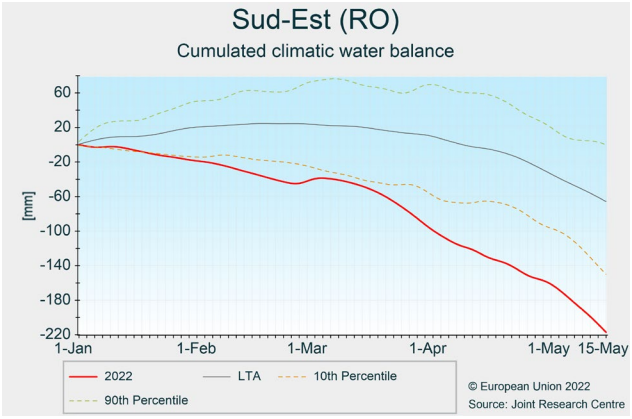
Rainfall has been scarce in Romania since the beginning of the year. In April, wetter conditions prevailed in most of the country. Near seasonal precipitation was observed in the south whereas the rest of the country experienced slightly above (locally up to 30%) average levels. Since early May, significantly drier-than-usual conditions prevailed. In the major winter crop producing regions, rainfall was up to 80% below the LTA.

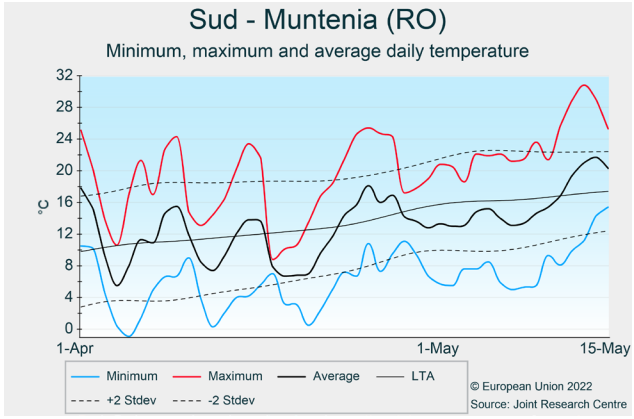
Below-average temperatures prevailed throughout the whole of spring (since 1 March). In April, temperatures were up to 2 °C below-average across Romania. Only the south-eastern parts of the country experienced slightly warmer-than-usual conditions. Since early May, below-average temperatures prevailed in the east. By contrast, the western half of the country experienced slightly warmer-than-average conditions.

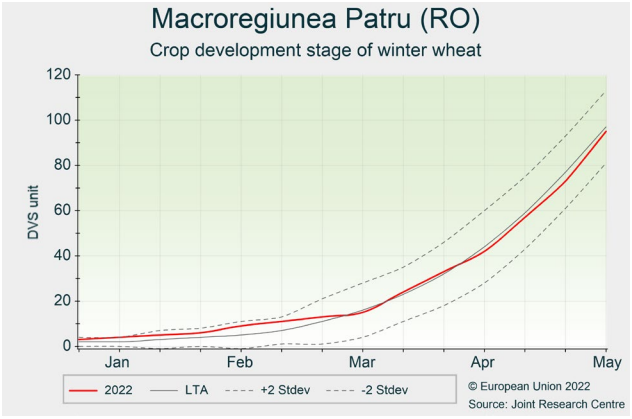
The overall cold spring resulted in a delayed development of winter crops. Nevertheless, this allowed the crops to enter the critical stages (e.g. stem elongation, heading) without any thermal stress.

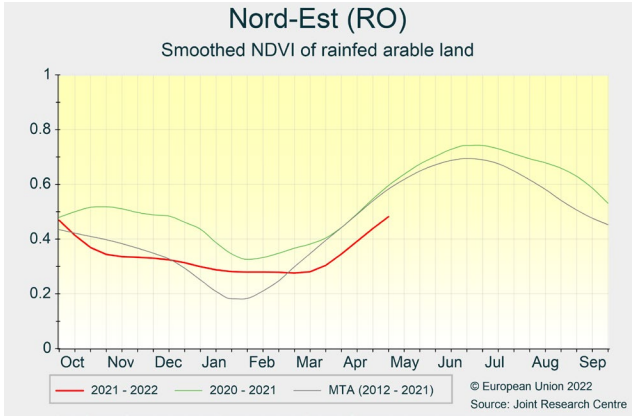
In response to the above-mentioned suboptimal conditions, our yield forecast for winter crops was revised downwards. Though winter crops are already negatively affected by the rain deficit, rainfall is still urgently needed to avoid a further severe deterioration of the yield potential.

Wet conditions at the beginning of the review period followed by dry conditions since the end of April allowed for an acceleration of fieldwork and the sowings were planned to be finalised during the first dekad of May.



# Spain and Portugal

## Winter crops negatively affected, summer crops in good condition

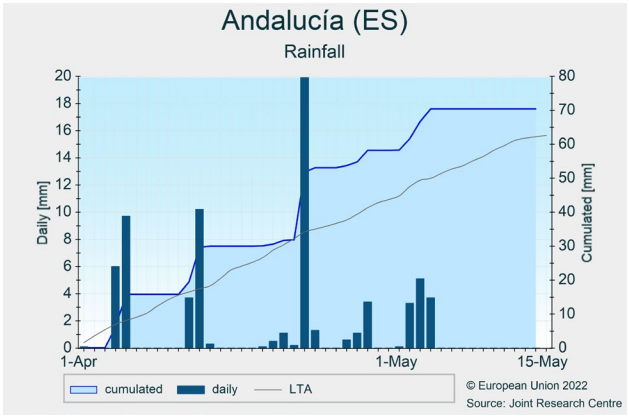
*Rainfall in early April was sufficient to alleviate drought conditions, but not to fully recover the winter crops yield outlook, as soil water contents remain close to critical levels in Extremadura and Alentejo. Conditions for the emergence of summer crops were favourable.*

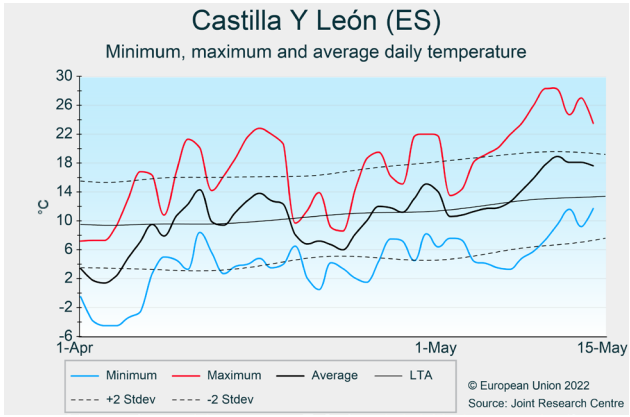
The return of rainfall in April in the whole Iberian Peninsula substantially improved the growing conditions. However, a major frost event traversed the Peninsula from north to south, damaging crops locally, especially fruit trees. Since early May, temperatures have increased and dry conditions have returned, with no rainfall expected in the coming dekad.

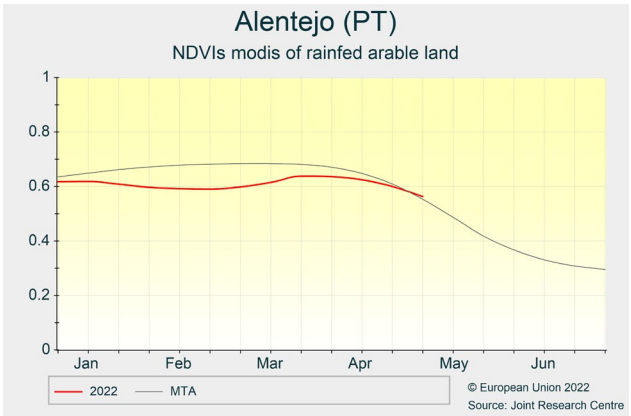
Reservoirs in the southern Iberian Peninsula have benefited from the April rainfall. For example, in *Murcia* the capacity doubled to 39% and in *Andalucia* it increased by 6% to 37%; however, in *Extremadura*, storage did not change and remained low at 39% (www.embalses.net). In Portugal, water levels in most reservoirs are above 50% of capacity, but with large variations (sir.dgadr.gov.pt/reservas), especially in *Alentejo*.

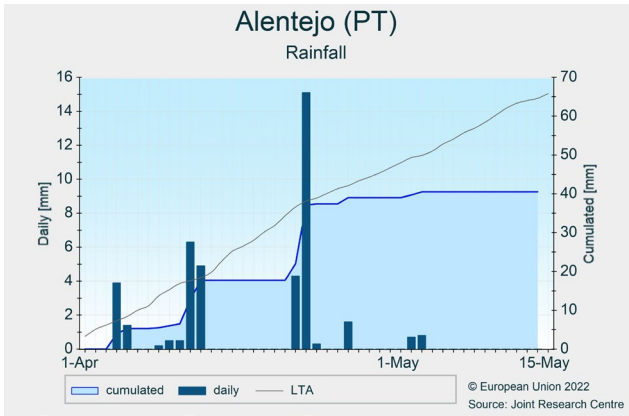
The rain in April managed to sustain a part of the winter crop yield, but crops have not recovered completely in the southern regions (*Alentejo, Andalucia* and *Extremadura*). In northern Spain (e.g. *Castilla y Léon*), near to average yields are still possible, depending on regular (light) rainfall in the coming month ahead. Our yield forecasts for winter crops remain mostly unchanged, and below the 5-year average, but the outlook might further decrease if dry conditions persist over the coming month. Spring barley is suffering in its vegetative phase from the currently dry and warm conditions across the country, so that the yield forecast has been reduced for Spain.

The sowing of summer crops has highly benefited from the rainfall and summer crops are currently at emergence and in good condition, so that our outlook for these crops is on a par with the 5-year average.



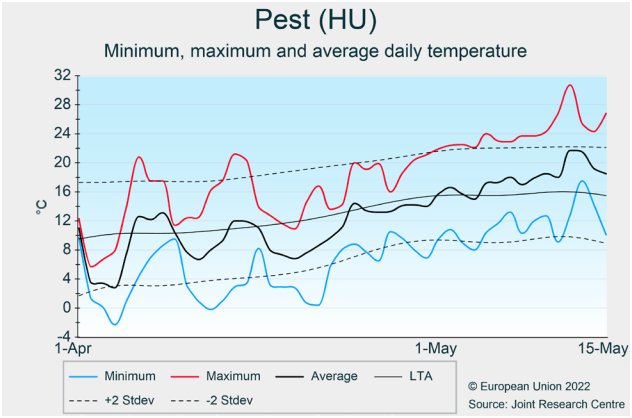
# Hungary

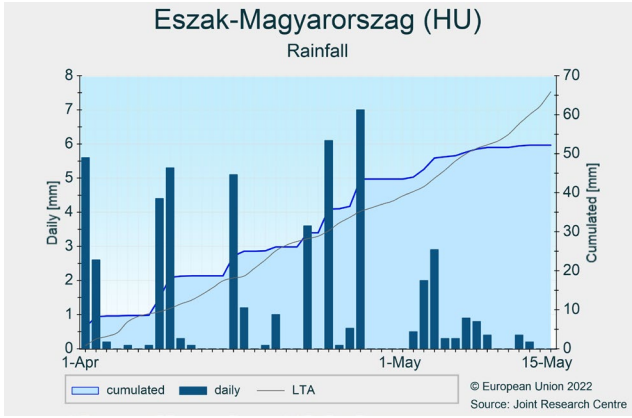
## Improved outlook thanks to favorable conditions in April

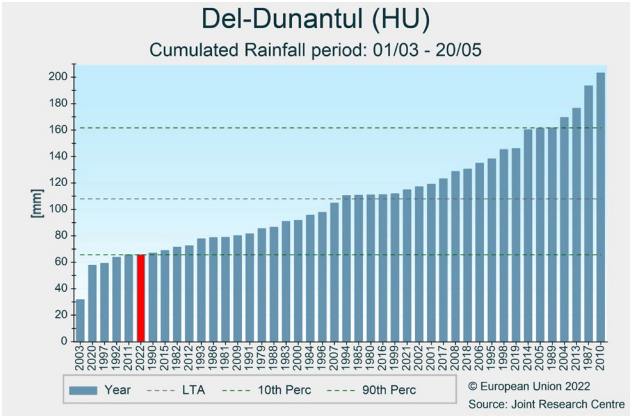
*Yield potential is preserved in most of the country, with some concern in the south due to dry conditions.*

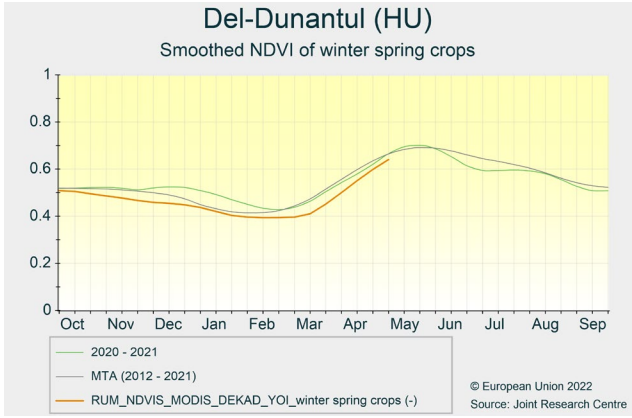
After a very dry winter, the water regime during the review period was close to average in central Hungary (from *Nyugat-Dunántúl* to *Észak-Magyarország*), with rainfall events well distributed in time. However, in the south (*Dél-Dunántúl*), the rainfall deficit accumulated since the beginning of March is between 25% and 50% of the LTA. As in most of central Europe, the overall temperatures were lower than the LTA in April, followed by a sharp increase since 5 May.

The start of the winter crop season was delayed due to the dry (March) and cooler (April) conditions. Precipitation in April was essential to preserve the yield potential of winter crops in most of the country. However, in *Dél-Dunántúl* where little rainfall occurred, the dry conditions have started impacting winter cereals in their flowering stage. The quickly rising temperatures in early May, in sharp contrast with the cold of April, may accelerate the flowering stage unfavourably. The start of the summer crop season was positive in most of the country (except in the south), benefiting from regular rainfall since early April, maintaining good soil moisture levels. The yield forecasts are slightly raised for winter crops and maintained at the trend level for summer and spring crops.



# Italy

## Timely rainfall relieves water stress on winter cereals; concerns over predicted heat

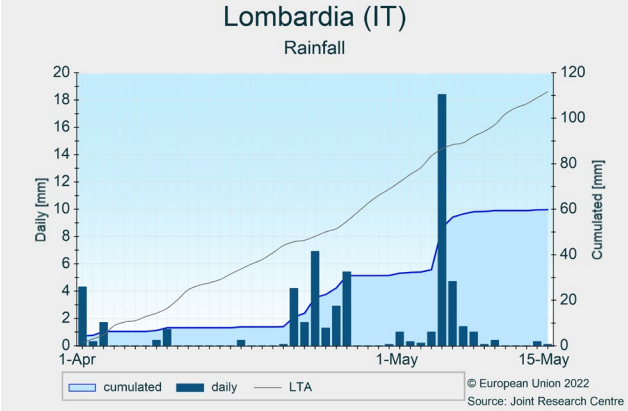
*After drought conditions, winter wheat benefitted from little but timely rainfall, and yield forecasts are revised upward but remain below last year's figure. The durum wheat forecast is above last year's and the 5-year average. Forecasted heat could jeopardise this outlook. Summer crops have started well but with concerns for irrigation water availability for the rest of the season.*

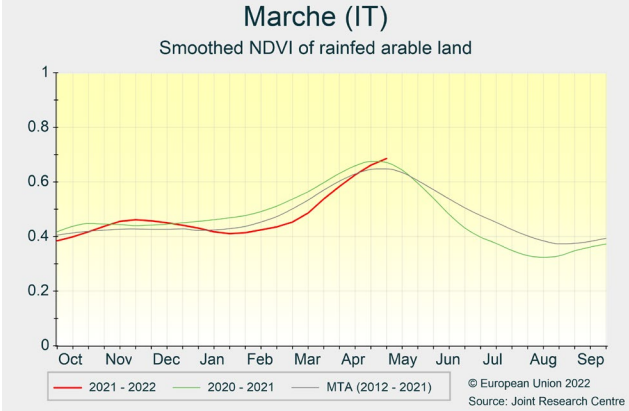
The difficult season for winter cereals was alleviated by timely rain around the flowering stage. Despite such rain, concerns about winter crops remain due to forecasted hot temperatures. Should these forecasts materialise, this could frustrate the recent recovery and lead to heat stress and yield decrease. The summer crops season started well but with very serious concerns about water availability for irrigation in the coming weeks.

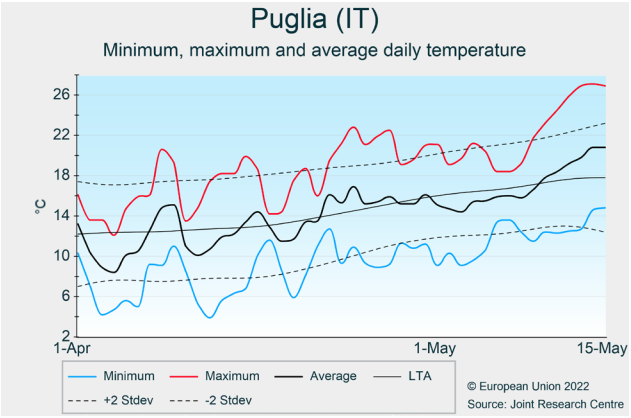
In northern Italy, some precipitation in April and at the beginning of May mitigated drought conditions. Despite amounting to only half of the expected average precipitation sum, 60 mm of rainfall arrived just before flowering – a prime moment to maintain yield potential. In north-eastern regions, rainfall was slightly more frequent and abundant with even more favourable effects on winter crops. The sowing of maize has been completed and, in all northern regions, maize benefited from the wet windows to germinate and to develop. Overall, conditions are average to optimal.

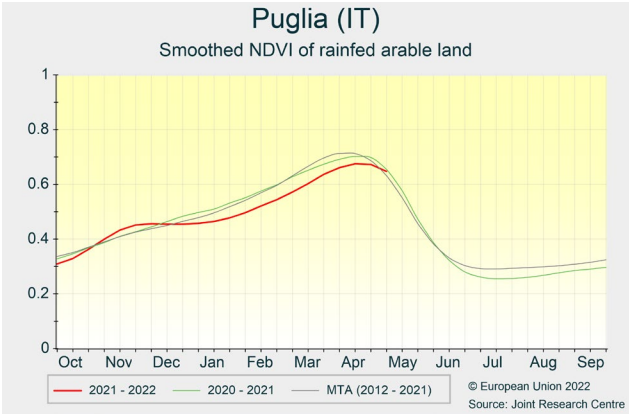
In central Italy, whose regions experienced similar weather patterns as in the north, crop conditions improved in Toscana, Umbria and in the Marche with a boost of biomass accumulation sustained by precipitation, despite this being below the average (−50% from 1 April).

In southern Italy, the main durum wheat-producing regions (Sicilia and Puglia) faced a complex spring but well-distributed rainfall (−50% compared to LTA) and average temperatures have provided crops with more favourable conditions at the beginning of grain filling.



# Czechia, Austria and Slovakia

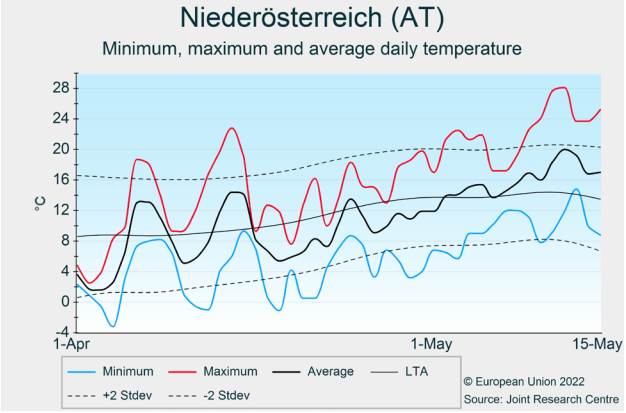
## April rain regionally improved conditions for winter crops

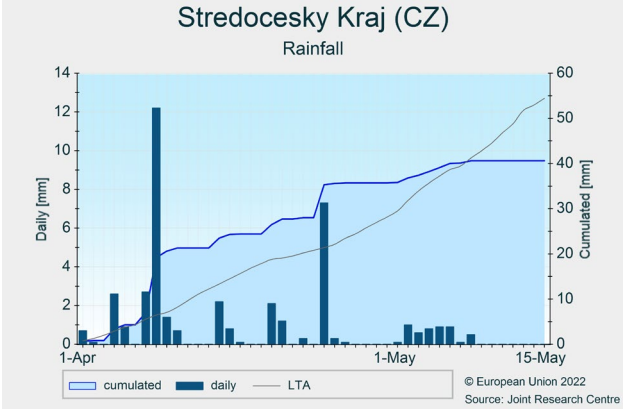
*The development and biomass accumulation of winter and spring crops, delayed after a cold start to the growing season, have regained speed with warmer temperatures since early May. April rainfall improved soil moisture conditions in Austria, but in Czechia and Slovakia regional deficits in water supply remained.*

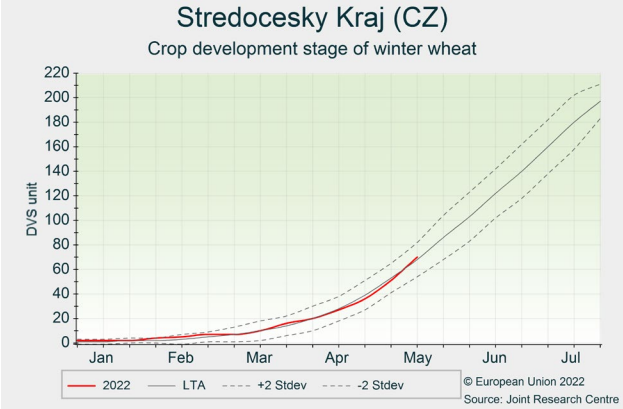
In April, temperatures were changing dynamically from below-average to above-average, but in general, the month was colder-than-usual. Frost events occurred frequently during the first half of April, but minimum temperatures dropped below -3 °C only during a cold spell at the beginning of the month. Following a colder-than-usual beginning of May, temperatures rose gradually to above-average levels. At the end of the review period, temperature maxima reached 28 °C.

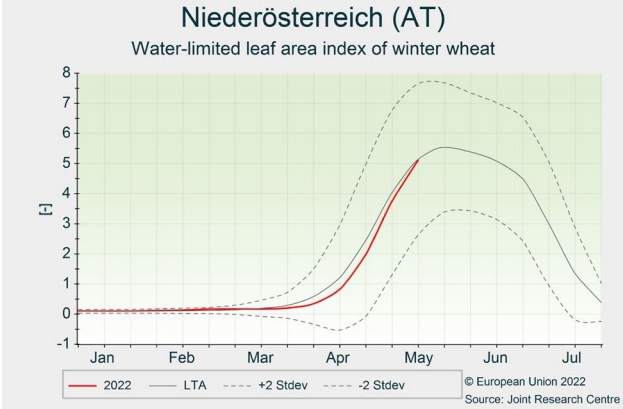
Precipitation totals for the review period remained below average in most of Czechia, especially in the south-eastern and central regions (e.g. Stredocesky Kraj) and in eastern Slovakia. On the other hand, in eastern Austria and western Slovakia precipitation totals were around average or even above. Accordingly, April rainfall improved soil moisture conditions in Austria, while deficits in water supply remained in central and eastern Czechia as well as eastern Slovakia.

The development and biomass accumulation of winter and spring crops, delayed after a cold start to the growing season, have regained speed with warmer temperatures since early May and have reached around seasonal average levels at the end of the review period. In addition, warming in May favoured an early development of spring crops and summer crops. Currently, we are maintaining our previous forecast for winter crops close to the 5-year average. However, adequate precipitation is needed in the weeks to come to allow for fair yield formation of winter cereals and to sustain the average forecasts.



# Bulgaria

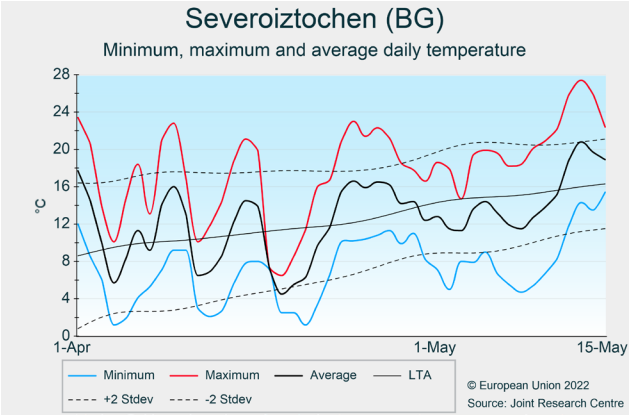
## Rainfall urgently needed to safeguard average winter crop yields

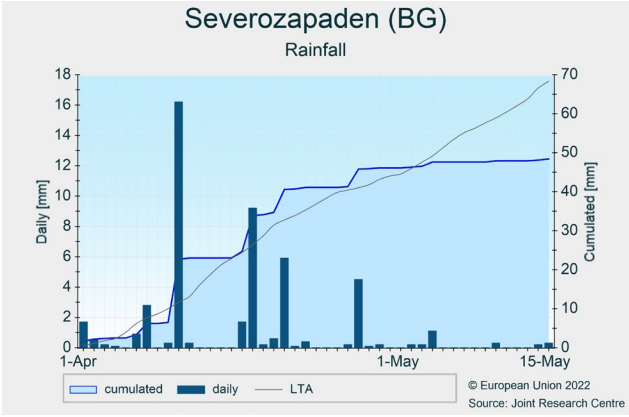
*No significant rain has fallen since isolated heavy rainfall events in the second dekad of April. This is hampering winter crop development. The winter crop yield outlook has been revised slightly downwards. Summer crop forecasts are still based on historical trends.*

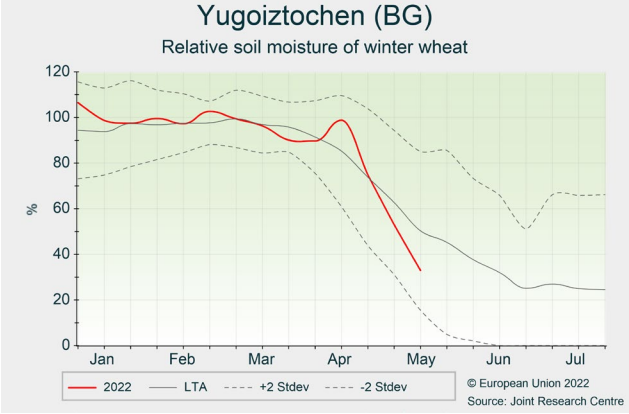
Temperatures were in line with seasonal values during the review period with average daily temperatures oscillating ±2 °C around the LTA. Colder days were only registered in the second dekad of April, when temperature maxima dropped to 6 °C, without any significant concerns for crop development.

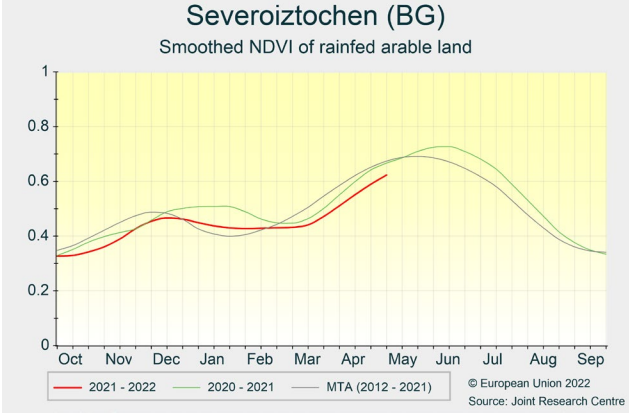
After a dry start to spring, a few days with intense rainfall occurred in the second dekad of April resulting in average precipitation totals, as reported in the April bulletin. However, since then, a rainfall deficit has been recorded in the whole country and dry conditions still persisted in the first half of May. Overall, less than 10 mm of rain has been recorded since 20 April, compared to 50 mm accumulated in the previous period. Despite the warm weather, the phenological development of crops remains delayed and the lack of precipitation has led to below-average biomass accumulation. Rainfall is urgently needed to support adequate progress of winter crops, as the soil moisture levels are rapidly decreasing. Consequently, the yield forecasts for winter cereals were revised slightly downwards, but remain in line with the 5-year average (but well below last year's levels).

Wet conditions around mid-April hampered field operations and slowed down the sowing campaign for spring and summer crops, which is now nearing completion. Summer crop forecasts are still based on historical trends.



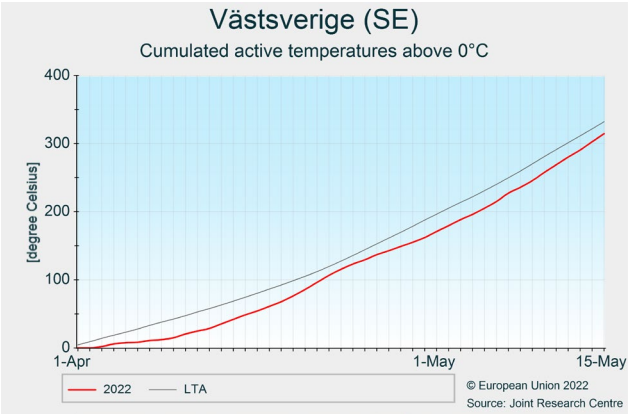
# Denmark and Sweden

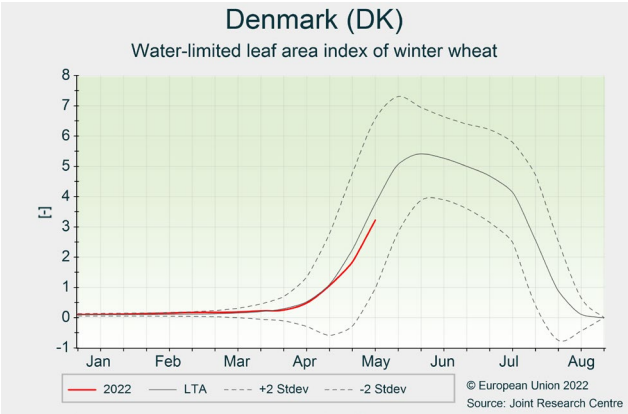
## Crops in good condition despite rain deficit

*Colder-than-usual conditions slowed the development and growth of winter crops. Crops are in good condition, but more rainfall is needed to maintain the positive outlook.*

Temperatures prevailed below the average, with the exception of the warm period occurring during the second dekad of April. Frost events were frequent during the night in the first half of April. Significant rainfall events were observed only in the first 2 weeks of April and were nearly absent for the rest of the period. Radiation levels were close to average.

Despite the dry conditions, winter crops are in good condition, as crop water demand was moderated by the relatively low temperatures and low crop biomass. The yield outlook is still positive, but the reduced soil moisture content will negatively affect the potential in the absence of more substantial rainfall in the coming weeks. Should the rain deficit continue, spring barley with a rooting system that is not yet deep and well-developed may be impacted earlier than winter crops. As a beneficial effect, the rain deficit limited the development of pests and diseases. The sowing of maize and sugar beet is currently underway and soil dryness is negatively affecting emergence. Our yield forecasts for winter crops were revised somewhat downward, but remains close to or above the historical trend and the 5-year average..



# Estonia, Latvia, Lithuania, Finland

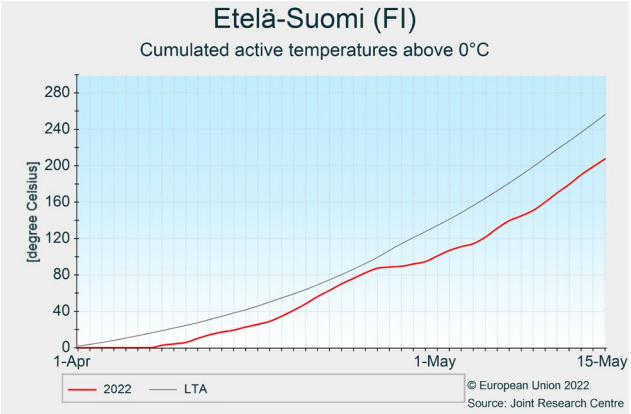
## Cold weather delays the beginning of the sowing campaign in Finland

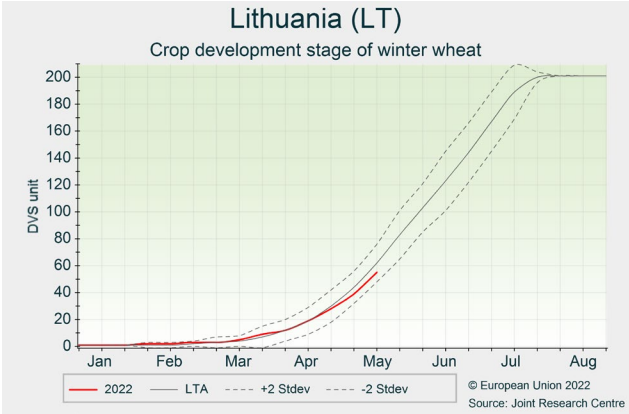
*The frequent colder-than-usual temperatures and the lasting snow of the period slightly delayed the beginning of the sowing campaign in Finland. Spring sowing progressed well in the Baltic countries, where recent rainfall sustained the early growth stages.*

Colder-than-usual temperatures and night frosts characterised the period in all countries. Rainfall was mainly concentrated during the first 2 weeks of April and close to or above the LTA. Cumulative global radiation was close to average in the Baltic countries and slightly above average in Finland.

In the Baltic countries, winter crops are in good condition, and, according to our models, slightly delayed. In these countries, sowing progressed well and the first sown spring crops emerged adequately. In Finland, sowing started at the beginning of May in southern Finland, around 1 week later than usual, slightly delayed by the cold weather conditions and the persistent snow. Sowing in Finland is expected to be in full swing in mid-May, with the exception of the northern areas, where it is planned to start at the end of May. In Finland, winter damage and crop losses have been reported, particularly for some oilseed rape and barley crops, which will be replaced with spring cereals and spring oilseeds.

The yield forecasts for winter crops remain close to or slightly above the 5-year average. The forecasts for spring crops are still based on historical trends.



# Greece and Cyprus

## Positive outlook for winter crops in Greece and Cyprus

*Despite below-average soil moisture conditions, winter crops in Greece benefitted from mild temperatures and prompt irrigation, leading to a moderate upward revision of our yield forecast. Expectations for barley production in Cyprus are above average.*

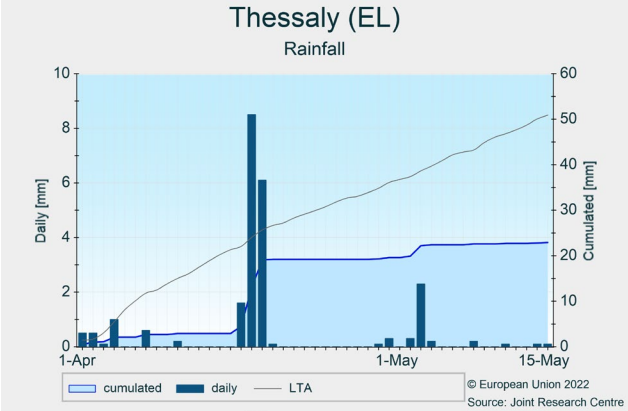
During the period under review (1 April-15 May), daily temperatures in Greece and Cyprus were slightly below the long-term average. Below-average soil moisture conditions were recorded in the main winter cereal-producing regions (*Macedonian* regions and *Thessaly*). This was partly relieved by supplementary irrigation. Nevertheless, slightly colder-than-LTA temperature values, particularly in the first half of April and in the first half of May, aided in maintaining soil moisture levels and avoiding stress conditions for crops.

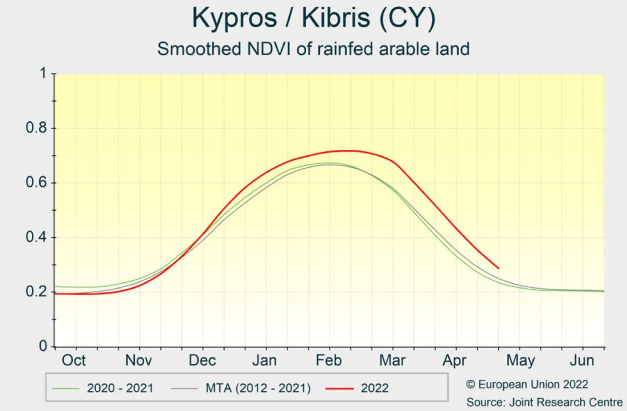
Remote sensing profiles for Greece suggest delayed biomass formation; this was more pronounced in *Western Macedonia* (almost 20 days). Overall, winter crops are at the end of the flowering period, but the development stage for wheat was moderately delayed by the colder-than-usual weather conditions, whereas barley and triticale follow a seasonal development trajectory.

In Cyprus, remote sensing profiles suggest that barley is at the end of its vegetative cycle. Furthermore, above-average biomass formation suggests good yield expectations for the coming harvest.

The sowing of summer crops in Greece was completed between the end of April and the beginning of May, with no delay. Mild temperatures and good soil moisture have set good conditions for crops to emerge.

Our yield forecasts for winter crops are moderately revised upward, both for Greece and Cyprus. Our forecasts for summer crops in Greece remain close to the last 5-year average.



# Ireland

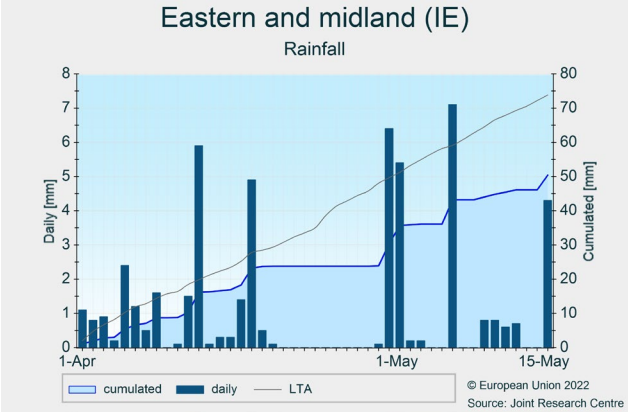
## Overall good yield potential

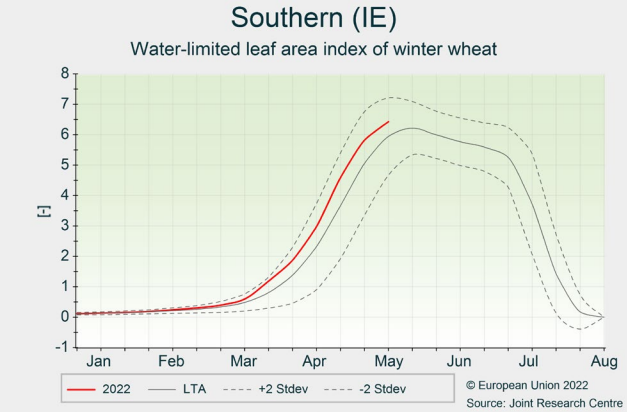
*The relatively dry conditions of April were mitigated by rainfall at the beginning of May. Winter crops are in good condition and with low disease pressure. The yield outlook remains positive for winter and spring crops.*

Temperatures fluctuated around the LTA. Rainfall was variable across the country, being relatively scarce in the southern and eastern areas and more abundant in the north. However, the last dekad of April was dry in all regions. Radiation levels were slightly below the LTA.

The sowing of spring barley was concluded by the end of April in the northern areas where field works were hampered by the abundant rainfall during the first two weeks of April. Adequate temperatures and soil moisture levels ensured an optimal emergence and a uniform establishment. Winter cereals are in good condition, with emerging ears for winter barley and flag leaf stage for winter wheat. Winter rapeseed is at full flowering. Sugar beet sowing is almost completed, whereas potato planting is under way.

In some areas in the south and east, soil water content was depleted, but the rainfall of the beginning of May mitigated the soil moisture deficit observed at the end of April. Yield forecasts remain positive for winter and spring crops and above the 5-year average.



# Belgium, Luxembourg and the Netherlands

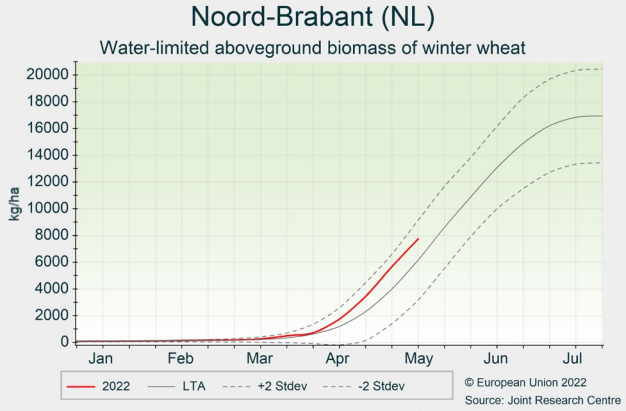
## Rain urgently needed to sustain high yield potential

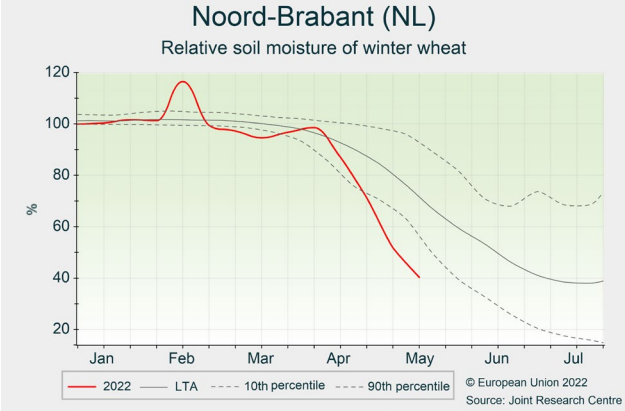
*Weather was favourable for the growth and development of winter crops and for sowing summer crops. However, a lack of rainfall caused soils to become exceptionally dry for this time of year. Substantial rainfall in the coming weeks will be needed to sustain a high yield potential.*

After a cold and wet start to April the current review period remained practically dry, with daily average temperatures around the LTA. Frost events after the first week of April were rare and mild and confined to inland areas and the northern Netherlands. The first half of May was warmer than usual, with the highest temperatures on 15 May reaching 28 °C in the southern Netherlands, Belgium and Luxembourg. Sunshine levels were well above the LTA.

Overall, temperatures and radiation surplus were favourable for winter crops. In most areas, leaf area development and biomass accumulation are above average. Crop development is slightly advanced; winter wheat is reaching the end of vegetative growth. However, soil water contents are exceptionally low for this time of year. In areas with sandy soils and low groundwater tables, water stress has already started to limit growth. The situation is most serious in the southern Netherlands and Belgium. Restrictions of water use for irrigation have already been put in place there. Our yield forecasts for winter crops are maintained close to the historical trends. High (even very high) yields are still possible, but substantial rainfall in the coming 7 to 10 days will be needed to sustain growth and to avoid negative impacts around the sensitive flowering period.

Weather conditions were also favourable for the sowing of summer crops, which is practically completed. Many farmers applied some irrigation for seedbed preparation and to facilitate sprouting and emergence. Our yield forecasts for summer crops are still based on the historical trends.



# Slovenia and Croatia

## Winter and spring cereals in good condition

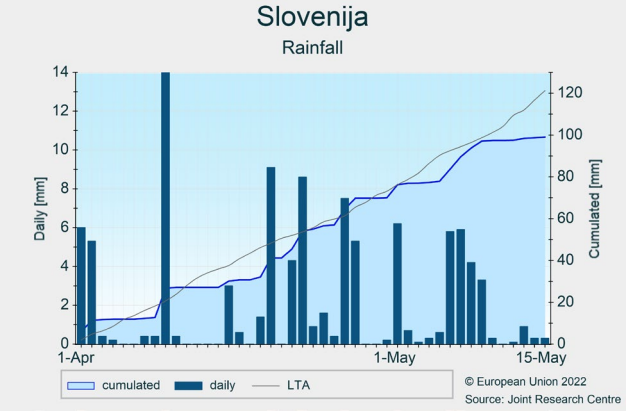
*Winter crops are completing their vegetative development in good conditions, and spring sowing benefited from April rainfall. The general outlook is positive, but rainfall in the coming weeks will determine yield formation.*

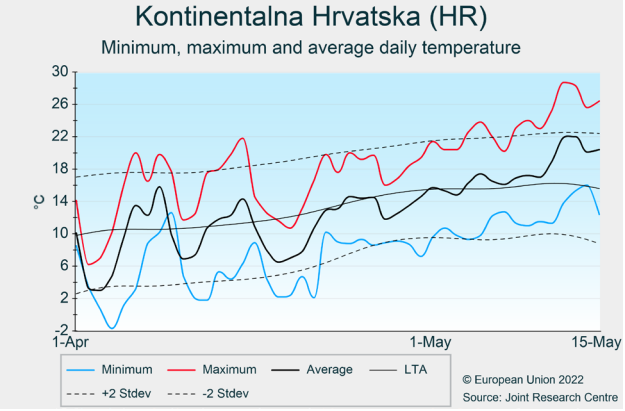
Temperatures prevailed slightly colder than the LTA in April until early May, and increased thereafter. After a very dry March, precipitation mostly returned to average levels during April, while the first weeks of May saw only limited rainfall across both countries, and less than 5 mm in north-eastern Croatia. Cumulated rainfall over the period of analysis remained slightly below the LTA for Slovenia and Adriatic Croatia, while the deficit was more pronounced in Continental Croatia. Global radiation was close to the LTA.

Overall, winter crops are completing their vegetative development in fairly good conditions, and are now close to flowering, according to our models. Thanks to the precipitation in April, the sowing and first development of spring cereals succeeded in good conditions, too.

By the end of the period of analysis, soil moisture had not yet appeared as a limiting factor for crop growth. However, if the limited water supply does persist, especially in north-eastern Croatia, the moisture deficit may affect yield formation in the coming weeks, as winter crops are about to enter their reproductive stage.

The general outlook for the period of interest remains positive, and the yield forecasts were set close to or slightly above the 5-year average.



# 5.2 United Kingdom

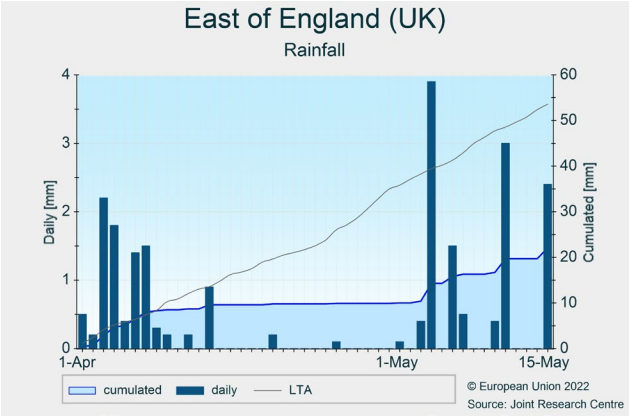
## Crops progressing well despite dry April

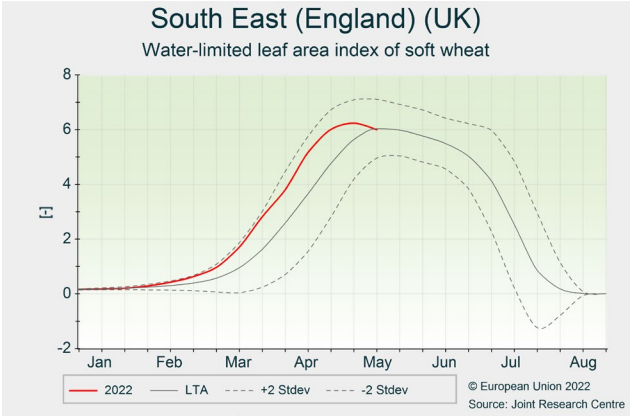
*Winter and spring cereals are generally faring well, as the rainfall at the beginning of April sustained adequate establishment of spring crops and yield potential for winter cereals. However, the period was predominantly dry and more rain is needed to maintain the current positive outlook.*

Cumulative temperatures were slightly above seasonal values. Rainfall was scarce in most regions, and concentrated during the first two weeks of April. Some beneficial precipitation was observed at the beginning of May. The exception was Scotland, where rainfall was close to average. Radiation levels were generally higher than usual.in the southern regions.

Winter crops are generally in fair condition, with low pest and disease pressure. Phenological development is advanced, with winter barley at ear emergence, and winter wheat at flag leaf stage. Spring crops emerged well and are at variable stage depending on the sowing date, with the most advanced crops at tillering phase.

The rain deficit did not impact winter crops, even though soil moisture contents decreased to well below average levels in the southern regions, according to our simulations. However, more rainfall is needed to maintain good yield potentials, particularly now that the crops are approaching critical growth stages. Yield forecasts are maintained close to the 5-year average.



# 5.3 Black Sea Area

# Ukraine

## Suboptimal crop conditions in the south-west

*Winter crops are still delayed because of the prevailing colder-than-usual conditions since the beginning of spring. Abundant rain in April was able to partially restore soil moisture conditions in most of the country (except the south-west) and prevented severe yield losses.*

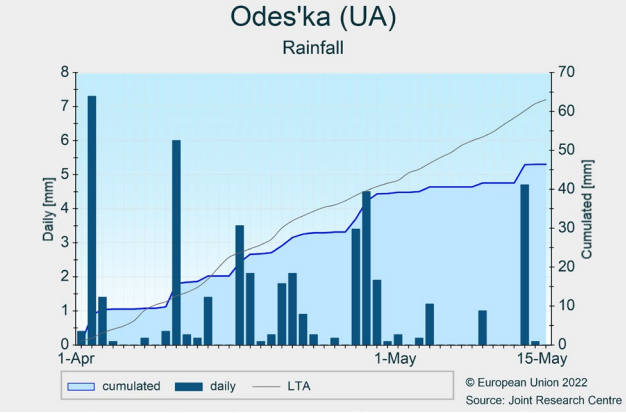
Following the overall drier-than-usual conditions in February and March, most of Ukraine experienced above-average precipitation in April. In northern and central parts of the country, April rainfall exceed the LTA by up to 80%, resulting in substantially improved soil moisture conditions. Only the oblasts in the south-west (e.g. south of Odesa, Khmelnitsky, Vinnitsa) remained significantly drier than usual.

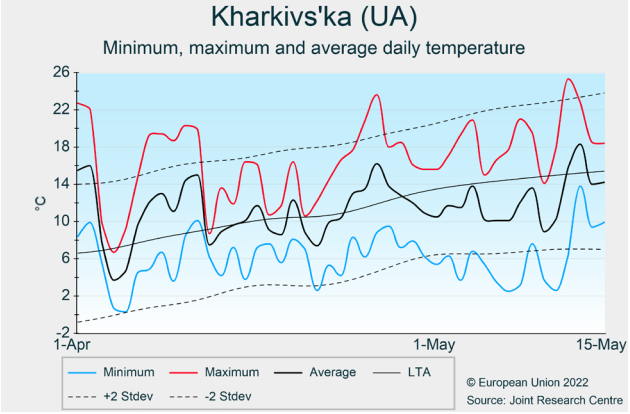
Dry conditions prevailed during the first half of May, putting winter crops again at risk of water deficit during the critical stages of heading and grain filling.

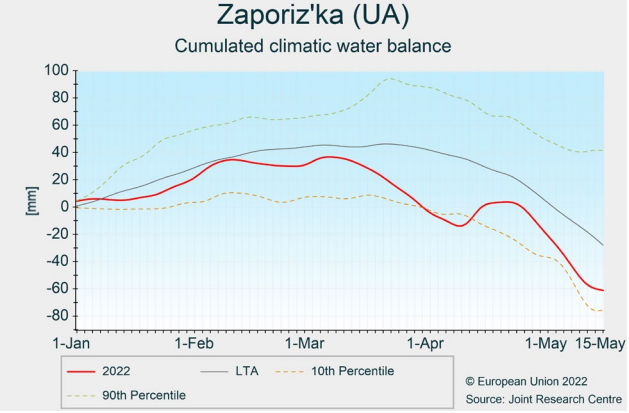
Temperatures have been below-average since the beginning of spring. During the review period, temperatures were 0 to 2 °C below the LTA in most of the country. Only the oblasts located in the east (e.g. Kharkiv) registered above-average temperatures. Consequently, winter crop development is still delayed overall. On the positive side, the below-average temperatures reduced crop water demands and allowed the crops to grow without exposure to thermal stress during the tillering and stem elongation stages of winter cereals.

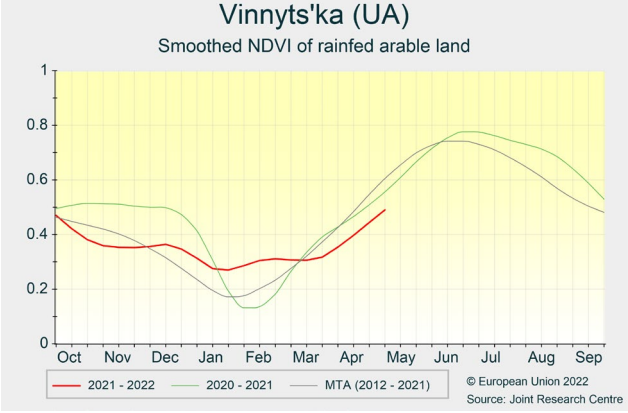
In response to the above-mentioned conditions, our yield forecast for winter crops was revised slightly downward to take into account the suboptimal conditions in the south-west. More favourable weather conditions, particularly rainfall in the south, are needed to avoid a further deterioration of crop condition. Our forecasts assume regular field operations such as nitrogen fertilisation and disease control, which as a matter of fact remain uncertain due to the Russian invasion on Ukraine's territory.

According to the Ukrainian Ministry of Agriculture[5], the sowing campaign of spring and summer crops is still ongoing. The sowings of spring wheat and spring barley are almost finished while one third of the projected area of sunflower and grain maize remains to be sown.




[5] https://minagro.gov.ua/news/v-ukrayini-zasiyali-1886-tis-ga-yaroyi-pshenici (Published 20 May 2022, 11:50 am)

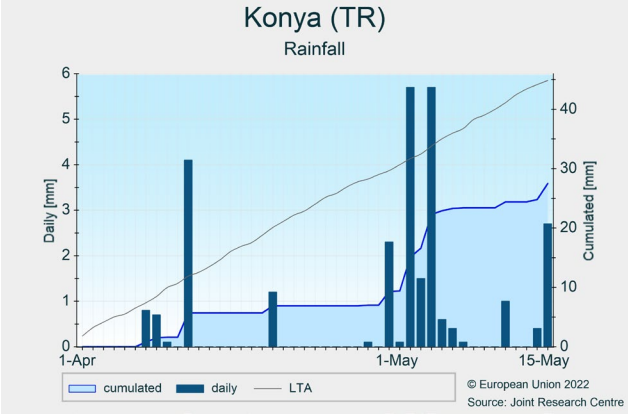
# Turkey

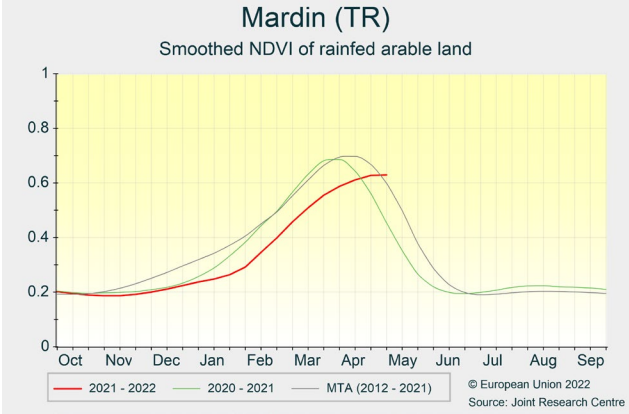
## Positive yields outlook but delayed season

*The winter crops season remains delayed in most of the country, yet with positive yield expectations. The yield forecasts for barley and wheat are well above last year's level and the 5-year average, and notably for barley (+7.4%) and durum wheat (+7.2%).*

In Anatolian regions, a sharp increase in temperatures was observed in April, and in ten days, average daily temperatures increased from -4°C to 24°C. The temperatures remained above the average during most of the month, before dropping again to below the average in May. Several days of light precipitation at the beginning of May interrupted a dry spell and was beneficial for crops as another dry window restarted immediately after and it is still ongoing. Considering the review period as a whole, precipitation remains 10 mm to 30 mm (i.e. up to 80%) below the LTA. Winter crops remain in good shape despite the strong delays even though the risk of heat stress and consequent yield reduction is increasing.

In south-eastern regions, weather conditions followed the same pattern as described above: a sharp increase of temperature in April with predominantly dry weather. This led to unfavourable conditions for rainfed winter crops in *Mardin* and in *Gaziantep*. In all the regions, flowering occurred by the end of April with below-average biomass accumulation due to the combined effect of the cold spring and dry conditions. In contrast, the irrigated crops display an optimal season, as the effect of the warm April, in combination with water from irrigation, boosted crop biomass accumulation to above-average levels. The yield perspective for the whole region is fair, but with a high risk of heat stress at grain filling in the coming weeks.



# 5.4 European Russia and Belarus

## European Russia

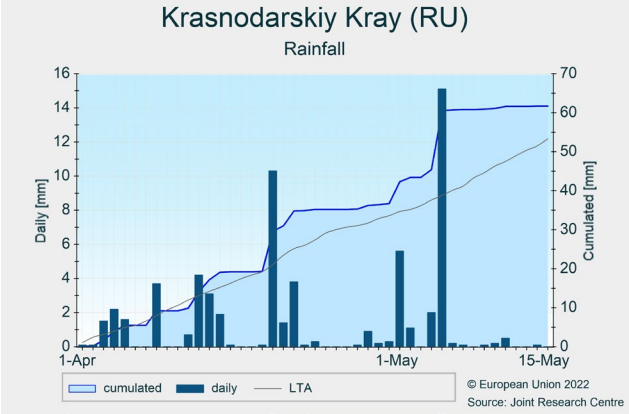
### Favourable weather conditions sustain a high yield potential for winter crops

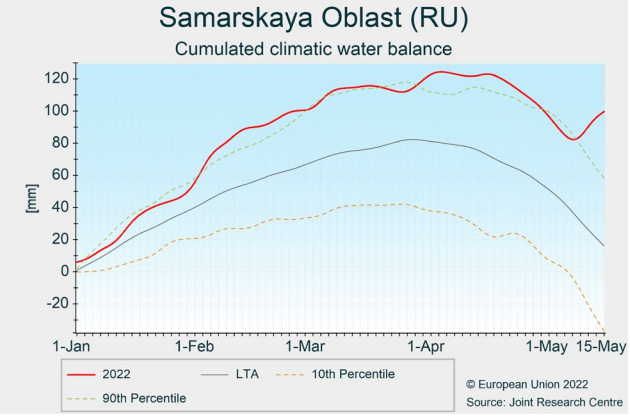
*Winter crops benefited from above-average temperatures combined with sufficient precipitation levels in April. The below-average temperatures prevailing since early May are positive for the heading stage of winter crops in the south of European Russia.*

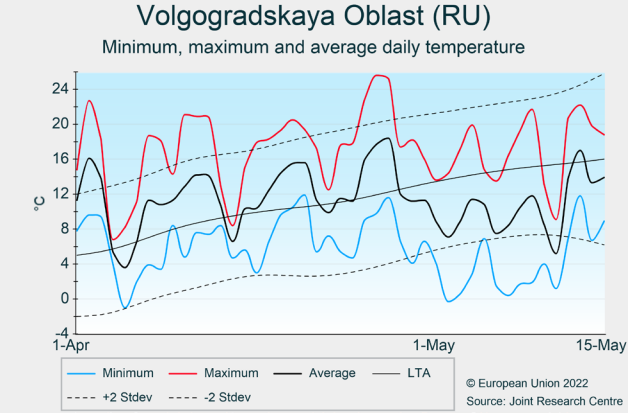
In April, slightly below-average to seasonal rainfall prevailed in most of European Russia. Well above-average rainfall (locally more than double the LTA) were observed in the Central okrug and in the eastern half of the Volga okrug. Only the North Caucasian okrug experienced drier-than-usual conditions. During the first half of May, frequent rainfall prevailed in south-western Russia and in the Volga okrug while the northern parts of the Southern okrug and the southern parts of the Central okrug remained mostly dry. This resulted in maintaining sufficient soil moisture levels.

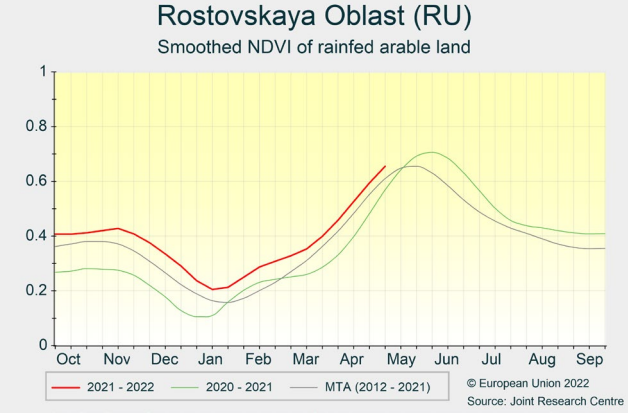
In April, warmer-than-average conditions prevailed in the main winter crop growing regions. Temperatures were locally up to 4 °C above-average in south-western Russia and in the east of the Volga okrug. This allowed winter crops to catch up from the delay caused by the colder-than-usual temperatures in March.

May was significantly colder than usual, particularly in the Volga okrug and the Central okrug, where a negative thermal anomaly of 6 °C (compared with the LTA) prevailed. This is positive for the winter crops under the heading development stages (especially in the south.



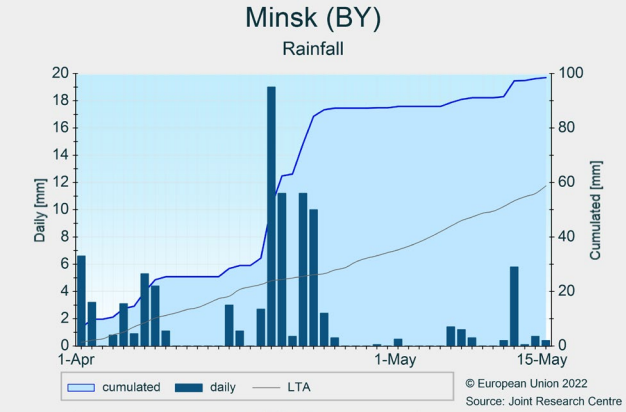
# Belarus

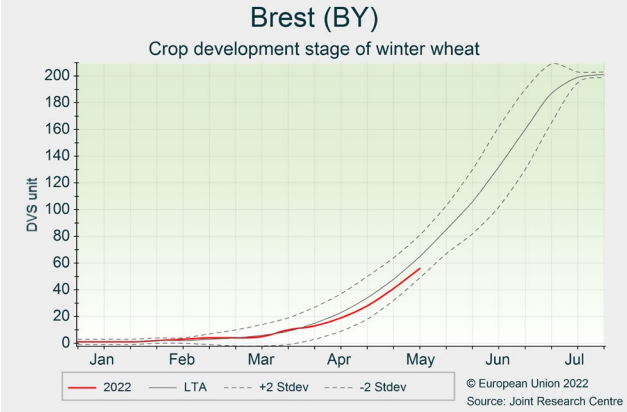
## A very wet and cold April but yield forecasts follow historical trends

*A very wet April resulted in waterlogging of soils in many regions and impaired spring crop sowing operations. Below-average temperatures slowed down the development of winter crops.*

The review period was characterised by colder-than-usual conditions. Frost events were frequent until the first dekad of May, but temperature minima rarely dropped below -3 °C. April precipitation totals were significantly above the LTA in most of the country, and were especially high in Minsk, Gomel and Mogilev regions where cumulative rainfall exceeded the LTA by 150% or even 200%. As a result, soils were overly wet in many regions. Only in the Vitebsk region was April precipitation around average. By contrast, the first half of May was characterised by precipitation significantly (< 50%) below the LTA in most of the country. Cumulative global radiation was below normal.

Our model indicates some delays in the development and biomass accumulation of winter wheat due to colder-than-usual conditions during the review period. Nevertheless, there are currently no major concerns for winter cereals. Frequent frost and excessive rains in April impaired sowing operations, germination and emergence of spring crops. Agro-meteorological conditions improved towards the end of the review period. We are maintaining last month's yield forecast, based on historical trends.



# 5.5 Maghreb

# Morocco, Algeria and Tunisia

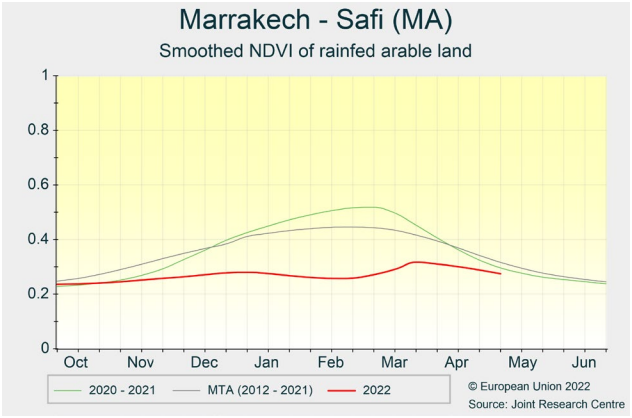
## Improving crop conditions in Algeria and Tunisia, negative outlook for Morocco

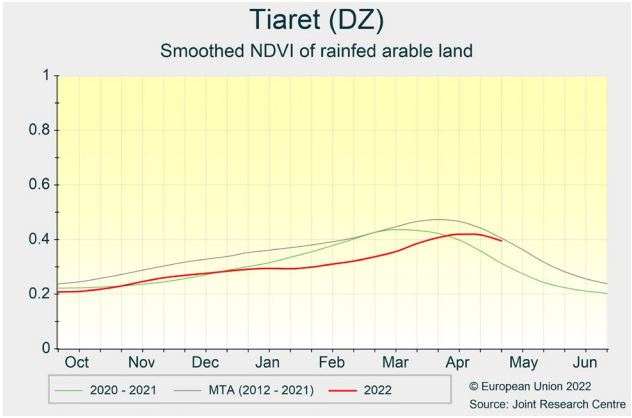
*Winter crops in central and eastern Algeria had a strong recovery after beneficial rainfall, while the other areas remain hampered by this season's drought in the west. Temperatures triggered above-average crop growth in Tunisia. The dire expectations for the cereals campaign in Morocco are confirmed.*

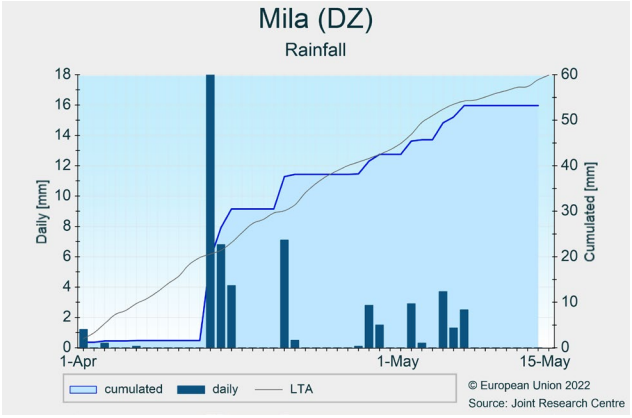
During the review period, average daily temperatures in Morocco increased and ranged from the LTA to +2 °C above the LTA. Accumulated rainfall was above average on the north coast and below average along the littoral (south-western) regions. The interpretation of remote sensing data suggests that winter crops have almost completed the grain-filling phase. Crop biomass accumulation levels well below the LTA are confirmed across the country because of the seasonal and widespread drought conditions. Our forecasts, aligned with the previous outlook, are setting yields values from −54% (soft wheat) to −61% (barley) compared to the last 5-year-average.

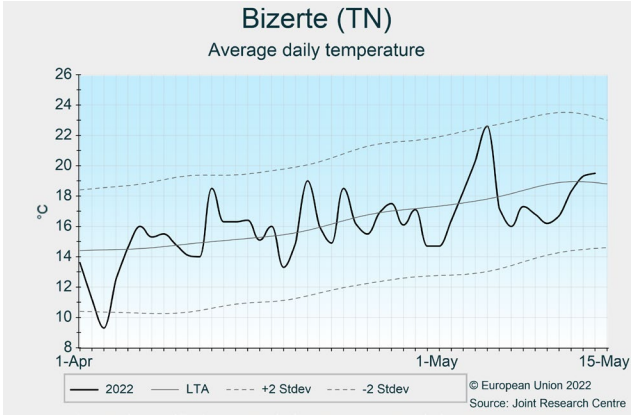
In **Algeria**, above-average rainfall in April (50-80% above the LTA) allowed winter crops in central and eastern regions to recover to average or moderately above-average levels. The recovery trend, already spotted in the previous outlook, continued in April at a more marked pace. Conversely, in the eastern wilayas of Tiaret, Tlemcen, Sidi Bel Abbes and Saida, winter crops failed to recover due to the drought conditions. The biomass accumulation here is below average. Despite remaining below the last 5-year average, yield forecasts were revised upward, for durum wheat in particular, which is the least cultivated crop within western regions.

Wheat production in **Tunisia** benefitted from beneficial daily temperatures and did not suffer the below-average levels of rainfall during the reporting period. Crop growth is in good condition despite a seasonal delay of almost 20 days. The outlook for barley is less positive than wheat since two of the most important (inland) regions are performing below average in terms of biomass accumulation (i.e. Kasserine and Kairouan).



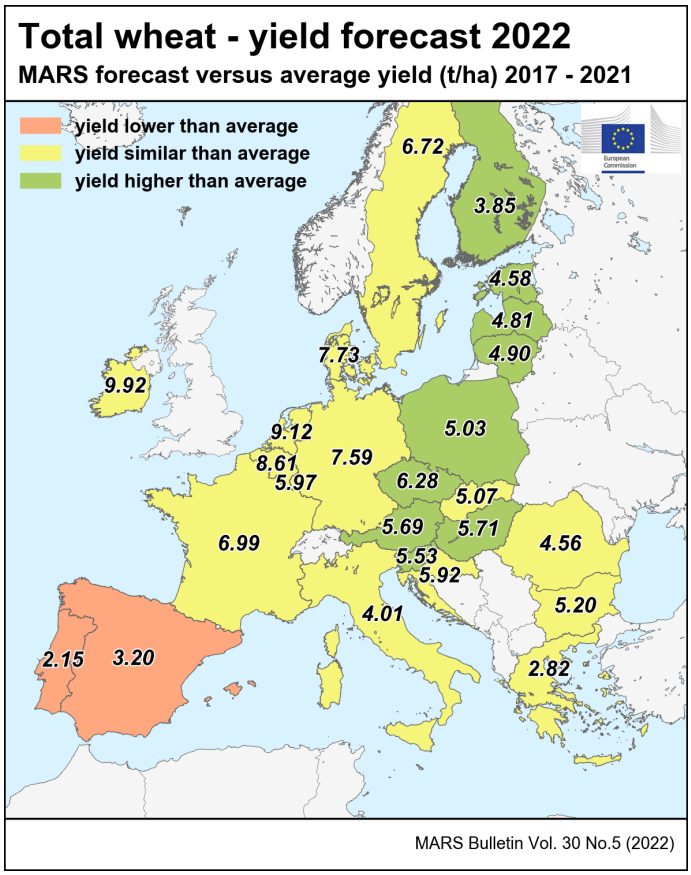



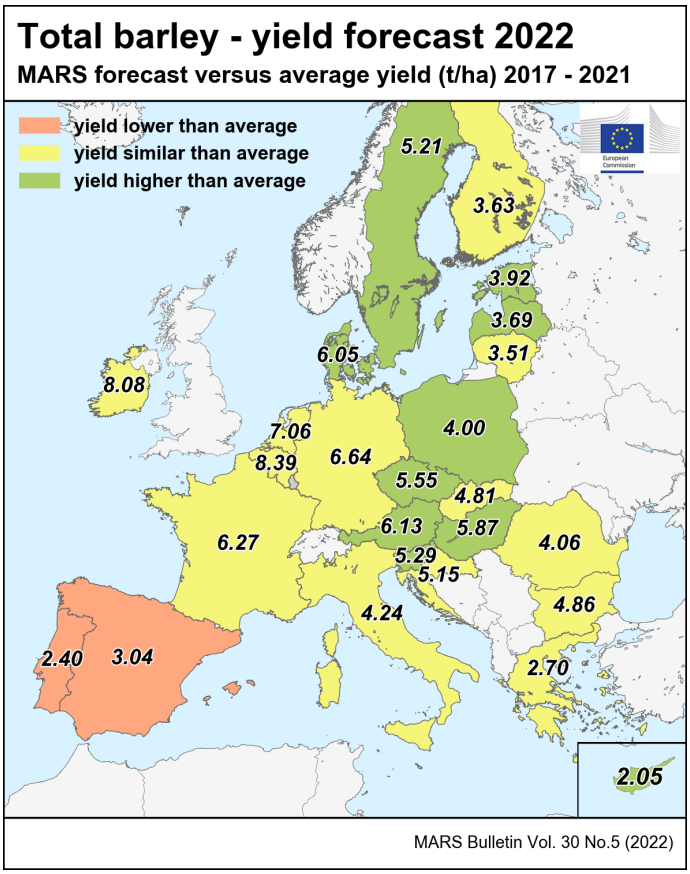



# 6. Crop yield forecast

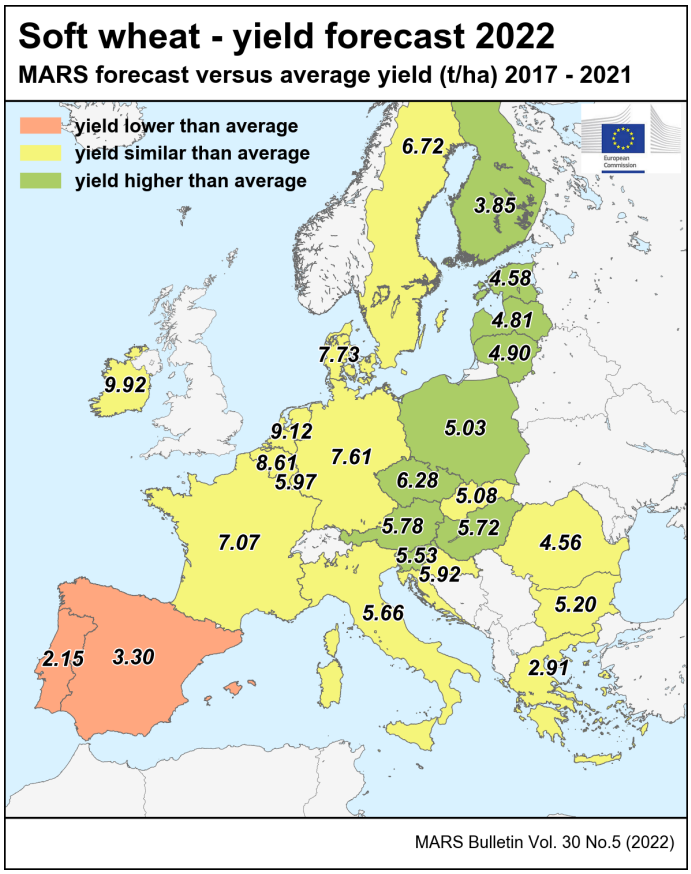
| Country | Total wheat (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 5.62 | 5.82 | **5.69** | + 1.4 | – 2.1 |
| AT | 5.34 | 5.50 | **5.69** | + 6.6 | + 3.5 |
| BE | 8.61 | 7.80 | **8.61** | + 0.0 | + 10 |
| BG | 5.04 | 5.96 | **5.20** | + 3.3 | – 13 |
| CY | — | — | **—** | — | — |
| CZ | 5.84 | 6.33 | **6.28** | + 7.5 | – 0.7 |
| DE | 7.36 | 7.30 | **7.59** | + 3.1 | + 4.0 |
| DK | 7.77 | 7.62 | **7.73** | – 0.5 | + 1.4 |
| EE | 4.27 | 4.09 | **4.58** | + 7.2 | + 12 |
| EL | 2.73 | 2.73 | **2.82** | + 3.2 | + 3.2 |
| ES | 3.45 | 3.93 | **3.20** | – 7.3 | – 19 |
| FI | 3.63 | 3.21 | **3.85** | + 6.0 | + 20 |
| FR | 7.16 | 7.02 | **6.99** | – 2.3 | – 0.4 |
| HR | 5.84 | 6.63 | **5.92** | + 1.4 | – 11 |
| HU | 5.44 | 5.97 | **5.71** | + 4.8 | – 4.4 |
| IE | 9.65 | 10.6 | **9.92** | + 2.8 | – 6.0 |
| IT | 3.90 | 4.12 | **4.01** | + 2.8 | – 2.9 |
| LT | 4.55 | 4.50 | **4.90** | + 7.6 | + 8.8 |
| LU | 5.89 | 5.96 | **5.97** | + 1.4 | + 0.2 |
| LV | 4.60 | 4.48 | **4.81** | + 4.5 | + 7.3 |
| MT | — | — | **—** | — | — |
| NL | 8.86 | 8.20 | **9.12** | + 2.9 | + 11 |
| PL | 4.74 | 5.07 | **5.03** | + 6.1 | – 0.7 |
| PT | 2.48 | 2.65 | **2.15** | – 13 | – 19 |
| RO | 4.52 | 5.30 | **4.56** | + 0.9 | – 14 |
| SE | 6.53 | 6.31 | **6.72** | + 3.0 | + 6.5 |
| SI | 5.09 | 5.77 | **5.53** | + 8.5 | – 4.1 |
| SK | 5.08 | 5.63 | **5.07** | – 0.3 | – 10 |



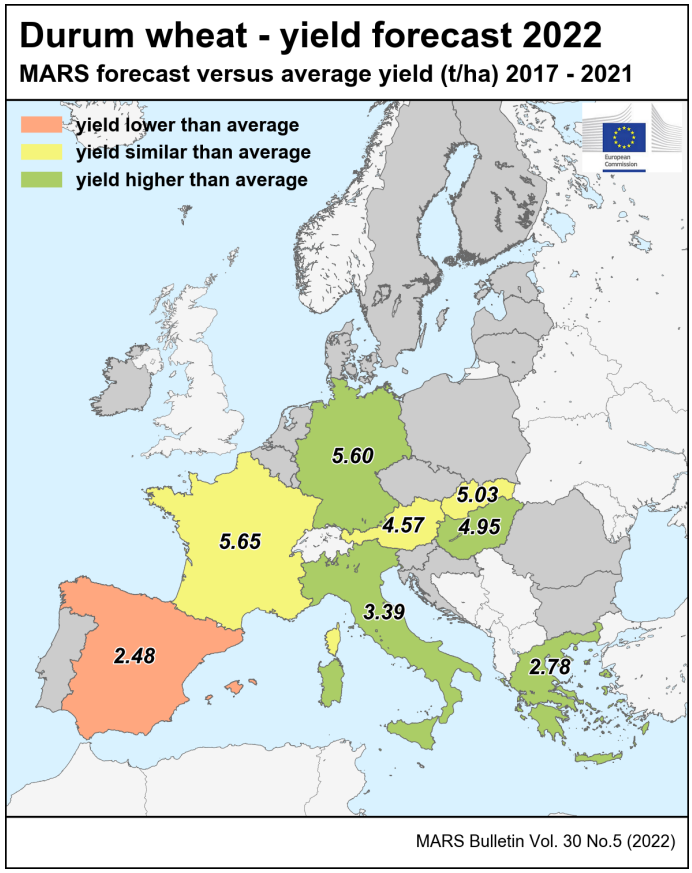

| Country | Total barley (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 4.84 | 5.08 | **4.89** | + 1.0 | – 3.7 |
| AT | 5.81 | 5.97 | **6.13** | + 5.5 | + 2.7 |
| BE | 8.15 | 7.79 | **8.39** | + 2.9 | + 7.7 |
| BG | 4.69 | 5.38 | **4.86** | + 3.5 | – 9.7 |
| CY | 1.79 | 1.83 | **2.05** | + 15 | + 12 |
| CZ | 5.28 | 5.35 | **5.55** | + 5.2 | + 3.7 |
| DE | 6.53 | 6.76 | **6.64** | + 1.6 | – 1.9 |
| DK | 5.68 | 5.65 | **6.05** | + 6.4 | + 7.1 |
| EE | 3.66 | 3.26 | **3.92** | + 7.2 | + 20 |
| EL | 2.67 | 2.47 | **2.70** | + 1.2 | + 9.2 |
| ES | 3.22 | 3.55 | **3.04** | – 5.5 | – 14 |
| FI | 3.54 | 2.63 | **3.63** | + 2.4 | + 38 |
| FR | 6.31 | 6.62 | **6.27** | – 0.7 | – 5.3 |
| HR | 5.01 | 5.49 | **5.15** | + 2.7 | – 6.2 |
| HU | 5.54 | 6.39 | **5.87** | + 6.1 | – 8.1 |
| IE | 7.89 | 8.45 | **8.08** | + 2.5 | – 4.4 |
| IT | 4.09 | 4.21 | **4.24** | + 3.5 | + 0.7 |
| LT | 3.45 | 3.46 | **3.51** | + 1.9 | + 1.5 |
| LU | — | — | **—** | — | — |
| LV | 3.17 | 2.89 | **3.69** | + 16 | + 27 |
| MT | — | — | **—** | — | — |
| NL | 6.82 | 6.71 | **7.06** | + 3.5 | + 5.1 |
| PL | 3.77 | 4.18 | **4.00** | + 5.9 | – 4.4 |
| PT | 2.96 | 3.35 | **2.40** | – 19 | – 28 |
| RO | 4.14 | 5.26 | **4.06** | – 1.9 | – 23 |
| SE | 4.49 | 3.92 | **5.21** | + 16 | + 33 |
| SI | 4.97 | 5.45 | **5.29** | + 6.4 | – 2.9 |
| SK | 4.70 | 5.07 | **4.81** | + 2.4 | – 5.1 |



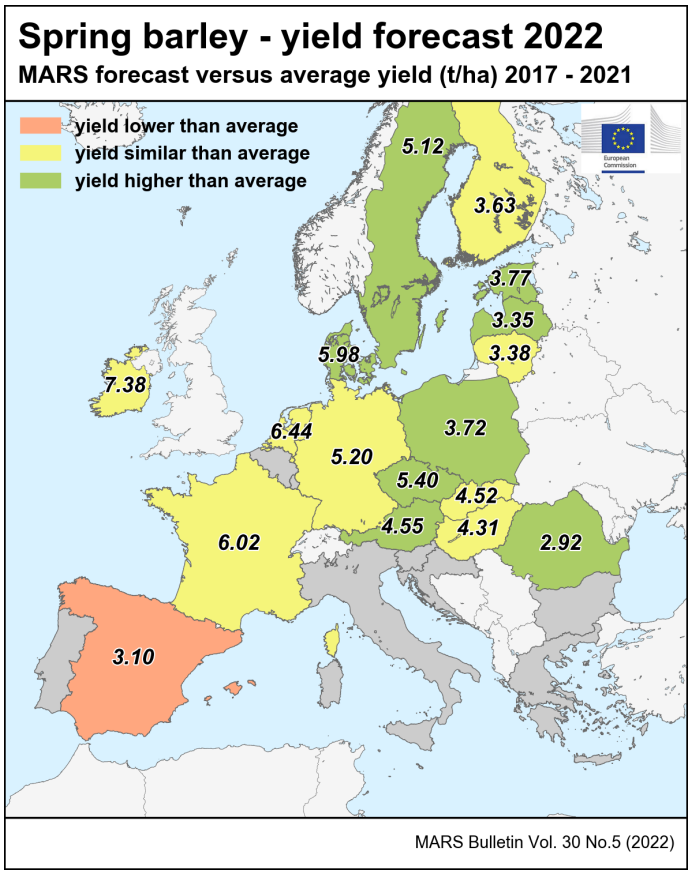
| Country | Soft wheat (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 5.84 | 6.04 | **5.89** | + 0.9 | – 2.5 |
| AT | 5.40 | 5.57 | **5.78** | + 6.9 | + 3.7 |
| BE | 8.61 | 7.80 | **8.61** | + 0.0 | + 10 |
| BG | 5.04 | 5.96 | **5.20** | + 3.3 | – 13 |
| CY | — | — | **—** | — | — |
| CZ | 5.84 | 6.33 | **6.28** | + 7.5 | – 0.7 |
| DE | 7.39 | 7.32 | **7.61** | + 3.1 | + 3.9 |
| DK | 7.77 | 7.62 | **7.73** | – 0.5 | + 1.4 |
| EE | 4.27 | 4.09 | **4.58** | + 7.2 | + 12 |
| EL | 2.90 | 3.02 | **2.91** | + 0.5 | – 3.7 |
| ES | 3.56 | 4.17 | **3.30** | – 7.4 | – 21 |
| FI | 3.63 | 3.21 | **3.85** | + 6.0 | + 20 |
| FR | 7.26 | 7.12 | **7.07** | – 2.6 | – 0.6 |
| HR | 5.84 | 6.63 | **5.92** | + 1.4 | – 11 |
| HU | 5.47 | 5.99 | **5.72** | + 4.6 | – 4.4 |
| IE | 9.65 | 10.6 | **9.92** | + 2.8 | – 6.0 |
| IT | 5.49 | 6.33 | **5.66** | + 3.1 | – 11 |
| LT | 4.55 | 4.50 | **4.90** | + 7.6 | + 8.8 |
| LU | 5.89 | 5.96 | **5.97** | + 1.4 | + 0.2 |
| LV | 4.60 | 4.48 | **4.81** | + 4.5 | + 7.3 |
| MT | — | — | **—** | — | — |
| NL | 8.86 | 8.20 | **9.12** | + 2.9 | + 11 |
| PL | 4.74 | 5.07 | **5.03** | + 6.1 | – 0.7 |
| PT | 2.48 | 2.65 | **2.15** | – 13 | – 19 |
| RO | 4.52 | 5.30 | **4.56** | + 0.9 | – 14 |
| SE | 6.53 | 6.31 | **6.72** | + 3.0 | + 6.5 |
| SI | 5.09 | 5.77 | **5.53** | + 8.5 | – 4.1 |
| SK | 5.11 | 5.59 | **5.08** | – 0.6 | – 9.1 |



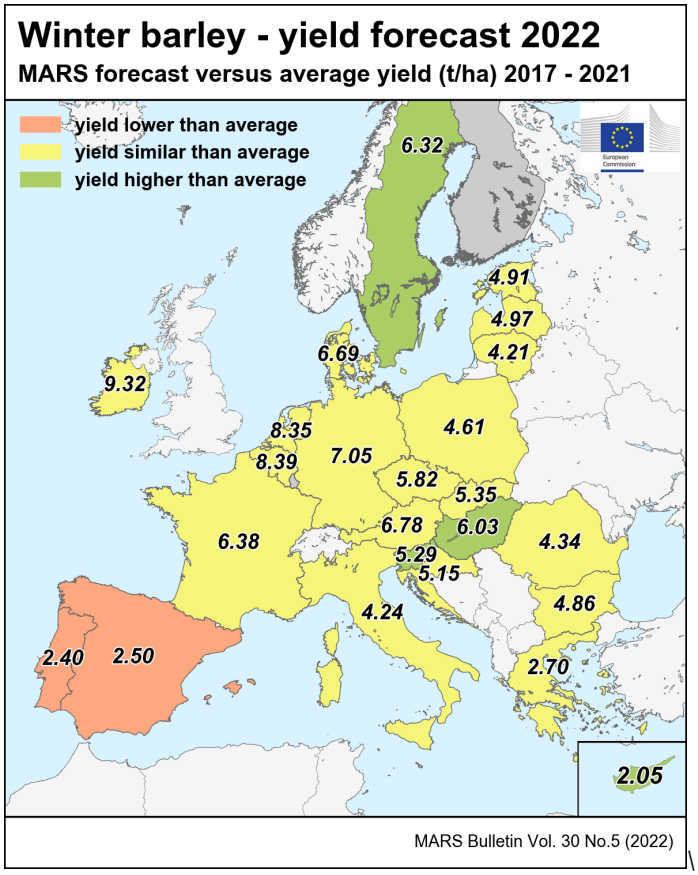

| Country | Durum wheat (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 3.52 | 3.54 | **3.61** | + 2.7 | + 2.1 |
| AT | 4.42 | 4.51 | **4.57** | + 3.5 | + 1.4 |
| BE | — | — | **—** | — | — |
| BG | — | — | **—** | — | — |
| CY | — | — | **—** | — | — |
| CZ | — | — | **—** | — | — |
| DE | 5.24 | 5.52 | **5.60** | + 6.9 | + 1.6 |
| DK | — | — | **—** | — | — |
| EE | — | — | **—** | — | — |
| EL | 2.67 | 2.60 | **2.78** | + 4.2 | + 6.6 |
| ES | 2.85 | 2.49 | **2.48** | – 13 | – 0.7 |
| FI | — | — | **—** | — | — |
| FR | 5.51 | 5.37 | **5.65** | + 2.6 | + 5.1 |
| HR | — | — | **—** | — | — |
| HU | 4.74 | 5.42 | **4.95** | + 4.5 | – 8.7 |
| IE | — | — | **—** | — | — |
| IT | 3.25 | 3.31 | **3.39** | + 4.3 | + 2.5 |
| LT | — | — | **—** | — | — |
| LU | — | — | **—** | — | — |
| LV | — | — | **—** | — | — |
| MT | — | — | **—** | — | — |
| NL | — | — | **—** | — | — |
| PL | — | — | **—** | — | — |
| PT | — | — | **—** | — | — |
| RO | — | — | **—** | — | — |
| SE | — | — | **—** | — | — |
| SI | — | — | **—** | — | — |
| SK | 4.91 | 5.91 | **5.03** | + 2.4 | – 15 |



| Country | Spring barley (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 4.13 | 4.21 | **4.18** | + 1.2 | – 0.8 |
| AT | 4.12 | 4.36 | **4.55** | + 11 | + 4.3 |
| BE | — | — | **—** | — | — |
| BG | — | — | **—** | — | — |
| CY | — | — | **—** | — | — |
| CZ | 5.04 | 5.09 | **5.40** | + 7.2 | + 6.2 |
| DE | 5.20 | 5.09 | **5.20** | + 0.0 | + 2.1 |
| DK | 5.53 | 5.51 | **5.98** | + 8.0 | + 8.5 |
| EE | 3.46 | 2.79 | **3.77** | + 8.8 | + 35 |
| EL | — | — | **—** | — | — |
| ES | 3.29 | 3.61 | **3.10** | – 5.7 | – 14 |
| FI | 3.54 | 2.63 | **3.63** | + 2.4 | + 38 |
| FR | 5.97 | 6.10 | **6.02** | + 0.8 | – 1.3 |
| HR | — | — | **—** | — | — |
| HU | 4.16 | 4.72 | **4.31** | + 3.8 | – 8.7 |
| IE | 7.25 | 7.89 | **7.38** | + 1.9 | – 6.4 |
| IT | — | — | **—** | — | — |
| LT | 3.36 | 3.30 | **3.38** | + 0.4 | + 2.2 |
| LU | — | — | **—** | — | — |
| LV | 3.01 | 2.46 | **3.35** | + 11 | + 36 |
| MT | — | — | **—** | — | — |
| NL | 6.29 | 6.17 | **6.44** | + 2.3 | + 4.3 |
| PL | 3.47 | 3.78 | **3.72** | + 7.2 | – 1.6 |
| PT | — | — | **—** | — | — |
| RO | 2.78 | 3.42 | **2.92** | + 5.0 | – 15 |
| SE | 4.39 | 3.77 | **5.12** | + 17 | + 36 |
| SI | — | — | **—** | — | — |
| SK | 4.40 | 4.72 | **4.52** | + 2.7 | – 4.2 |



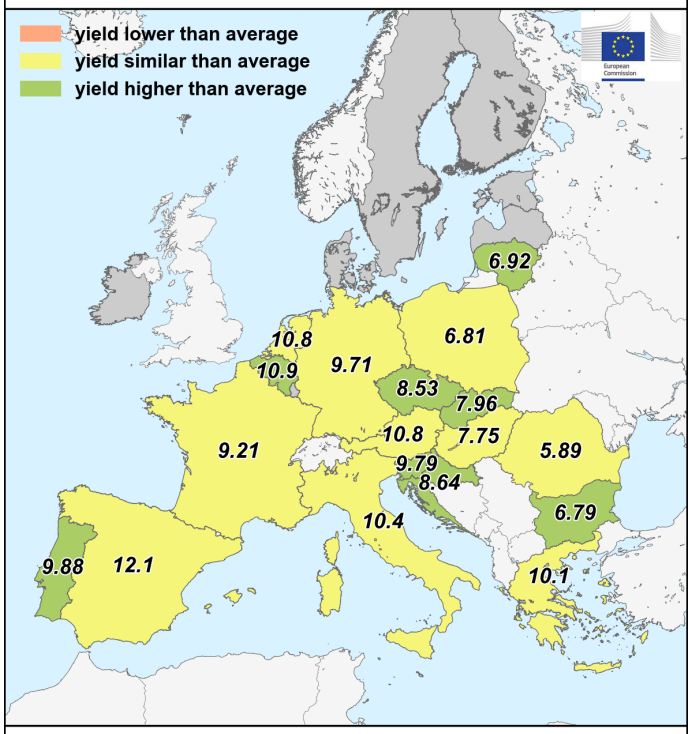

| Country | Winter barley (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 5.75 | 6.09 | **5.78** | + 0.5 | – 5.1 |
| AT | 6.52 | 6.53 | **6.78** | + 4.0 | + 3.8 |
| BE | 8.15 | 7.79 | **8.39** | + 2.9 | + 7.7 |
| BG | 4.69 | 5.38 | **4.86** | + 3.5 | – 9.7 |
| CY | 1.79 | 1.83 | **2.05** | + 15 | + 12 |
| CZ | 5.76 | 5.87 | **5.82** | + 1.0 | – 0.9 |
| DE | 6.91 | 7.16 | **7.05** | + 2.0 | – 1.6 |
| DK | 6.60 | 6.64 | **6.69** | + 1.4 | + 0.8 |
| EE | 5.02 | 5.11 | **4.91** | – 2.2 | – 3.9 |
| EL | 2.67 | 2.47 | **2.70** | + 1.2 | + 9.2 |
| ES | 2.69 | 2.98 | **2.50** | – 7.2 | – 16 |
| FI | — | — | **—** | — | — |
| FR | 6.47 | 6.85 | **6.38** | – 1.4 | – 6.9 |
| HR | 5.01 | 5.49 | **5.15** | + 2.7 | – 6.2 |
| HU | 5.72 | 6.58 | **6.03** | + 5.5 | – 8.3 |
| IE | 9.07 | 9.42 | **9.32** | + 2.8 | – 1.0 |
| IT | 4.09 | 4.21 | **4.24** | + 3.5 | + 0.7 |
| LT | 4.15 | 4.17 | **4.21** | + 1.4 | + 1.1 |
| LU | — | — | **—** | — | — |
| LV | 4.86 | 4.95 | **4.97** | + 2.2 | + 0.5 |
| MT | — | — | **—** | — | — |
| NL | 8.12 | 7.83 | **8.35** | + 2.7 | + 6.6 |
| PL | 4.58 | 4.77 | **4.61** | + 0.7 | – 3.3 |
| PT | 2.96 | 3.35 | **2.40** | – 19 | – 28 |
| RO | 4.50 | 5.54 | **4.34** | – 3.5 | – 22 |
| SE | 5.94 | 5.58 | **6.32** | + 6.3 | + 13 |
| SI | 4.97 | 5.45 | **5.29** | + 6.4 | – 2.9 |
| SK | 5.30 | 5.72 | **5.35** | + 1.1 | – 6.4 |



| Country | Grain maize (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 7.87 | 7.94 | **7.92** | + 0.6 | – 0.3 |
| AT | 10.6 | 11.2 | **10.8** | + 1.6 | – 3.5 |
| BE | 10.4 | 10.7 | **10.9** | + 4.6 | + 1.7 |
| BG | 6.38 | 5.79 | **6.79** | + 6.5 | + 17 |
| CY | — | — | **—** | — | — |
| CZ | 8.18 | 9.88 | **8.53** | + 4.3 | – 14 |
| DE | 9.50 | 10.4 | **9.71** | + 2.2 | – 6.3 |
| DK | — | — | **—** | — | — |
| EE | — | — | **—** | — | — |
| EL | 10.2 | 9.91 | **10.1** | – 0.9 | + 2.2 |
| ES | 11.9 | 12.3 | **12.1** | + 1.9 | – 1.3 |
| FI | — | — | **—** | — | — |
| FR | 9.15 | 10.4 | **9.21** | + 0.6 | – 11 |
| HR | 8.12 | 7.77 | **8.64** | + 6.3 | + 11 |
| HU | 7.57 | 6.04 | **7.75** | + 2.4 | + 28 |
| IE | — | — | **—** | — | — |
| IT | 10.3 | 10.3 | **10.4** | + 1.4 | + 1.4 |
| LT | 6.59 | 5.86 | **6.92** | + 4.9 | + 18 |
| LU | — | — | **—** | — | — |
| LV | — | — | **—** | — | — |
| MT | — | — | **—** | — | — |
| NL | 10.8 | 12.9 | **10.8** | + 0.1 | – 17 |
| PL | 6.79 | 7.47 | **6.81** | + 0.3 | – 8.9 |
| PT | 9.18 | 9.75 | **9.88** | + 7.6 | + 1.4 |
| RO | 5.99 | 5.90 | **5.89** | – 1.6 | – 0.2 |
| SE | — | — | **—** | — | — |
| SI | 9.22 | 9.39 | **9.79** | + 6.2 | + 4.2 |
| SK | 7.54 | 7.86 | **7.96** | + 5.5 | + 1.2 |

## Grain maize - yield forecast 2022

**MARS forecast versus average yield (t/ha) 2017 - 2021**

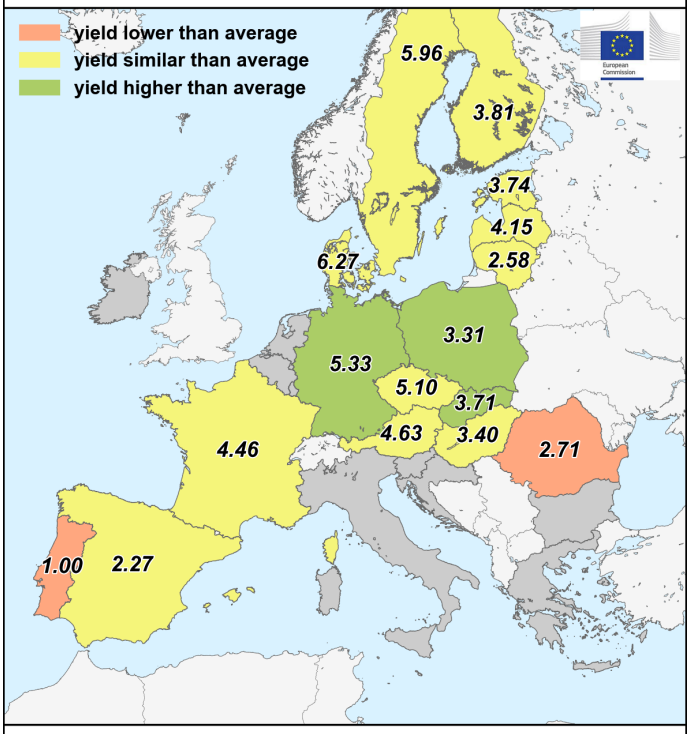



MARS Bulletin Vol. 30 No.5 (2022)

| Country | Rye (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 3.90 | 4.17 | **4.10** | + 5.3 | – 1.6 |
| AT | 4.52 | 4.61 | **4.63** | + 2.5 | + 0.4 |
| BE | — | — | **—** | — | — |
| BG | — | — | **—** | — | — |
| CY | — | — | **—** | — | — |
| CZ | 5.07 | 5.03 | **5.10** | + 0.6 | + 1.3 |
| DE | 5.10 | 5.27 | **5.33** | + 4.5 | + 1.1 |
| DK | 6.08 | 6.34 | **6.27** | + 3.0 | – 1.2 |
| EE | 3.77 | 3.61 | **3.74** | – 0.8 | + 3.6 |
| EL | — | — | **—** | — | — |
| ES | 2.31 | 2.56 | **2.27** | – 1.5 | – 11 |
| FI | 3.91 | 3.54 | **3.81** | – 2.6 | + 7.8 |
| FR | 4.47 | 4.43 | **4.46** | – 0.2 | + 0.8 |
| HR | — | — | **—** | — | — |
| HU | 3.31 | 3.18 | **3.40** | + 2.8 | + 6.8 |
| IE | — | — | **—** | — | — |
| IT | — | — | **—** | — | — |
| LT | 2.57 | 2.43 | **2.58** | + 0.5 | + 6.3 |
| LU | — | — | **—** | — | — |
| LV | 4.13 | 3.84 | **4.15** | + 0.4 | + 7.9 |
| MT | — | — | **—** | — | — |
| NL | — | — | **—** | — | — |
| PL | 2.99 | 3.31 | **3.31** | + 11 | + 0.1 |
| PT | 1.07 | 1.14 | **1.00** | – 7.0 | – 13 |
| RO | 2.88 | 3.37 | **2.71** | – 5.9 | – 20 |
| SE | 6.06 | 5.66 | **5.96** | – 1.6 | + 5.2 |
| SI | — | — | **—** | — | — |
| SK | 3.50 | 3.55 | **3.71** | + 6.0 | + 4.7 |

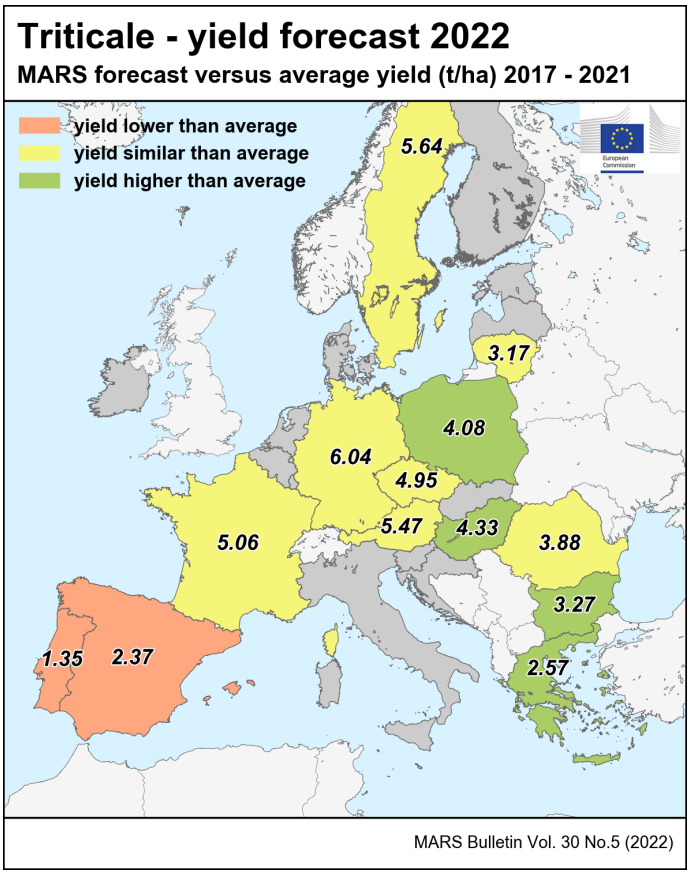
## Rye - yield forecast 2022

**MARS forecast versus average yield (t/ha) 2017 - 2021**

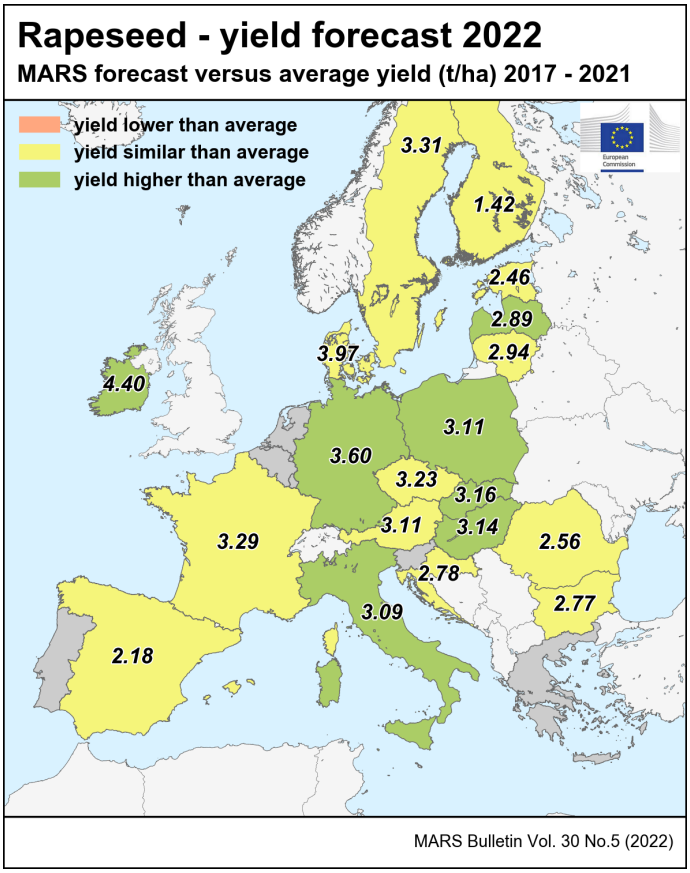



MARS Bulletin Vol. 30 No.5 (2022)

| Country | Triticale (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 4.19 | 4.42 | **4.29** | + 2.4 | – 2.8 |
| AT | 5.36 | 5.29 | **5.47** | + 2.1 | + 3.5 |
| BE | — | — | — | — | — |
| BG | 3.13 | 3.83 | **3.27** | + 4.6 | – 15 |
| CY | — | — | — | — | — |
| CZ | 4.84 | 4.74 | **4.95** | + 2.2 | + 4.2 |
| DE | 5.86 | 5.81 | **6.04** | + 3.0 | + 3.8 |
| DK | — | — | — | — | — |
| EE | — | — | — | — | — |
| EL | 2.37 | 2.46 | **2.57** | + 8.5 | + 4.5 |
| ES | 2.64 | 2.94 | **2.37** | – 10 | – 19 |
| FI | — | — | — | — | — |
| FR | 5.09 | 5.20 | **5.06** | – 0.7 | – 2.7 |
| HR | — | — | — | — | — |
| HU | 4.02 | 4.36 | **4.33** | + 7.7 | – 0.7 |
| IE | — | — | — | — | — |
| IT | — | — | — | — | — |
| LT | 3.25 | 2.77 | **3.17** | – 2.6 | + 14 |
| LU | — | — | — | — | — |
| LV | — | — | — | — | — |
| MT | — | — | — | — | — |
| NL | — | — | — | — | — |
| PL | 3.87 | 4.25 | **4.08** | + 5.6 | – 4.0 |
| PT | 1.60 | 1.54 | **1.35** | – 16 | – 12 |
| RO | 4.03 | 4.55 | **3.88** | – 3.9 | – 15 |
| SE | 5.57 | 5.14 | **5.64** | + 1.3 | + 10 |
| SI | — | — | — | — | — |
| SK | — | — | — | — | — |



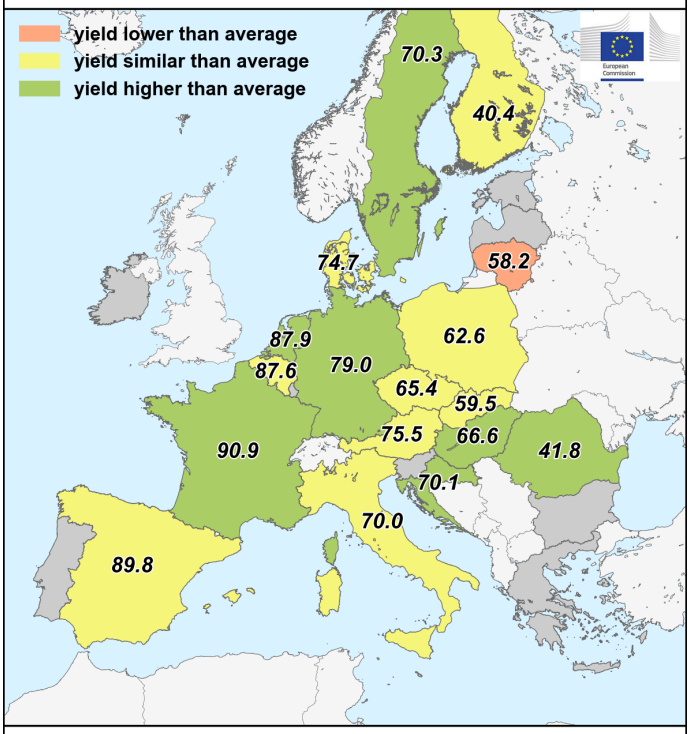

| Country | Rape and turnip rape (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 3.07 | 3.19 | **3.17** | + 3.2 | – 0.5 |
| AT | 3.00 | 3.04 | **3.11** | + 3.6 | + 2.2 |
| BE | — | — | — | — | — |
| BG | 2.72 | 2.82 | **2.77** | + 1.9 | – 2.0 |
| CY | — | — | — | — | — |
| CZ | 3.16 | 3.00 | **3.23** | + 2.3 | + 7.7 |
| DE | 3.33 | 3.50 | **3.60** | + 8.1 | + 2.8 |
| DK | 4.00 | 4.01 | **3.97** | – 0.7 | – 1.0 |
| EE | 2.42 | 2.81 | **2.46** | + 1.2 | – 13 |
| EL | — | — | — | — | — |
| ES | 2.14 | 2.18 | **2.18** | + 1.8 | – 0.2 |
| FI | 1.39 | 1.18 | **1.42** | + 2.8 | + 20 |
| FR | 3.28 | 3.35 | **3.29** | + 0.3 | – 1.8 |
| HR | 2.76 | 2.43 | **2.78** | + 0.7 | + 14 |
| HU | 2.95 | 2.73 | **3.14** | + 6.6 | + 15 |
| IE | 4.22 | 4.58 | **4.40** | + 4.2 | – 4.0 |
| IT | 2.80 | 3.05 | **3.09** | + 10 | + 1.1 |
| LT | 2.97 | 3.20 | **2.94** | – 1.0 | – 8.3 |
| LU | — | — | — | — | — |
| LV | 2.68 | 2.53 | **2.89** | + 7.5 | + 14 |
| MT | — | — | — | — | — |
| NL | — | — | — | — | — |
| PL | 2.95 | 3.21 | **3.11** | + 5.5 | – 3.1 |
| PT | — | — | — | — | — |
| RO | 2.60 | 3.02 | **2.56** | – 1.4 | – 15 |
| SE | 3.18 | 3.24 | **3.31** | + 3.9 | + 2.1 |
| SI | — | — | — | — | — |
| SK | 3.00 | 3.06 | **3.16** | + 5.3 | + 3.3 |



| Country | Sugar beets (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 73.9 | N/A | **78.0** | + 5.4 | N/A |
| AT | 73.6 | 79.7 | **75.5** | + 2.6 | – 5.3 |
| BE | 86.7 | 82.5 | **87.6** | + 1.0 | + 6.2 |
| BG | — | — | **—** | — | — |
| CY | — | — | **—** | — | — |
| CZ | 63.0 | 67.7 | **65.4** | + 3.8 | – 3.3 |
| DE | 75.1 | 81.8 | **79.0** | + 5.2 | – 3.4 |
| DK | 73.3 | 77.5 | **74.7** | + 1.8 | – 3.6 |
| EE | — | — | **—** | — | — |
| EL | — | — | **—** | — | — |
| ES | 87.5 | 87.5 | **89.8** | + 2.6 | + 2.6 |
| FI | 38.8 | 35.6 | **40.4** | + 4.0 | + 14 |
| FR | 82.3 | 85.7 | **90.9** | + 11 | + 6.2 |
| HR | 64.5 | 71.6 | **70.1** | + 8.7 | – 2.1 |
| HU | 59.5 | 53.0 | **66.6** | + 12 | + 26 |
| IE | — | — | **—** | — | — |
| IT | 67.6 | N/A | **70.0** | + 3.5 | N/A |
| LT | 61.6 | 58.3 | **58.2** | – 5.6 | – 0.3 |
| LU | — | — | **—** | — | — |
| LV | — | — | **—** | — | — |
| MT | — | — | **—** | — | — |
| NL | 84.0 | N/A | **87.9** | + 4.7 | N/A |
| PL | 61.4 | 61.0 | **62.6** | + 2.0 | + 2.7 |
| PT | — | — | **—** | — | — |
| RO | 38.9 | 39.6 | **41.8** | + 7.6 | + 5.6 |
| SE | 66.2 | 71.9 | **70.3** | + 6.1 | – 2.3 |
| SI | — | — | **—** | — | — |
| SK | 59.1 | 62.6 | **59.5** | + 0.8 | – 4.9 |

## Sugar beet - yield forecast 2022

**MARS forecast versus average yield (t/ha) 2017 - 2021**

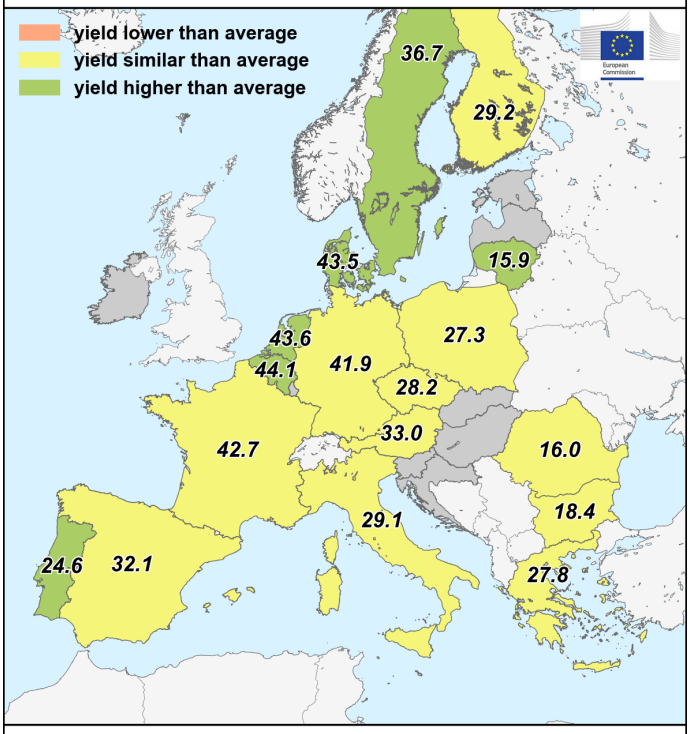



MARS Bulletin Vol. 30 No.5 (2022)

| Country | Potato (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 33.9 | N/A | **35.9** | + 5.9 | N/A |
| AT | 32.0 | 34.1 | **33.0** | + 3.1 | – 3.4 |
| BE | 40.9 | 42.9 | **44.1** | + 7.8 | + 2.7 |
| BG | 18.8 | 17.9 | **18.4** | – 2.2 | + 2.8 |
| CY | — | — | **—** | — | — |
| CZ | 28.2 | 29.4 | **28.2** | + 0.3 | – 4.1 |
| DE | 41.6 | 43.8 | **41.9** | + 0.8 | – 4.4 |
| DK | 41.6 | 42.3 | **43.5** | + 4.6 | + 2.9 |
| EE | — | — | **—** | — | — |
| EL | 28.0 | 25.5 | **27.8** | – 0.5 | + 9.0 |
| ES | 31.8 | 32.5 | **32.1** | + 0.8 | – 1.2 |
| FI | 28.7 | 27.5 | **29.2** | + 1.6 | + 6.2 |
| FR | 41.4 | 41.5 | **42.7** | + 3.3 | + 2.9 |
| HR | — | — | **—** | — | — |
| HU | — | — | **—** | — | — |
| IE | — | — | **—** | — | — |
| IT | 29.2 | 29.2 | **29.1** | – 0.3 | – 0.1 |
| LT | 15.0 | 13.1 | **15.9** | + 6.4 | + 22 |
| LU | — | — | **—** | — | — |
| LV | — | — | **—** | — | — |
| MT | — | — | **—** | — | — |
| NL | 41.8 | N/A | **43.6** | + 4.4 | N/A |
| PL | 27.4 | 30.0 | **27.3** | – 0.2 | – 9.0 |
| PT | 22.6 | 24.0 | **24.6** | + 9.0 | + 2.5 |
| RO | 16.5 | 16.5 | **16.0** | – 3.1 | – 3.0 |
| SE | 34.4 | 34.8 | **36.7** | + 6.5 | + 5.3 |
| SI | — | — | **—** | — | — |
| SK | — | — | **—** | — | — |

## Potato - yield forecast 2022

**MARS forecast versus average yield (t/ha) 2017 - 2021**

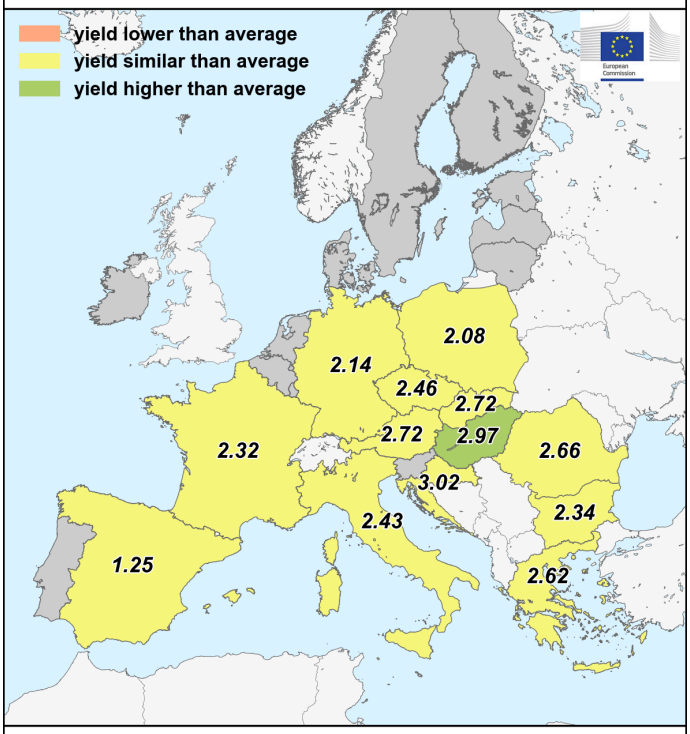



MARS Bulletin Vol. 30 No.5 (2022)

| Country | Sunflower (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 2.33 | 2.34 | **2.39** | + 2.5 | + 1.9 |
| AT | 2.71 | 3.01 | **2.72** | + 0.3 | – 10 |
| BE | — | — | — | — | — |
| BG | 2.31 | 2.38 | **2.34** | + 1.0 | – 2.0 |
| CY | — | — | — | — | — |
| CZ | 2.48 | 2.62 | **2.46** | – 1.1 | – 6.2 |
| DE | 2.20 | 2.60 | **2.14** | – 3.0 | – 18 |
| DK | — | — | — | — | — |
| EE | — | — | — | — | — |
| EL | 2.65 | 2.53 | **2.62** | – 1.1 | + 3.7 |
| ES | 1.24 | 1.22 | **1.25** | + 0.8 | + 2.2 |
| FI | — | — | — | — | — |
| FR | 2.39 | 2.74 | **2.32** | – 3.0 | – 15 |
| HR | 3.04 | 3.00 | **3.02** | – 0.5 | + 0.7 |
| HU | 2.85 | 2.60 | **2.97** | + 4.1 | + 14 |
| IE | — | — | — | — | — |
| IT | 2.40 | 2.40 | **2.43** | + 1.0 | + 1.3 |
| LT | — | — | — | — | — |
| LU | — | — | — | — | — |
| LV | — | — | — | — | — |
| MT | — | — | — | — | — |
| NL | — | — | — | — | — |
| PL | 2.12 | 2.35 | **2.08** | – 2.1 | – 12 |
| PT | — | — | — | — | — |
| RO | 2.58 | 2.43 | **2.66** | + 3.3 | + 10 |
| SE | — | — | — | — | — |
| SI | — | — | — | — | — |
| SK | 2.66 | 2.71 | **2.72** | + 2.2 | + 0.4 |

## Sunflower - yield forecast 2022

**MARS forecast versus average yield (t/ha) 2017 - 2021**

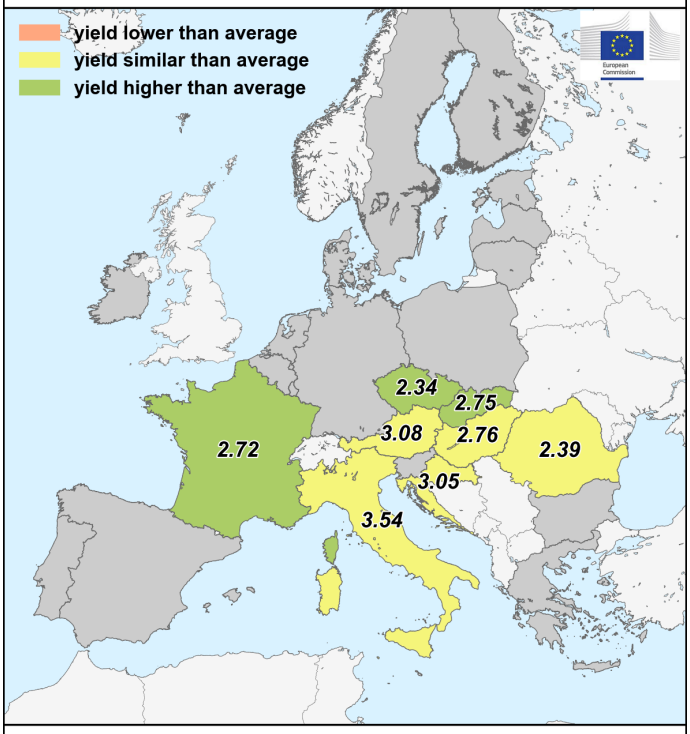



MARS Bulletin Vol. 30 No.5 (2022)

| Country | Soybean (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| **EU** | 2.89 | 2.83 | **2.99** | + 3.4 | + 5.4 |
| AT | 2.98 | 3.06 | **3.08** | + 3.5 | + 0.5 |
| BE | — | — | — | — | — |
| BG | — | — | — | — | — |
| CY | — | — | — | — | — |
| CZ | 2.24 | 2.49 | **2.34** | + 4.4 | – 5.8 |
| DE | — | — | — | — | — |
| DK | — | — | — | — | — |
| EE | — | — | — | — | — |
| EL | — | — | — | — | — |
| ES | — | — | — | — | — |
| FI | — | — | — | — | — |
| FR | 2.61 | 2.85 | **2.72** | + 4.2 | – 4.6 |
| HR | 2.96 | 3.00 | **3.05** | + 3.1 | + 1.7 |
| HU | 2.71 | 2.61 | **2.76** | + 1.9 | + 5.8 |
| IE | — | — | — | — | — |
| IT | 3.42 | 3.11 | **3.54** | + 3.5 | + 14 |
| LT | — | — | — | — | — |
| LU | — | — | — | — | — |
| LV | — | — | — | — | — |
| MT | — | — | — | — | — |
| NL | — | — | — | — | — |
| PL | — | — | — | — | — |
| PT | — | — | — | — | — |
| RO | 2.39 | 2.29 | **2.39** | + 0.1 | + 4.4 |
| SE | — | — | — | — | — |
| SI | — | — | — | — | — |
| SK | 2.48 | 2.66 | **2.75** | + 11 | + 3.2 |

## Soybean - yield forecast 2022

**MARS forecast versus average yield (t/ha) 2017 - 2021**




MARS Bulletin Vol. 30 No.5 (2022)

| Country | Wheat (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| BY | 3.45 | 3.54 | **3.72** | + 7.8 | + 5.1 |
| DZ | 1.59 | 1.45 | **1.23** | – 23 | – 15 |
| MA | 1.98 | 2.63 | **0.87** | – 56 | – 67 |
| TN | 1.85 | 1.95 | **2.01** | + 8.7 | + 3.0 |
| TR | 2.79 | 2.66 | **2.98** | + 6.7 | + 12 |
| UA | 4.07 | 4.53 | **4.13** | + 1.4 | – 8.9 |
| UK | 8.03 | 7.80 | **8.16** | + 1.6 | + 4.6 |

| Country | Barley (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| BY | 2.85 | 2.86 | **3.29** | + 16 | + 15 |
| DZ | 1.15 | 1.00 | **0.91** | – 21 | – 9.4 |
| MA | 1.30 | 1.87 | **0.51** | – 61 | – 73 |
| TN | 0.94 | 0.84 | **0.92** | – 2.6 | + 9.7 |
| TR | 2.53 | 1.87 | **2.71** | + 7.4 | + 45 |
| UA | 3.35 | 3.82 | **3.24** | – 3.1 | – 15 |
| UK | 6.15 | 6.09 | **6.26** | + 1.8 | + 2.8 |

| Country | Grain maize (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| BY | 5.58 | 5.31 | **5.80** | + 3.8 | + 9.1 |
| DZ | — | — | **—** | — | — |
| MA | — | — | **—** | — | — |
| TN | — | — | **—** | — | — |
| TR | 9.30 | 8.90 | **9.36** | + 0.6 | + 5.2 |
| UA | 6.76 | 7.68 | **7.29** | + 7.7 | – 5.1 |
| UK | — | — | **—** | — | — |

| Country | Soybean (t/ha) | | | | |
|---|---|---|---|---|---|
| | Avg 5yrs | 2021 | MARS 2022 forecasts | %22/5yrs | %22/21 |
| BY | — | — | **—** | — | — |
| DZ | — | — | **—** | — | — |
| MA | — | — | **—** | — | — |
| TN | — | — | **—** | — | — |
| TR | 4.29 | 4.15 | **4.60** | + 7.2 | + 11 |
| UA | 2.29 | 2.64 | **2.56** | + 12 | – 3.2 |
| UK | — | — | **—** | — | — |

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

*Sources:* 2017-2022 data come from DG Agriculture and Rural Development short-term-outlook data (dated April 2022, received on 04.05.2022), Eurostat Eurobase (last update: 05.05.2022) and EES (last update: 15.11.2017).

Non-EU 2017-2021 data come from USDA, Turkish Statistical Institute (TurkStat), Eurostat Eurobase (last update: 05.05.2022), Department for Environment, Food & Rural Affairs of UK (DEFRA), Ministry for Development of Economy, Trade and Agriculture of Ukraine, FAO and PSD-online.

2022 yields come from MARS Crop Yield Forecasting System (output up to 20.05.2022).

EU aggregate after 1.2.2020 is reported.

N/A = Data not available.

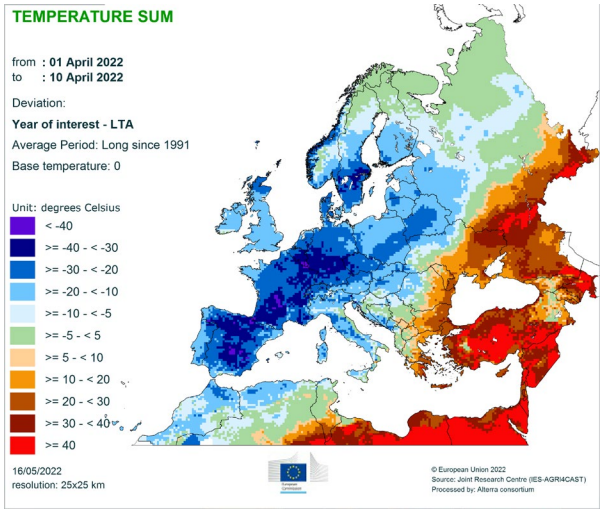
The column header '%22/5yrs' stands for the 2022 change with respect to the 5-year average(%). Similarly, '%22/21' stands for the 2022 change with respect to 2021(%).

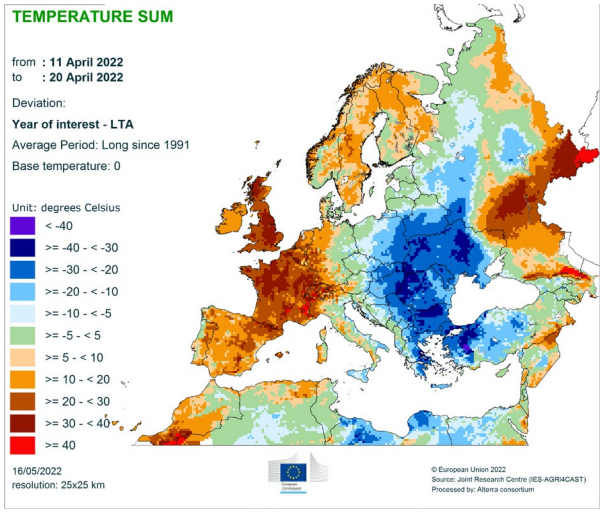
| Cop name | Eurostat Crop name | Eurostat Crop Code | Official Eurostat Crop definition* |
|---|---|---|---|
| Total wheat | Wheat and spelt | C1100 | Common wheat (*Triticum aestivum* L. emend. Fiori et Paol.), spelt (*Triticum spelta* L.), einkorn wheat (*Triticum monococcum* L.) and durum wheat (*Triticum 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.). |

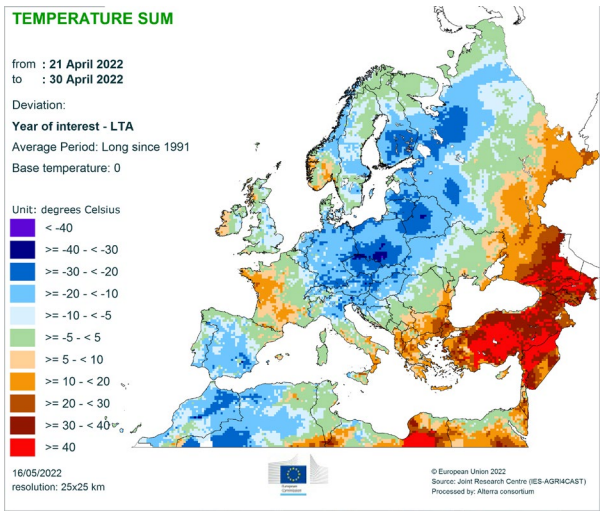
* *Source:* Eurostat - Annual crop statistics (Handbook 2020 Edition)

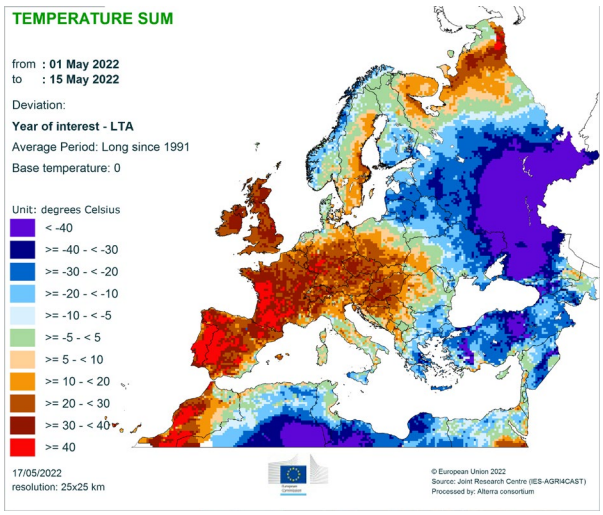
# 7. Atlas

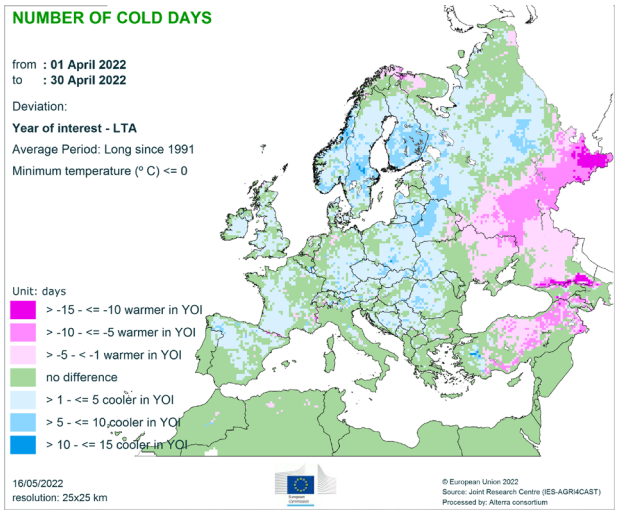
## Temperature regime

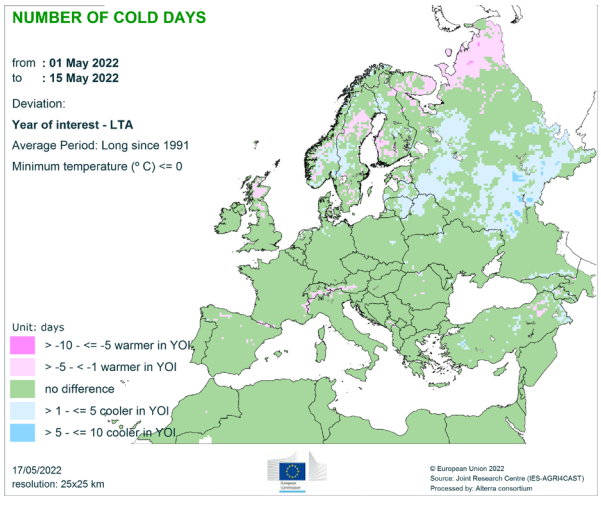


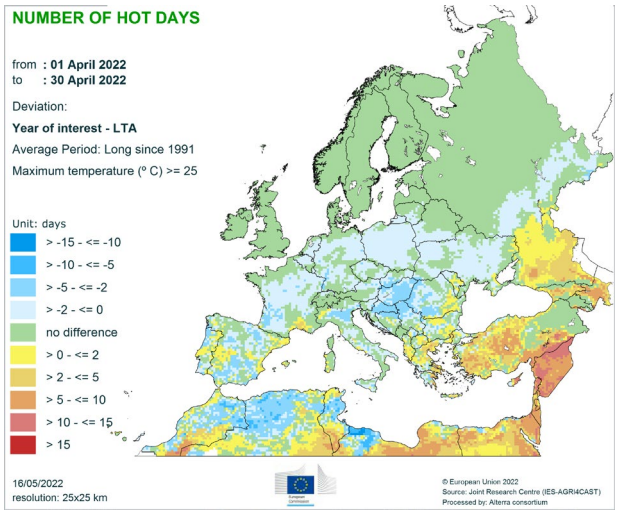



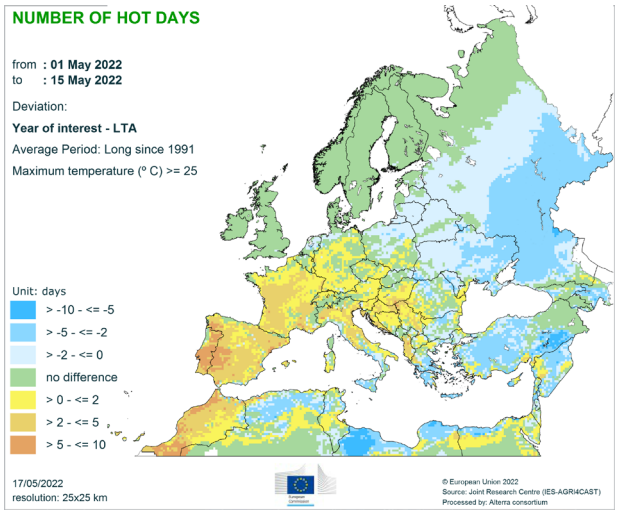



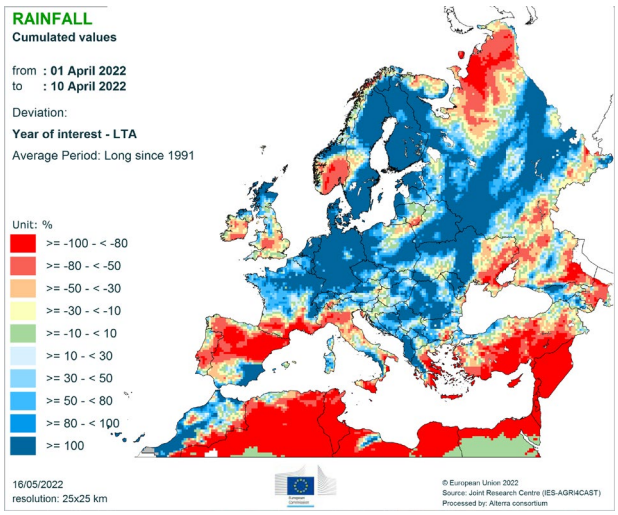



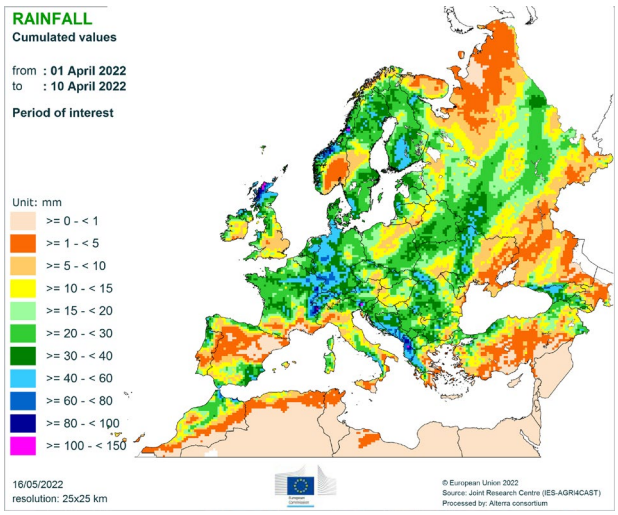



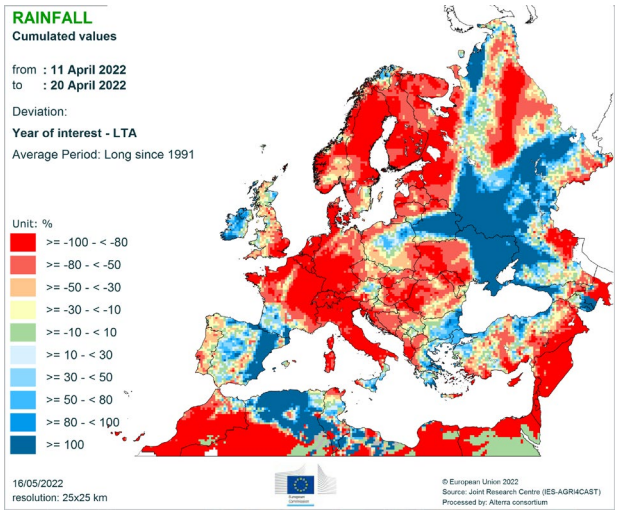


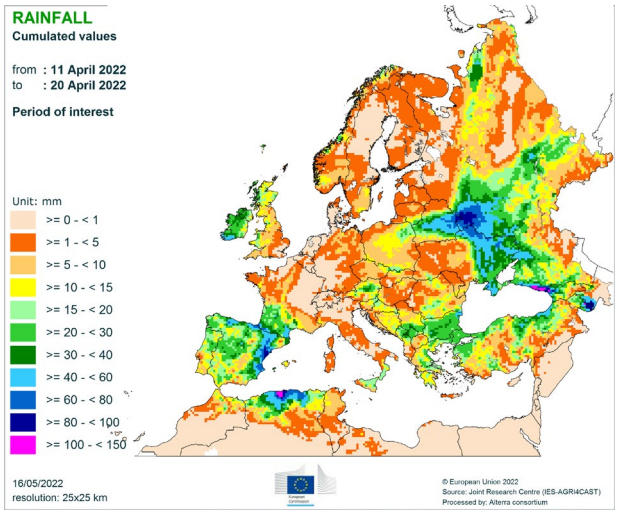



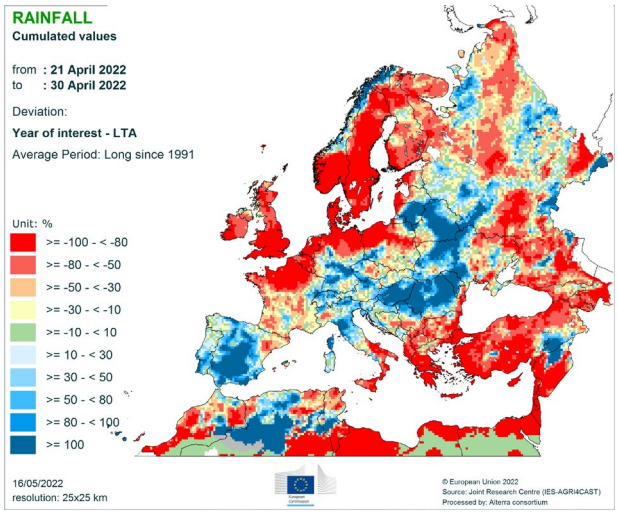

# Precipitation

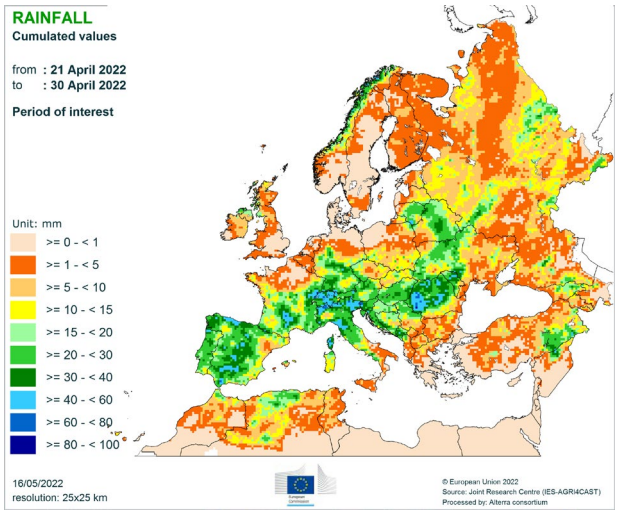


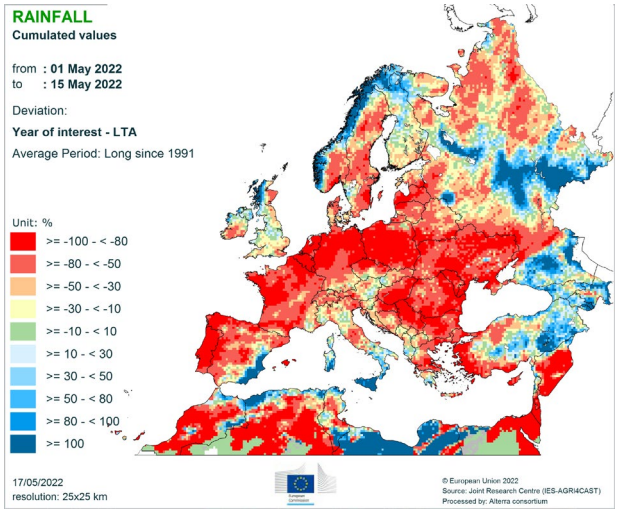



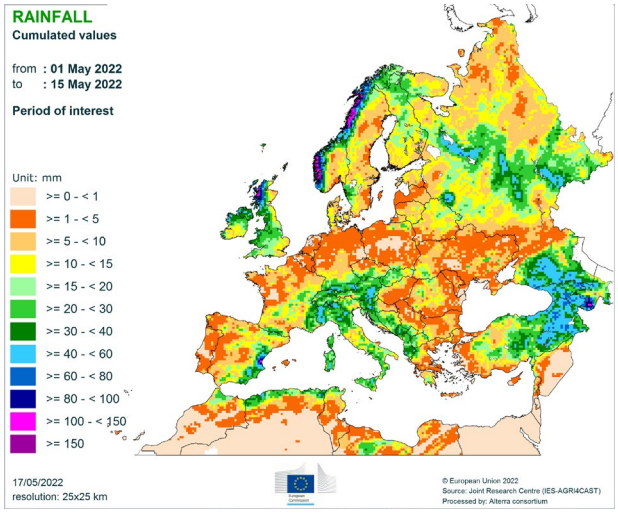



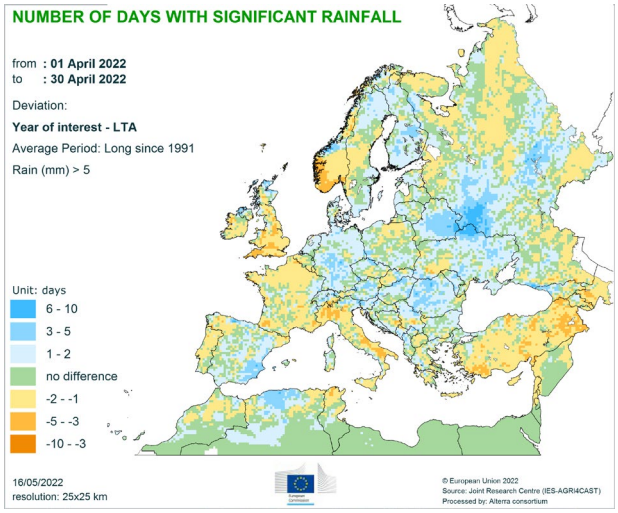



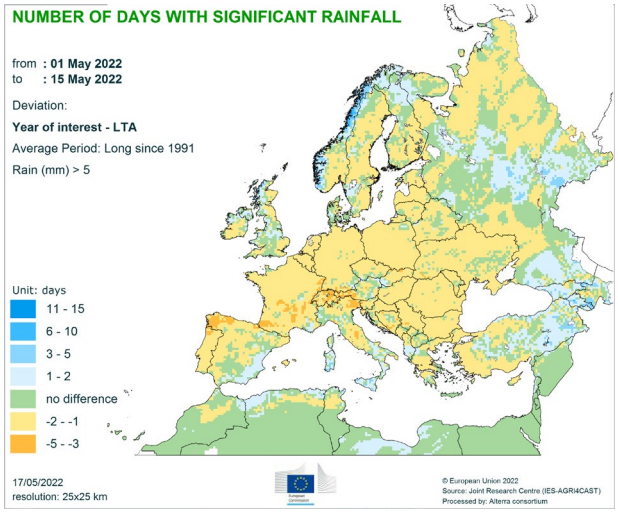

RAINFALL
Cumulated values
from : 21 April 2022
to : 30 April 2022
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
16/05/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (IES-AGRI4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 21 April 2022
to : 30 April 2022
Period of interest
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
16/05/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (IES-AGRI4CAST)
Processed by: Alterra consortium

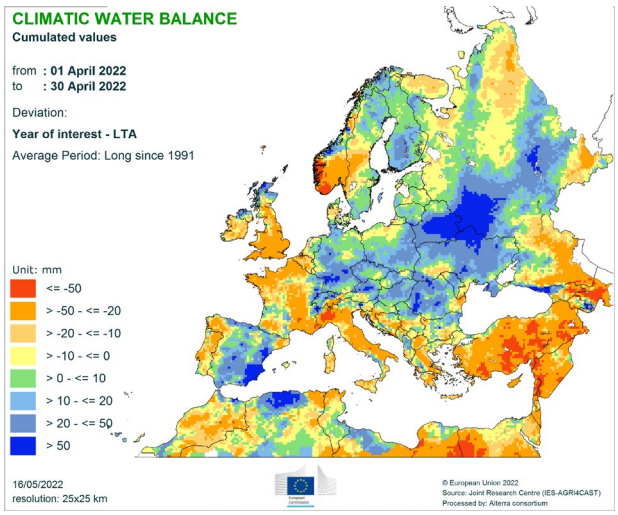

RAINFALL
Cumulated values
from : 01 May 2022
to : 15 May 2022
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
17/05/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (IES-AGRI4CAST)
Processed by: Alterra consortium

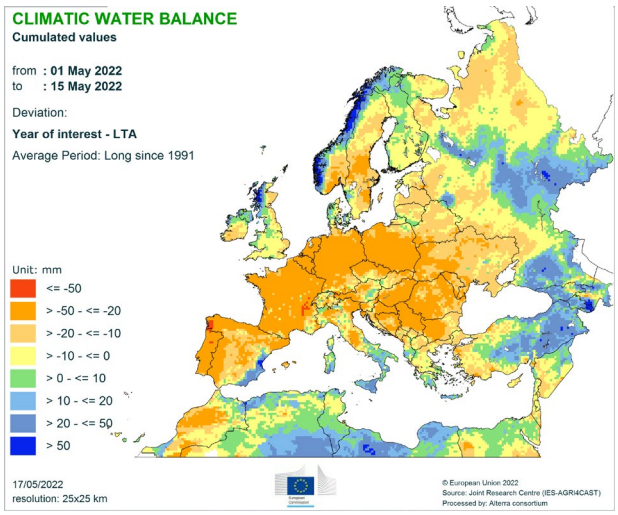

RAINFALL
Cumulated values
from : 01 May 2022
to : 15 May 2022
Period of interest
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
17/05/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (IES-AGRI4CAST)
Processed by: Alterra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 April 2022
to : 30 April 2022
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
-10 - -3
16/05/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (IES-AGRI4CAST)
Processed by: Alterra consortium

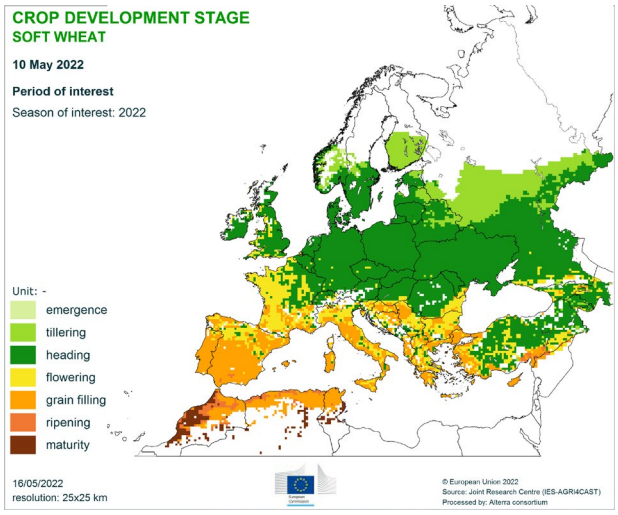

NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 May 2022
to : 15 May 2022
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Rain (mm) > 5
Unit: days
11 - 15
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
17/05/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (IES-AGRI4CAST)
Processed by: Alterra consortium

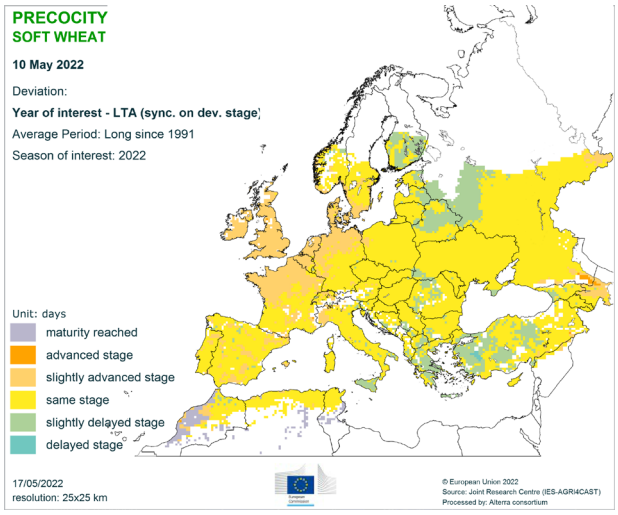
# Climatic water balance

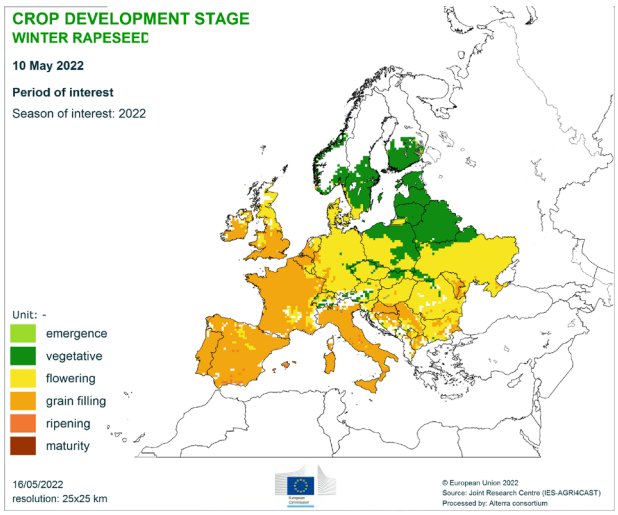


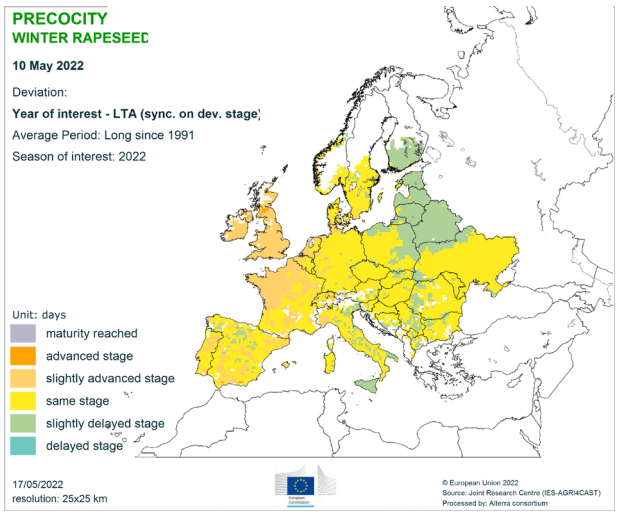



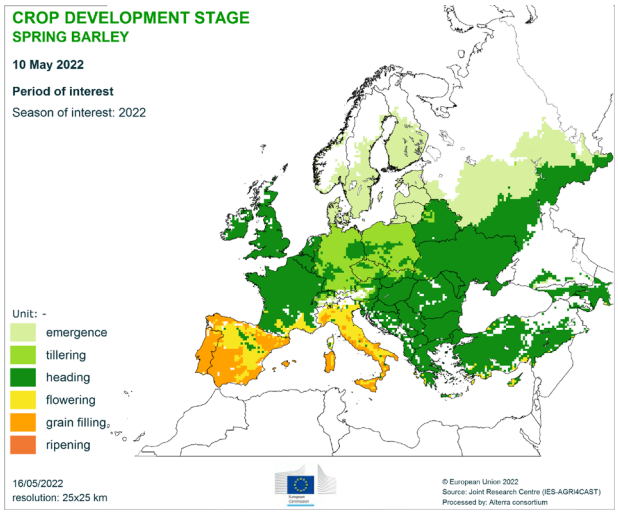

# Crop development stages and precocity

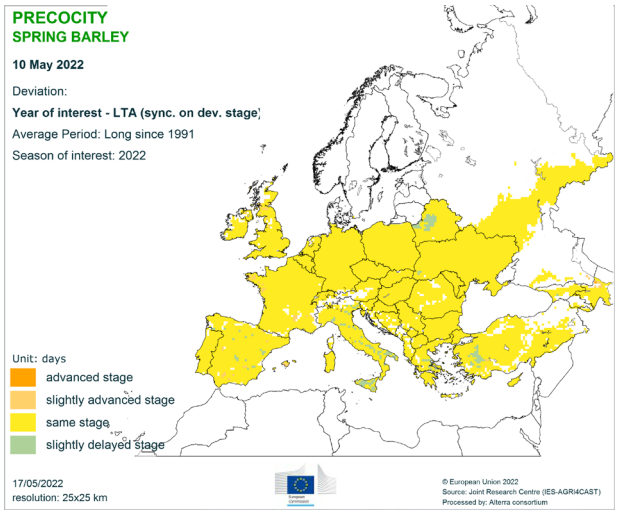


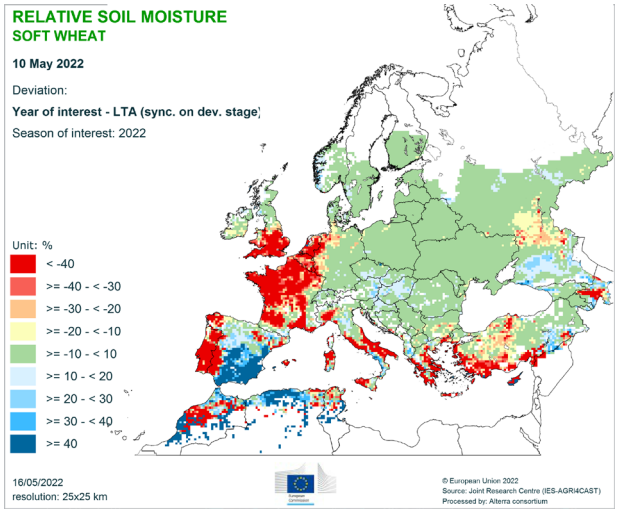



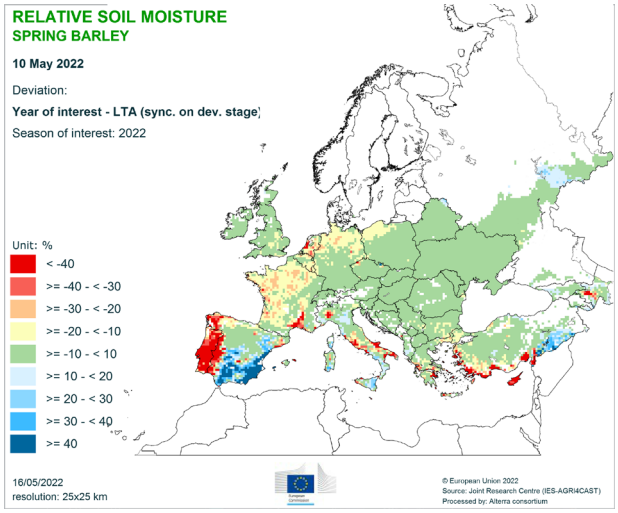





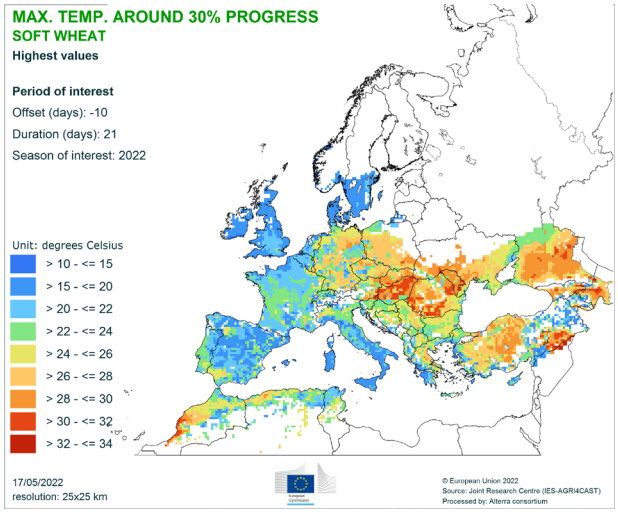



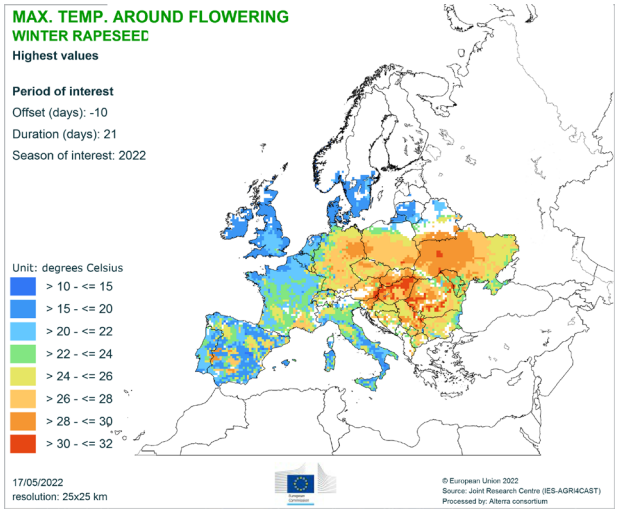

# Relative soil moisture



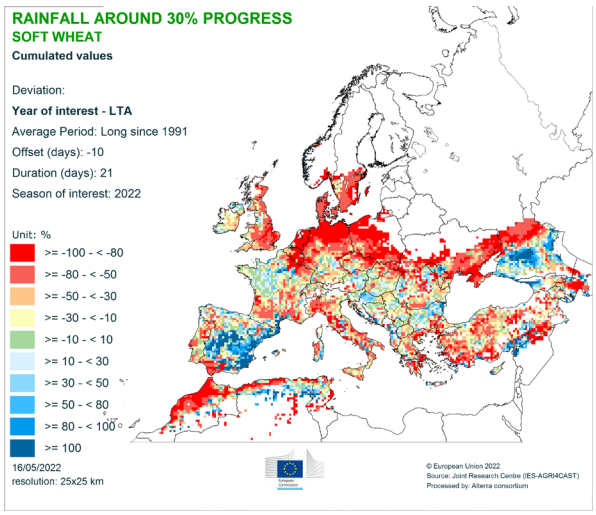



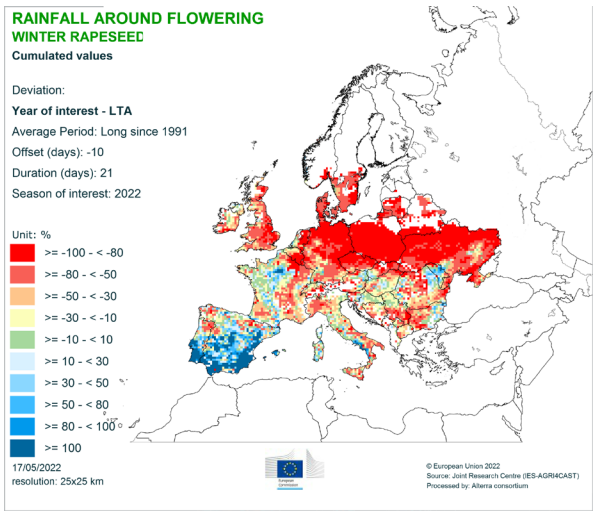

# Maximum temperature around crops development



# Precipitation around crops development



## JRC MARS Bulletins 2022

| Date | Publication | Reference |
|---|---|---|
| 24 Jan | Agromet analysis | Vol. 30 No 1 |
| 21 Feb | Agromet analysis | Vol. 30 No 2 |
| 21 Mar | Agromet analysis, pasture analysis, yield forecast | Vol. 30 No 3 |
| 26 Apr | Agromet analysis, remote sensing, pasture analysis, sowing conditions, yield forecast | Vol. 30 No 4 |
| 23 May | Agromet analysis, remote sensing, pasture analysis, sowing update, yield forecast | Vol. 30 No 5 |
| 20 Jun | Agromet analysis, remote sensing, pasture analysis, rice analysis, yield forecast | Vol. 30 No 6 |
| 25 Jul | Agromet analysis, remote sensing, pasture analysis, harvesting conditions, yield forecast | Vol. 30 No 7 |
| 22 Aug | Agromet analysis, remote sensing, pasture update, harvesting update, yield forecast | Vol. 30 No 8 |
| 19 Sep | Agromet analysis, remote sensing, pasture analysis, rice analysis, harvesting update, yield forecast | Vol. 30 No 9 |
| 24 Oct | Agromet analysis, pasture update, sowing conditions, harvesting update, yield forecast | Vol. 30 No 10 |
| 21 Nov | Agromet analysis, sowing update, harvesting update | Vol. 30 No 11 |
| 19 Dec | Agromet analysis | Vol. 30 No 12 |

Mission statement: As the science and knowledge service of the European Commission, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle.

PDF: KJ-AW-22-005-EN-N ISSN 2443-8278 doi:10.2760/908536

The JRC MARS Bulletin – Crop monitoring in Europe is a European Commission publication of the Joint Research Centre's AGRI4CAST project (JRC Food Security Unit – Directorate for Sustainable Resources)

JRC MARS Bulletins are available at https://ec.europa.eu/jrc/en/mars/bulletins

AGRI4CAST Resources are available at https://agri4cast.jrc.ec.europa.eu

Analysis and reports
B. Baruth, S. Bassu, W. Ben Aoun, I. Biavetti, M. Bratu, I. Cerrani, Y. Chemin, M. Claverie, P. De Palma, D. Fumagalli, G. Manfron, J. Morel, L. Nisini, L. Panarello, G. Ronchetti, L. Seguini, E. Tarnavsky, A. Toreti, M. van den Berg, Z. Zajac, A. Zucchini

Reporting support
SeproTec, I. Biavetti, G. Mulhern

Edition
M. van den Berg, S. Niemeyer, M. van der Velde

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

Contact
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 1991-2021.



Publications Office of the European Union