Issued: 20 September 2021
JRC MARS Bulletin Vol. 29 No 9

European Commission

JRC MARS Bulletin

Crop monitoring in Europe

September 2021

Diminishing yield outlook in southern Europe

Positive outlook for grain-maize in France, Germany and Poland

At EU level, changes to the yield forecasts for most summer crops – except green maize - are revised slightly downwards, though remain above the 5-year average. Downward revisons are mainly due to the negative impacts of continued hot and dry conditions in southern Europe. The yield forecasts for summer crops in western and central Europe remain positive, even benefiting from a slight upwards revision. The outlook is particularly positive for grain maize in France, Germany and Poland.

Southern, and south-eastern European regions experienced continued dry conditions, often accompanied by hot temperatures, which negatively impacted the yield potentials of summer crops. This is particularly the case in large parts of Italy, Hungary, Romania, Bulgaria and Greece, as well as in southern Turkey.

Rain surplus in eastern Germany and in Poland benefited summer crops, but hampered the harvesting of winter and spring cereals, and caused delays to early sowing activities. In Finland, the overly wet end of summer is the most recent of a series of unfavourable events that reduced yield expectations in terms of both quantity and quality.

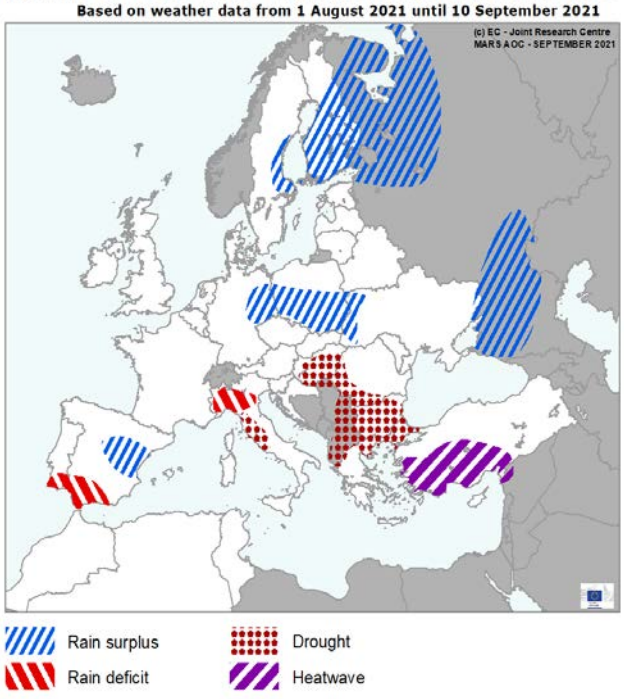
Rain surplus in southern Russia, improved the conditions for summer crops.

Contents:

Covers the period from 1 August until 10 September

AREAS OF CONCERN - EXTREME WEATHER EVENTS

Based on weather data from 1 August 2021 until 10 September 2021



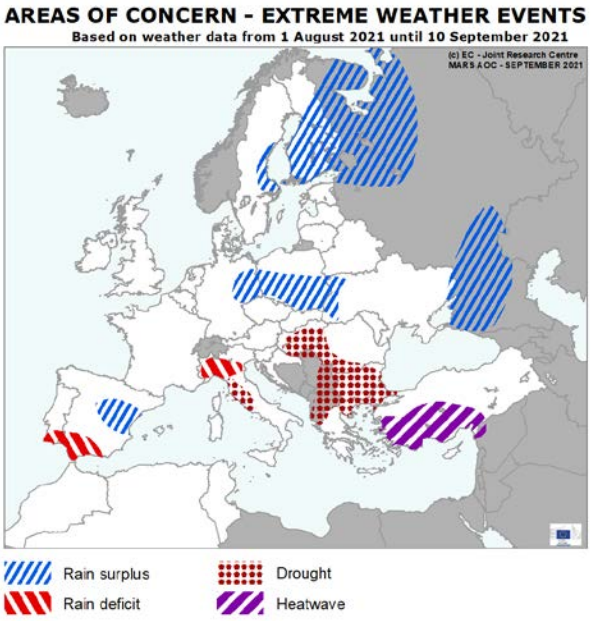
Crop	Yield t/ha				
	Avg 5yrs	August Bulletin	MARS 2021 forecasts	%21/5yrs	% Diff August
Spring barley	4.12	4.30	**4.23**	+ 2.9	– 1.6
Grain maize	7.75	7.90	**7.78**	+ 0.3	– 1.5
Potato	33.0	34.8	**34.6**	+ 4.8	– 0.7
Sugar beet	73.6	75.0	**75.0**	+ 1.8	– 0.0
Sunflower	2.27	2.39	**2.36**	+ 3.7	– 1.3
Soybean	2.93	3.01	**2.96**	+ 1.1	– 1.7
Green maize	40.7	43.4	**44.0**	+ 8.0	+ 1.3
Rice	6.75	—	**6.94**	+ 2.8	—

Issued: 20 September 2021

Joint Research Centre

1. Agrometeorological overview

1.1. Areas of concern



The map above displays the meteorological events that occurred between 1 August and 10 September; the events reported in the August issue of our Bulletin are not repeated here.

Southern and south-eastern European regions experienced continued dry conditions, often accompanied by high temperatures, which exacerbated the droughts in place since August. This is the case in the central-western regions of **Italy**, in most of **Hungary**, in southern and western **Romania**, in **Bulgaria** and in north-eastern **Greece**. In all those regions, non-irrigated and insufficiently irrigated crops were negatively impacted.

A rain deficit is also recorded in north-western **Italy** – where the main negative effect observed is on green maize – and in southern **Spain.** Other regions with below-average precipitation (e.g. **France, United Kingdom, Ireland**) are not displayed on the map, as here the deficit was mostly beneficial for crops and followed periods with abundant or excessive rainfall.

A rain surplus occurred in eastern **Germany** and in **Poland**, which helped to restore soil moisture levels to the benefit of summer crops, but hampered the harvesting of winter and spring cereals, and caused delays to early sowing activities. In **Finland**, the overly wet end to summer is the most recent in a series of unfavourable events that reduced yield expectations in terms of both quantity and quality.

A rain surplus in southern Russia improved conditions for summer crops.

In southern **Turkey**, the high temperatures at the end of August, accompanied by a prolonged rainfall deficit, have weakened yield formation in summer crops.

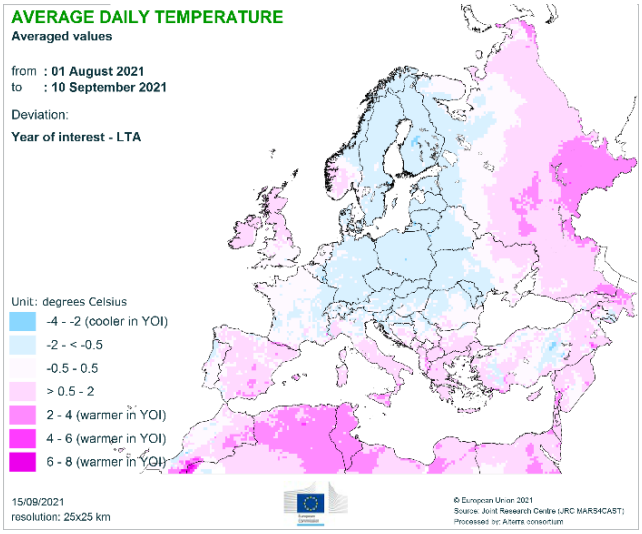
1.2. Meteorological review (1 August to 10 September 2021)

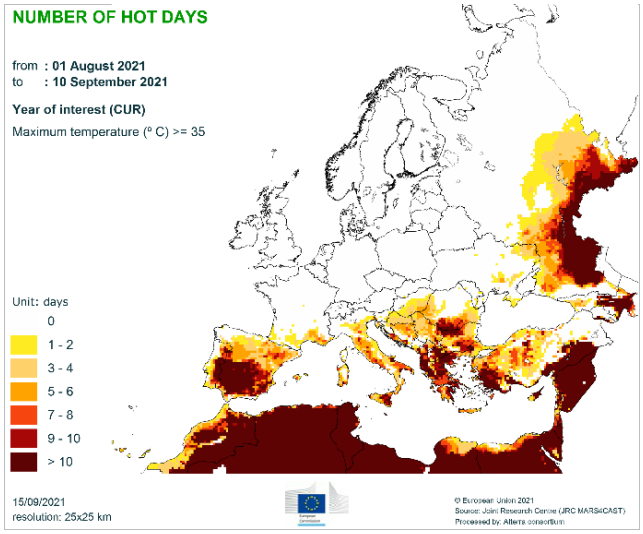
Slightly warmer-than-usual conditions were recorded in most of the Mediterranean region, Ireland, Scotland and European Russia. Daily mean temperature anomalies were mainly from +0.5 °C to +2 °C in these regions. In large parts of these areas, more than 10 hot days (with daily maximum temperature greater than or equal to 35 °C) were observed, associated with heatwaves in the first half of August.

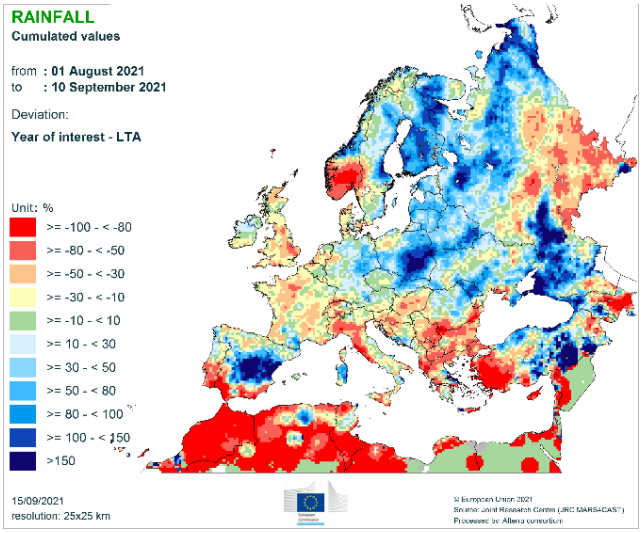
Slightly colder-than-usual conditions, with daily mean temperature anomalies from -2 °C to -0.5 °C, were mainly recorded in a large region extending from Germany to western Ukraine and Belarus, and covering most of the Scandinavian Peninsula in the north.

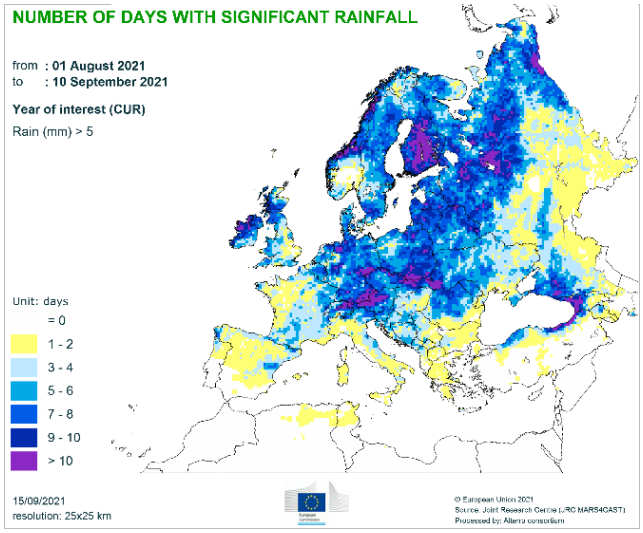
Wetter-than-usual conditions were mainly observed in large areas of eastern and northern Europe, Spain and eastern Turkey. Anomalies in total precipitation were mostly greater than +80% compared with the LTA, with large regions experiencing values above +150%.

Drier-than-usual conditions were mainly observed in the south-western part of the Iberian Peninsula, the north-western part of Italy, large regions in south-eastern Europe, western Turkey, southern Norway, and the central and the easternmost parts of European Russia. Anomalies in total cumulative precipitation from -100% to -50% were recorded in these regions.









1.3. Summer review (June, July, August)

Slightly warmer-than-usual conditions were recorded in most of Europe, with daily mean temperature anomalies (with respect to the LTA) mainly from +0.5 °C to +2 °C.

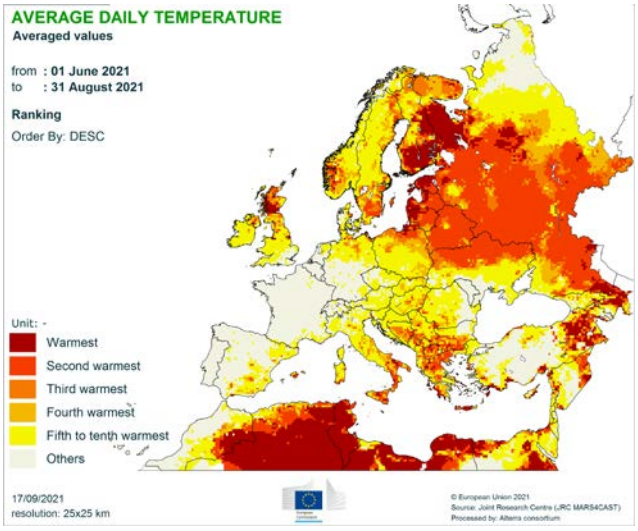
Warmer-than-usual conditions were observed in a large region of European Russia. Daily mean temperature anomalies were mainly from +2 °C to +4 °C. The summer was among the three hottest in our records (since 1979) in European Russia, Finland, the Baltic countries, southern Scandinavia, northern UK, southern Balkan region, southern Italy, and large parts of northern Africa.

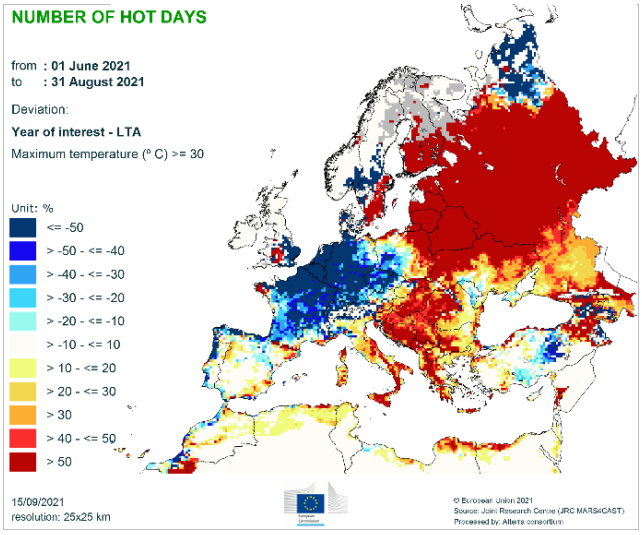
Wetter-than-usual conditions were mainly observed in a large region extending from Spain to Poland, and in the Black Sea region. Anomalies in total precipitation were mostly from +50% to +100%, although in large areas higher values were observed.

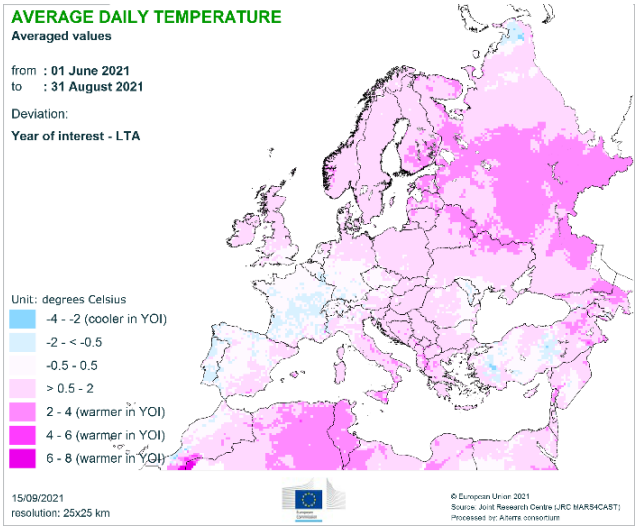
Drier-than-usual conditions, with anomalies in total precipitation from -100% to -80%, were observed in parts of Italy, south-eastern Europe, and European Russia.

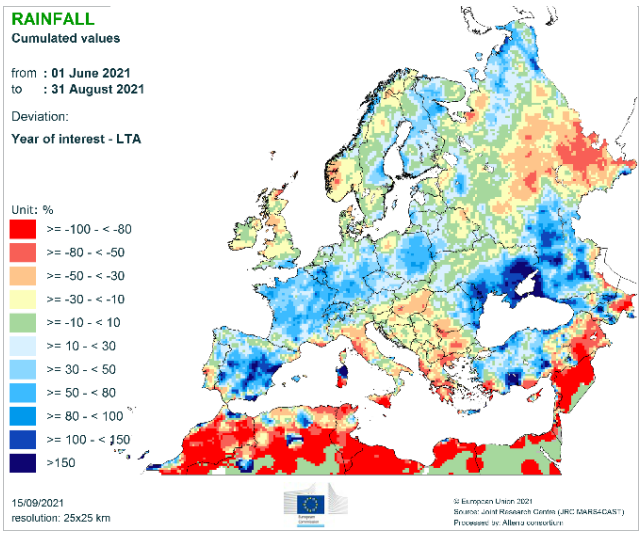
Many **weather and climate extremes** occurred during the summer. In mid-July, severe **floods** affected western Germany, Belgium, the Netherlands and Switzerland.

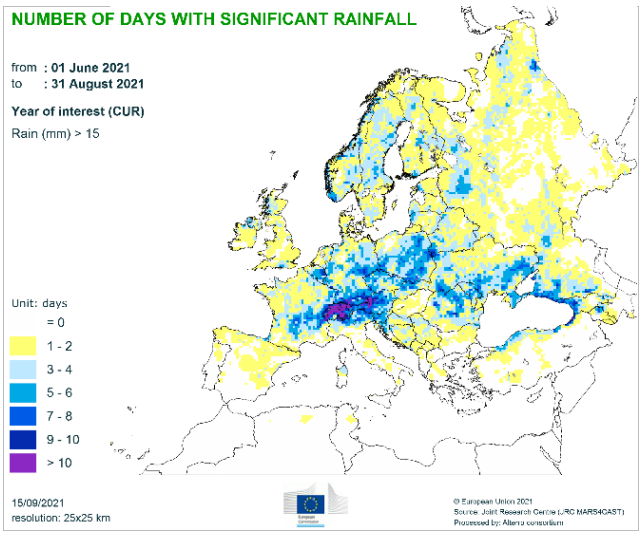
Severe heatwaves affected large regions of southern and eastern Europe. Three to four heatwaves were observed in large areas of the Mediterranean region and in the Black Sea region. During the last heatwaves, in August, the European daily maximum temperature record was broken in the county of Siracusa (Sicily, Italy), where **48.8 °C** was recorded.








RAINFALL
Cumulated values
from : 01 June 2021
to : 31 August 2021
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100 - < 150
>150
15/09/2021
resolution: 25x25 km


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 June 2021
to : 31 August 2021
Year of interest (CUR)
Rain (mm) > 15
Unit: days
= 0
1 - 2
3 - 4
5 - 6
7 - 8
9 - 10
> 10
15/09/2021
resolution: 25x25 km

1.4. Weather forecast (18-24 September)

Weather conditions will be mainly determined by three large-scale cyclonic disturbances evolving over the Iberian Peninsula, the North Atlantic, and eastern Europe/Russia. This large-scale atmospheric pattern will favour cooler conditions and precipitation events that will be intense in some areas.

Warmer-than-usual conditions are expected in central and southern Italy, in a large region of south-eastern Europe, and in western Turkey. Daily mean temperature anomalies will range from +2 °C to +4 °C (locally up to +6 °C).

Slightly warmer-than-usual conditions are forecast in the UK, along the northern Atlantic coast, and in large regions of Italy and south-eastern Europe. Daily mean temperature anomalies are expected to be from +0.5 °C to +2 °C.

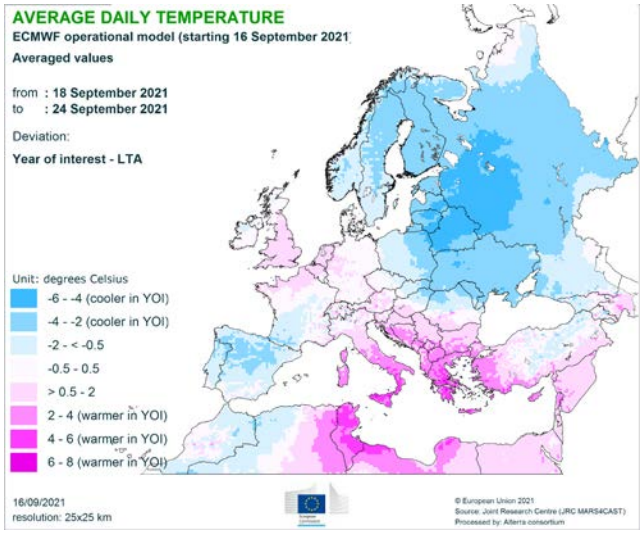
Colder-than-usual conditions are forecast in eastern Europe, Ukraine, European Russia, Finland, Sweden, and in large areas of Spain. Daily mean temperature anomalies will mainly be from -4 °C to -2 °C, although a large region of European Russia will experience more pronounced anomalies, down to -6 °C.

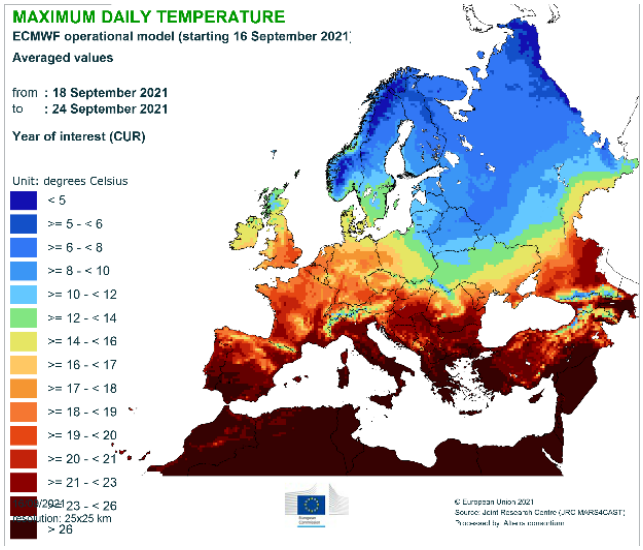
Slightly colder-than-usual conditions are forecast in most of the Iberian Peninsula, western France, and Norway. Daily mean temperature anomalies from -2 °C to -0.5 °C are expected.

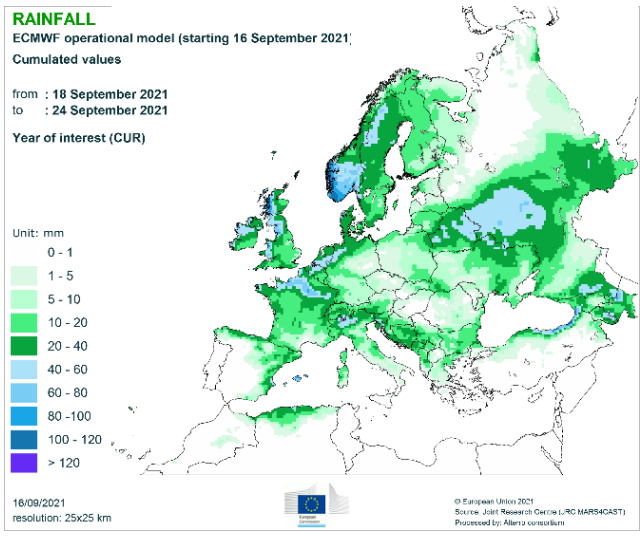
Wet conditions are mainly forecast in a large region over France, the northern Atlantic coast of Europe, the Scandinavian Peninsula, a region centred over European Russia and Belarus, along the Balkans, in Ireland, and in the UK. Total precipitation from 10 mm to 40 mm is expected, although in some large areas values will range from 40 mm to 80 mm (and locally above).

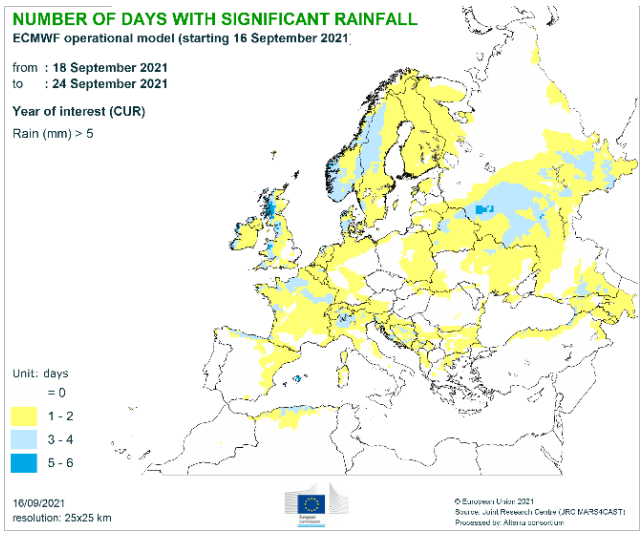
Dry conditions are expected in a large part of the Iberian Peninsula, in Turkey, and in an area over Hungary and Romania.

Long-range weather forecast for October, November and December points to likely to occur warmer-than-usual conditions in the Mediterranean and drier-than-usual conditions in large regions of Turkey.



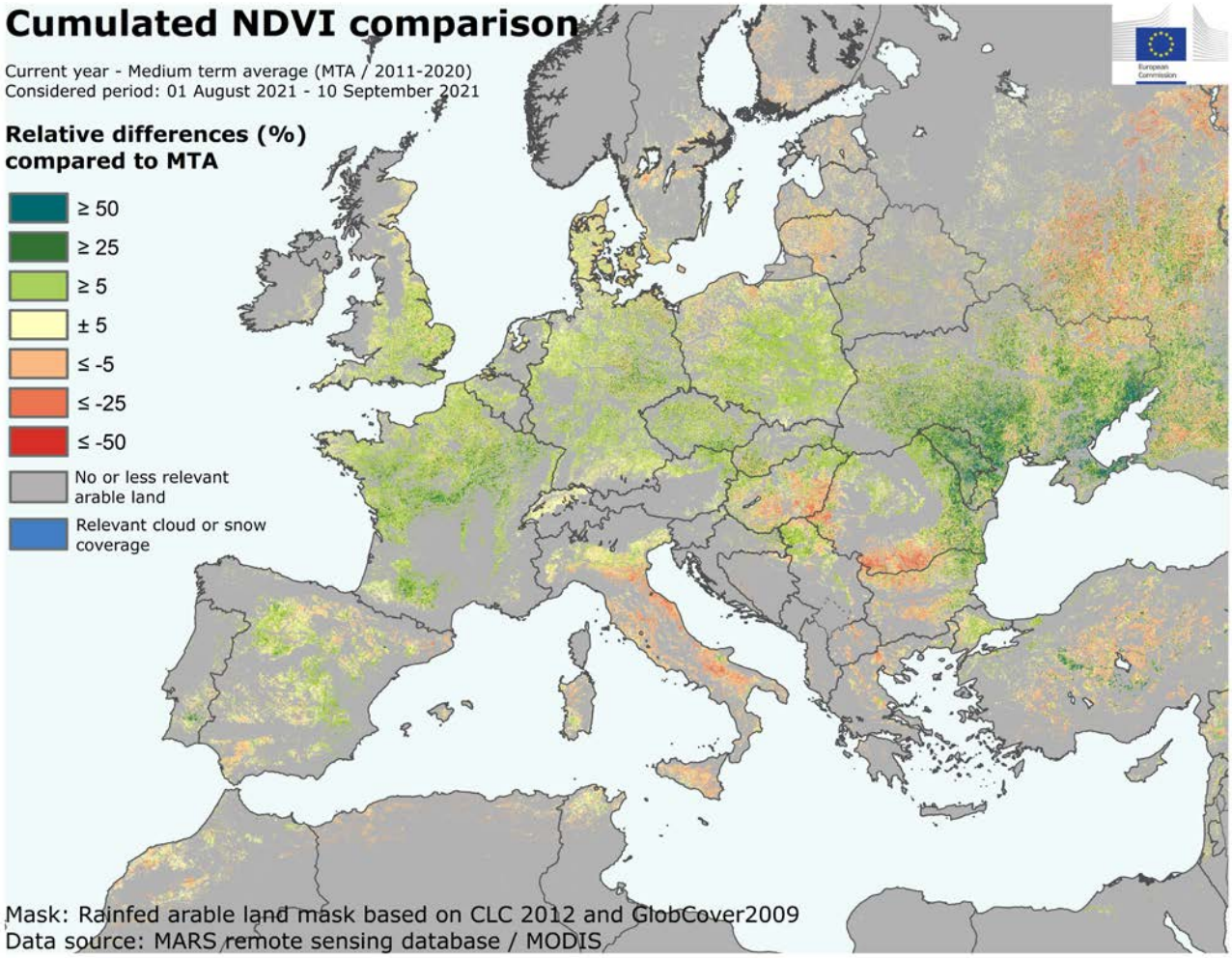



RAINFALL
ECMWF operational model (starting 16 September 2021)
Cumulated values
from : 18 September 2021
to : 24 September 2021
Year of interest (CUR)
Unit: mm
0 - 1
1 - 5
5 - 10
10 - 20
20 - 40
40 - 60
60 - 80
80 -100
100 - 120
> 120
16/09/2021
resolution: 25x25 km
© European Union 2021
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Altamira consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
ECMWF operational model (starting 16 September 2021)
from : 18 September 2021
to : 24 September 2021
Year of interest (CUR)
Rain (mm) > 5
Unit: days
= 0
1 - 2
3 - 4
5 - 6
16/09/2021
resolution: 25x25 km
© European Union 2021
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Altamira consortium

2. Remote sensing – observed canopy conditions

Major concerns for summer crops in south-eastern Europe

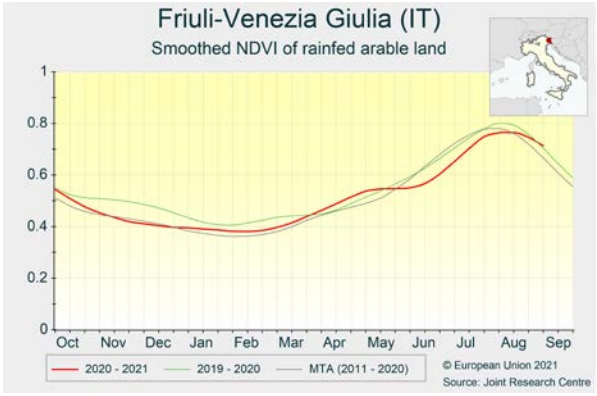


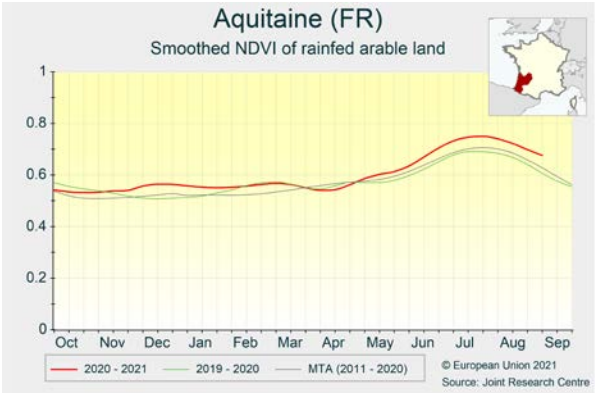
The map displays the differences between the Normalized Difference Vegetation Index (NDVI) cumulated from 1 August to 10 September 2021 and the medium-term average (MTA, 2011-2020) for the same period. Positive anomalies (in green) reflect above-average canopy density or early crop development while negative anomalies (in red) reflect below-average biomass accumulation or late crop development.

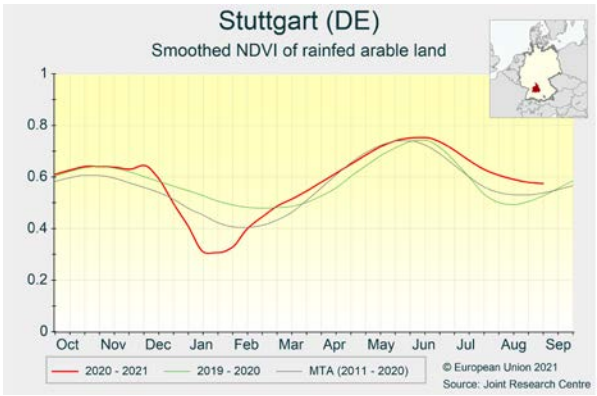
The map above predominately displays summer crop conditions, as the winter crop season is finished except in the northernmost countries. A colder-than-usual end to summer contributed to the positive anomalies observed in France, Germany, southern Poland, Austria, Czechia, Slovakia, eastern Romania and Ukraine. In eastern Hungary, western Romania and Bulgaria, summer crops have been seriously impacted by dry and hot conditions lasting since July and worsening in August. In the Baltic countries, Sweden and Finland, the negative anomaly is mainly a consequence of hot temperatures in July, which accelerated the senescence of winter and spring cereals.

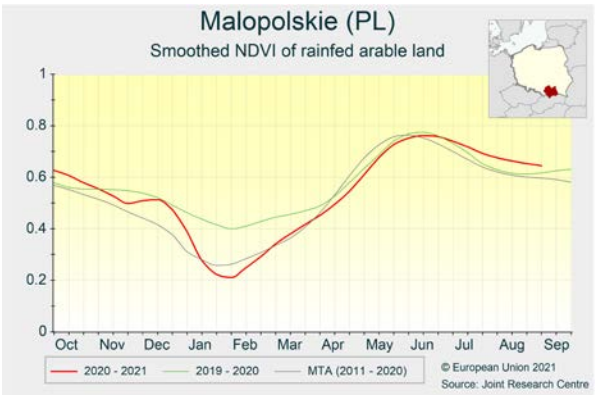
In north-eastern **Italy**, slightly lower-than-usual temperatures extended grain filling, especially in regions where crop development was slightly delayed (e.g. *Friuli-Venezia Giulia*). In **France**, a rather dry month of August provided good conditions for summer crops, from grain filling to maturity. The NDVI profile shows crop biomass accumulation well above the average, also thanks to temperatures having remained slightly below seasonal averages (e.g. *Aquitaine*). Similarly, colder-than-usual weather was observed in **Germany**, slowing down the later development stages of summer crops but maintaining favourable conditions (e.g. *Stuttgart*). In **Poland**, crops benefited from lower-than-average temperatures and adequate water supply in August, which slowed maturity and generated positive NDVI anomalies (green colours on the map, e.g. *Malopolskie*). Negative anomalies (red colours) are clearly visible in the **Baltic countries**, **Finland** and **Sweden**, as a consequence of

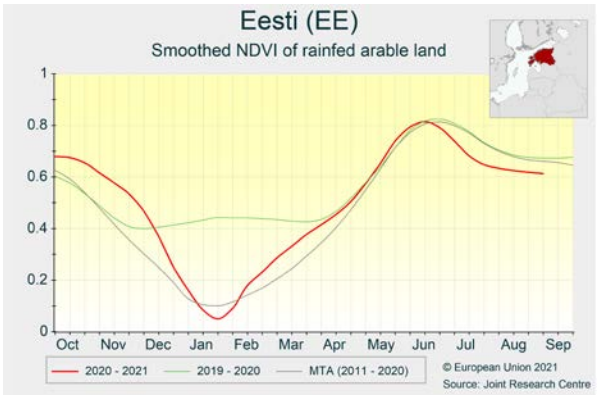
early senescence. In these regions, winter and spring cereals suffered from exceptionally high temperatures in July, resulting in advancement and shortening of the vegetative cycle, leading to moderate to severe concerns about final yields (e.g. *Eesti*). In central Europe (**Slovakia**, **Czechia**, **Austria** and north-western regions of **Hungary**), favourable conditions for summer crops persisted in August, with temperatures oscillating around the seasonal average and sufficient precipitation. Conversely, in south-eastern **Hungary**, crops were strongly negatively affected by a dry spell persisting since June (e.g. *Del-Alfold*). In **western Romania** and **Bulgaria**, extremely dry conditions and a very hot first half of August (with maximum daily temperatures exceeding 35 °C) were observed. As a consequence, summer crops – already suffering from high temperatures in July – accelerated senescence, thus reducing yield expectations (e.g. *Severozapaden*). In the eastern regions of these countries, the weather was less hot and conditions were favourable for crop development; NDVI values are still above the average. In **Ukraine**, with exception of the most north-eastern regions, seasonal temperatures and fair rainfall favoured grain filling, contributing to positive NDVI anomalies (e.g. *Vinnyts'ka*). In the **United Kingdom**, the harvest of soft wheat and spring barley is ongoing, marking the end of an overall fairly positive season.

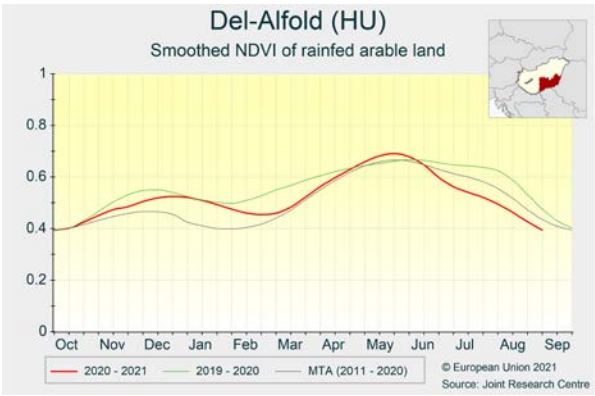


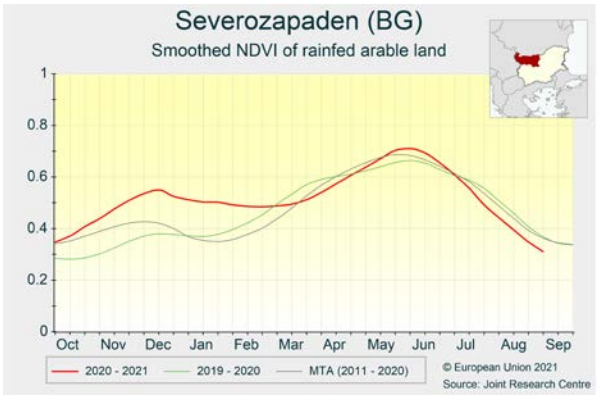


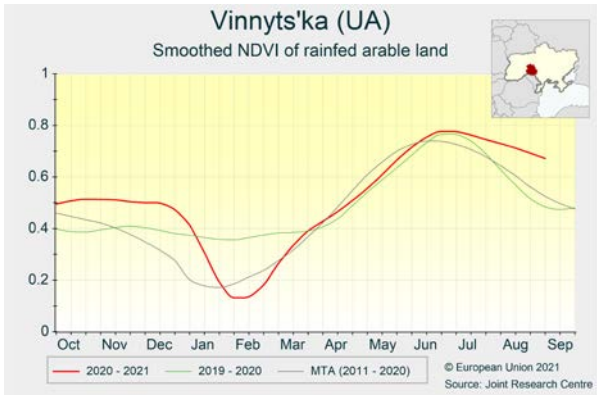








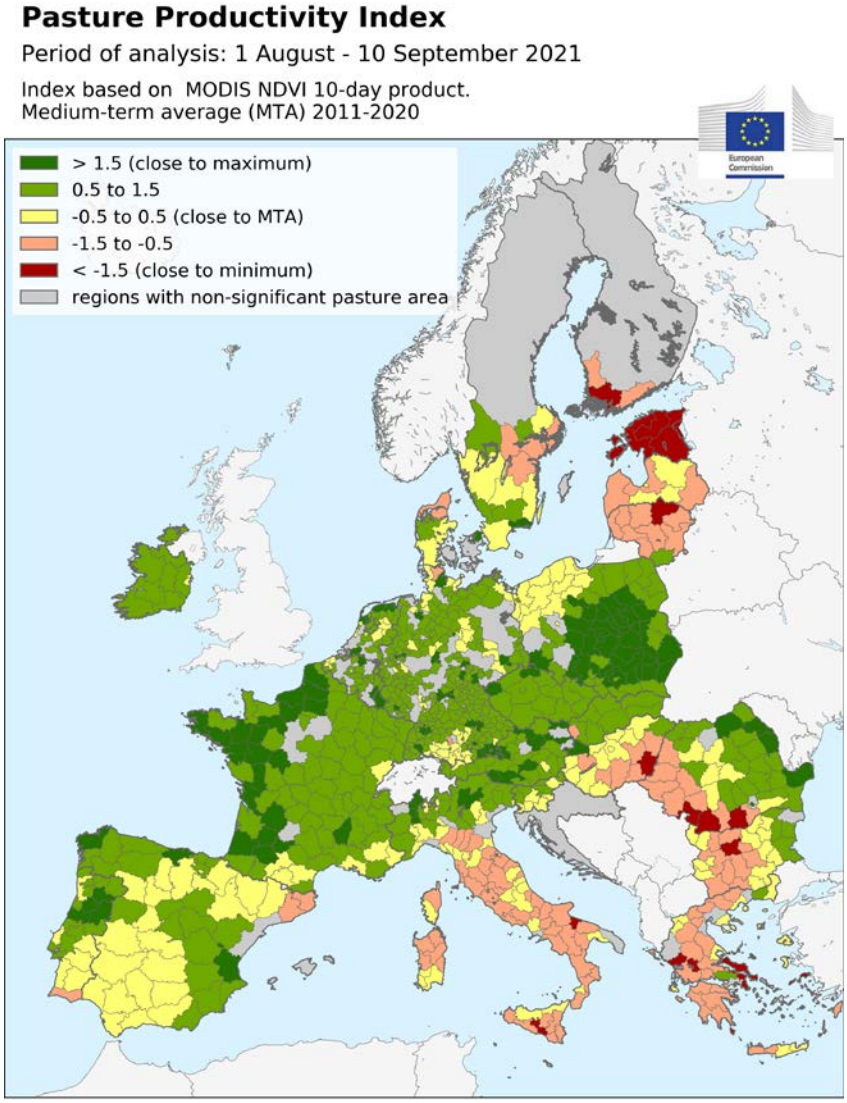

Severozapaden (BG)
Smoothed NDVI of rainfed arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2020 - 2021
2019 - 2020
MTA (2011 - 2020)
© European Union 2021
Source: Joint Research Centre


Vinnyts'ka (UA)
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
2020 - 2021
2019 - 2020
MTA (2011 - 2020)
© European Union 2021
Source: Joint Research Centre

3. Pastures in Europe - regional monitoring

Grass canopies in favourable condition, except in south and north-east

*During the review period, pastures in **Italy, Bulgaria,** southern **Romania, Hungary** and central regions of **Greece** in the south, and **Finland** and the **Baltic countries** in the north-east, presented below-average productivity. The condition of pastures in north-western **Poland**, **Spain** and the southern part of **Portugal** are in line with the medium-term average (MTA). Pastures in the remainder of the European regions presented canopy conditions above the MTA.*



The map above shows the pasture productivity index (PPI)[1] for the period 1 August to 10 September 2021.

In **Italy, Bulgaria,** southern **Romania** and **Hungary**, grassland growth is particularly affected by the rainfall deficits or droughts, with the negative impacts exacerbated by hot temperatures**.**

After the very hot and dry conditions reported in the August issue of the Bulletin, **Greece** has seen a decrease in average daily temperatures, which at the beginning of September dropped below the LTA. Grazing areas benefited from frequent and well-distributed rainfall episodes throughout Greece, and in central regions (*Thessaly, Central Greece*, and *Western Greece*), cumulative rainfall has been moderately above the LTA.

[1] PPI, the relative index of pasture productivity, is an indicator of biomass formation based on integration of the NDVI remote sensing product for pasture areas (at NUTS level 3) over a period of interest. The index shows the relative position of the current season within the historical series from 2011 to 2020.

In **Spain** and southern **Portugal**, high temperatures were recorded, with two heatwave peaks during the review period. However, such conditions are fairly common for these regions at this time of the year, with grass canopies regularly under heavy stress but with PPI close to the MTA.

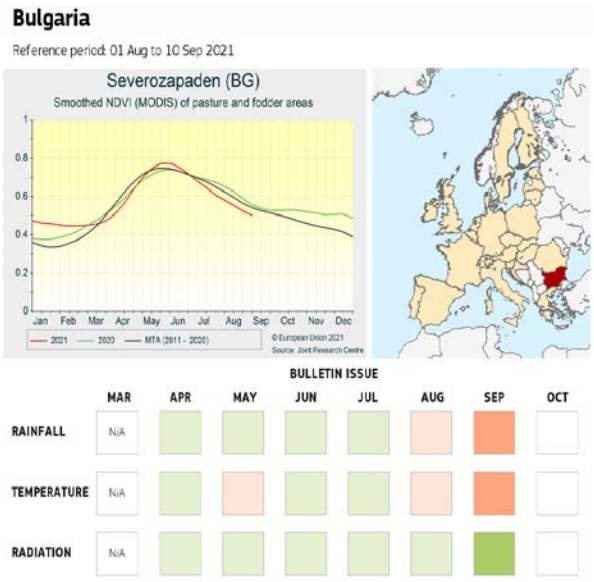
Finland and the **Baltic countries**, after a warm and relatively dry period, as reported in the August issue of the B|ulletin, experienced below-average radiation and temperatures, whereas rainfall was above average. Despite the predominance of negative PPIs, the anomalies are of minor magnitude. This is confirmed for **Finland,** where in most areas the total silage yield is estimated to be close to average[2].

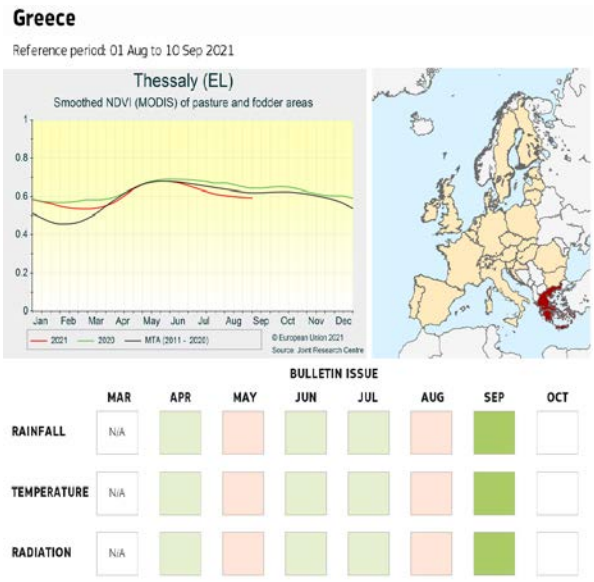
Denmark and **Sweden** experienced below-average temperatures, but frequent and sufficient rainfall and radiation to adequately sustain biomass growth.

In **Poland**, agrometeorological conditions were favourable for biomass accumulation (moderate temperatures, high soil moisture content). In north-western regions, the persistent dry conditions lasted until the end of August, when soil moisture conditions finally improved.

Austria, **Czechia** and **Slovakia** experienced favourable conditions for biomass accumulation. Abundant precipitation in August provided adequate soil moisture conditions in all regions, except south-eastern **Austria**, which presents a rainfall deficit.

In **Ireland**, **France**, **Germany** and the **Benelux** countries, pastures are in good to very good condition, thanks to abundant rainfall and mild temperatures.

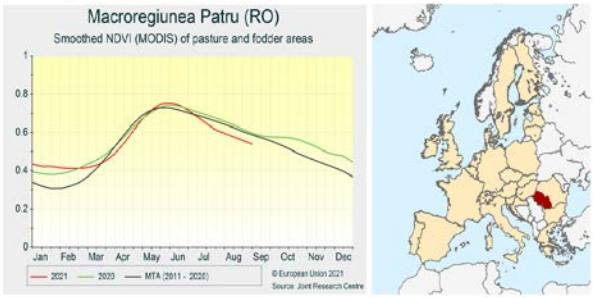




[2] https://www.proagria.fi/ajankohtaista/puinnit-edenneet-hitaasti-sateiden-lomassa-17147

Romania - South

Reference period: 01 Aug to 10 Sep 2021

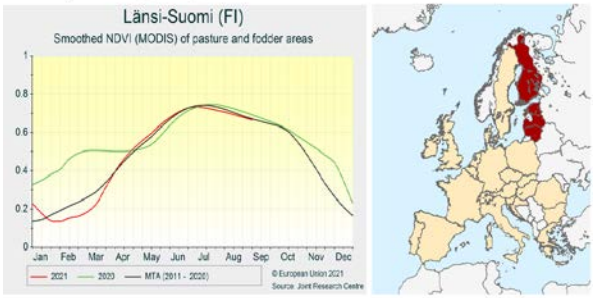


BULLETIN ISSUE

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
RAINFALL	N/A							
TEMPERATURE	N/A							
RADIATION	N/A							

Finland and Baltic countries

Reference period: 01 Aug to 10 Sep 2021

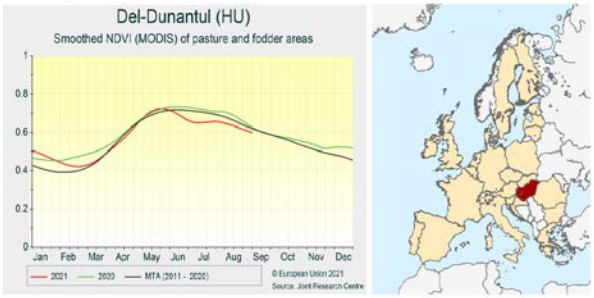


BULLETIN ISSUE

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
RAINFALL	N/A							
TEMPERATURE	N/A							
RADIATION	N/A							

Hungary

Reference period: 01 Aug to 10 Sep 2021



BULLETIN ISSUE

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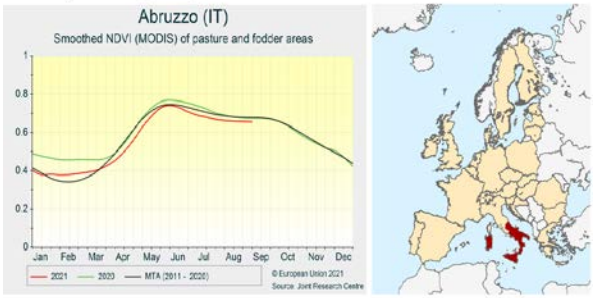
TEMPERATURE	N/A							
RADIATION	N/A							

Italy - South and islands

Reference period: 01 Aug to 10 Sep 2021



BULLETIN ISSUE

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Germany - South

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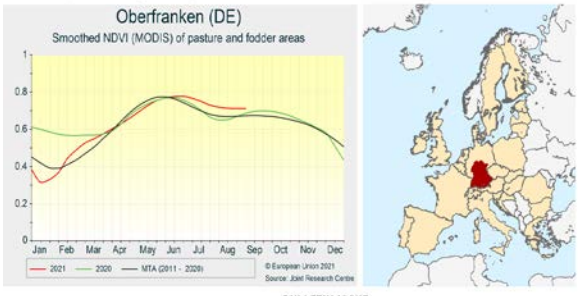

BULLETIN ISSUE

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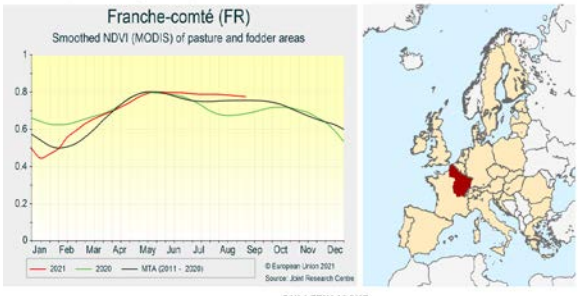
TEMPERATURE	N/A							
RADIATION	N/A							

France - East

Reference period: 01 Aug to 10 Sep 2021



BULLETIN ISSUE

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
RAINFALL	N/A							
TEMPERATURE	N/A							
RADIATION	N/A							

4. Country analysis

4.1. European Union

France

Positive outlook for summer crops

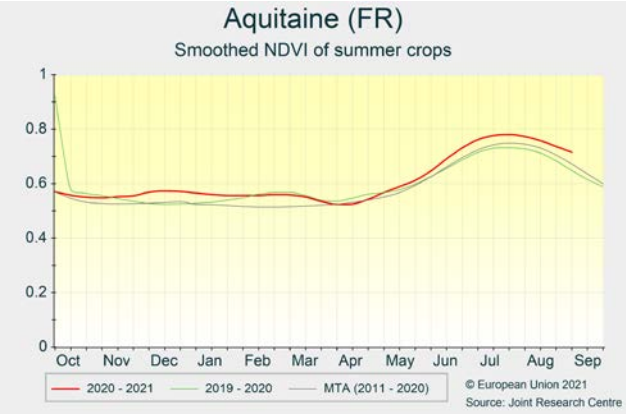
Wet weather conditions predominated in France this summer. These conditions were highly favourable for growth and development of summer crops. The yield outlook is above average, with potentially close-to-record levels for green maize, grain maize and sunflowers.

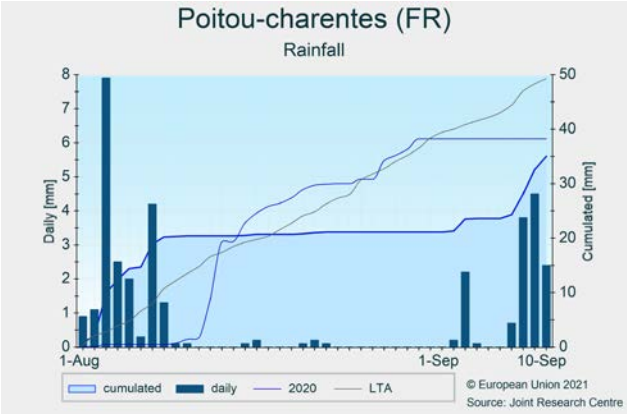
Wet weather conditions predominated from mid-June until the first dekad of August. In the north-east of the country, rainfall exceeded 150% of the LTA. The two last dekads of August were much drier than usual, with rainfall below 50% of the LTA in most of the country. Some rainfall events finally occurred at the beginning of September – mostly in the south, while dry conditions continued in the north and east. Temperatures remained mild throughout the review period. At national level, the cumulative active temperature above 10 °C was 10% below the LTA.

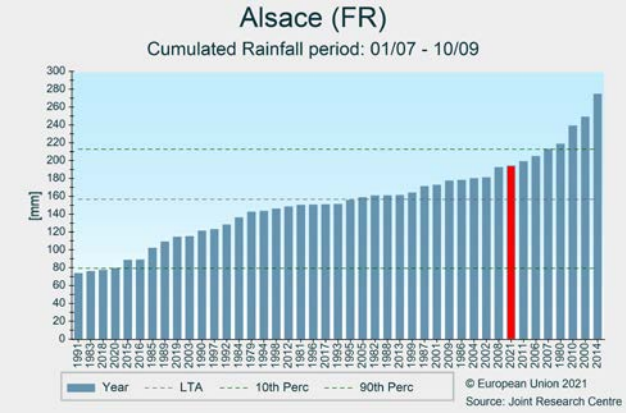
The wet and mild conditions from June to the beginning of August, followed by dry conditions, were favourable for summer crops, particularly for maize and sunflowers in the south-west of the country. The modelled biomass accumulation and satellite observations depict a close-to-record year. The outlook for sugar beet is influenced by contrasting factors, with high green biomass development, but also high pressure from pests and diseases, and below-average radiation in the main producing regions (which tends to negatively affect sugar content). The outlook for potatoes is positive, as the pressure from mildew is being managed by farmers. Soybean, being mostly irrigated, did not benefit as much as other crops from the wet conditions.

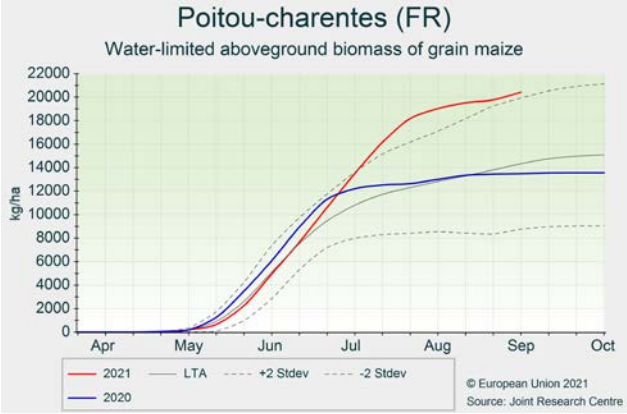
The yield forecasts for maize and sunflowers were maintained in the high range. If harvesting conditions are favourable, we cannot exclude an absolute record for maize.

Regarding winter cereals, post-harvest survey results confirm poor grain quality, but point to somewhat lower yields than previously expected due to underestimation of the impacts in the north and north-east of the excessively wet conditions in June-July.









Germany

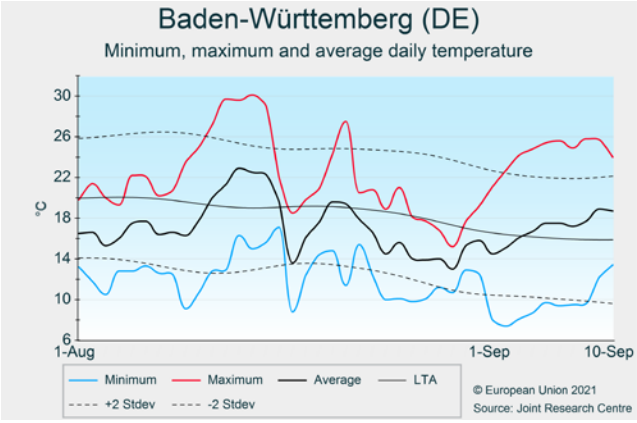
Contrasting weather conditions continue

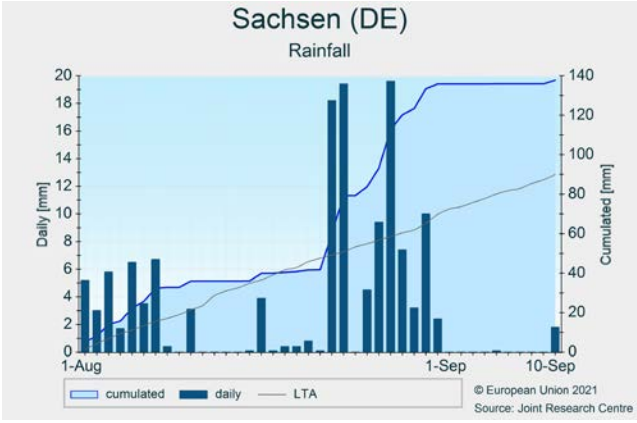
Above-average rainfall for most of the country led to sufficient soil moisture, and good and steady biomass accumulation in summer crops. Somewhat cooler temperatures slowed development in the south. The forecast for maize has increased slightly, whereas it was confirmed for sugar beet, and decreased for potatoes because of cooler temperatures and wet conditions.

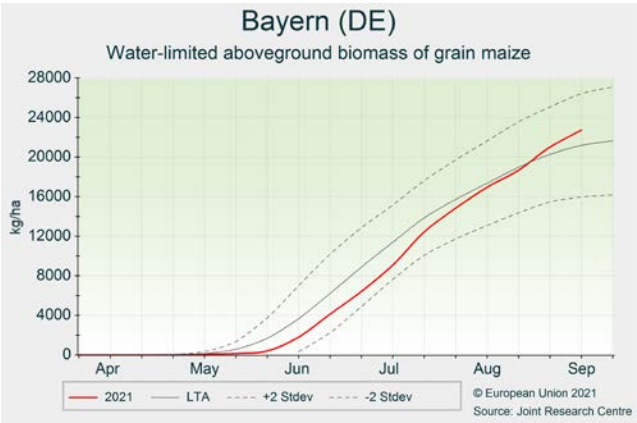
The review period (1 August – 10 September) was characterised by a slightly negative temperature sum anomaly. This was the result of a prolonged period with below-average temperatures, interrupted by a few hot days that ended abruptly; for instance, mid-August temperatures dropped by at least 10 °C from one day to the next.

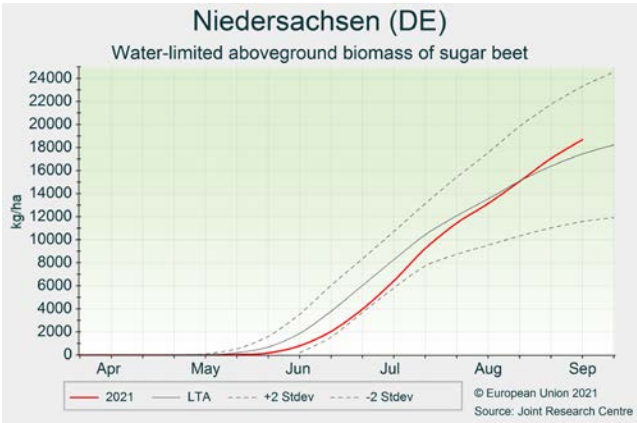
Precipitation totals are significantly above average in the eastern federal states, restoring soil moisture and ground water after a prolonged deficit. Relatively dry spots are observed in *Nordrhein-Westfalen* and southern *Baden-Württemberg*. The harvesting period for winter and spring cereals was extended, due to an above-average number of rainy days which prevented fields and crops from drying. Consequently, the sowing of rapeseed was also delayed in some of the regions, for instance in *Sachsen*. The wetter-than-usual conditions for the last part of the development cycle were especially detrimental for soft wheat yields, which are confirmed as disappointing.

For maize, the weather conditions during the review period were generally favourable, and steady biomass accumulation is simulated. The yield forecast has slightly increased. However, the negative temperature sum is somewhat delaying vegetative development in the south. Sugar beet, after a very cold start to the season with below-average biomass accumulation, has recovered and the yield is forecast to be above last year's level. So far, reported sugar content is still lower than usual, as there were not many days with high sunshine duration. Our forecasts for potatoes have been revised downwards (although still clearly above the average), mainly due to the lower-than-usual temperatures and an increased risk of pest and diseases due to the wet conditions.









Poland

Good conditions for summer crops

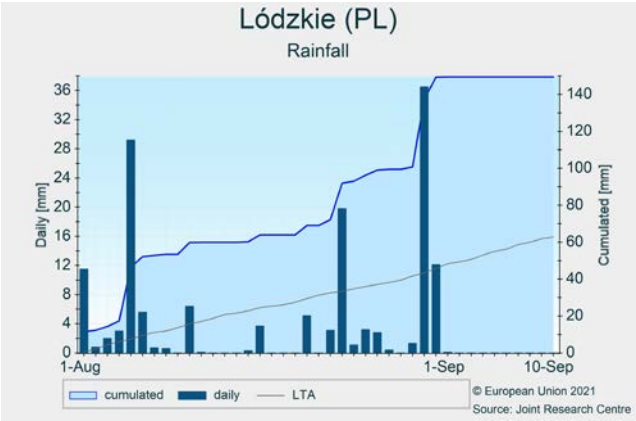
Significant precipitation in August prolonged the harvesting period for winter cereals and impaired timely sowing of rapeseed. Moderately warm and wet conditions increased soil moisture levels and favoured biomass accumulation for summer crops. The outlook for maize has improved.

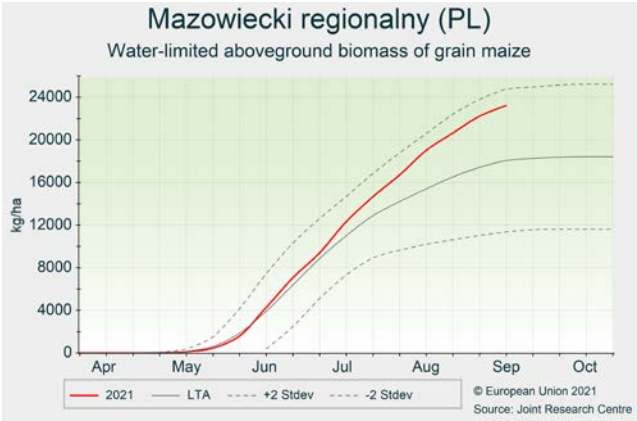
The review period (1 August – 10 September) was characterised by colder-than-usual temperatures (around 1.2 °C below the LTA) and precipitation totals significantly above the average in most of the country (except for the north-west regions, where cumulative rainfall was below average). As a result of the predominantly wet and moderately warm conditions, soil moisture reserves were replenished. Also in north-west regions, soil moisture deficits were finally alleviated by rainfall at the end of August.

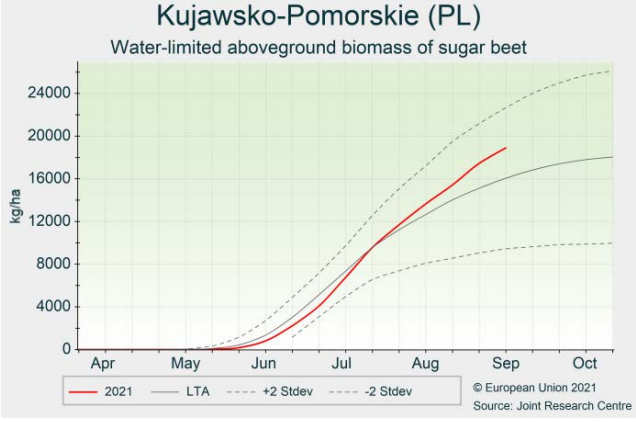
High precipitation rates throughout August extended the harvesting period for winter cereals and delayed the sowing of rapeseed, as well as other field works. In several regions, excessively wet topsoils and soil crusting (after heavy rains) impaired the emergence of sown rapeseed.

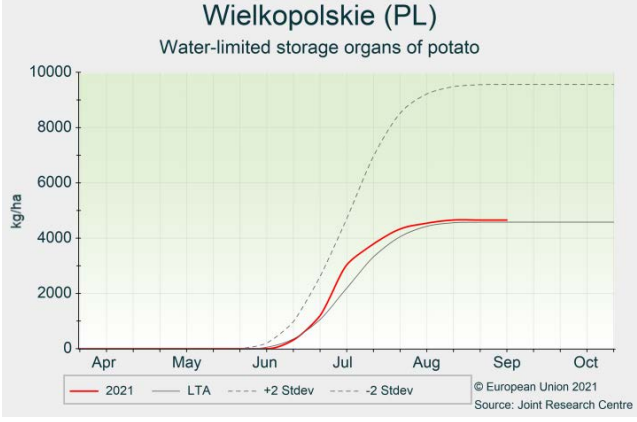
For summer crops, weather conditions during the review period were generally favourable. After a very cold start to the season, sugar beet has regained biomass accumulation, and overall yields are now expected to be above last year's level. However, yield expectations vary across regions, and reported sugar content is still below average. The harvest of green maize began in the first dekad of September, while grain maize is in its ripening phase. Our model indicates above-average biomass and storage organ accumulation for grain maize in the main producing regions, except for *Wielkopolskie* and *Zachodniopomorskie* regions, where crop conditions remain below average due to the persistent rain deficit in early summer and the first two dekads of August. The potato harvest has been concluded with variable yield results: above average in central and south-western regions, and below average in the north-east and south-east. Some negative impacts on potato quality have been reported due to fungal diseases.

Our forecasts for grain and green maize, as well as for potatoes, have been revised upwards compared to the previous Bulletin, due to favourable agro-meteorological conditions, while yield expectations for sugar beet remain above last year's value but below the 5-year average.









Ireland

Harvest almost completed, with good yields confirmed

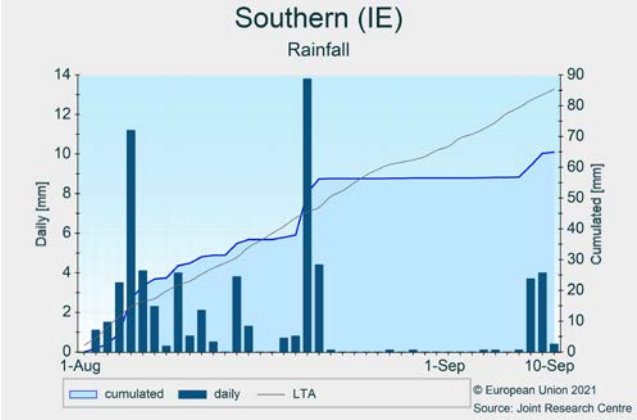
Weather conditions were optimal for harvest during the last dekad of August. The spring barley harvest was almost completed at the beginning of September. Positive yield outlooks were maintained.

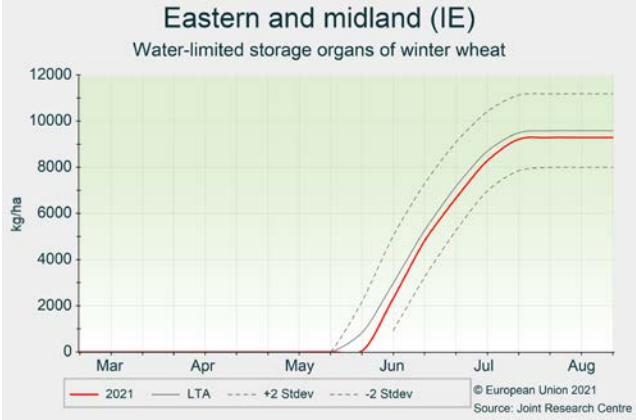
The first 4 days of August were colder than usual, after which temperatures fluctuated around the average. Slightly above-seasonal temperatures persisted during the third dekad of August. Above-average temperatures characterised the last week of the review period (3-10 September).

Rainfall was above the average until the second dekad of August, after which rain was nearly absent until the end of the review period. Cumulative rainfall for the whole period was below the LTA. Cumulative radiation levels were also below seasonal values.

Although harvesting was hampered during the first two dekads of August, optimal weather conditions at the end of August resulted in most of the crops being harvested by the beginning of September. Reported yields are generally good, without quality concerns.

Winter rapeseed drilling proceeded under optimal conditions at the end of August and beginning of September. The potato harvest started at the end of August. The positive yield forecasts of last month's Bulletin were maintained.





Spain and Portugal

Harvesting of summer crops started with fair yield outlook

Two peaks of hot temperatures were observed, the first one preventing access to the fields in several regions due to the risk of fire ignition. Grain maize is in the final stage of development in the southern half of the Iberian Peninsula. Sunflowers have been harvested. Yield forecasts are unchanged, around the 5-year average.

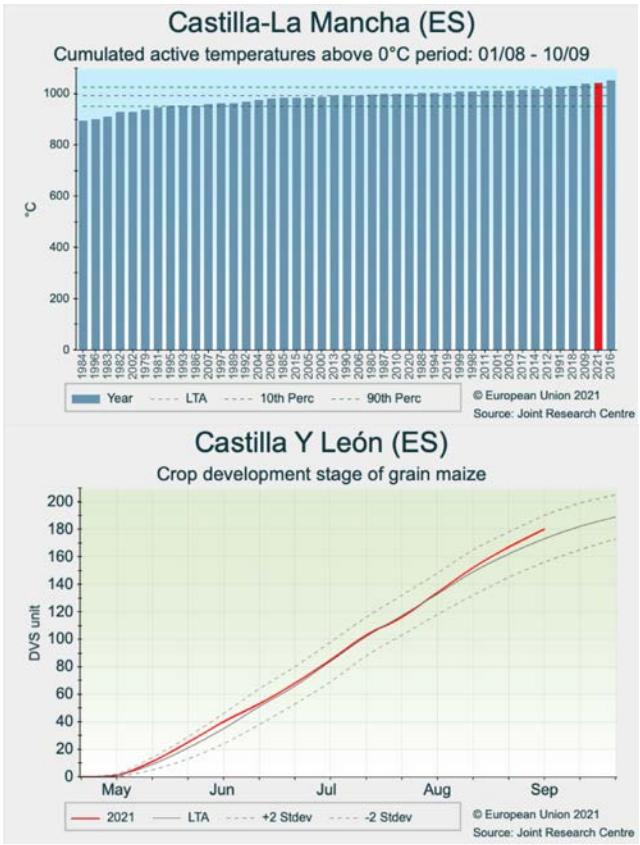
As mentioned in the August Bulletin, a heatwave was at its peak around 15 August in most of the Iberian Peninsula. A second, less severe, heatwave was observed in the first dekad of September. Due to the risk of mechanically ignited fire, during the peak of the first heatwave many regions banned access to the fields for machinery during the daytime (*Castilla y León, Castilla-La Mancha, Catalonia, Comunidad Valenciana*). In *Castilla-La Mancha,* the current review period was the second warmest on our records (since 1978).

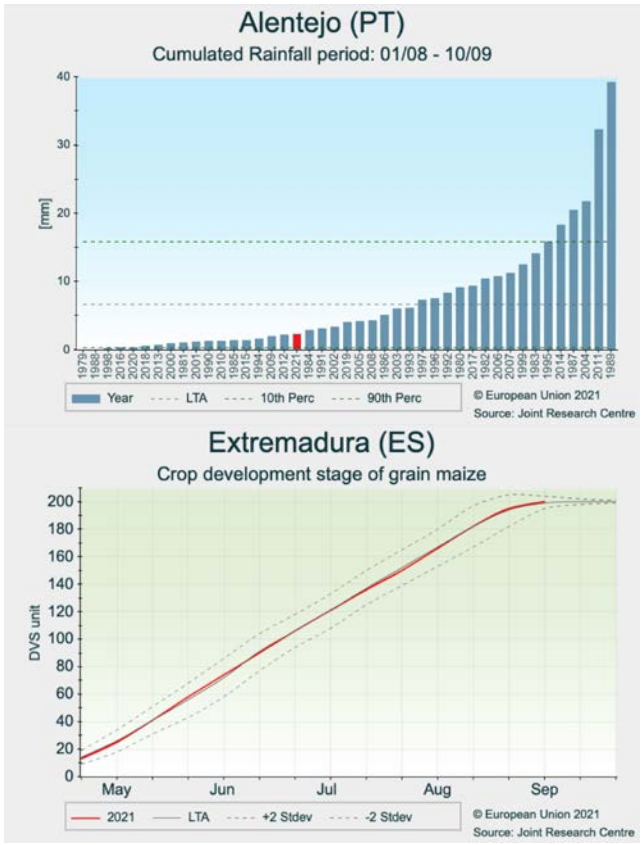
Rainfall was above average (but still minimal, as usual in this period of the year) in most parts of the Iberian Peninsula, with the exceptions of *Alentejo* and *Andalucia* where rainfall was below the LTA.

The harvesting of sunflowers was completed, with the first post-harvest reports suggesting yields at a similar level to our forecast and close to the 5-year average.

Grain maize is in the ripening phase in *Alentejo*, *Andalucia*, *Castilla-La Mancha* and *Extremadura*. In other regions, maize is still at the grain-filling stage. So far, crops have developed normally, and no irrigation restrictions have been declared in important maize-producing areas, despite the continued low levels in water reservoirs[3].

The yield forecasts for grain maize and green maize are unchanged: at the 5-year average for Spain, and above the 5-year average for Portugal. For potatoes, our yield forecast stays slightly below the 5-year average for Spain, and above average for Portugal.





[3] Currently at 41%; well below the level of last year (48%) and the 10-year average (54%) for the same period (source: www.embalses.net, 14/09/2021).

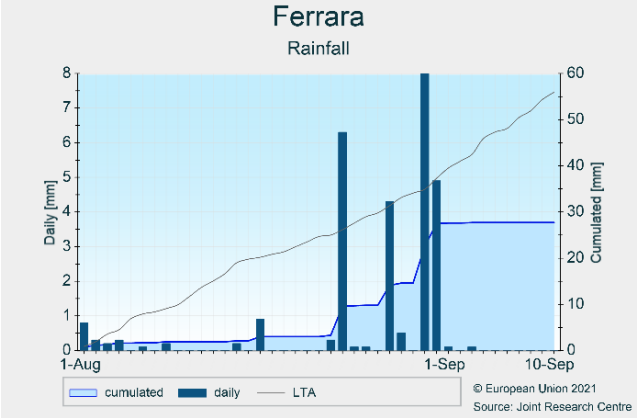
Italy

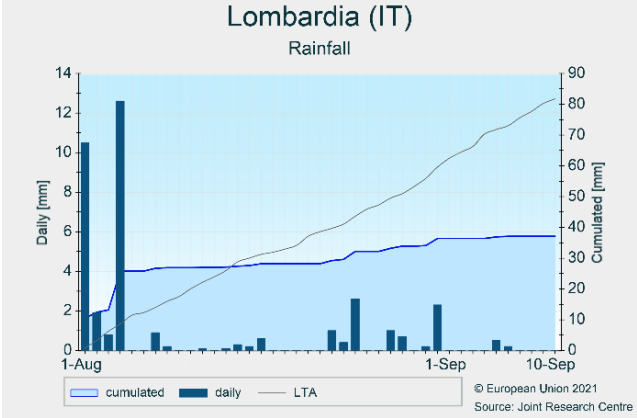
Too hot and too dry for summer crops

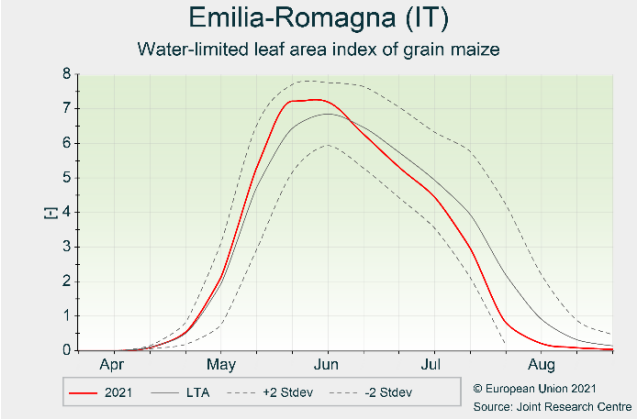
The season for summer crops has been difficult, because of the high temperatures and low precipitation. In most regions, *the harvest started early, before the end of August. Yield forecasts are confirmed below the 5-year average, and notably lower for green maize.*

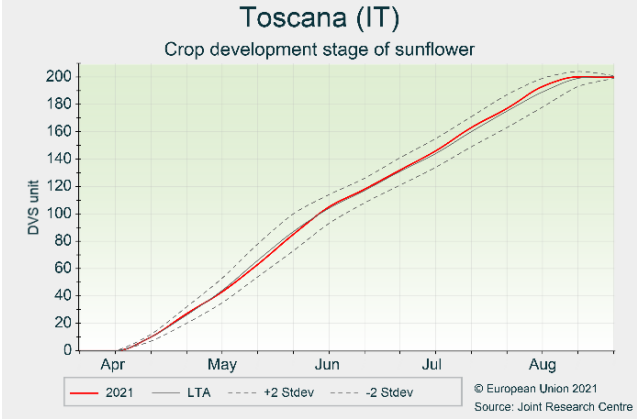
In Italy, unfavourable weather conditions were recorded in the first 15 days of August, due to a heatwave that peaked around 15 August with temperatures well above 35 °C in most central and northern regions. Since then, temperatures have moved to near-seasonal values, but precipitation has remained scarce. In the provinces bordering *Veneto* and *Emilia-Romagna* (e.g. *Ferrara*), the end of August was marked by local storms and hail. The precipitation was insufficient and came too late to compensate for the long dry spell, while it caused damage to harvest activities and to ripening crops that were still in the field. The first 10 days of September remained practically dry in north-western regions (e.g. *Lombardia*), along the whole Po valley, and in *Toscana* and *Lazio*.

Maize harvest activities started slightly earlier than usual in most of the northern regions, due to the hot summer weather. The persistent dry weather further reduced yield potentials for maize and soybean, particularly where not irrigated. Specifically, green maize – which is usually less irrigated – suffered much more than other crops from the unfavourable prolonged dry conditions. Sunflowers reached maturity by mid-August and we have not modified our forecast since the August issue of this Bulletin.









Hungary

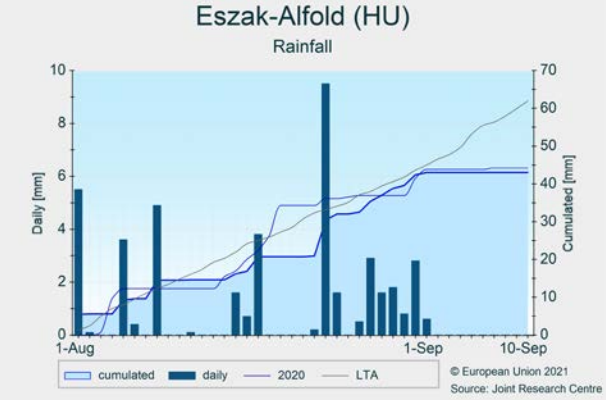
Negative yield outlook for summer crops

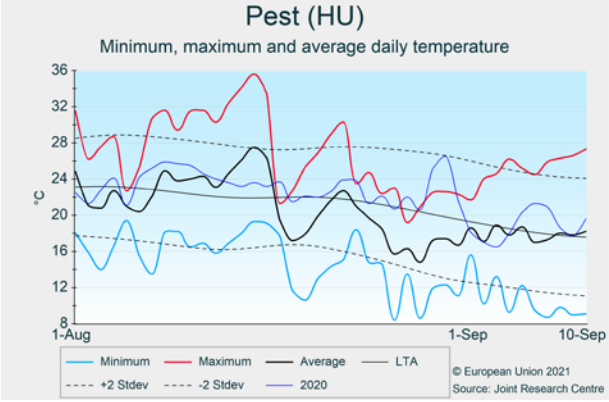
During August, weather parameters followed the LTA in most parts of the country, without resolving the water deficit accumulated since the end of spring. The beginning of September was dry. The yield outlook for summer crops is negative, and particularly bad for grain maize.

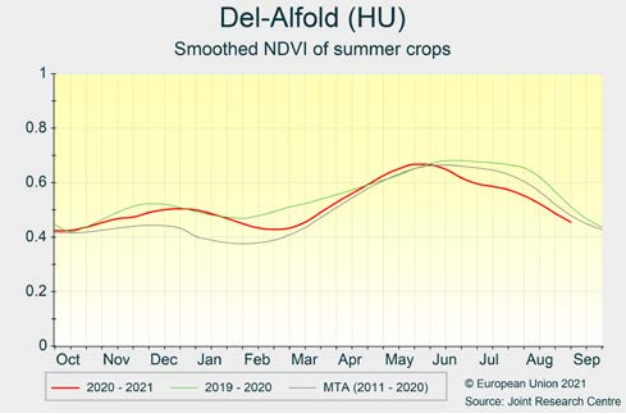
In August, temperatures and global radiation remained close to the LTA. August rainfall was also in line with the LTA in two thirds of the country, while rainfall recorded in the central part was 10% to 30% below the LTA. During the first dekad of September, no rainfall occurred in the whole country.

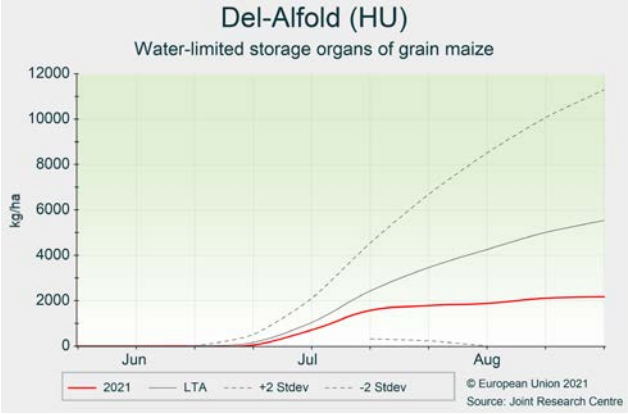
The rainfall in August was too little and came too late to provide any compensation for the dry conditions in June and July. Summer crops, currently at the maturity stage, were particularly affected by water stress in the south-east of the country. The contrast between the south and the north of the country is significant in terms of yield potential. While close-to-average yields of maize and sunflowers are expected in the north (*Észak-Magyarország*), the yield outlook in the south (*Dél-Alföld*) is clearly negative. As some grain maize fields with expected low yield are likely to be harvested as green maize, the harvested areas might be reduced and the yield loss levelled. At national level, the forecast is reduced further, well below the 5-year average.

Conditions were favourable for the sowing of rapeseed, which benefited from the dry mid-August conditions followed by a week of rainfall at the end of August.









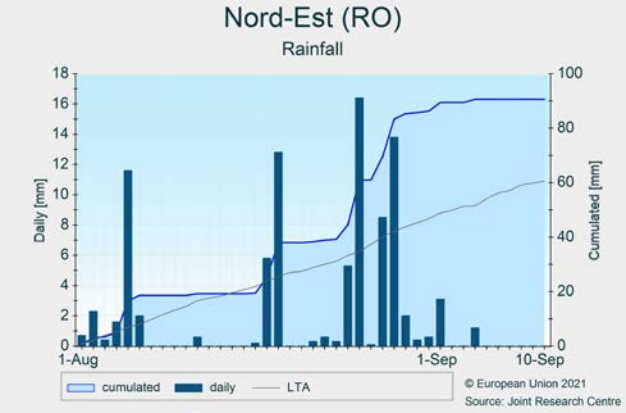
Romania

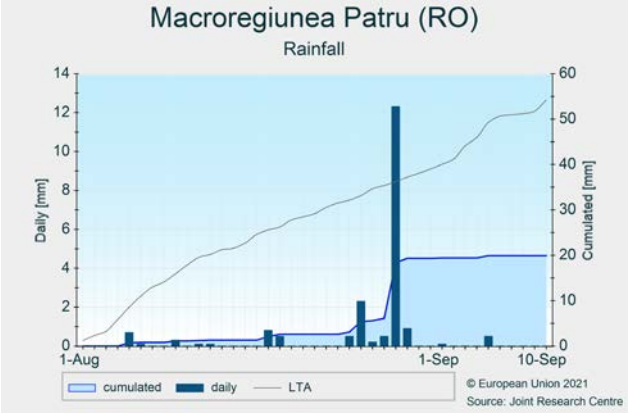
Drought continues to limit summer crops in southern Romania

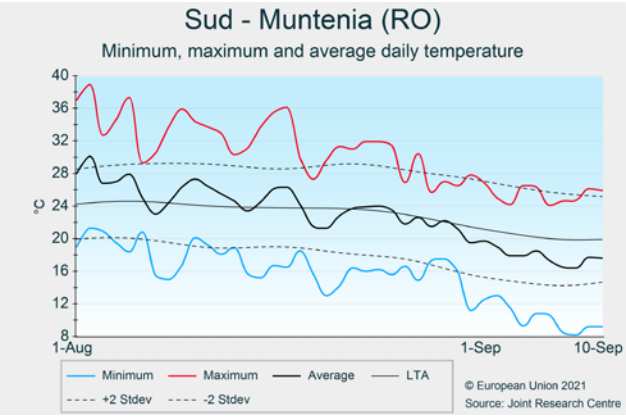
The hot and dry start to August in southern and south-eastern Romania was interrupted by light rainfall episodes in the second half of the month. Nevertheless, drought conditions in these regions continue to limit the growth of summer crops. The grain maize yield outlook has been revised downwards.

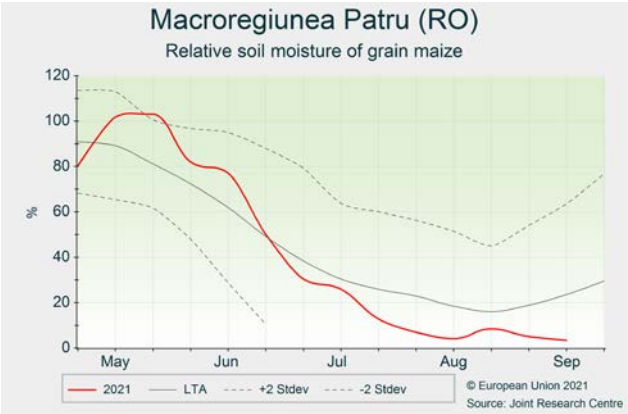
August started with unusually high temperatures in southern and western Romania, with maximum values above 38 °C (locally even above 40 °C). Temperatures returned to seasonal levels after mid-August. With less than 30 mm falling over the reporting period, a marked lack of rainfall was observed in south-eastern and southern Romania (less than half the LTA). These meteorological conditions intensified the soil moisture deficit for summer crops, especially grain maize. A rainfall surplus was recorded in parts of central and northern Romania; summer crops in these regions were progressing well.

The harvesting campaign for winter crops was completed in August. Due to the prevailing dry and hot conditions in the southern part of the country, the grain maize yield outlook has been revised downwards. Nevertheless, the yield outlook still remains well above last year's value and slightly above the 5-year average. The yield outlooks for the other summer crops remain largely unchanged with respect to our estimates in August.









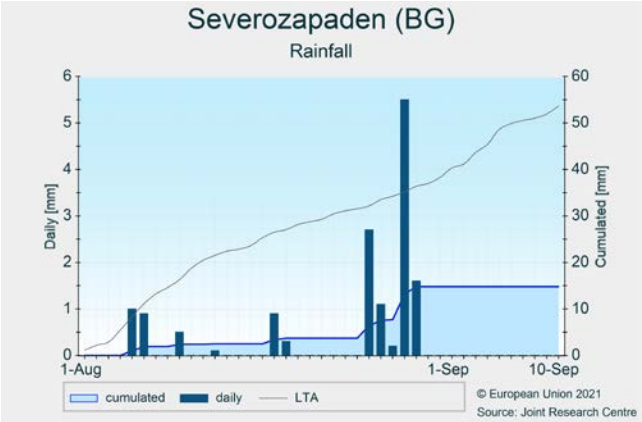
Bulgaria

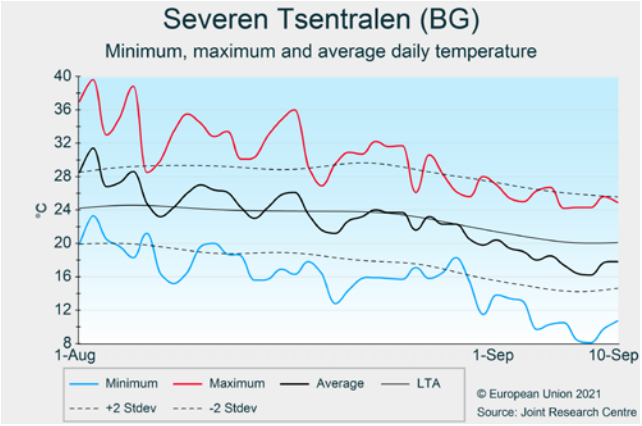
Hot and dry weather limited summer crops

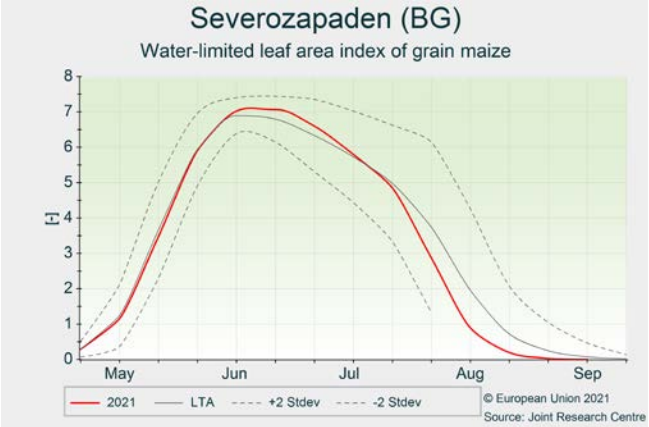
The first half of August was characterised by hot and dry weather. These dry conditions continue to limit the growth of summer crops. The yield outlook for summer crops has therefore been revised further downwards.

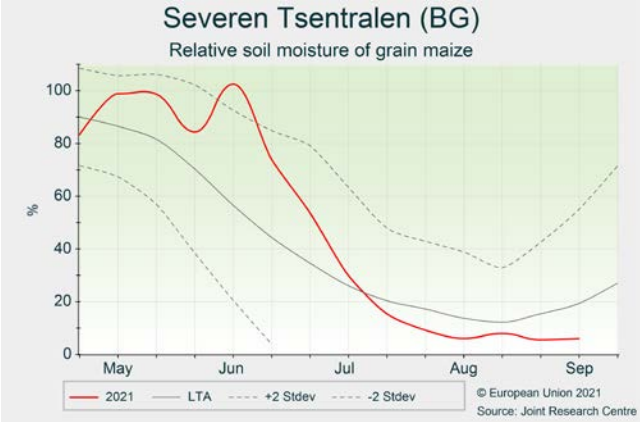
Bulgaria has experienced an unusually dry period since the beginning of August. Less than 30 mm of rainfall was recorded in the major agricultural areas – less than half of the expected rainfall totals. Additionally, the first half of August featured high temperatures; regionally, peak temperatures recorded were above 40 °C. Temperatures returned to seasonal levels after mid-August. The hot and dry meteorological conditions accelerated phenological development and intensified the soil moisture deficit for summer crops.

The harvesting campaign for winter crops was fully completed in August. Due to prevailing dry and hot conditions, the crop yield outlook for summer crops has been lowered with respect to the August Bulletin.









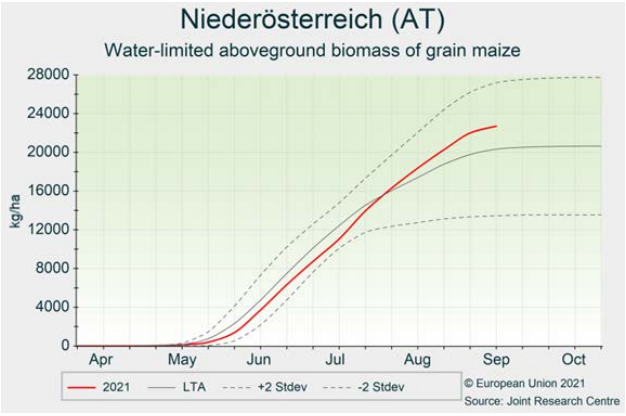
Austria, Czechia, and Slovakia

Favourable conditions for summer crops

The weather during the analysis period was favourable for biomass accumulation of summer crops in most of the regions, resulting in a slightly increased outlook.

The analysis period was colder than usual, with thermal anomalies with respect to the LTA ranging from -0.8 °C (Austria) to -1.3 °C (Slovakia) . A mild hot spell was observed for a couple of days in Austria and Slovakia during mid-August. However, the overall number of hot days with temperatures exceeding 30 °C was considerably lower than usual. Rainfall totals varied from significantly above average in Slovakia and north-east Czechia, to below average in southern Austria. August precipitation sustained adequate soil moisture levels for summer crops.

Due to the moderate temperatures, summer crops are on track with close-to-normal development, and grain maize is approaching maturity. Abundant August precipitation supported good biomass accumulation for summer crops, with the exception of southern Austria where conditions were dry. Grain maize continued to recuperate after a difficult spring and early summer. Maize biomass and storage organs have exceeded average seasonal values in Czechia and north-east Austria, while they reached around average values in Slovakia. Due to generally favourable conditions, our crop yield forecast for summer crops was slightly improved for grain maize in Czechia, and for potatoes and sugar beet in all three countries, as compared to the August issue of the Bulletin.



Denmark and Sweden

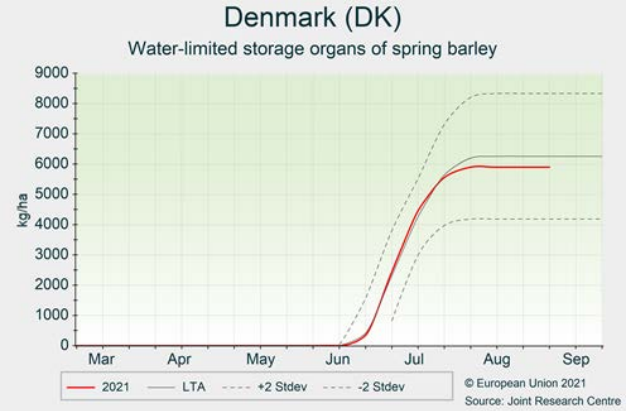
A difficult harvest

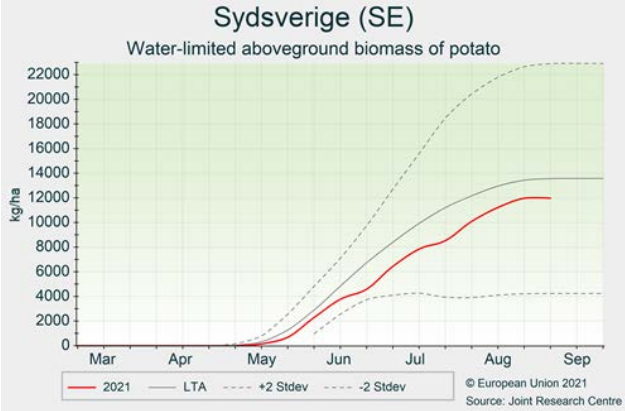
Low temperatures and heavy rainfall characterised the harvest campaign, which has nearly concluded. These conditions led to lower yield results than expected, and possibly lower quality. Yield forecasts have been revised downwards. Due to the wet weather, winter crop sowing was slightly delayed but nevertheless had progressed well by the end of August.

Until the end of August, temperatures were colder than usual, after which they increased above seasonal values, with the exception of a few days (4-7 September). Rainfall was substantial during the first two weeks of August, after which rainfall sums decreased markedly, particularly in Denmark.

The substantial rainfall delayed part of the cereal harvest and is expected to affect quality. Yield reports are lower than expected for winter wheat and spring barley, due to low grain weight. In particular, spring barley in Denmark shows variable results from region to region, depending on the extent of the June rainfall deficit; the most affected areas are in the east. The heavy rain in August delayed sowing of rapeseed; nonetheless, it had progressed well by the end of August.

The yield forecast has been reduced, with respect to the previous Bulletin, to close-to-average values for winter and spring crops in both countries. These reductions take account of the difficult conditions at the end of the growing season, as well as the difficult harvest. Spring barley has been decreased to 5.58 t/ha (-3.8%), and 4.66 t/ha (-5%) in Denmark and Sweden, respectively. Soft wheat and winter barley have been revised downwards in Denmark, to 7.68 t/ha (-3%) for soft wheat and 6.47 t/ha (-4.2%) for winter barley. Crop models indicate close-to-average or slightly below-average biomass for potato crops and sugar beet, despite the beneficial rainfall during August. Yield forecasts for these two crops are unchanged or revised slightly downwards.





Finland, Lithuania, Latvia and Estonia

Heavy and frequent rainfall hampered harvest

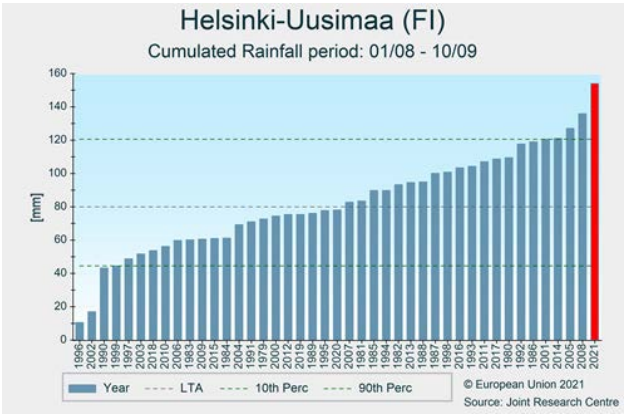
The harvest campaign has nearly concluded – albeit under difficult conditions, with heavy and frequent rainfall possibly causing yield and quality losses. Yield forecasts are mostly unchanged, except for decreases in Finland. Expectations for spring barley remain low.

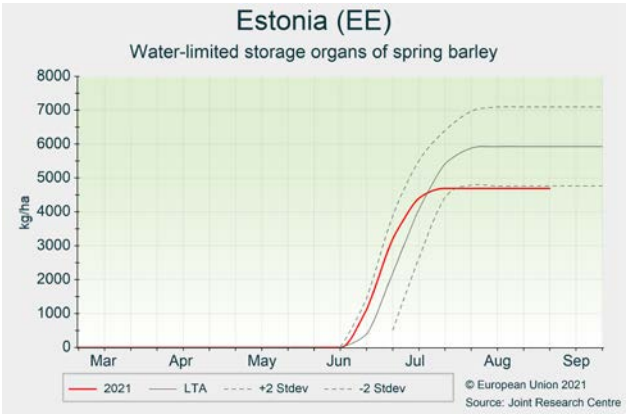
The review period was characterised by colder-than-usual temperatures. Heavy and frequent rainfall was registered in all countries, with cumulative values above the average. In particular, precipitation was up to double the usual levels in many places in Finland, where the period was the wettest since 1979.

In the Baltic countries, the rainy weather may have caused yield and quality losses during the harvest campaign. Threshing of spring barley was delayed until the beginning of September. Weather conditions slowed the sowing of winter rapeseed in August.

In Finland, the harvest has almost concluded for winter cereals, whereas it is ongoing for spring cereals and spring rapeseed, with below-average expectations. The frequent rainfall events slowed harvest progress and hampered the sowing of winter cereals and rapeseed in many areas. Generally, the wet weather of August has been favourable for the growth of sugar beet, and the harvest is expected to be satisfactory. Harvest prospects for potatoes have been reported as good, although there is some uncertainty in areas affected by excessive soil water moisture and possible increases in disease pressure.

Yield forecasts remain close to the August estimates – except for soft wheat, spring barley, rye and rapeseed in Finland (decreased to 3.1 t/ha, 2.98 t/ha, 3.78 t/ha and 1.21 t/ha, respectively) and soft wheat and rye in Latvia (decreased to 4.28 t/ha and 4.08 t/ha, respectively), due to the unfavourably wet conditions during harvest. The cold weather decreased yield expectations for grain maize.





Belgium, Luxembourg and the Netherlands

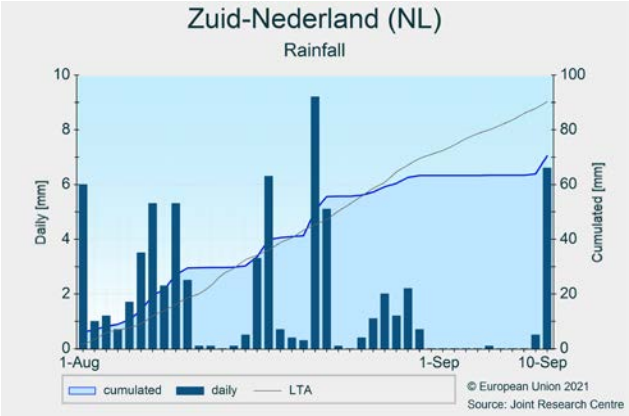
Fair (but not spectacular) yield outlook for summer crops

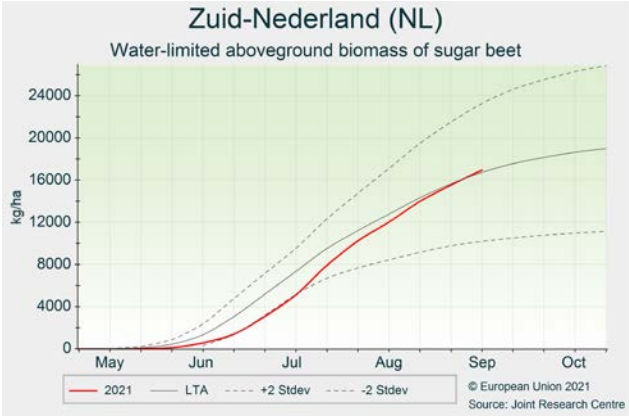
Summer crops benefited from adequate water supply and mild temperatures, but conditions were not commensurate with significant improvements in yield outlook.

Below-average temperatures continued to prevail until the end of August, after which they increased to above-average levels. Rainfall followed a similar pattern, with frequent, albeit mainly relatively small events until the end of August. This was followed by a period of more settled weather, with another rainy period starting at the end of the review period. Considering the whole review period, mean average temperatures were just below the LTA, with more significant anomalies (-0.5°C to -2°C) in eastern Belgium and Luxembourg. Cumulated rainfall was below the LTA in Luxembourg and central and southern parts of the Netherlands, and at or slightly above the LTA in other regions. Solar radiation levels were slightly below the LTA. August was particularly cloudy.

Despite the prevailing wet conditions, short periods without rain allowed farmers to complete the harvesting of winter cereals in the second half of August. Preliminary field reports confirm mediocre yields and grain quality.

Summer crops (in the Benelux mainly potatoes, sugar beet and green maize) benefited from the adequate water supply, and the more settled weather in September, although the lack of sunshine in August hampered biomass accumulation. Consequently, and confirmed by our models and remote sensing indicators, crops that normally benefit from irrigation or high ground water levels have not fully recovered from the delayed (cold) start to the season and excessive wetness in July, whereas crops that in an average year experience water stress, currently present above-average biomass. Our forecasts at country level were essentially maintained.





Greece

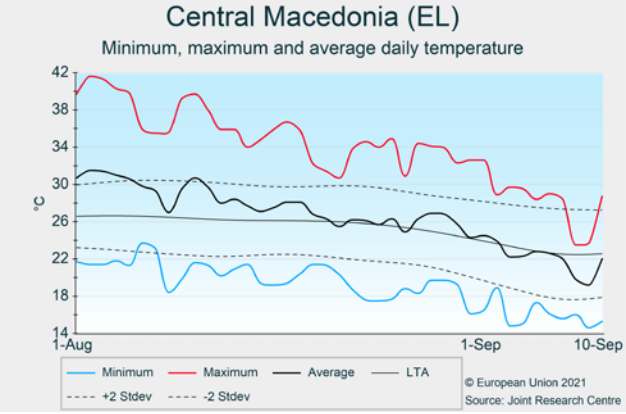
Yield outlook for summer crops slightly diminished

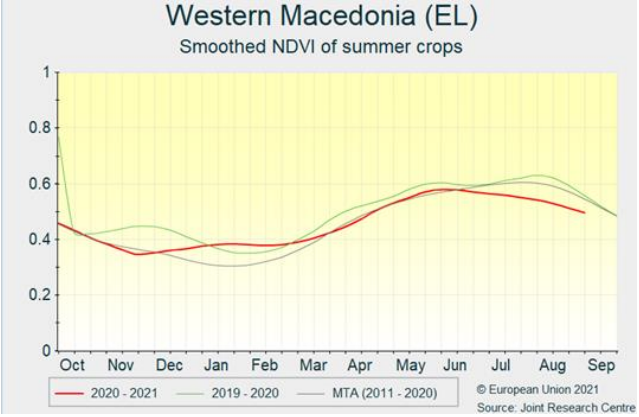
Despite moderately warm temperatures and some rainfall, summer crops could not benefit from these favourable conditions due to the heat and drought stress experienced in the preceding hot and dry summer months, which also covered the flowering and ripening periods. Forecasts have therefore been revised moderately downwards.

In Greece, after a very hot July and beginning of August, temperatures started decreasing during the second half of August, reaching values moderately below the LTA since the beginning of September. Rainfall episodes have been more frequent and were fairly distributed, compared to the very dry previous months. However, crops could only partially benefit from these favourable weather conditions, since they came late, with summer crops already in the maturity phase.

The maize harvest started in late August in southern Greece, and at the beginning of September in northern Greece. The yield outlook for this crop is slightly lower compared to average expectations, due to an extended heatwave during summer. Likewise, the harvest of sunflowers started in late August; the yield expectation is around or moderately below average, as the prolonged heat stress during flowering will have most likely compromised yield formation.

Satellite imagery (fAPAR) and crop model simulations confirm below-average to average biomass accumulation for all summer crops, except for potatoes which show biomass accumulation close to an average season. Overall, our forecasts are revised moderately downwards.





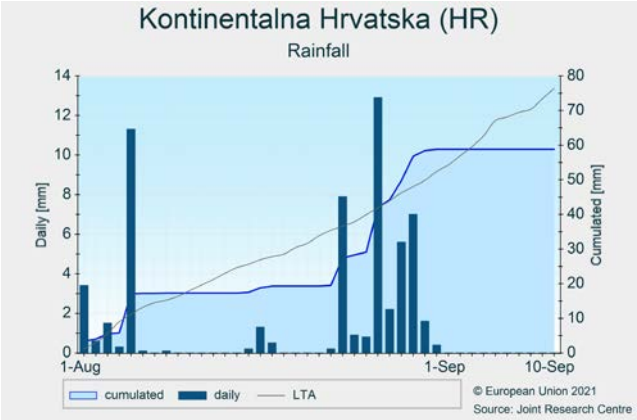
Slovenia and Croatia

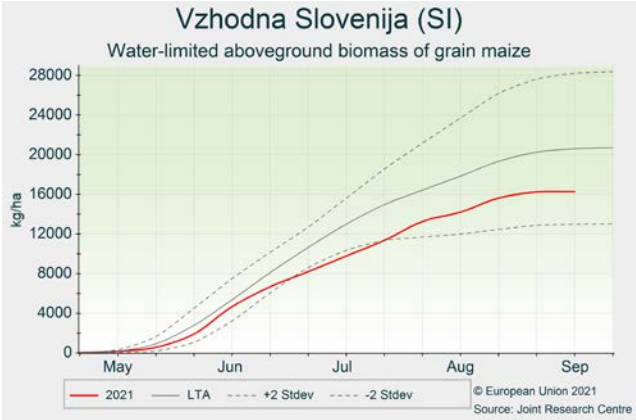
Outlook for summer crops remains below the 5-year average

August brought hot and dry weather in many important agricultural areas. Below-average rainfall was not sufficient to replenish the soil moisture deficit that had been accumulating since the beginning of summer. The yield outlook for summer crops remains well below the 5-year average.

The analysis period was characterised by a lack of precipitation in both Slovenia and Croatia. Less than 60 mm of rainfall was recorded across most of Croatia. At the same time, less than 100 mm was recorded in the main agricultural areas of eastern Slovenia. Maximum temperatures reached up to 38 °C during the first half of August, but air temperatures returned to normal levels towards the end of the month. The low rainfall recorded since the beginning of August was not sufficient to replenish the soil moisture deficit for summer crops.

The harvesting campaign for winter crops was completed in August. Prevailing dry and hot conditions during the first half of August further impacted the yield outlook for summer crops, which remains well below the 5-year average.





4.2. Rice in Europe

Average to above-average yield forecasts in most of the producing countries

During the review period (10 June – 10 September), thermal sums in the European rice districts were mainly above the LTA and led to exceptionally high seasonal cumulates of growing degree days in south-eastern Europe (*Thessaloniki*, Greece; *Pazardzhik,* Bulgaria; *Bekes*, Hungary; *Arad*, Romania). Temperature anomalies were insufficient to induce spikelet sterility (after heatwaves) in Greece and Italy, but led to some concerns for rice in Portugal (*Centro* and *Alentejo*) due to frequent day-to-day variations, and in France (*Bouches-du-Rhône*) due to below-average thermal conditions in June and July.

Remote sensing indicators generally indicate average to above-average values for crop biomass accumulation in Italy and Greece, while some concerns were highlighted in Spain for the *Cadiz* and *Sevilla* provinces, where low fAPAR values indicated reduced biomass growth compared to average conditions. Model simulations highlighted biotic stress in eastern Romania (*Braila*), where rice biomass accumulation is low compared to an average season.

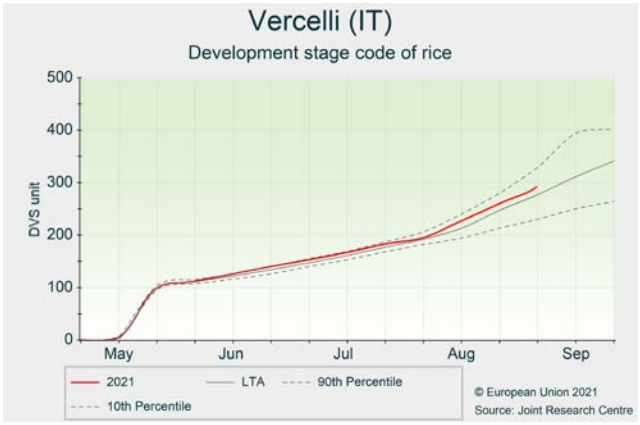
Overall, yield expectations for the European Union rice producers are above average in Italy and Greece, from average to moderately above average in Spain, Portugal and Hungary, moderately below average in Romania and Bulgaria, and below average in France. The yield forecast for rice in the EU is set at 6.94 t/ha, which corresponds to 2.8% above the last 5-year average.

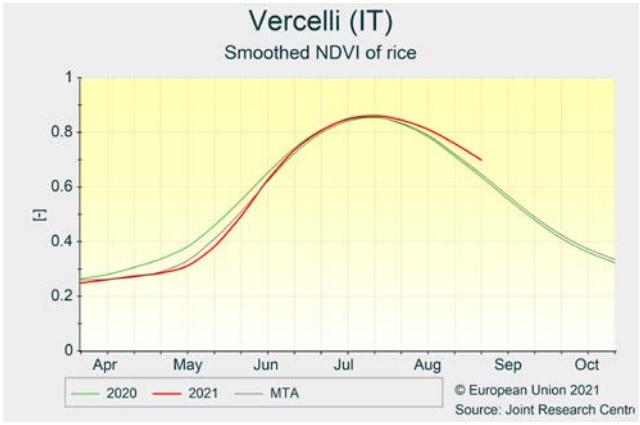
Italy

A hot season boosted rice biomass

In northern Italy, June was characterised by below-average precipitation; *Lombardia* and *Piemonte* received little rainfall (around 25 mm). Meanwhile, temperatures were slightly above average, and around 20 June a heatwave raised temperatures to +4°C to +6°C compared to the LTA. Around mid-July, temperatures increased again (to +4°C compared to the LTA) for a few days, before dropping to below-average values in the last 5 days of the month. This cool period was accompanied by frequent precipitation in *Lombardia* and *Piemonte* until early August. Another heatwave occurred during the first 15 days of August, moving maximum temperatures up to 35-36 °C. Since then, temperatures have been seasonal and precipitation scarce.

Rice displayed above-ground biomass well above the average in all provinces of *Lombardia* and *Piemonte,* and slightly above the average in *Veneto* and *Emilia-Romagna*. The initial delay in crop development in late spring was recovered, and flowering occurred on time in all the rice-cultivating areas, between late July and early August. Since then, rice development has accelerated due to the heat, and it is now slightly advanced compared to the LTA. Remote sensing analysis reveals favourable biomass accumulation for the whole season (e.g. *Vercelli*) or from flowering onwards (e.g. *Pavia*), also confirming the favourable accumulation for stems, leaves and storage organs highlighted by our crop model simulations. While the wet and hot period around the beginning of August provided very favourable conditions for the spread of blast disease, no relevant biotic stresses were reported in the specialised press. Overall yield expectations are fair to good.



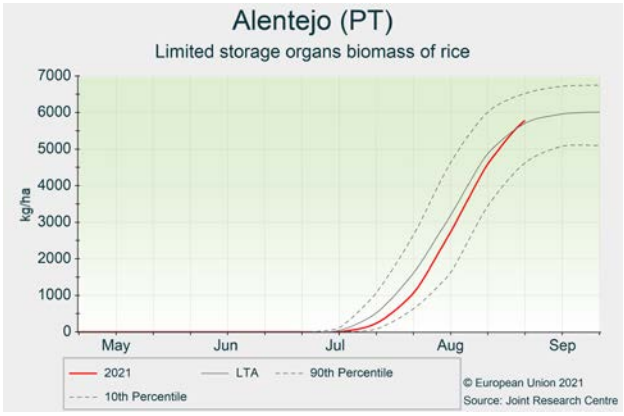


Spain and Portugal

Average to above-average yield outlook

During the review period (10 June – 10 September), cumulative radiation was average in most of the peninsula, except for the eastern coast. Here, the regions of *Comunidad Valenciana* and *Catalonia* registered the third lowest and second lowest radiation sums, respectively, on our records. Meanwhile, in the *Centro* and *Alentejo* regions of Portugal, temperatures remained below average most of the time, with frequent day-to-day changes and a few hot days in July. In the regions of *Comunidad Valenciana* and *Murcia,* daily temperatures were around average throughout the rice season.

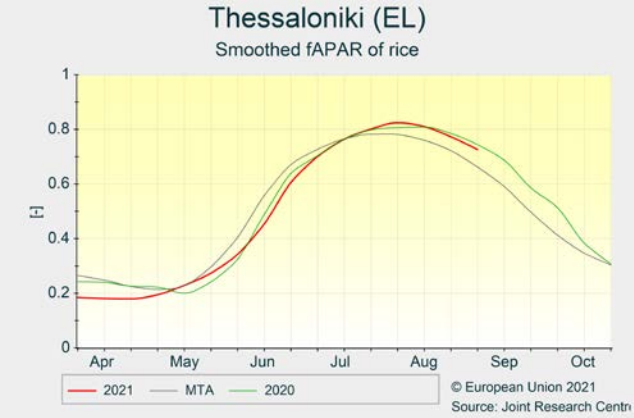
In the eastern part of the peninsula, planting at higher temperatures accelerated crop development towards the vegetative stages. Our model indicates that, for the review period, the risk of blast disease spreading remains high in *Comunidad Valenciana* and *Catalonia*. This is not the case in other rice-producing areas of the Iberian Peninsula, where radiation was average and conditions for flowering and ripening were optimum. Rice in the *Alentejo* and *Centro* regions in Portugal suffered from unusually low temperatures from July to September, leading to below-average fAPAR values in *Alentejo* and moderately below-average values in *Centro*. Rice areas in the *Sevilla* and *Cadiz* regions also present a lower fAPAR, indicating reduced biomass accumulation compared to average conditions. This can be explained by a few cold temperature events in the early part of the review period, which weakened plant development. Our yield forecasts remain almost unchanged compared to the previous outlook; they are in line with an average season in Spain and moderately above average in Portugal. A margin of uncertainty remains for the final outlook in the regions of *Alentejo*, *Cadiz* and *Seville.*

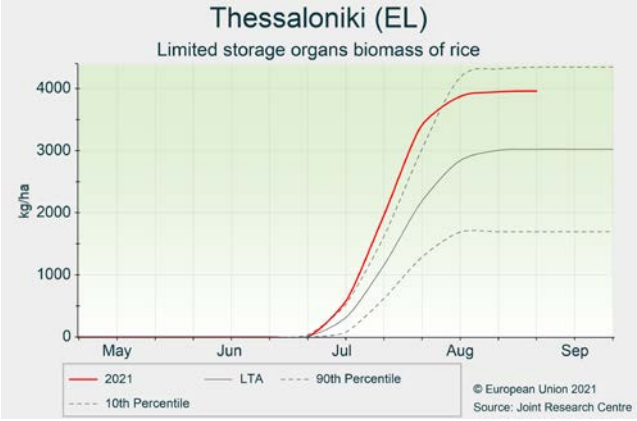


Greece

Positive outlook for the rice campaign

During the review period (10 June – 10 September), overall optimal weather conditions have been recorded for rice plants; warm weather with sufficient rainfall prevailed in the main rice-producing areas of Greece. Satellite imagery (fAPAR) and crop model simulations indicate that rice biomass accumulation was mainly above the medium-term and long-term references. However, between May and June, a delay of about 10 days in crop growth was identified, lasting from late vegetative stages up to the end of flowering. Although daily temperature conditions this season were warmer than usual and there was a prolonged heatwave, temperatures remained tolerable for the crop. A rise in biomass accumulation has been observed from July onwards and particularly since the reproductive stages, exceeding past year's level of biomass accumulation. Crop model simulations see rice (at the end of this review period) at the grain-ripening stage. In Greece, the harvest of rice should typically start in late September for long-grain varieties and in mid-October for medium-grain varieties. The yield outlook is positive, and good grain quality is expected, so our yield forecast is revised upwards and set to above the last 5-year average.

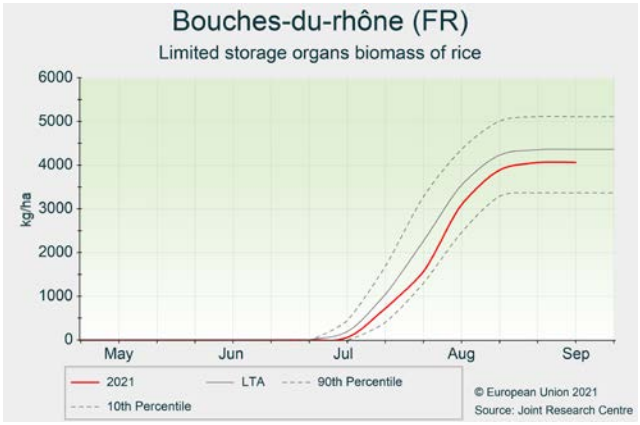


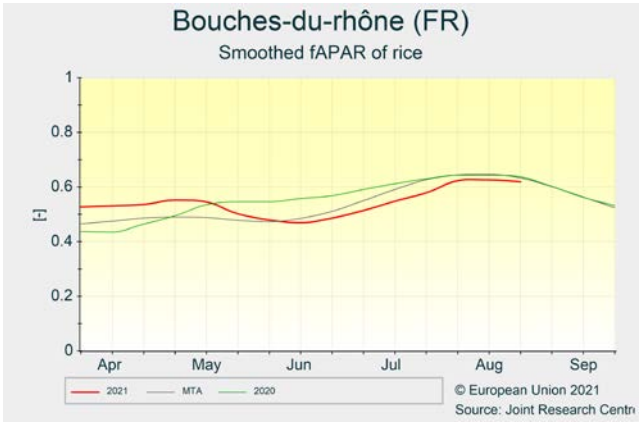


France

Below-average outlook for rice in France

The rice campaign was characterised by a delay in crop growth in southern France (*Bouches-du-Rhône*) from June onward, at the beginning of the vegetative stages. This steadily increased to 10-15 days in July, at the beginning of flowering. Crop development was influenced by below-average daily temperatures, which remained on average 1 °C to 2 °C below the LTA from the second dekad of June to mid-July. A sub-optimal cumulate of growing degree days (T_{base} 10 °C) led to below-average biomass formation in the period June-July. Crop model simulations and remote sensing analyses converge in confirming below-average biomass accumulation across the main phenological phases of the rice season. However, no biotic stress (due to blast disease) is expected. Therefore, the outlook for final production is below the LTA; our yield estimation is revised downwards compared to the previous outlook (June) and is set 4% below the last 5-year average.





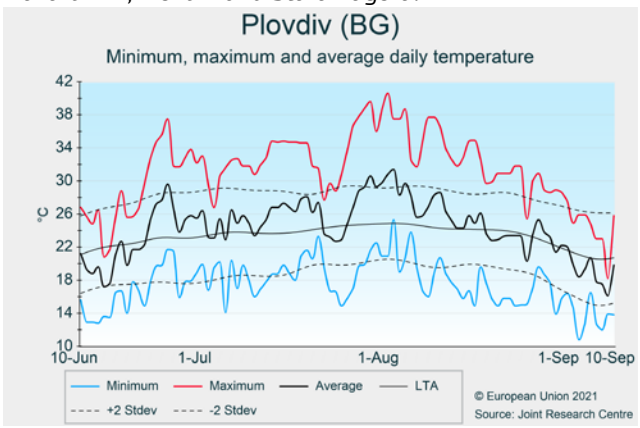
Bulgaria

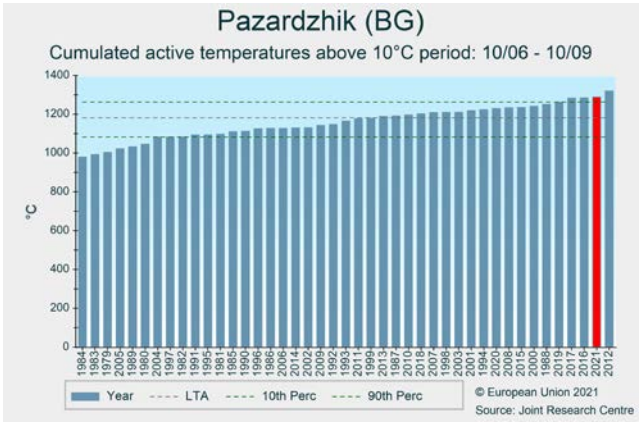
Ripening hampered by high temperatures in August

After a positive start to the rice-growing season, characterised by seasonal daily temperatures and below-average rainfall, the climatic conditions for rice in Bulgaria worsened during summer. Average daily temperatures were always above the LTA from 20 June to 20 August, with two main heatwaves occurring at the beginning of July and (more intensely) in the first week of August. The resulting cumulative temperature sums (T_{base} 10°C) during the analysis period were among the highest on our records (since 1979) in all the rice-cultivating regions of Bulgaria – *Pazardzhik*, *Plovdiv* and *Stara Zagora*.

For the *Pazardzhik* and *Plovdiv* regions, remote sensing information indicates a slowdown in biomass accumulation from end of flowering to the ripening phase, as a consequence of the unusually high average and maximum daily temperatures. Our rice model simulation indicates total leaf area index (LAI) and total grain biomass below the average reference.

In accordance with the variables analysed, our yield forecast is lower than the outlook in June but still moderately above the 5-year average.





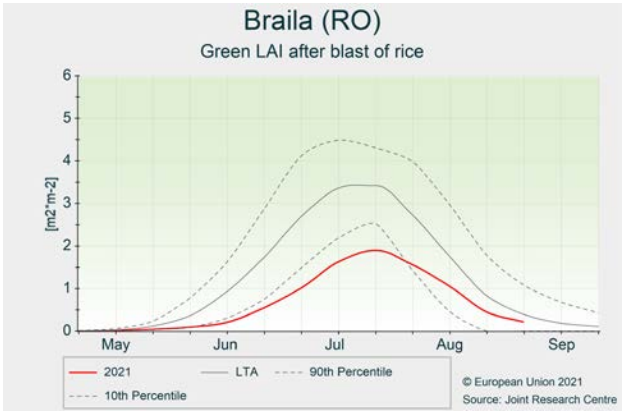
Romania and Hungary

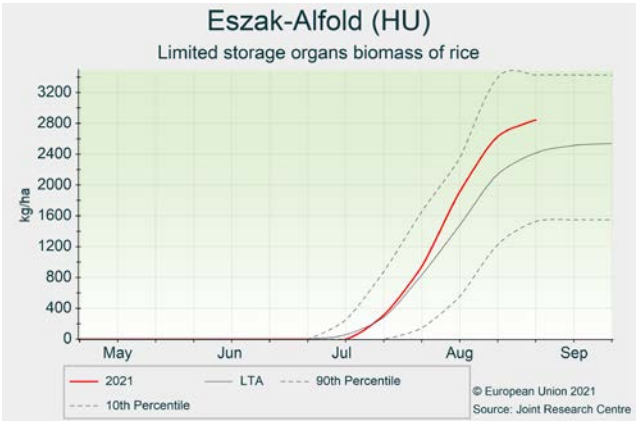
Rice yield forecast revised downwards in Romania; average expectations in Hungary

Colder-than-usual weather this spring hampered the early development stages of rice, especially in eastern **Romania**. Wet conditions prevailed during summer in the eastern part of the country, leading to an increased risk of blast infection, while heat and lack of rainfall prevailed in the south. Despite these warmer-than-usual conditions in southern Romania, the rice crop was able to partially recover, reaching close-to-average biomass accumulation levels. Canopy expansion was delayed in eastern Romania (especially *Braila* region), and the leaf area index after

blast infection remained low. According to our model simulations, biomass accumulation in eastern Romania therefore remains below the LTA. Considering the rice campaign for the country as a whole, the yield outlook has been revised downwards.

In **Hungary**, wet conditions and above-average temperatures prevailed in July in the rice-cultivating areas, when the crop was reaching its late vegetative and flowering stages. Maximum temperatures ranged above 32 °C from 6 to 15 July. In August (ripening stages), temperatures were slightly below average, with rainfall close to the LTA. The yield outlook is positive, benefiting from close-to-average weather conditions. We maintain the rice yield forecast for Hungary just above the trend.





4.3. United Kingdom

Difficult harvesting campaign

Damp and drizzly weather in the south and east caused further delay to the harvesting of winter and spring cereals, which was only concluded in September. As a consequence, grain quality was negatively affected, and some yield losses might also have occurred.

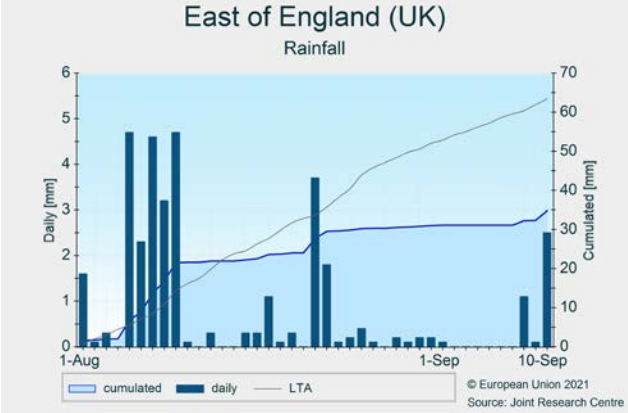
Average to slightly below-average temperatures prevailed in August, but the first ten days of September were markedly warmer-than-usual. Considering the review period as a whole, mean average temperatures ranged from just below the LTA in south-eastern regions, to 1.5°C above the LTA in western Scotland.

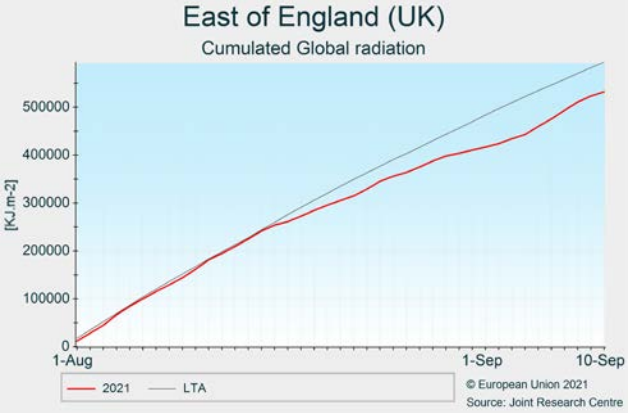
Rainfall was distinctly below the LTA throughout the country (albeit with strong local variations), and mainly concentrated in the first three weeks of August. However, particularly in southern and eastern parts of England, numerous events of drizzle occurred throughout the second half of August and the first days of September, resulting in well below-average levels of radiation.

The rain, drizzle and damp in the south and east were unfavourable for the conclusion of the harvesting campaign of winter and spring cereals, which was already late in the season due to the accumulated delay in phenological development resulting from the cold spring, and the frequent rains around ripening. As a consequence, harvesting was only completed in September; grain quality was negatively affected; and some yield losses might also have occurred. Despite the unfavourable conditions during harvest, forecasts are maintained slightly above the 5-average for spring and winter cereals.

The depicted weather conditions, complemented by the competition for labour and machinery, also created difficulties for the start to the sowing campaign (particularly rapeseed) for the next winter crops season.

In northern regions, harvesting and field preparations could be performed without noteworthy problems.





4.4. Black Sea Area

Ukraine

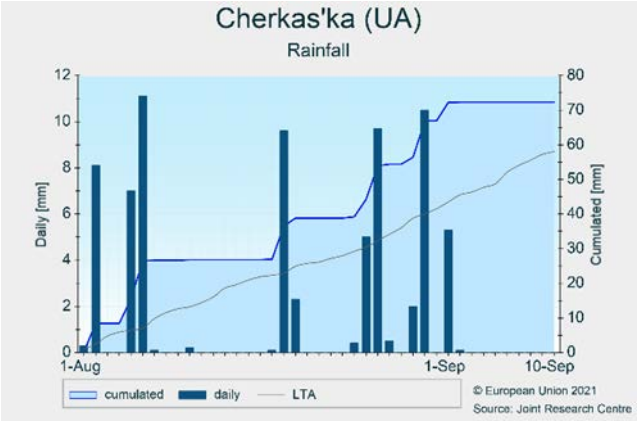
Harvest of summer crops started; above-average yields expected

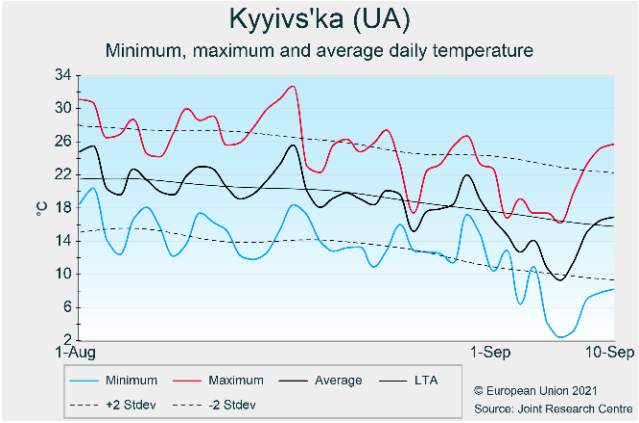
Stormy weather, with locally heavy rains, prevailed in most of Ukraine during the review period. Temperatures were back to more seasonal levels after the warmer-than-usual July. Therefore, summer crops were not exposed to any severe heat stress and profited from sufficient soil moisture reserves.

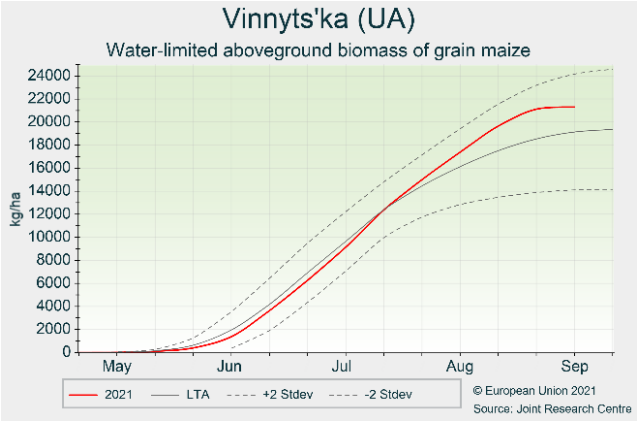
Several oblasts in the central and northern parts of Ukraine experienced above-average precipitation during the review period, locally exceeding double the LTA. In the rest of the country, rainfall was mostly close to seasonal levels. This means that higher-than-usual moisture conditions have been maintained since June. Hence, summer crops were overall not exposed to dry conditions at any point during the growing season.

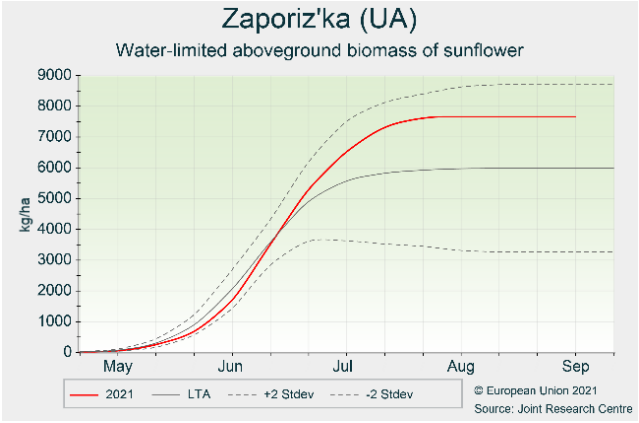
At national level, Ukraine experienced near-seasonal temperatures during the review period: slightly above-average temperatures (+0-2 °C) prevailed in the eastern half of the country, while a slightly negative thermal anomaly was experienced in the western part. The daily maxima were overall below the threshold of 35 °C, except locally in *Kharkivs'ka* and *Luhans'ka* oblasts for a few days around August. Therefore, the grain-filling stage of summer crops took place under favourable conditions. Yield forecasts were consequently maintained above average.

The harvest of summer crops has just started in the oblasts in easternmost Ukraine (*Donets'ka*, *Luhans'ka* and *Kharkivs'ka* oblasts), and is expected to progress rapidly thanks to the dry conditions experienced since early September.









Turkey

Mixed conditions for summer crops

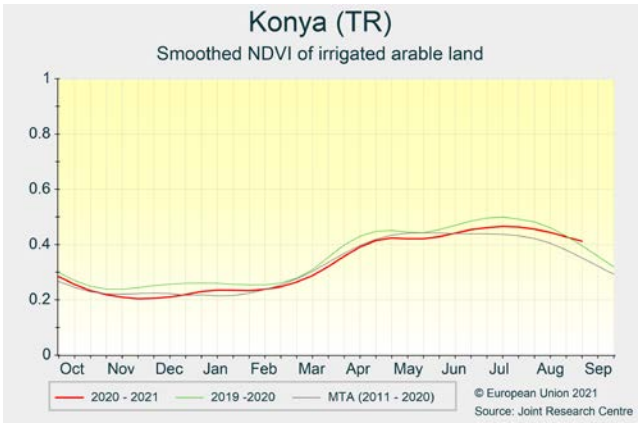
Despite a hot and dry season necessitating massive irrigation, yield expectations are around average for summer crops. A favourable season in the northern regions compensated a somewhat unfavourable grain-filling period in southern regions.

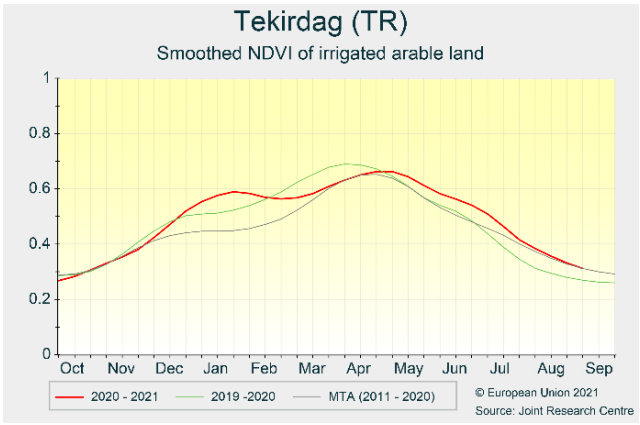
In central regions, a heatwave at the beginning of August and one after 20 August alternated with a period of average or lower-than-usual temperatures. The fresh periods favoured grain filling of maize and soybean, while during the hot peaks irrigation mitigated potential heat stress.

Similar weather conditions are observed in the Mediterranean regions of Adana and Hatay. In those regions, the heatwaves in early August weakened flowering and biomass accumulation. While in Hatay, most of the damage was mitigated by irrigation, this was not the case in Adana and a shortening of the grain formation phase, which had already started in July, accelerated in August and led to earlier-than-usual senescence.

In Marmara regions, the frequent and abundant precipitation of early summer proved very favourable and allowed for good biomass development. As a consequence, the increase in temperatures at the beginning of August had only a marginal negative effect on yield expectations. Nonetheless, the grain-filling stages of maize and soybean were shortened, and yield potential reduced. In the other regions of Marmara, summer crops moved from delayed to normal stages, and entered the maturity stage by 20 August with fair yield expectations.

Concerns raised at the beginning of the summer season proved partially founded, and the harvest of summer crops will start in late September with average expectations overall..





4.5. European Russia and Belarus

European Russia

Continued positive thermal anomaly; harvest of grain maize started

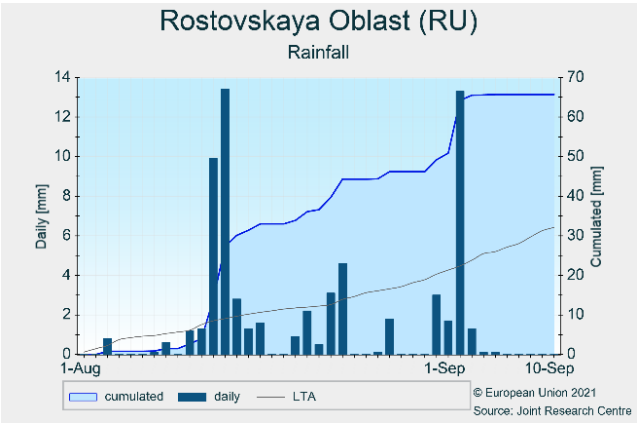
Above-average temperatures continued throughout August in most of the agricultural areas. There were strong variations in rainfall between regions. Most of the central and easternmost parts of European Russia remained drier than usual.

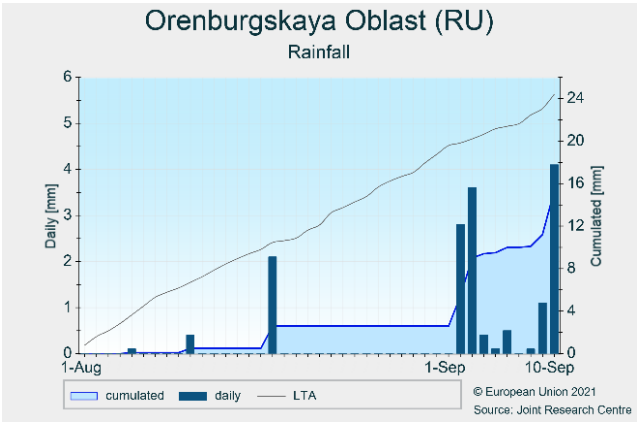
Following the warmer-than-usual conditions that had prevailed since the end of June, most of European Russia continued to experience a temperature surplus during the current review period, except for the westernmost areas. Temperatures exceeded the LTA by up to 2 °C in most parts of the territory; and by up to 4 °C in parts of the Volga and the Central okrugs, where the daily maxima regularly exceeded 35 °C in August.

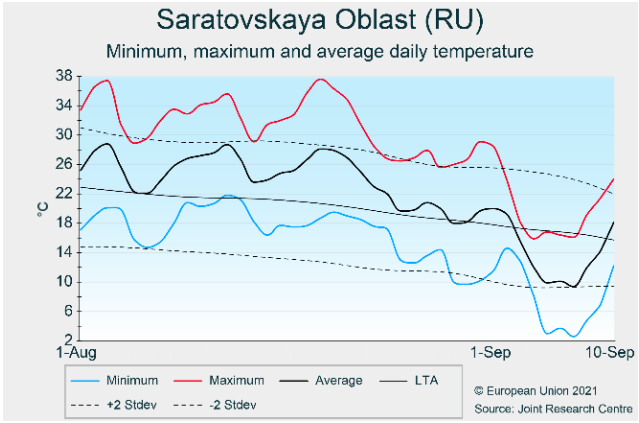
Considering the main production areas for summer crops: precipitation in south-western Russia was frequent and abundant (locally exceeding twice the LTA), which allowed for adequate water supply to summer crops in these regions (e.g. *Rostovskaya*). In contrast, significantly drier-than-usual conditions were observed in major parts of the Central and the Volga okrugs (e.g. *Orenburgskaya*), with negative impacts on summer crops, which were further exacerbated by the exceptionally hot conditions in large parts of these regions.

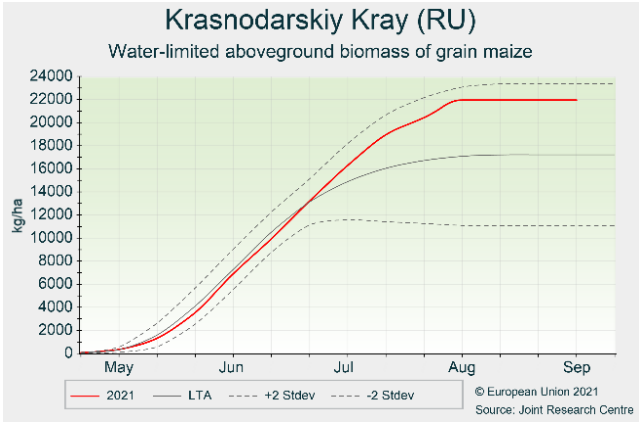
The harvest of summer crops started at the end of August in several oblasts. Above-average yields are expected in south-western Russia, whereas below-average yields are expected in the rest of European Russia.

Sowings for the new winter crop season have also started. According to the Russian Ministry of Agriculture, 7.8 Mha of winter crops had already been sown by 14 September.









Belarus

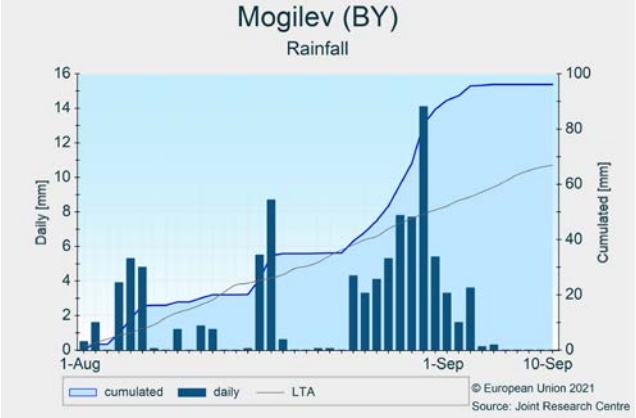
Variable yield expectations for grain maize across regions

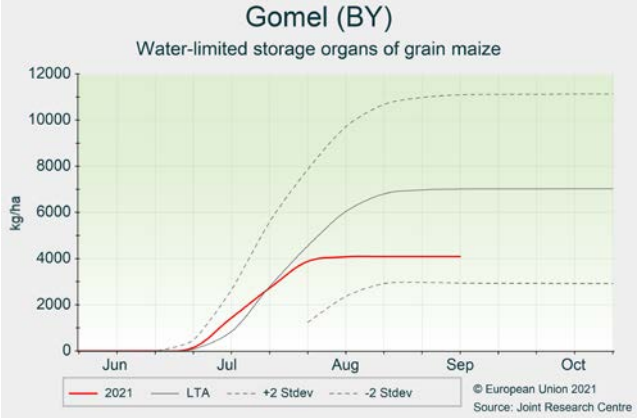
Agro-meteorological conditions were favourable for biomass and storage organ accumulation in grain maize, except in the south-eastern and eastern regions where a prolonged rainfall deficit reduced yield potential.

During August, temperatures were only slightly below average, while the first dekad of September was considerably colder than usual. Cumulative rainfall for the analysis period (1 August – 10 September) was significantly above average, but unevenly distributed in time: it was concentrated in August. Prolonged dry conditions in the south-east (see previous Bulletin) continued until the third dekad of August, when heavy precipitation finally replenished soil moisture reserves.

A rainy start to August caused a delay to the harvest of winter crops. Conditions were more favourable for finalising the harvest in the second dekad of the month, as well as for sowing winter crops. Heavy rainfall that followed at the end of August locally resulted in excessive soil moisture levels and impaired field operations.

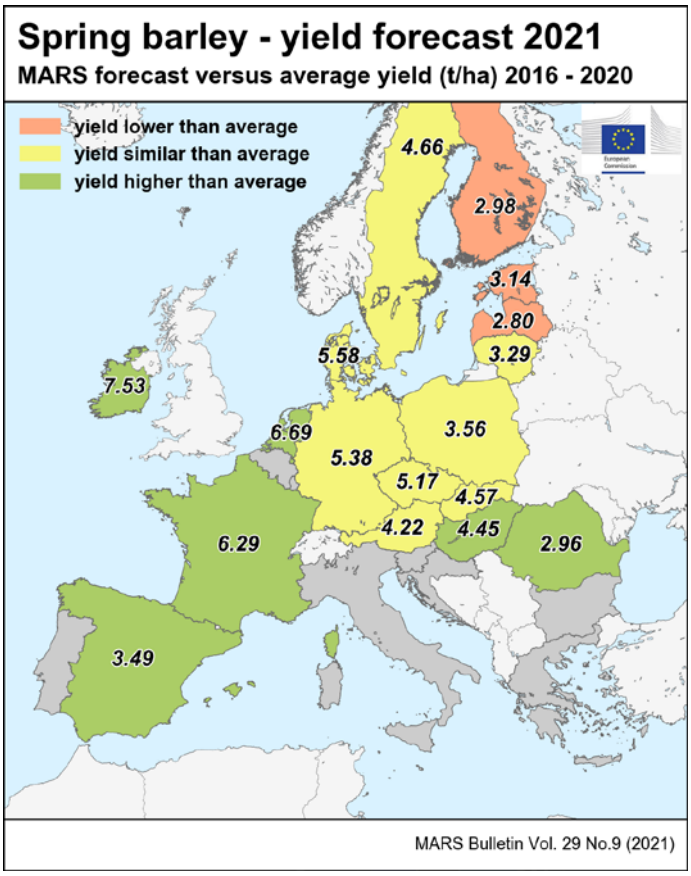
With respect to maize, thermal and soil moisture conditions were mostly adequate for kernel formation, except in the south-east, which remained dry until the last dekad of August. Biomass and storage organ accumulation of grain maize have been variable across the country, with above-seasonal averages in western regions and below-seasonal averages in the *Gomel* and *Mogilev* regions in the east. We slightly reduced our outlook for grain maize.



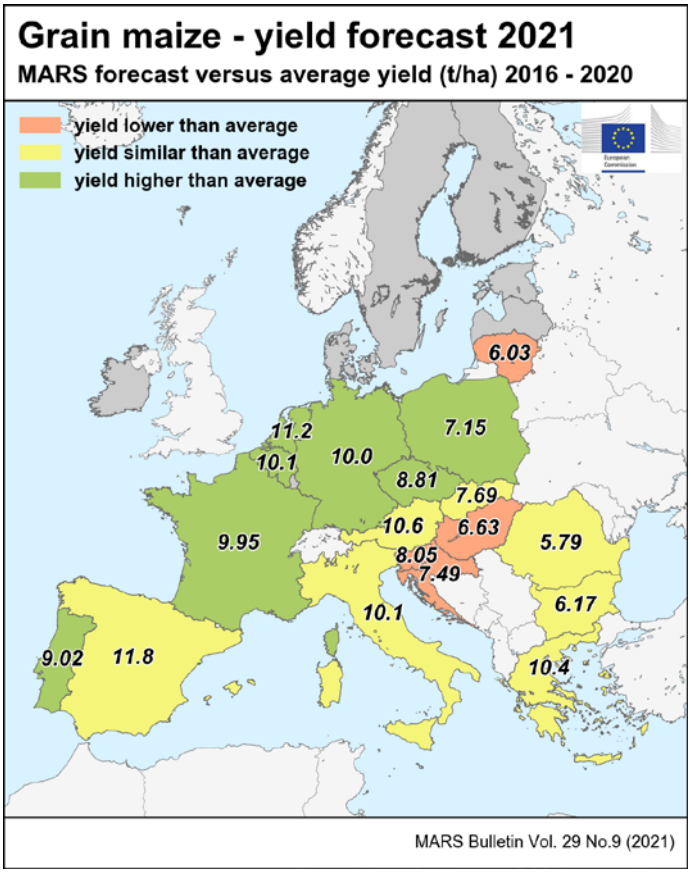


5. Crop yield forecast

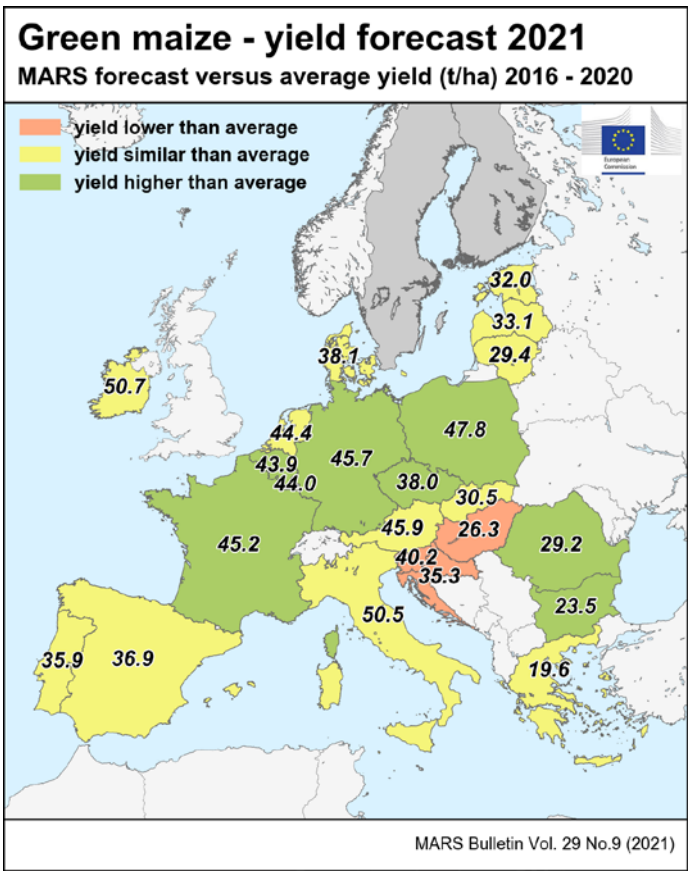
Country	Spring barley (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	4.12	4.49	**4.23**	+ 2.9	– 5.7
AT	4.36	4.90	**4.22**	– 3.2	– 14
BE	—	—	—	—	—
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	5.11	5.15	**5.17**	+ 1.2	+ 0.5
DE	5.22	5.48	**5.38**	+ 3.0	– 1.9
DK	5.53	6.34	**5.58**	+ 1.0	– 12
EE	3.39	4.04	**3.14**	– 7.2	– 22
EL	—	—	—	—	—
ES	3.30	4.02	**3.49**	+ 5.7	– 13
FI	3.74	3.52	**2.98**	– 20	– 15
FR	5.81	4.90	**6.29**	+ 8.3	+ 29
HR	—	—	—	—	—
HU	4.06	4.32	**4.45**	+ 9.6	+ 3.0
IE	7.14	7.11	**7.53**	+ 5.5	+ 5.9
IT	—	—	—	—	—
LT	3.33	4.23	**3.29**	– 1.0	– 22
LU	—	—	—	—	—
LV	3.08	3.42	**2.80**	– 9.3	– 18
MT	—	—	—	—	—
NL	6.36	6.10	**6.69**	+ 5.2	+ 10
PL	3.44	3.65	**3.56**	+ 3.4	– 2.7
PT	—	—	—	—	—
RO	2.76	2.08	**2.96**	+ 7.3	+ 42
SE	4.57	5.08	**4.66**	+ 1.8	– 8.4
SI	—	—	—	—	—
SK	4.46	4.91	**4.57**	+ 2.4	– 6.8



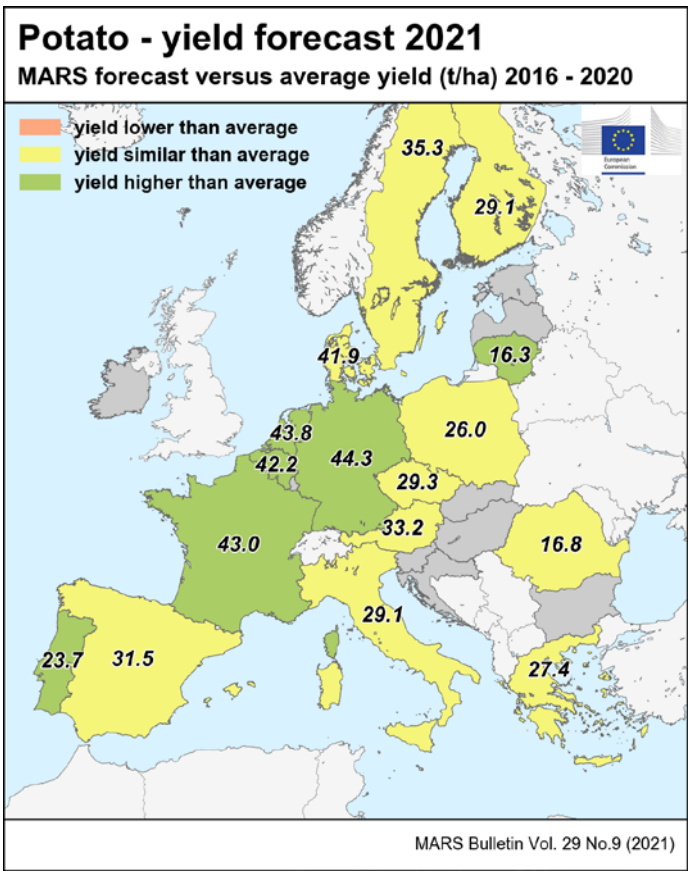
Country	Grain maize (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	7.75	7.30	**7.78**	+ 0.3	+ 6.5
AT	10.6	11.3	**10.6**	+ 0.1	– 6.5
BE	9.63	7.67	**10.1**	+ 5.4	+ 32
BG	6.36	5.10	**6.17**	– 3.1	+ 21
CY	—	—	—	—	—
CZ	8.09	9.46	**8.81**	+ 8.8	– 6.9
DE	9.36	9.59	**10.0**	+ 7.2	+ 4.6
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	10.3	9.89	**10.4**	+ 1.1	+ 5.1
ES	11.6	11.9	**11.8**	+ 1.8	– 0.2
FI	—	—	—	—	—
FR	8.73	8.03	**9.95**	+ 14	+ 24
HR	8.39	8.96	**7.49**	– 11	– 16
HU	8.12	8.62	**6.63**	– 18	– 23
IE	—	—	—	—	—
IT	10.3	11.2	**10.1**	– 2.1	– 10
LT	6.83	6.95	**6.03**	– 12	– 13
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	9.81	10.7	**11.2**	+ 15	+ 4.8
PL	6.59	7.10	**7.15**	+ 8.4	+ 0.6
PT	8.67	9.22	**9.02**	+ 4.1	– 2.1
RO	5.65	4.11	**5.79**	+ 2.4	+ 41
SE	—	—	—	—	—
SI	9.23	10.8	**8.05**	– 13	– 25
SK	7.58	8.58	**7.69**	+ 1.5	– 10



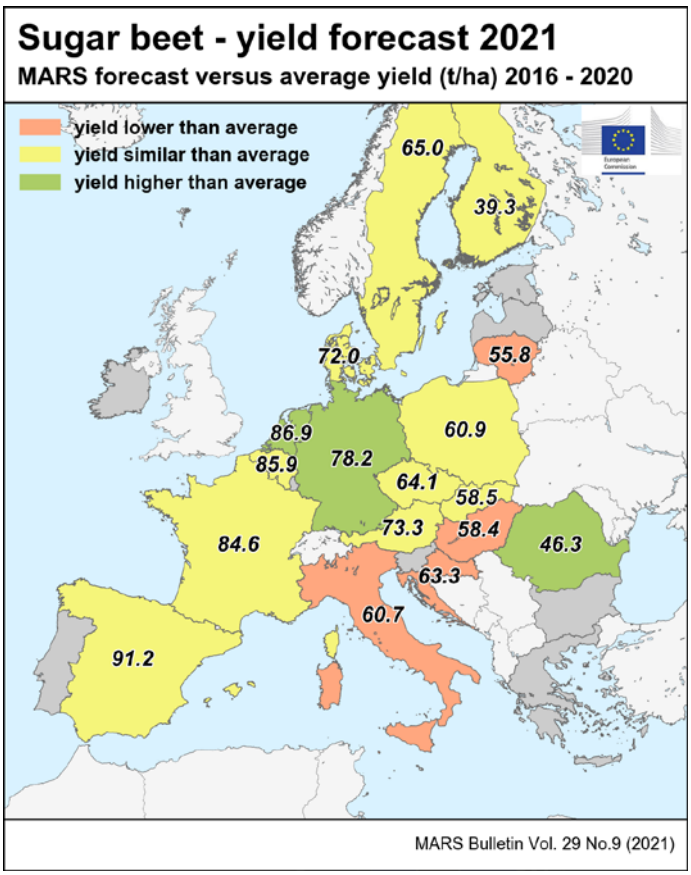
Country	Green maize (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU*	40.7	41.1	**44.0**	+ 8.0	+ 6.9
AT	47.0	49.2	**45.9**	– 2.5	– 6.9
BE	38.9	38.9	**43.9**	+ 13	+ 13
BG	22.0	21.8	**23.5**	+ 7.1	+ 7.9
CY	—	—	**—**	—	—
CZ	36.0	39.1	**38.0**	+ 5.3	– 2.8
DE	41.4	42.4	**45.7**	+ 11	+ 7.8
DK	37.8	32.8	**38.1**	+ 0.7	+ 16
EE	32.5	35.0	**32.0**	– 1.5	– 8.6
EL	20.1	19.9	**19.6**	– 2.7	– 1.7
ES	36.9	36.9	**36.9**	+ 0.0	– 0.1
FI	—	—	**—**	—	—
FR	40.0	38.9	**45.2**	+ 13	+ 16
HR	39.2	43.1	**35.3**	– 10	– 18
HU	30.4	31.7	**26.3**	– 14	– 17
IE	50.6	47.4	**50.7**	+ 0.3	+ 7.0
IT	51.6	54.5	**50.5**	– 2.2	– 7.4
LT	29.5	28.7	**29.4**	– 0.3	+ 2.2
LU	45.1	45.8	**44.0**	– 2.4	– 3.9
LV	33.1	34.1	**33.1**	+ 0.0	– 2.7
MT	—	—	**—**	—	—
NL	43.0	43.7	**44.4**	+ 3.4	+ 1.6
PL	45.3	45.4	**47.8**	+ 5.5	+ 5.3
PT	36.1	35.4	**35.9**	– 0.7	+ 1.2
RO	26.8	25.6	**29.2**	+ 9.0	+ 14
SE	—	—	**—**	—	—
SI	46.5	49.8	**40.2**	– 14	– 19
SK	31.3	34.3	**30.5**	– 2.3	– 11



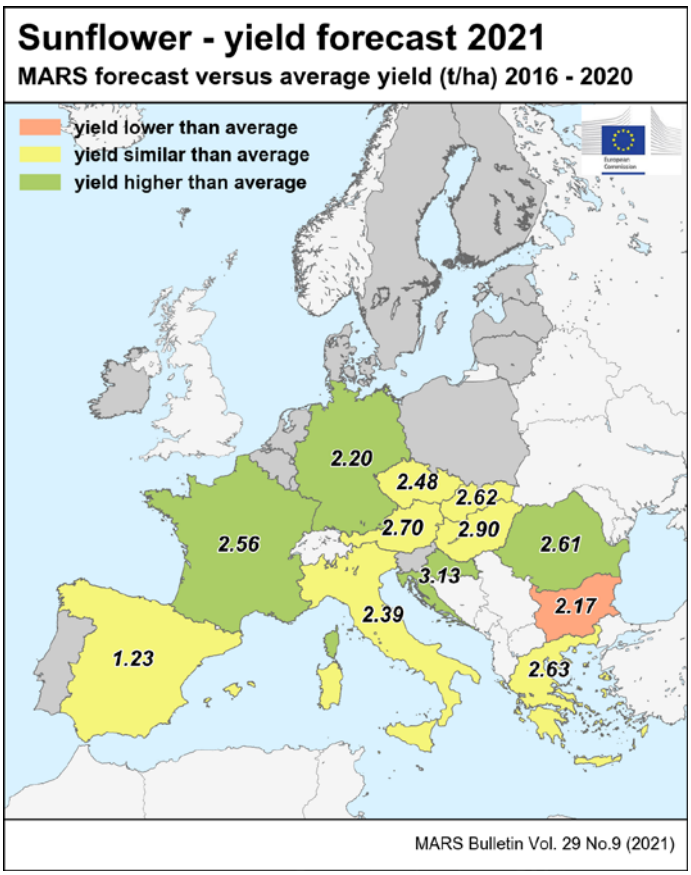
Country	Potato (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	33.0	33.6	**34.6**	+ 4.8	+ 2.8
AT	32.3	36.5	**33.2**	+ 2.7	– 9.1
BE	40.1	40.8	**42.2**	+ 5.3	+ 3.3
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	28.3	29.2	**29.3**	+ 3.6	+ 0.3
DE	41.6	42.8	**44.3**	+ 6.3	+ 3.4
DK	41.6	44.0	**41.9**	+ 0.7	– 4.9
EE	—	—	**—**	—	—
EL	28.4	29.9	**27.4**	– 3.6	– 8.5
ES	31.7	32.0	**31.5**	– 0.7	– 1.6
FI	28.6	30.2	**29.1**	+ 1.6	– 3.8
FR	40.9	40.4	**43.0**	+ 5.3	+ 6.4
HR	—	—	**—**	—	—
HU	—	—	**—**	—	—
IE	—	—	**—**	—	—
IT	29.1	30.3	**29.1**	+ 0.1	– 4.0
LT	15.5	15.7	**16.3**	+ 4.9	+ 3.5
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	42.0	42.7	**43.8**	+ 4.3	+ 2.6
PL	25.7	25.2	**26.0**	+ 1.4	+ 3.1
PT	21.6	23.5	**23.7**	+ 10	+ 1.1
RO	16.2	16.2	**16.8**	+ 3.4	+ 3.7
SE	34.5	36.3	**35.3**	+ 2.3	– 2.8
SI	—	—	**—**	—	—
SK	—	—	**—**	—	—



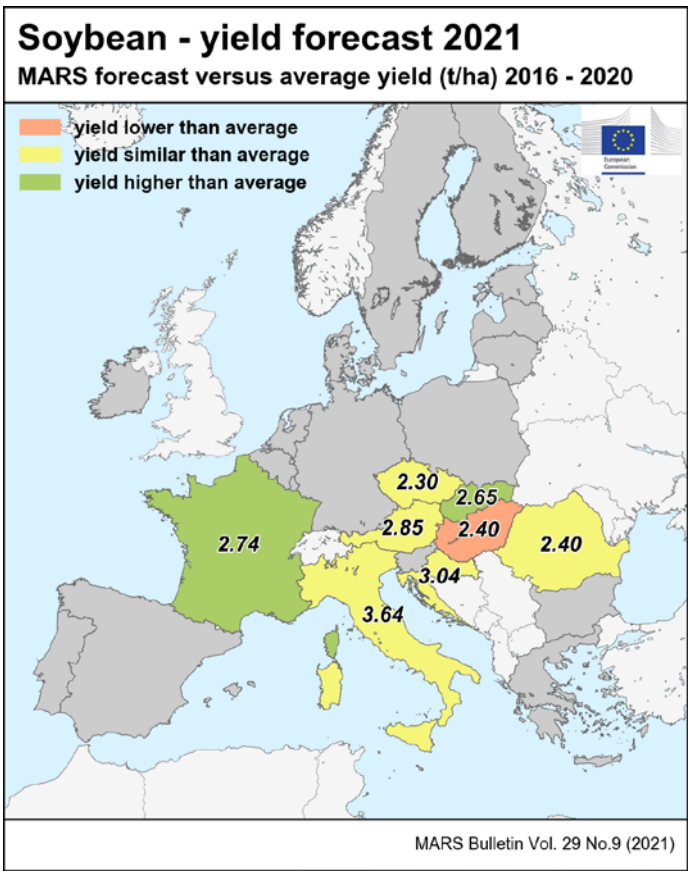
Country	Sugar beets (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	73.6	67.5	**75.0**	+ 1.8	+ 11
AT	74.2	79.5	**73.3**	– 1.3	– 7.8
BE	84.8	84.4	**85.9**	+ 1.2	+ 1.7
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	63.1	61.5	**64.1**	+ 1.6	+ 4.1
DE	73.9	74.2	**78.2**	+ 5.7	+ 5.4
DK	72.0	77.1	**72.0**	– 0.1	– 6.6
EE	—	—	—	—	—
EL	—	—	—	—	—
ES	89.2	93.6	**91.2**	+ 2.2	– 2.5
FI	39.2	38.5	**39.3**	+ 0.2	+ 2.1
FR	82.3	62.5	**84.6**	+ 2.8	+ 35
HR	66.3	73.8	**63.3**	– 4.5	– 14
HU	62.4	58.3	**58.4**	– 6.3	+ 0.1
IE	—	—	—	—	—
IT	65.5	59.4	**60.7**	– 7.3	+ 2.3
LT	62.3	68.1	**55.8**	– 11	– 18
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	82.9	82.1	**86.9**	+ 4.9	+ 5.8
PL	61.7	57.9	**60.9**	– 1.2	+ 5.2
PT	—	—	—	—	—
RO	40.2	40.4	**46.3**	+ 15	+ 15
SE	64.9	68.0	**65.0**	+ 0.2	– 4.4
SI	—	—	—	—	—
SK	60.6	60.4	**58.5**	– 3.3	– 3.1



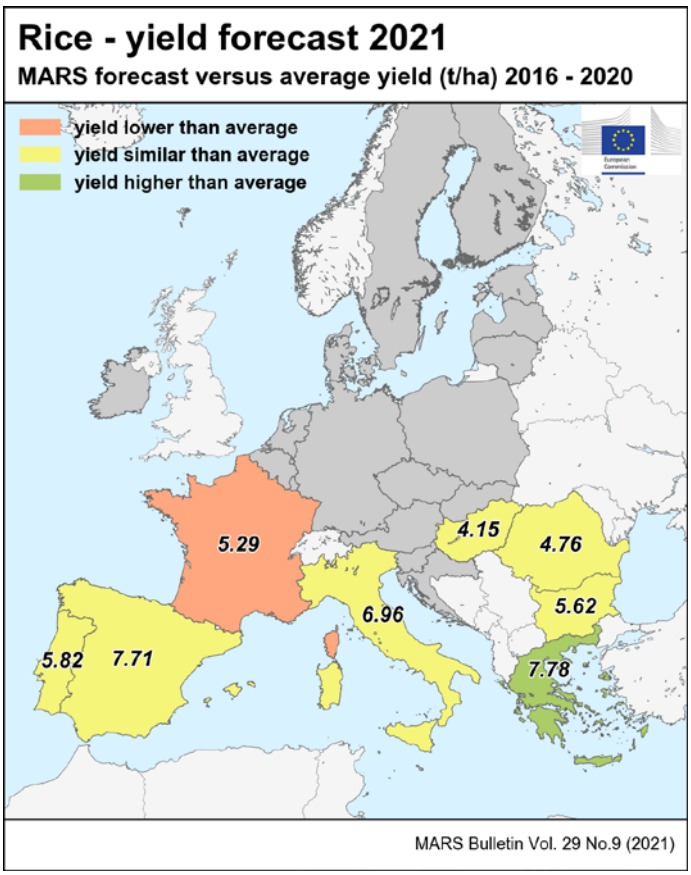
Country	Sunflower (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	2.27	1.99	**2.36**	+ 3.7	+ 18
AT	2.74	2.39	**2.70**	– 1.6	+ 13
BE	—	—	—	—	—
BG	2.28	2.10	**2.17**	– 4.9	+ 3.7
CY	—	—	—	—	—
CZ	2.52	2.58	**2.48**	– 1.6	– 3.8
DE	2.05	2.06	**2.20**	+ 7.3	+ 6.8
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	2.72	2.52	**2.63**	– 3.4	+ 4.3
ES	1.21	1.35	**1.23**	+ 2.1	– 8.5
FI	—	—	—	—	—
FR	2.27	2.05	**2.56**	+ 13	+ 24
HR	2.98	3.10	**3.13**	+ 5.2	+ 1.1
HU	2.93	2.75	**2.90**	– 1.0	+ 5.2
IE	—	—	—	—	—
IT	2.41	2.43	**2.39**	– 0.8	– 1.6
LT	—	—	—	—	—
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	—	—	—	—	—
PT	—	—	—	—	—
RO	2.46	1.70	**2.61**	+ 6.1	+ 54
SE	—	—	—	—	—
SI	—	—	—	—	—
SK	2.72	2.53	**2.62**	– 3.6	+ 3.5



Country	Soybean (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	2.93	2.79	**2.96**	+ 1.1	+ 5.8
AT	2.97	2.96	**2.85**	– 3.8	– 3.5
BE	—	—	—	—	—
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	2.24	2.33	**2.30**	+ 3.0	– 1.3
DE	—	—	—	—	—
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	—	—	—	—	—
ES	—	—	—	—	—
FI	—	—	—	—	—
FR	2.54	2.17	**2.74**	+ 7.8	+ 26
HR	2.98	3.10	**3.04**	+ 1.9	– 2.0
HU	2.80	2.90	**2.40**	– 14	– 17
IE	—	—	—	—	—
IT	3.55	3.77	**3.64**	+ 2.4	– 3.6
LT	—	—	—	—	—
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	—	—	—	—	—
PT	—	—	—	—	—
RO	2.35	1.85	**2.40**	+ 2.0	+ 30
SE	—	—	—	—	—
SI	—	—	—	—	—
SK	2.45	2.53	**2.65**	+ 8.2	+ 4.8



Country	Rice (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	6.75	6.83	**6.94**	+ 2.8	+ 1.6
AT	—	—	—	—	—
BE	—	—	—	—	—
BG	5.70	5.70	**5.62**	– 1.4	– 1.4
CY	—	—	—	—	—
CZ	—	—	—	—	—
DE	—	—	—	—	—
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	6.55	7.54	**7.78**	+ 19	+ 3.2
ES	7.68	7.68	**7.71**	+ 0.3	+ 0.4
FI	—	—	—	—	—
FR	5.52	5.28	**5.29**	– 4.1	+ 0.1
HR	—	—	—	—	—
HU	4.15	3.85	**4.15**	+ 0.1	+ 7.8
IE	—	—	—	—	—
IT	6.72	6.81	**6.96**	+ 3.5	+ 2.1
LT	—	—	—	—	—
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	—	—	—	—	—
PT	5.64	5.29	**5.82**	+ 3.2	+ 10
RO	4.89	4.49	**4.76**	– 2.8	+ 5.9
SE	—	—	—	—	—
SI	—	—	—	—	—
SK	—	—	—	—	—



Country	Wheat (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
BY	3.27	3.29	**3.44**	+ 5.3	+ 4.7
TR	2.80	2.97	**2.78**	– 0.7	– 6.3
UA	4.00	3.80	**4.64**	+ 16	+ 22
UK	8.05	7.16	**8.21**	+ 2.0	+ 15

Country	Barley (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
BY	2.72	2.76	**2.46**	– 9.4	– 11
TR	2.66	2.65	**2.62**	– 1.7	– 1.3
UA	3.25	3.22	**3.77**	+ 16	+ 17
UK	6.11	5.91	**6.28**	+ 2.7	+ 6.2

Country	Grain maize (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
BY	5.94	6.00	**5.66**	– 4.7	– 5.7
TR	9.42	9.41	**9.62**	+ 2.1	+ 2.2
UA	6.52	5.62	**7.65**	+ 17	+ 36
UK	—	—	**—**	—	—

Country	Soybean (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
BY	—	—	**—**	—	—
TR	4.33	4.42	**4.53**	+ 4.6	+ 2.6
UA	2.25	2.05	**2.32**	+ 3.0	+ 13
UK	—	—	**—**	—	—

NB: Yields are forecast for crops with more than 10 000 ha per country with sufficently long and coherent yield time series (for rice more than 1 000 ha per country).

Sources: 2016-2021 data come from DG Agriculture and Rural Development short-term-outlook data (dated August 2021, received on 03.09.2021), Eurostat Eurobase (last update: 03.09.2021) and EES (last update: 15.11.2017).

Non-EU 2016-2020 data come from USDA, Turkish Statistical Institute (TurkStat), Eurostat Eurobase (last update: 03.09.2021), Ministry for Development of Economy, Trade and Agriculture of Ukraine, FAO and PSD-online.

2021 yields come from MARS Crop Yield Forecasting System (output up to 10.09.2021).

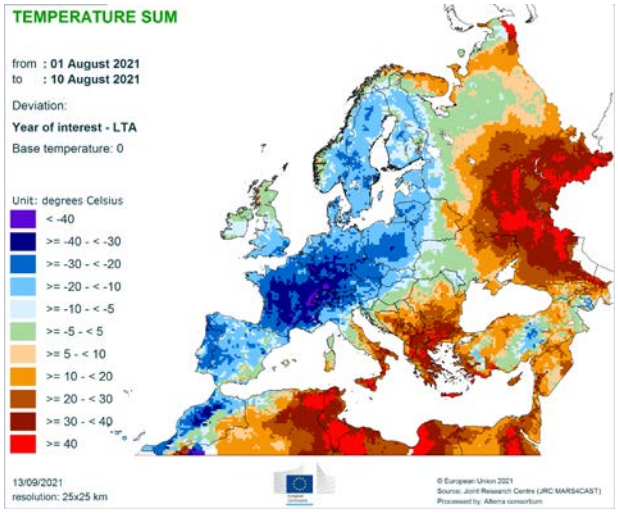
EU aggregate after 1.2.2020 is reported.

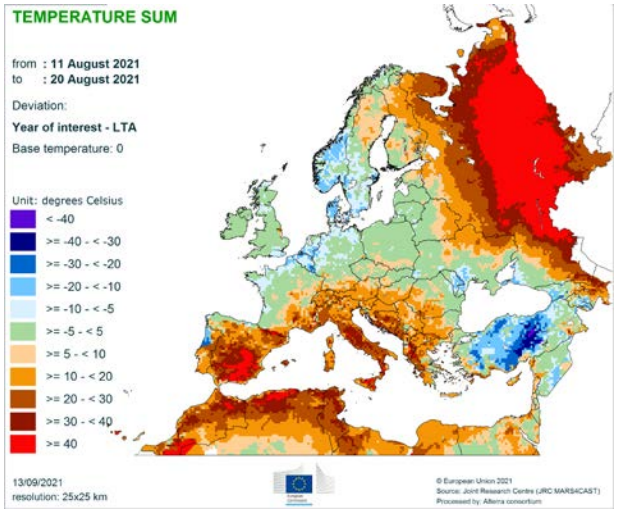
The column header '%21/5yrs' stands for the 2021 change with respect to the 5-year average(%). Similarly, '%21/20' stands for the 2021 change with respect to 2020(%).

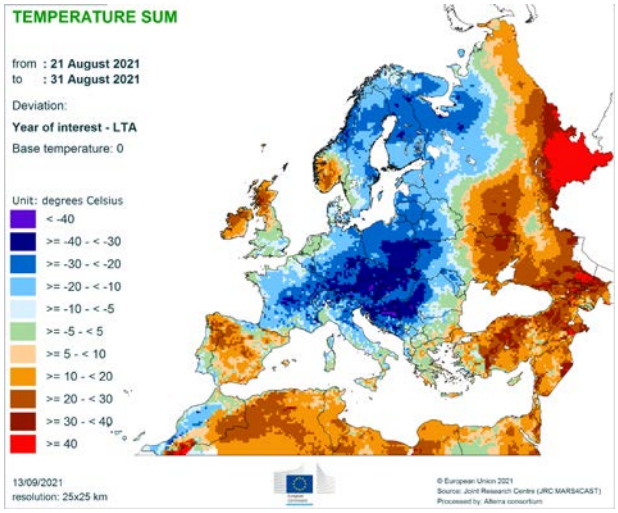
* The EU figures do not include green maize forecasts for Sweden since recent data on yields were not consistent.

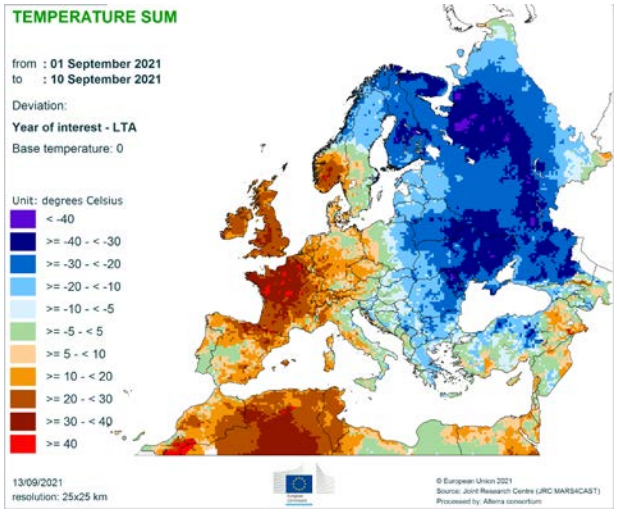
6. Atlas

Temperature regime

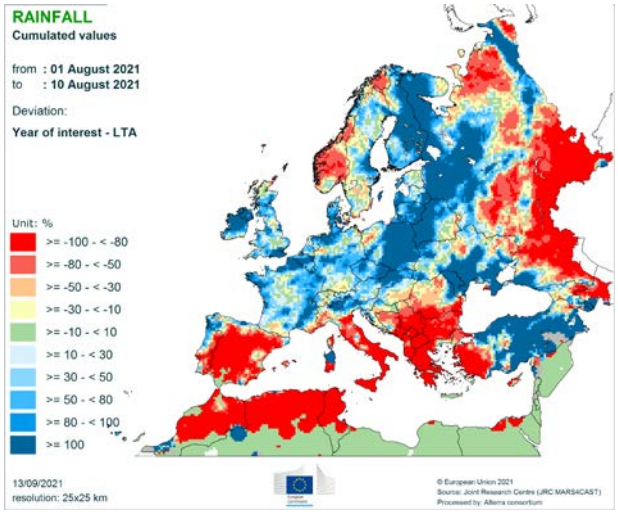


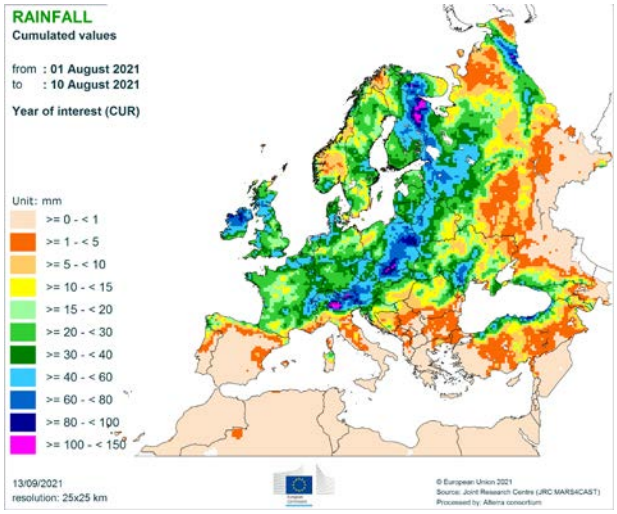


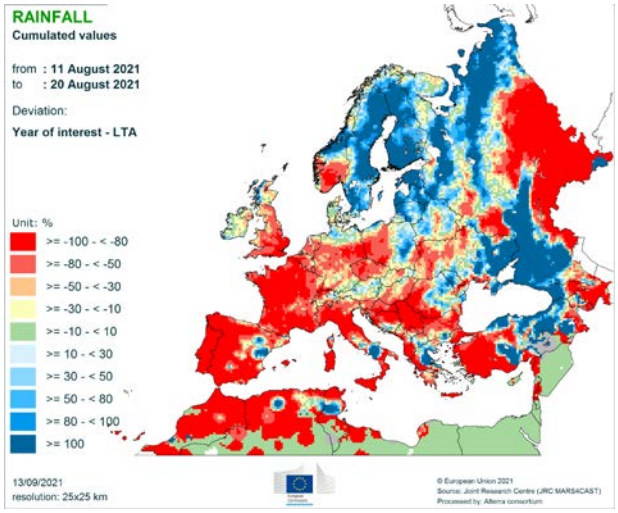


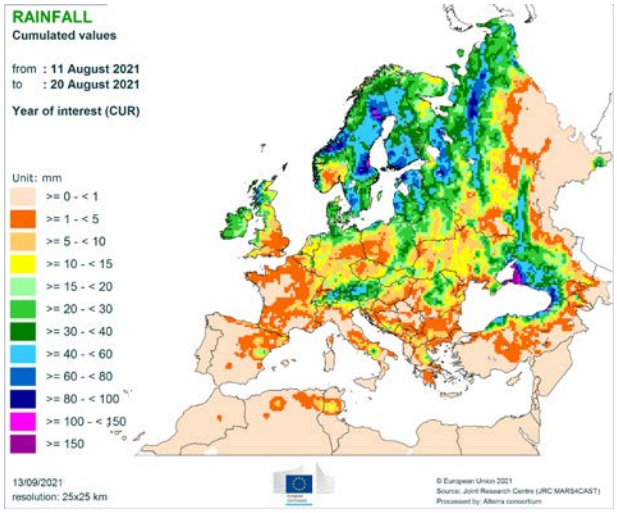


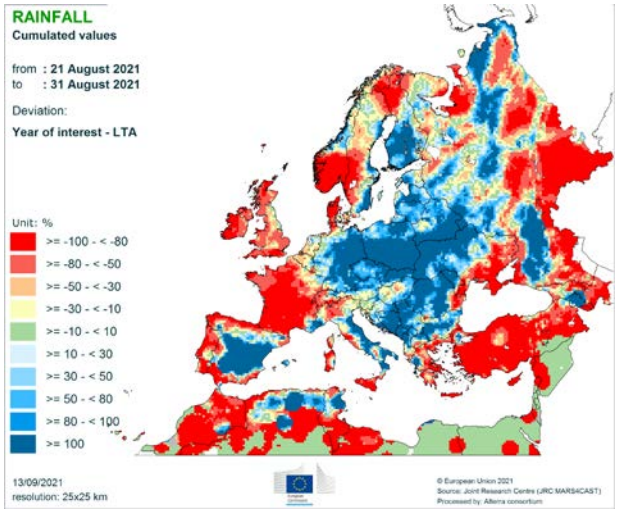
Precipitation

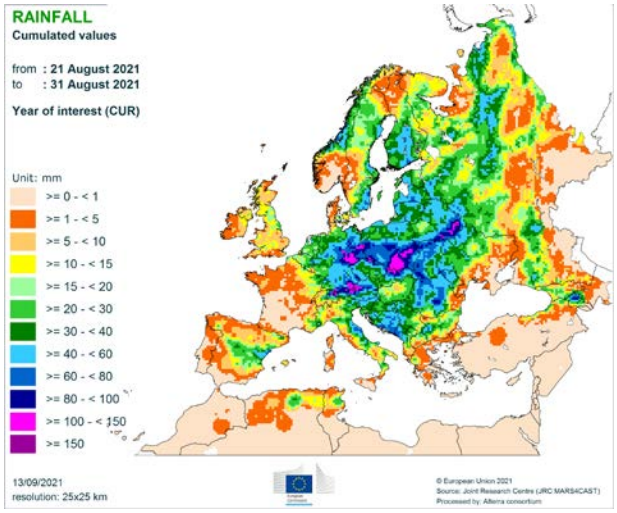


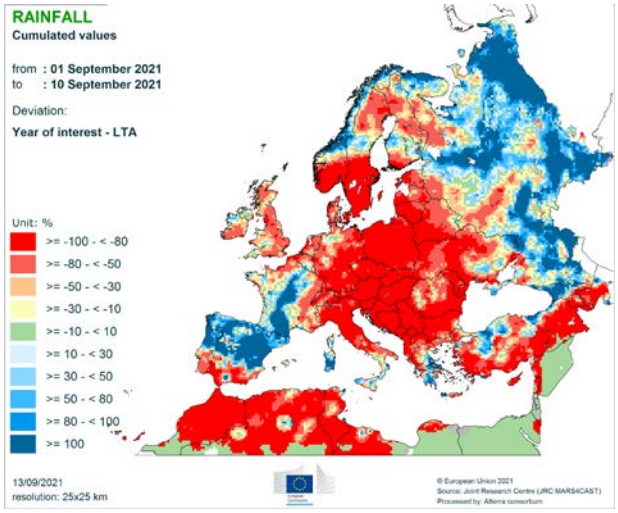


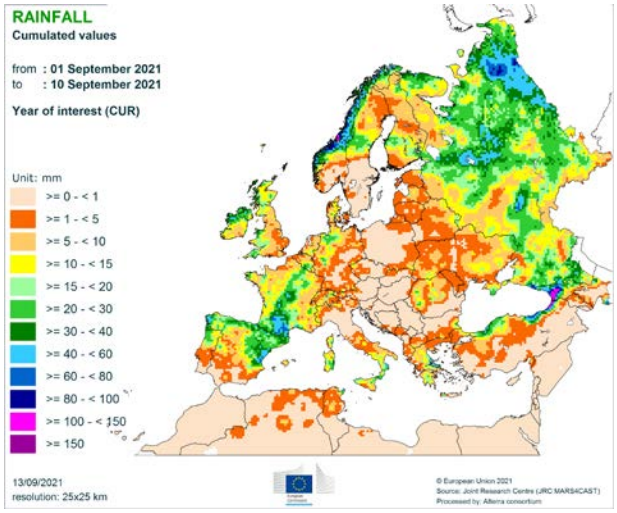

RAINFALL
Cumulated values
from : 11 August 2021
to : 20 August 2021
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
13/09/2021
resolution: 25x25 km


RAINFALL
Cumulated values
from : 11 August 2021
to : 20 August 2021
Year of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
13/09/2021
resolution: 25x25 km

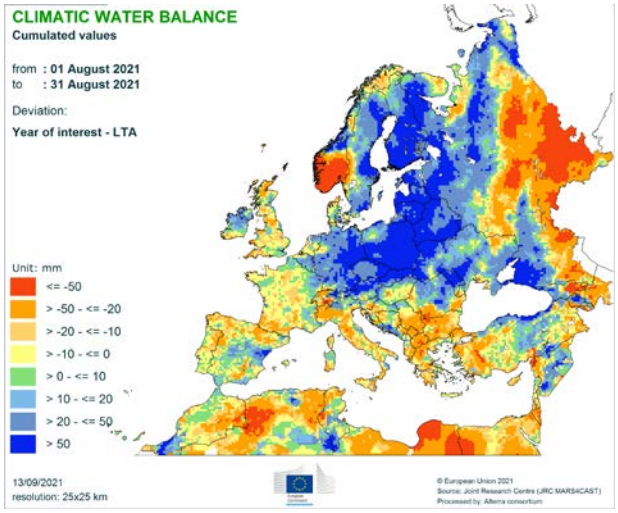

RAINFALL
Cumulated values
from : 21 August 2021
to : 31 August 2021
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
13/09/2021
resolution: 25x25 km

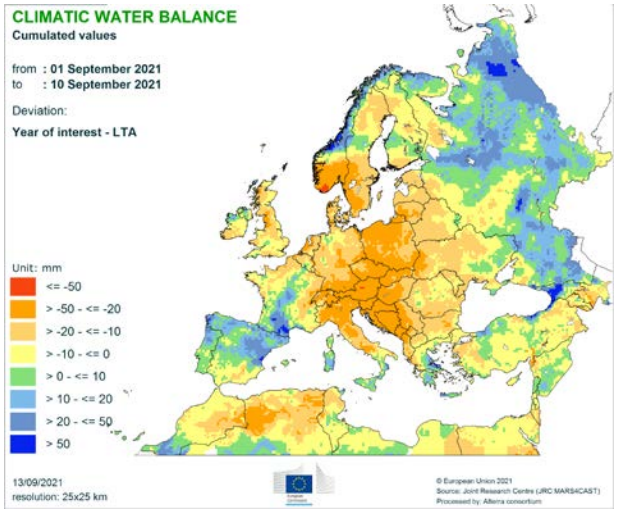

RAINFALL
Cumulated values
from : 21 August 2021
to : 31 August 2021
Year of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
13/09/2021
resolution: 25x25 km


RAINFALL
Cumulated values
from : 01 September 2021
to : 10 September 2021
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
13/09/2021
resolution: 25x25 km

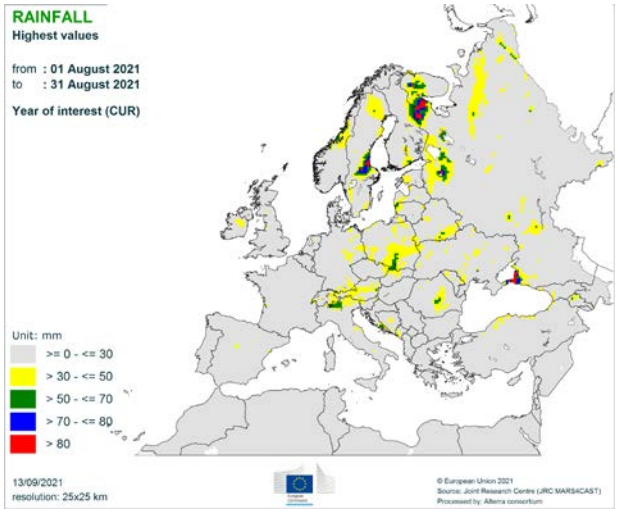

RAINFALL
Cumulated values
from : 01 September 2021
to : 10 September 2021
Year of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
13/09/2021
resolution: 25x25 km

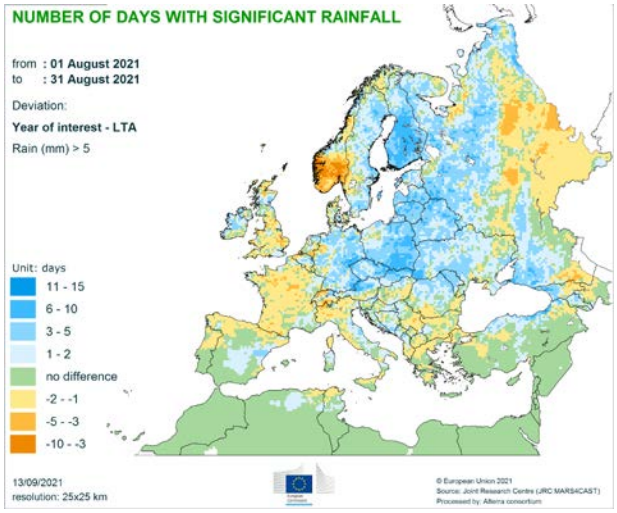
Climatic water balance

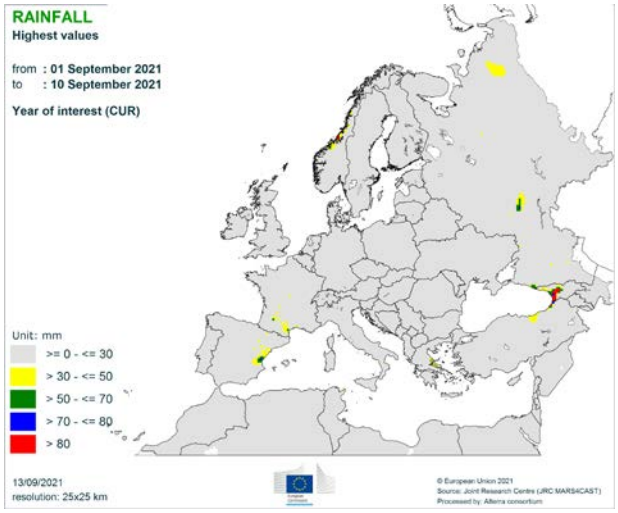


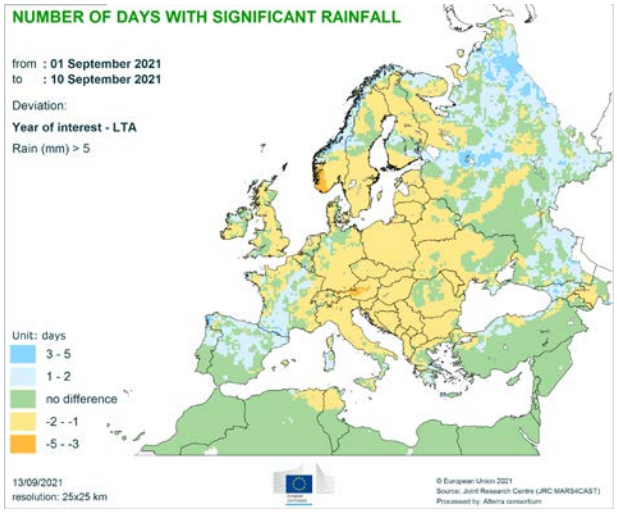


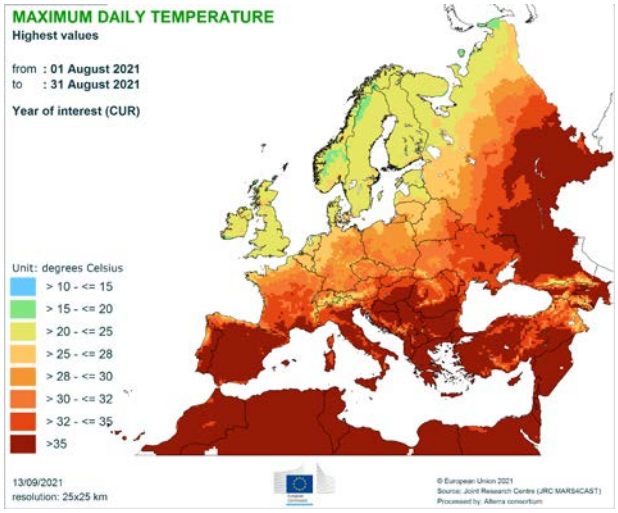
Weather events

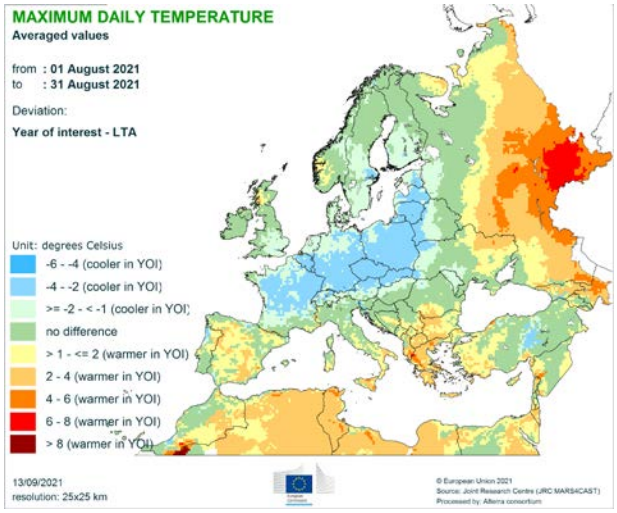


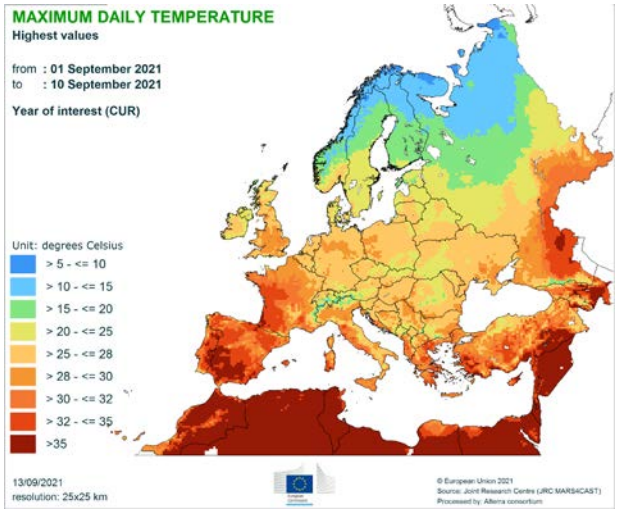


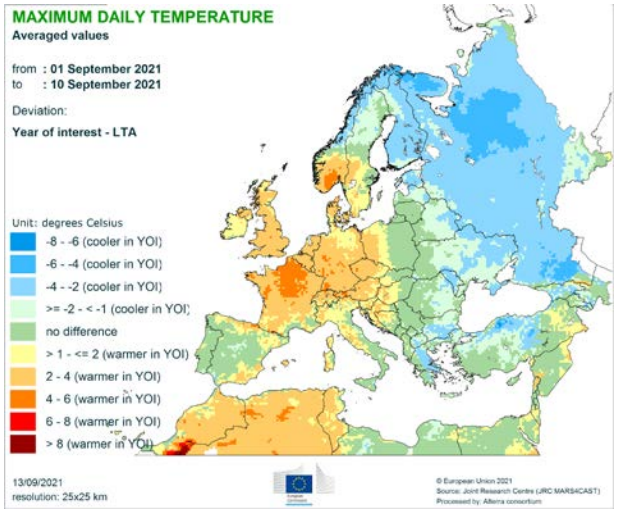


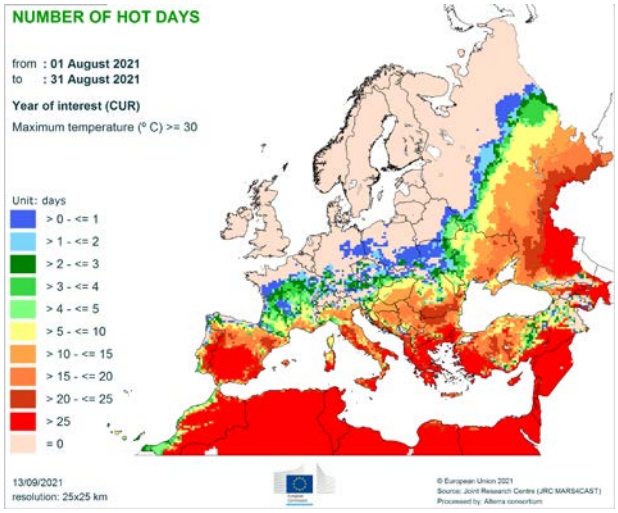


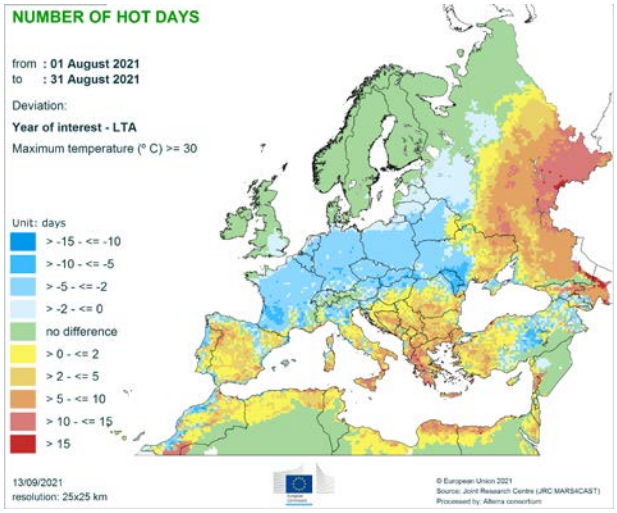

MAXIMUM DAILY TEMPERATURE
Highest values
from : 01 August 2021
to : 31 August 2021
Year of interest (CUR)
Unit: degrees Celsius
> 10 - <= 15
> 15 - <= 20
> 20 - <= 25
> 25 - <= 28
> 28 - <= 30
> 30 - <= 32
> 32 - <= 35
>35
13/09/2021
resolution: 25x25 km

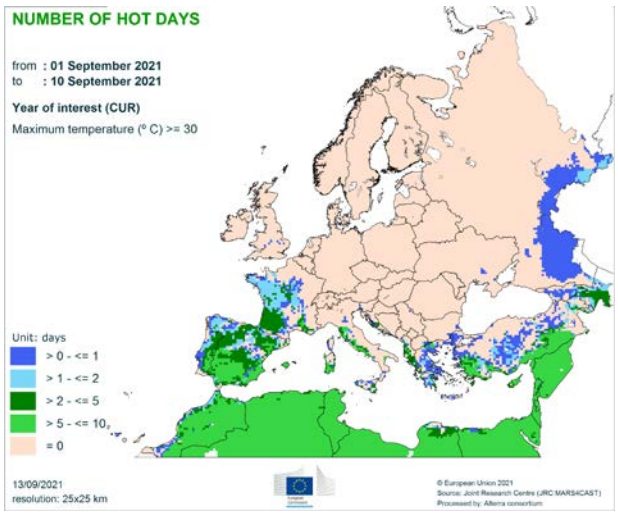

MAXIMUM DAILY TEMPERATURE
Averaged values
from : 01 August 2021
to : 31 August 2021
Deviation:
Year of interest - LTA
Unit: degrees Celsius
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
>= -2 - < -1 (cooler in YOI)
no difference
> 1 - <= 2 (warmer in YOI)
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
> 8 (warmer in YOI)
13/09/2021
resolution: 25x25 km

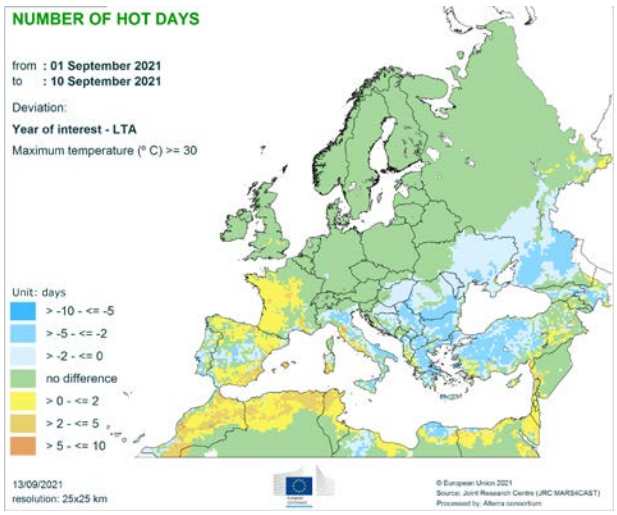

MAXIMUM DAILY TEMPERATURE
Highest values
from : 01 September 2021
to : 10 September 2021
Year of interest (CUR)
Unit: degrees Celsius
> 5 - <= 10
> 10 - <= 15
> 15 - <= 20
> 20 - <= 25
> 25 - <= 28
> 28 - <= 30
> 30 - <= 32
> 32 - <= 35
>35
13/09/2021
resolution: 25x25 km


MAXIMUM DAILY TEMPERATURE
Averaged values
from : 01 September 2021
to : 10 September 2021
Deviation:
Year of interest - LTA
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)
13/09/2021
resolution: 25x25 km

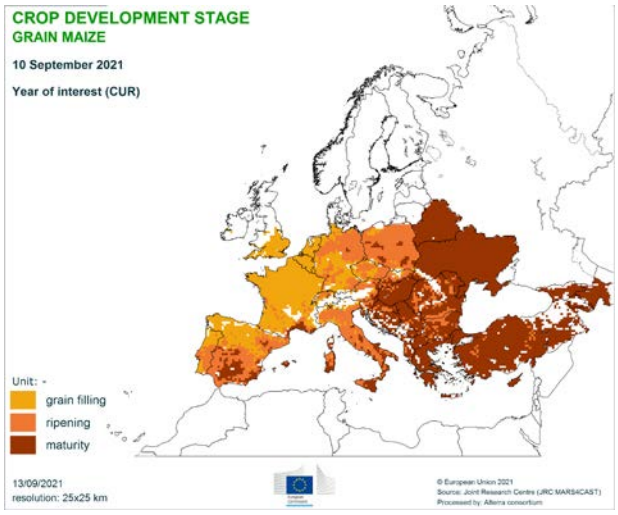

NUMBER OF HOT DAYS
from : 01 August 2021
to : 31 August 2021
Year of interest (CUR)
Maximum temperature (° C) >= 30
Unit: days
> 0 - <= 1
> 1 - <= 2
> 2 - <= 3
> 3 - <= 4
> 4 - <= 5
> 5 - <= 10
> 10 - <= 15
> 15 - <= 20
> 20 - <= 25
> 25
= 0
13/09/2021
resolution: 25x25 km

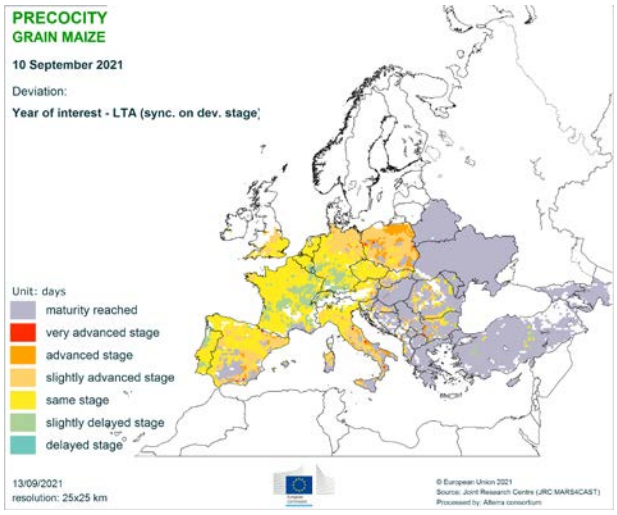

NUMBER OF HOT DAYS
from : 01 August 2021
to : 31 August 2021
Deviation:
Year of interest - LTA
Maximum temperature (° C) >= 30
Unit: days
> -15 - <= -10
> -10 - <= -5
> -5 - <= -2
> -2 - <= 0
no difference
> 0 - <= 2
> 2 - <= 5
> 5 - <= 10
> 10 - <= 15
> 15
13/09/2021
resolution: 25x25 km

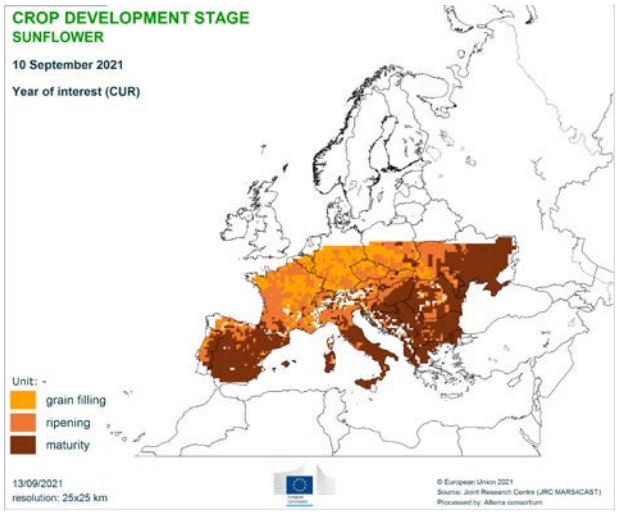


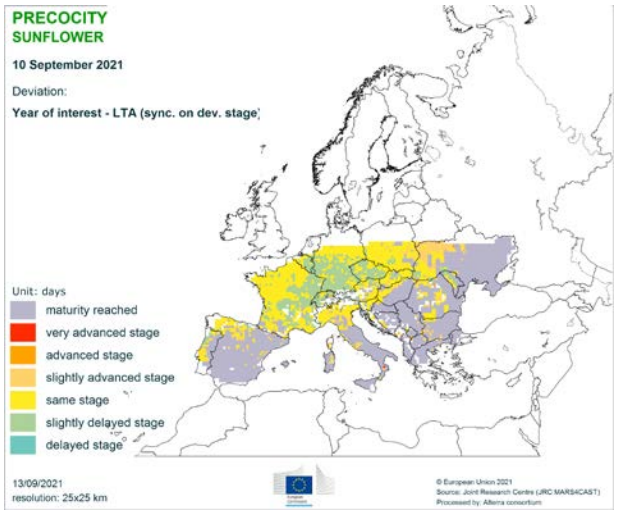


Crop development stages and precocity

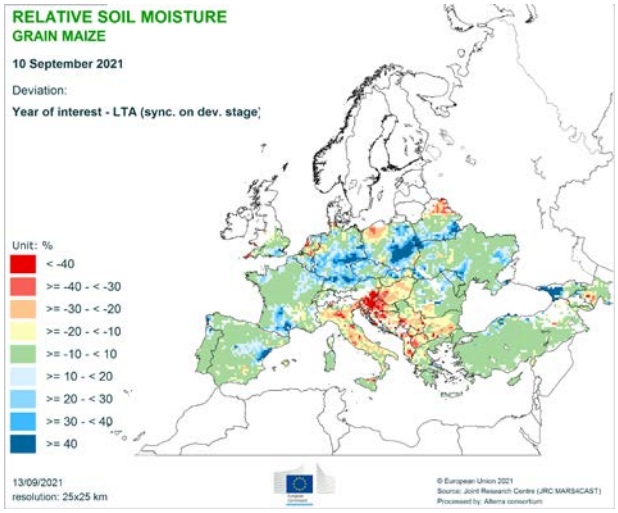


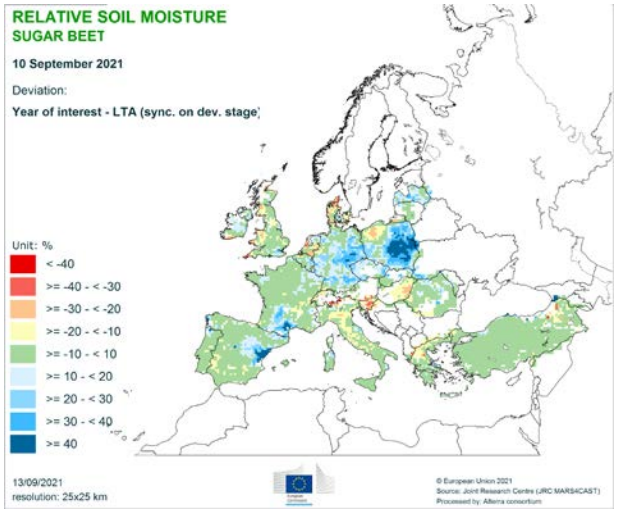




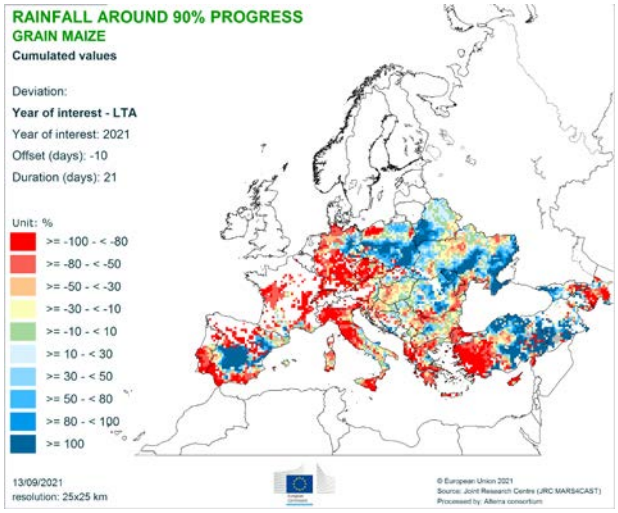


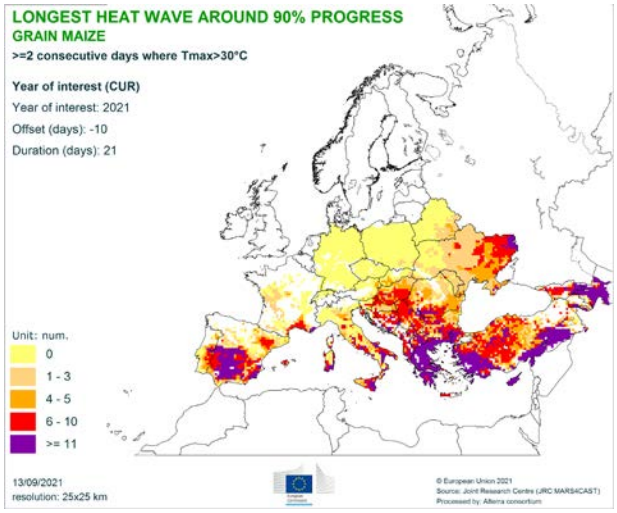
Relative soil moisture

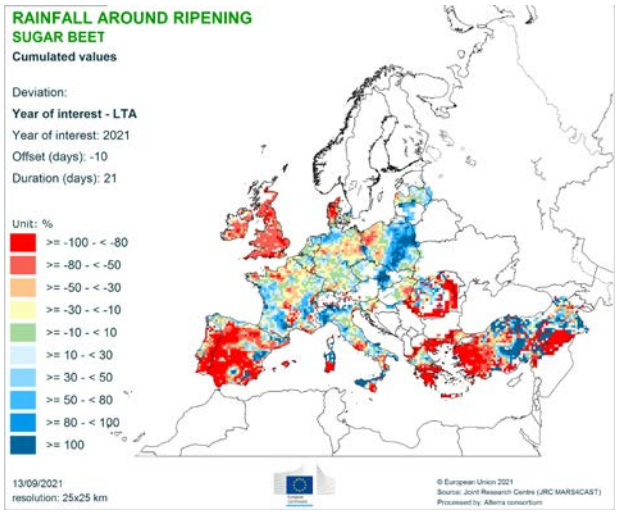


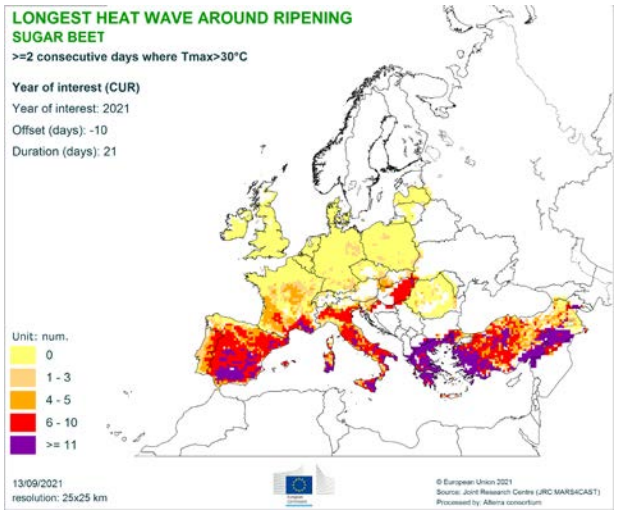


Rainfall and longest heat wave around ripening

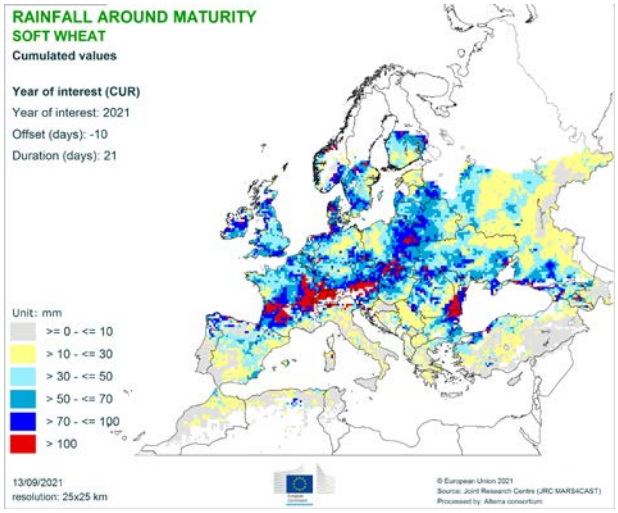


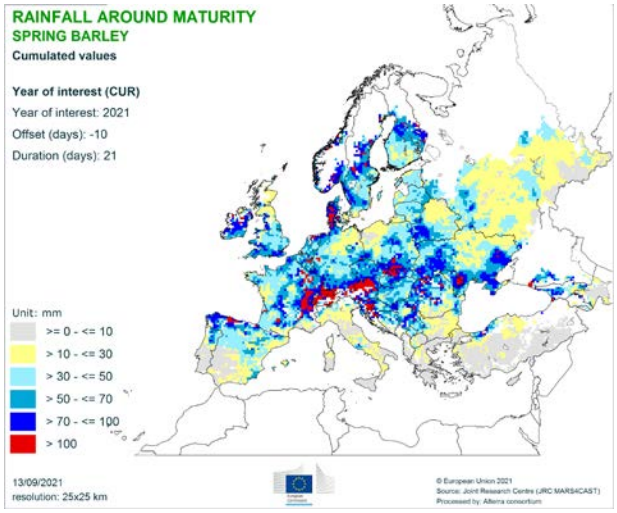






Precipitation around harvesting





JRC MARS Bulletins 2021

Date	Publication	Reference
25 Jan	Agromet analysis	Vol. 29 No 1
22 Feb	Agromet analysis	Vol. 29 No 2
15 Mar	Agromet analysis, yield forecast	Vol. 29 No 3
26 Apr	Agromet analysis, remote sensing, pasture analysis, sowing conditions, yield forecast	Vol. 29 No 4
25 May	Agromet analysis, remote sensing, pasture analysis, sowing update, yield forecast	Vol. 29 No 5
21 Jun	Agromet analysis, remote sensing, pasture analysis, rice analysis, yield forecast	Vol. 29 No 6
26 Jul	Agromet analysis, remote sensing, pasture analysis, harvesting conditions, yield forecast	Vol. 29 No 7
23 Aug	Agromet analysis, remote sensing, pasture update, harvesting update, yield forecast	Vol. 29 No 8
20 Sep	Agromet analysis, remote sensing, pasture analysis, rice analysis, harvesting update, yield forecast	Vol. 29 No 9
25 Oct	Agromet analysis, pasture update, sowing conditions, harvesting update, yield forecast	Vol. 29 No 10
22 Nov	Agromet analysis, sowing update, harvesting update	Vol. 29 No 11
13 Dec	Agromet analysis	Vol. 29 No 12

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

Technical note
The long-term average (LTA) used within this Bulletin as a reference is calculated on the basis of weather data from 1991-2020. .

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