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European Commission

JRC MARS Bulletin

Crop monitoring in Europe

August 2022

Yield outlook for summer crops further reduced

Summer drought keeps its grip on Europe

The exceptionally hot and/or dry weather conditions in large parts of Europe continue to substantially reduce yield outlooks for EU summer crops. This is most markedly the case for grain maize (-8.6% at EU level), sunflowers (-5.5%), and soybeans (-9.6%). Conversely, these conditions benefited the harvesting of winter crops, which contributed to a slight improvement of the yield forecast for these crops.

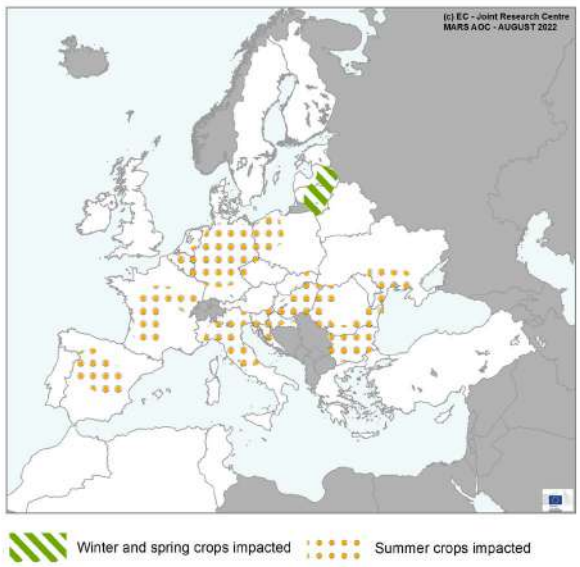
Spain, France, central and northern Italy, central Germany, Hungary, Romania, Slovenia and Croatia are among the most severely affected regions in Europe. Water and heat stress periods partly coincided with the sensitive flowering stage and grain filling. This resulted in irreversibly lost yield potential. Several countries have imposed measures to restrict water use for irrigation. In some regions (e.g. north-western Italy, southern and central Spain), very low water levels in reservoirs have been insufficient to meet the water needs of crops, and irrigation of some fields has been abandoned.

In the Benelux countries, western Germany, western Poland, eastern Slovakia, and Bulgaria, scarcity of rainfall combined with occasionally hot temperature peaks also stressed summer crops with negative effects on the yield outlook.

Contents:

Covers the period from 1 July until 15 August

AREAS OF CONCERN - SUMMER/WINTER CROPS



Crop	Yield t/ha				
	Avg 5yrs	July Bulletin	MARS 2022 forecasts	%22/5yrs	% Diff July
Total cereals	5.49	5.38	**5.28**	- 3.9	- 1.9
Total wheat	5.62	5.54	**5.56**	- 1.1	+ 0.4
Soft wheat	5.84	5.74	**5.76**	- 1.3	+ 0.3
Durum wheat	3.52	3.40	**3.42**	- 2.9	+ 0.6
Total barley	4.85	4.83	**4.85**	+ 0.1	+ 0.4
Spring barley	4.13	4.10	**4.12**	- 0.2	+ 0.5
Winter barley	5.75	5.72	**5.72**	- 0.5	+ 0.0
Grain maize	7.87	7.25	**6.63**	- 16	- 8.6
Rye	3.90	4.07	**4.11**	+ 5.3	+ 1.0
Triticale	4.19	4.20	**4.21**	+ 0.4	+ 0.2
Rape and turnip rape	3.07	3.13	**3.15**	+ 2.4	+ 0.6
Potato	34.2	35.1	**34.2**	+ 0.2	- 2.5
Sugar beet	74.4	77.4	**75.3**	+ 1.2	- 2.7
Sunflower	2.34	2.18	**2.06**	- 12	- 5.5
Soybean	2.88	2.72	**2.46**	- 15	- 9.6
Green maize	41.6	39.7	**38.6**	- 7.0	- 2.6

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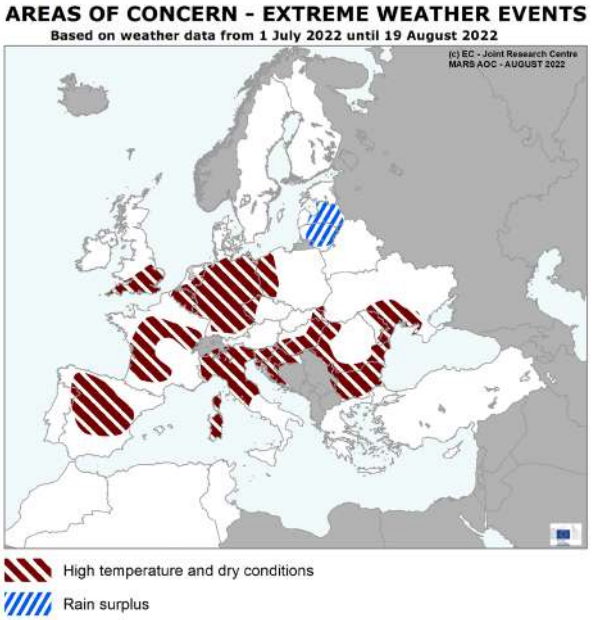
Joint Research Centre

1. Agrometeorological overview

1.1. Areas of concern



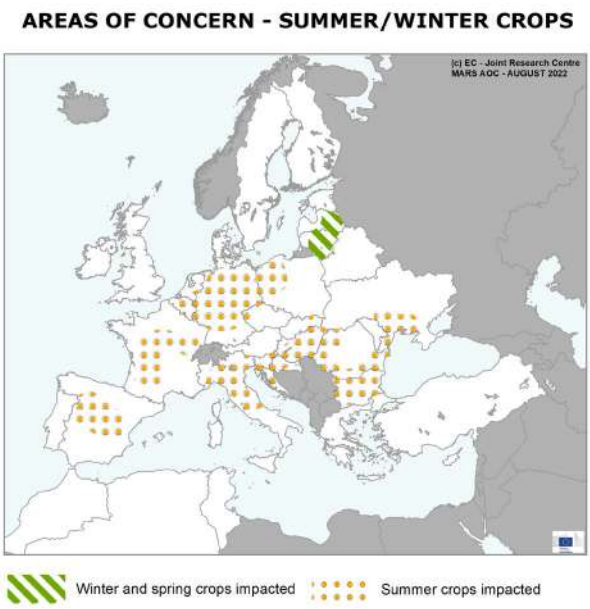
The analysis period continued to be marked by extremely hot and dry conditions in several regions of Europe. The areas where those extremes were more relevant for agriculture (i.e. Areas of concern - extreme weather events) and where relevant crops were most affected (i.e. Areas of concern - summer/winter crops) are depicted in the areas–of-concern maps.

The drought conditions and the peak of temperatures toward the end of July in Spain, France, central and northern Italy, central Germany, and Hungary affected the growth of summer crops and flower fertility, resulting in lower yield potential. The very low water levels in reservoirs in many regions (e.g. north-western Italy, southern and central Spain) were insufficient to meet the water needs of crops and irrigation of some fields has been abandoned. Some of the grain maize fields are likely to be (or have been) harvested as green (fodder) maize.

The scarcity of rainfall in the Benelux countries, western Germany, and western Poland combined with the above-average temperature at the end of July stressed summer crops with negative effects on the yield outlook.

In eastern Slovakia, eastern and southern Romania, Bulgaria, and southern Ukraine, most of the impact on summer crops was caused by lack of precipitation, worsened by the high temperatures that increased crop water demand. Summer crops in the regions of Romania mentioned above even suffered from heat stress events around flowering and grain filling, which further reduced yield potential.

On the other hand, the lack of precipitation favoured the harvesting of winter crops in most of the countries. However, a distinct rainfall surplus in Latvia and Lithuania negatively affected winter crops during the latest stages of grain filling and ripening, and might have caused some delay to the start of harvesting.



1.2. Meteorological review (1 July – 15 August 2022)

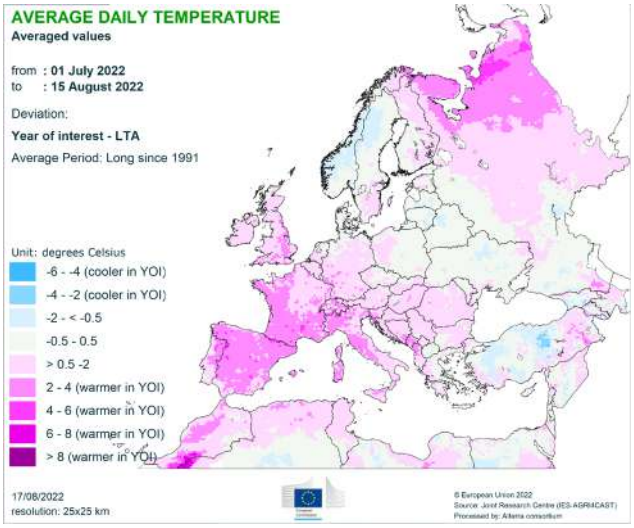
The pattern of persistently warmer and drier-than-usual conditions continued in most of Europe during the review period and only in coastal Scandinavia and parts of Turkey were colder and wetter-than-usual conditions observed.

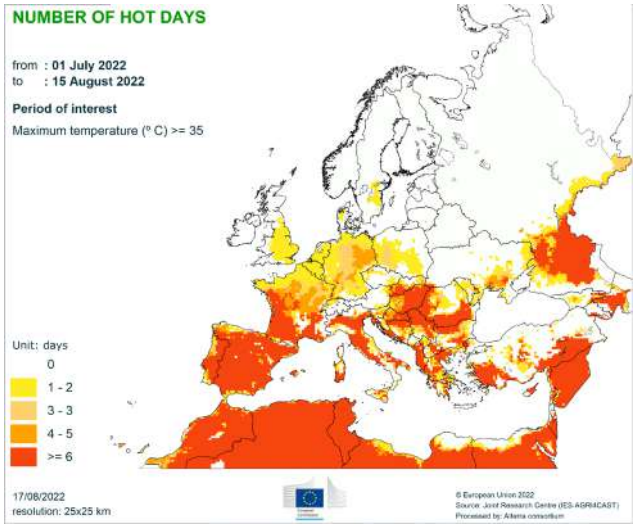
Warmer-than-usual conditions were observed in most of the Iberian Peninsula, much of France, parts of the British Isles, in the Alps region, central and northern Italy, parts of the western Balkans, and in northern parts of European Russia with daily mean temperatures exceeding the 1991-2021 long-term average (LTA) by 2 to 4°C (locally up to 6°C). During the review period, six or more days with daily maximum temperature exceeding 35°C were observed in most of the Iberian Peninsula, south-western France, most of Italy, large parts of the western Balkans, as well as most of Hungary, southern Romania, and in parts of Bulgaria, Greece, and Turkey as well as in southernmost European Russia. The 35°C threshold was exceeded on 4 to 5 days in central France, eastern and southern Germany, and southern Ukraine. On the hottest days, maximum temperatures exceeded 40°C in most of the Iberian Peninsula, western France, and parts of England.

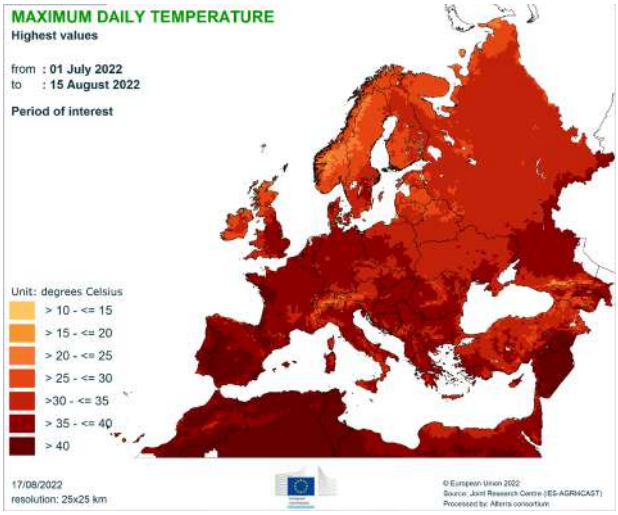
Slightly colder-than-usual conditions with temperature anomalies between -0.5 and -2°C with respect to the LTA were observed in coastal Scandinavia, small areas of Latvia, Lithuania, Belarus, and Ukraine, parts of southern European Russia, and large parts of Turkey where locally temperature anomalies reached -6°C below the LTA. No days with maximum temperature exceeding 35°C were observed in these regions.

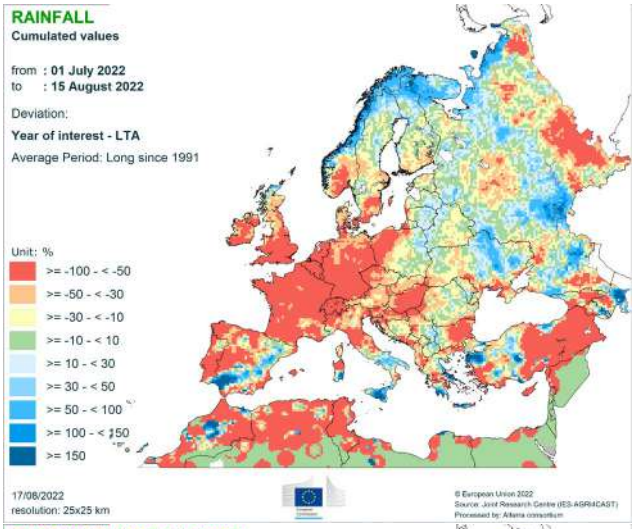
Drier-than-usual conditions with precipitation anomalies of -50% or more (compared to the LTA) were observed in most of Portugal, parts of Spain, large parts of the United Kingdom, most of France, the Benelux countries, most of Germany, the Alps region, central and northern Italy, southern Norway, southernmost Sweden, western Poland, Hungary, the western Balkan region, eastern Bulgaria, southernmost Ukraine, parts of north-eastern, central, and southern European Russia, and eastern Turkey. Most of these regions only had up to 2 days of significant rainfall (above the 5 mm threshold). This is reflected in the climatic water balance anomaly of -50% below the LTA in most of France, the UK, and central Europe, with more substantial local climatic water balance anomalies (-300% below the LTA) in the Alps region, western British Isles, and southern Scandinavia.

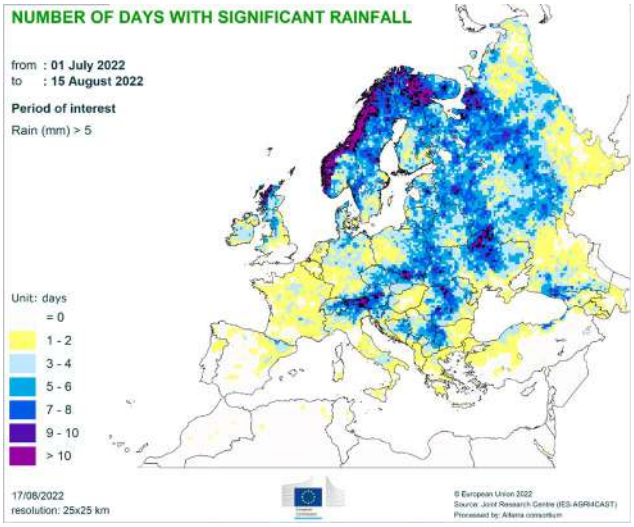
Wetter-than-usual conditions (50% or more compared to the LTA) were observed in coastal Scandinavia, parts of northern, central, and southern European Russia, eastern Ukraine, southern Italy, and parts of Greece and Turkey, and more substantially (100% or more) locally in southern Spain, the island of Sicily, parts of Greece, and locally in parts of western and central Turkey. More than 10 days with significant rainfall (above 5 mm) were observed in coastal Scandinavia and small parts of northern Russia, northern Ukraine, southern Poland, northern Romania, and the Alps region during the review period. Only in coastal Scandinavia were the wet conditions reflected in a positive climatic water balance anomaly.

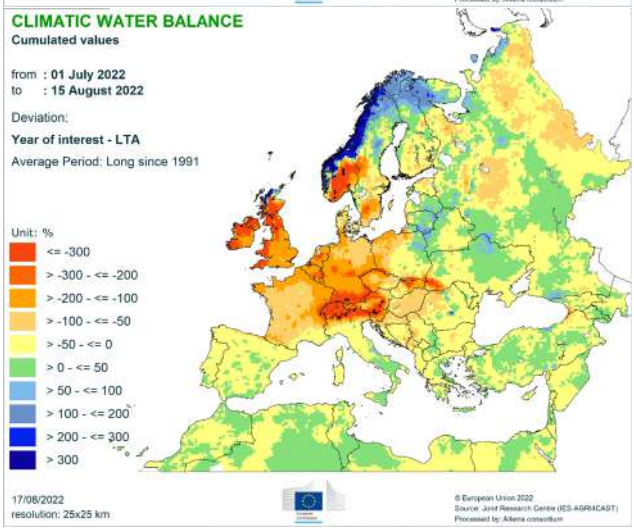





MAXIMUM DAILY TEMPERATURE
Highest values
from : 01 July 2022
to : 15 August 2022
Period of interest
Unit: degrees Celsius
> 10 - <= 15
> 15 - <= 20
> 20 - <= 25
> 25 - <= 30
>30 - <= 35
> 35 - <= 40
> 40
17/08/2022
resolution: 25x25 km


RAINFALL
Cumulated values
from : 01 July 2022
to : 15 August 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
17/08/2022
resolution: 25x25 km


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 July 2022
to : 15 August 2022
Period of interest
Rain (mm) > 5
Unit: days
= 0
1 - 2
3 - 4
5 - 6
7 - 8
9 - 10
> 10
17/08/2022
resolution: 25x25 km


CLIMATIC WATER BALANCE
Cumulated values
from : 01 July 2022
to : 15 August 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
17/08/2022
resolution: 25x25 km

1.3. Weather forecast (18 - 27 August)

Weather conditions in the forecast period are determined by a recent movement of cooler air from northwest of the United Kingdom and a high pressure system from the Azores moving northward, clashing with the very humid and warm air mass over Europe, causing thunderstorms and intense rainfall western Europe. Hot spells are expected to continue in many parts of Europe which are already experiencing exceptional drought conditions.

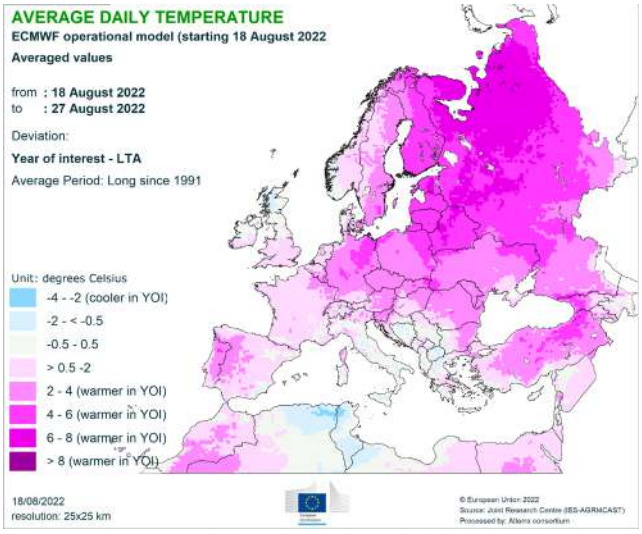
Much warmer-than-usual conditions with average daily temperatures between 4°C and 8°C above the LTA are forecast for most of Finland, European Russia, the Baltic states, Belarus, eastern Ukraine, eastern Poland, parts of western Poland and eastern and central Germany as well as along the Black Sea coast in Georgia and parts of eastern Turkey. Six or more days with daily temperature exceeding 30°C are forecast in most of the Iberian Peninsula, parts of southern France, Italy, the Balkan region, southern Moldova, southern and eastern Ukraine, southern European Russia, parts of Georgia, and much of Turkey. **Slightly warmer-than-usual conditions** with between 1 and 5 days with daily maximum temperatures above 30°C during the forecast period are expected in parts of northern Spain, central France, southern Italy, the Benelux countries, most of Germany and central Europe, the western Balkans as well as parts of the Baltic states, Belarus, most of Ukraine, and central European Russia.

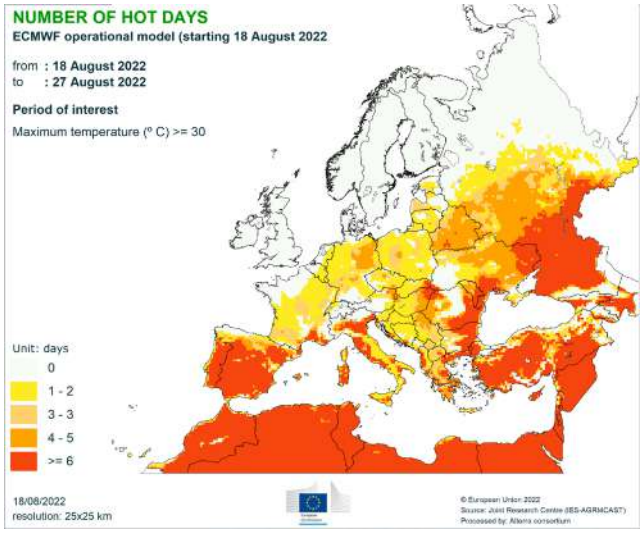
Slightly colder-than-usual conditions are forecast in southern Italy and part of the Balkan region with temperatures between 0.5 and 2°C below the LTA. No days with maximum temperatures above 30°C are forecast for northern France, the Alps region, the United Kingdom, Scandinavia, and northern European Russia as well as western Ukraine and central Romania.

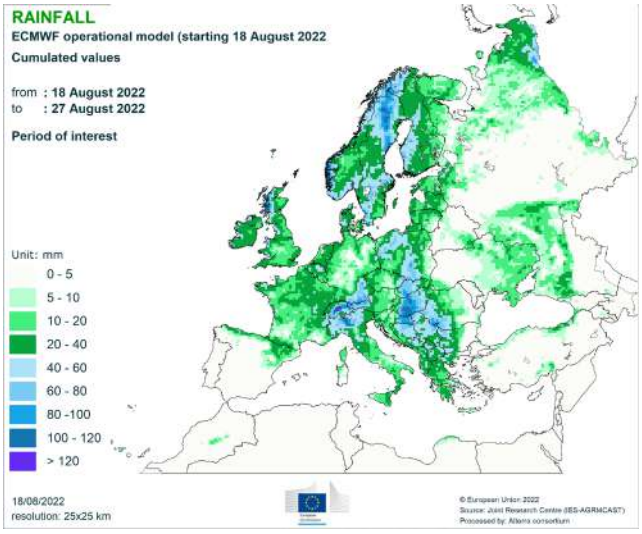
Dry conditions with less than 5 mm of accumulated precipitation are forecast in most of the Iberian Peninsula, small parts of southern France, most of Germany, large parts of European Russia, most of Belarus, western Ukraine, Moldova, eastern Romania, eastern Bulgaria, Turkey, and Georgia.

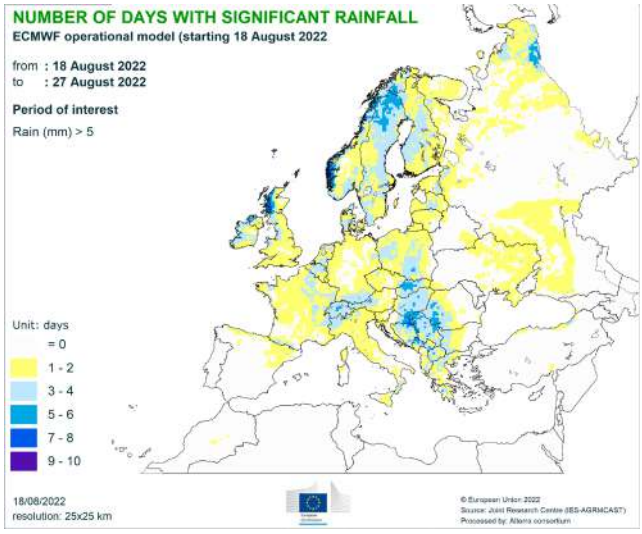
Wet conditions with accumulated precipitation between **40 and 120 mm** are forecast in the northwest of the British Isles, large parts of Scandinavia, small areas of northernmost European Russia, most of Poland, Slovakia, Hungary, eastern Croatia, western Romania, and parts of the western Balkans as well as southern Germany, the Alps , and northern Italy. These regions are predicted to receive between 3 and 8 days with significant rainfall (above 5 mm) while the rest of Europe is forecast to receive up to 2 days with significant rainfall during the forecast period.

According to the **long-range weather forecast** for September, October, and November, **warmer-than-usual conditions** are highly likely to persist over much of Europe in September and likely to continue in October when **drier-than-usual conditions** are also likely to persist in the Iberian Peninsula, parts of western Europe, and small areas of central Europe and the Balkans.



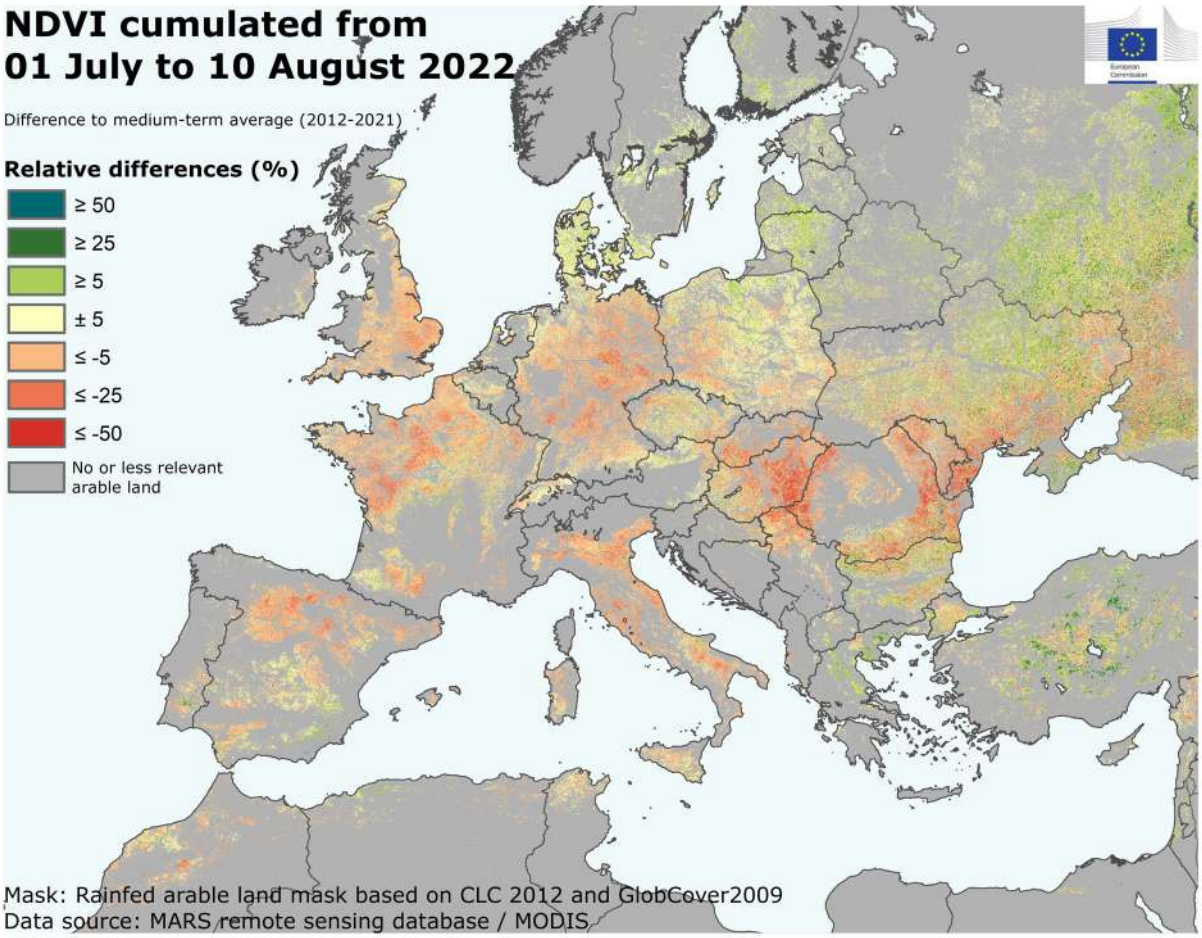



RAINFALL
ECMWF operational model (starting 18 August 2022
Cumulated values
from : 18 August 2022
to : 27 August 2022
Period of interest
Unit: mm
0 - 5
5 - 10
10 - 20
20 - 40
40 - 60
60 - 80
80 -100
100 - 120
> 120
18/08/2022
resolution: 25x25 km


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
ECMWF operational model (starting 18 August 2022
from : 18 August 2022
to : 27 August 2022
Period of interest
Rain (mm) > 5
Unit: days
= 0
1 - 2
3 - 4
5 - 6
7 - 8
9 - 10
18/08/2022
resolution: 25x25 km

2. Remote sensing – observed canopy conditions

Worsening conditions throughout Europe with few exceptions



This map displays the difference between the cumulated Normalised Difference Vegetation Index (NDVI) from 1 July to 10 August 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 predominately displays the condition of summer crops in southern, central, and eastern Europe where winter crops are in senescence or have already been harvested whereas winter and spring crops stand out in northern Europe. Persistent hot and dry conditions seriously affect summer crop growth and negative NDVI anomalies now prevail in most of Europe. The only exceptions are in the Baltic states, Scandinavia, and European Russia where above-average precipitation and colder weather favoured biomass accumulation for spring crops.

Average daily temperatures in **northern Italy** during the analysis period remained 3-4°C above the LTA and together with persistent drought resulted in a very low biomass accumulation for summer crops (e.g. *Lombardia*). The lack of rainfall in **France** and the record high temperatures registered in July have compromised the vegetative growth of summer crops particularly in southern and western regions (e.g. *Midi-pyrénées*).

Germany mostly presents negative anomalies (red colours) all over the country since drier and hotter-than-usual conditions have stressed summer crops during flowering (e.g. *Oberpfalz*). Exceptions are in the most northern areas that had a more favourable temperature and/or precipitation regime.

In **Poland**, below average biomass accumulation can be seen in western regions, where rainfall remained very low

in July. Conversely, adequate water supply to crops in eastern and northern regions was provided by abundant precipitation in the first and third dekad of July together with temperatures close to or even slightly below the LTA allowing for an extended senesence (e.g. *Warminsko-Mazurskie*).

In the **Baltic countries**, above-average rainfall and colder-than-usual temperatures prolonged the grain-filling period as shown in the NDVI profile (e.g. *Eesti*).

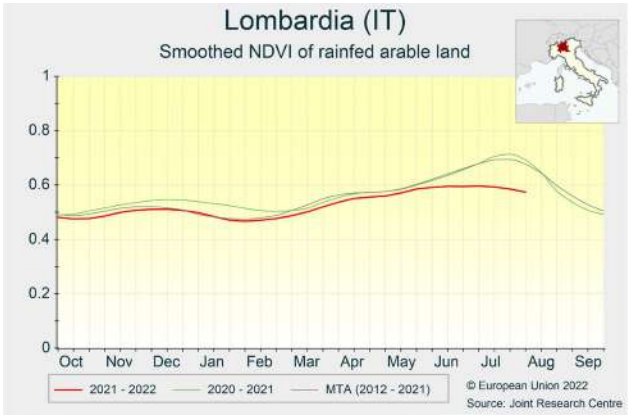
After a favourable start to the summer in Central Europe (including **Austria**, **Czechia**, and **Slovakia**), biomass accumulation for summer crops is now below average due to below average precipitation and temperature increases recorded since the second half of July.

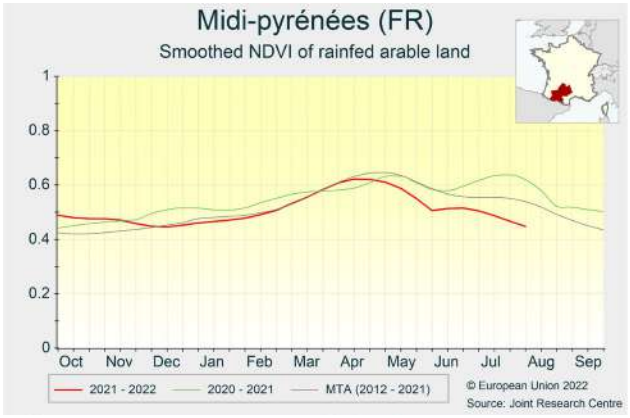
In **Hungary**, the long-lasting drought that characterised the season in eastern regions has now extended to the western half of the country, affecting summer crop growth negatively (e.g. *Kozep-Dunantul*).

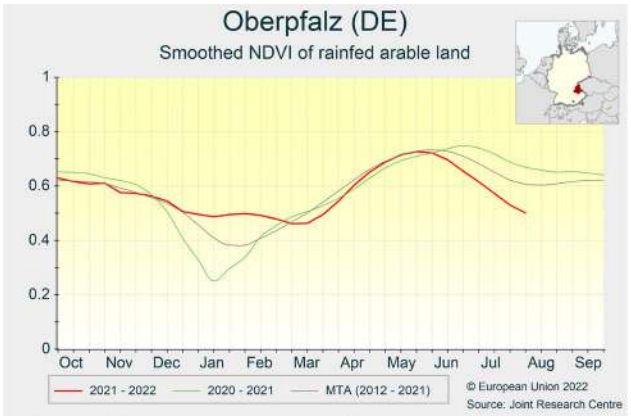
Hot and dry conditions also impacted summer crops in **Romania** and **Bulgaria**. No significant precipitation in July in combination with warmer-than-usual temperatures in the second half of the month accelerated crop ripening (e.g. *Severoiztochen*).

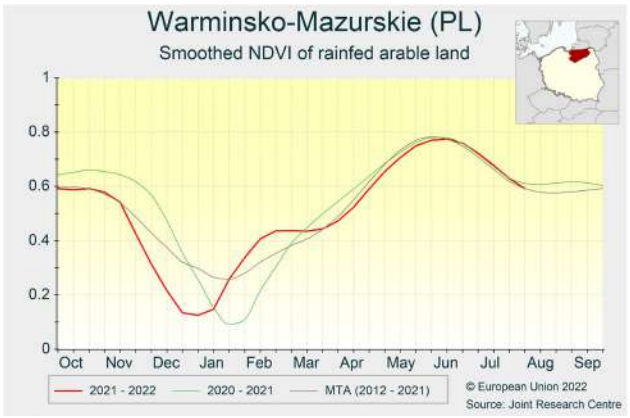
In **Ukraine**, a rainfall deficit observed in the first half of July was followed by colder-than-usual weather that slowed down crop development in northern and western regions and allowed crops to benefit from the rain that arrived in the first dekad of August. In **European Russia**, abundant rainfall and temperatures oscillating around the average have favoured grain-filling and maintained well above-average biomass accumulation.

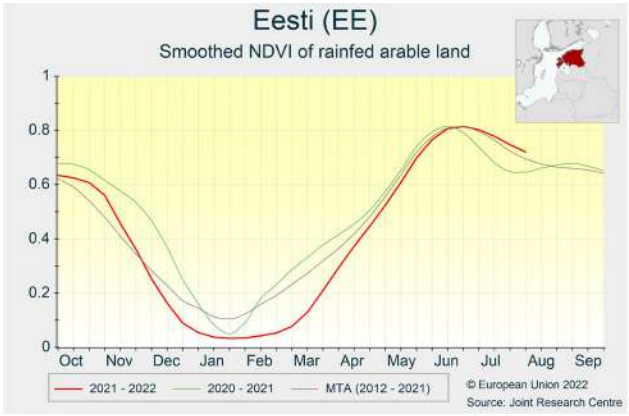
Similar to France, in the **United Kingdom** a lack of precipitation and high temperatures prevailed in July, particularly in southern regions. Since the season had advanced, these conditions had limited impacts on winter crops and partially affected spring cereals. In **Turkey**, the prevailing positive anomalies on the map (green colours) reflect a delayed season, also characterised by colder-than-usual temperatures during July (e.g. *Samsun*).

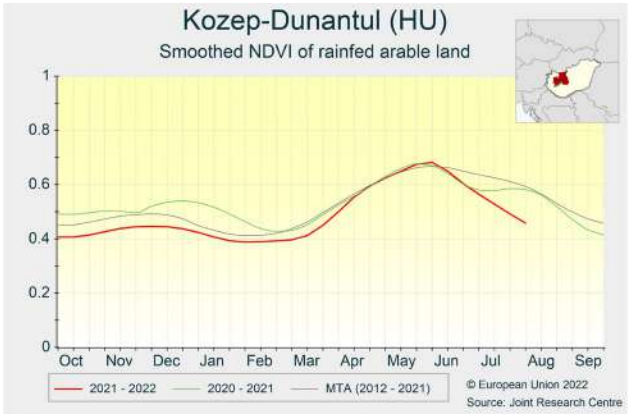


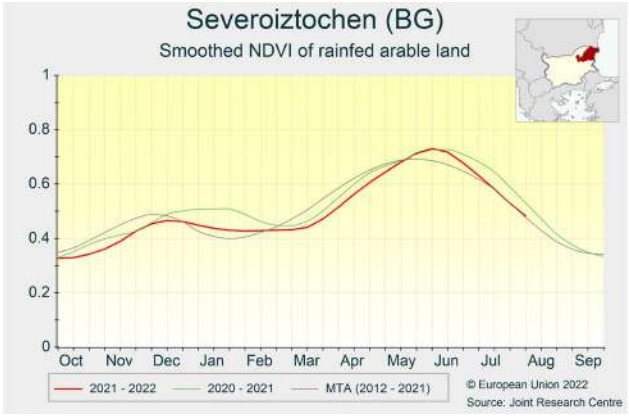


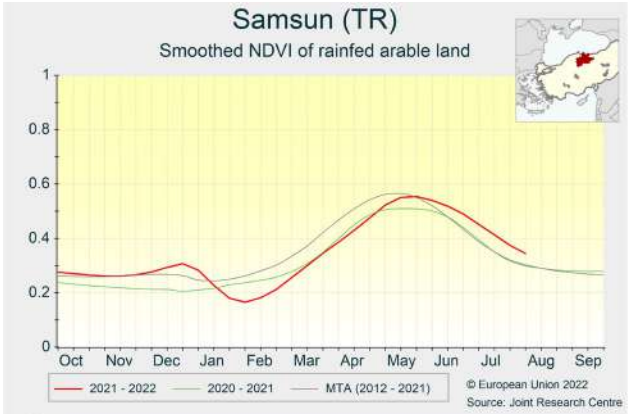





Eesti (EE)
Smoothed NDVI of rainfed arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2021 - 2022
2020 - 2021
MTA (2012 - 2021)
© European Union 2022
Source: Joint Research Centre


Kozep-Dunantul (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

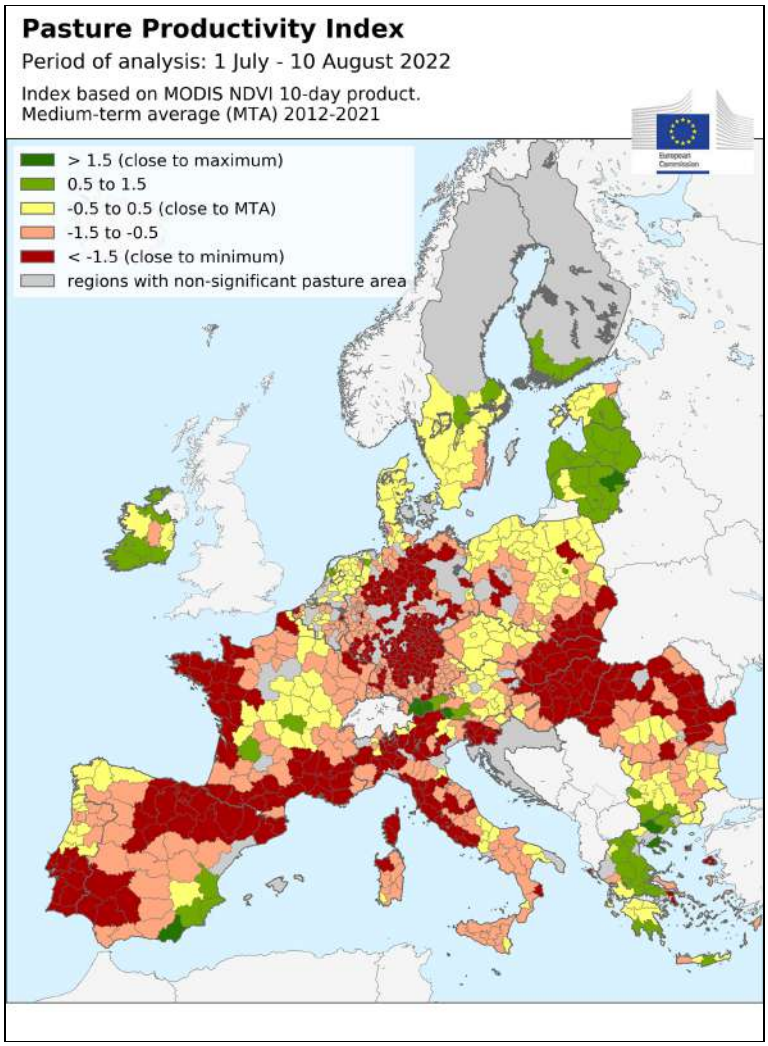

Severoiztochen (BG)
Smoothed NDVI of rainfed arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2021 - 2022
2020 - 2021
MTA (2012 - 2021)
© European Union 2022
Source: Joint Research Centre


Samsun (TR)
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

Pastures under stress in most parts of Europe

For the period of review, most of the European regions present negative anomalies of pasture productivity linked to dry conditions; in many regions, very hot temperatures have also been present. Compared with the previous reporting period, the condition of pastures worsened in most parts of western and central Europe. Pastures in fair to good condition in comparison with an average year prevail in the Baltic Sea region, Sweden, Denmark, Ireland and Greece.



For the period of review, the PPI [1] indicator reflects predominantly negative conditions of pastures across Europe, associated with dry conditions, the negative impacts of which were exacerbated in most regions by exceptionally hot weather on some days.

In **France**, negative impacts due to the dry and hot weather conditions extended to most pasture areas. The most central areas, which benefited from sparse but regular small rainfall events, are less affected.

In **Germany**, hot and dry conditions caused strongly reduced pasture biomass accumulation in most of the country, most markedly in central Germany, and somewhat less in Alpine and northernmost regions.

In the **Benelux** countries, the lack of rain reduced the pasture growth to a stand-still. Resowing might be needed

[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, also referred to as the Mid-Term Average (MTA).

in some areas with sandy soils and in the worst affected regions in the south.

Exceptionally hot and dry conditions, with associated negative impacts on pastures continued in northern and central **Italy**, **Spain,** and southern **Portugal,** and expanded (albeit with fewer hot events) in **Hungary**, **Romania** and **Bulgaria**. **Slovenia** and **Croatia** also experienced a considerable reduction in grassland growth due to dry conditions.

In **Austria, Czechia** and **Slovakia,** the pronounced rain deficit since mid-July, combined with a very hot end of July, resulted in depleting soil moisture levels and reduced biomass accumulation.

In **Poland**, conditions were variable across regions: fairly positive in eastern and central regions, and negative in western regions where dry conditions prevailed. Milder and wetter conditions in northeastern parts of the country favoured pasture biomass accumulation.

Pastures are in fair to good condition in **Finland** and the **Baltic countries**, which benefited from average to above-average rainfall. Solar radiation was below average in Lithuania and Latvia and close to average in Estonia and Finland. Temperatures were slightly colder than usual in Lithuania and Latvia, and close to the average in Estonia and Finland.

Pastures in **Ireland**, **Denmark**, and **Sweden** are in fair condition. So far, the rain deficits in these countries have not substantially impacted growth.

In Greece, pastures benefited from slightly improved conditions, with seasonal temperatures and a larger-than-usual day/night temperature range favoring dew collection by the canopy.

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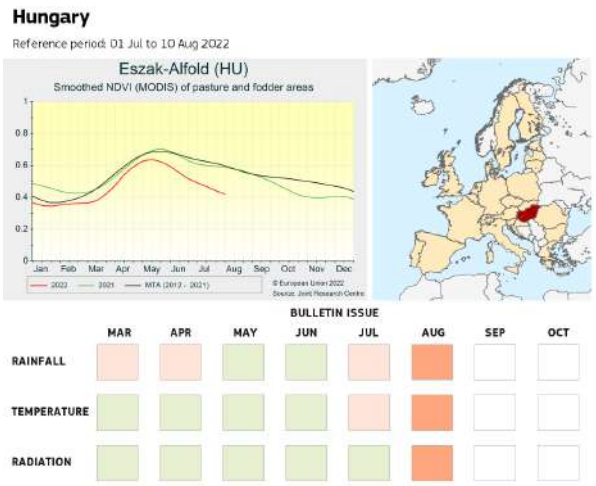
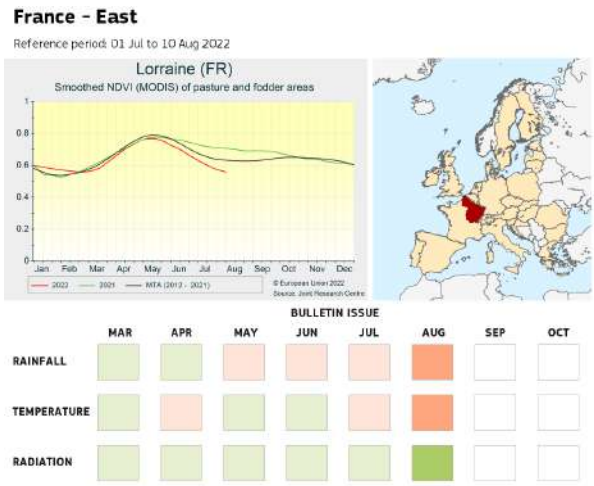
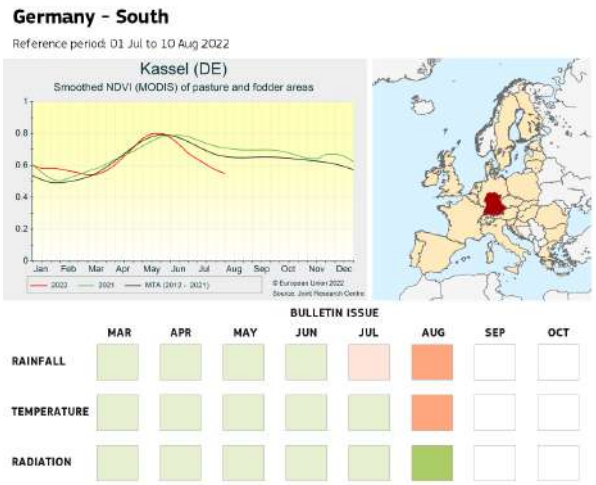
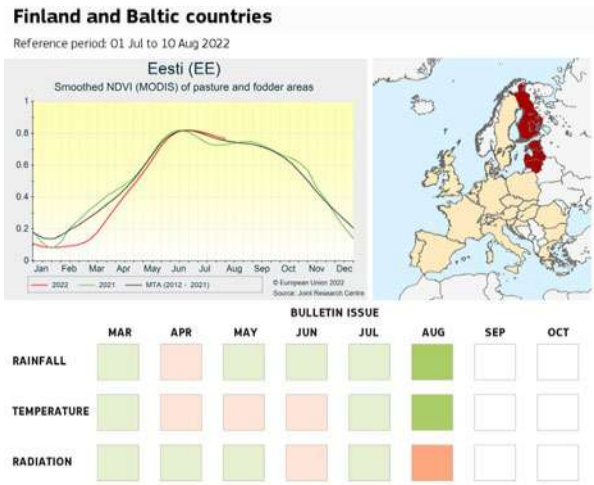


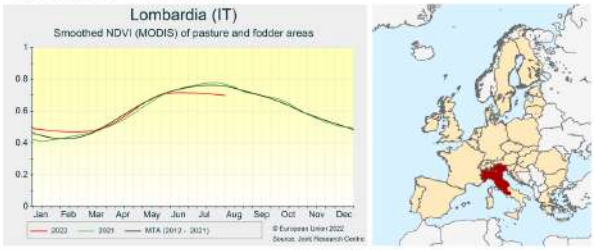






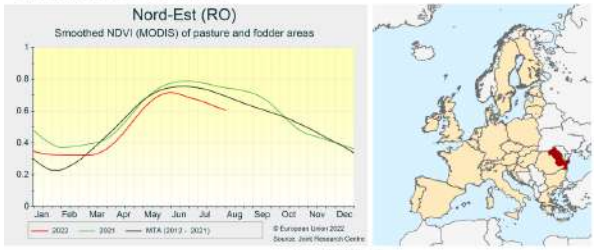
Italy - North and central

Reference period: 01 Jul to 10 Aug 2022



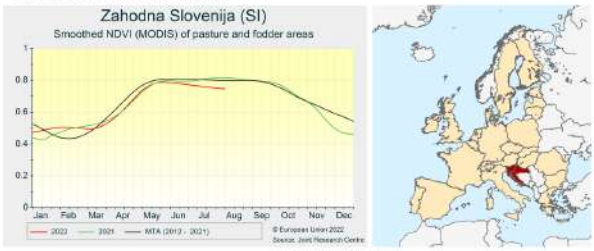
Romania - East

Reference period: 01 Jul to 10 Aug 2022



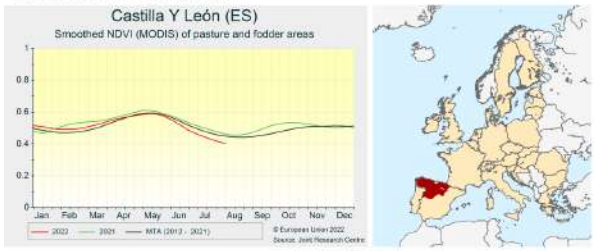
Slovenia and Croatia

Reference period: 01 Jul to 10 Aug 2022



Spain and Portugal - North

Reference period: 01 Jul to 10 Aug 2022



4. Country analysis

4.1. European Union

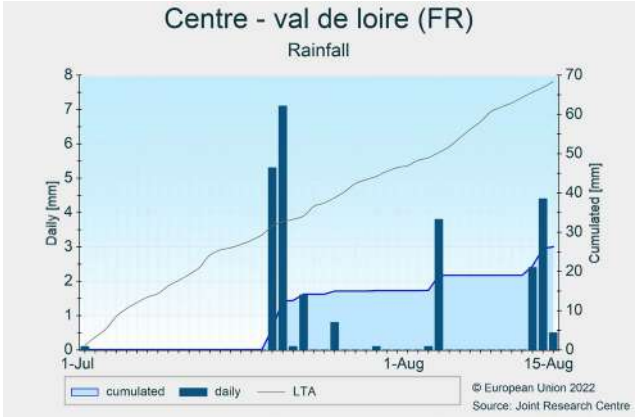
France

Negative outlook for summer crops

Extremely dry conditions have prevailed over the entire country since the beginning of July and cumulative rainfall in a large part of the country has not exceed 20 mm since then, corresponding to the lowest level in our 30+ year database. Temperatures were above the LTA with two heatwaves being recorded: 10 days around mid-July and 7 days at the beginning of August. The number of hot days was more than twice the LTA.

Summer crops have been severely impacted by these adverse conditions. Maize and sunflowers were impacted during flowering, which led to irreversible damage. Irrigation restrictions have been imposed since mid-July and now affect 70% of agricultural land. The situation is particularly worrying in the centre-west where groundwater levels are exceptionally low[2]. Yield forecasts for all summer crops have been revised downwards.

The harvesting of winter crops progressed smoothly, benefitting from the dry conditions, and has now been concluded. Field-based reports indicate good quality and better-than-expected yields. Our yield forecasts for winter crops have been revised slightly upwards.

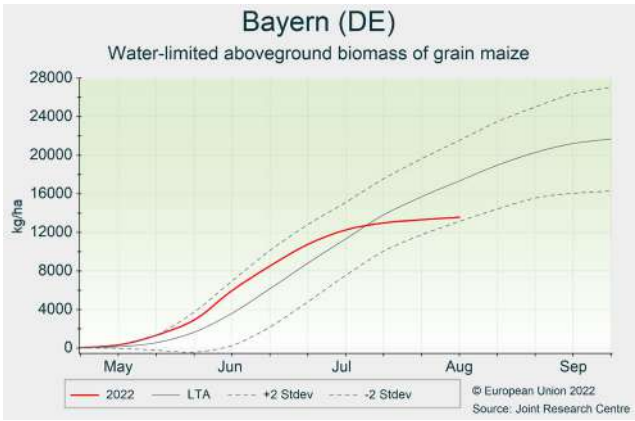


Germany

Diminished summer crop potential

The continued dry conditions in combination with three short but intense heatwaves since the 1st of July were detrimental to the yield potential of summer crops. The heat stress, coinciding with the flowering period of maize, was most pronounced in *Bayern*, *Baden-Wuerttemberg*, *Saarland*, and parts of *Rheinland-Pfalz* and *Hessen*. Rainfall in most of the country was half or less than the LTA. A precipitation deficit is present everywhere, and is most distinct in central and eastern Germany. Soil moisture contents under summer crops have partially reached critical levels for crop sustainability. With the exception of green maize, yield forecasts for grain maize, potato and sugar beet were revised further downwards.

The harvest of winter and spring crops has mostly been completed and reports confirm average to above-average yields at national level, but with large variations across the country due to the contrasting weather conditions during the preceding months.



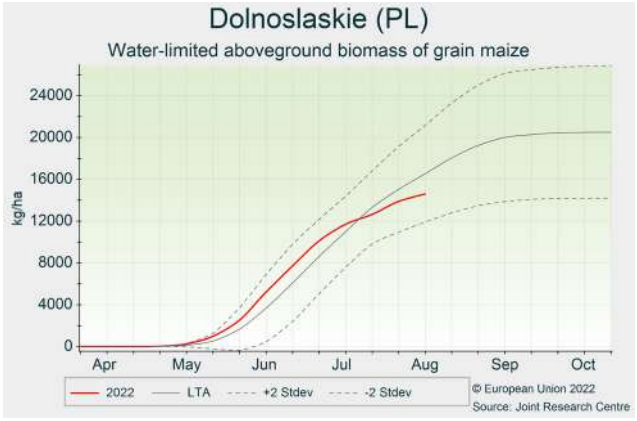
[2]https://www.brgm.fr/fr/actualite/communique-presse/nappes-eau-souterraine-au-1er-aout-2022

Poland

Fairly good conditions for summer crops, except in the dry west

In July significantly below-average rainfall in western regions resulted in deteriorating soil moisture availability while agrometeorological conditions in other regions favoured grain filling of winter and spring crops. The first half of August was very dry throughout the country. Harvesting of winter crops started during the second half of July and has progressed well, with only a few interruptions due to rain. Initial field reports from southern and central regions indicate generally above average yields and good grain quality with the exception of spring barley on lighter soils, negatively impacted by water deficits earlier in the season.

Agrometeorological conditions have generally favoured summer crops except in western regions where dry conditions combined with a very hot period during the second half of July negatively impacted biomass accumulation in grain maize and yield formation. Sugar beet and potatoes are generally in fairly good condition although rain is much needed to sustain adequate growth. Our yield forecast for winter crops increased slightly while the forecast for grain maize has decreased.



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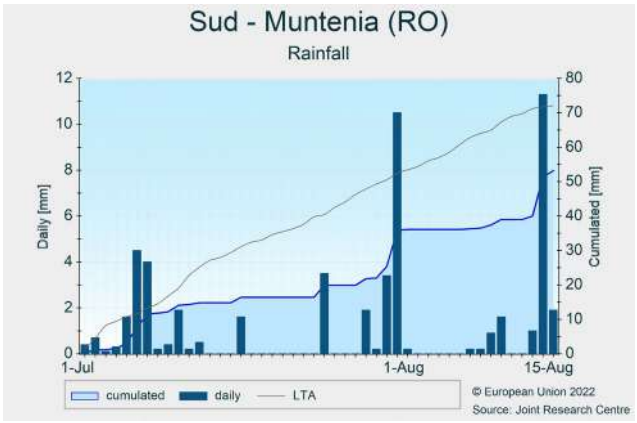
Romania

Persistent drought further worsened summer crop yield expectations

During the period under review, precipitation was 30% to 50% below the LTA in most regions and has been particularly scarce along the borders with Hungary and Bulgaria. Average temperatures remained 1°C to 2°C higher than usual in most regions. The last dekad of July and the first dekad of August were particularly hot, with daily maxima regularly exceeding 30°C.

These conditions allowed for fast progress of the campaign to harvest winter crops, finished during the first week of August. However, the growth and development of summer crops were even more negatively affected. The pollination and early grain filling phases took place under dry and hot conditions, which led to irreversible damage to the crops. Consequently, their yield forecast was revised even further downward, and is currently well below the 5-year average. Harvesting of summer crops is expected to start during the last dekad of August.



Spain and Portugal

Dry and very hot weather with summer crops under continued stress

Weather during the review period was hot and dry throughout the Iberian Peninsula.

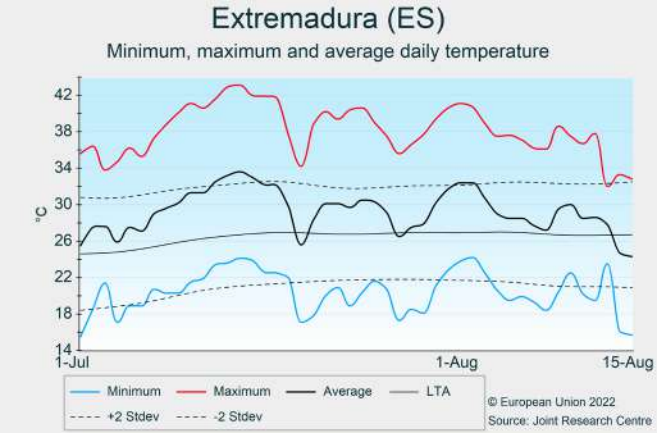
In Spain, water levels in reservoirs used for irrigation have reached an exceptionally low average of 39.18% of design capacity, while water levels have dropped to between 40% and 50% of capacity in *Castilla y Leon, Catalonia,* and *Navarra,* and they are much lower (at about 30%) in *Castilla-La-Mancha*, *Extremadura*, *Murcia*, and *Andalucia*[3].

As a consequence, conditions for summer crops, which were already planted with water restrictions in mind, have worsened even more and additional restrictions on most water demanding crops such as maize and rice are expected.

Grain maize – even when irrigated - has been under continued heat stress at least in the southern half of the Iberian Peninsula, where daily maximum temperatures on the warmest days exceeded 40°C. Maize development is 10 to 15 days in advance in the whole peninsula, now being in the reproductive phase. This accelerated development has resulted in thinner stems and fewer kernels on average, with negative impacts on yields.

Other crops, such as sunflowers, which are normally not or partially irrigated, have been impacted negatively due to heat and drought, particularly in Spain.

Our yield forecasts for summer crops remain distinctly below the 5-year average.



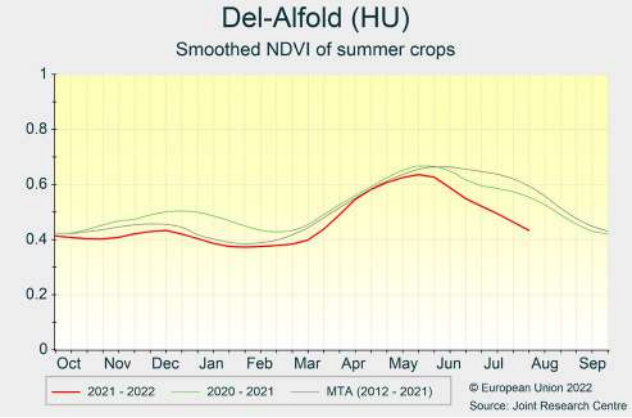
Hungary

Exceptionally low yield expectations for all crops

Extremely dry conditions have prevailed throughout the country since the beginning of July. Except for *Nyugat-Dunántúl*, precipitation did not exceed 40 mm during the review period corresponding to a deficit of more than 50% compared to LTA. Temperatures were slightly above LTA.

Summer crops are in fair condition in *Nyugat-Dunántúl* whereas in eastern parts of the country, where the rain deficit accumulated since spring is most pronounced, soils are exceptionally dry and summer crops are in very poor condition. Maize and sunflowers have already dried in at least two thirds of the country, and yield expectations are exceptionally low. Some of the grain maize fields are likely to have been harvested as green (fodder) maize. Our maize yield forecast at national level has been revised downward.

Our yield forecast for winter crops has also been revised downward. The winter crop harvest has been completed and field-based reports indicate exceptionally low yields due to the long-lasting dry conditions (since winter) whose impacts were underestimated in our previous forecasts.



[3] www.embalses.net ; accessed August 15th, 2022

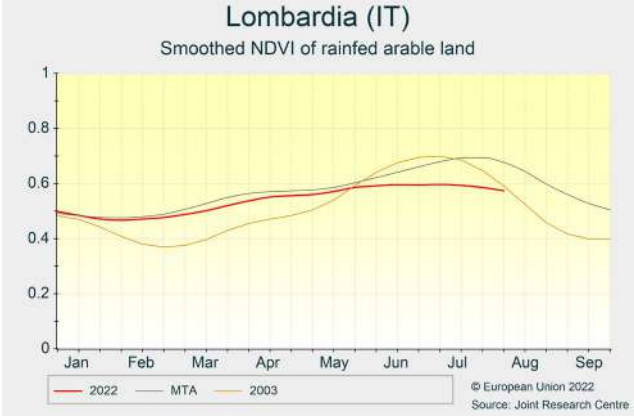
Italy

Poor conditions for summer crops

Drought and hot conditions have continued in northern Italy. Water reservoirs remain at historically low levels, and no water for irrigation in many agricultural districts of Piedmont, Lombardy and Emilia Romagna has been available since late July. The conditions described have caused farmers to advance maize harvesting (by 15 to 30 days) and, in some cases, to change its destination from grain maize to green (fodder) maize. Some fields, where irrigation was not available or too costly, have been abandoned without harvesting at all. Yield and production expectations are poor for all summer crops, including soybeans and sugar beet.

In **central Italy**, drought and hot temperatures have also been persistent, with maximum temperatures below 30°C on only a few days. As a consequence, sunflowers are in very poor condition.

The overall outlook for summer crops is very poor and is in line with (or even below) the results of 2003.



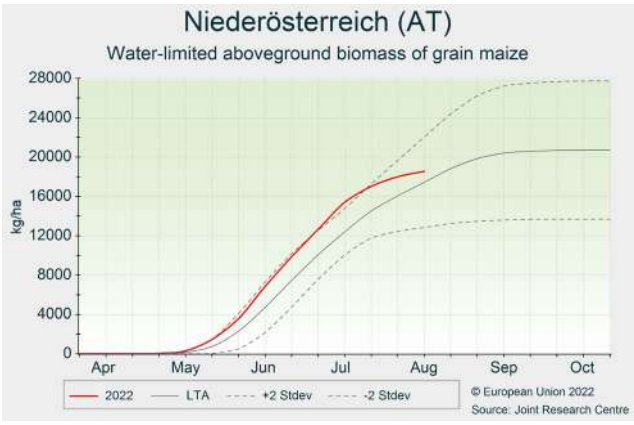
Czechia, Austria and Slovakia

Summer crops yield forecast revised downwards

Developing soil moisture deficits together with hot conditions at the end of July affected the yield potential of summer crops negatively especially in Slovakia. Biomass accumulation of grain maize has dropped considerably, and is now below seasonal average levels in western and south-eastern Czechia and Slovakia, but remains at fair levels in other production regions. Sugar beet has been little affected so far, but more rain is urgently needed to sustain the yield potential.

The predominantly dry weather conditions favoured the ripening and harvesting of winter crops. Harvesting is close to being completed, with generally fairly good results according to field reports.

Our yield forecasts for winter crops have been slightly increased while the forecasts for summer crops have been revised downwards.



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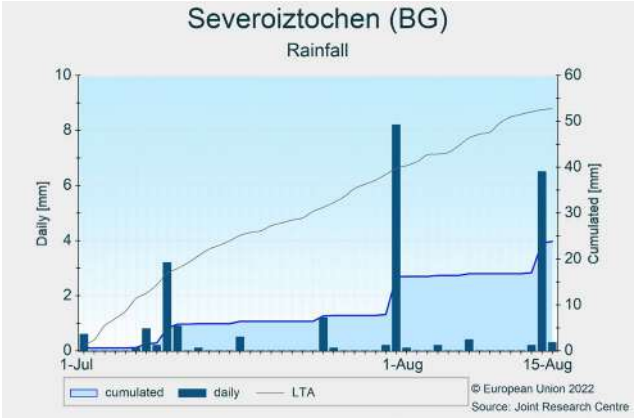
Bulgaria

Reduced yield expectations for maize and sunflowers

During the review period, Bulgaria experienced unusually hot and dry weather. Temperatures remained persistently between +1°C and +4°C above the LTA. The highest values were recorded in the third dekad of July, when daily maximum temperatures reached 39°C in central and western parts of the country.

Rainfall was scarce: a few events occurred in early July and in the second dekad of August in westernmost regions. July was among the driest we have in our records. The persistent dry conditions caused depletion of soil moisture reserves and exposed summer crops to water stress during the critical grain-filling period. The yield forecasts for grain maize and sunflowers have therefore been revised downwards, and are now below the 5-year average. The harvesting campaign for winter cereals has been completed within the usual window, with a fairly good yield outlook.

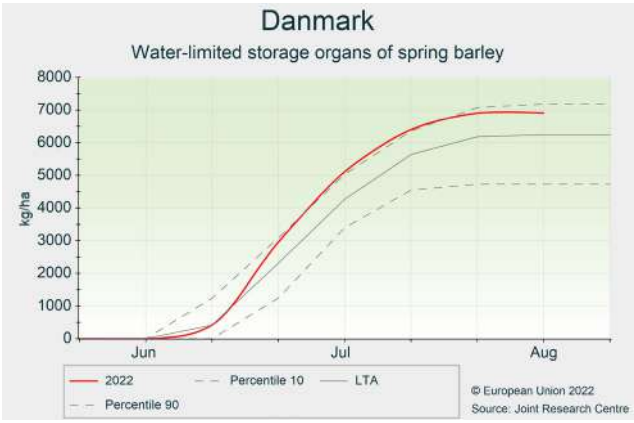


Denmark and Sweden

Positive yield outlook maintained

Temperatures were close to the LTA with the exception of a short warmer-than-usual period in both countries between 19 and 22 July. Solar radiation was close to the LTA. Rainfall was below average in both countries, but well distributed in time so alleviating soil moisture deficit.

Most of the winter rapeseed has been harvested, and the cereals harvest is in full swing. First field-based reports suggest high variation in yields as a consequence of the warm temperatures and regionally limited rainfall during the summer months. At national level, the outlook is positive for winter cereals in both countries, with a potentially very good year for winter barley in Denmark. Regarding spring barley, yields in Sweden are expected to vary from above average to close to average as some areas were impacted by dry conditions, with higher yields expected in southern Sweden. The outlook in Denmark is positive. Our yield forecasts for winter and spring cereals have been revised slightly upward to above the 5-year average.



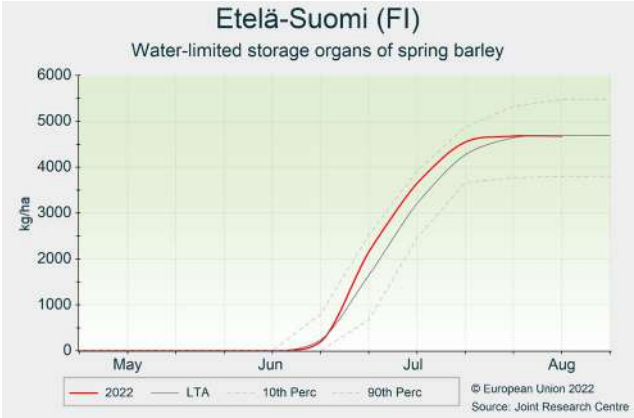
Estonia, Latvia, Lithuania, Finland

Relatively cold temperatures sustain good yields

Temperatures during the period of review were, on average, slightly colder than usual in Lithuania and Latvia, and close to the LTA in Estonia and Finland.

Rainfall was above average with two particularly heavy rain events in Lithuania and Latvia in the last two dekads of July. These heavy thunderstorms may have caused some crop damage and associated yield losses and deterioration to grain quality, which are difficult to quantify. Potato crops suffered locally from the excess of water. However, in general conditions favoured grain filling and the cereal and rapeseed harvest is underway in the Baltic countries with good yields expected. In Finland, the winter cereal harvest began as usual during the first week of August, but with expectations varying across the country.

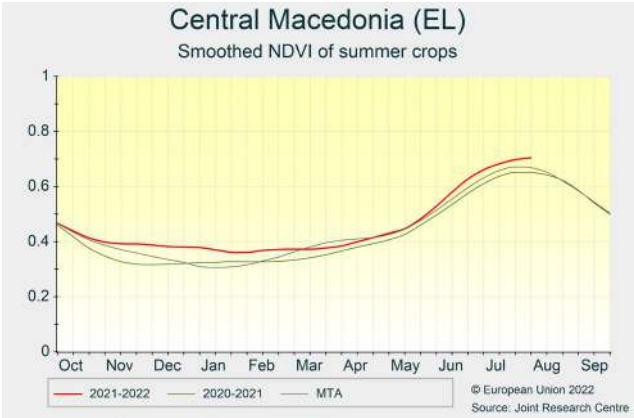
The yield forecasts for cereals have been increased after taking the adequate temperatures during the grain filling stage into account.



Greece and Cyprus

Slightly improved outlook for summer crops

Daily temperatures in July and mid-August fluctuated around the LTA in mainland Greece while they were moderately above average (temperature sums >10% of the LTA) along the West coast (Epirus, Western Greece, and Peloponnese). The revised period was generally dry for Greece and Cyprus following an average summer season. Since the beginning of July, rainfall cumulates have been -5 to -15 mm below the long-term average in eastern Greece and in-line-with the LTA in the major crop producing areas of this country (i.e. the Macedonian regions and Thessaly). The winter crop season in both Greece and Cyprus has already ended. Satellite-based observations (NDVI) suggest above-average biomass accumulation for summer crops in Greece, which are currently at the beginning of the grain-filling stage. Our overall expectations for the summer crops campaign in this country are positive: yield forecasts have been moderately revised upwards compared to the July outlook and continues to be above the last 5-year average.



Ireland

Harvest progressing well under favourable weather conditions

The period was characterised by above average temperatures with the highest maximum temperature being 30°C reached in the east during the second dekad of July. The weather was particularly dry, and the most significant rain events were recorded at the end of July/early August.

Harvest started in mid-July and progressed well, mainly under warm dry conditions. Winter barley harvest has almost been completed. The winter wheat and spring barley harvest is under way. Field reports suggest fair to good yields overall but with large variability across the country and with generally better results for wheat than for winter barley, and from the south to the north. The warm temperatures of the period accelerated crop development but with limited impact on grain weight and final yields of winter and spring cereals because these crops were already at the end of the grain filling stage. Our yield forecasts remain practically unchanged compared to the July Bulletin.

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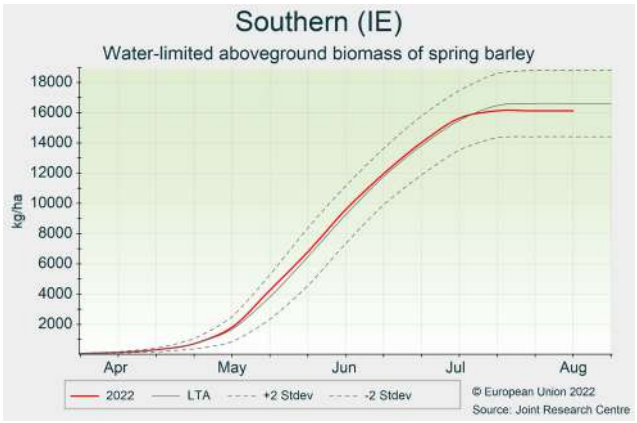

Belgium, Luxembourg and the Netherlands

Summer crops impacted by continued rain deficit; most severely in the south

Yield potentials of rainfed summer crops were negatively impacted by the dry and (occasionally) very hot conditions, particularly in Luxembourg, Belgium and south-western Netherlands, where the accumulated rain deficit is most pronounced. Potatoes and maize are most affected. In sugar beet, negative impacts on biomass accumulation are partly compensated by high sugar contents; substantial growth is still possible if rain returns.

Well-watered summer crops benefitted from the high radiation and predominantly mild temperatures. However, as water withdrawal restrictions have been imposed in most areas, the yield potential of these crops is also likely to be negatively affected, depending on rainfall in the coming days and weeks.

Our yield forecasts for all summer crops were revised downward.

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Winter crops, which completed their cycle, mainly benefited from the dry conditions, which allowed smooth harvesting. Field reports indicate above-average yields and good grain quality.

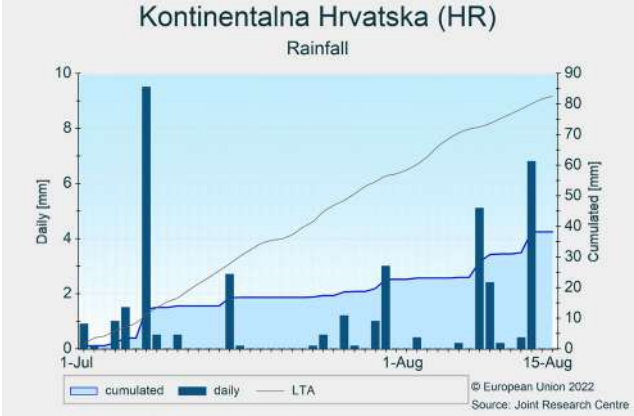
Slovenia and Croatia

Negative impacts on crops due to continued dry and warm conditions

Dry and warm conditions in both countries (which have prevailed since the beginning of summer) continued, negatively impacting growth and development of crops. Satellite imagery shows NDVI values starting to decrease much earlier than usual, indicating an early reduction of photosynthetic activity.

Summer crops – especially maize – have been greatly impacted by the prolonged dry and warm conditions. According to local sources, yield losses are expected to be high (up to 30% for barley and wheat, and up to 50% for maize)[4]. Overall, winter crops have less suffered from this summer's unusual weather conditions. Harvesting of winter crops has now been completed, with the wheat harvesting campaign almost being at an end by late July.

Our yield forecasts were revised further downwards for all crops, with larger reductions for summer crops than for winter crops.



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[4] https://www.24ur.com/novice/slovenija/Recne-struge-vse-bolj-suhe-susa-prizadela-tudi-kmetovalce.html
https://www.rtvslo.si/okolje/kmetijstvo/koruze-in-travinja-bo-polovico-manj-suse-pa-se-ni-konec/636066

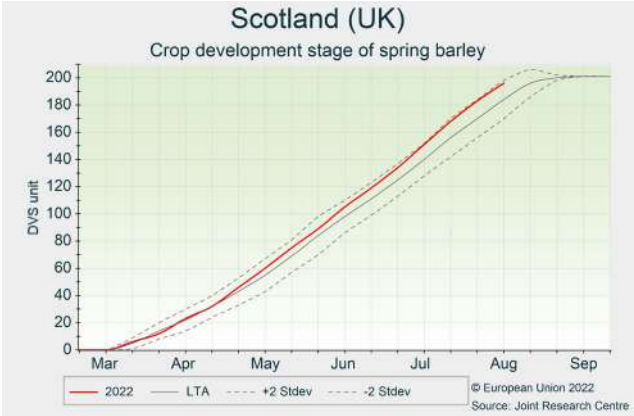
4.2. United Kingdom

Early and quick harvest supports good yields for winter crops

The period was characterised by above-average temperatures, with maximum temperatures above 30°C for some days in mid-July. Record-high maximum temperatures (39°C in the East Midlands) were reached on 19 July.

Rainfall was scarce throughout the country, and particularly in the South. The hot and dry weather had limited impact on winter crops, which were advanced and at the end of the grain filling stage, while conditions favoured an early harvest. The winter barley harvest has been completed, and the harvest of winter wheat is in full swing, with good yields reported but with mixed grain quality. Spring barley harvesting has started in southern regions while the crop is close to reaching maturity in the north, where yields expectations are also promising.

The yield forecasts have been slightly increased for winter cereals due to the good conditions for harvesting.



4.3. Black Sea Area

Ukraine

Improved conditions in central and northern regions; continued drought in the south

Summer crops in central-northern and eastern parts of Ukraine (particularly grain maize and sunflowers in these regions) benefited from improved soil moisture conditions and the absence of thermal stress during flowering and early grain filling. Near seasonal agro-meteorological conditions prevailed in western oblasts (major soybean producing regions), which allowed fairly good crop development. However, the continued drought in the southern oblasts (e.g. *Odesa, Kherson*) worsened the yield potential even more, particularly of grain maize and sunflowers which prevail in this region.

The harvest of winter crops is still ongoing and currently reported yields are in line with our forecast[5]. Our yield forecast of summer crops has been revised slightly upward. A more detailed analysis will be provided in the upcoming September edition of the Bulletin on Ukraine in the Global outlook series[6].

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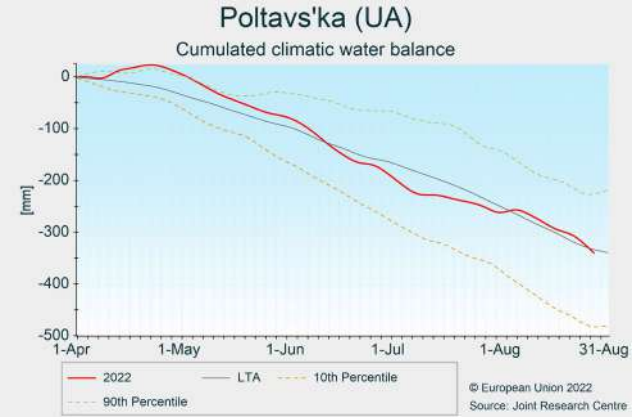

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Turkey

Favourable summer conditions

Temperatures in *West* and *Central Anatolia* in July were milder than usual (average daily temperature -2°C compared to the average) and just one heatwave of moderate intensity (Tmax < 35°C) occurred around 10 July. Hot conditions have prevailed since 1 August with a heatwave that lasted 5 to 6 days. Precipitation was scarce, as usual. Winter crops completed their cycle in July under favourable conditions, and harvesting activities benefited from the scarce rainfall. The summer crops season is proceeding well, notably for soybean, which is mostly growing in the *Konya* region.

In the southern *Akdeniz* region, where most of the grain maize is produced, slightly below-average temperatures caused some delay to the development of summer crops. Nonetheless, biomass accumulation is above average (e.g. *Hatay* region) thanks to the absence of significant heat or water stress.

At country level, winter crops yield expectations remain average, while forecasts for summer crops yield are more positive.

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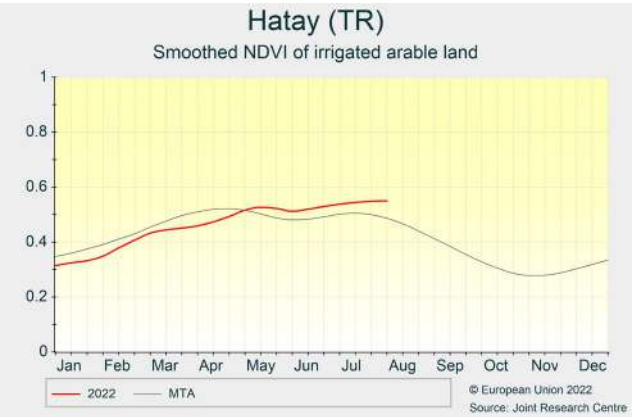


[5] https://minagro.gov.ua/news/agrarii-mykolaivshchyny-ta-zakarpattya-zaverhyly-zbyrannya-kultur-rannyoi-grupy

[6] https://publications.jrc.ec.europa.eu/repository/handle/JRC127974 (to be activated on 12 September 2022).

4.4. European Russia and Belarus

European Russia

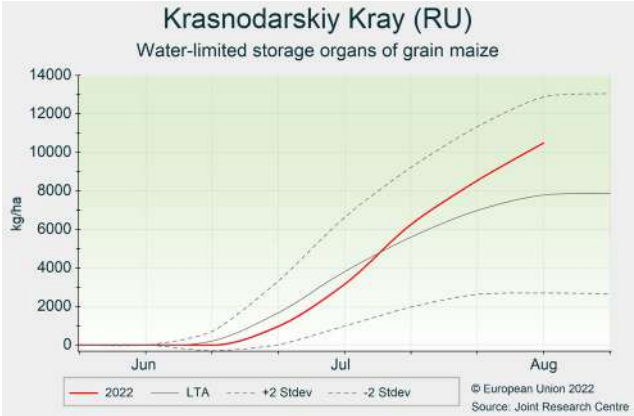
Record high cereal production expected

Favourable crop conditions prevailed during the period under review. In July, near seasonal temperature prevailed, except for the Southern okrug and the south-eastern parts of the Volga okrug, where it was slightly cooler. Since early August temperatures have increased sharply in the Central and Volga okrugs.

Abundant rainfall was recorded, especially in the Southern okrug and the Volga okrug. However, drier-than-usual conditions prevailed since the beginning of August, especially in The North-Caucasian okrug and in most of the Volga okrug.

Our crop model shows that the improved soil moisture and the absence of thermal stress during the flowering stage improved the condition of grain maize. However, the hot temperatures since early August could negatively affect grain filling.

The harvest of winter and spring cereals is still continuing, and yields are still expected to be well above average. The excessive rainfall of July could have resulted in a deterioration of grain quality.



Belarus

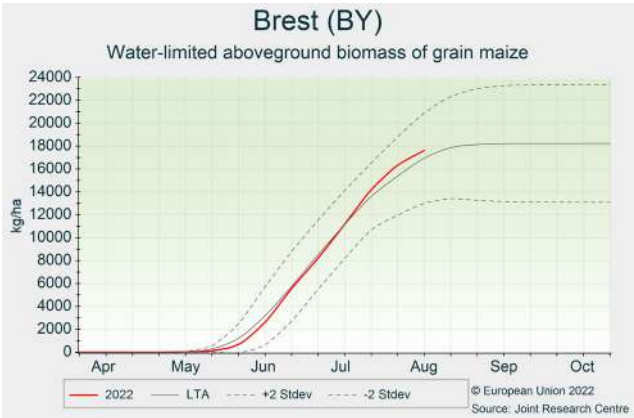
Favourable conditions for summer crops

Mild temperatures in July extended the grain-filling phase of winter and spring crops. Harvesting of winter crops began at the end of July, and is progressing well although there have been some brief pauses due to rain.

Soil moisture levels were generally favourable for growth and development of summer crops due to average to above-average rainfall. Grain maize benefited from warm (but not too hot) August temperatures, allowing accelerated development and biomass accumulation, which has now reached around average to above average seasonal levels as indicated by our model.

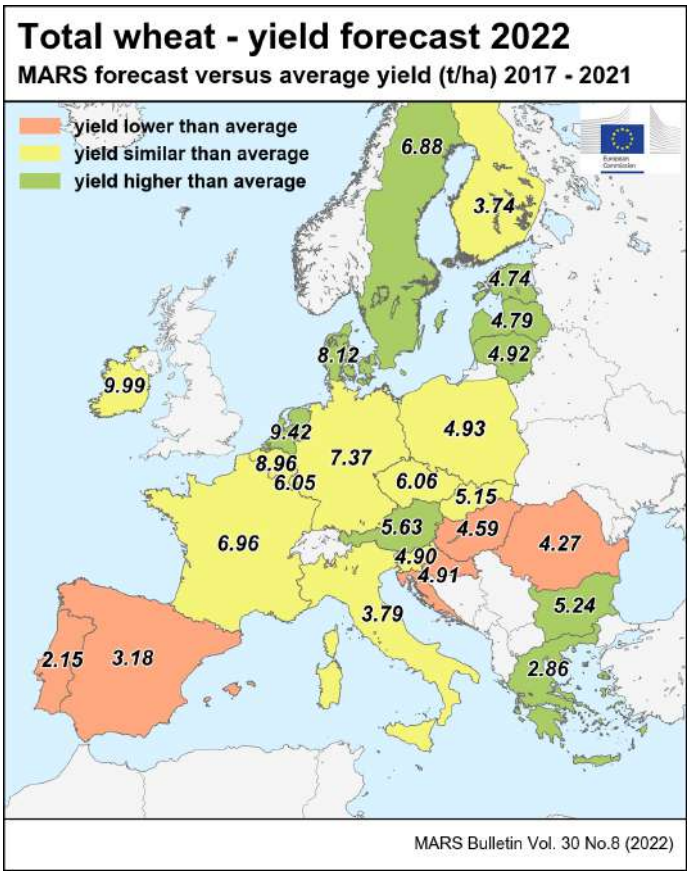
We have kept our yield forecast for winter crops the same while the yield outlook for grain maize has improved..

graph to be replaced.

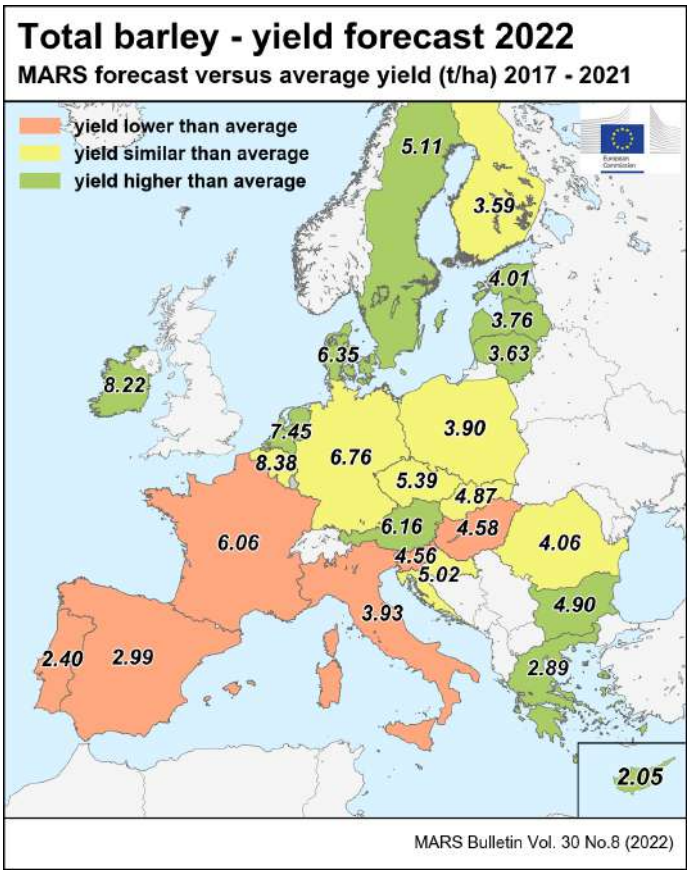


5. Crop yield forecast

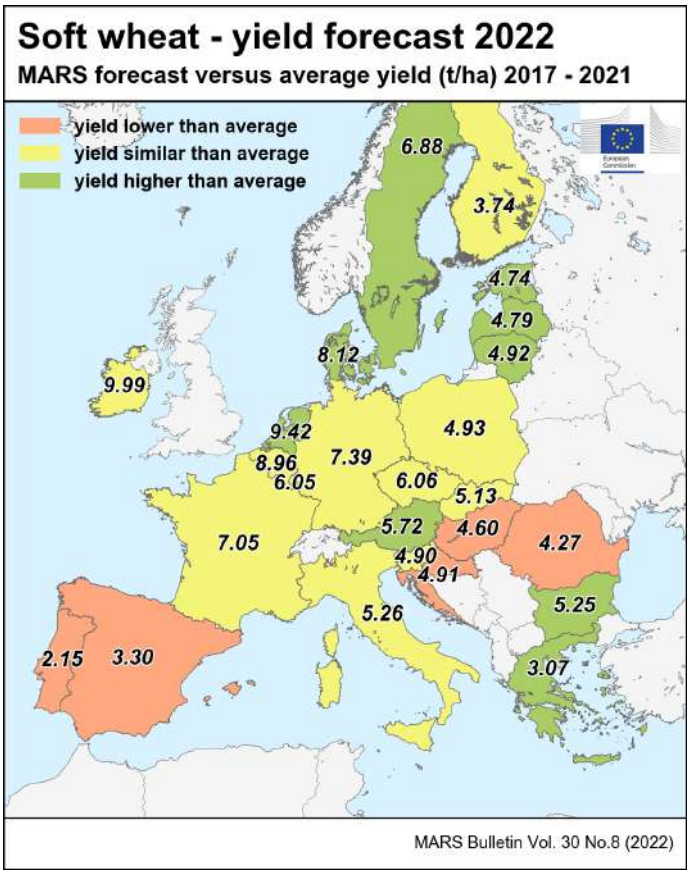
Country	Total wheat (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	5.62	5.81	**5.56**	– 1.1	– 4.3
AT	5.34	5.50	**5.63**	+ 5.5	+ 2.4
BE	8.63	7.88	**8.96**	+ 3.9	+ 14
BG	5.02	5.90	**5.24**	+ 4.5	– 11
CY	—	—	**—**	—	—
CZ	5.84	6.32	**6.06**	+ 3.7	– 4.1
DE	7.36	7.30	**7.37**	+ 0.1	+ 1.0
DK	7.77	7.62	**8.12**	+ 4.5	+ 6.6
EE	4.27	4.09	**4.74**	+ 11	+ 16
EL	2.73	2.73	**2.86**	+ 4.8	+ 4.9
ES	3.45	3.93	**3.18**	– 7.7	– 19
FI	3.62	3.19	**3.74**	+ 3.1	+ 17
FR	7.16	7.02	**6.96**	– 2.8	– 0.8
HR	5.84	6.63	**4.91**	– 16	– 26
HU	5.44	5.97	**4.59**	– 16	– 23
IE	9.65	10.6	**9.99**	+ 3.5	– 5.3
IT	3.90	4.12	**3.79**	– 2.9	– 8.2
LT	4.55	4.50	**4.92**	+ 8.1	+ 9.4
LU	5.89	5.96	**6.05**	+ 2.7	+ 1.5
LV	4.60	4.48	**4.79**	+ 4.1	+ 6.9
MT	—	—	**—**	—	—
NL	8.86	8.20	**9.42**	+ 6.2	+ 15
PL	4.74	5.07	**4.93**	+ 4.0	– 2.7
PT	2.48	2.65	**2.15**	– 13	– 19
RO	4.54	5.30	**4.27**	– 5.8	– 19
SE	6.53	6.31	**6.88**	+ 5.3	+ 8.9
SI	5.09	5.77	**4.90**	– 3.9	– 15
SK	5.08	5.63	**5.15**	+ 1.2	– 8.6



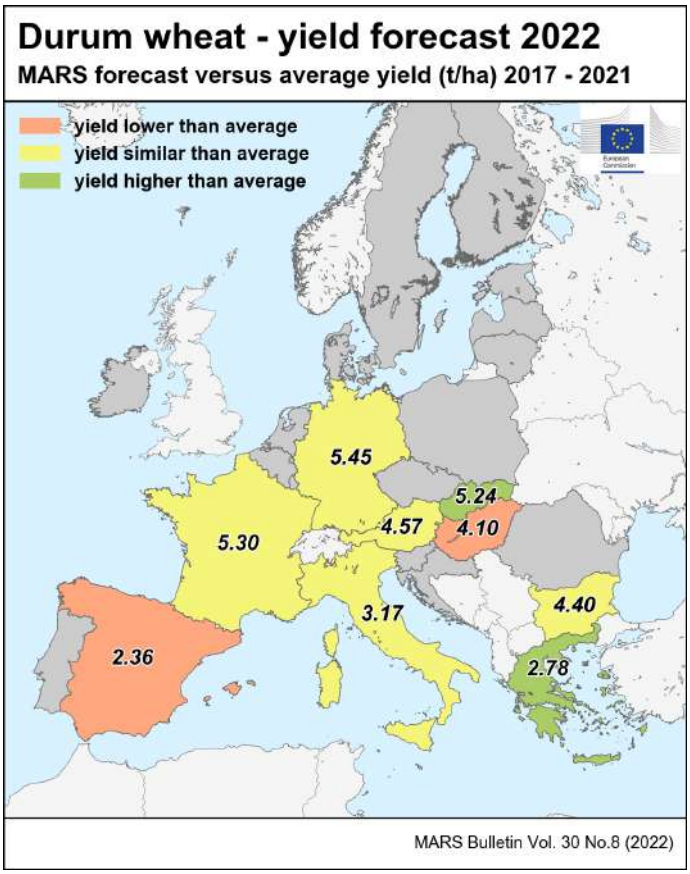
Country	Total barley (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	4.85	5.08	**4.85**	+ 0.1	– 4.6
AT	5.81	5.97	**6.16**	+ 6.0	+ 3.2
BE	8.19	7.97	**8.38**	+ 2.3	+ 5.1
BG	4.70	5.45	**4.90**	+ 4.1	– 10
CY	1.79	1.83	**2.05**	+ 15	+ 12
CZ	5.28	5.35	**5.39**	+ 2.2	+ 0.7
DE	6.53	6.76	**6.76**	+ 3.4	– 0.1
DK	5.68	5.65	**6.35**	+ 12	+ 13
EE	3.66	3.26	**4.01**	+ 9.7	+ 23
EL	2.67	2.47	**2.89**	+ 8.3	+ 17
ES	3.22	3.55	**2.99**	– 6.9	– 16
FI	3.55	2.66	**3.59**	+ 1.2	+ 35
FR	6.31	6.62	**6.06**	– 4.0	– 8.4
HR	5.01	5.49	**5.02**	+ 0.1	– 8.6
HU	5.54	6.39	**4.58**	– 17	– 28
IE	7.89	8.45	**8.22**	+ 4.2	– 2.8
IT	4.09	4.21	**3.93**	– 4.1	– 6.7
LT	3.45	3.46	**3.63**	+ 5.4	+ 5.0
LU	—	—	**—**	—	—
LV	3.17	2.89	**3.76**	+ 19	+ 30
MT	—	—	**—**	—	—
NL	6.82	6.71	**7.45**	+ 9.3	+ 11
PL	3.77	4.18	**3.90**	+ 3.4	– 6.7
PT	2.96	3.35	**2.40**	– 19	– 28
RO	4.14	5.26	**4.06**	– 1.9	– 23
SE	4.49	3.92	**5.11**	+ 14	+ 30
SI	4.97	5.45	**4.56**	– 8.4	– 16
SK	4.70	5.07	**4.87**	+ 3.8	– 3.8



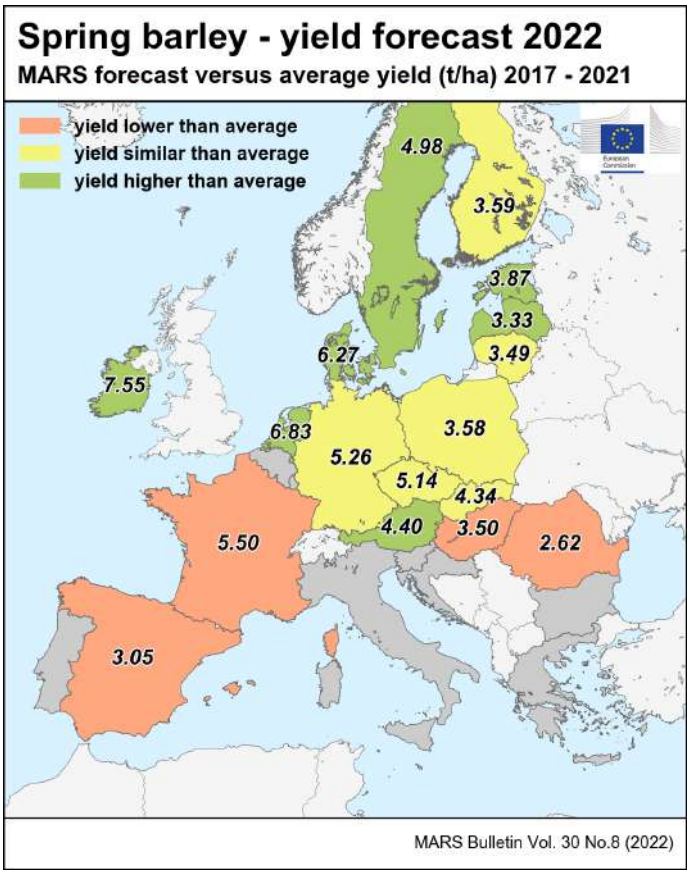
Country	Soft wheat (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	5.84	6.04	**5.76**	– 1.3	– 4.5
AT	5.40	5.57	**5.72**	+ 5.8	+ 2.6
BE	8.63	7.88	**8.96**	+ 3.9	+ 14
BG	5.03	5.91	**5.25**	+ 4.5	– 11
CY	—	—	**—**	—	—
CZ	5.84	6.32	**6.06**	+ 3.7	– 4.1
DE	7.39	7.32	**7.39**	+ 0.1	+ 0.9
DK	7.77	7.62	**8.12**	+ 4.5	+ 6.6
EE	4.27	4.09	**4.74**	+ 11	+ 16
EL	2.90	3.02	**3.07**	+ 5.7	+ 1.3
ES	3.56	4.17	**3.30**	– 7.5	– 21
FI	3.62	3.19	**3.74**	+ 3.1	+ 17
FR	7.26	7.12	**7.05**	– 2.9	– 0.9
HR	5.84	6.63	**4.91**	– 16	– 26
HU	5.47	5.99	**4.60**	– 16	– 23
IE	9.65	10.6	**9.99**	+ 3.5	– 5.3
IT	5.46	6.13	**5.26**	– 3.7	– 14
LT	4.55	4.50	**4.92**	+ 8.1	+ 9.4
LU	5.89	5.96	**6.05**	+ 2.7	+ 1.5
LV	4.60	4.48	**4.79**	+ 4.1	+ 6.9
MT	—	—	**—**	—	—
NL	8.86	8.20	**9.42**	+ 6.2	+ 15
PL	4.74	5.07	**4.93**	+ 4.0	– 2.7
PT	2.48	2.65	**2.15**	– 13	– 19
RO	4.54	5.30	**4.27**	– 5.8	– 19
SE	6.53	6.31	**6.88**	+ 5.3	+ 8.9
SI	5.09	5.77	**4.90**	– 3.9	– 15
SK	5.11	5.59	**5.13**	+ 0.5	– 8.1



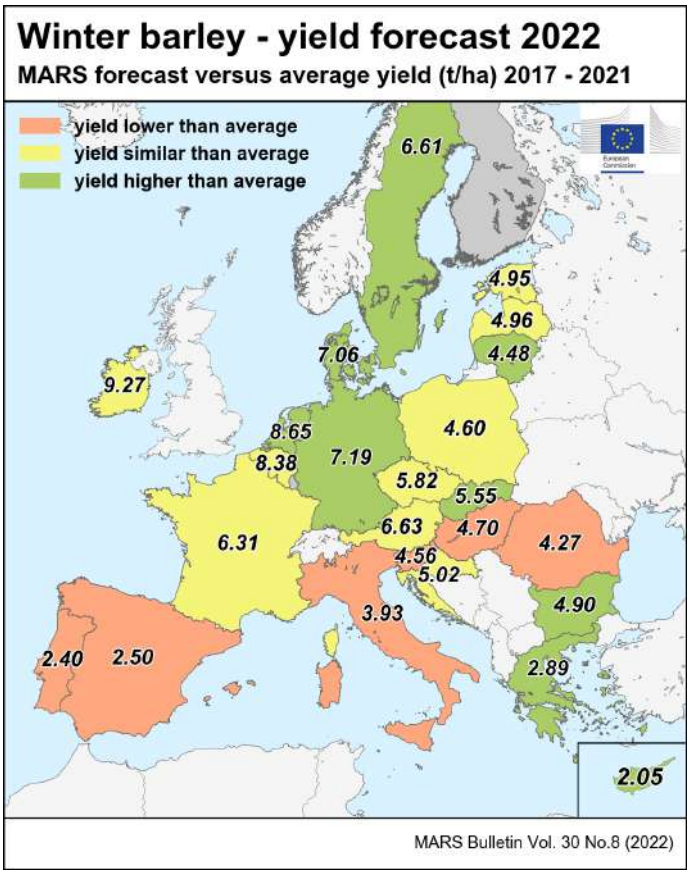
Country	Durum wheat (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	3.52	3.55	**3.42**	– 2.9	– 3.6
AT	4.42	4.51	**4.57**	+ 3.5	+ 1.4
BE	—	—	**—**	—	—
BG	4.28	5.44	**4.40**	+ 2.8	– 19
CY	—	—	**—**	—	—
CZ	—	—	**—**	—	—
DE	5.24	5.52	**5.45**	+ 4.0	– 1.2
DK	—	—	**—**	—	—
EE	—	—	**—**	—	—
EL	2.67	2.60	**2.78**	+ 4.2	+ 6.6
ES	2.85	2.49	**2.36**	– 17	– 5.3
FI	—	—	**—**	—	—
FR	5.51	5.37	**5.30**	– 3.8	– 1.3
HR	—	—	**—**	—	—
HU	4.74	5.42	**4.10**	– 13	– 24
IE	—	—	**—**	—	—
IT	3.25	3.31	**3.17**	– 2.4	– 4.1
LT	—	—	**—**	—	—
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	—	—	**—**	—	—
PT	—	—	**—**	—	—
RO	—	—	**—**	—	—
SE	—	—	**—**	—	—
SI	—	—	**—**	—	—
SK	4.91	5.91	**5.24**	+ 6.9	– 11



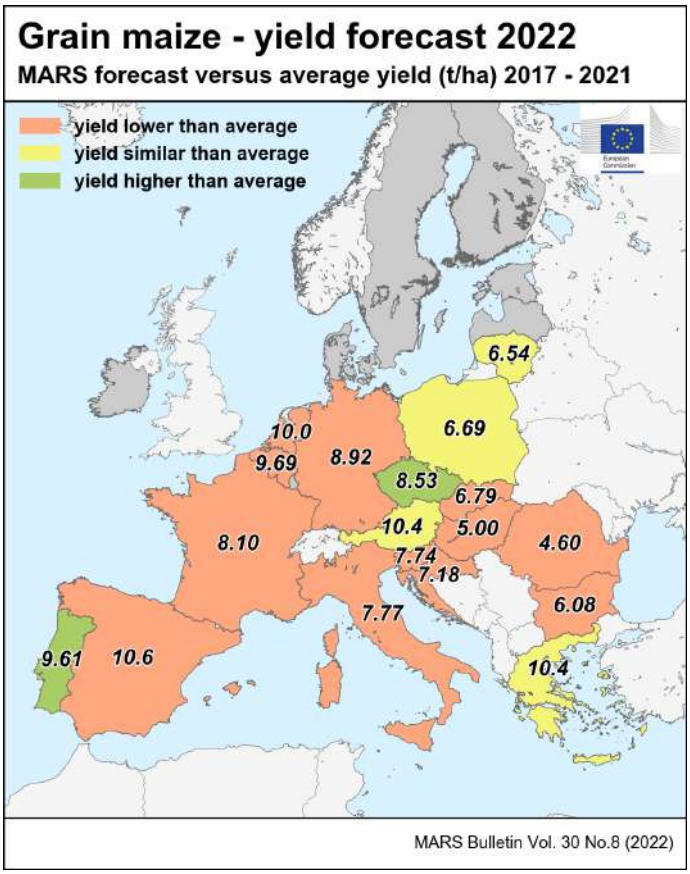
Country	Spring barley (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	4.13	4.22	**4.12**	– 0.2	– 2.2
AT	4.12	4.36	**4.40**	+ 6.9	+ 0.9
BE	—	—	**—**	—	—
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	5.04	5.09	**5.14**	+ 2.0	+ 1.1
DE	5.20	5.09	**5.26**	+ 1.2	+ 3.4
DK	5.53	5.51	**6.27**	+ 13	+ 14
EE	3.46	2.79	**3.87**	+ 12	+ 38
EL	—	—	**—**	—	—
ES	3.29	3.61	**3.05**	– 7.2	– 16
FI	3.55	2.66	**3.59**	+ 1.2	+ 35
FR	5.97	6.10	**5.50**	– 7.9	– 9.8
HR	—	—	**—**	—	—
HU	4.16	4.72	**3.50**	– 16	– 26
IE	7.25	7.89	**7.55**	+ 4.2	– 4.3
IT	—	—	**—**	—	—
LT	3.36	3.30	**3.49**	+ 3.8	+ 5.6
LU	—	—	**—**	—	—
LV	3.01	2.46	**3.33**	+ 10	+ 35
MT	—	—	**—**	—	—
NL	6.29	6.17	**6.83**	+ 8.5	+ 11
PL	3.47	3.78	**3.58**	+ 3.3	– 5.2
PT	—	—	**—**	—	—
RO	2.78	3.42	**2.62**	– 5.8	– 23
SE	4.39	3.77	**4.98**	+ 13	+ 32
SI	—	—	**—**	—	—
SK	4.40	4.72	**4.34**	– 1.3	– 7.9



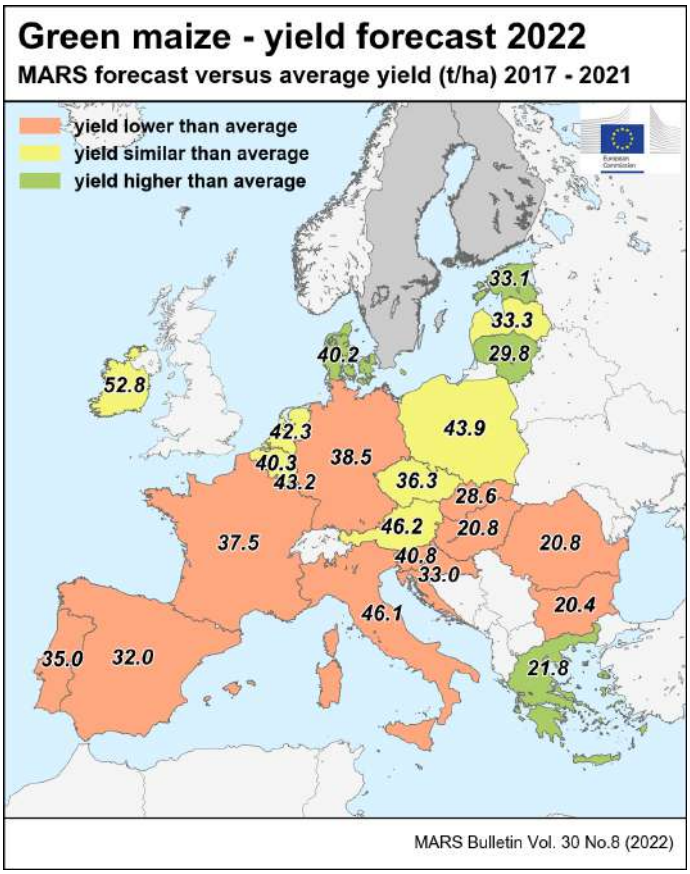
Country	Winter barley (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	5.75	6.09	**5.72**	– 0.5	– 6.0
AT	6.52	6.53	**6.63**	+ 1.7	+ 1.5
BE	8.19	7.97	**8.38**	+ 2.3	+ 5.1
BG	4.70	5.45	**4.90**	+ 4.1	– 10
CY	1.79	1.83	**2.05**	+ 15	+ 12
CZ	5.76	5.87	**5.82**	+ 1.0	– 0.9
DE	6.91	7.16	**7.19**	+ 4.1	+ 0.4
DK	6.60	6.64	**7.06**	+ 6.9	+ 6.3
EE	5.02	5.11	**4.95**	– 1.4	– 3.2
EL	2.67	2.47	**2.89**	+ 8.3	+ 17
ES	2.69	2.98	**2.50**	– 7.2	– 16
FI	—	—	**—**	—	—
FR	6.47	6.85	**6.31**	– 2.6	– 7.9
HR	5.01	5.49	**5.02**	+ 0.1	– 8.6
HU	5.72	6.58	**4.70**	– 18	– 29
IE	9.07	9.42	**9.27**	+ 2.2	– 1.6
IT	4.09	4.21	**3.93**	– 4.1	– 6.7
LT	4.15	4.17	**4.48**	+ 7.9	+ 7.5
LU	—	—	**—**	—	—
LV	4.86	4.95	**4.96**	+ 1.9	+ 0.3
MT	—	—	**—**	—	—
NL	8.12	7.83	**8.65**	+ 6.5	+ 11
PL	4.58	4.77	**4.60**	+ 0.5	– 3.6
PT	2.96	3.35	**2.40**	– 19	– 28
RO	4.50	5.54	**4.27**	– 5.0	– 23
SE	5.94	5.58	**6.61**	+ 11	+ 19
SI	4.97	5.45	**4.56**	– 8.4	– 16
SK	5.30	5.72	**5.55**	+ 4.8	– 2.9



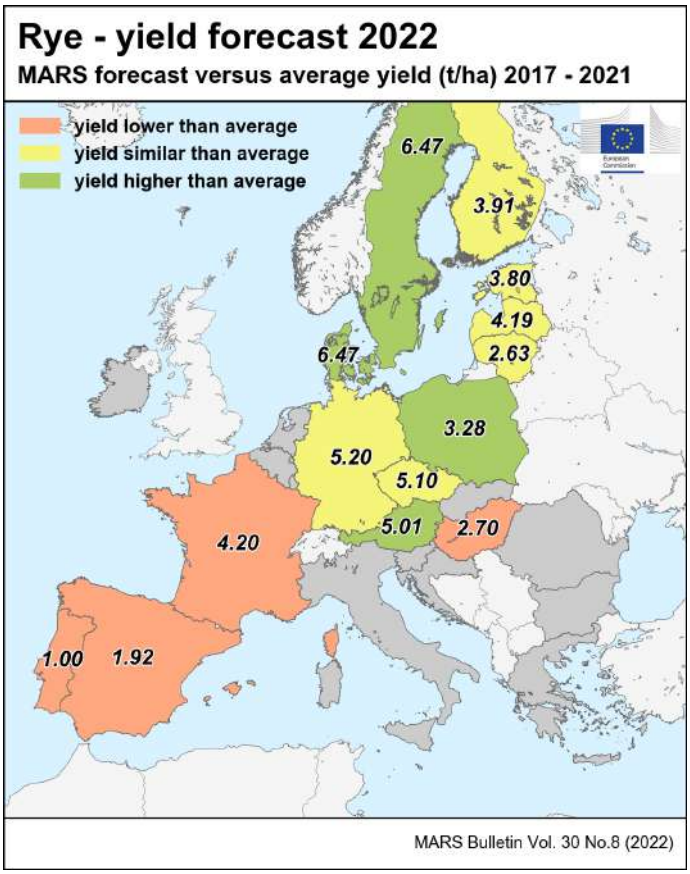
Country	Grain maize (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	7.87	7.91	**6.63**	– 16	– 16
AT	10.6	11.2	**10.4**	– 1.6	– 6.5
BE	10.6	11.9	**9.69**	– 8.9	– 19
BG	6.40	5.89	**6.08**	– 5.0	+ 3.2
CY	—	—	**—**	—	—
CZ	8.12	9.65	**8.53**	+ 5.0	– 12
DE	9.50	10.4	**8.92**	– 6.1	– 14
DK	—	—	**—**	—	—
EE	—	—	**—**	—	—
EL	10.2	9.91	**10.4**	+ 2.1	+ 5.3
ES	11.9	12.3	**10.6**	– 11	– 14
FI	—	—	**—**	—	—
FR	9.09	10.0	**8.10**	– 11	– 19
HR	8.12	7.77	**7.18**	– 12	– 7.6
HU	7.57	6.04	**5.00**	– 34	– 17
IE	—	—	**—**	—	—
IT	10.3	10.3	**7.77**	– 25	– 25
LT	6.59	5.86	**6.54**	– 0.8	+ 12
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	10.8	12.9	**10.0**	– 6.8	– 22
PL	6.79	7.47	**6.69**	– 1.5	– 11
PT	9.18	9.75	**9.61**	+ 4.6	– 1.5
RO	5.99	5.90	**4.60**	– 23	– 22
SE	—	—	**—**	—	—
SI	9.22	9.39	**7.74**	– 16	– 18
SK	7.54	7.86	**6.79**	– 10	– 14



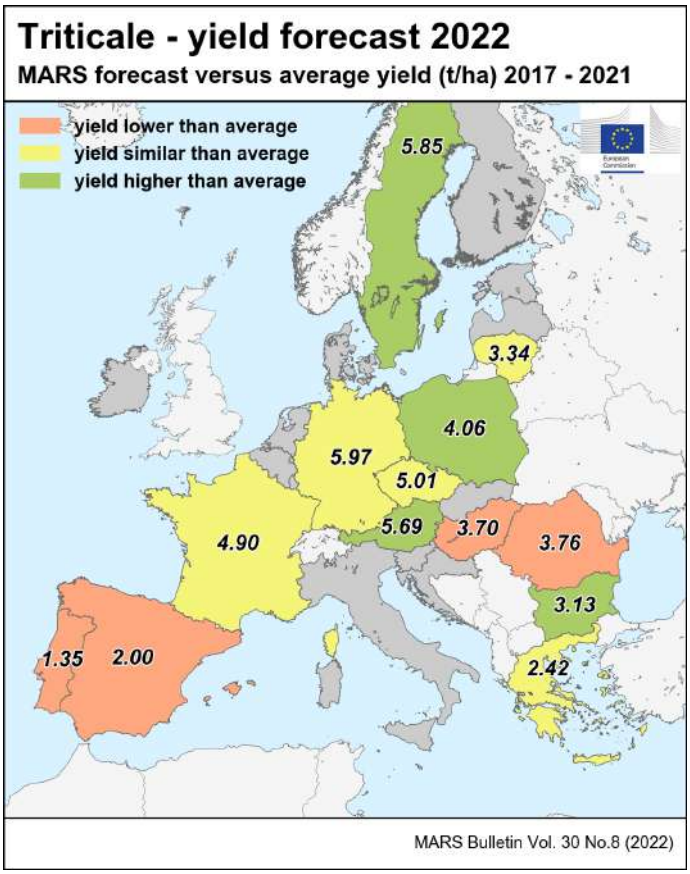
Country	Green maize (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU*	41.6	45.5	**38.6**	– 7.0	– 15
AT	46.6	47.1	**46.2**	– 0.7	– 1.8
BE	40.6	43.6	**40.3**	– 0.8	– 7.6
BG	21.6	19.1	**20.4**	– 5.7	+ 6.9
CY	—	—	**—**	—	—
CZ	35.6	38.9	**36.3**	+ 2.1	– 6.5
DE	42.2	47.2	**38.5**	– 8.8	– 18
DK	38.3	40.7	**40.2**	+ 4.9	– 1.1
EE	31.4	27.4	**33.1**	+ 5.5	+ 21
EL	20.2	20.5	**21.8**	+ 7.6	+ 6.1
ES	36.5	37.0	**32.0**	– 12	– 13
FI	—	—	**—**	—	—
FR	41.7	47.3	**37.5**	– 10	– 21
HR	37.7	34.9	**33.0**	– 13	– 5.4
HU	29.8	27.8	**20.8**	– 30	– 25
IE	52.5	59.7	**52.8**	+ 0.6	– 12
IT	51.7	53.6	**46.1**	– 11	– 14
LT	28.4	27.7	**29.8**	+ 4.6	+ 7.6
LU	47.3	53.0	**43.2**	– 8.7	– 19
LV	32.3	28.9	**33.3**	+ 3.2	+ 15
MT	—	—	**—**	—	—
NL	43.8	45.2	**42.3**	– 3.5	– 6.4
PL	45.3	48.4	**43.9**	– 3.1	– 9.2
PT	40.2	43.9	**35.0**	– 13	– 20
RO	27.2	26.1	**20.8**	– 23	– 20
SE	—	—	**—**	—	—
SI	45.4	42.9	**40.8**	– 10	– 4.8
SK	29.9	27.9	**28.6**	– 4.2	+ 2.6



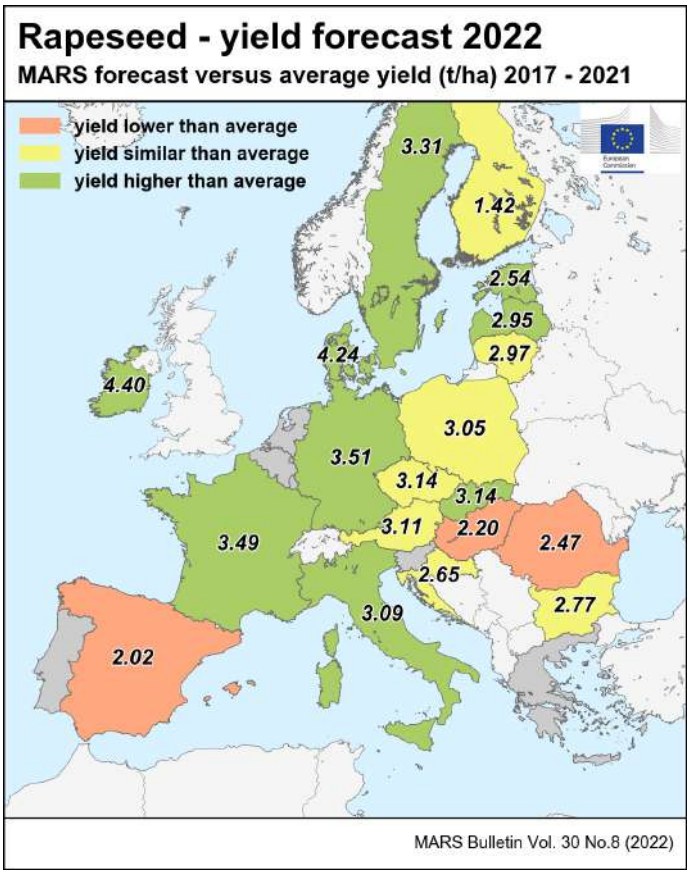
Country	Rye (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	3.90	4.18	**4.11**	+ 5.3	– 1.6
AT	4.52	4.61	**5.01**	+ 11	+ 8.7
BE	—	—	—	—	—
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	5.07	5.03	**5.10**	+ 0.6	+ 1.3
DE	5.10	5.27	**5.20**	+ 2.0	– 1.2
DK	6.08	6.34	**6.47**	+ 6.3	+ 2.0
EE	3.77	3.61	**3.80**	+ 0.8	+ 5.1
EL	—	—	—	—	—
ES	2.31	2.56	**1.92**	– 17	– 25
FI	3.93	3.67	**3.91**	– 0.5	+ 6.6
FR	4.46	4.40	**4.20**	– 5.9	– 4.6
HR	—	—	—	—	—
HU	3.31	3.18	**2.70**	– 18	– 15
IE	—	—	—	—	—
IT	—	—	—	—	—
LT	2.57	2.43	**2.63**	+ 2.3	+ 8.1
LU	—	—	—	—	—
LV	4.13	3.84	**4.19**	+ 1.4	+ 9.1
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	2.99	3.31	**3.28**	+ 9.8	– 0.9
PT	1.07	1.14	**1.00**	– 7.0	– 13
RO	—	—	—	—	—
SE	6.06	5.66	**6.47**	+ 6.8	+ 14
SI	—	—	—	—	—
SK	—	—	—	—	—



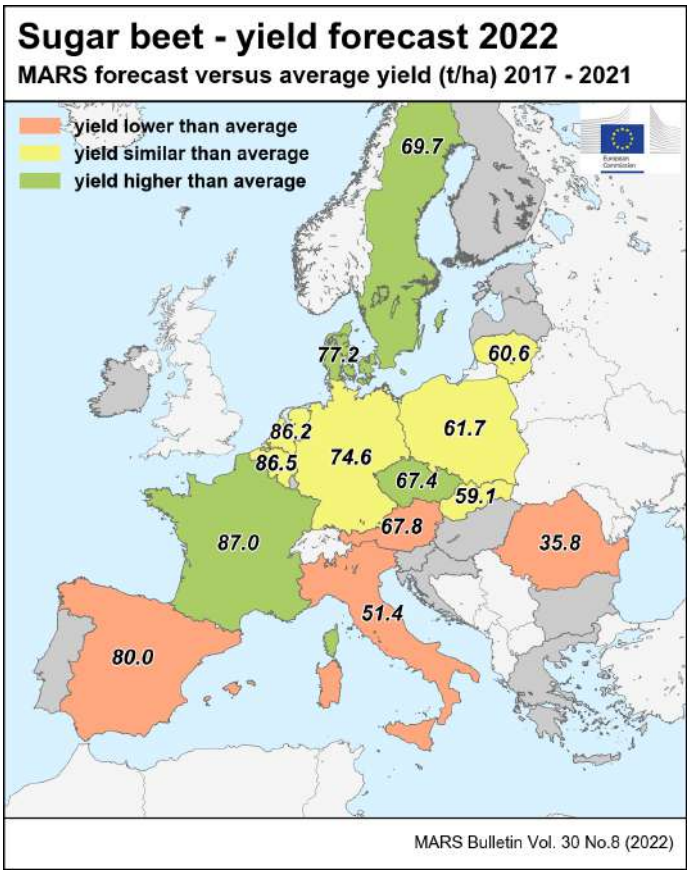
Country	Triticale (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	4.19	4.41	**4.21**	+ 0.4	– 4.7
AT	5.36	5.29	**5.69**	+ 6.1	+ 7.6
BE	—	—	—	—	—
BG	3.00	3.28	**3.13**	+ 4.5	– 4.3
CY	—	—	—	—	—
CZ	4.84	4.73	**5.01**	+ 3.5	+ 5.8
DE	5.86	5.81	**5.97**	+ 1.8	+ 2.6
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	2.37	2.46	**2.42**	+ 2.4	– 1.4
ES	2.64	2.94	**2.00**	– 24	– 32
FI	—	—	—	—	—
FR	5.09	5.20	**4.90**	– 3.8	– 5.8
HR	—	—	—	—	—
HU	4.02	4.36	**3.70**	– 8.0	– 15
IE	—	—	—	—	—
IT	—	—	—	—	—
LT	3.25	2.77	**3.34**	+ 2.8	+ 21
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	3.87	4.25	**4.06**	+ 4.9	– 4.5
PT	1.60	1.54	**1.35**	– 16	– 12
RO	4.03	4.55	**3.76**	– 6.8	– 18
SE	5.57	5.14	**5.85**	+ 5.1	+ 14
SI	—	—	—	—	—
SK	—	—	—	—	—



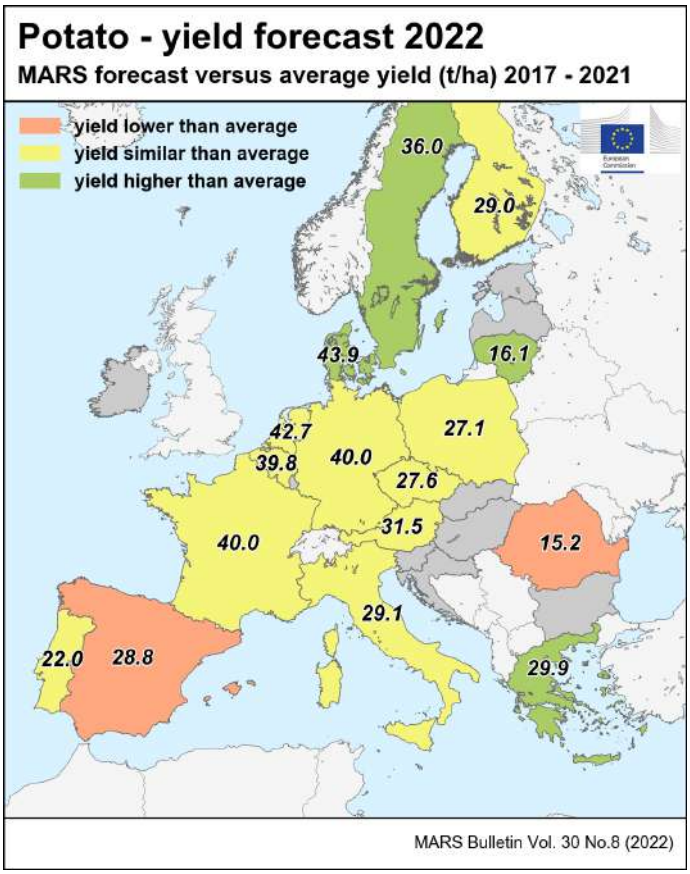
Country	Rape and turnip rape (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	3.07	3.19	**3.15**	+ 2.4	– 1.5
AT	3.00	3.04	**3.11**	+ 3.6	+ 2.2
BE	—	—	**—**	—	—
BG	2.72	2.84	**2.77**	+ 1.7	– 2.8
CY	—	—	**—**	—	—
CZ	3.16	2.99	**3.14**	– 0.5	+ 4.9
DE	3.33	3.50	**3.51**	+ 5.6	+ 0.3
DK	4.00	4.01	**4.24**	+ 6.0	+ 5.7
EE	2.41	2.74	**2.54**	+ 5.3	– 7.4
EL	—	—	**—**	—	—
ES	2.14	2.18	**2.02**	– 5.3	– 7.2
FI	1.39	1.20	**1.42**	+ 2.1	+ 18
FR	3.28	3.35	**3.49**	+ 6.3	+ 4.1
HR	2.76	2.42	**2.65**	– 3.8	+ 9.4
HU	2.96	2.81	**2.20**	– 26	– 22
IE	4.22	4.56	**4.40**	+ 4.3	– 3.6
IT	2.80	3.05	**3.09**	+ 10	+ 1.1
LT	2.89	2.91	**2.97**	+ 2.5	+ 1.8
LU	—	—	**—**	—	—
LV	2.77	2.90	**2.95**	+ 6.8	+ 1.8
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	2.95	3.21	**3.05**	+ 3.5	– 4.9
PT	—	—	**—**	—	—
RO	2.61	3.09	**2.47**	– 5.4	– 20
SE	3.18	3.24	**3.31**	+ 4.1	+ 2.3
SI	—	—	**—**	—	—
SK	3.01	3.09	**3.14**	+ 4.3	+ 1.6



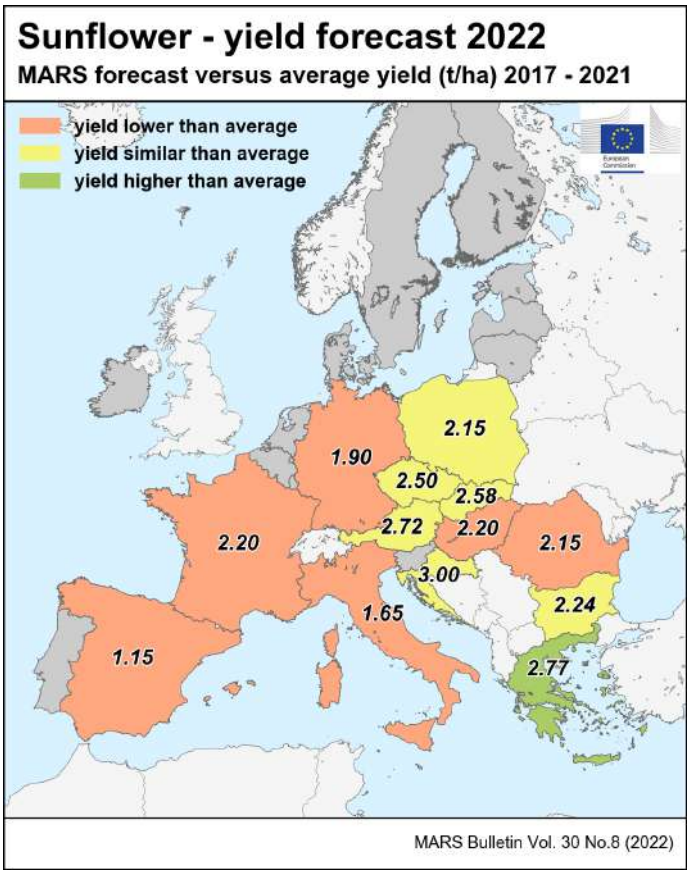
Country	Sugar beets (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	74.4	N/A	**75.3**	+ 1.2	N/A
AT	73.6	79.7	**67.8**	– 7.9	– 15
BE	86.7	82.5	**86.5**	– 0.3	+ 4.8
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	63.0	67.7	**67.4**	+ 7.0	– 0.4
DE	75.1	81.8	**74.6**	– 0.6	– 8.8
DK	73.3	77.5	**77.2**	+ 5.3	– 0.4
EE	—	—	**—**	—	—
EL	—	—	**—**	—	—
ES	87.5	87.5	**80.0**	– 8.5	– 8.5
FI	—	—	**—**	—	—
FR	82.3	85.7	**87.0**	+ 5.7	+ 1.6
HR	—	—	**—**	—	—
HU	—	—	**—**	—	—
IE	—	—	**—**	—	—
IT	67.6	N/A	**51.4**	– 24	N/A
LT	61.6	58.3	**60.6**	– 1.7	+ 3.8
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	84.0	N/A	**86.2**	+ 2.7	N/A
PL	61.4	61.0	**61.7**	+ 0.5	+ 1.1
PT	—	—	**—**	—	—
RO	38.8	39.6	**35.8**	– 7.8	– 9.7
SE	66.2	71.9	**69.7**	+ 5.3	– 3.0
SI	—	—	**—**	—	—
SK	59.1	62.6	**59.1**	+ 0.1	– 5.5



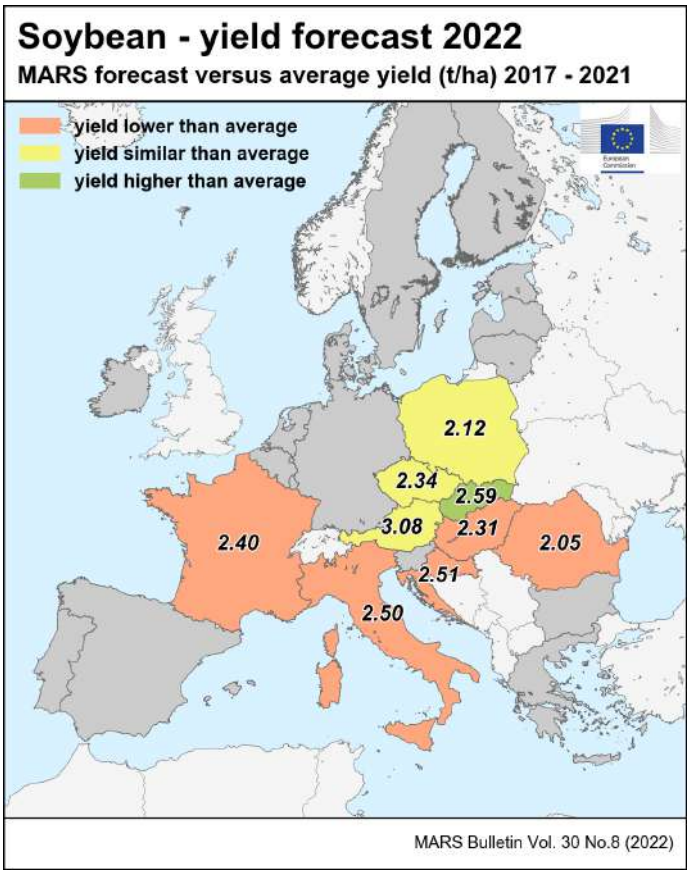
Country	Potato (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	34.2	N/A	**34.2**	+ 0.2	N/A
AT	32.0	34.1	**31.5**	– 1.6	– 7.8
BE	40.9	42.9	**39.8**	– 2.5	– 7.1
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	28.2	29.4	**27.6**	– 1.9	– 6.2
DE	41.6	43.8	**40.0**	– 3.7	– 8.6
DK	41.6	42.3	**43.9**	+ 5.7	+ 3.9
EE	—	—	—	—	—
EL	28.0	25.5	**29.9**	+ 6.9	+ 17
ES	31.8	32.5	**28.8**	– 9.7	– 11
FI	28.7	27.5	**29.0**	+ 1.0	+ 5.5
FR	41.4	41.5	**40.0**	– 3.3	– 3.6
HR	—	—	—	—	—
HU	—	—	—	—	—
IE	—	—	—	—	—
IT	29.2	29.2	**29.1**	– 0.3	– 0.1
LT	15.0	13.1	**16.1**	+ 7.2	+ 23
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	41.8	N/A	**42.7**	+ 2.2	N/A
PL	27.4	30.0	**27.1**	– 1.0	– 9.7
PT	22.6	24.0	**22.0**	– 2.4	– 8.3
RO	16.7	16.5	**15.2**	– 9.1	– 8.0
SE	34.4	34.8	**36.0**	+ 4.6	+ 3.3
SI	—	—	—	—	—
SK	—	—	—	—	—



Country	Sunflower (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	2.34	2.38	**2.06**	– 12	– 14
AT	2.71	3.01	**2.72**	+ 0.3	– 9.8
BE	—	—	—	—	—
BG	2.31	2.38	**2.24**	– 3.0	– 5.8
CY	—	—	—	—	—
CZ	2.54	2.90	**2.50**	– 1.7	– 14
DE	2.20	2.60	**1.90**	– 14	– 27
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	2.65	2.53	**2.77**	+ 4.6	+ 9.6
ES	1.24	1.22	**1.15**	– 7.3	– 6.1
FI	—	—	—	—	—
FR	2.39	2.74	**2.20**	– 7.9	– 20
HR	3.05	3.04	**3.00**	– 1.5	– 1.4
HU	2.87	2.70	**2.20**	– 23	– 19
IE	—	—	—	—	—
IT	2.40	2.40	**1.65**	– 32	– 31
LT	—	—	—	—	—
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	2.13	2.38	**2.15**	+ 0.6	– 9.7
PT	—	—	—	—	—
RO	2.61	2.54	**2.15**	– 18	– 15
SE	—	—	—	—	—
SI	—	—	—	—	—
SK	2.65	2.66	**2.58**	– 2.6	– 2.9



Country	Soybean (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	2.88	2.82	**2.46**	– 15	– 13
AT	2.98	3.06	**3.08**	+ 3.5	+ 0.5
BE	—	—	**—**	—	—
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	2.28	2.61	**2.34**	+ 2.9	– 10
DE	—	—	**—**	—	—
DK	—	—	**—**	—	—
EE	—	—	**—**	—	—
EL	—	—	**—**	—	—
ES	—	—	**—**	—	—
FI	—	—	**—**	—	—
FR	2.61	2.85	**2.40**	– 8.1	– 16
HR	2.88	2.63	**2.51**	– 13	– 4.6
HU	2.71	2.61	**2.31**	– 15	– 11
IE	—	—	**—**	—	—
IT	3.42	3.11	**2.50**	– 27	– 20
LT	—	—	**—**	—	—
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	2.08	2.25	**2.12**	+ 1.5	– 6.0
PT	—	—	**—**	—	—
RO	2.43	2.49	**2.05**	– 16	– 18
SE	—	—	**—**	—	—
SI	—	—	**—**	—	—
SK	2.44	2.52	**2.59**	+ 6.2	+ 2.9



Country	Wheat (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
BY	3.45	3.54	**3.62**	+ 4.8	+ 2.2
TR	2.79	2.66	**2.90**	+ 4.0	+ 9.0
UA	4.07	4.53	**4.11**	+ 0.9	– 9.3
UK	8.03	7.80	**8.12**	+ 1.1	+ 4.1

Country	Barley (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
BY	2.85	2.86	**3.32**	+ 17	+ 16
TR	2.53	1.87	**2.56**	+ 1.1	+ 37
UA	3.35	3.82	**3.34**	– 0.2	– 13
UK	6.15	6.09	**6.24**	+ 1.6	+ 2.6

Country	Grain maize (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
BY	5.58	5.31	**5.75**	+ 2.9	+ 8.2
TR	9.30	8.90	**9.47**	+ 1.8	+ 6.4
UA	6.76	7.68	**7.21**	+ 6.5	– 6.2
UK	—	—	**—**	—	—

Country	Soybean (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
BY	—	—	**—**	—	—
TR	4.29	4.15	**4.64**	+ 8.1	+ 12
UA	2.29	2.64	**2.40**	+ 4.8	– 9.1
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 July 2022, received on 26.07.2022), Eurostat Eurobase (last update: 29.07.2022) and EES (last update: 15.11.2017).

Non-EU 2017-2021 data come from USDA, Turkish Statistical Institute (TurkStat), Eurostat Eurobase (last update: 29.07.2022), Ministry for Development of Economy, Trade and Agriculture of Ukraine, Department for Environment, Food & Rural Affairs of UK (DEFRA), FAO and PSD-online.

2022 yields come from MARS Crop Yield Forecasting System (output up to 20.08.2022).

EU aggregate after 01.02.2020 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(%).

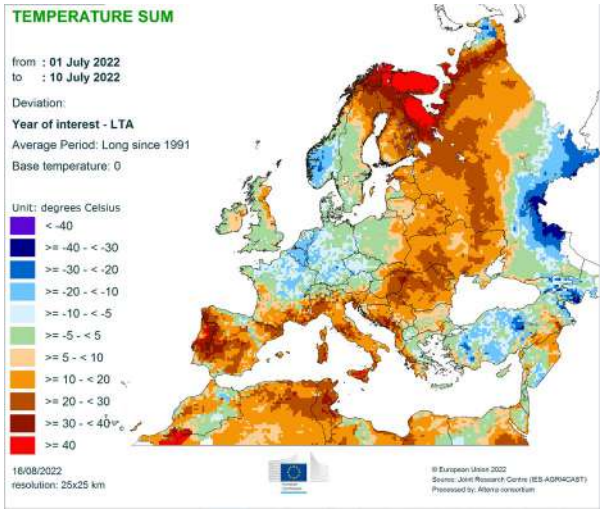
* The EU figures do not include green maize forecasts for Sweden since recent data on yields were not consistent.

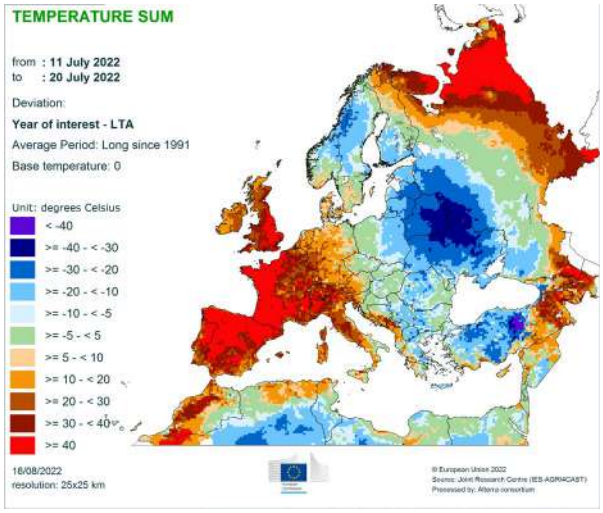
Cop name	Eurostat Crop name	Eurostat Crop Code	Official Eurostat Crop definition*
Total wheat	Wheat and spelt	C1100	Common wheat (*Triticum aestivum* L. emend. Fiori et Paol.), spelt (*Triticum spelta* L.), einkorn wheat (*Triticum monococcum* L.) and durum wheat (*Triticum durum* Desf.).
Total barley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

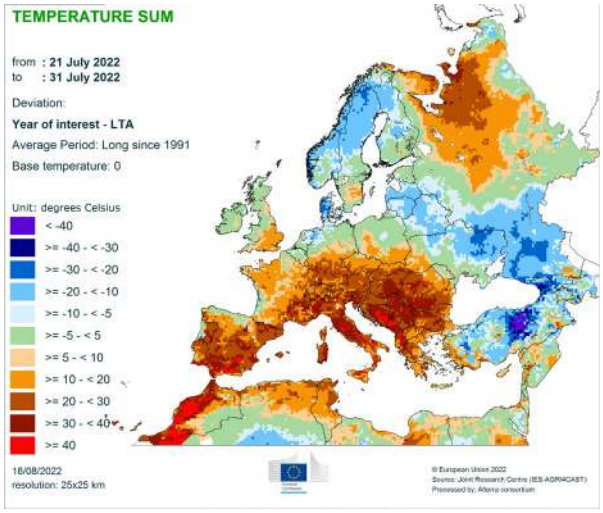
** Source:* Eurostat - Annual crop statistics (Handbook 2020 Edition)

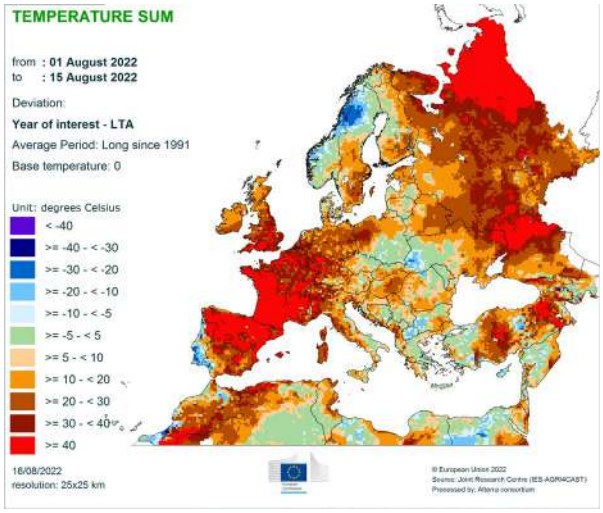
6. Atlas

Temperature regime

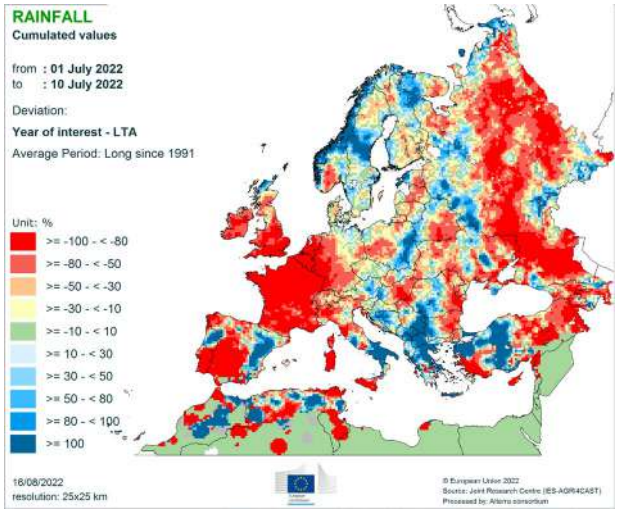


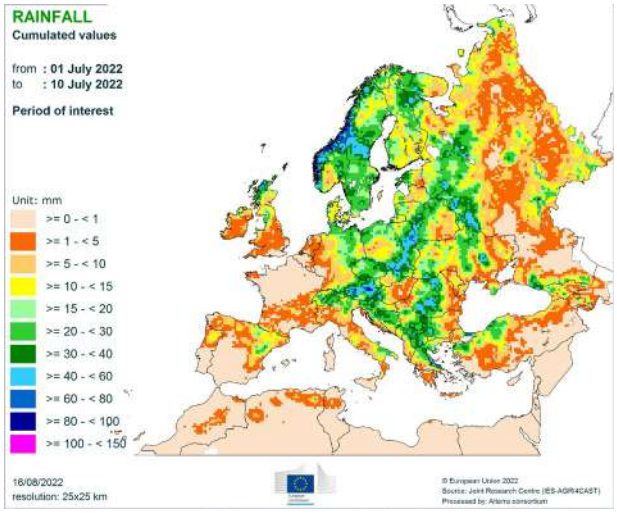


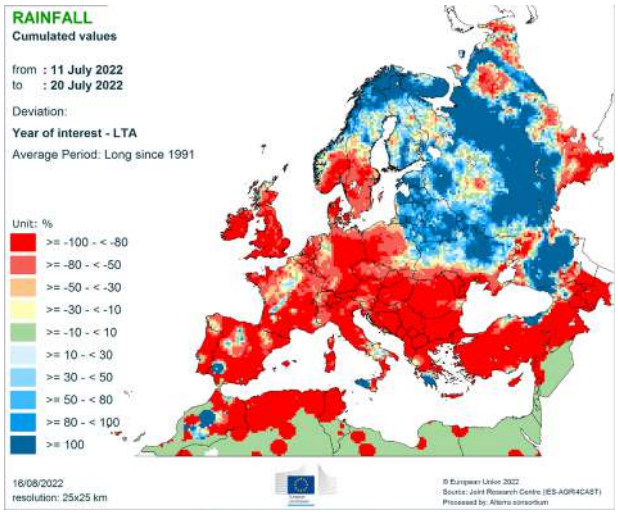


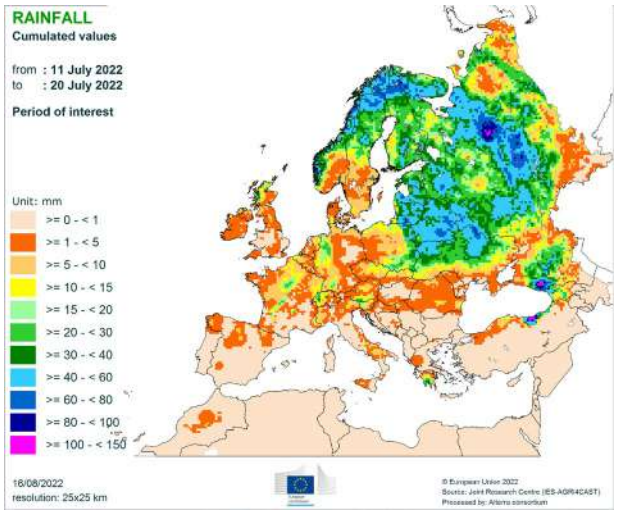


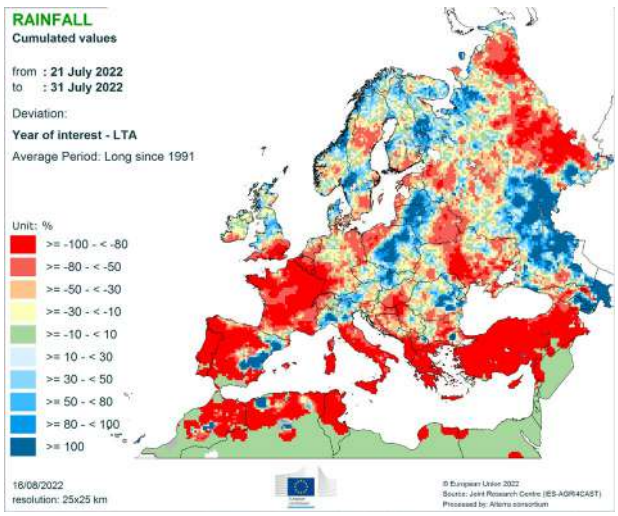
Precipitation

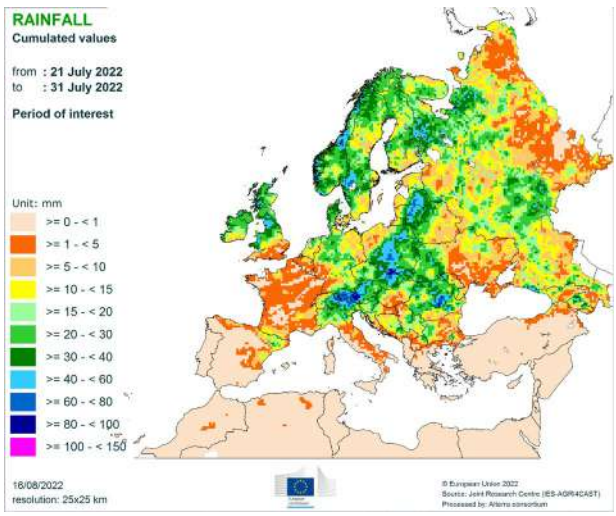


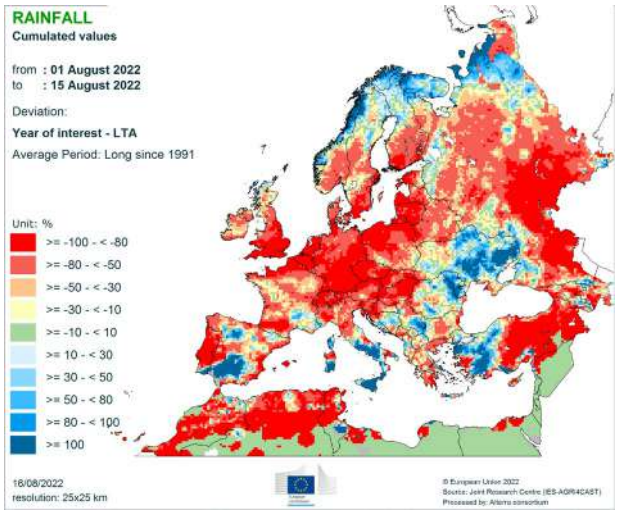


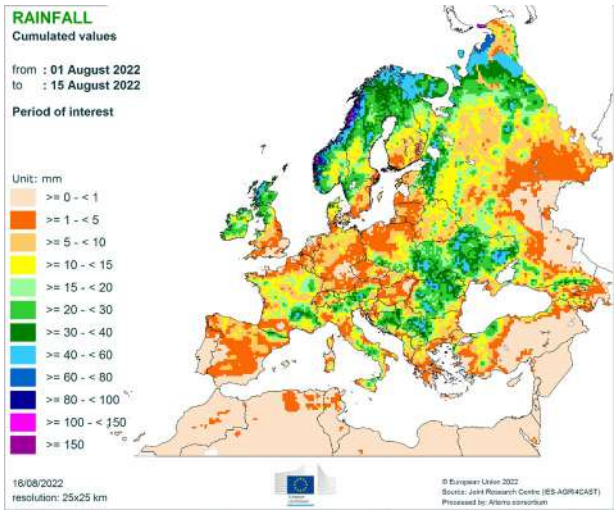




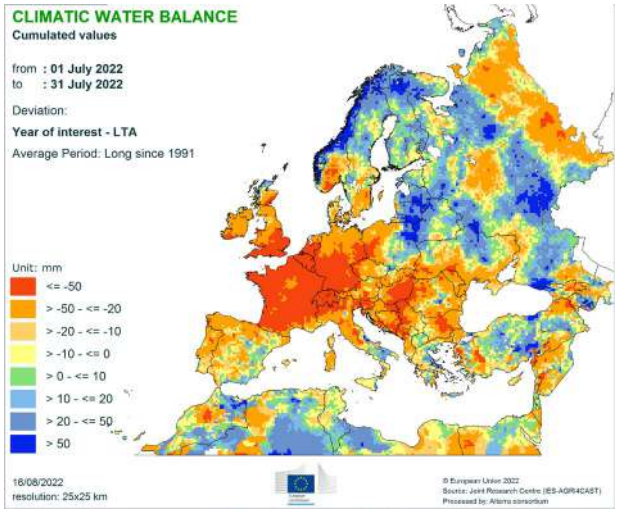


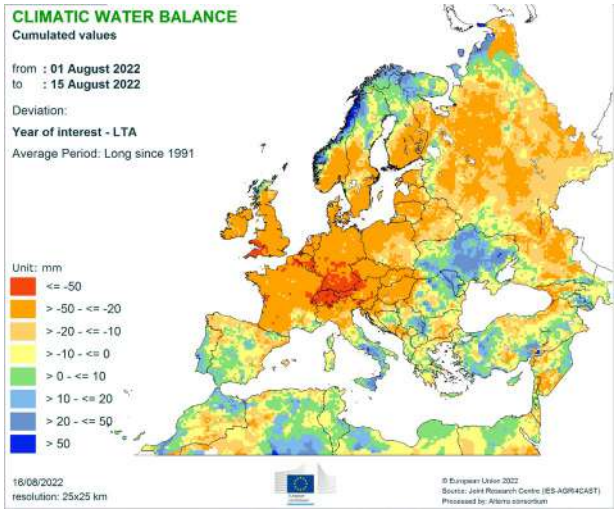




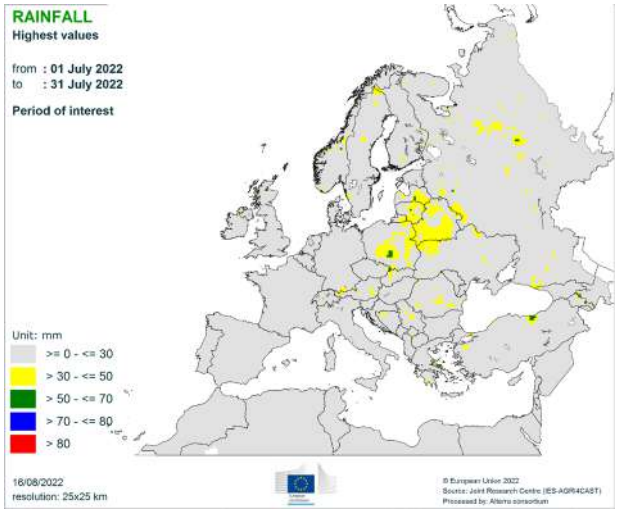


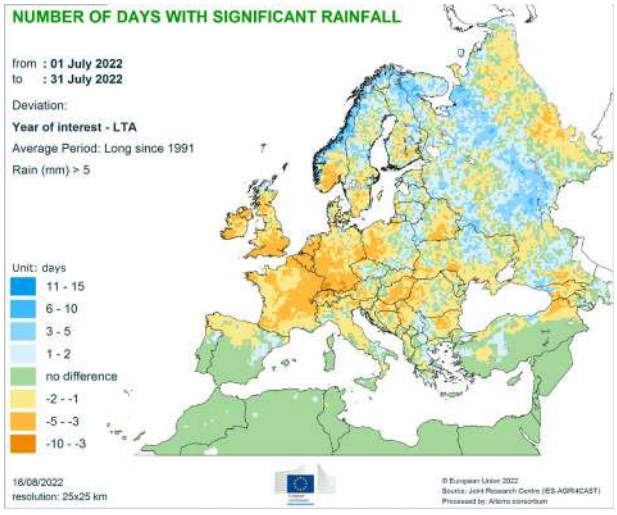
Climatic water balance

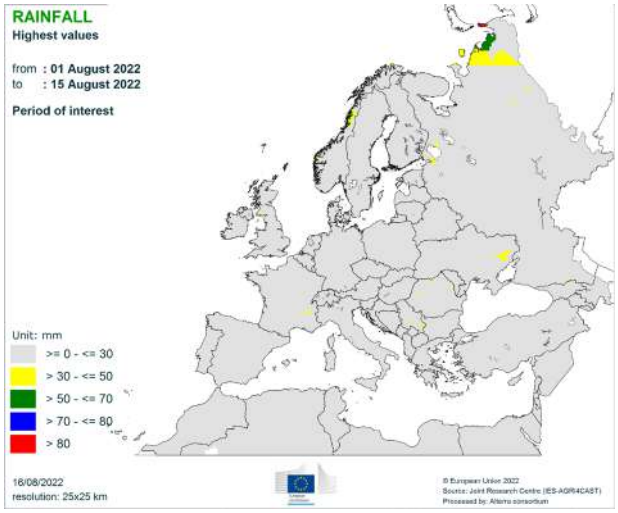


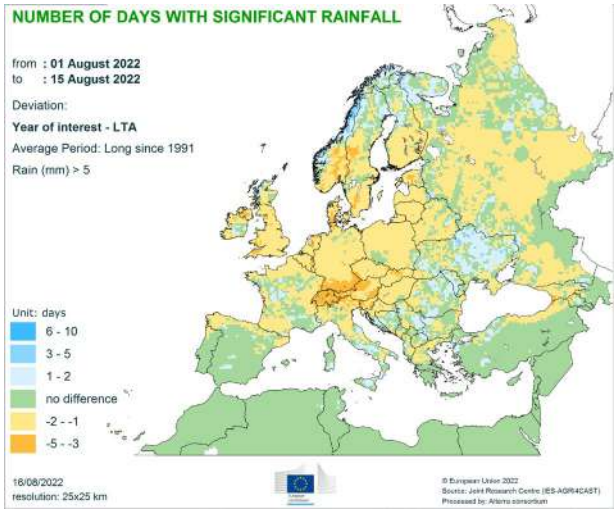


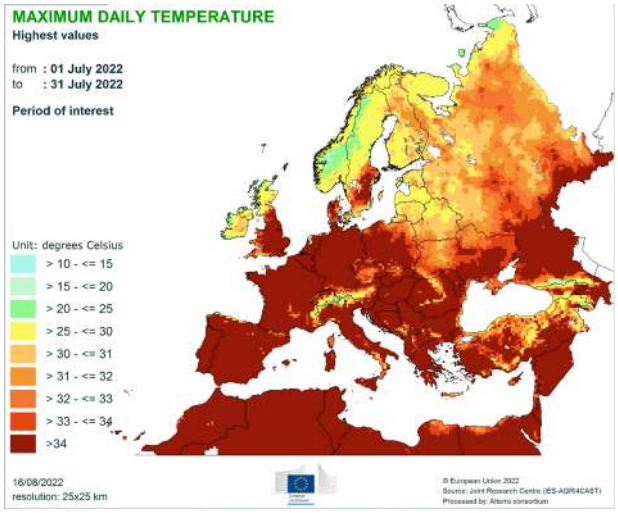
Weather events

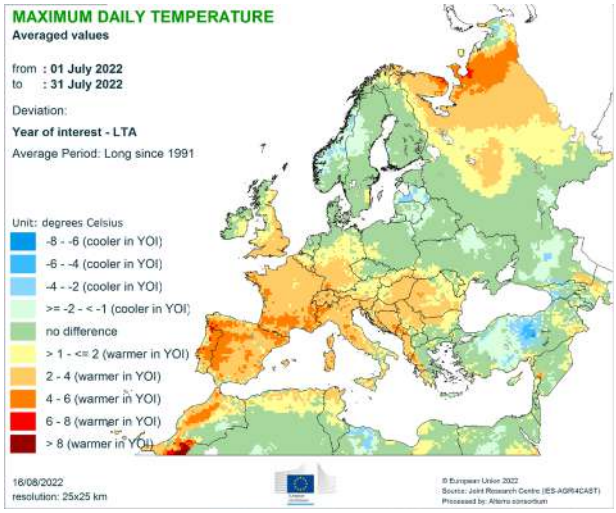


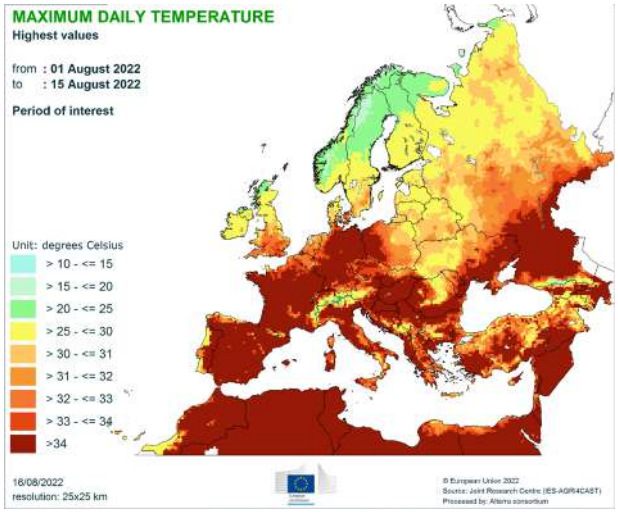


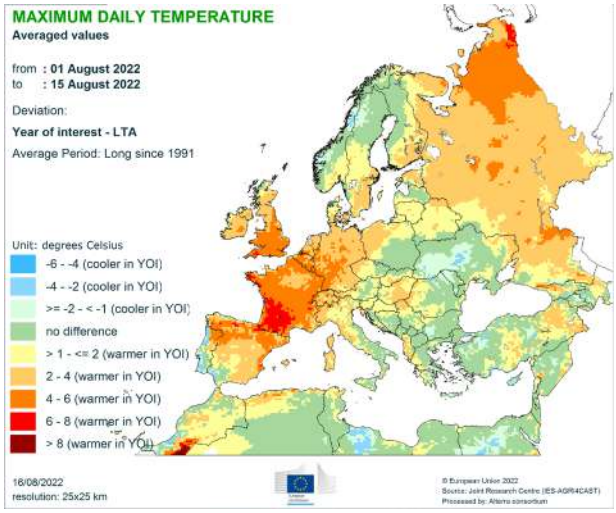

RAINFALL
Highest values
from : 01 August 2022
to : 15 August 2022
Period of interest
Unit: mm
>= 0 - <= 30
> 30 - <= 50
> 50 - <= 70
> 70 - <= 80
> 80
16/08/2022
resolution: 25x25 km

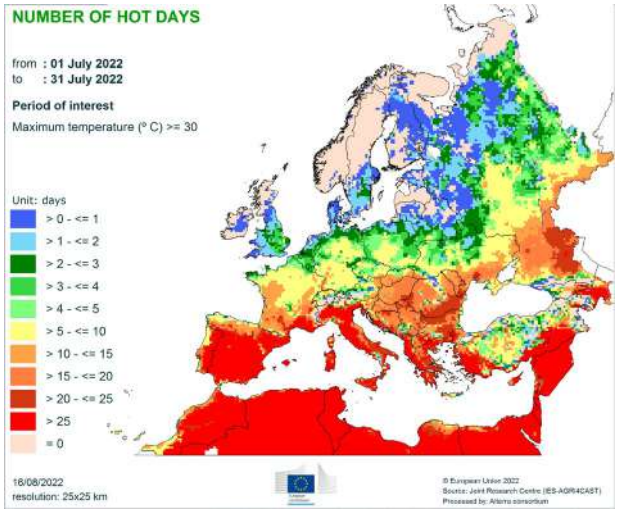

NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 August 2022
to : 15 August 2022
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Rain (mm) > 5
Unit: days
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
16/08/2022
resolution: 25x25 km

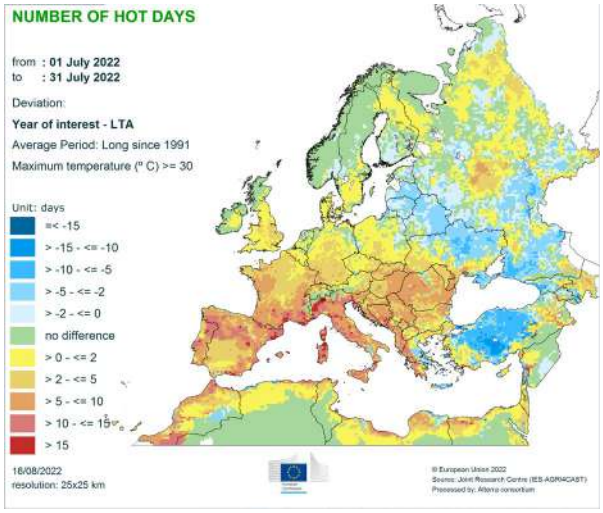

MAXIMUM DAILY TEMPERATURE
Highest values
from : 01 July 2022
to : 31 July 2022
Period of interest
Unit: degrees Celsius
> 10 - <= 15
> 15 - <= 20
> 20 - <= 25
> 25 - <= 30
> 30 - <= 31
> 31 - <= 32
> 32 - <= 33
> 33 - <= 34
>34
16/08/2022
resolution: 25x25 km

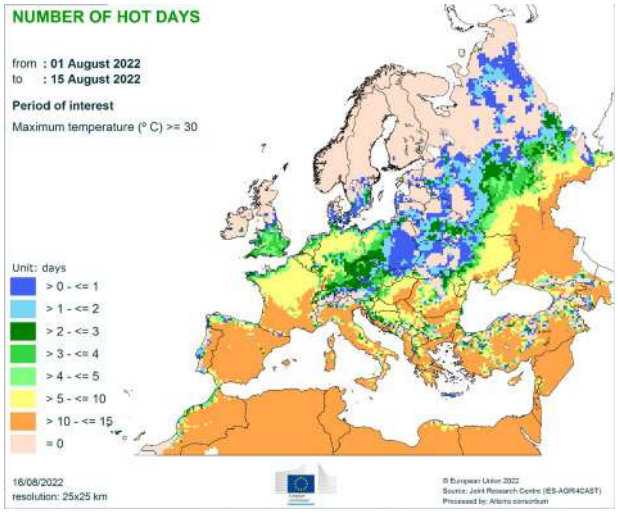

MAXIMUM DAILY TEMPERATURE
Averaged values
from : 01 July 2022
to : 31 July 2022
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Unit: degrees Celsius
-8 - -6 (cooler in YOI)
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
>= -2 - < -1 (cooler in YOI)
no difference
> 1 - <= 2 (warmer in YOI)
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
> 8 (warmer in YOI)
16/08/2022
resolution: 25x25 km

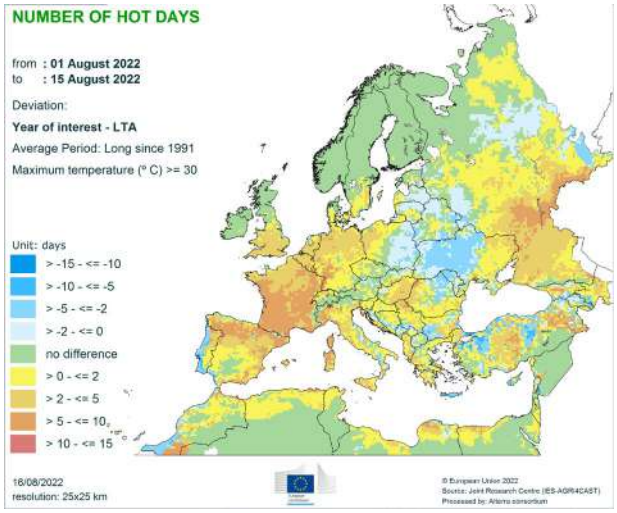

MAXIMUM DAILY TEMPERATURE
Highest values
from : 01 August 2022
to : 15 August 2022
Period of interest
Unit: degrees Celsius
> 10 - <= 15
> 15 - <= 20
> 20 - <= 25
> 25 - <= 30
> 30 - <= 31
> 31 - <= 32
> 32 - <= 33
> 33 - <= 34
>34
16/08/2022
resolution: 25x25 km


MAXIMUM DAILY TEMPERATURE
Averaged values
from : 01 August 2022
to : 15 August 2022
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Unit: degrees Celsius
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
>= -2 - < -1 (cooler in YOI)
no difference
> 1 - <= 2 (warmer in YOI)
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
> 8 (warmer in YOI)
16/08/2022
resolution: 25x25 km

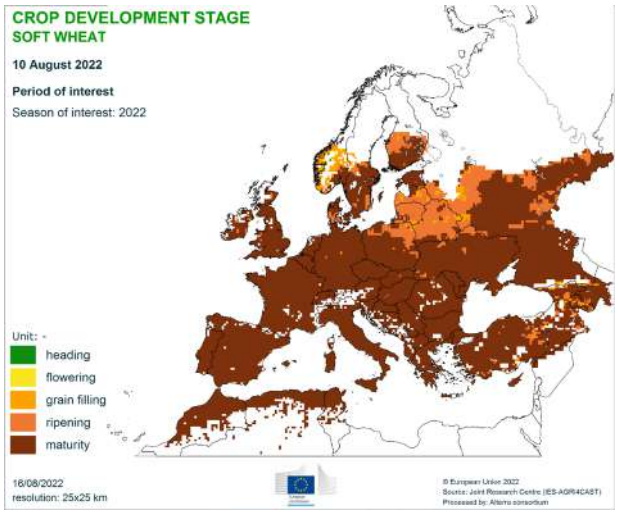


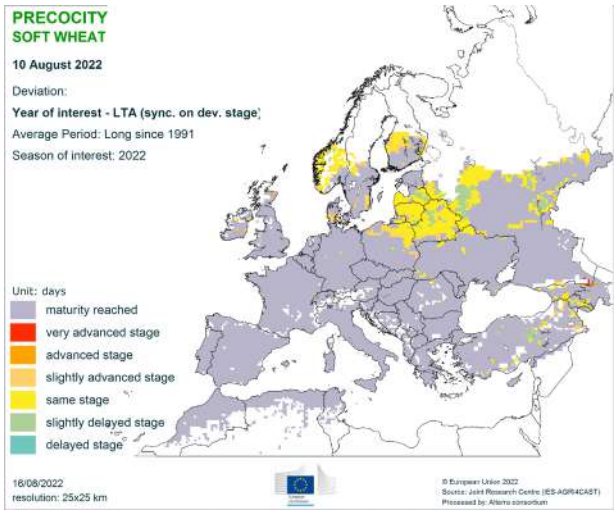


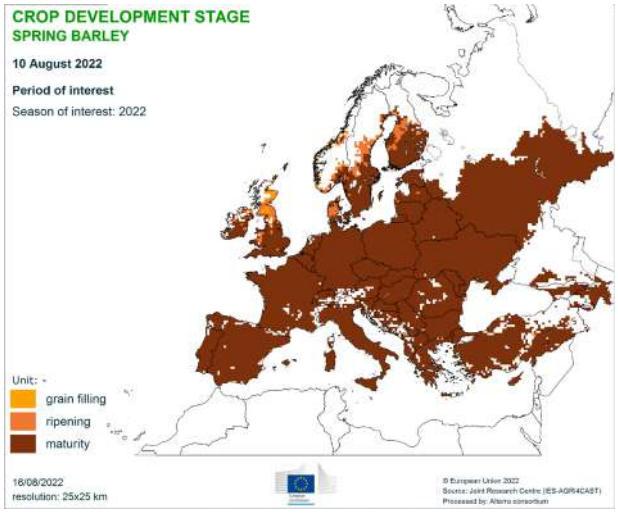


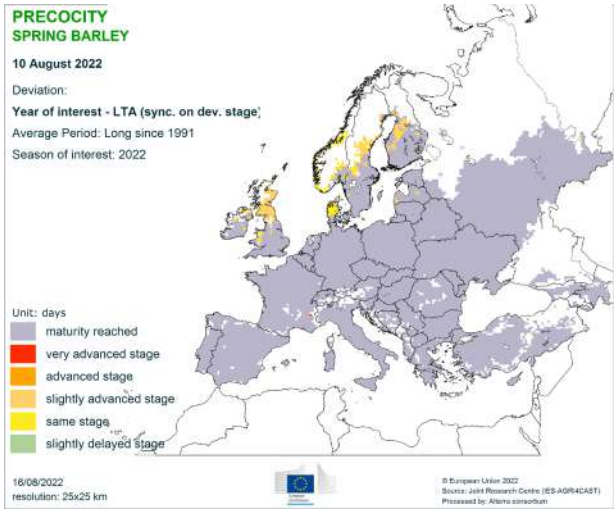


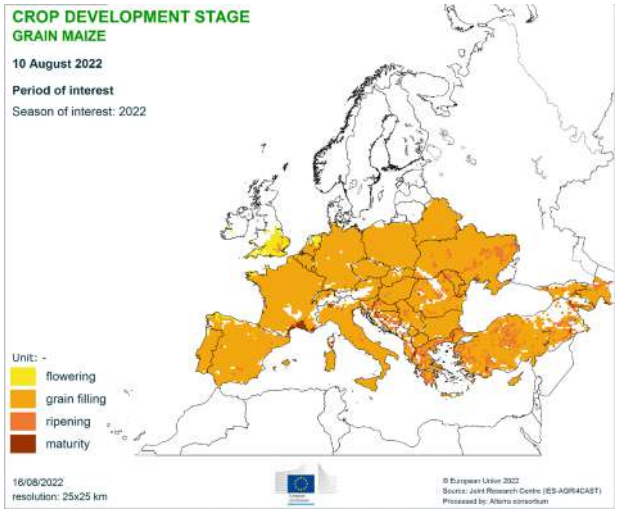
Crop development stages and precocity

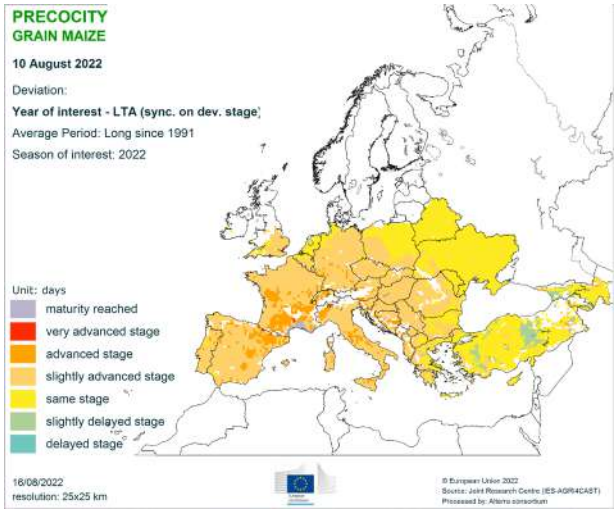


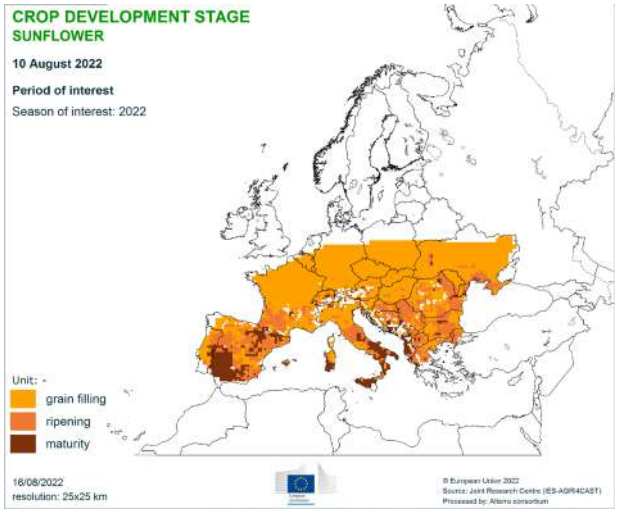


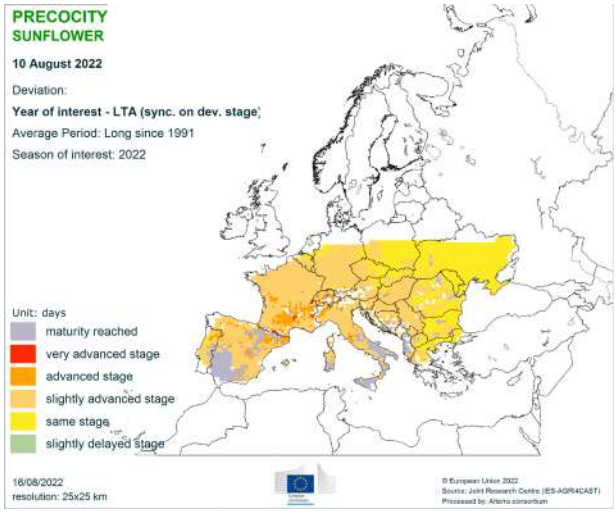

CROP DEVELOPMENT STAGE
SPRING BARLEY
10 August 2022
Period of interest
Season of interest: 2022
Unit: -
grain filling
ripening
maturity
16/08/2022
resolution: 25x25 km


PRECOCITY
SPRING BARLEY
10 August 2022
Deviation:
Year of interest - LTA (sync. on dev. stage)
Average Period: Long since 1991
Season of interest: 2022
Unit: days
maturity reached
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
16/08/2022
resolution: 25x25 km

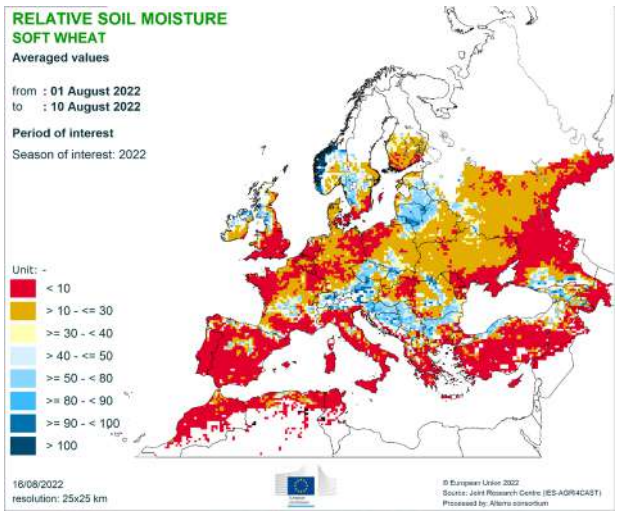

CROP DEVELOPMENT STAGE
GRAIN MAIZE
10 August 2022
Period of interest
Season of interest: 2022
Unit: -
flowering
grain filling
ripening
maturity
16/08/2022
resolution: 25x25 km

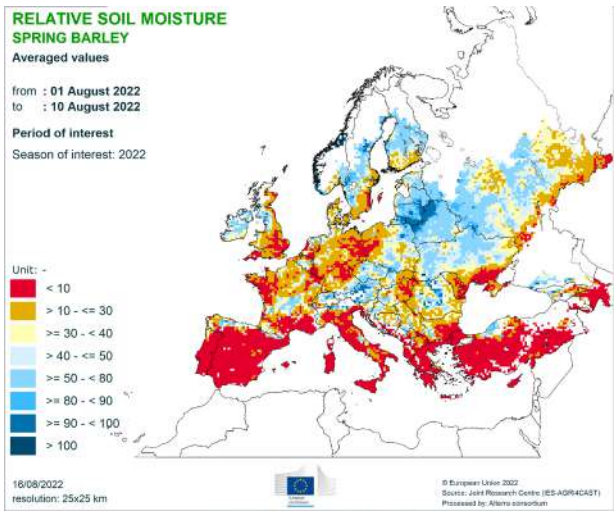

PRECOCITY
GRAIN MAIZE
10 August 2022
Deviation:
Year of interest - LTA (sync. on dev. stage)
Average Period: Long since 1991
Season of interest: 2022
Unit: days
maturity reached
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
delayed stage
16/08/2022
resolution: 25x25 km

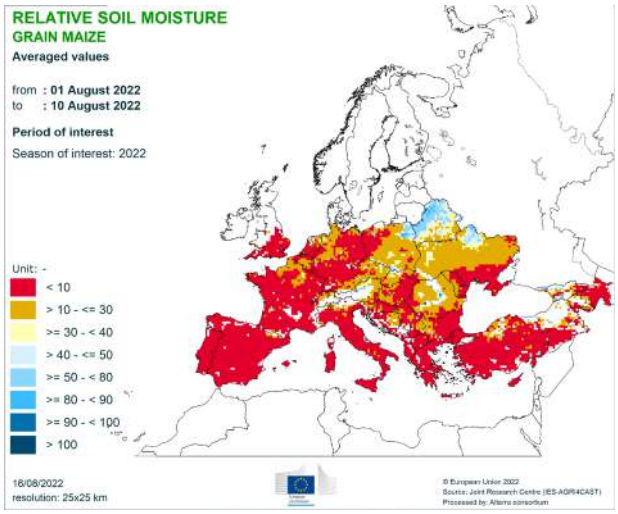

CROP DEVELOPMENT STAGE
SUNFLOWER
10 August 2022
Period of interest
Season of interest: 2022
Unit: -
grain filling
ripening
maturity
16/08/2022
resolution: 25x25 km

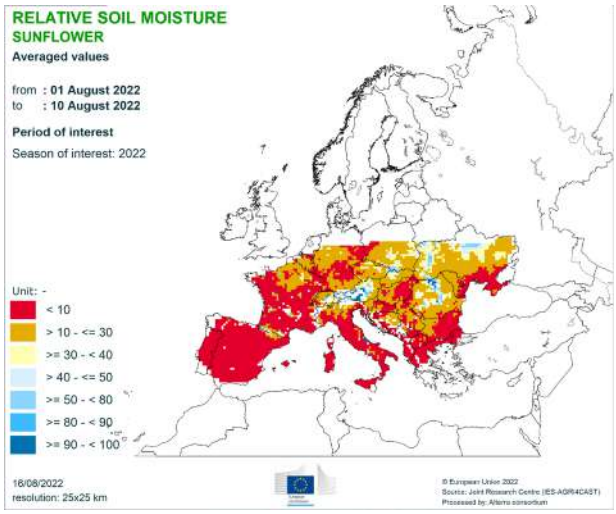

PRECOCITY
SUNFLOWER
10 August 2022
Deviation:
Year of interest - LTA (sync. on dev. stage)
Average Period: Long since 1991
Season of interest: 2022
Unit: days
maturity reached
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
16/08/2022
resolution: 25x25 km

Relative soil moisture

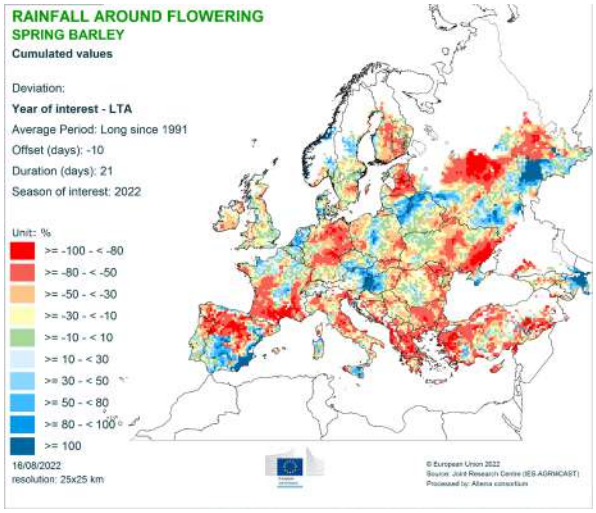


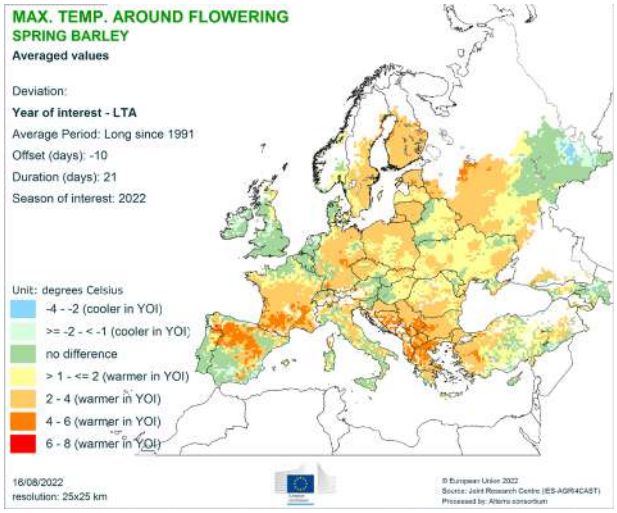


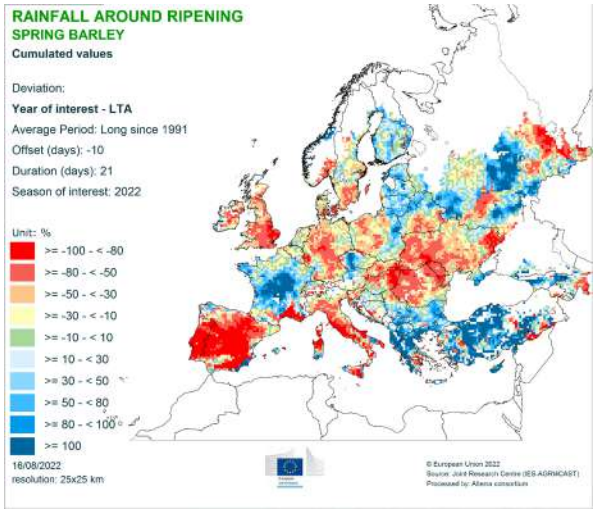


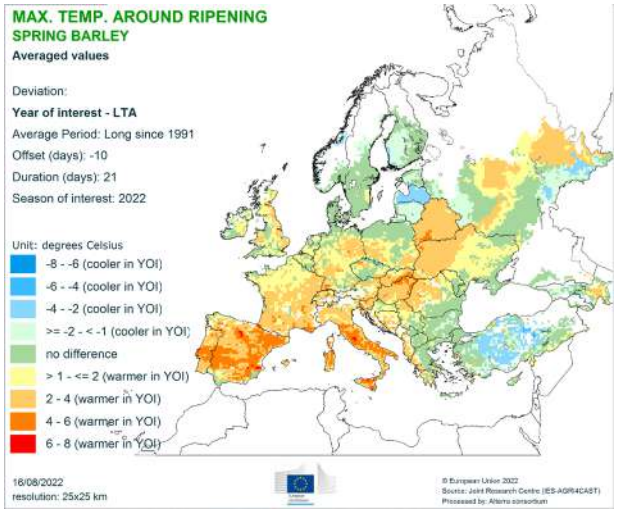


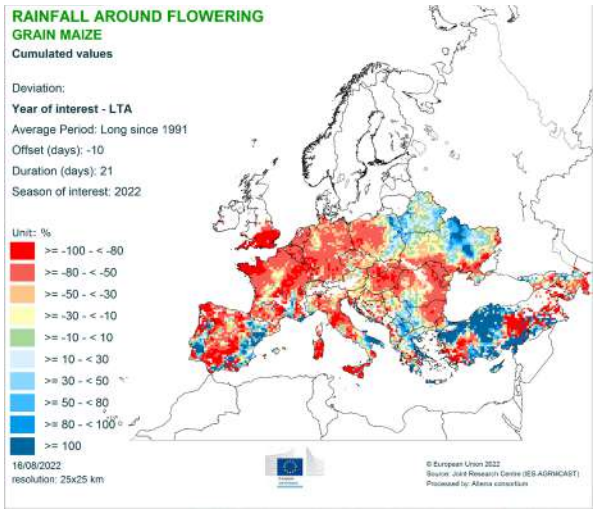
Precipitation and temperature anomalies around flowering and ripening

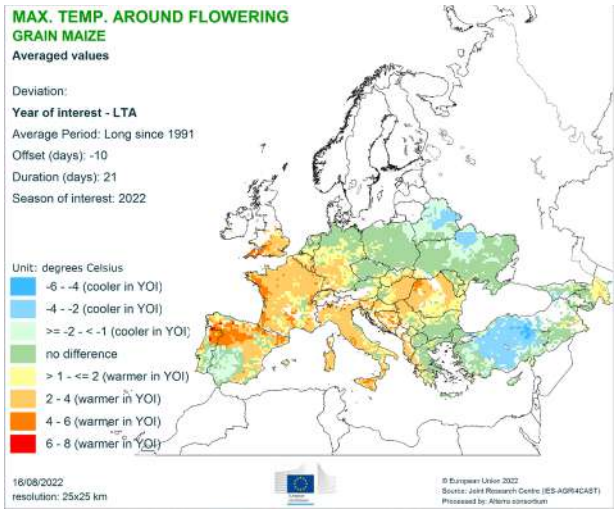


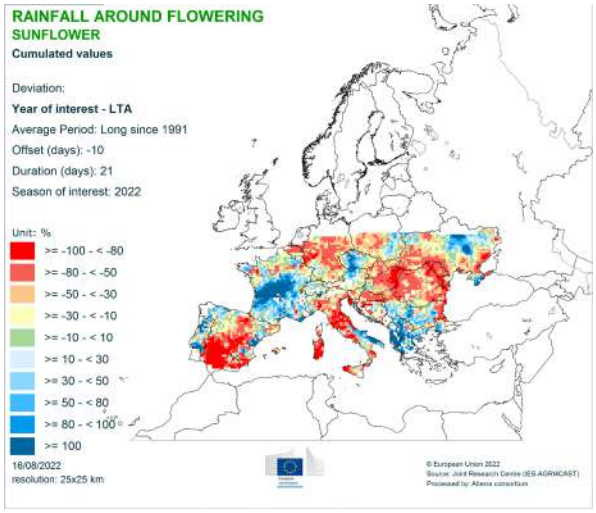


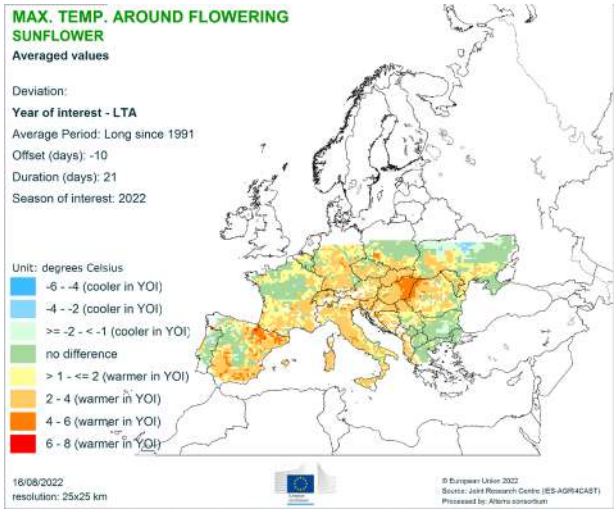

RAINFALL AROUND RIPENING
SPRING BARLEY
Cumulated values
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Offset (days): -10
Duration (days): 21
Season of interest: 2022
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
16/08/2022
resolution: 25x25 km


MAX. TEMP. AROUND RIPENING
SPRING BARLEY
Averaged values
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Offset (days): -10
Duration (days): 21
Season of interest: 2022
Unit: degrees Celsius
-8 - -6 (cooler in YOI)
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
>= -2 - < -1 (cooler in YOI)
no difference
> 1 - <= 2 (warmer in YOI)
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
16/08/2022
resolution: 25x25 km

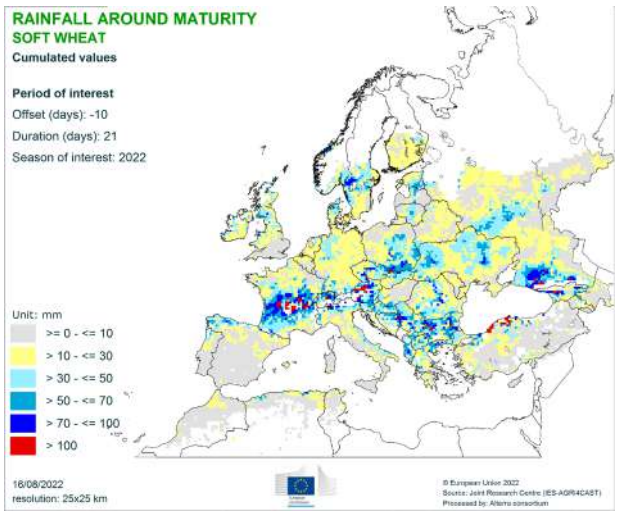

RAINFALL AROUND FLOWERING
GRAIN MAIZE
Cumulated values
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Offset (days): -10
Duration (days): 21
Season of interest: 2022
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
16/08/2022
resolution: 25x25 km

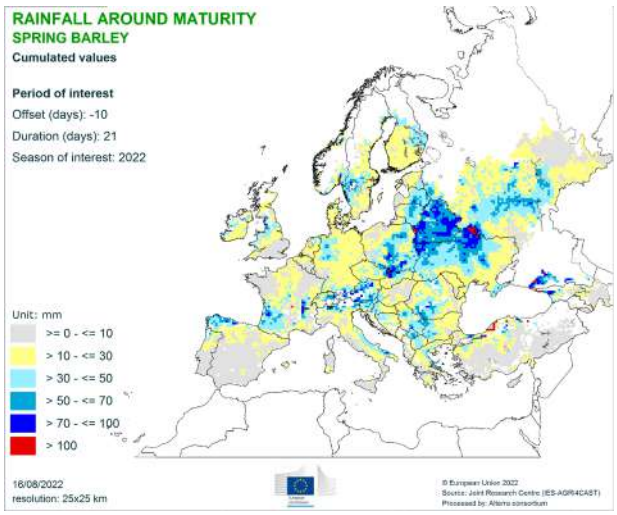

MAX. TEMP. AROUND FLOWERING
GRAIN MAIZE
Averaged values
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Offset (days): -10
Duration (days): 21
Season of interest: 2022
Unit: degrees Celsius
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
>= -2 - < -1 (cooler in YOI)
no difference
> 1 - <= 2 (warmer in YOI)
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
16/08/2022
resolution: 25x25 km

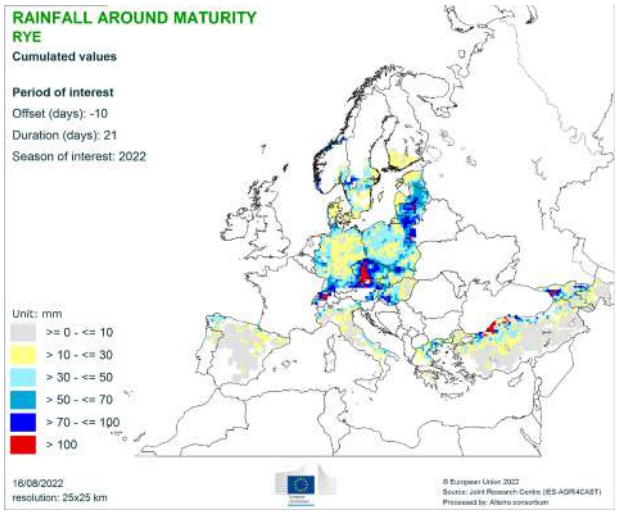

RAINFALL AROUND FLOWERING
SUNFLOWER
Cumulated values
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Offset (days): -10
Duration (days): 21
Season of interest: 2022
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
16/08/2022
resolution: 25x25 km

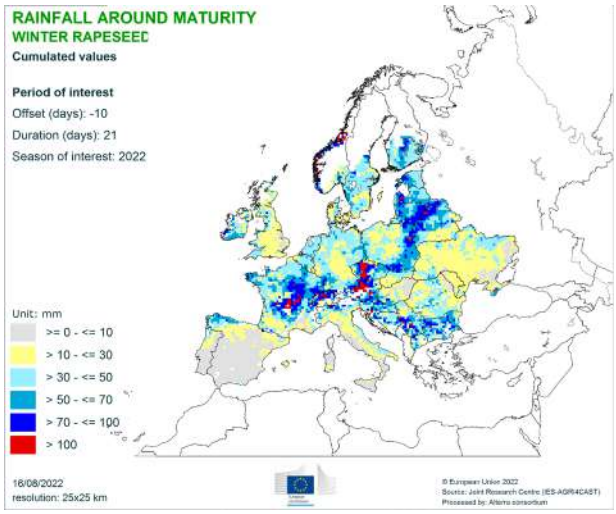

MAX. TEMP. AROUND FLOWERING
SUNFLOWER
Averaged values
Deviation:
Year of interest - LTA
Average Period: Long since 1991
Offset (days): -10
Duration (days): 21
Season of interest: 2022
Unit: degrees Celsius
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
>= -2 - < -1 (cooler in YOI)
no difference
> 1 - <= 2 (warmer in YOI)
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
16/08/2022
resolution: 25x25 km

Precipitation around harvesting









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

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Reporting support
SeproTec, I. Biavetti, G. Mulhern

Edition
M. van den Berg, B. Baruth

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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.

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