European Commission

JRC MARS Bulletin Vol. 28 No 6

Period covered: 1 May until 10 June 2020
Issued: 15 June 2020

JRC MARS Bulletin
Crop monitoring in Europe
June 2020

Yield forecasts for winter crops further reduced

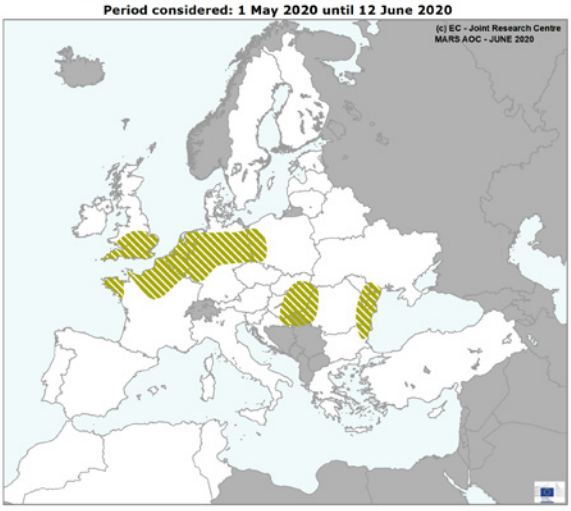
Improved outlook for grain maize and sunflower

At EU level, the yield forecasts for winter cereals and rapeseed were revised downwards by around 2 %, mainly because of sharp downward revisions for France, Romania and the Benelux countries. The yield forecast for grain maize and sunflower was revised upwards at EU level, mainly due to improved, or continued, favourable conditions for summer crops in Romania, Hungary, Bulgaria and Spain. The yield outlook for spring barley slightly improved at EU level, due to an upward revision for Spain, which outweighed the downward revisions for France, Poland, Germany and several other countries.

The yield outlook for winter crops is now clearly below the 5-year average, whereas the forecasts for grain maize and sunflower are distinctly above that reference. The main reason for the poor outlook for winter cereals is the persistent rain deficit in large areas of north-western Europe as well as in Hungary and eastern Romania. During the review period (1 May to 10 June) winter crops in these regions were negatively impacted in the sensitive stages around flowering and/or during grain filling, according to the crop type and region. In some regions in north-western Europe, spring cereals and summer crops were also negatively affected.

1 Agrometeorological overview
2 Remote sensing – observed canopy conditions
3 Pastures in Europe – regional monitoring
4 Country analysis
5 Crop yield forecast
6 Atlas

AREAS OF CONCERN - WINTER CROPS
Period considered: 1 May 2020 until 12 June 2020



Flowering / grain filling impacted

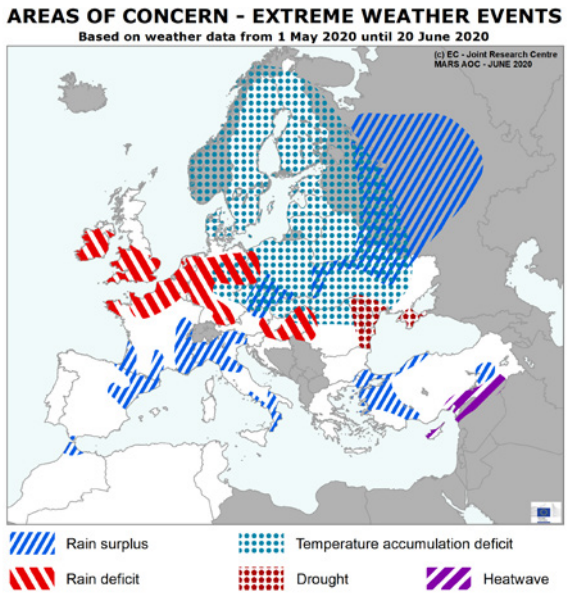
Crop	Yield (t/ha)				
	Avg 5yrs	May bulletin	MARS 2020 forecasts	% diff 20/5yrs	% diff May
Total cereals	5.60	5.39	**5.39**	– 3.7	+ 0.0
Total wheat	5.54	5.50	**5.39**	– 2.6	– 2.0
Soft wheat	5.77	5.72	**5.60**	– 2.8	– 2.1
Durum wheat	3.47	3.38	**3.31**	– 4.6	– 2.1
Total barley	4.78	4.72	**4.71**	– 1.4	– 0.2
Spring barley	4.02	4.05	**4.07**	+ 1.2	+ 0.5
Winter barley	5.75	5.63	**5.58**	– 2.8	– 0.9
Grain maize	7.58	7.94	**8.20**	+ 8.2	+ 3.3
Rye	3.75	3.90	**3.91**	+ 4.3	+ 0.3
Triticale	4.04	4.15	**4.06**	+ 0.5	– 2.2
Rape and turnip rape	3.08	2.95	**2.90**	– 5.9	– 1.7
Potato	32.6	33.9	**34.1**	+ 4.5	+ 0.3
Sugar beet	74.7	75.4	**75.5**	+ 1.0	+ 0.1
Sunflower	2.24	2.34	**2.39**	+ 6.3	+ 2.1

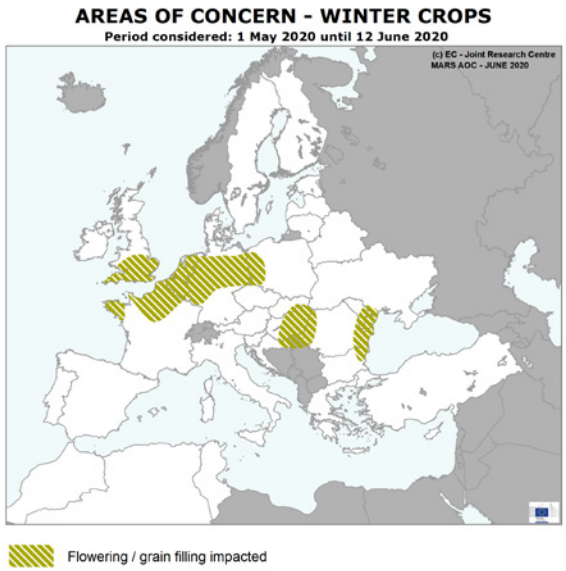
Issued: 12 June 2020

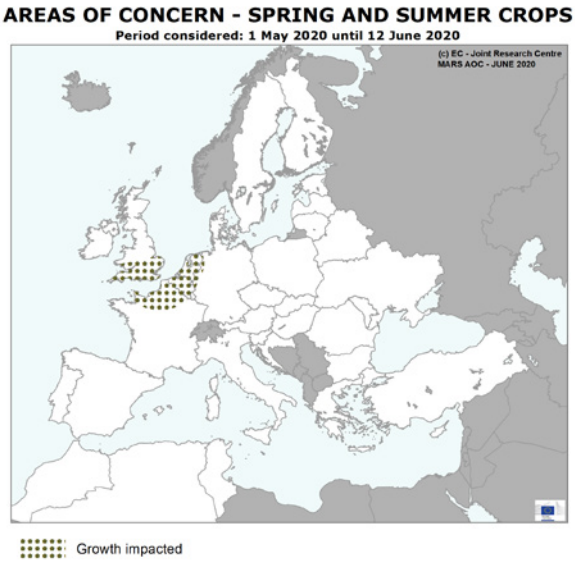
Joint Research Centre

1. Agrometeorological overview

1.1. Areas of concern







Many parts of Europe received substantial rainfall during the review period. However, north-western Europe still presents large areas with persistent precipitation deficit which built up throughout spring. During the review period, the precipitation deficit, with respect to the long-term average (LTA), increased by 25-80 mm in northern **France**, southern parts of the **United Kingdom**, **Ireland**, the **Benelux** countries, northern and western **Germany** and western **Poland**. In all these regions, winter crops were negatively impacted by the dry conditions in the sensitive stages around flowering or in early grain filling, according to the crop type and region. In northern **France**, the southern **United Kingdom** and the **Benelux** countries, the growth of spring cereals, sugar beet and potatoes (already weakened due to difficult conditions around sowing and emergence) was also limited by the water deficit.

Dry conditions, with consequent impacts on winter crops during flowering and early grain filling, also persisted in **Hungary**.

In eastern **Romania** and south-eastern **Ukraine**, drought conditions are still present and winter crops entered the grain-filling phase much earlier than usual and under very poor conditions.

A marked deficit of temperature accumulation is observed in northern and north-eastern Europe: this has slowed crop development but generally without negative impacts on yield expectations. In areas with low soil moisture contents, the colder-than-usual conditions were beneficial in mitigating the impacts of water stress.

A surplus of precipitation is observed in northern and southern **Italy**, south-eastern and south-western **France**, north-eastern **Spain**, **Czechia**, southern **Poland, Ukraine**, central **Russia**, western and eastern **Turkey** and northern **Morocco**. In most of these regions, the precipitation surplus was considered beneficial, providing a promising start to the season for summer crops and restoring soil moisture levels to sustain the yield formation of winter crops. However, it mostly arrived too late to substantially improve the yield outlook for winter crops.

A heatwave, with temperatures above 35 °C, occurred between 15 and 22 May in eastern **Cyprus** and southern **Turkey**; crops were not damaged as the winter crops' season had almost ended and maize could benefit from irrigation to lower the canopy temperature, if needed.

1.2. Meteorological review (1 May until 10 June 2020)

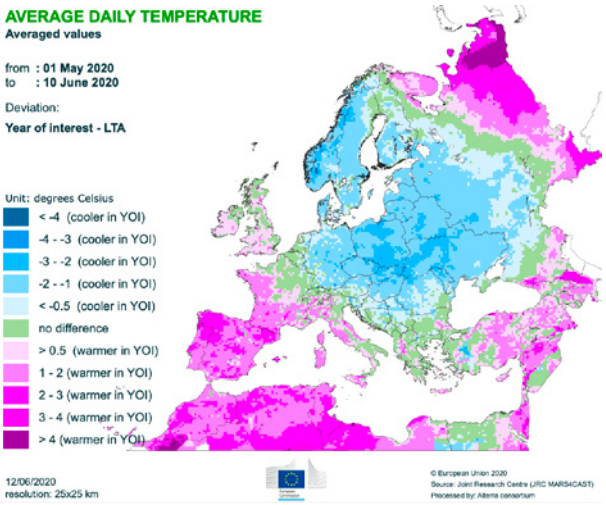
Warmer-than-usual conditions prevailed in south-western Europe, the Maghreb and the northern part of European Russia. Air temperatures in these regions were up to 3 °C above the LTA. Maximum recorded temperatures in the southern Iberian Peninsula, the southern Balkans and western Turkey reached above 30 °C. A **heatwave** during the second dekad of May brought unusually high temperatures to Greece, Cyprus and western Turkey, with recorded maximum temperatures regionally well above 35 °C and locally even beyond 40 °C. The thermal sum recorded in south-western Europe and the Maghreb was generally between 50 and 150 growing degree days (°Cd) – or 10-20 % – above the LTA, thus accelerating the phenological development of crops.

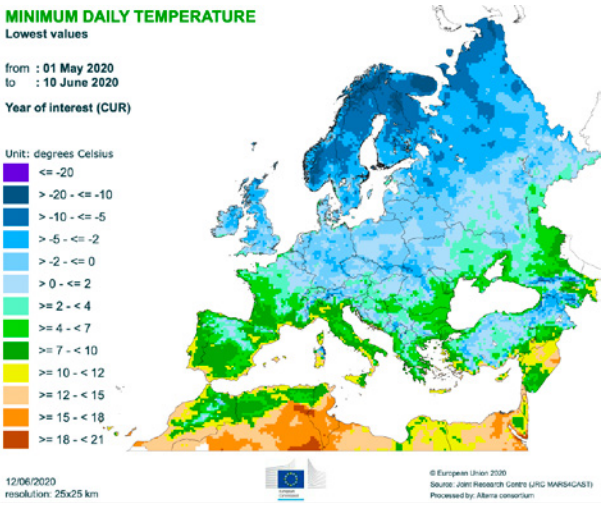
Colder-than-usual weather, with temperatures down to 3 °C below the LTA, prevailed in central, eastern and northern Europe. Here, minimum temperatures during the **cold spell** in the second dekad of May dropped below 0 °C. Thermal sums recorded in regions affected by the cold weather were between 50 °Cd and 150 °Cd below the normal values (– 10 % to – 20 %) for the analysis period, slowing the phenological development of winter crops.

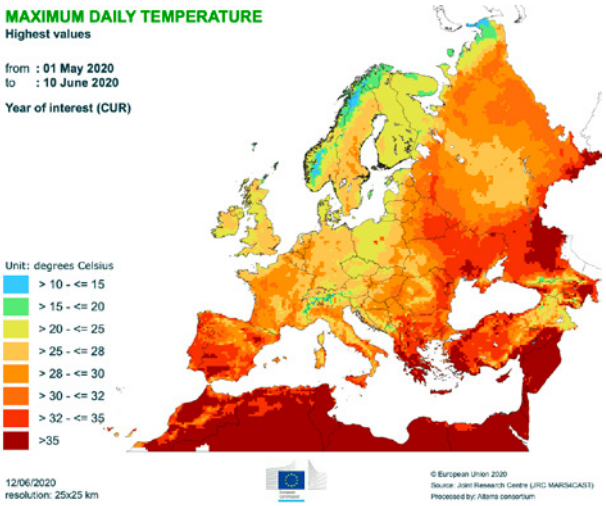
Drier-than-usual weather prevailed in the British Isles, northern France, the Benelux countries, Germany and Hungary. Less than half of normal rainfall was recorded in some of these regions. **Observed rainfall cumulates of below 20 mm** in southern parts of the United Kingdom were **the lowest on our records** (since 1979) for the analysis period. The Benelux countries and central Hungary recorded less than 40 mm. In northern Germany, cumulative rainfall did not exceed 50 mm.

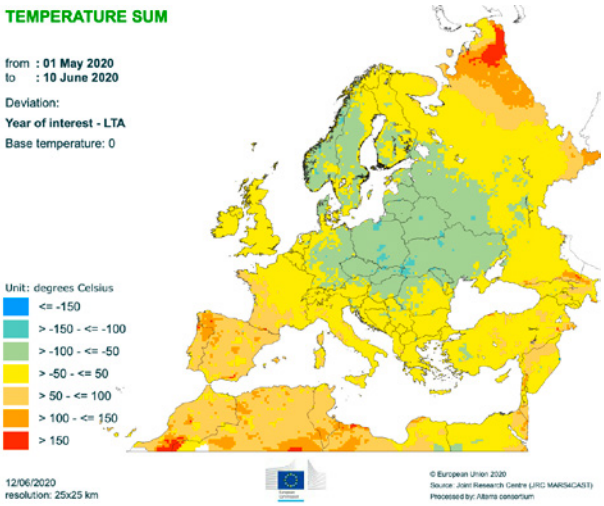
Wetter-than-usual conditions prevailed in most of the Iberian Peninsula except the far north-west, and in southern France, Italy, Poland, Czechia, eastern Europe and western Turkey. Several regions in northern Italy, southern France and central parts of European Russia recorded more than double the usual rainfall cumulates. Abundant rainfall of **more than 150 mm** was recorded in southern France, northern Italy, the Alps, western Ukraine, southern Poland and several regions of central European Russia.

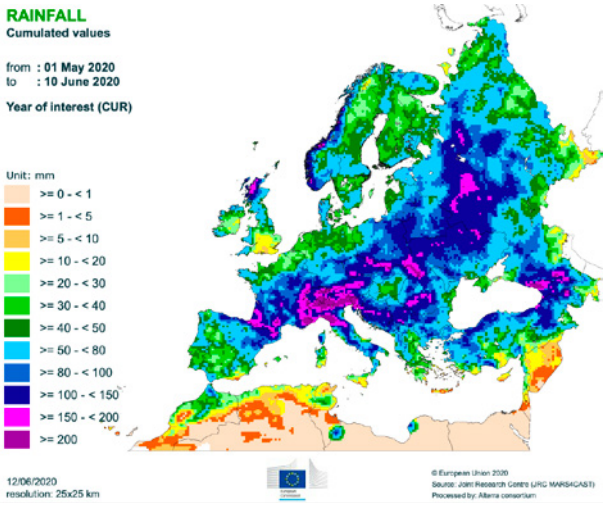
The long-term **climatic water balance** (difference between rainfall and reference evapotranspiration) since the beginning of spring has improved in many central and eastern European regions as a consequence of the recent rainfall, thus decreasing the prevailing moisture deficit. In contrast, the deficit has increased in western Europe, especially in the British Isles, northern France, the Benelux countries and western Germany.

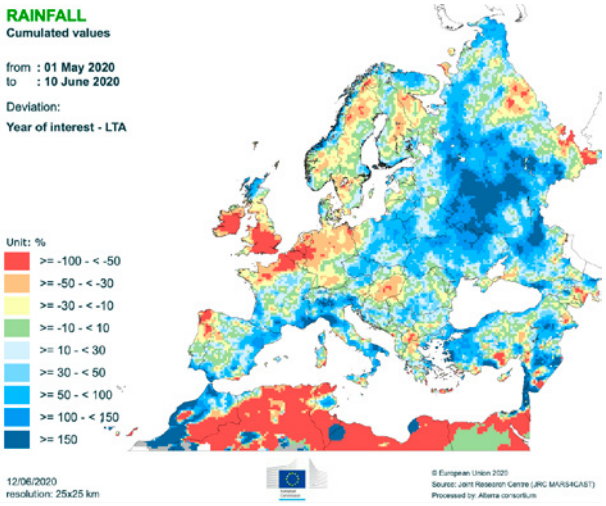


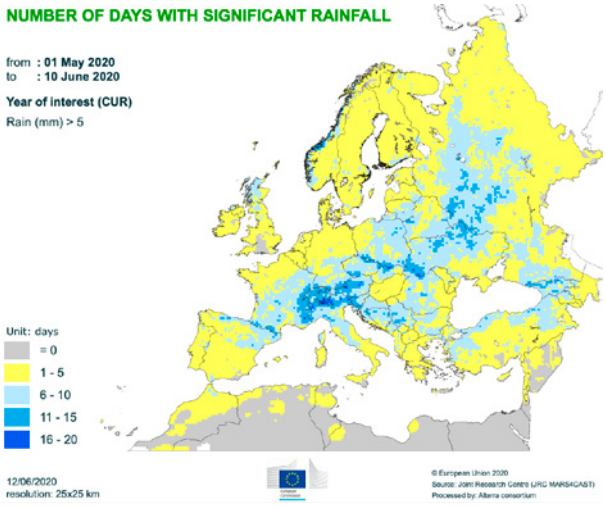


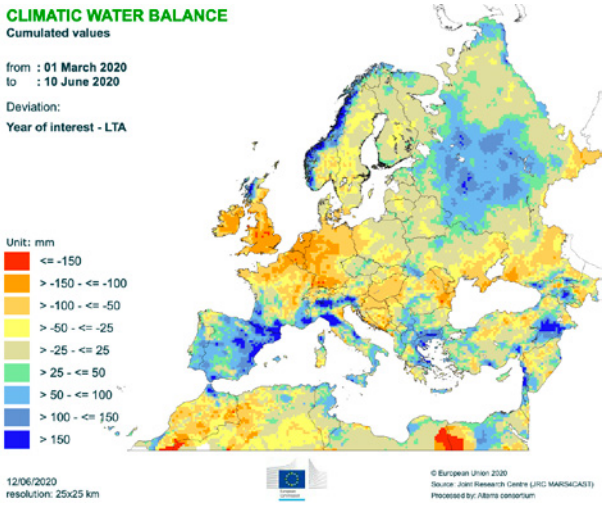





RAINFALL
Cumulated values
from : 01 May 2020
to : 10 June 2020
Year of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150 - < 200
>= 200
12/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Altarra consortium


RAINFALL
Cumulated values
from : 01 May 2020
to : 10 June 2020
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 100
>= 100 - < 150
>= 150
12/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Altarra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 May 2020
to : 10 June 2020
Year of interest (CUR)
Rain (mm) > 5
Unit: days
= 0
1 - 5
6 - 10
11 - 15
16 - 20
12/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Altarra consortium

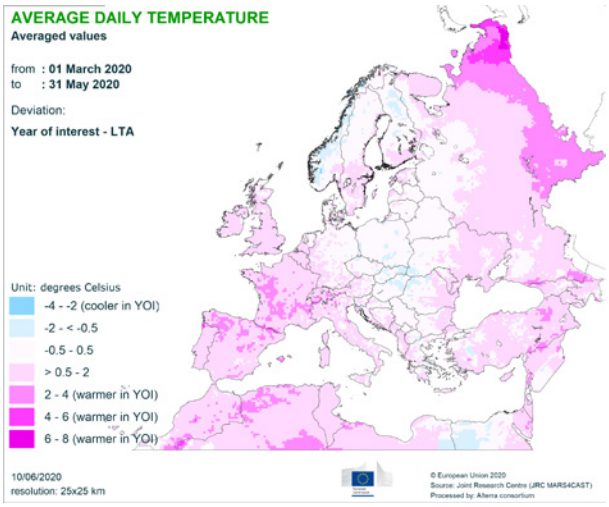

CLIMATIC WATER BALANCE
Cumulated values
from : 01 March 2020
to : 10 June 2020
Deviation:
Year of interest - LTA
Unit: mm
<= -150
> -150 - <= -100
> -100 - <= -50
> -50 - <= -25
> -25 - <= 25
> 25 - <= 50
> 50 - <= 100
> 100 - <= 150
> 150
12/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Altarra consortium

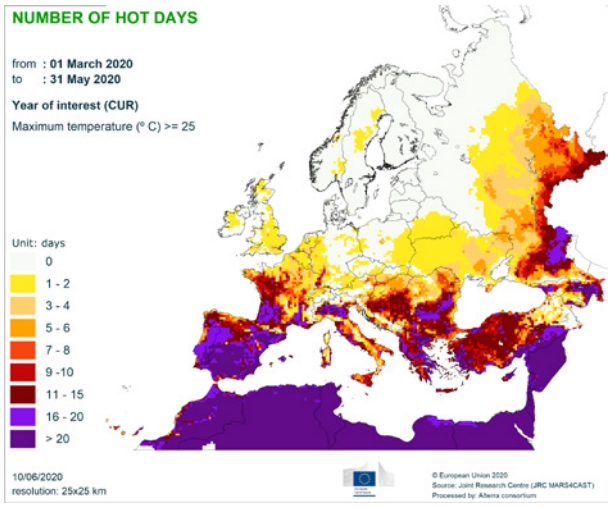
1.3. Spring review (March, April, May)

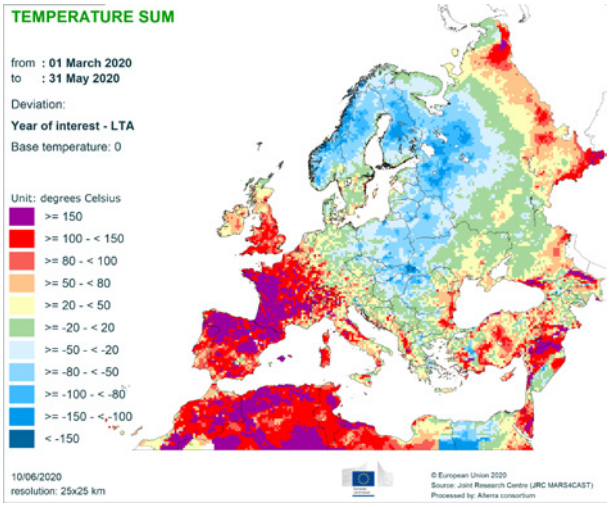
Slightly warmer-than-usual conditions were observed in western Europe, the United Kingdom, Ireland, southern Sweden and Finland, large areas of south-eastern Europe and Turkey, as well as in Ukraine and European Russia. Daily mean temperature anomalies (with respect to the LTA) did not exceed 2 °C (locally 4 °C). In March, eastern Europe and European Russia experienced much higher mean temperature anomalies, from 2 °C to 8 °C. In April and May, warm anomalies were only experienced in western Europe, while colder-than-usual conditions prevailed in eastern Europe. As a consequence, **positive anomalies in temperature sums** (baseline 0 °C) accumulated over spring were recorded in western Europe and the United Kingdom, with values between 100 °Cd and 150 °Cd (and above in large areas). Meanwhile, **negative anomalies in temperature sums** (mainly between – 80 °Cd and – 50 °Cd) were recorded in eastern Europe, north-western Russia, the Scandinavian peninsula and Finland. Finally, large areas in the Mediterranean region experienced a higher-than-usual number of hot days (with daily maximum temperatures of ≥ 25 °C), i.e. more than 16 hot days were recorded in the analysis period.

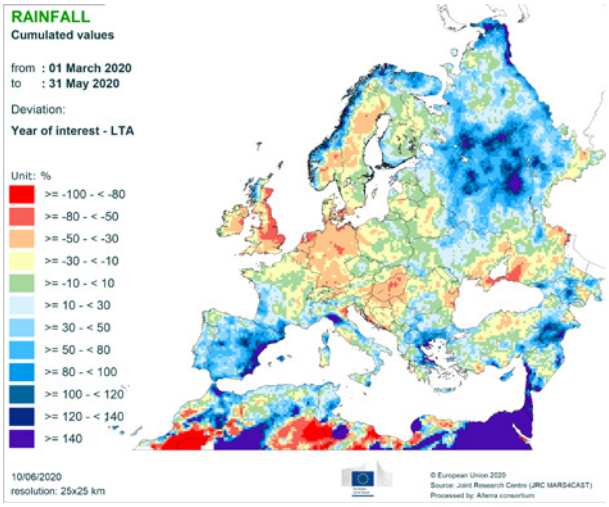
Wetter-than-usual conditions were observed in the Iberian Peninsula, large regions of south-eastern Europe, western France, Italy and European Russia. Total precipitation anomalies were mainly from 50 % to 80 %, although in large areas values above 140 % were observed.

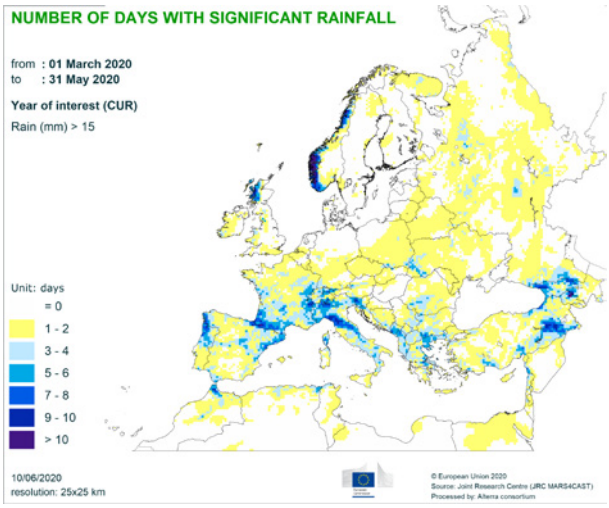
Drier-than-usual conditions were recorded in a large region of central Europe centred over Germany, as well as in the Benelux countries, the United Kingdom, Ireland, north-eastern Italy, the westernmost parts of Poland, Hungary and eastern Romania. Total precipitation anomalies in these regions were mainly from – 50 % to – 30 %; although locally and in the western part of the United Kingdom values reaching – 80 % were recorded. In April, the drier conditions were observed in most of central and eastern Europe, while in May they were mainly limited to the United Kingdom, Ireland, the Benelux countries, north-eastern France, north-western Germany, southern Norway and Hungary.

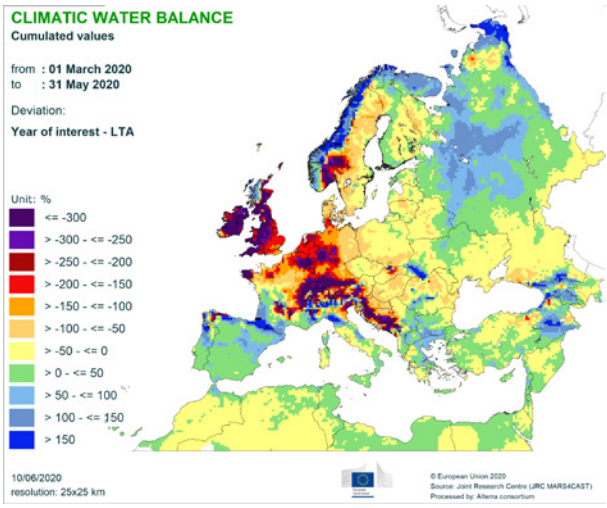





TEMPERATURE SUM
from : 01 March 2020
to : 31 May 2020
Deviation:
Year of interest - LTA
Base temperature: 0
Unit: degrees Celsius
>= 150
>= 100 - < 150
>= 80 - < 100
>= 50 - < 80
>= 20 - < 50
>= -20 - < 20
>= -50 - < -20
>= -80 - < -50
>= -100 - < -80
>= -150 - < -100
< -150
10/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 March 2020
to : 31 May 2020
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 - < 120
>= 120 - < 140
>= 140
10/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 March 2020
to : 31 May 2020
Year of interest (CUR)
Rain (mm) > 15
Unit: days
= 0
1 - 2
3 - 4
5 - 6
7 - 8
9 - 10
> 10
10/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


CLIMATIC WATER BALANCE
Cumulated values
from : 01 March 2020
to : 31 May 2020
Deviation:
Year of interest - LTA
Unit: %
<= -300
> -300 - <= -250
> -250 - <= -200
> -200 - <= -150
> -150 - <= -100
> -100 - <= -50
> -50 - <= 0
> 0 - <= 50
> 50 - <= 100
> 100 - <= 150
> 150
10/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

1.4. Weather forecast (13-19 June)

Weather conditions during the forecast period will be mainly characterised by atmospheric instability. A cyclonic disturbance will deepen from the North Atlantic, south-west of Ireland, to the central Mediterranean and will move towards south-eastern Europe at the end of the forecast period. Meanwhile, another trough will hit Ireland and the United Kingdom.

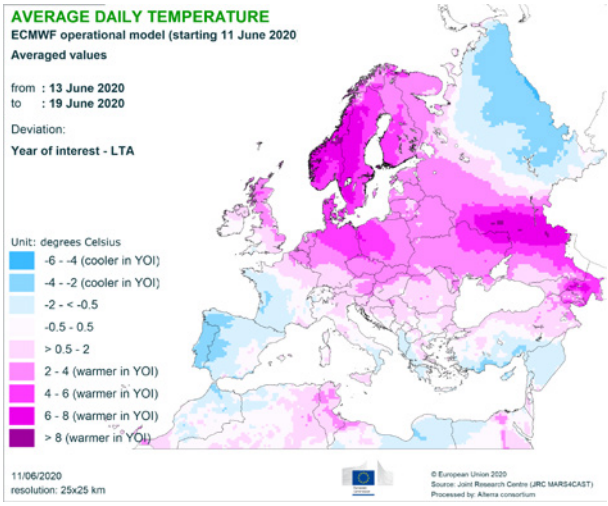
Colder-than-usual conditions are forecast in the western part of the Iberian Peninsula and in Russia, with daily mean temperature anomalies (with respect to the LTA) from – 4 °C to – 2 °C. **Slightly colder-than-usual conditions** are expected in Spain, western France, southern Italy, western Greece, Albania and southern Turkey. In these regions, daily mean temperature anomalies will not drop below – 2 °C.

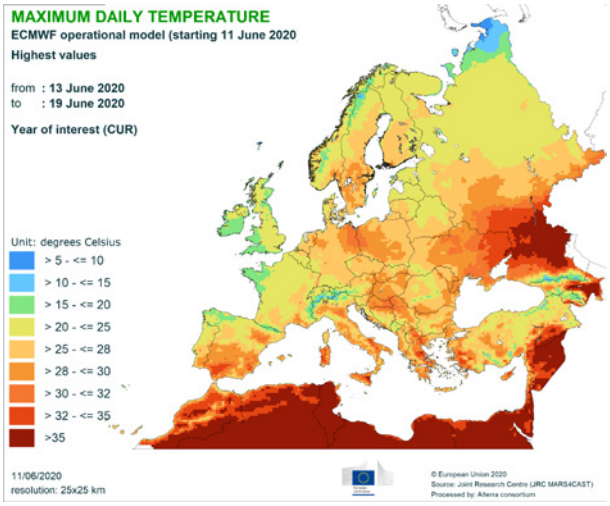
Warmer-than-usual conditions will prevail over most of central, eastern and northern Europe, with daily mean temperature anomalies mainly ranging from 2 °C to 4 °C, but up to 6 °C in a large region between Germany, Poland and Denmark. In most regions, daily maximum temperatures are not expected to exceed 28 °C. Nevertheless, in large areas they may reach 30-32 °C. In a large region of the Scandinavian Peninsula, as well as in the southern part of European Russia, the anomalies will range from 6 °C to 8 °C. In the latter region, daily maximum temperatures are forecast to exceed 35 °C.

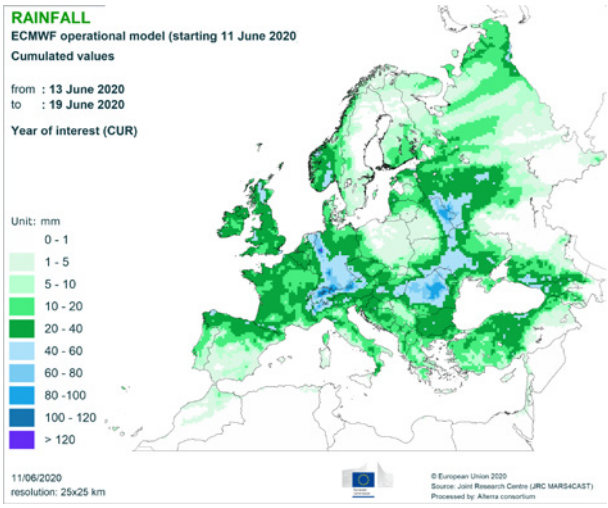
Dry conditions, with less than 5 mm of accumulated precipitation, are expected in a large region centred over Poland, as well as in Sweden and Spain.

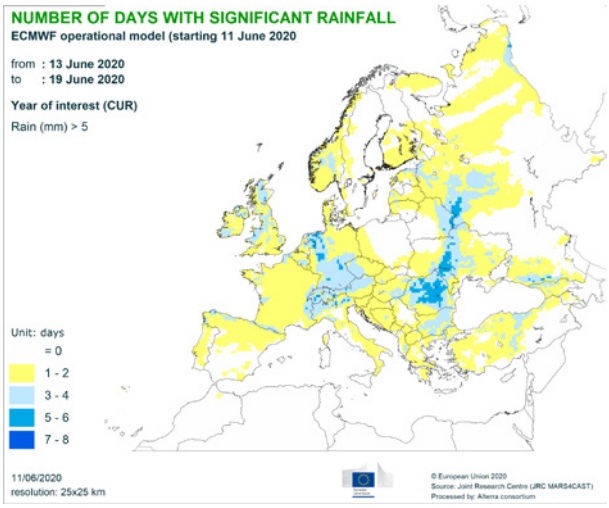
Wet conditions, with accumulated precipitation mostly ranging between **40 mm and 60 mm** (locally above 60 mm), are forecast in an elongated region running from the Netherlands to north-western Italy, and in a region running from Romania to eastern Belarus.

The long-range weather forecast for July, August and September indicates warmer-than-usual conditions are likely to occur in the Mediterranean region and south-eastern Europe. In the rest of Europe, warmer-than-usual conditions are more likely than not. Forecasts also indicate potentially drier-than-usual conditions in most of Europe.

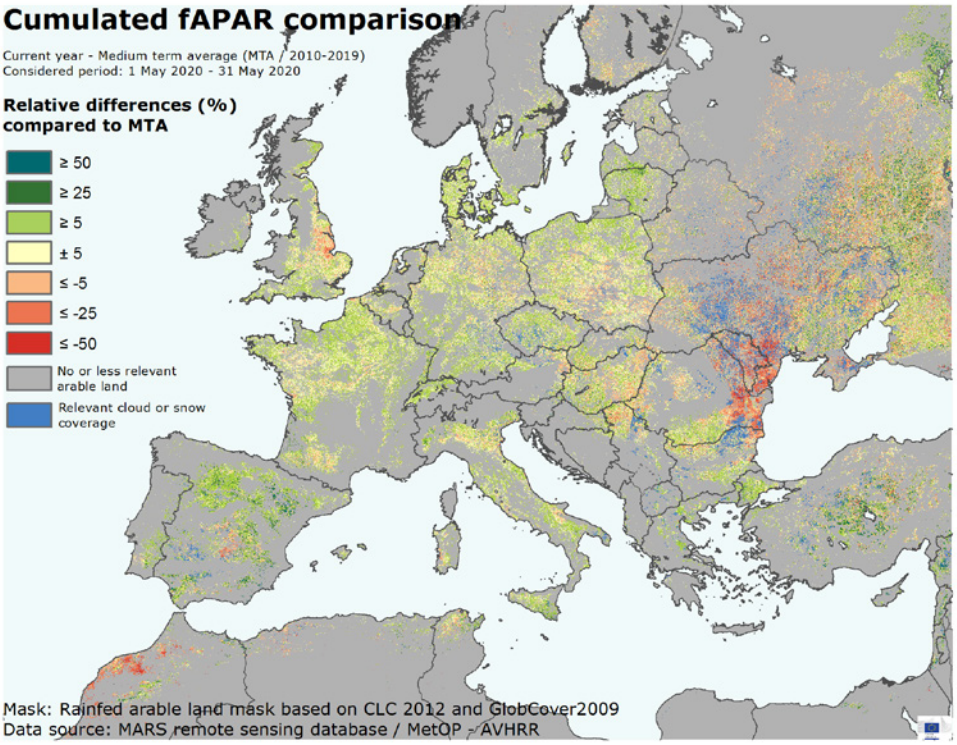








2. Remote sensing – observed canopy conditions

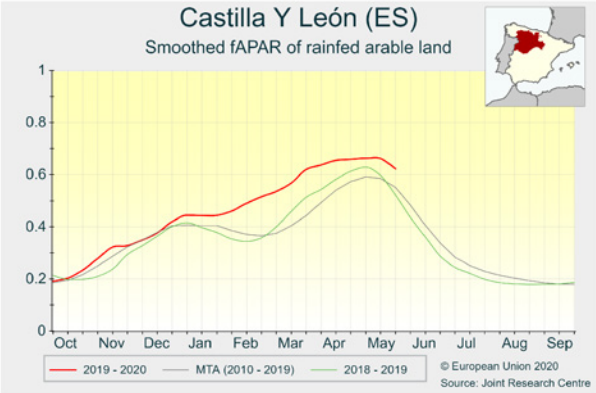


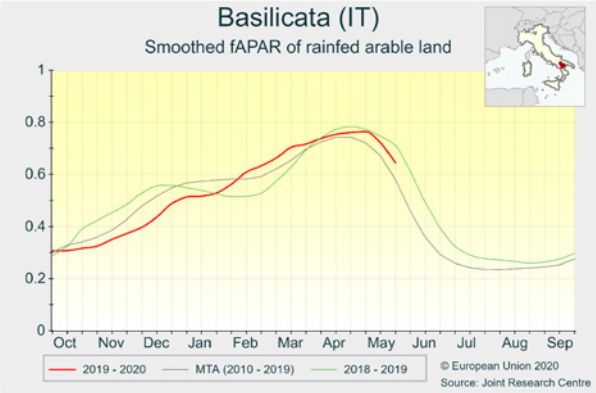
The map displays the differences between the fraction of absorbed photosynthetically active radiation (fAPAR) cumulated from 1 May to 31 May 2020 and the medium-term average (MTA, 2010-2019) for the same period. Positive anomalies (in green) reflect above-average canopy density or early crop development while negative anomalies (in red) reflect below-average biomass accumulation or late crop development.

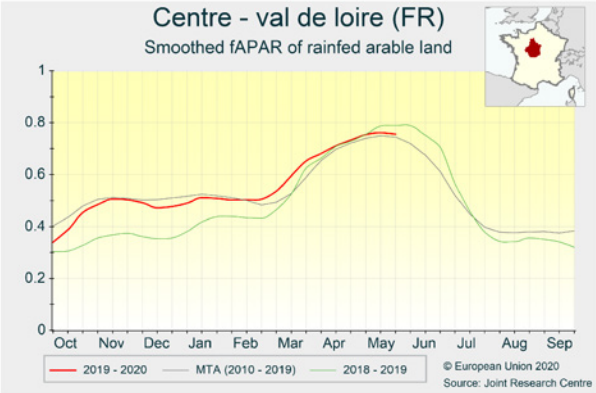
Relevant cloud coverage in the analysis period – with unrealistic low fAPAR values – is coloured in blue on the map (southern Spain, eastern Romania, Ukraine and western Russia). Neighbouring regions could also be affected to some extent by undetected clouds.

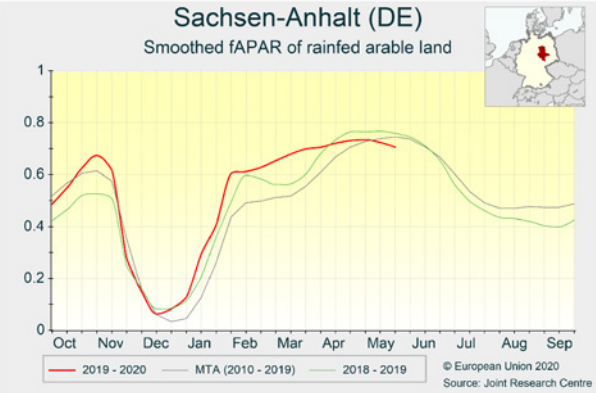
In **Spain**, above-average rainfall sustained adequate water supply to winter crops, thus enhancing and extending grain filling, favouring yield formation. Winter crops are in good shape and have started to reach the end of their growth cycle (e.g. *Castilla y León*). In **southern Italy**, winter crops are in grain filling with continuing mixed conditions as described in May. In **Northern Italy**, western regions benefited from abundant rainfall during May, whereas eastern regions still present suboptimal soil moisture and unfavourable growth conditions for winter and summer crops. In **France**, May brought some precipitation in the first 15 days. The rain was beneficial but not sufficient to fully restore soil moisture, also because of the subsequent dry spell in the second half of May. At the end of the analysis period (31 May), winter crops are around flowering in most of the country, and although cumulative biomass is close to average (e.g. *Centre*), poor growing conditions are expected to significantly lower grain yields. In the **United Kingdom**, winter crops are approaching the flowering stage and, despite a persistent rainfall deficit in May, biomass accumulation has reached close-to-average values in the main producing regions in the south. In central regions, the persistently below-average to average fAPAR values since the end of winter are attributed to poor crop performance, especially of rapeseed, and this year's increased share of spring cereals compared to winter cereals. In **Germany**, some precipitation in May and somewhat colder-than-usual weather with a distinct cold spell have resulted in better growing conditions; as in France, such conditions are not compensating for the dry spring, but sustaining summer crop growth in its early stages. In eastern Germany (e.g. *Sachsen-Anhalt*), winter crops are entering grain filling much earlier than usual and with slightly suboptimal biomass accumulation. In **Poland**, in most western regions, rain was sufficient to sustain adequate growth of winter crops during May. However, the unusually cool temperatures slowed crop development and biomass accumulation (e.g. *Lodzkie*) with negative effects for spring and summer crops. In the **Baltic countries** and in **Finland**, the fAPAR still displays very advanced stages despite the colder-than-usual temperatures in May. In central Europe (**Slovakia**, **Czechia**, **Austria** and **Hungary**), the rainfall over the last month was crucial to maintain average biomass accumulation in most regions. In **Hungary**, precipitation was less abundant and winter crops are now in mixed conditions. In **Romania** and **Bulgaria**, the effect of the spring drought is now clearly visible in most regions. In western and central provinces, the early and favourable biomass accumulation came to an end in early May due to the persistent dry spell. The precipitation that occurred later on proved beneficial for winter crops in central Romanian regions only (e.g. *Marcoregiunea*), while summer crops benefited over a wider area. Regions in eastern Romania and Bulgaria display profiles where early senescence is clearly visible (e.g. *Severoitztochen*)

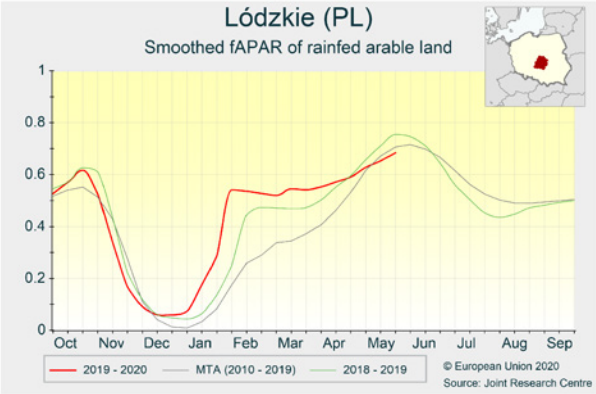
due to the spring drought. Similar conditions are displayed in south-western **Ukraine**, while southern regions display unfavourable (in south-western regions) to average (south-eastern regions) biomass accumulation. Regions in central Ukraine present a significant delay in summer crop growth (e.g. *Cherkas'ka*) with unfavourable biomass accumulation; however, these data are affected by persistent cloud coverage in the latest period. In **Turkey**, the hot spell during May may have impacted flowering of winter crops in the main growing regions of Anatolia.

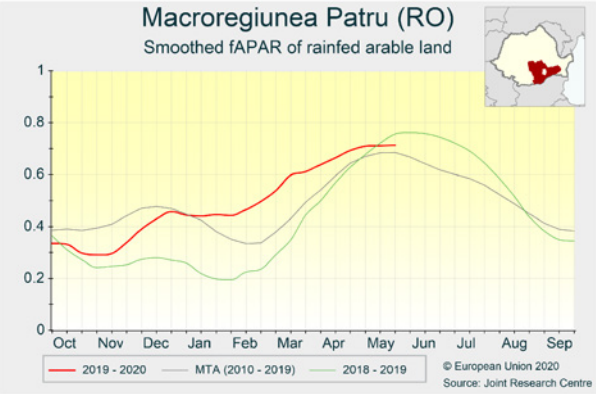


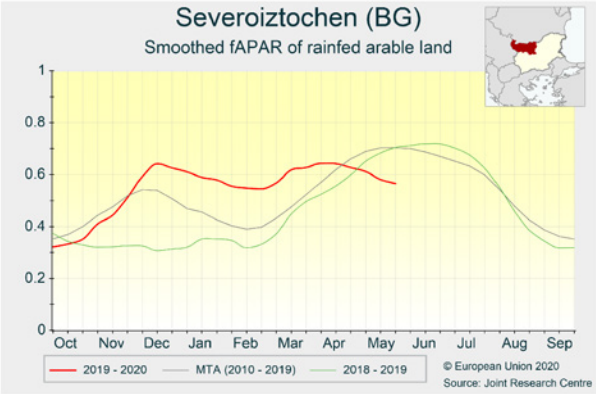


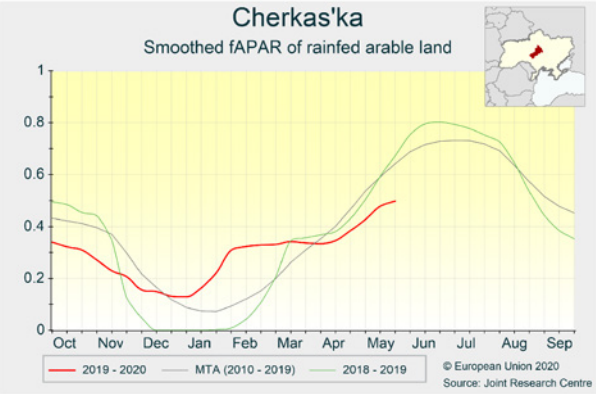






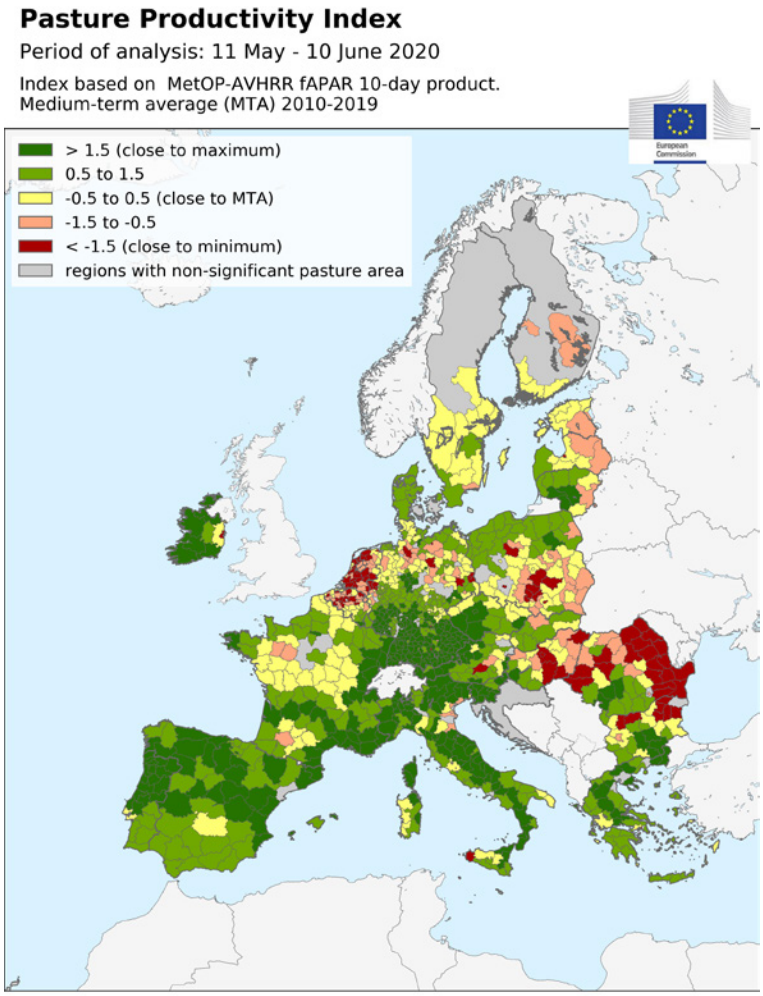






3. Pastures in Europe – regional monitoring

Good conditions in the west and south, constraints to growth in the north and east



Favourable conditions for pasture growth prevail in most regions of southern and western Europe. However, despite substantial rainfall, the evident impacts of water stress are still constraining biomass accumulation in central and eastern European countries. This is because soil moisture levels remain suboptimal in several regions, or because pastures need time to recover. Below-average temperatures have had a limiting effect on pasture growth in northern central and north-eastern regions.

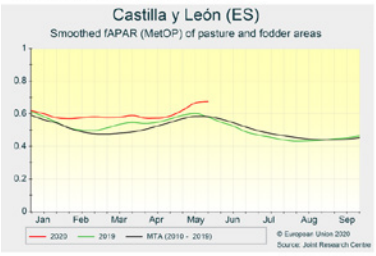
The pasture productivity index (PPI) for the period 11 May to 10 June 2020 is shown on the main map, above. The predominantly positive values in western and southern regions indicate above-average biomass accumulation. The prevailing favourable condition of pastures in these regions is the result of early spring growth, led by warm temperatures, and overall timely rainfall events during the past month (in the **Iberian Peninsula**, southern **France**, most of **Italy**, **Slovenia**, **Greece** and southern **Romania**).

The negative PPIs in many regions of central and eastern Europe are related to below-average biomass accumulation, primarily due to lack of rainfall. In several parts of northern central and north-eastern Europe, they are also due to colder-than-usual conditions. **Germany**, north-western **France**, **Ireland** and **Romania** experienced a return of rainfall after the very dry April period. However, the situation has not yet recovered, as there is still widespread water stress in pastureland in these countries. A similar situation is found in **Slovakia**, **Austria**, **Czechia**, **Hungary** and south-eastern **Bulgaria**, where rainfall partly relieved stressed conditions but pastures did not fully recover, and farmers expect lower-than-average yields from the first cut. In the **Benelux** countries, the condition of pastures actually worsened as rainfall did not return. These countries experienced the driest, or one of the driest, April-May periods on record.

Average to below-average condition of pastures in **Poland**, **Denmark**, **Sweden**, **Finland** and the **Baltic** countries has been caused by lower-than-usual temperatures (also in some parts of northern **Germany**), in addition to below-average rainfall conditions in some of those countries (**Denmark**, **Lithuania**, **Sweden** and **Poland**) and/or time needed to recover from very dry conditions in April (**Poland**).

Spain and Portugal - North

Reference period: 01 May to 31 May 2020

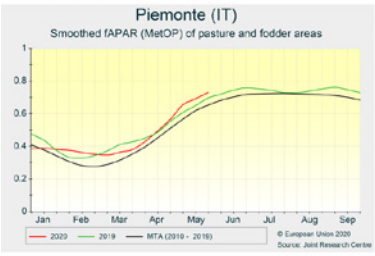


BULLETTIN ISSUE

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
RAINFALL								
TEMPERATURE								
RADIATION								

Italy - North and central

Reference period: 01 May to 31 May 2020

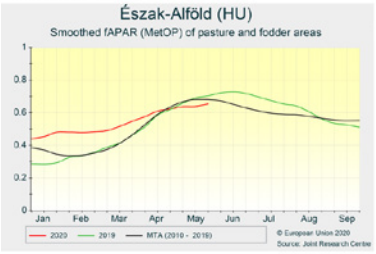


BULLETTIN ISSUE

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
RAINFALL								
TEMPERATURE								
RADIATION								

Hungary

Reference period: 01 May to 31 May 2020

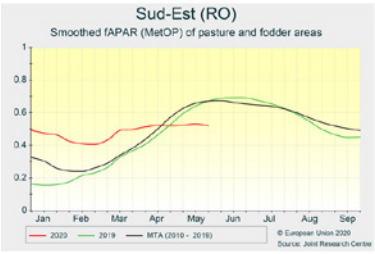


BULLETTIN ISSUE

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
RAINFALL								
TEMPERATURE								
RADIATION								

Romania - East

Reference period: 01 May to 31 May 2020

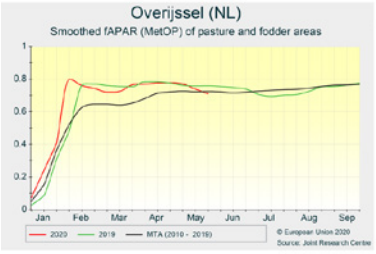


BULLETTIN ISSUE

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
RAINFALL								
TEMPERATURE								
RADIATION								

Benelux

Reference period: 01 May to 31 May 2020

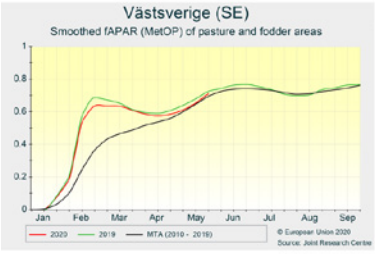


BULLETTIN ISSUE

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
RAINFALL								
TEMPERATURE								
RADIATION								

Denmark and Sverige

Reference period: 01 May to 31 May 2020



BULLETTIN ISSUE

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
RAINFALL								
TEMPERATURE								
RADIATION								

4. Country analysis

4.1. European Union

France

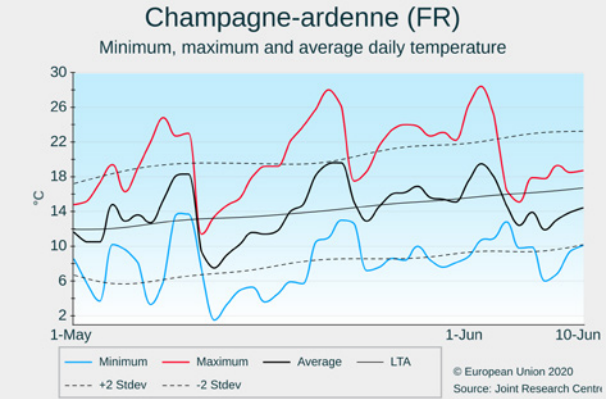
A poor outlook for winter crops but fair start for most summer crops

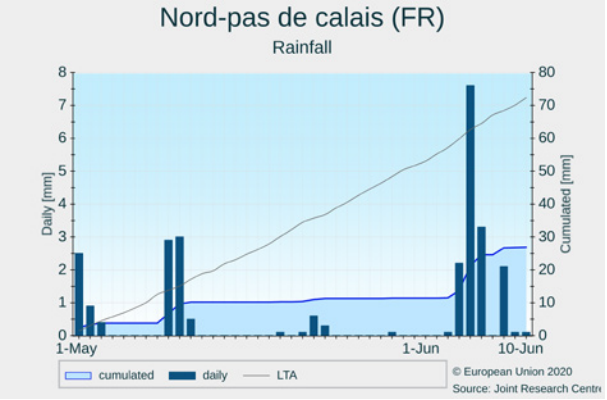
After a long period of rain deficit, substantial rainfall arrived in most regions at the beginning of May, thus limiting further degradation of winter crop conditions and benefiting summer crops. Winter crop yields are forecast at an exceptionally low level, while the forecasts for summer crops are maintained close to the trend.

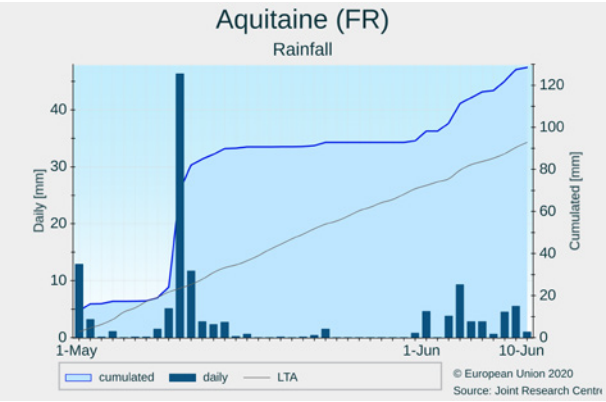
Cumulative rainfall during the review period was around average in most parts of France. However, it remained well below the LTA in the north (*Bretagne, Normandie, Picardie* and *Nord Pas-de-Calais*), whereas a surplus was recorded in the southernmost regions (*PACA, Languedoc-Roussillon, Aquitaine*). Temperatures remained above the LTA, except during mid May and since 7 June. Radiation was exceptionally high for the period considered.

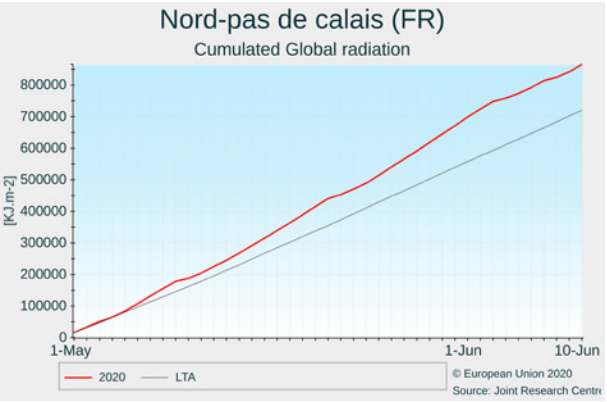
Winter crop conditions did not further degrade, and conditions during flowering have generally been favourable. Nevertheless, yield forecasts for all winter crops have been revised further downwards to an unusually low level, reflecting the impact of the dry period previously observed while plants had not developed a sufficient rooting system, and the substantial shortening of the vegetative period. Spring barley has suffered from the dry conditions since sowing and yield is forecast well below the 5-year average. The margin of uncertainty is high, however, considering this year's unique sequence of contrasting extreme conditions, with large spatial and temporal heterogeneity.

Summer crops emerged quickly thanks to the above-average temperatures and are benefiting from the rainfall observed since early May. More rainfall is still needed to replenish the soil moisture levels, particularly in the east, as well as in north-western regions where the current rain deficit is expected to have already had some negative impact on rainfed potatoes and sugar beet. The yield forecasts for all summer crops are maintained close to the trend.









Germany

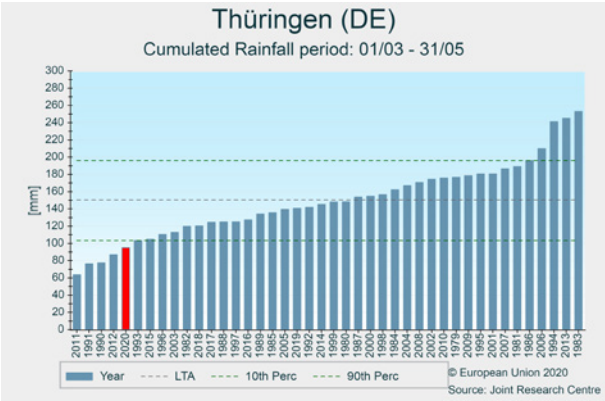
Another difficult season with low yield expectations for winter crops

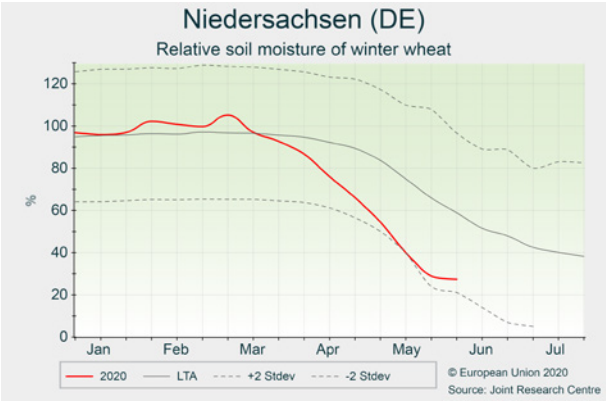
A relatively cold period, with much-needed rainfall, benefited summer crops and prevented severe further deterioration of winter crop conditions. However, it was insufficient for crops to recover and arrived partly too late. The precipitation deficit persists. Winter crop yields, with the exception of winter barley, have been revised further downwards. The outlook for summer crops is mostly above the 5-year average.

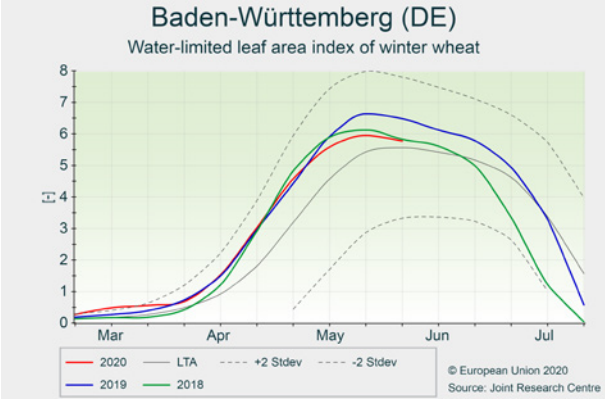
Temperature sums for the review period are clearly below the LTA. A distinct cold spell in mid May, with a couple of night frosts, significantly contributed to this cold anomaly. Some frost damage (to rapeseed) was reported. Radiation levels have been high across the country.

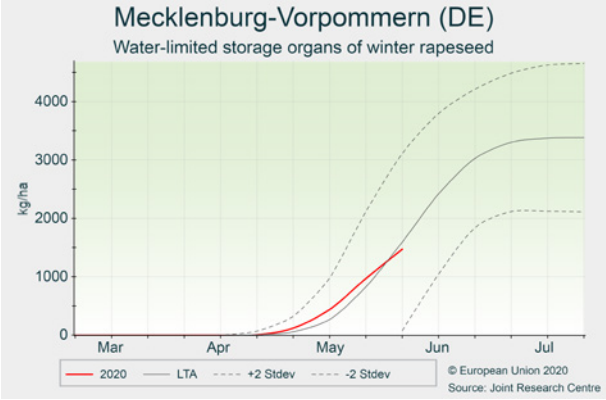
Despite some rainfall, the precipitation deficit since 1 March remains considerable and this year's spring is among the driest on record. The recent rains were extremely important for the summer crops, as here soil moisture levels can now sustain adequate growth in most regions. However, more rain is definitely needed for the upcoming, more demanding growth stages of summer crops and to ensure adequate grain filling for winter and spring cereals.

Despite the relatively cold temperatures slowing crop growth, with positive effects on winter crops due to prolonged ear emergence (mainly winter wheat) and lower evaporative demand, the dry period has already tempered yield expectations for winter and spring cereals, as well as for rapeseed. Winter wheat has concluded ear emergence across the country and is about to enter the sensitive flowering stage, including in northern Germany; winter barley is about 2-4 weeks ahead of winter wheat development. Rye and rapeseed are at grain-filling stage. The yield forecasts for winter crops, with the exception of winter barley, have been revised further downwards. They are mostly close to or above last year's yield, but with a high level of uncertainty and clear potential for further downward revision. Yield forecasts for summer crops, with the exception of maize, are still based on trends.









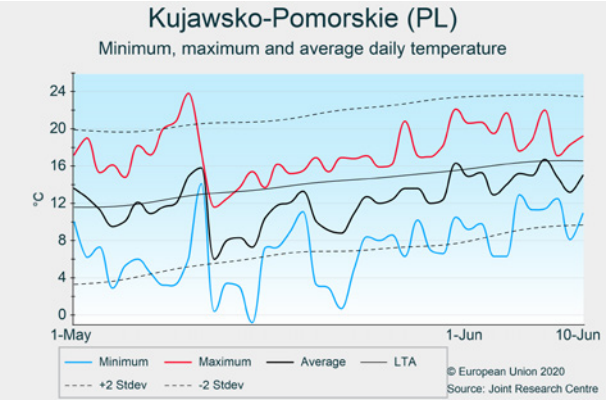
Poland

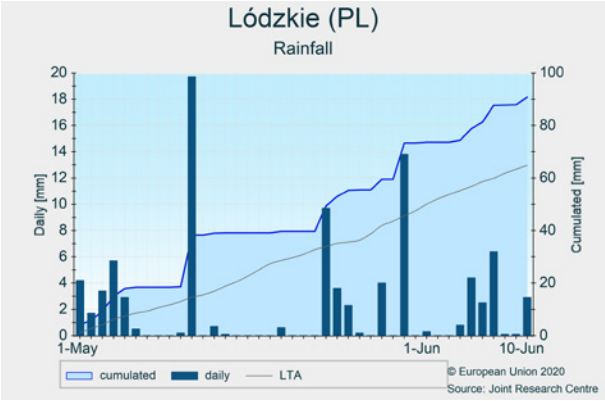
May rains improved crop conditions

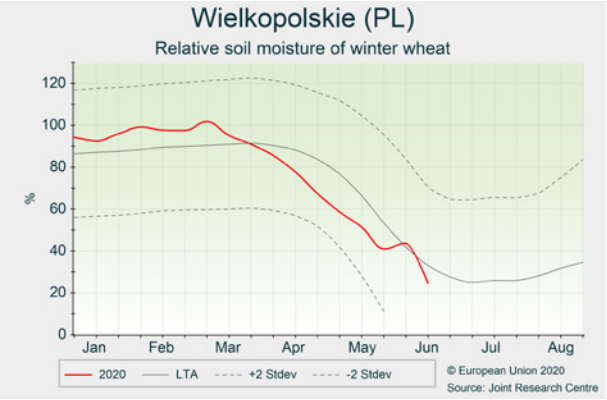
Beneficial rains helped to restore soil moisture contents, and temporarily improved crop conditions in most of the country, except in the north-west where soils have constantly been very dry.

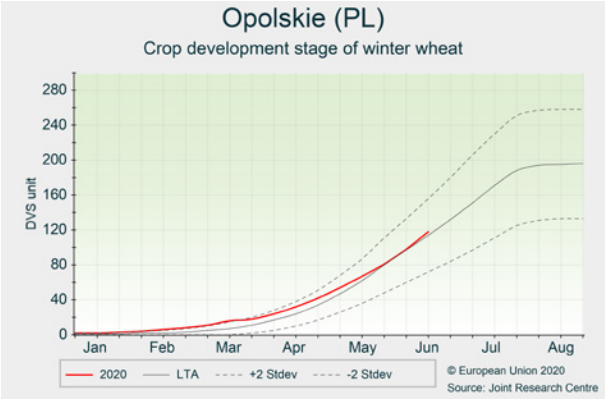
In May, cumulative rainfall was significantly above the LTA in most of the country, with the exception of the north-western regions (*Zachodniopomorskie* and *Lubuskie*) where rainfall was below average. As a result, topsoil water contents were temporarily replenished. The situation is delicate as warm and dry conditions are expected to return in the coming week. Temperatures during May were below average (2-4 °C below the LTA). The first dekad of June was characterised by below-average temperatures (up to 2 °C lower than usual) and little rain in the western border and south-eastern regions.

The weather conditions in May allowed crops to recover growth after a very dry April. In most of the country, spring and winter cereals are in fair condition, except in the north-western regions where dry soil had a negative impact on crops. Winter crop development and biomass accumulation have slowed due to the lower-than-usual temperatures in May and early June, and are now close to average. Soil water conditions for summer crops and spring cereals have also improved, but plants remain delayed in their development due to the cold temperatures. Also, strong pest pressure is observed in sugar beet. The outlook for winter crops is currently still close to or above the 5-year average, while the expectations for spring barley, potato and sugar beet are below the 5-year average.









Ireland

Crop conditions variable across the country

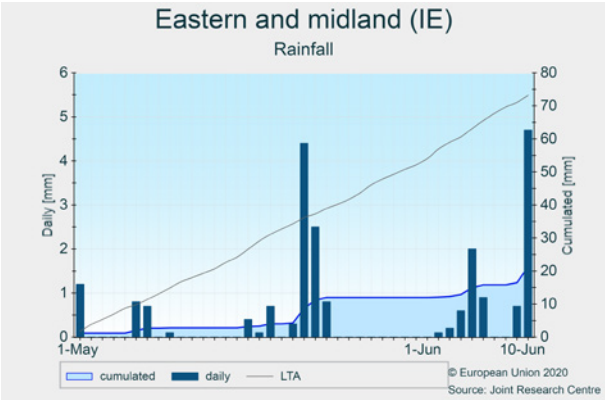
In some regions, particularly in the north and west, rainfall improved soil conditions. In eastern regions, soils were depleted and the continued moisture deficit negatively impacted crop growth, particularly in spring cereals. Yield forecasts mostly remain close to the average but are revised downwards for spring barley.

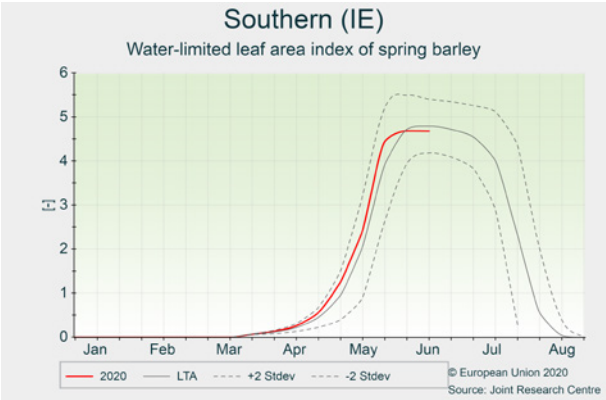
The review period was characterised by warmer-than-usual temperatures, with the exception of a few cold days during the second dekad of May when average temperatures dropped 6-7 °C below the LTA.

Dryness was alleviated in May, but precipitation events were unevenly distributed across the country. In northern and western areas, precipitation sums amounted to 33 mm in May (50 % below the LTA). Precipitation remained particularly scarce in eastern areas (77 % below the LTA), where soil moisture content reached critical levels. Rainfall in the north, west and to a lesser extent south of the country helped to partially restore soil moisture content, reducing concern for winter cereals approaching flowering.

Overall, crop conditions show large differences across the country due to the variations in volume of rainfall, with some crops in poor condition while others are well established. Some crops – particularly spring cereals – are thin and pale in dry areas, as dry soils negatively impacted nutrient supply. On the other hand, crop stands are dense in regions where rainfall was more favourable. There is considerable variation in the growth stages of spring cereals, although most have reached flag leaf stage. In general, pest and disease levels are low.

The yield forecasts remain close to the 5-year average. Forecasts are reduced for spring barley, due to the dry conditions that affected crop growth in many areas across the country.





Spain and Portugal

Good crop growing conditions prevail

Most of the Iberian Peninsula is experiencing very good crop growing conditions, with plentiful rainfall and favourable temperatures. Therefore, the overall crop yield outlook is positive for both winter and summer crops.

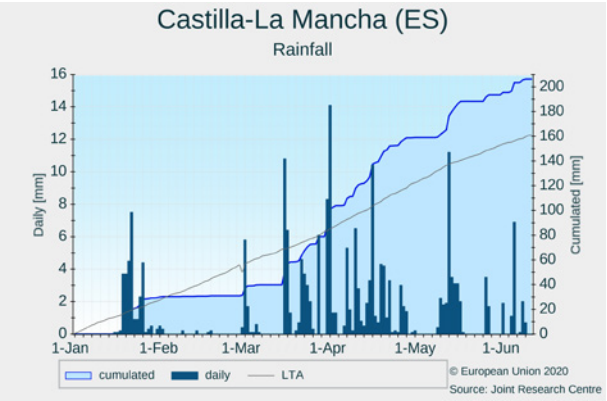
Temperatures have been steadily following an above-average trend since the winter months. In general, during the analysis period (1 May-10 June), we are observing temperatures 2-3 °C above the average, resulting in around 20 % higher temperature sums. As maximum temperatures remained below or around 30 °C, no heat damage to crops is expected.

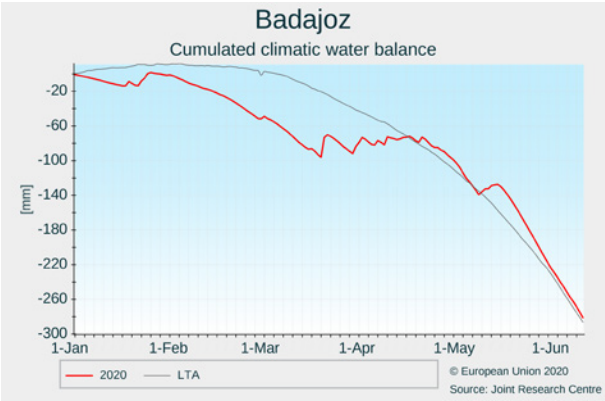
Rainfall above the LTA during the analysis period has been beneficial in most regions (e.g. *Castilla-La Mancha*). Soil moisture conditions have recovered from the dry winter (e.g. *Badajoz*). In *Aragon* and *Catalonia*, on the extreme side, cumulative precipitation reached around 150 mm above the LTA, which may have hampered grain filling of winter crops.

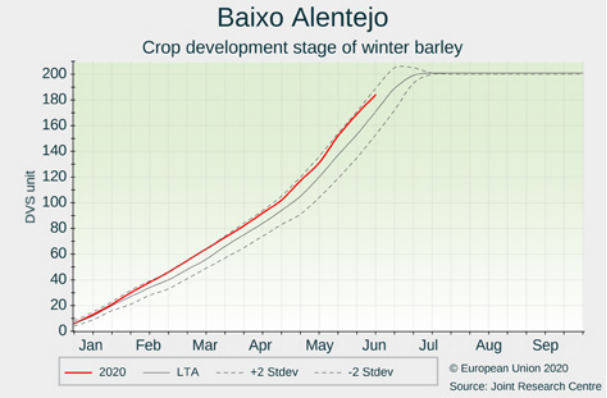
High temperatures and abundant rainfall are accounting for faster development and growth of crops, especially for summer crops in early stages (*Badajoz*), but are also tending to increase disease pressure, mainly for winter crops in the south-east (*Malaga* and *Almeria*), locally impacting their yield expectations.

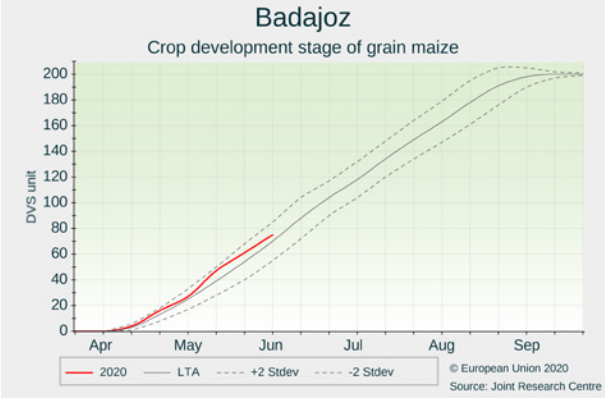
Limited water supply for irrigation is still a concern in southern Spain (*Extremadura* and *Andalucia*), where reservoirs currently hold less than half the 10-year average for June (*source:* www.embalses.net).

The yield outlook for both winter and summer crops is positive and – for most crops – above the levels of the May issue of the bulletin.









Italy

Winter crop season is ending under mixed conditions

The forecast for durum wheat is revised downwards and remains below the 5-year average. Below-average figures for soft wheat and winter barley are unchanged. Maize and sunflower present generally good conditions, while soybean sowing campaigns were still ongoing during May. Yield forecasts for summer crops still reflect the historical trend value.

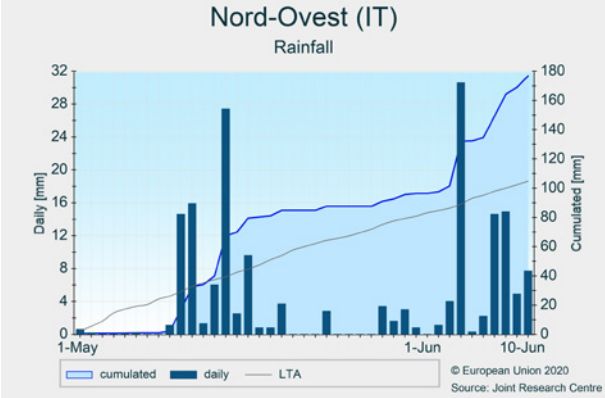
In Italy, May and the beginning of June presented slightly positive temperature anomalies (up to 2 °C above the LTA) and average precipitation in most of the agricultural regions. Winter and summer crops present mixed conditions, as the result of a difficult spring where the challenging season in eastern and southern regions is only partially compensated by the recent favourable conditions in western and central Italy.

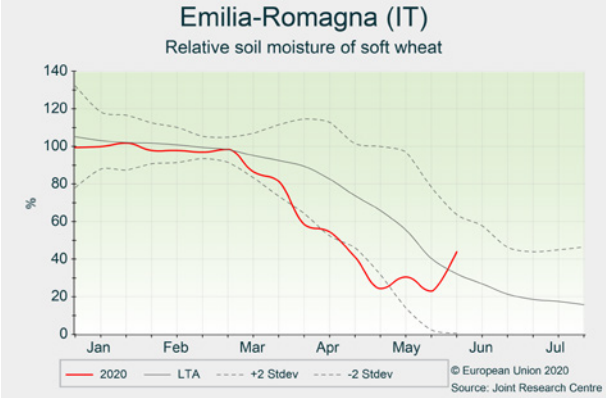
In north-western regions, the temperature was slightly higher than usual, with favourable precipitation in the first 15 days of May and at the beginning of June (e.g. *Nord-Ovest*), maintaining the climatic water balance around the average. Grain filling of winter crops proceeded favourably, while maize is in advanced stages, with average leaf area expansion.

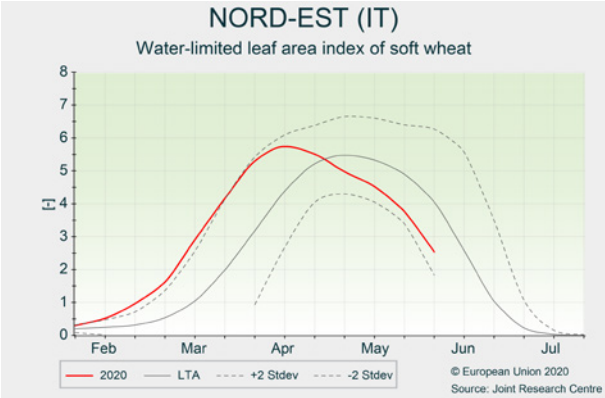
In north-eastern regions, after a wet start to May, warm anomalies contributed to maintaining very low soil moisture. More precipitation occurred at the end of May and the beginning of June, which increased soil moisture to average values for the first time since March (e.g. *Emilia-Romagna*). Winter crops remain in very advanced stages. The flowering period was centred around 15 May, and grain filling started under unfavourable conditions. Maize fields present uneven growth conditions. Soybean sowing is still ongoing, benefiting from the latest rain.

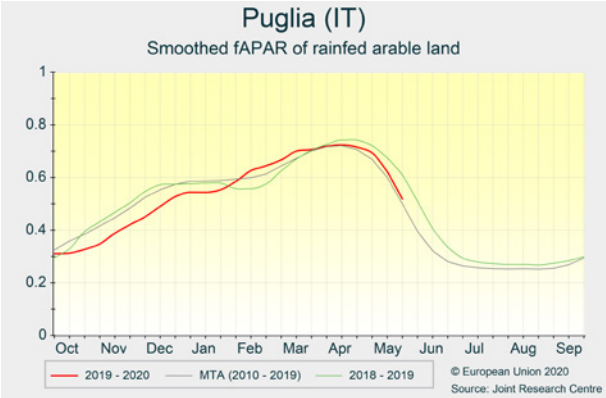
In central Italy, a dry spell ended around 20 May and precipitation restored soil moisture levels, favourable to grain filling in winter crops and biomass accumulation in sunflowers.

In southern regions, the rain in late May and early June arrived too late to change the yield expectations, as wheat and barley are in the final stages of grain filling. Harvest timing is expected to be in line with the average, but earlier than in recent years. In *Sicilia*, harvesting is ongoing with good yield expectations.









Hungary

Moderate rains arrived late for winter crops

Moderate rainfall in the first half of May hardly improved soil moisture conditions for the flowering of winter cereals. Summer crops are underdeveloped in several places, but precipitation since the last dekad of May has improved conditions and led to a more positive yield outlook for summer crops.

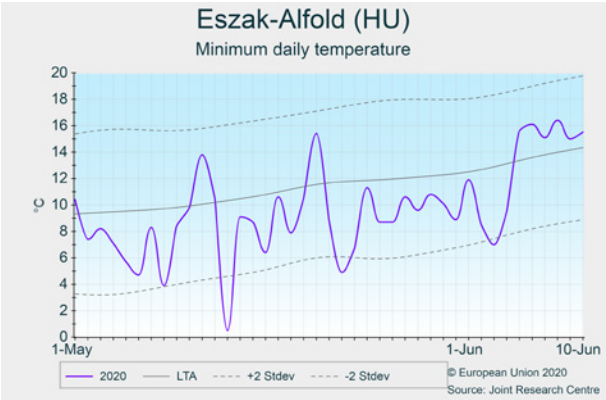
Lower-than-usual temperatures predominated in Hungary, most markedly in May, resulting in a 1-2.5 °C negative thermal anomaly for the period as a whole, with the strongest negative anomalies in the north-eastern region. Around 13 May, frost events at ground level caused damage to the leaves of grain maize, but recovery is expected.

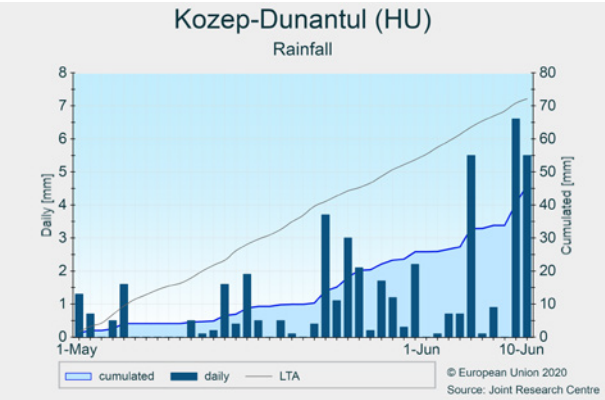
After a long period without significant rainfall (as reported in the May issue of the bulletin), moderate rain (in the range of 5-20 mm) was recorded during the first two dekads of May. Rainfall tendency increased from the last dekad of May but in the form of small events, resulting in precipitation totals that remain well below the LTA level for the review period, from 35-50 mm in central Hungary to 50-80 mm in surrounding areas closer to the border.

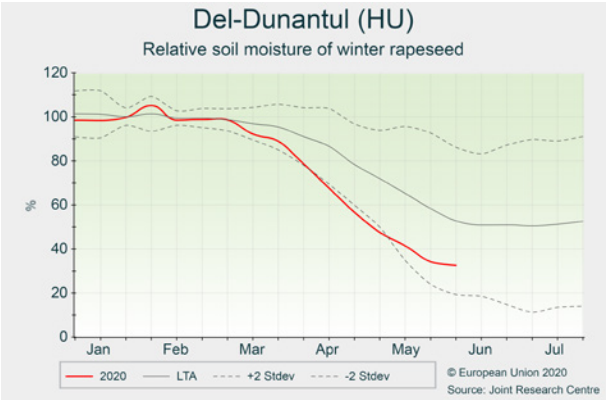
The colder-than-usual weather unfavourably slowed growth and leaf area expansion of grain maize and other thermophile crops. Inadequate conditions (low temperatures and dry topsoils) led to underdeveloped and uneven summer crop stands in several places. However, the beneficial rains of the past 3 weeks have improved soil moisture conditions, with positive effects on crop growth.

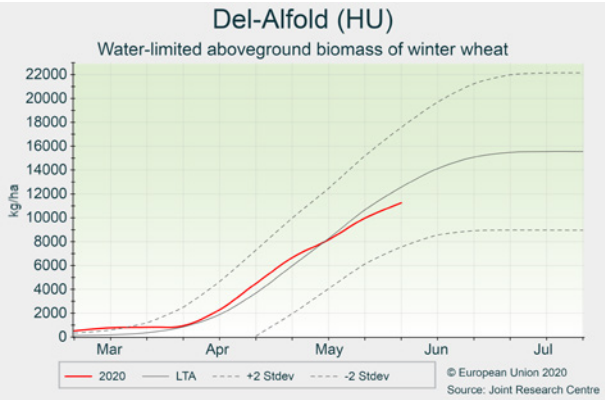
Rapeseed finished flowering in mid May and reached grain filling. Winter cereals are flowering or are in early grain-filling stage. Soil moisture contents under winter crops were significantly lower than usual, but the low temperatures in May somewhat mitigated the negative effects of water deficit. Biomass accumulation of winter cereals and rapeseed is typically below average in the eastern half of the country, but close to average in western regions, where water supply has been more adequate.

The yield forecasts for winter cereals and rapeseed were reduced or maintained, while forecasts for summer crops were revised upwards.









Romania

Beneficial rains improved yield outlook for summer crops

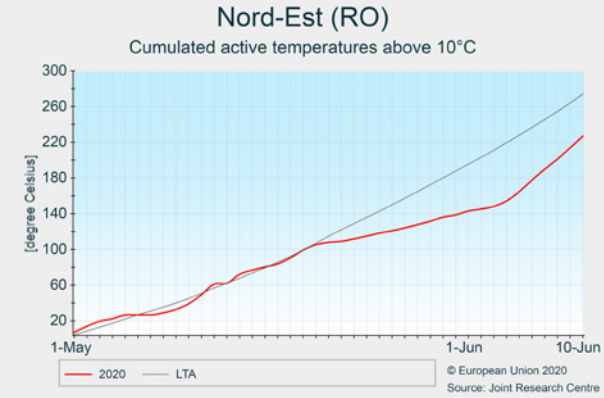
Suboptimal water supply conditions negatively impacted winter crops during flowering and early grain filling. Rainfall eventually increased soil moisture contents to near-average levels in most regions, but this primarily benefits summer crops.

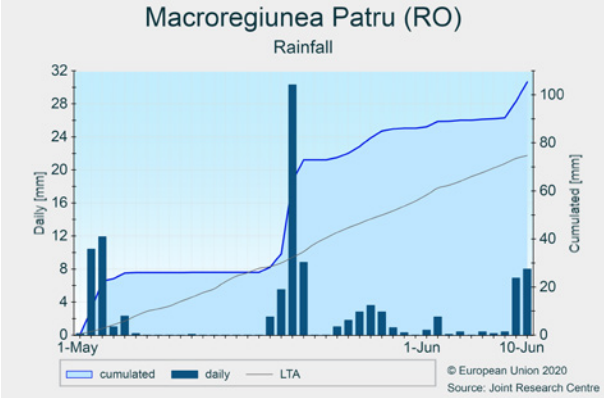
Since the beginning of May, temperatures have been mostly below the LTA, except in the second dekad of May, which was significantly warmer than usual, especially in the southern half of Romania. The review period as a whole (1 May-10 June) presented a 0.5-2.0 °C negative temperature anomaly. These colder-than-usual conditions resulted in slowing of phenological development of winter and summer crops.

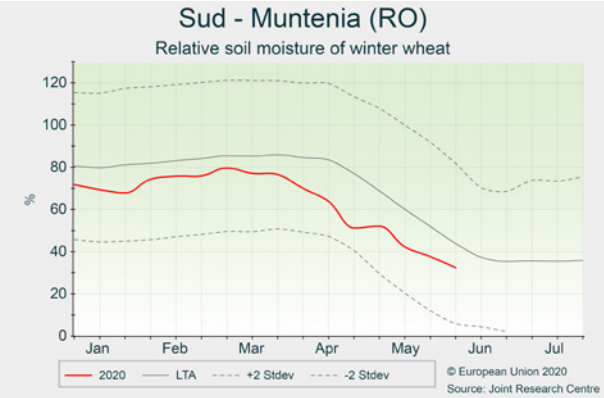
After a dry April, rain became more substantial in May. In most regions, precipitation totals approached the average or exceeded it by up to 50 % (locally by up to 90 %). However, the easternmost areas close to the Black Sea (*Sud-Est* and the eastern half of *Sud-Muntenia*) and the western part of the *Vest* region (*Banat*) remained drier than usual.

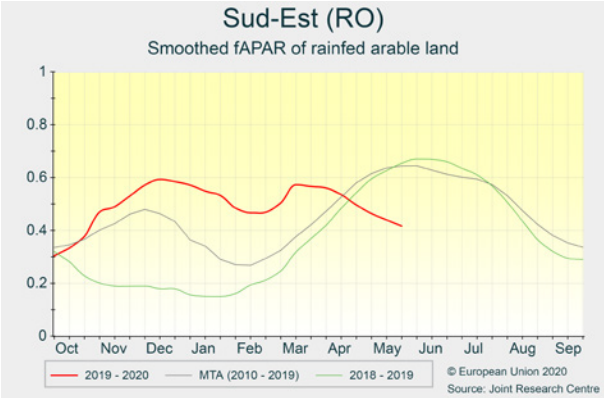
The reproductive phase of winter cereals, which is crucial for yield formation, has not been shortened so far thanks to the overall near-average thermal conditions. However, the crop water supply was suboptimal during the flowering and early grain-filling periods in north-eastern, south-western and, most distinctly, south-eastern regions. According to remote sensing information, biomass accumulation and photosynthetic activity remain close to or above average in *Nord-Vest* and *Macroregiunea Patru* but have dropped well below average in these other regions.

The yield forecast for winter crops was revised further downwards, to substantially below the trend level. The yield outlook for summer crops has improved and current soil moisture levels are adequate to sustain growth in the coming weeks.









Bulgaria

Beneficial rain for summer crops

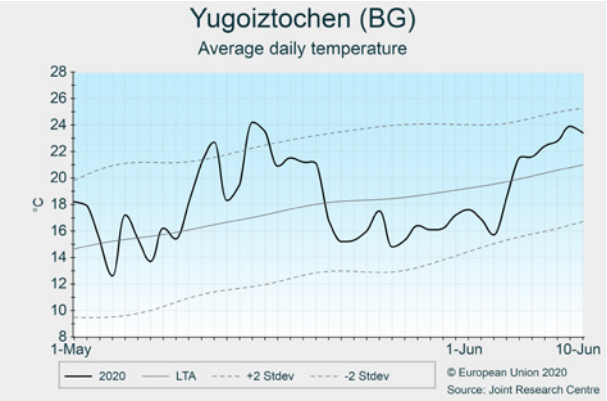
Near-average to above-average rainfall improved water supply conditions for summer crops, but arrived too late to significantly improve the yield outlook for winter crops.

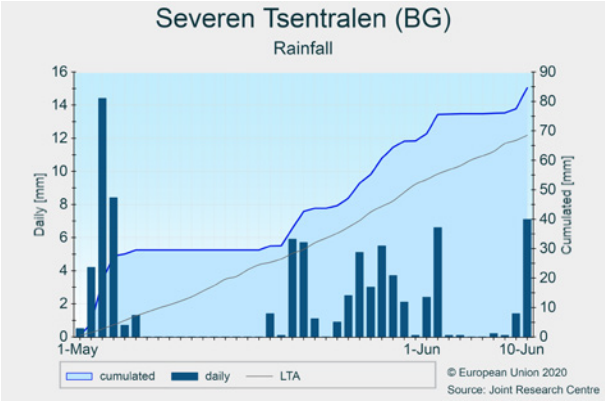
Considering the review period as a whole (1 May-10 June), more or less seasonal thermal conditions prevailed in Bulgaria, with alternating warmer-than-usual and colder-than-usual periods. The second dekad of May presented a 3-6 °C positive anomaly, whereas the last dekad of May had a 3-4 °C negative thermal anomaly.

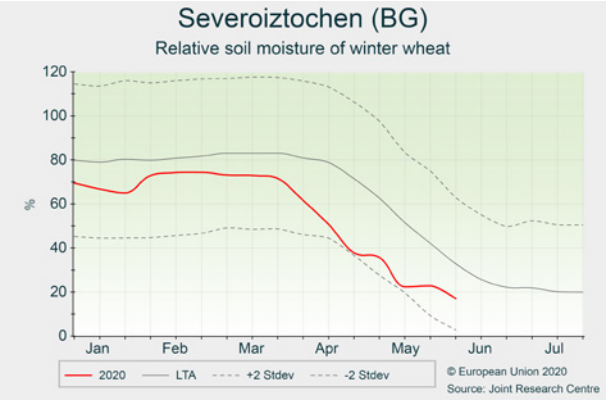
Precipitation totals reached 50-120 mm in most regions, thus exceeding the LTA by 10-80 %. Rain was particularly abundant in the first and last dekads of May. Only southern parts of the country (some regions in *Yugozapaden* and *Yuzhen Tsentralen*) received near-average or slightly below-average rainfall.

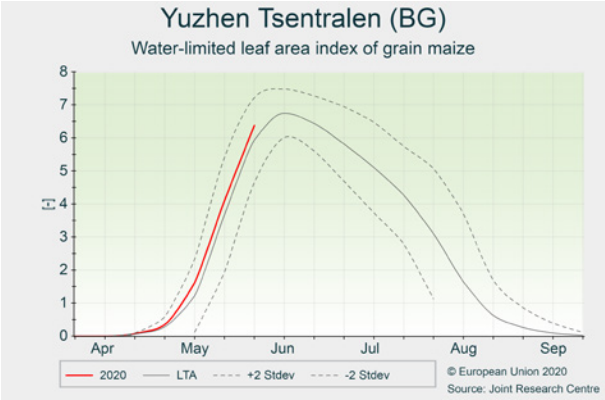
Even though precipitation was mostly above average, it was insufficient to significantly improve soil moisture conditions, due to the considerable water demand of the crops. Rains in the third dekad of May arrived too late for winter crops in most of eastern Bulgaria, where the reproductive crop development phases (heading and flowering) occurred in the absence of sufficient soil moisture. At the end of the review period, soil moisture contents under winter crops are mostly below average, except in the westernmost parts of the country where near-seasonal levels prevail. Summer crops benefited from the improving water supply conditions in most regions, and biomass accumulation and canopy expansion accelerated. However, in some parts of *Yugoiztochen* and *Yuzhen Tsentralen*, water supply remained less than optimal.

Our yield forecasts for winter crops were revised downwards, due to the continued unfavourable conditions, particularly in eastern regions. However, the yield outlook became more positive for summer crops.









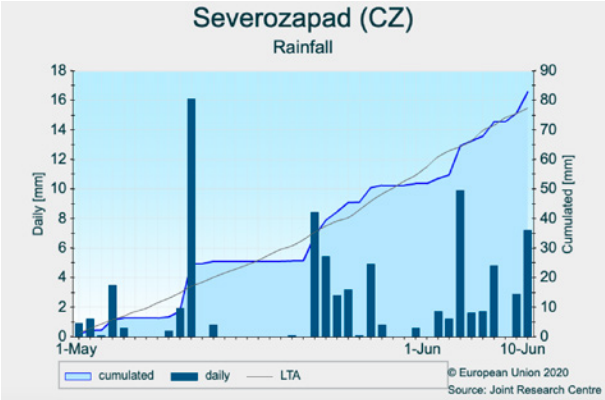
Austria, Czechia, and Slovakia

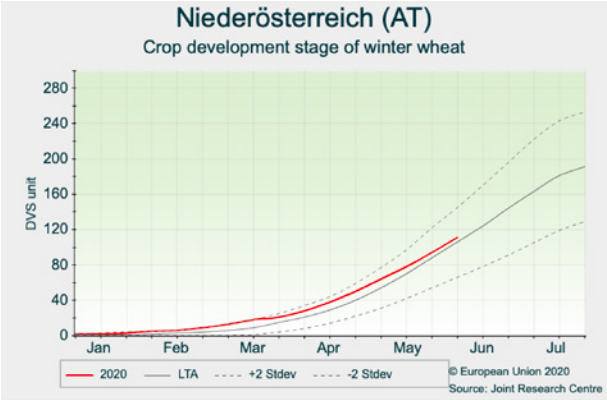
Beneficial rainfall slightly improved growing conditions

Cold weather slowed the phenological development of winter crops, which is now broadly aligned with the LTA. Recent rainfall decreased the moisture deficit in the upper soil layer, improving growing conditions for summer crops. The rain also allowed for a slight upward revision of the crop yield outlook for winter crops.

The period since the beginning of May has been colder than usual, with air temperatures down to 3 °C below the LTA. During the cold air intrusion at the beginning of the second dekad of May, temperatures regionally dropped below 0 °C, only locally causing frost damage to emerged grain maize. Maximum temperatures throughout the entire period remained below 28 °C. Above-average rainfall was recorded in Czechia and northern Austria, with total cumulates above 50 mm (regionally in Czechia and northern Austria above 100 mm). The southern part of Slovakia and south-eastern Austria remained drier than usual, with rainfall cumulates below 50 mm.

The recent rainfall was able to compensate for the topsoil moisture deficit in Czechia and regionally in northern Austria, which had been increasing due to the lack of rainfall since mid March. The cold weather anomaly in May slowed the phenological development of winter crops – now in the flowering stage – counterbalancing the advanced development due to the preceding warm period. The yield outlook for winter cereals has been revised slightly upwards due to the recent rainfall. This rainfall has also been beneficial for the initial growth of summer crops. The outlook for summer crops remains broadly in line with the long-term trend.





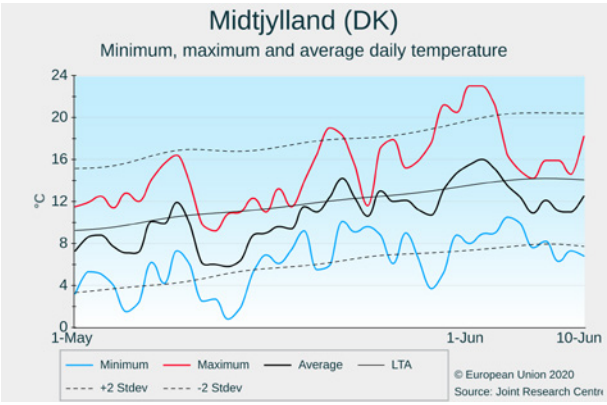
Denmark and Sweden

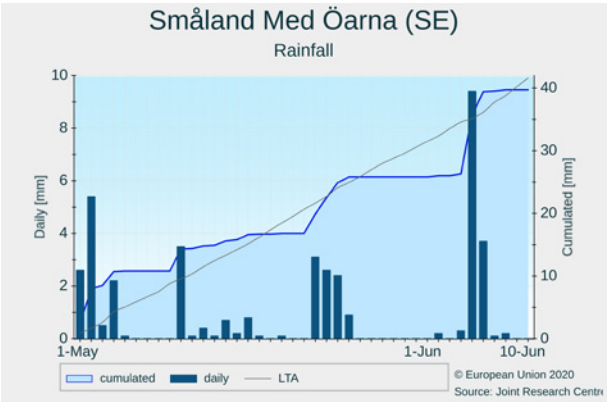
Positive outlook reinforced by recent rainfall

After a long period with below-average rainfall, the rainfall regime returned to seasonal levels. Temperatures remained low in May, causing delays to crop development but limiting evapotranspiration and potential exposure to water stress. The yield forecasts are maintained well above the 5-year average.

While rainfall from mid March remained persistently below the LTA, cumulative rainfall since the beginning of May has been close to the LTA. In all regions, rainfall was particularly substantial around 4-5 June. Temperatures remained below seasonal values in May and fluctuated around the LTA at the beginning of June.

Despite the preceding long period with below-average rainfall, rainfall amounts were sufficient, and sufficiently well distributed, to sustain a positive yield outlook. For Sweden only, yield forecasts for winter cereals have been slightly lowered but remain above the 5-year average. The substantial rainfall observed in early June is expected to limit further exposure to water stress. The low temperatures in May have been favourable for winter crops, despite delaying crop development. Spring barley is also faring well, even though the season started slightly late (beginning of April) due to delayed sowing. The yield is forecast above the 5-year average (albeit below last year's level), with potential for further improvement.





Finland, Lithuania, Latvia and Estonia

Cold conditions delayed crop growth

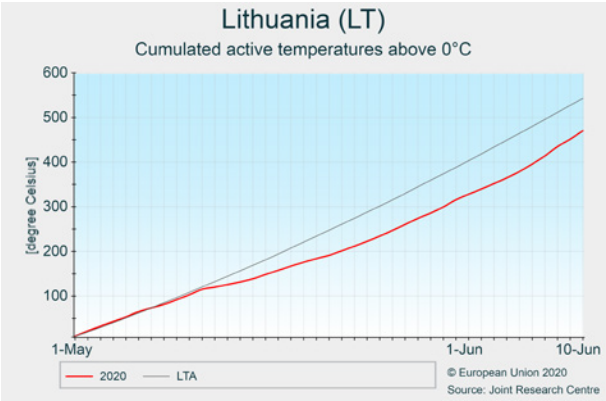
Winter crops are faring well in the Baltics and Finland. Cold weather delayed crop growth in the Baltic countries and Finland. Sowing campaigns progressed well in Finland after the end of May and are nearly completed. Mild temperatures in the coming weeks should allow crop growth to recover and maintain yield potential.

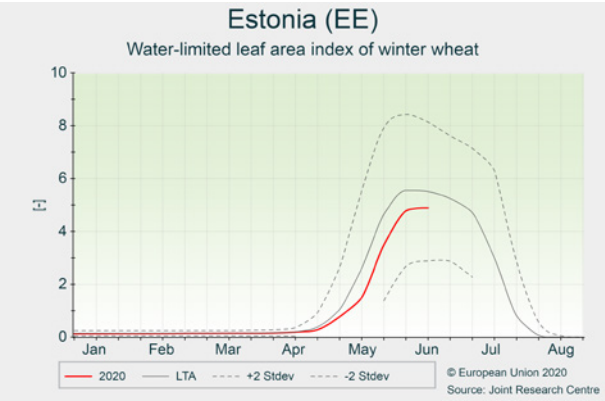
In Finland and the Baltic countries, colder-than-usual temperatures prevailed in May. After a few days with seasonal values during the last week of May, temperatures decreased to below the average again at the beginning of June but reached above-average values at the end of the review period. A few night frosts occurred without major consequences. Cumulative radiation was below average in Lithuania but close to the average in the other countries.

Similarly, cumulative rainfall was above average in Lithuania, but close to or slightly below the LTA in the other countries.

In particular, precipitation distribution was variable across Finland (more abundant on the southern coast) and rain mainly fell during the second dekad of May. The abundant precipitation during May slowed spring sowing in Finland. However, since the end of May sowing campaigns have continued to progress well and will be nearly completed at the end of the review period. Our crop model simulations indicate that cold temperatures decreased development and crop growth in May in all countries. Mild temperatures in the coming weeks should help crop growth to recover. Spring cereals are in vegetative growth stages and winter cereals are reaching the flag leaf stage. Rapeseed is at the flowering stage and crop indicators are positive.

Yield forecasts remain close to the 5-year average.





Belgium, Luxembourg and the Netherlands

Rainfall arrived too late to avert reduced yield outlook

The rainfall since the beginning of June arrived too late and was too little to prevent a further reduction in the yield outlook for winter crops. Potato crops partly recovered, but many sugar beet stands remain poorly developed. Soil water levels are still well below the seasonal average. Yield forecasts for all crops were revised downwards.

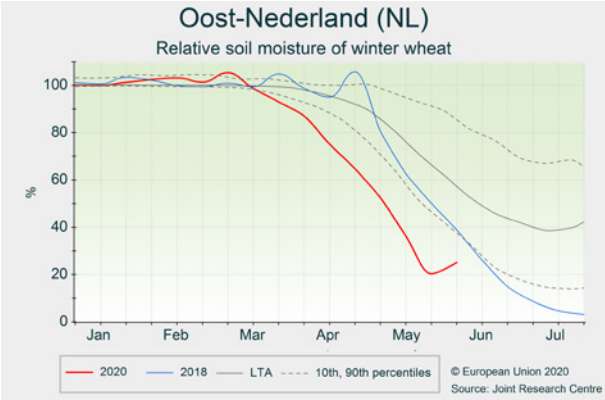
The review period (1 May-10 June) was characterised by a continued rain deficit. The rainfall that did occur was concentrated in the first dekad of May and the first dekad of June, with the most significant events around 5 June. Cumulative rainfall for the period as a whole ranged from less than 40 % of the LTA in the southern Netherlands and northern Belgium to about 70 % of the LTA in Luxembourg; it was 40-50 % of the LTA in most other regions.

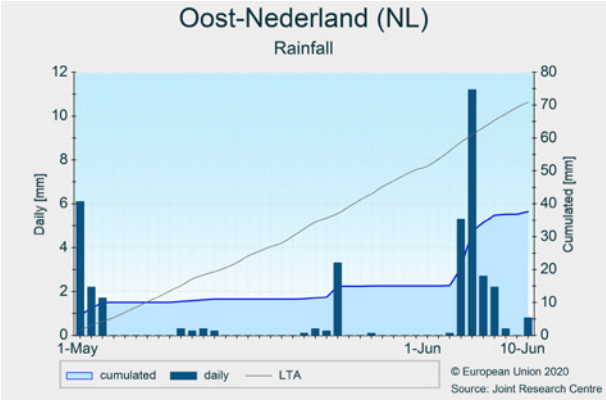
Daily mean temperatures fluctuated around the LTA, with distinctly colder-than-usual periods around 13 May and 5 June. Frost events at ground level were common around 13 May in inland regions, causing some damage to crops, especially early planted potatoes. Radiation levels continued to be exceptionally high.

The continued rain deficit negatively affected all crops. In addition to constraining biomass accumulation, the period with driest conditions (end of May and first days of June) partially coincided with the start of the flowering period for winter wheat, with negative effects on grain numbers. Sugar beet, potatoes and maize crops faced another period of stress after they had just started to recover from the difficult conditions around sowing and emergence. Conditions are most difficult in the eastern and southern Netherlands and in northern Belgium.

Crops that benefit from irrigation, especially early sown stands (of summer, spring and winter crops) on light- to medium-textured soils, are performing well, and benefited from the high radiation levels and predominantly mild temperatures. However, above-average potential yields for these crops are unlikely to compensate for the lower yields expected elsewhere. Moreover, water withdrawal restrictions have already been put in place in many regions ([1]), and rainfall foreseen in the coming days will be insufficient to lift soil moisture contents to safe levels.

Consequently, the yield forecasts for all crops were revised downwards.





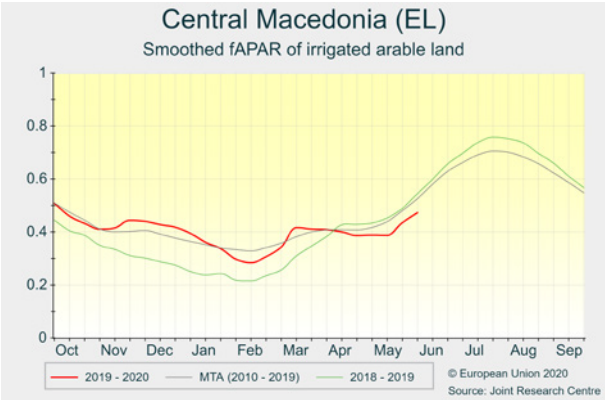
Greece and Cyprus

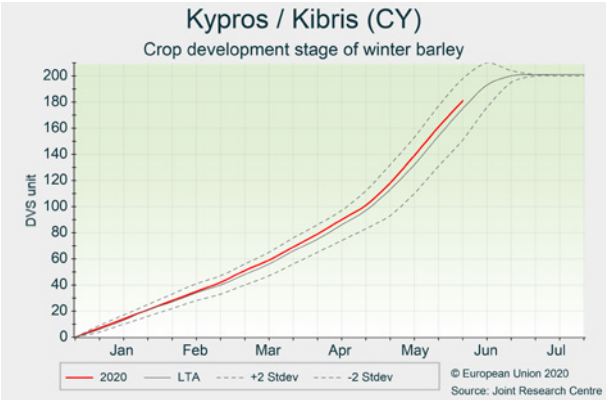
Positive outlook despite delayed crop growth in the north

In Greece, the positive expectations for winter and summer crops remain unchanged. Summer crop growth slowed in some provinces due to localised hailstorms in Central Macedonia. The recovery process has already started. In Cyprus, the harvest is ongoing without any particular concerns.

Temperatures were around average at the beginning and end of the review period (1 May-10 June). In the second dekad of May, daily temperatures in Greece were unusually warm: 3-5 °C above average values. Temperatures then dropped rapidly to 2 °C below the LTA during the third dekad of May. Rainfall was abundant in the eastern regions of *Central* and *East Macedonia*, *Central Greece* and *Attica*. Rainfall cumulates here have been almost 40 % above the LTA. Rainfall events occurred in the first and last days of May in the regions of *Macedonia,* and in June in central and southern regions. Damaging hailstorms occurred at the end of April in *Central Macedonia*. Remote sensing-based assessments show a slowdown in biomass accumulation for summer crops in the provinces of *Serres*, *Pella* and *Imathia*. This was observed during May, together with subsequent onset of crop recovery at the end of May. Crops have not been permanently damaged and there is time for them to recover since they are at vegetative stages.

Overall, spring weather conditions indicate good prospects for growth. Winter cereals ended the grain-filling phase under positive conditions and are now in senescence. Summer crops are entering the green-up period and progressing well in all regions except *Central Macedonia*, where crop conditions are slightly below average. In Cyprus, harvest is ongoing without any particular concerns. Yield expectations for this season are in line with historical trend levels.





([1]) www.brabantsedelta.nl/onttrekkingsverbod www.integraalwaterbeleid.be/nl/overleg/droogtecommissie www.wrij.nl/thema/kennis-informatie/waterthema'-0/klimaat/droogte/droogte-nieuws/onttrekkingsverboden/

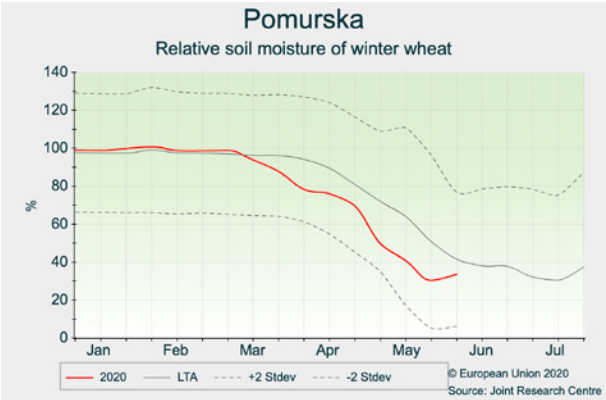
Slovenia and Croatia

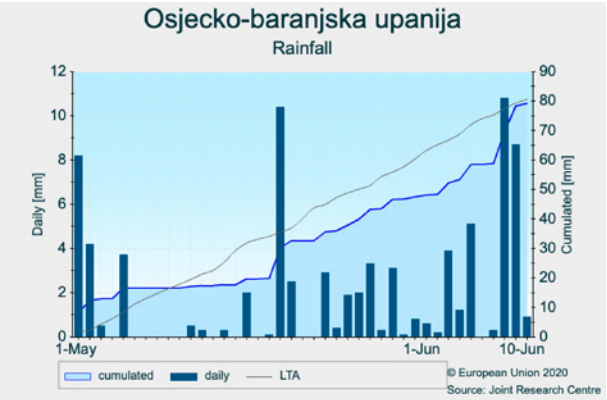
Recent rainfall alleviated drought conditions

Recent rainfall has slightly improved crop growing conditions, which were largely determined by drought in the preceding period. Consequently, our crop yield outlook for winter cereals was revised slightly upwards. The outlook for winter rapeseed, however, remains the same as in the May issue of the bulletin.

The analysis period (1 May-10 June) was colder than usual, with temperatures down to 2 °C below the LTA. These conditions have slowed the phenological development of winter crops. Minimum temperatures mainly remained above 0 °C in most agricultural areas. Rainfall cumulates have been around or above the LTA. Only in north-eastern Slovenia and eastern Croatia did rainfall totals remain below the average, but even here cumulates between 50 mm and 80 mm slightly improved prevailing drought conditions. Nevertheless, the climatic water deficit since the beginning of spring still persists in regions such as *Pomurska* and *Vukovarsko-Srijemska Zupanija*.

The beneficial rainfall came just in time to reduce the soil moisture deficit before winter cereals entered the sensitive stage of flowering. The crop yield outlook for winter cereals was therefore revised slightly upwards with respect to the last bulletin. However, for winter rapeseed, the rain arrived only after flowering and hence too late to avoid damage; the yield outlook for rapeseed therefore remains below the 5-year average. The yield outlook for summer crops remains in line with the long-term trend.





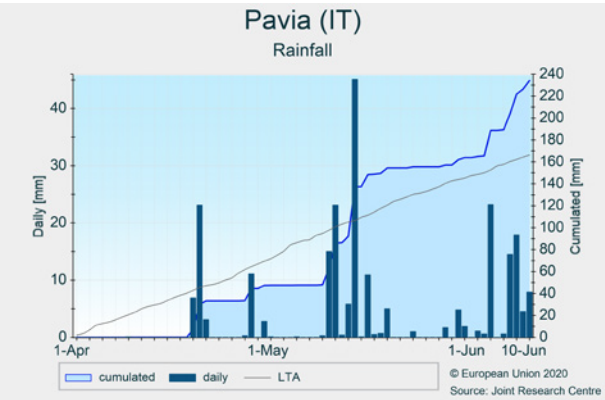
4.2. European Union – rice-producing countries

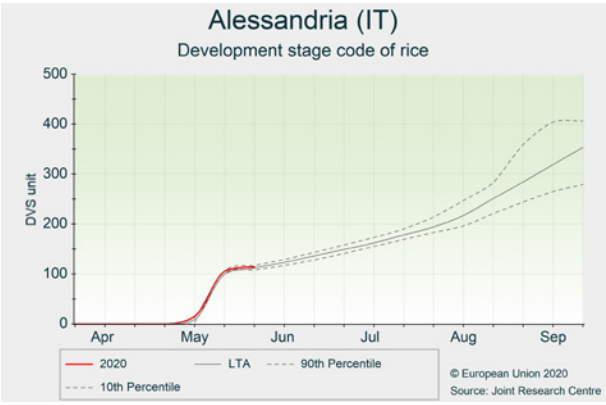
The beginning of the rice campaign in Europe was characterised by higher-than-usual temperatures in the Iberian Peninsula and southern France, dry weather conditions in northern Italy, and lower-than-usual temperatures in Hungary and the Balkans. The rice-sowing campaign took place on time and without abiotic constraints for rice. Weather conditions favoured the progress of rice germination and the initial growing stages in the main rice-producing regions of Italy and France, and boosted rice growth in Portugal and Spain. Above-average biomass accumulation and crop advancement are also observed in Bulgaria. Lower-than-usual temperatures were unfavourable for sprouting and early crop growth of rice in Hungary, Romania and Greece. Currently, rice phenology in Europe is at a more or less advanced stage of tillering. Our forecast for rice yield in Europe is 6.98 t/ha, corresponding to 2.7 % above the last 5-year average.

Italy

Sowing almost completed in all regions, under favourable conditions

In northern Italy, April was dry and favoured seedbed preparation in all rice-producing regions. In the first half of May, weather conditions still stayed mostly dry, favouring sowing activity. Only in the second half did weather conditions turn warm and wet, favouring the emergence of rice planted in the normal time window but delaying late sowing. In April and May, rice development was advanced compared to the usual schedule, thanks to above-average temperature accumulation. Since the end of May, development has slowed and moved towards average values for the beginning of June, following the decrease in temperatures. The start to the season is favourable overall, especially in the main rice-producing regions of Piemonte and Lombardia. Only the early planted rice sown in early April suffered from the lack of rainfall that month, resulting in unfavourable crop emergence. Similarly, in eastern Emilia-Romagna the very dry conditions in May led to a difficult beginning to the campaign. According to local sources (*Il Risicoltore*, June 2020, www.enterisi.it), the practice of sowing into dry soils rather than paddy fields further expanded this year, increasing competition for water with other crops (e.g. maize) that make use of the same irrigation shifts during summer. The yield forecast is based on trend analysis.

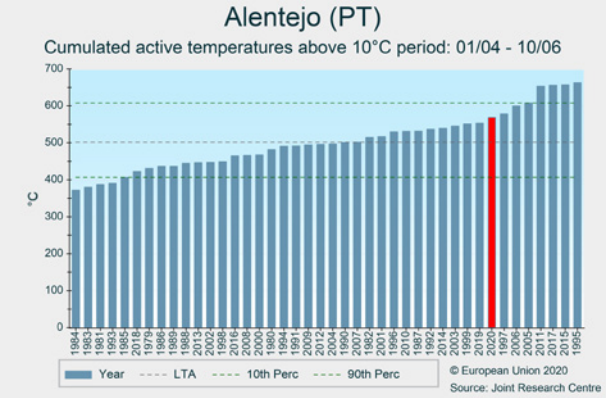


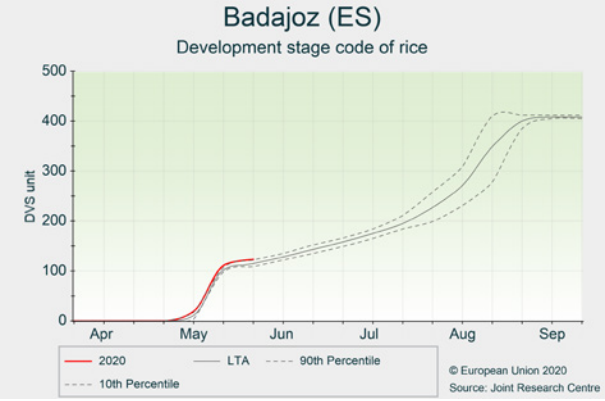


Spain and Portugal

Good start to the season

The Iberian Peninsula has seen higher-than-usual temperatures during the analysis period (1 May-10 June), leading to above-average active temperature sums (e.g. *Alentejo* region in Portugal). Rice crop biomass after sowing is accruing faster than usual in most regions. In Portugal, rice is in the mid-tillering development stage, while in Spain it is mostly at the beginning of tillering. The above-average crop growth is a direct response to the favourable weather observed across the central and southern half of the peninsula. In the southern part of the peninsula, where rainfall was low in winter and despite plentiful rainfall during spring, water stored in reservoirs for irrigation is currently still a third below the 10-year average (www.embalses.net), leading to higher vulnerability for rice fields in *Andalucía*. Accordingly, while the current high levels of temperature/radiation are providing a good start to the season, the crop could be exposed to limited water supply during the summer period. Based on higher-than-average temperatures and good biomass growth of tillers, our yield forecast for rice in the Iberian Peninsula is set to be above the 5-year average.

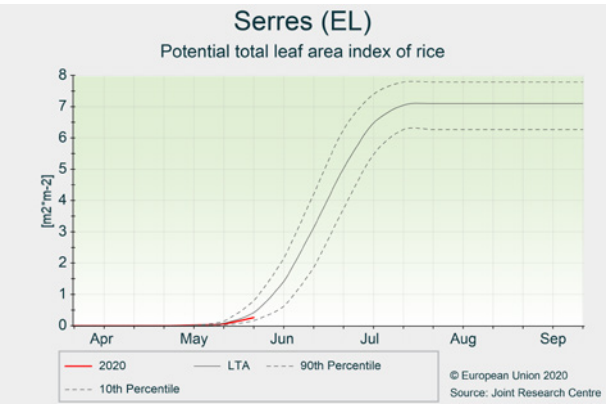


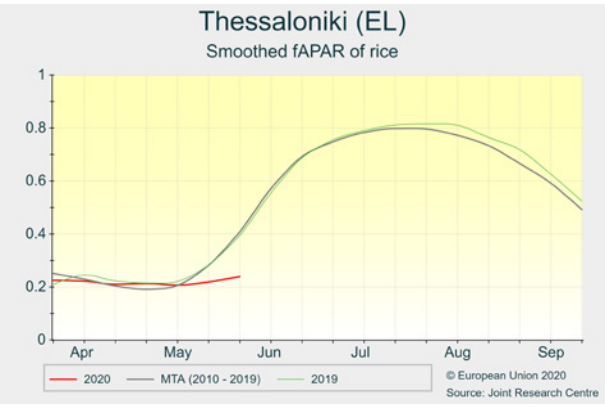


Greece

Slow start to the rice season

Rice sowing in the areas of *Thessaloniki* and *Serres* (covering more than 80 % of national production) occurred on time this year in mid April. However, subsequent plant germination and emergence were delayed by nearly 10 days because of lower-than-usual daily temperatures in the second half of April. In addition, damaging hailstorms occurred at the end of April in Central *Macedonia*. Our fAPAR profiles suggest below-average biomass accumulation in May and the beginning of June, which is confirmed by our crop model simulations, also depicting below-average values for leaf area development. Nevertheless, we have been observing an initial recovery in crop development since the last dekad of May, which if it continues could restore crop biomass to average or even above-average levels. At the end of the review period (10 June), rice is entering the tillering phase. Our yield forecast is currently set to below the 5-year average. However, taking into account the high productivity and the low inter-annual variability of paddy systems, overall expectations are still positive.

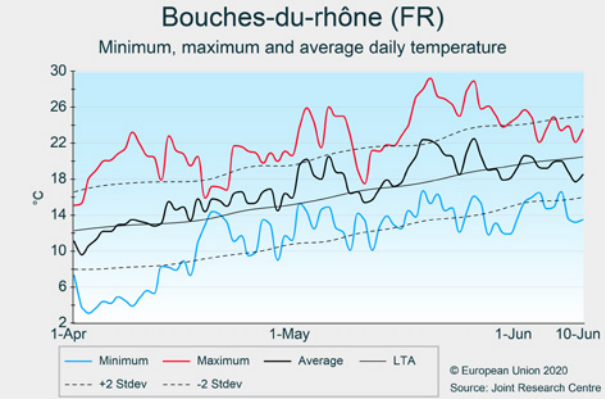


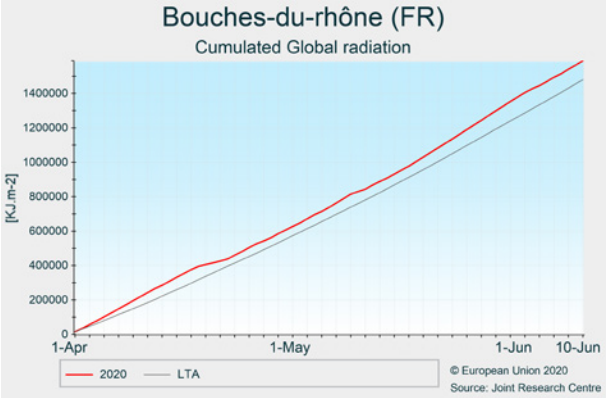


France

A beneficial start to the season

Temperatures have stayed above the LTA in the *Camargue* since the beginning of May. Daily average temperatures remained above 12 °C (minimum temperature for rice growth) during the usual sowing window for rice from 20 April to 15 May. For the sowing period as a whole, global radiation was above the average. Only the thunderstorms with intense rainfall recorded on 10 May interrupted farmers' sowing activities. Wind speed was not excessive throughout the sowing window. This information is of importance for rice sown in the *Camargue*, since strong winds can hamper homogeneous germination in fields with broadcast seeding, as reported during last year's rice season. After sowing, from mid May to June, temperatures remained largely above the average. Together with the positive radiation anomaly, this favoured the germination and initial growth of the rice crops. The end of the second dekad of May was particularly favourable, with temperatures staying largely above the average. The yield forecast is based on the trend, as most of the yield variability depends on temperatures and radiation during the coming months.

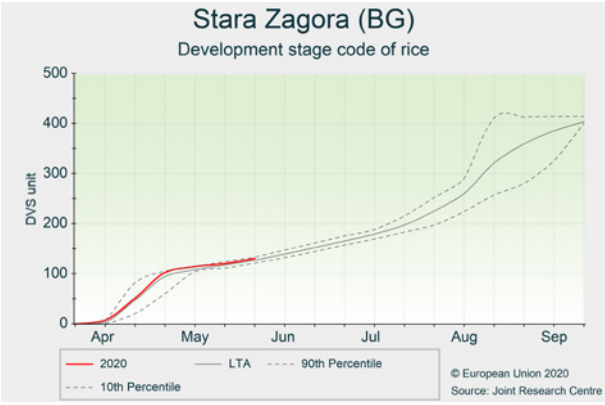


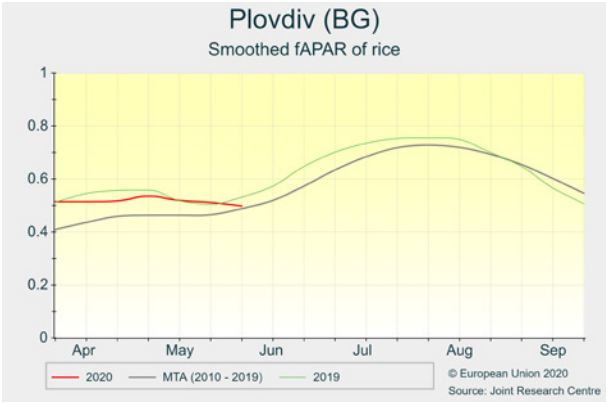


Bulgaria

A positive start to the season for rice

Below-average temperatures were registered in Bulgaria at the beginning of April (where *Plovdiv* and *Stara Zagora* are the main rice-producing regions), followed by mild weather conditions until mid May. Temperatures during the start of the season allowed a normal rice-sowing campaign during the second dekad of April and subsequent good progress in crop germination. Warm temperatures were beneficial for crop growth in the second dekad of May, before returning to average temperatures from the last dekad of May onwards. Rainfall has been fairly equally distributed during the review period, without requiring specific interventions by farmers or causing any abiotic stress to the crop. Our analysis of remote sensing-based indicators shows a general advancement in crop development of rice, and above-average biomass accumulation during the crop establishment phase. Crop model simulations confirm slightly advanced development at the beginning of May and above-average biomass production. At the end of the review period (10 June), rice is at the beginning of tillering. In line with the favourable growing conditions so far, our forecast is above the 5-year average.

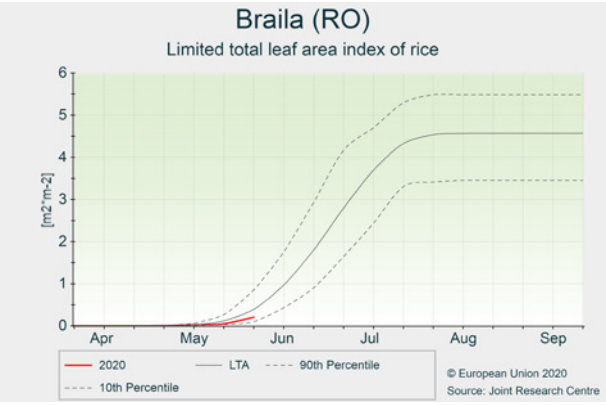


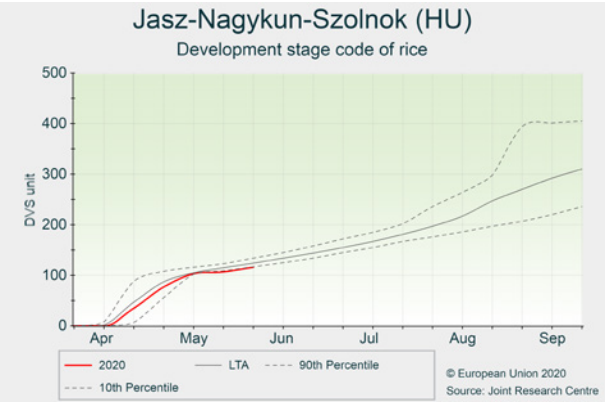


Romania and Hungary

Unfavourable weather conditions during crop establishment

The rice-sowing campaign for this year was timely, but emergence and early development were delayed due to the subsequent below-average temperatures. In the second half of April and first half of May, moderate rainfall allowed adequate progress with rice sowing in Hungary (*Jász-Nagykun-Szolnok*, *Békés* and *Csongrád*) and in the rice-producing south-eastern regions of Romania (*Olt*, *Braila* and *Ialomita*). However, lower-than-usual temperatures in the last dekad of April and last dekad of May were unfavourable for sprouting and early crop growth. In addition, high variability in daily temperatures characterised the entire review period (1 May-10 June), and mild night frosts may have occurred in Hungary around 13 May and in Romania around 22 April. After 20 May, precipitation increased in both countries while still remaining below average, together with low radiation levels prevailing in south-eastern Romania. Rice crop establishment appears to have been weak so far in Hungary and southern-central Romania. Our crop model simulations confirm this unfavourable situation, since crop development is considerably delayed and crop growth has so far been characterised by below-average leaf area and biomass accumulation. The main rice-producing regions in eastern Romania (*Sud-Est*) suffered less from unfavourable weather impacts; therefore, simulated indicators of crop growth and crop development are closer to, although still below, average. The result of our current analysis indicates yield expectations slightly below the long-term trend. However, rice growth and yield expectations could still recover if more favourable meteorological conditions dominate over the coming summer.





4.3. United Kingdom

United Kingdom

Dry conditions reduce outlook for winter and spring cereals

Soil moisture deficits were prevalent across the country, although some beneficial rain improved crop conditions in northern areas. Pest and disease levels are low. Yield forecasts have been revised downwards for winter and spring crops.

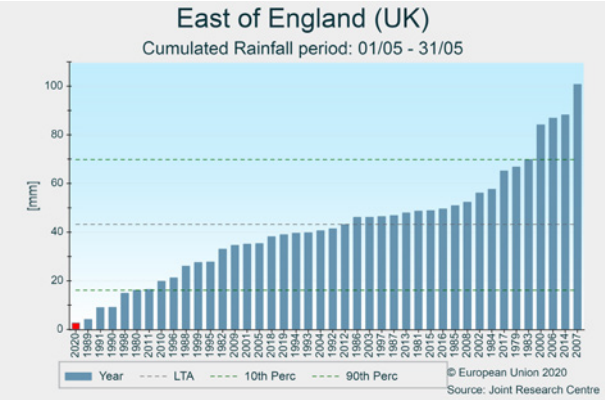
A colder-than-usual period characterised the first 2 weeks of May. Temperatures were above average for the second half of May and the beginning of June. Some cold nights were still registered in May. Radiation was markedly above average.

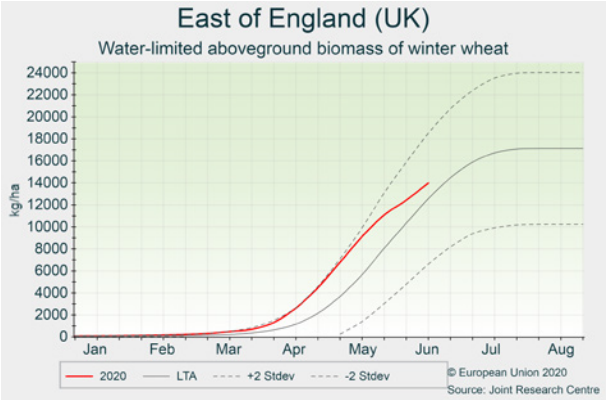
Rainfall continued to be below average, particularly in eastern regions with values 90 % below the LTA – the lowest recorded totals since 1979. In northern areas beneficial rainfall improved crop conditions, although rainfall was highly variable. Rainfall levels in northern areas of Scotland exceeded those in eastern and southern regions of Scotland.

Conditions continue to be particularly dry in the east and south of the country, with an increasingly negative impact on winter and spring crops. Winter cereals are approaching flowering in very variable conditions, with crops having lost tillers and ear numbers. According to our model simulations, biomass accumulation has started decreasing in the east and south. Spring cereals are generally in the tillering phase, although large field-to-field variability is observed in terms of growth stages. Late-drilled spring barley, which was sown in dry seedbeds, is currently the main concern, with an expected decrease in yield. In general, weed, pest and disease pressure remains low.

Rapeseed crops suffered from the lack of rainfall. After a challenging start to the season, with widespread damage from cabbage stem flea beetle, the remaining rapeseed crops are in poor to fair condition ([2]). Sugar beet is in variable condition. Many potato fields have been supplied with irrigation.

Yield forecasts for winter crops have been revised downwards due to continuing dry conditions in the east and south. Winter crop yield forecasts are now below the 5-year average. The outlook for spring barley has been slightly decreased to take the impact of the late drilling into account.





([2]) https://ahdb.org.uk/cereals-oilseeds/crop-development-report, accessed 9 June 2020.

4.4. Black Sea area

Ukraine

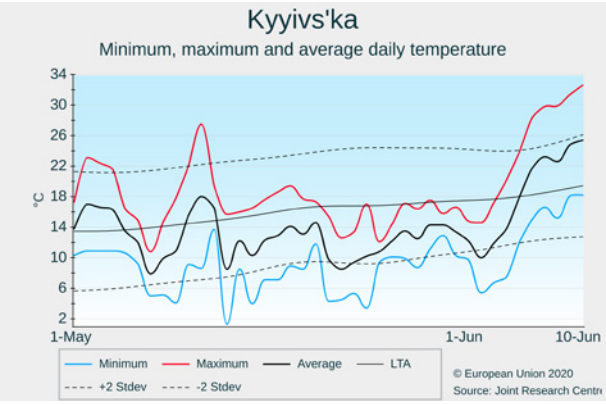
Substantial rain surplus provides promising outlook for summer crops

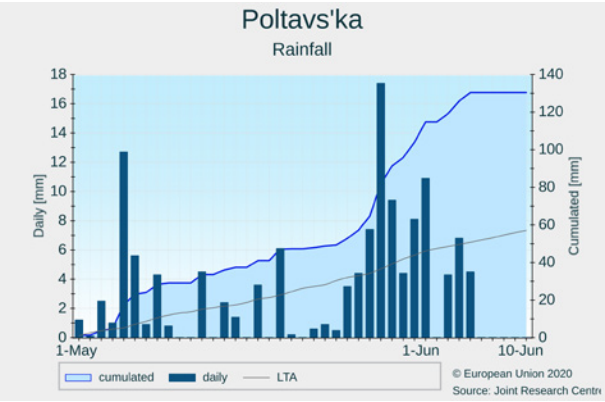
In most of the country, the exceptional rain surplus observed since the beginning of May replenished the soil moisture following a long dry period, thus relieving concerns about a looming widespread drought and a difficult start to the season for summer crops.

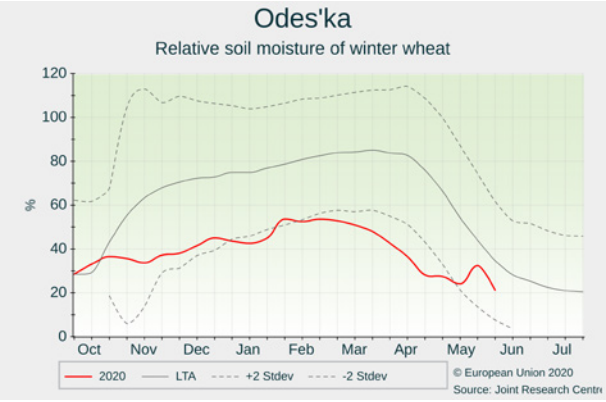
Since the beginning of May, a substantial rain surplus has been observed in most of Ukraine, which was particularly pronounced in central and northern regions. Meanwhile, temperatures remained relatively low for the season, contrasting with the warmer-than-usual meteorological conditions observed until April. A drought is still ongoing in *Odes'ka* and *Krym*; although *Odes'ka* received some rain, it was not sufficient to lift soil moisture contents above critical levels. In other parts of Ukraine, the rain surplus totally replenished soil moisture. The rainfall came on time in the south-eastern oblasts to avoid exposing plants to substantial water stress. Nonetheless, a substantial amount of rain was recorded during flowering of winter wheat, thus exposing it to fusarium head blight, which triggered a slight downward revision of the yield forecast.

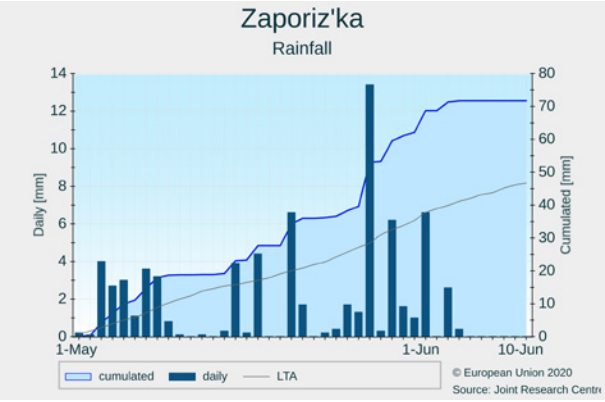
The yield forecast is below the trend for winter wheat as 33 % of the cultivated area was exposed to a long rain deficit. Winter barley suffered from the drought in *Odes'ka* and to a lower degree in *Mykolayivs'ka*, which together are responsible for 52 % of the area cultivated with winter barley. Spring barley is forecast above last year's level, as only 24 % of the spring barley area occurs in the oblasts that were exposed to the long rain deficit.

While the sowing campaign for summer crops started earlier than usual, particularly in the south, some rain was needed to ensure emergence, which finally came at the beginning of May. Moreover, the low temperatures have been delaying the development of most summer crops. Lastly, the large rain surplus observed in the north delayed a small proportion of summer crop sowing campaigns, as farmers were not able to access the fields. Nonetheless, the sowing campaign is coming to an end and, considering the rain surplus, the start to the season has been promising. Yield forecasts are currently maintained in line with the historical trend.









Turkey

Flowering of winter crops threatened by a heatwave

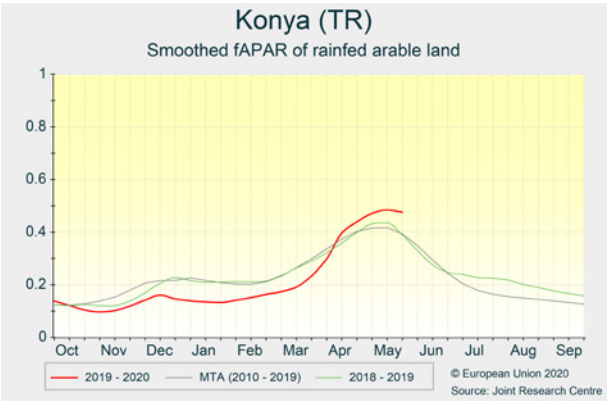
Yield forecasts for wheat and barley remain slightly above last year's and the 5-year average. The season is proceeding favourably but an anomalous heatwave casts concern over flower fertility of winter crops. Summer crops are in their initial stages and yield forecasts are based on trend analysis.

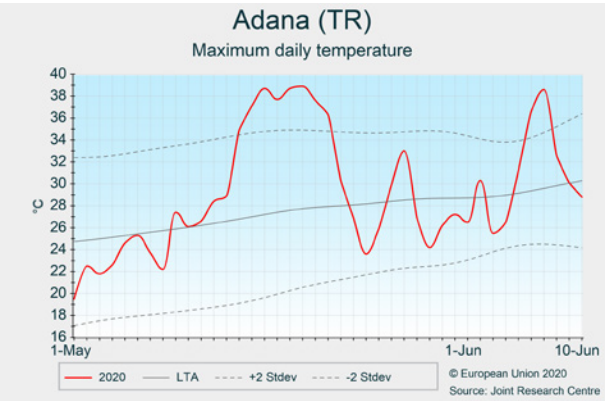
In western Anatolian regions, the beginning of May was wet and slightly colder than usual. From 10 May, a dry spell occurred and temperatures sharply increased, with maximum temperatures that remained around 30 °C for 5 to 6 days. This resulted in favourable biomass accumulation for winter crops, but the concurrence of the heat with the beginning of flowering in *Ankara* and *Konya* is concerning; the latter is the most important growing region in the country. In *Kirikkale* and *Kayseri*, the heatwave was less pronounced than in western Anatolia and allowed the delayed winter crops to progress to almost seasonal stages, just before flowering.

In Aegean regions (e.g. *Adana*), the weather was similar to that described for Anatolian regions, but here the heatwave had a stronger intensity with maximum temperatures above 35 °C, boosting growth of maize, which is now well advanced compared to last year.

Even in south-eastern regions (e.g. *Gaziantep*, *Sanliurfa* and *Mardin*), a wetter and colder-than-usual May was interrupted by a heatwave between 15 and 22 May, with maximum temperatures slightly below 35 °C. The heatwave's impact on grain filling was somewhat counterbalanced by the wet conditions before and after it, and grain filling is proceeding at a normal pace, especially in eastern regions (e.g. *Mardin*). The outlook for the region is very positive.

At national level, yield forecasts are very favourable for winter crops but somewhat tempered by the impact of the heatwave, which is difficult to quantify. It is the very beginning of the season for summer crops but overall conditions are favourable.





4.5. European Russia and Belarus

European Russia

Substantial rains improved yield outlook for winter wheat

Frequent and abundant rainfall relieved concerns for winter wheat. Winter and spring crops are generally in good shape, but the predominantly colder-than-usual temperatures were unfavourable for development and growth of grain maize and other thermophile summer crops.

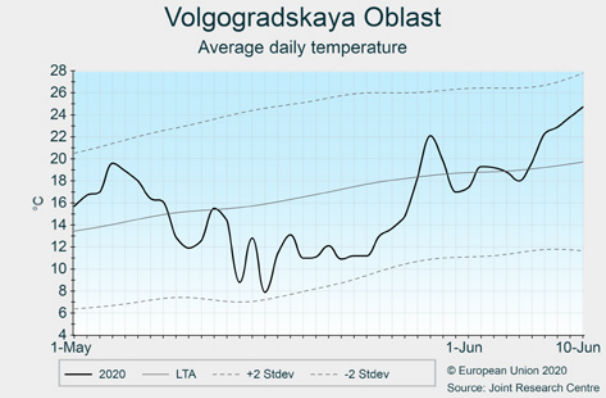
Thermal conditions fluctuated strongly, with a predominance of substantially (2-6 °C) warmer-than-usual temperatures in the first dekad of May and 1-4 °C colder-than-usual temperatures in the second and third dekad of May. In June, temperatures increased again, reaching well above-average levels at the end of the first dekad.

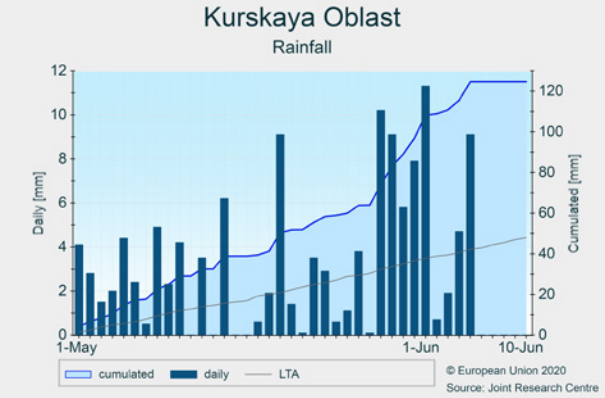
Rainfall was significantly (50-320 %) above the LTA in most regions, except the agricultural areas north of the Caucasus and along the Ural mountains. Cumulative precipitation reached up to 200 mm and was particularly abundant – locally excessive – in the Central Okrug during late May and early June.

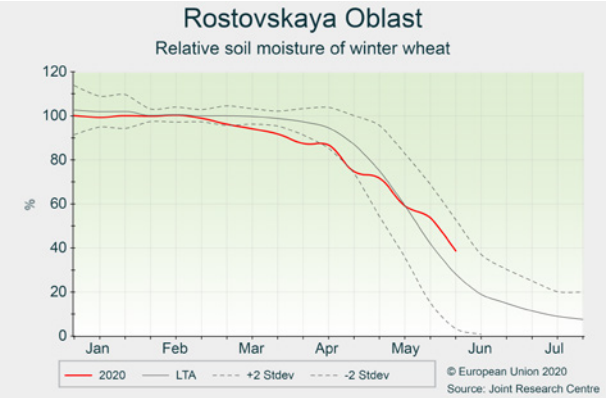
Spring sowing progressed adequately. The periods of abundant rainfall arrived when the campaign was almost completed but may have caused some delays in the northern areas of the Volga Okrug and in western parts of the North-western Okrug.

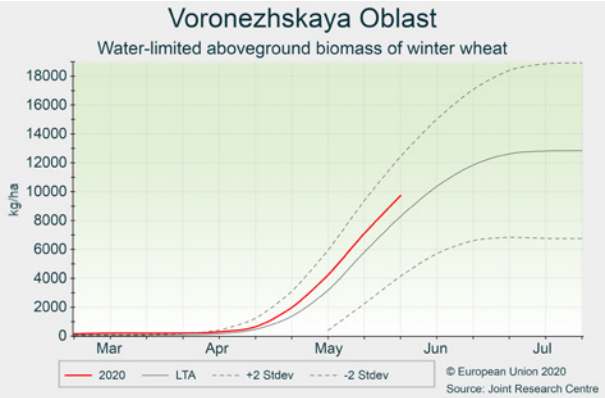
The phenological development of winter cereals slowed due to the colder-than-seasonal weather, favourably extending the flowering and early grain-filling periods. However, the below-average temperatures adversely affected the growth and development of grain maize and other thermophile summer crops, mainly in the Southern and Central Okrugs. Soil moisture contents under winter crops improved considerably, due to the beneficial rains and reduced crop water demand during the colder weather conditions. Biomass accumulation for winter wheat is positive in most of the main crop-producing southern and western regions, but it is below average in *Krasnodarskiy* and *Stavropolskiy* krays, as well as in some southern areas near Kazakhstan. Satellite-based indicators also suggest considerable yield potential for winter wheat. However, overly wet conditions may lead to increased pest pressure and a decrease in grain quality.

Spring cereals also made a promising start. Water supply is adequate. Early development is seasonal or slightly behind.









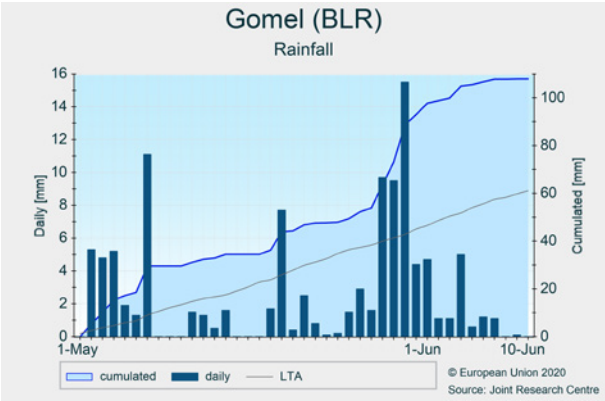
Belarus

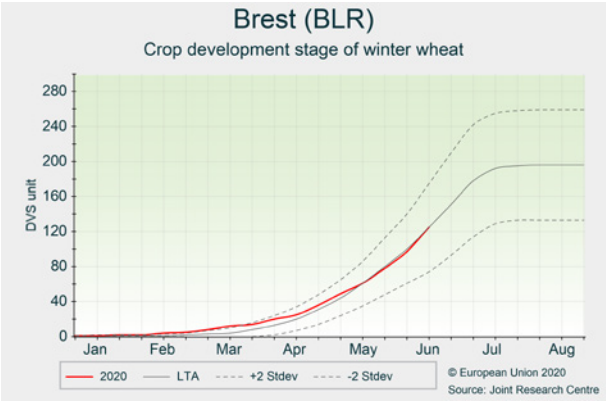
Positive outlook

Abundant rainfall alleviated poor soil water conditions after a dry April.

The analysis period was colder than usual, with daily temperatures 2-4 °C below the LTA. Cumulative precipitation was above the LTA in most of the country, especially in the regions of *Grodno*, *Brest*, *Gomel* and *Mogilev* (> 30 % of LTA).

Abundant precipitation during May significantly improved soil water conditions for crops. Due to lower temperatures, the development of winter grains slowed. Winter grains are entering flowering stage, while spring grains are starting the tillering stage. The development and biomass accumulation of grain maize is delayed due to the colder-than-usual conditions. The previous positive yield outlook is maintained.





4.6. Maghreb

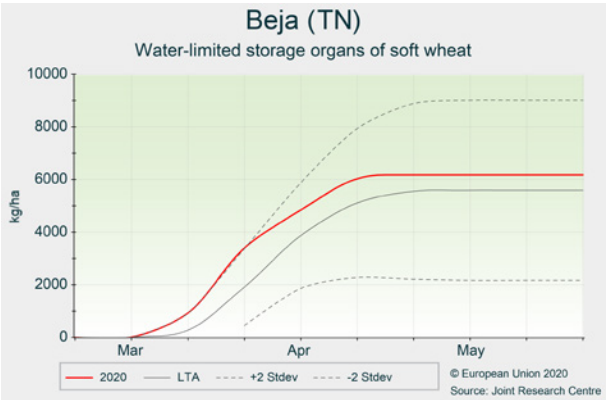
Morocco, Algeria and Tunisia

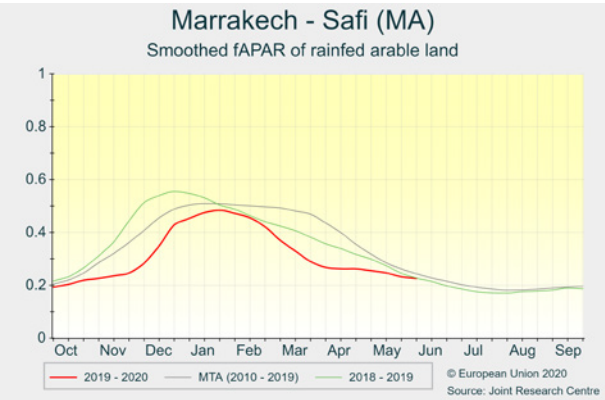
Unfavourable campaign marked by drought

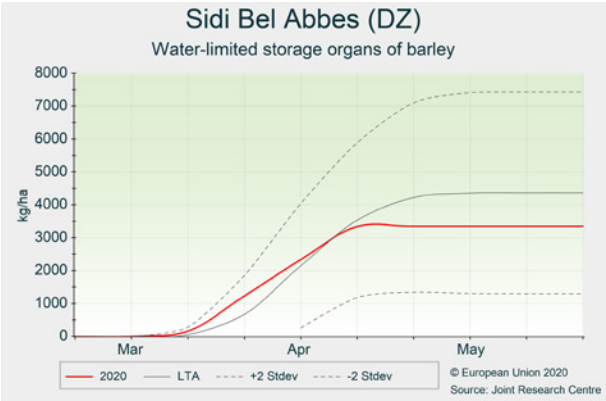
The harvest of a growing season marked by drought is finishing in the Maghreb. Outlook for barley is negative throughout the region. In Morocco, barley and wheat forecasts are nearly 20 % below average expectations. Average or just above-average wheat yields are forecast in Algeria and Tunisia.

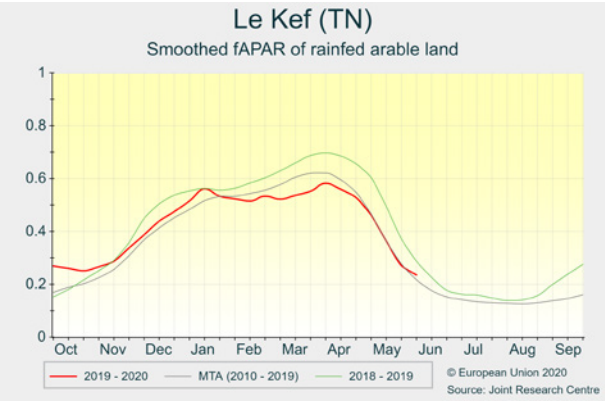
Conditions were warmer than usual in the Maghreb, with temperature sums 10-20 % above the average, and mean daily values exceeding the LTA by 2-4 °C. Rainfall events were unevenly distributed. Precipitation was scarce in central and eastern Maghreb and cumulates were only up to 50-60 % of the LTA. By contrast, precipitation totals in western Maghreb were exceptionally high: 40-50 % above the average.

The winter crop campaign has concluded in **Morocco** and the outlook for cereals remains negative for both wheat and barley. Seasonal drought and high temperature profiles were the main abiotic stressors for cereals, especially during February and March. The harvest is expected to be below last year's – which was already low – and among the worst for the last 10 years. Harvest is almost completed in **Algeria**. Barley has suffered more than wheat from the seasonal drought. This is because 65 % of barley production originates from the drought-affected north-western wilayas. In addition, the crop calendar for barley is advanced with respect to wheat, and sensitive growing stages suffered more from the drought. For wheat, the positive outlook expected for north-eastern wilayas is partly compensating for the negative expectations for north-western regions. **Tunisia** has a similar outlook and the harvest is ongoing. Yield expectations are estimated to be moderately above the 5-year average for durum and soft wheat while barley, which is predominantly cultivated in northern inland regions, has suffered from the drought in mid January and February and from heatwaves that occurred locally in June.



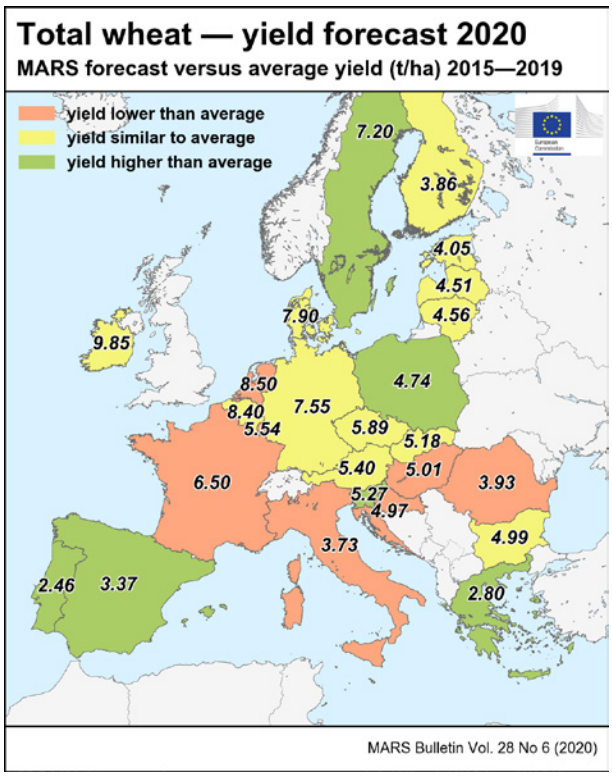




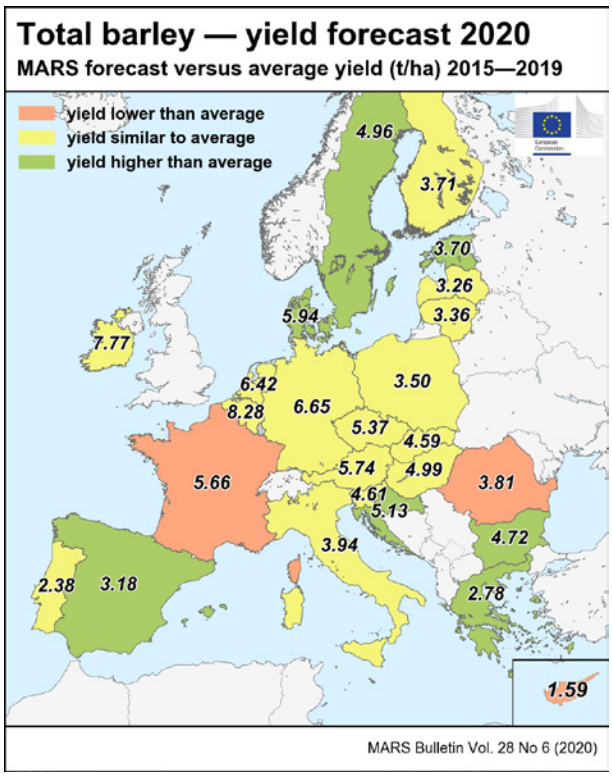


5. Crop yield forecast

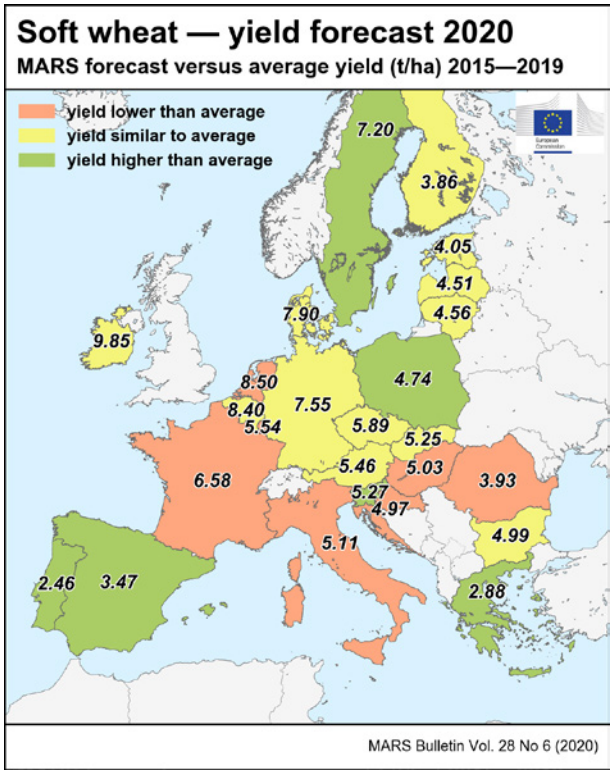
Country	Total wheat (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	5.54	5.77	**5.39**	– 2.6	– 6.6
AT	5.45	5.77	**5.40**	– 1.0	– 6.5
BE	8.47	9.23	**8.40**	– 0.8	– 9.0
BG	4.93	5.14	**4.99**	+ 1.3	– 2.9
CY	—	—	**—**	—	—
CZ	5.93	5.73	**5.89**	– 0.7	+ 2.8
DE	7.52	7.42	**7.55**	+ 0.4	+ 1.8
DK	7.66	8.19	**7.90**	+ 3.2	– 3.5
EE	3.97	5.07	**4.05**	+ 2.0	– 20
ES	2.62	2.65	**2.80**	+ 6.8	+ 5.6
FI	3.14	3.04	**3.37**	+ 7.2	+ 11
FR	3.91	4.56	**3.86**	– 1.3	– 15
EL	6.99	7.84	**6.50**	– 7.1	– 17
HR	5.54	5.53	**4.97**	– 10	– 10
HU	5.27	5.28	**5.01**	– 5.0	– 5.1
IE	9.84	9.99	**9.85**	+ 0.1	– 1.4
IT	3.94	3.75	**3.73**	– 5.5	– 0.7
LT	4.48	4.29	**4.56**	+ 1.6	+ 6.2
LU	5.78	6.01	**5.54**	– 4.0	– 7.8
LV	4.49	4.81	**4.51**	+ 0.3	– 6.4
MT	—	—	**—**	—	—
NL	8.90	9.44	**8.50**	– 4.5	– 9.9
PL	4.49	4.39	**4.74**	+ 5.6	+ 8.0
PT	2.19	2.23	**2.46**	+ 12	+ 10
RO	4.44	4.80	**3.93**	– 11	– 18
SE	6.55	7.40	**7.20**	+ 10	– 2.7
SI	4.99	5.23	**5.27**	+ 5.5	+ 0.8
SK	5.15	4.81	**5.18**	+ 0.6	+ 7.8
UK	8.34	8.94	**7.91**	– 5.2	– 11



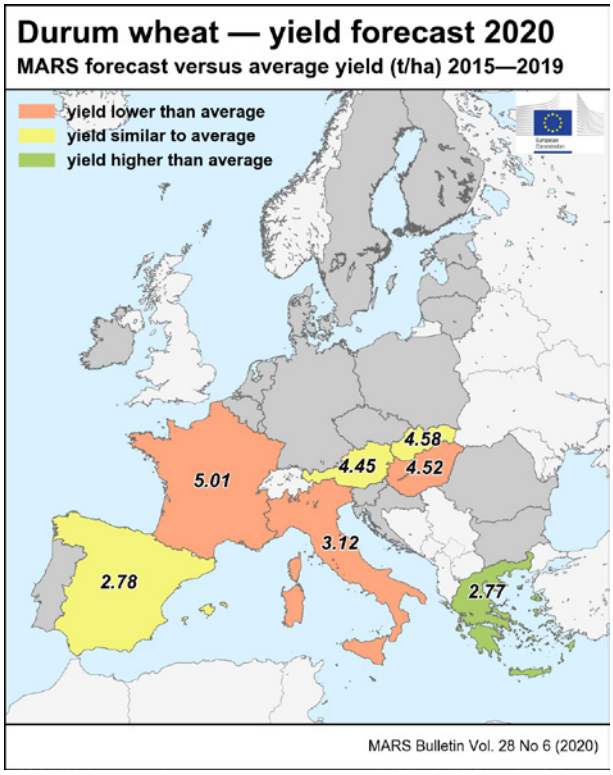
Country	Total barley (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	4.78	4.99	**4.71**	– 1.4	– 5.7
AT	5.67	6.07	**5.74**	+ 1.3	– 5.5
BE	8.06	8.56	**8.28**	+ 2.7	– 3.3
BG	4.40	4.90	**4.72**	+ 7.2	– 3.7
CY	1.67	2.70	**1.59**	– 4.9	– 41
CZ	5.33	5.38	**5.37**	+ 0.7	– 0.1
DE	6.66	6.78	**6.65**	– 0.1	– 1.9
DK	5.60	6.29	**5.94**	+ 6.0	– 5.5
EE	3.45	4.09	**3.70**	+ 7.4	– 9.5
ES	2.60	2.71	**2.78**	+ 6.8	+ 2.8
FI	2.93	2.76	**3.18**	+ 8.5	+ 16
FR	3.72	4.23	**3.71**	– 0.3	– 12
EL	6.45	7.08	**5.66**	– 12	– 20
HR	4.79	5.18	**5.13**	+ 7.1	– 1.1
HU	5.07	5.54	**4.99**	– 1.5	– 9.9
IE	8.01	8.66	**7.77**	– 2.9	– 10
IT	4.00	4.05	**3.94**	– 1.4	– 2.7
LT	3.36	3.37	**3.36**	+ 0.1	– 0.1
LU	—	—	**—**	—	—
LV	3.19	3.43	**3.26**	+ 2.4	– 4.8
MT	—	—	**—**	—	—
NL	6.44	6.51	**6.42**	– 0.2	– 1.3
PL	3.56	3.46	**3.50**	– 1.7	+ 1.0
PT	2.39	2.64	**2.38**	– 0.4	– 10
RO	4.04	4.44	**3.81**	– 5.7	– 14
SE	4.68	5.31	**4.96**	+ 5.9	– 6.6
SI	4.65	4.85	**4.61**	– 0.8	– 4.9
SK	4.66	4.81	**4.59**	– 1.7	– 4.6
UK	6.27	6.92	**6.03**	– 3.8	– 13



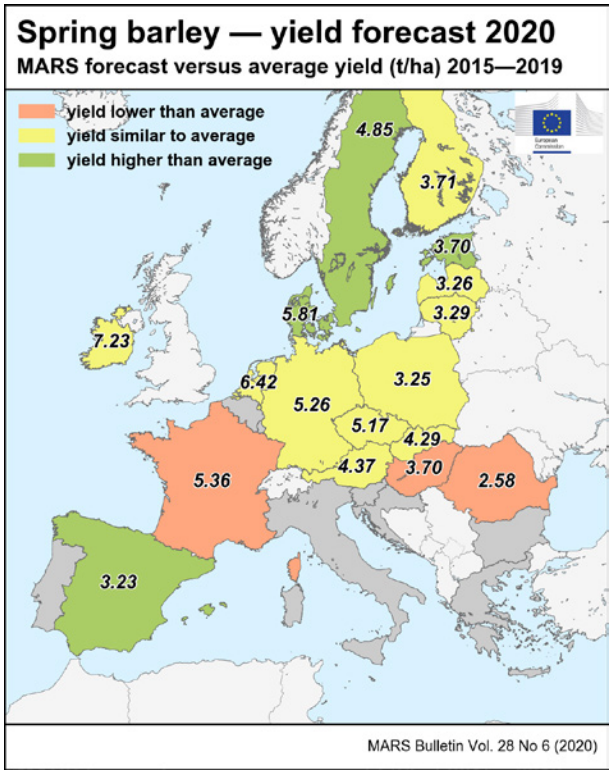
Country	Soft wheat (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	5.77	6.00	**5.60**	– 2.8	– 6.6
AT	5.52	5.83	**5.46**	– 1.0	– 6.4
BE	8.47	9.23	**8.40**	– 0.8	– 9.0
BG	4.93	5.14	**4.99**	+ 1.3	– 2.9
CY	—	—	—	—	—
CZ	5.93	5.73	**5.89**	– 0.7	+ 2.8
DE	7.52	7.42	**7.55**	+ 0.4	+ 1.8
DK	7.66	8.19	**7.90**	+ 3.2	– 3.5
EE	3.97	5.07	**4.05**	+ 2.0	– 20
EL	2.70	2.77	**2.88**	+ 6.6	+ 4.0
ES	3.23	3.09	**3.47**	+ 7.4	+ 12
FI	3.91	4.56	**3.86**	– 1.3	– 15
FR	7.11	7.92	**6.58**	– 7.5	– 17
HR	5.54	5.53	**4.97**	– 10	– 10
HU	5.29	5.32	**5.03**	– 5.0	– 5.4
IE	9.84	9.99	**9.85**	+ 0.1	– 1.4
IT	5.41	5.14	**5.11**	– 5.6	– 0.6
LT	4.48	4.29	**4.56**	+ 1.6	+ 6.2
LU	5.78	6.01	**5.54**	– 4.0	– 7.8
LV	4.49	4.81	**4.51**	+ 0.3	– 6.4
MT	—	—	—	—	—
NL	8.90	9.44	**8.50**	– 4.5	– 9.9
PL	4.49	4.39	**4.74**	+ 5.6	+ 8.0
PT	2.19	2.23	**2.46**	+ 12	+ 10
RO	4.44	4.80	**3.93**	– 11	– 18
SE	6.55	7.40	**7.20**	+ 10	– 2.7
SI	4.99	5.23	**5.27**	+ 5.5	+ 0.8
SK	5.22	4.87	**5.25**	+ 0.7	+ 7.9
UK	8.34	8.94	**7.91**	– 5.2	– 11



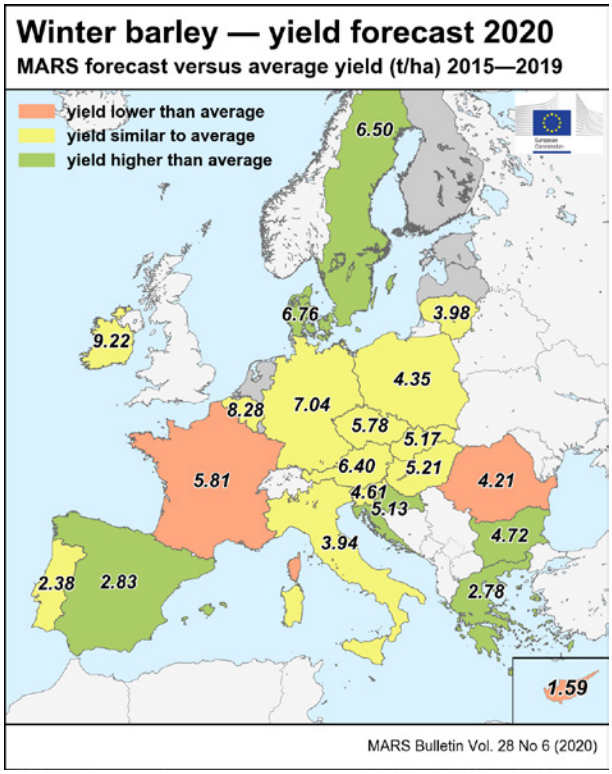
Country	Durum wheat (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	3.47	3.45	**3.31**	– 4.6	– 4.0
AT	4.58	4.83	**4.45**	– 2.9	– 7.8
BE	—	—	—	—	—
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	—	—	—	—	—
DE	—	—	—	—	—
DK	—	—	—	—	—
EE	—	—	—	—	—
ES	2.59	2.61	**2.77**	+ 7.0	+ 6.2
FI	2.73	2.76	**2.78**	+ 1.9	+ 0.7
FR	—	—	—	—	—
EL	5.29	6.28	**5.01**	– 5.3	– 20
HR	—	—	—	—	—
HU	4.71	4.34	**4.52**	– 4.1	+ 4.1
IE	—	—	—	—	—
IT	3.34	3.15	**3.12**	– 6.6	– 0.9
LT	—	—	—	—	—
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	—	—	—	—	—
PT	—	—	—	—	—
RO	—	—	—	—	—
SE	—	—	—	—	—
SI	—	—	—	—	—
SK	4.53	4.29	**4.58**	+ 0.9	+ 6.7
UK	—	—	—	—	—



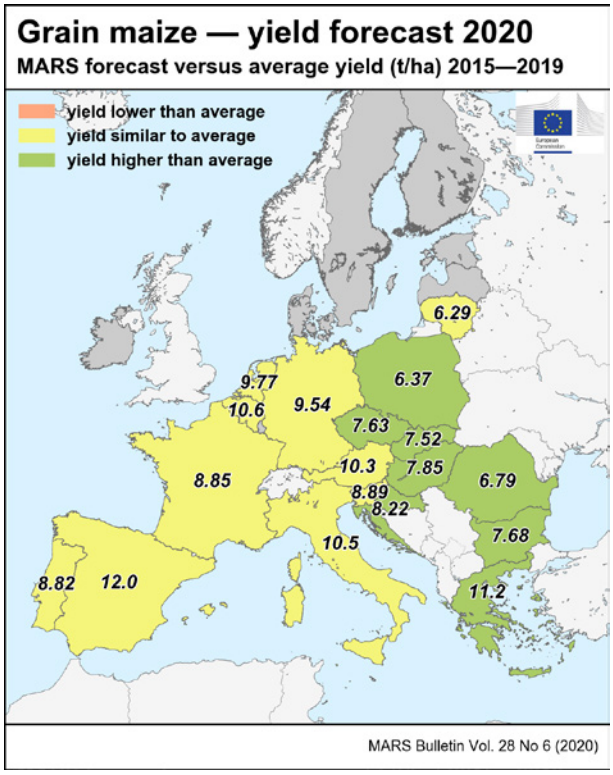
Country	Spring barley (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	4.02	4.13	**4.07**	+ 1.2	– 1.4
AT	4.44	4.17	**4.37**	– 1.5	+ 4.8
BE	—	—	**—**	—	—
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	5.18	5.07	**5.17**	– 0.2	+ 1.9
DE	5.21	5.12	**5.26**	+ 0.8	+ 2.6
DK	5.44	6.14	**5.81**	+ 6.7	– 5.4
EE	3.45	4.09	**3.70**	+ 7.4	– 9.5
EL	—	—	**—**	—	—
ES	3.01	2.80	**3.23**	+ 7.1	+ 15
FI	3.72	4.23	**3.71**	– 0.3	– 12
FR	6.22	7.04	**5.36**	– 14	– 24
HR	—	—	**—**	—	—
HU	3.96	4.56	**3.70**	– 6.6	– 19
IE	7.27	8.00	**7.23**	– 0.5	– 9.6
IT	—	—	**—**	—	—
LT	3.34	3.29	**3.29**	– 1.4	– 0.2
LU	—	—	**—**	—	—
LV	3.19	3.43	**3.26**	+ 2.4	– 4.8
MT	—	—	**—**	—	—
NL	6.44	6.51	**6.42**	– 0.2	– 1.3
PL	3.37	3.21	**3.25**	– 3.6	+ 1.3
PT	—	—	**—**	—	—
RO	2.73	2.81	**2.58**	– 5.4	– 8.2
SE	4.61	5.19	**4.85**	+ 5.2	– 6.6
SI	—	—	**—**	—	—
SK	4.45	4.57	**4.29**	– 3.5	– 6.2
UK	5.74	6.34	**5.66**	– 1.3	– 11



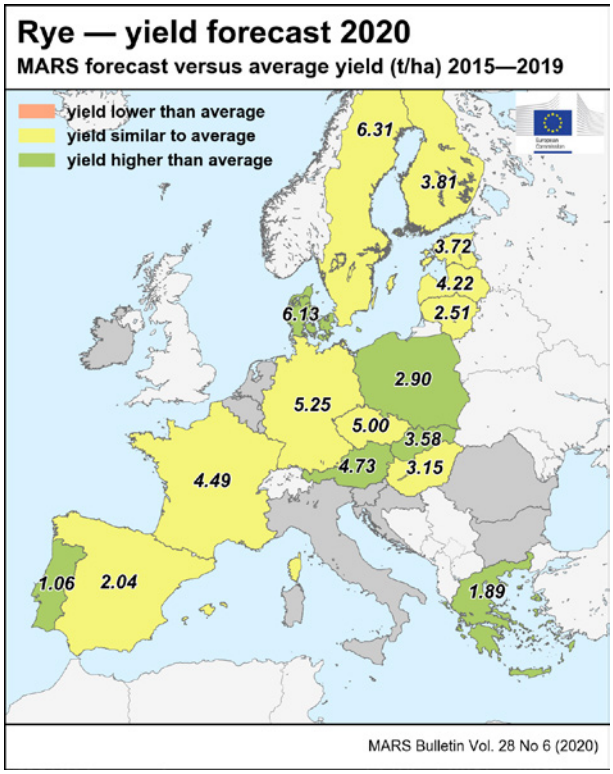
Country	Winter barley (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	5.75	6.11	**5.58**	– 2.8	– 8.6
AT	6.34	6.74	**6.40**	+ 0.9	– 5.0
BE	8.06	8.56	**8.28**	+ 2.7	– 3.3
BG	4.40	4.90	**4.72**	+ 7.2	– 3.7
CY	1.67	2.70	**1.59**	– 4.9	– 41
CZ	5.68	5.98	**5.78**	+ 1.7	– 3.4
DE	7.09	7.22	**7.04**	– 0.7	– 2.5
DK	6.47	7.03	**6.76**	+ 4.5	– 3.8
EE	—	—	**—**	—	—
EL	2.60	2.71	**2.78**	+ 6.8	+ 2.8
ES	2.41	2.31	**2.83**	+ 18	+ 23
FI	—	—	**—**	—	—
FR	6.54	7.09	**5.81**	– 11	– 18
HR	4.79	5.18	**5.13**	+ 7.1	– 1.1
HU	5.28	5.65	**5.21**	– 1.4	– 7.8
IE	9.25	9.42	**9.22**	– 0.3	– 2.1
IT	4.00	4.05	**3.94**	– 1.4	– 2.7
LT	3.90	3.89	**3.98**	+ 2.0	+ 2.3
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	4.26	4.31	**4.35**	+ 2.3	+ 1.1
PT	2.39	2.64	**2.38**	– 0.4	– 10
RO	4.48	4.91	**4.21**	– 5.9	– 14
SE	5.91	6.85	**6.50**	+ 10	– 5.1
SI	4.65	4.85	**4.61**	– 0.8	– 4.9
SK	5.21	5.29	**5.17**	– 0.7	– 2.4
UK	7.16	7.84	**6.80**	– 5.1	– 13



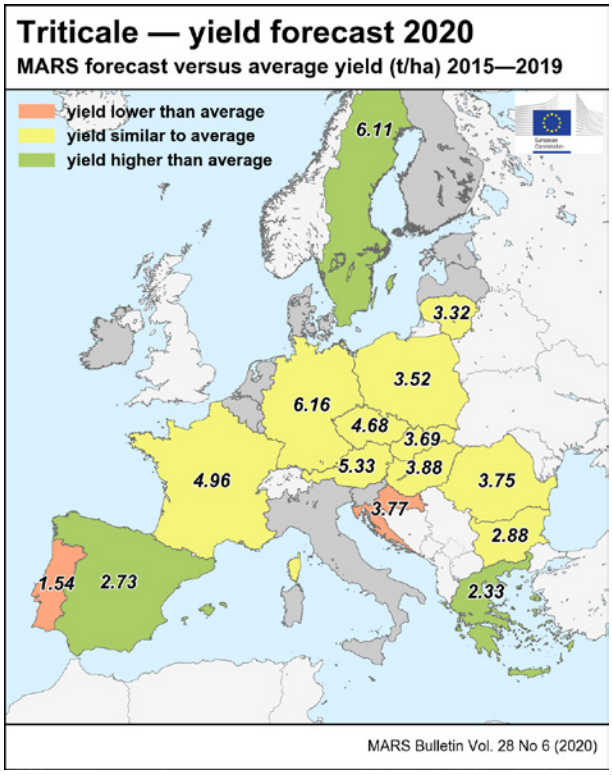
Country	Grain maize (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	7.58	7.90	**8.20**	+ 8.2	+ 3.8
AT	10.1	10.4	**10.3**	+ 2.0	– 1.3
BE	10.4	10.5	**10.6**	+ 1.6	+ 1.5
BG	6.44	6.96	**7.68**	+ 19	+ 10
CY	—	—	—	—	—
CZ	7.30	8.29	**7.63**	+ 4.5	– 8.0
DE	9.21	8.81	**9.54**	+ 3.6	+ 8.3
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	10.3	10.6	**11.2**	+ 8.4	+ 5.2
ES	11.6	11.8	**12.0**	+ 3.9	+ 1.9
FI	—	—	—	—	—
FR	8.85	8.58	**8.85**	+ 0.0	+ 3.1
HR	7.87	9.01	**8.22**	+ 4.5	– 8.8
HU	7.50	8.05	**7.85**	+ 4.6	– 2.5
IE	—	—	—	—	—
IT	10.2	10.0	**10.5**	+ 3.0	+ 4.5
LT	6.39	7.67	**6.29**	– 1.6	– 18
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	9.78	9.75	**9.77**	– 0.1	+ 0.2
PL	6.09	5.61	**6.37**	+ 4.7	+ 14
PT	8.52	8.98	**8.82**	+ 3.5	– 1.9
RO	5.52	6.52	**6.79**	+ 23	+ 4.1
SE	—	—	—	—	—
SI	8.85	9.27	**8.89**	+ 0.4	– 4.1
SK	6.94	7.39	**7.52**	+ 8.4	+ 1.8
UK	—	—	—	—	—



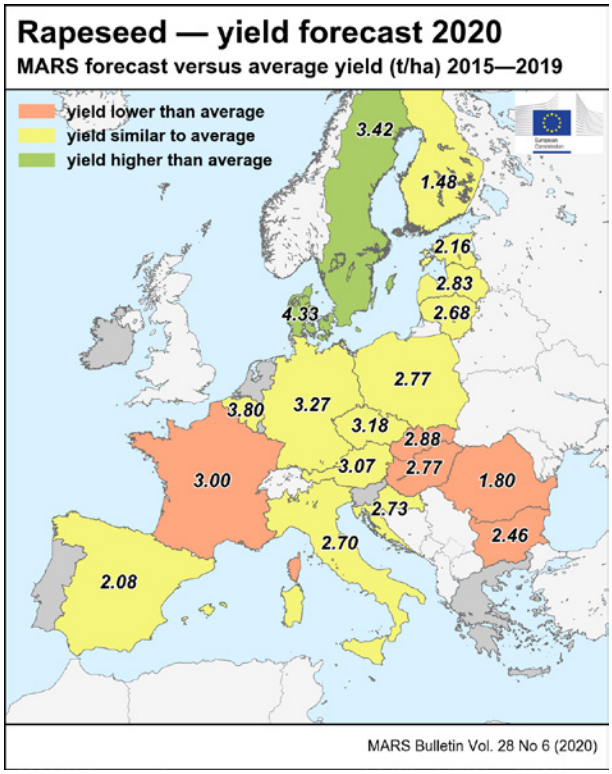
Country	Rye (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	3.75	3.87	**3.91**	+ 4.3	+ 1.0
AT	4.43	4.60	**4.73**	+ 6.8	+ 2.9
BE	—	—	—	—	—
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	4.93	5.06	**5.00**	+ 1.4	– 1.3
DE	5.12	5.24	**5.25**	+ 2.5	+ 0.2
DK	5.89	6.10	**6.13**	+ 4.2	+ 0.6
EE	3.61	4.12	**3.72**	+ 3.1	– 9.6
EL	1.72	1.86	**1.89**	+ 9.7	+ 1.4
ES	2.10	1.82	**2.04**	– 2.8	+ 13
FI	3.79	4.82	**3.81**	+ 0.7	– 21
FR	4.52	4.77	**4.49**	– 0.7	– 5.9
HR	—	—	—	—	—
HU	3.14	3.37	**3.15**	+ 0.5	– 6.4
IE	—	—	—	—	—
IT	—	—	—	—	—
LT	2.51	2.63	**2.51**	+ 0.0	– 4.5
LU	—	—	—	—	—
LV	4.14	4.43	**4.22**	+ 1.9	– 4.6
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	2.77	2.72	**2.90**	+ 4.8	+ 6.6
PT	0.95	1.06	**1.06**	+ 11	– 0.3
RO	—	—	—	—	—
SE	6.17	6.76	**6.31**	+ 2.1	– 6.7
SI	—	—	—	—	—
SK	3.44	3.44	**3.58**	+ 4.1	+ 4.0
UK	2.22	2.38	**2.26**	+ 1.6	– 5.3



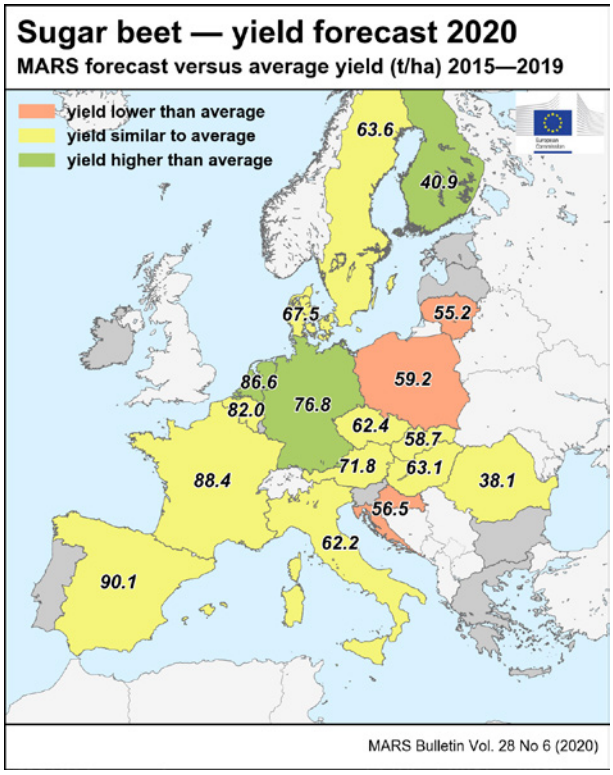
Country	Triticale (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	4.04	4.06	**4.06**	+ 0.5	+ 0.0
AT	5.36	5.49	**5.33**	– 0.6	– 2.9
BE	—	—	**—**	—	—
BG	2.96	2.84	**2.88**	– 2.5	+ 1.6
CY	—	—	**—**	—	—
CZ	4.79	4.93	**4.68**	– 2.4	– 5.0
DE	6.01	6.13	**6.16**	+ 2.4	+ 0.5
DK	—	—	**—**	—	—
EE	—	—	**—**	—	—
EL	2.11	2.24	**2.33**	+ 10	+ 3.7
ES	2.35	2.32	**2.73**	+ 16	+ 17
FI	—	—	**—**	—	—
FR	5.04	5.44	**4.96**	– 1.6	– 8.9
HR	3.93	3.98	**3.77**	– 4.1	– 5.1
HU	3.96	3.95	**3.88**	– 2.1	– 1.9
IE	—	—	**—**	—	—
IT	—	—	**—**	—	—
LT	3.36	3.29	**3.32**	– 1.0	+ 1.0
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	3.55	3.49	**3.52**	– 1.0	+ 0.8
PT	1.67	1.47	**1.54**	– 7.9	+ 5.2
RO	3.90	4.12	**3.75**	– 3.8	– 8.9
SE	5.58	6.36	**6.11**	+ 9.6	– 3.9
SI	—	—	**—**	—	—
SK	3.63	3.53	**3.69**	+ 1.5	+ 4.6
UK	4.33	4.48	**4.25**	– 1.8	– 5.2



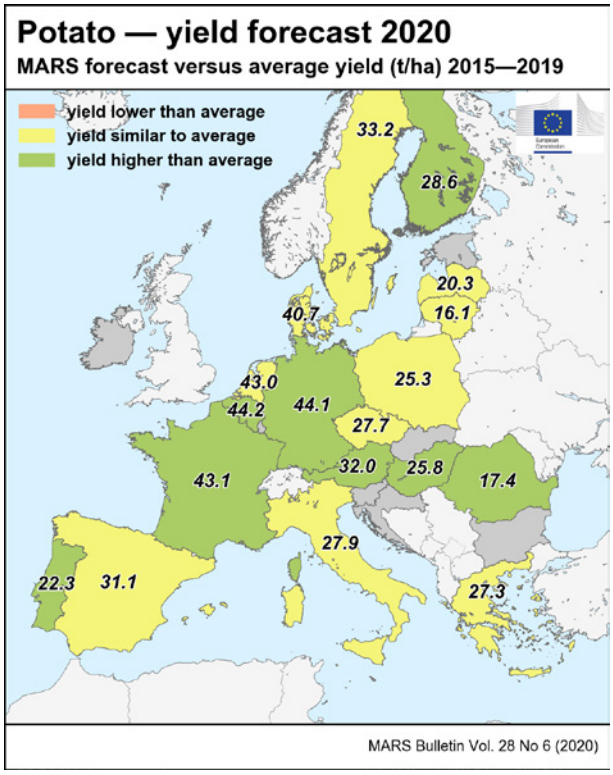
Country	Rape and turnip rape (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	3.08	2.96	**2.90**	– 5.9	– 2.0
AT	3.08	2.98	**3.07**	– 0.3	+ 3.1
BE	3.87	3.52	**3.80**	– 1.7	+ 7.9
BG	2.73	2.67	**2.46**	– 9.9	– 7.7
CY	—	—	**—**	—	—
CZ	3.26	3.05	**3.18**	– 2.3	+ 4.4
DE	3.39	3.30	**3.27**	– 3.5	– 0.9
DK	3.92	4.40	**4.33**	+ 11	– 1.7
EE	2.14	2.64	**2.16**	+ 1.0	– 18
EL	—	—	**—**	—	—
ES	2.10	2.13	**2.08**	– 1.2	– 2.5
FI	1.49	1.33	**1.48**	– 0.7	+ 12
FR	3.33	3.13	**3.00**	– 10	– 4.1
HR	2.78	2.50	**2.73**	– 1.9	+ 9.2
HU	3.08	2.97	**2.77**	– 10	– 6.8
IE	—	—	**—**	—	—
IT	2.60	2.66	**2.70**	+ 3.9	+ 1.8
LT	2.73	2.85	**2.68**	– 1.7	– 6.0
LU	—	—	**—**	—	—
LV	2.75	2.93	**2.83**	+ 3.0	– 3.4
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	2.77	2.73	**2.77**	– 0.1	+ 1.3
PT	—	—	**—**	—	—
RO	2.57	2.04	**1.80**	– 30	– 12
SE	3.18	3.62	**3.42**	+ 7.7	– 5.5
SI	—	—	**—**	—	—
SK	3.02	2.84	**2.88**	– 4.4	+ 1.5
UK	3.55	3.31	**3.33**	– 6.4	+ 0.6



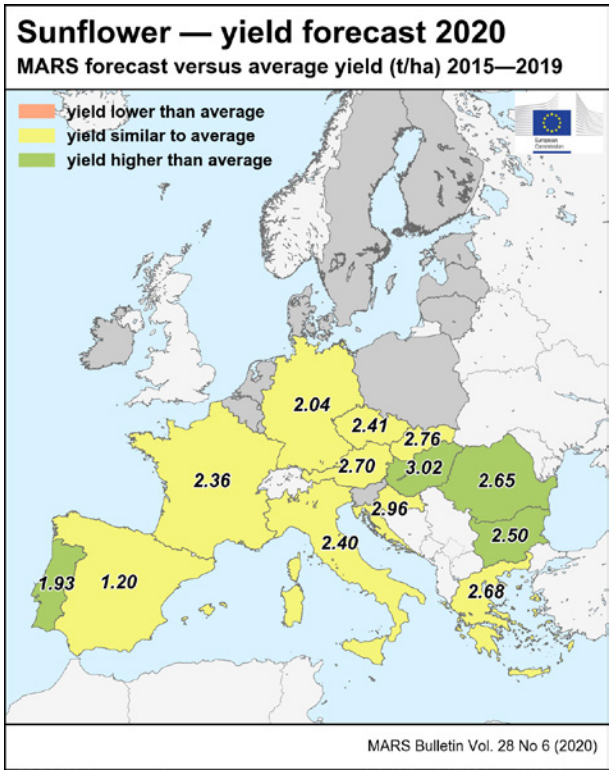
Country	Sugar beet (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	74.7	n/a	**75.5**	+ 1.0	n/a
AT	70.8	70.5	**71.8**	+ 1.5	+ 1.9
BE	84.9	88.2	**82.0**	– 3.5	– 7.0
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	62.7	61.8	**62.4**	– 0.4	+ 0.9
DE	73.6	72.7	**76.8**	+ 4.4	+ 5.5
DK	69.9	80.7	**67.5**	– 3.5	– 16
EE	—	—	**—**	—	—
EL	—	—	**—**	—	—
ES	91.0	96.7	**90.1**	– 1.0	– 6.9
FI	37.9	47.6	**40.9**	+ 7.9	– 14
FR	87.0	84.7	**88.4**	+ 1.7	+ 4.4
HR	61.9	61.2	**56.5**	– 8.8	– 7.7
HU	62.3	58.4	**63.1**	+ 1.3	+ 8.1
IE	—	—	**—**	—	—
IT	64.1	n/a	**62.2**	– 3.0	n/a
LT	59.3	71.0	**55.2**	– 6.9	– 22
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	83.1	83.9	**86.6**	+ 4.2	+ 3.2
PL	61.8	n/a	**59.2**	– 4.2	n/a
PT	—	—	**—**	—	—
RO	38.4	31.1	**38.1**	– 0.6	+ 22
SE	63.6	74.0	**63.6**	+ 0.0	– 14
SI	—	—	**—**	—	—
SK	59.7	57.6	**58.7**	– 1.7	+ 1.8
UK	70.4	69.0	**73.7**	+ 4.6	+ 6.8



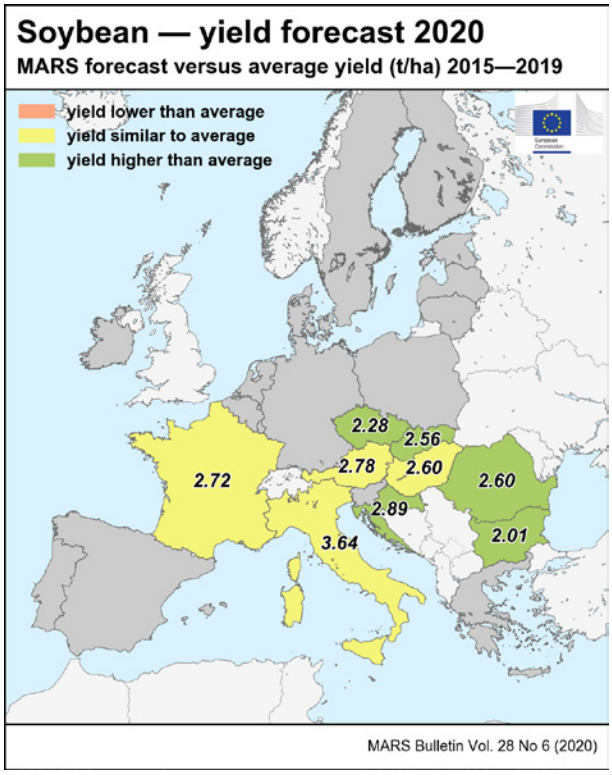
Country	Potato (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	32.6	n/a	**34.1**	+ 4.5	n/a
AT	30.3	31.3	**32.0**	+ 5.6	+ 2.2
BE	41.0	41.1	**44.2**	+ 7.7	+ 7.7
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	26.9	27.2	**27.7**	+ 3.0	+ 1.9
DE	41.8	39.0	**44.1**	+ 5.5	+ 13
DK	41.0	42.5	**40.7**	– 0.8	– 4.2
EE	—	—	**—**	—	—
EL	27.6	27.7	**27.3**	– 1.0	– 1.4
ES	31.5	33.1	**31.1**	– 1.3	– 6.1
FI	27.4	28.9	**28.6**	+ 4.3	– 1.1
FR	41.2	41.4	**43.1**	+ 4.5	+ 4.0
HR	—	—	**—**	—	—
HU	24.2	25.0	**25.8**	+ 6.5	+ 3.1
IE	—	—	**—**	—	—
IT	28.3	n/a	**27.9**	– 1.5	n/a
LT	15.8	18.1	**16.1**	+ 1.6	– 11
LU	—	—	**—**	—	—
LV	19.6	n/a	**20.3**	+ 3.5	n/a
MT	—	—	**—**	—	—
NL	42.0	42.0	**43.0**	+ 2.4	+ 2.4
PL	25.7	n/a	**25.3**	– 1.6	n/a
PT	20.8	22.7	**22.3**	+ 7.0	– 1.7
RO	15.6	14.8	**17.4**	+ 11	+ 17
SE	34.2	35.8	**33.2**	– 2.9	– 7.3
SI	—	—	**—**	—	—
SK	—	—	**—**	—	—
UK	40.5	36.5	**40.9**	+ 1.0	+ 12



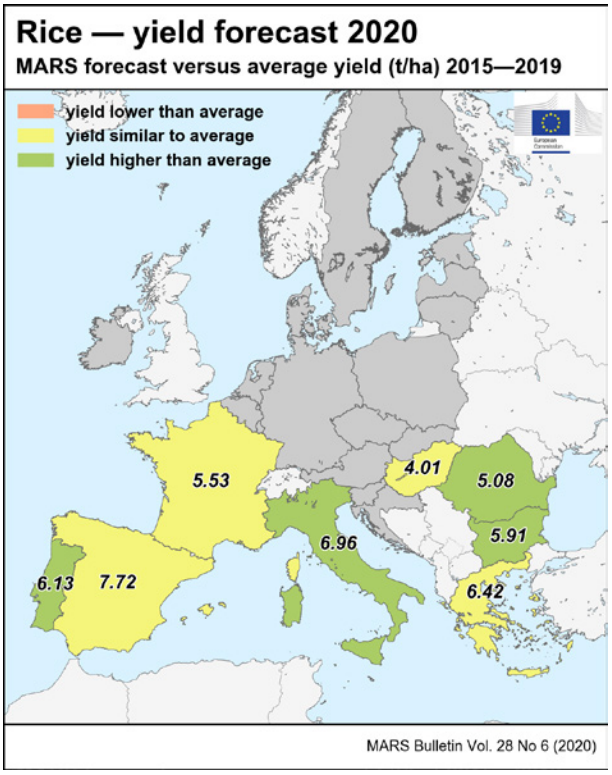
Country	Sunflower (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	2.24	2.31	**2.39**	+ 6.3	+ 3.3
AT	2.68	3.00	**2.70**	+ 0.9	– 10
BE	—	—	—	—	—
BG	2.28	2.31	**2.50**	+ 9.8	+ 8.1
CY	—	—	—	—	—
CZ	2.43	2.44	**2.41**	– 0.7	– 1.0
DE	2.02	2.04	**2.04**	+ 1.1	– 0.2
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	2.59	2.80	**2.68**	+ 3.3	– 4.5
ES	1.15	1.12	**1.20**	+ 3.7	+ 6.3
FI	—	—	—	—	—
FR	2.27	2.15	**2.36**	+ 3.9	+ 9.6
HR	2.88	2.89	**2.96**	+ 2.9	+ 2.3
HU	2.88	3.00	**3.02**	+ 4.7	+ 0.5
IE	—	—	—	—	—
IT	2.37	2.47	**2.40**	+ 1.0	– 3.0
LT	—	—	—	—	—
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	—	—	—	—	—
PT	1.49	1.76	**1.93**	+ 30	+ 9.9
RO	2.47	2.64	**2.65**	+ 7.2	+ 0.3
SE	—	—	—	—	—
SI	—	—	—	—	—
SK	2.66	2.64	**2.76**	+ 3.7	+ 4.6
UK	—	—	—	—	—



Country	Soybean (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	2.91	3.00	**2.98**	+ 2.2	– 0.8
AT	2.86	3.11	**2.78**	– 2.8	– 11
BE	—	—	—	—	—
BG	1.36	2.00	**2.01**	+ 48	+ 0.4
CY	—	—	—	—	—
CZ	2.10	2.27	**2.28**	+ 8.5	+ 0.4
DE	—	—	—	—	—
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	—	—	—	—	—
ES	—	—	—	—	—
FI	—	—	—	—	—
FR	2.66	2.62	**2.72**	+ 2.3	+ 3.7
HR	2.74	2.90	**2.89**	+ 5.4	– 0.5
HU	2.60	2.78	**2.60**	+ 0.2	– 6.5
IE	—	—	—	—	—
IT	3.61	3.66	**3.64**	+ 0.6	– 0.7
LT	—	—	—	—	—
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	—	—	—	—	—
PT	—	—	—	—	—
RO	2.39	2.55	**2.60**	+ 9.0	+ 2.1
SE	—	—	—	—	—
SI	—	—	—	—	—
SK	2.22	2.46	**2.56**	+ 15	+ 4.0
UK	—	—	—	—	—



Country	Rice (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
EU	6.73	6.74	**6.92**	+ 2.8	+ 2.7
AT	—	—	—	—	—
BE	—	—	—	—	—
BG	5.65	6.04	**5.91**	+ 4.7	– 2.1
CY	—	—	—	—	—
CZ	—	—	—	—	—
DE	—	—	—	—	—
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	6.62	7.42	**6.42**	– 3.0	– 14
ES	7.71	7.70	**7.72**	+ 0.2	+ 0.3
FI	—	—	—	—	—
FR	5.56	5.60	**5.53**	– 0.6	– 1.3
HR	—	—	—	—	—
HU	3.98	3.82	**4.01**	+ 0.6	+ 4.9
IE	—	—	—	—	—
IT	6.65	6.59	**6.96**	+ 4.7	+ 5.6
LT	—	—	—	—	—
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	—	—	—	—	—
PT	5.84	5.36	**6.13**	+ 4.9	+ 14
RO	4.79	4.98	**5.08**	+ 6.0	+ 2.1
SE	—	—	—	—	—
SI	—	—	—	—	—
SK	—	—	—	—	—
UK	—	—	—	—	—



Maghreb and Black Sea area

Country	Wheat (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
BY	3.51	3.83	**3.84**	+ 9.4	+ 0.3
DZ	1.57	n/a	**1.58**	+ 0.3	n/a
MA	1.91	1.54	**1.47**	– 23	– 4.5
TN	1.77	n/a	**1.83**	+ 3.2	n/a
TR	2.78	2.78	**2.89**	+ 3.6	+ 3.8
UA	4.01	4.16	**3.98**	– 1.0	– 4.4

Country	Barley (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
BY	3.08	3.50	**3.38**	+ 9.9	– 3.4
DZ	1.28	n/a	**1.20**	– 6.0	n/a
MA	1.26	n/a	**0.90**	– 28	n/a
TN	0.83	n/a	**0.76**	– 8.4	n/a
TR	2.70	2.64	**2.87**	+ 6.3	+ 8.8
UA	3.19	3.42	**3.26**	+ 2.2	– 4.8

Country	Grain maize (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
BY	5.86	6.00	**5.76**	– 1.9	– 4.1
DZ	—	—	—	—	—
MA	—	—	—	—	—
TN	—	—	—	—	—
TR	9.40	9.40	**9.64**	+ 2.5	+ 2.5
UA	6.59	7.19	**7.39**	+ 12	+ 2.7

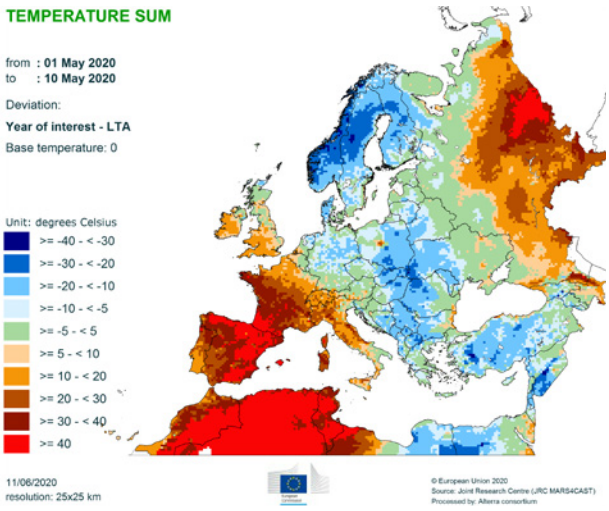
Country	Soybean (t/ha)				
	Avg 5yrs	2019	MARS 2020 forecasts	%20/5yrs	%20/19
BY	—	—	—	—	—
DZ	—	—	—	—	—
MA	—	—	—	—	—
TN	—	—	—	—	—
TR	4.33	4.25	**4.58**	+ 5.7	+ 7.7
UA	2.19	2.29	**2.37**	+ 8.3	+ 3.4

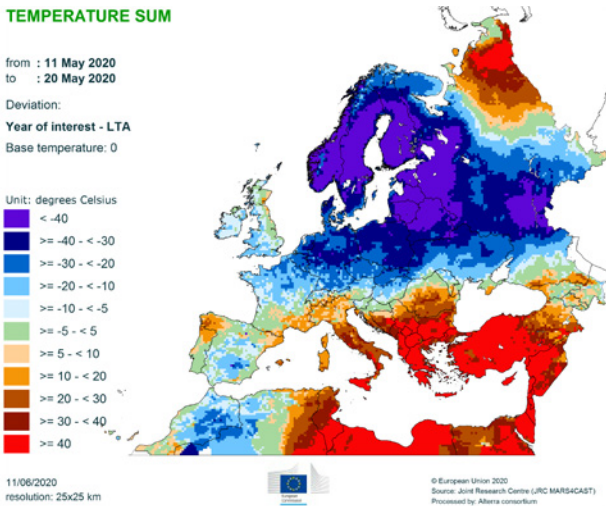
Note: Yields are forecast for crops with more than 10 000 ha per country with sufficently long and coherent yield time series (for rice more than 1 000 ha per country).
'%20/5yrs' stands for the 2020 change with respect to the 5-year average (%). Similarly, '%20/19' stands for the 2020 change with respect to 2019 (%).

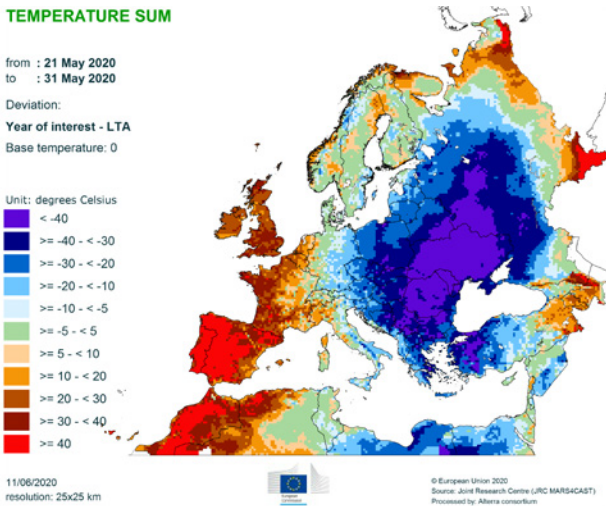
Sources: EU 2015–2020 data come from DG Agriculture and Rural Development short-term outlook data (dated February 2020, received on 2.3.2020), Eurostat Eurobase (last update: 25.2.2020) and EES (last update: 15.11.2017).
Non-EU 2015–2019 data come from USDA, DSASI-MADR Algeria, INRA Maroc, CNCT Tunisie, Turkish Statistical Institute (TurkStat), Eurostat Eurobase (last update: 25.2.2020), State Statistics Service of Ukraine, FAO and PSD-online.
2020 yields come from MARS crop yield forecasting system (output up to 10.3.2020).
EU aggregate after 1.2.2020 is reported.
n/a = Data not available.

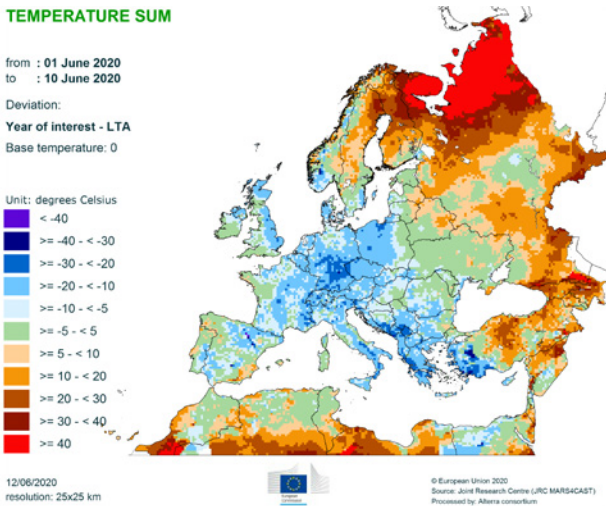
6. Atlas

Temperature regime

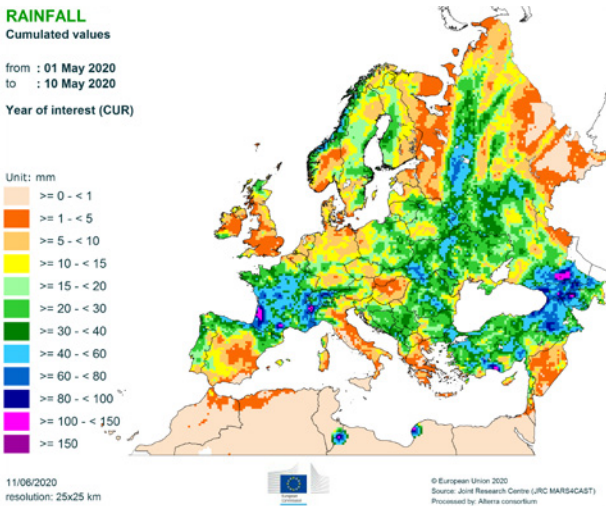


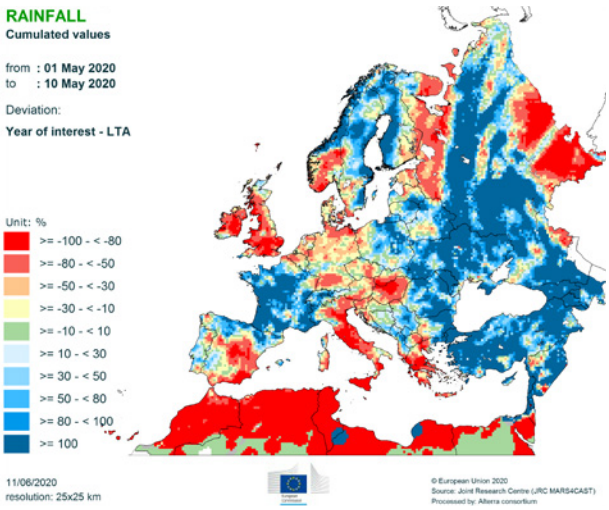


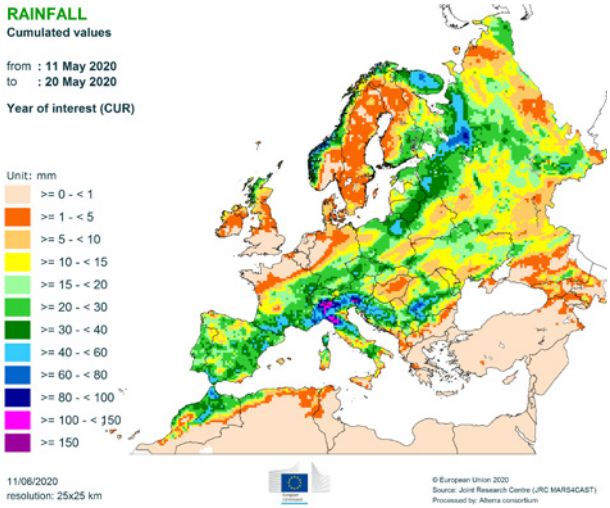


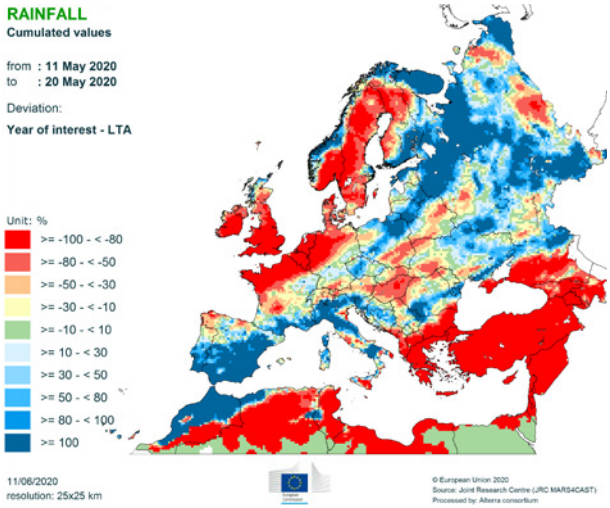


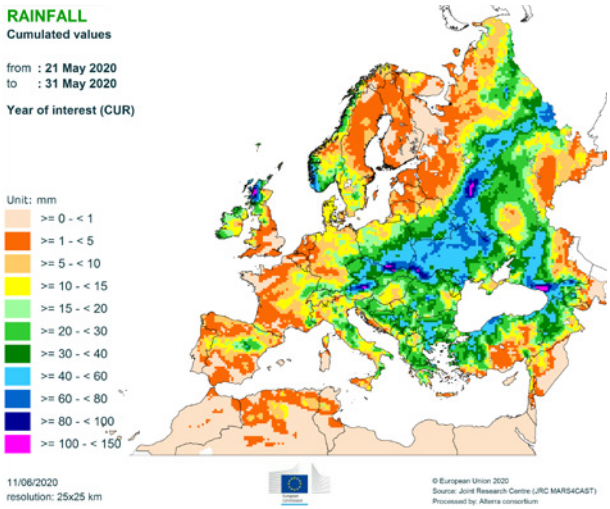
Precipitation

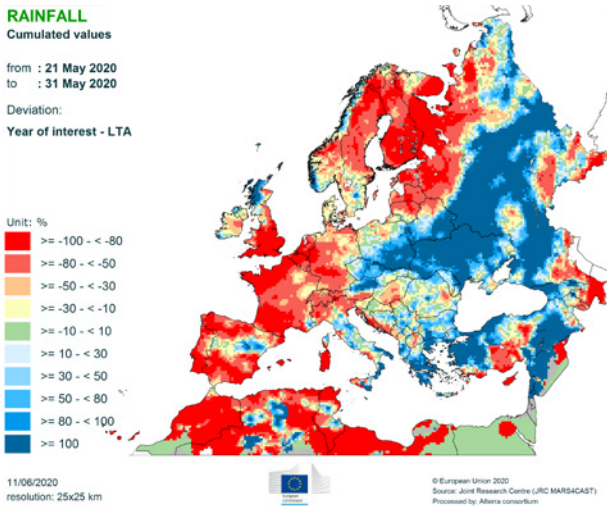


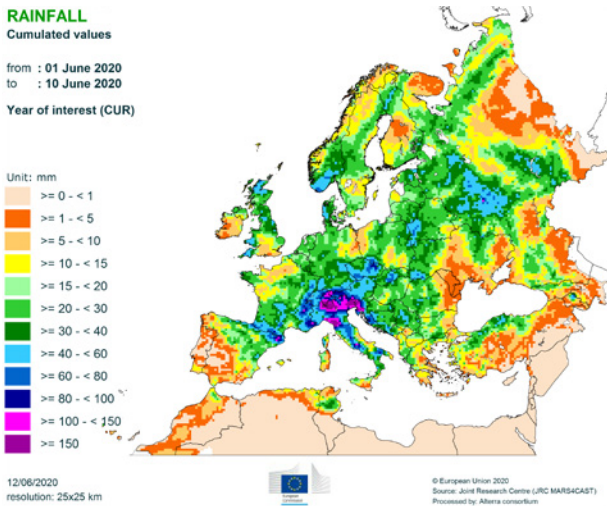


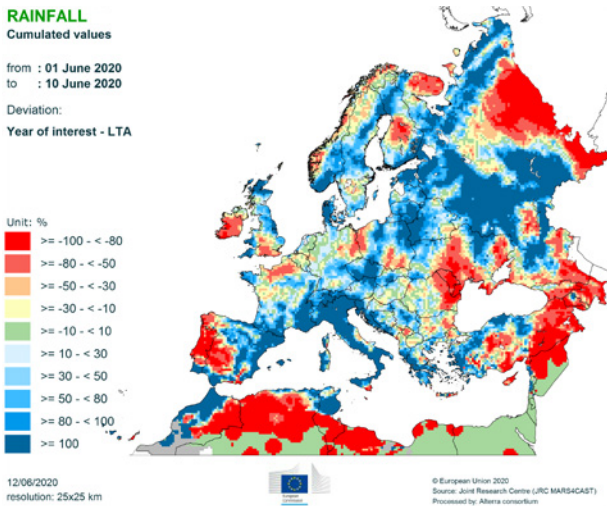

RAINFALL
Cumulated values
from : 11 May 2020
to : 20 May 2020
Year of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 11 May 2020
to : 20 May 2020
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
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

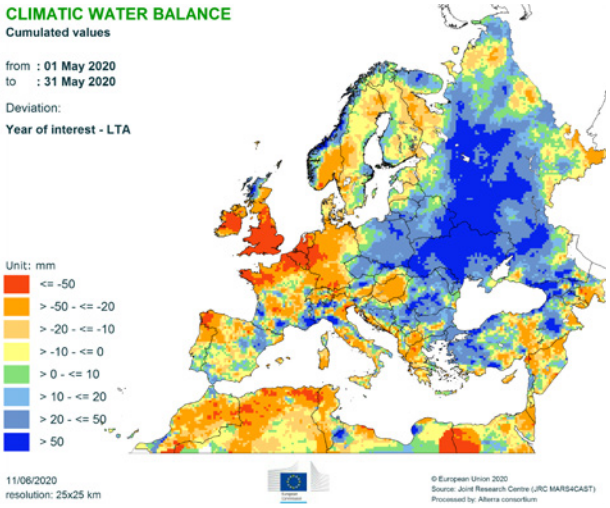

RAINFALL
Cumulated values
from : 21 May 2020
to : 31 May 2020
Year of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

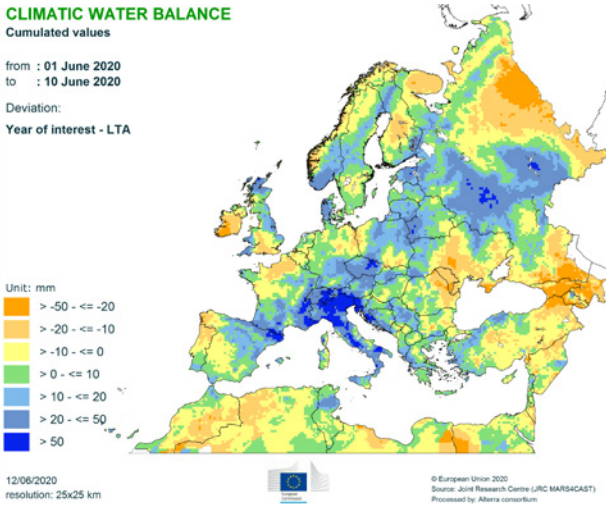

RAINFALL
Cumulated values
from : 21 May 2020
to : 31 May 2020
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 June 2020
to : 10 June 2020
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
12/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

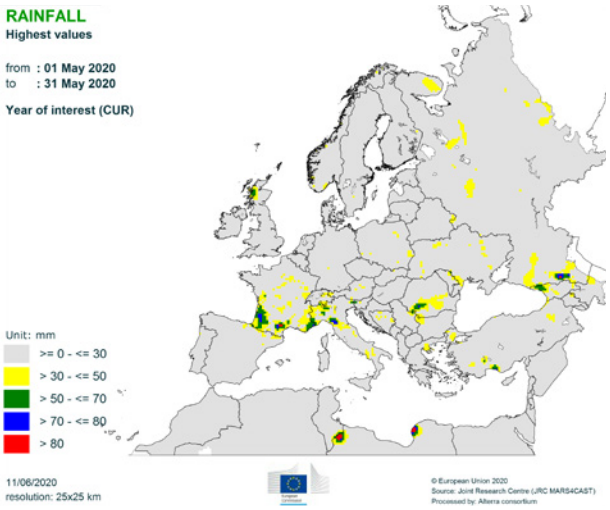

RAINFALL
Cumulated values
from : 01 June 2020
to : 10 June 2020
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
12/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

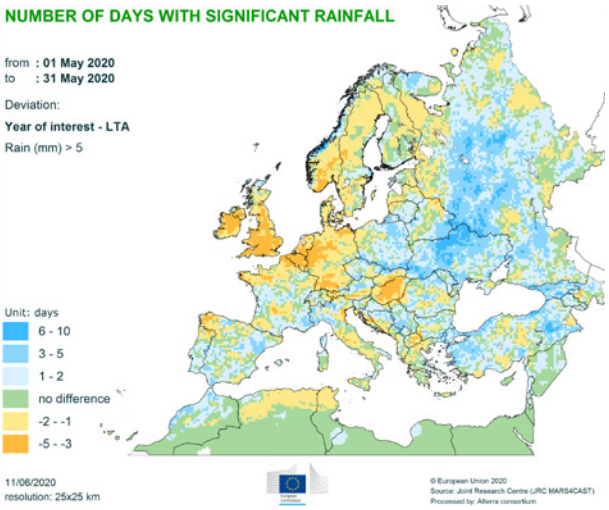
Climatic water balance

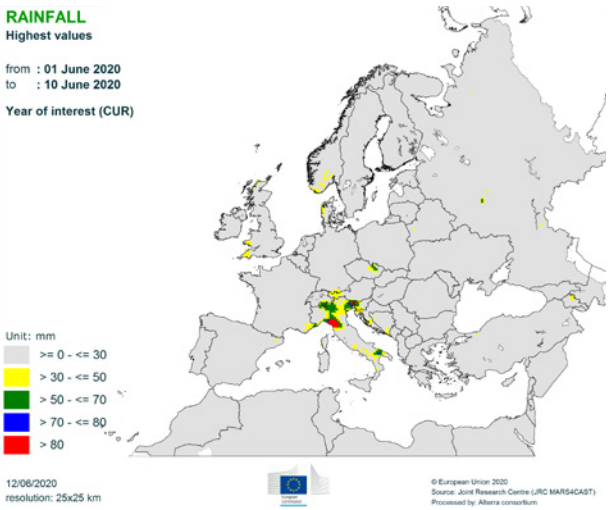


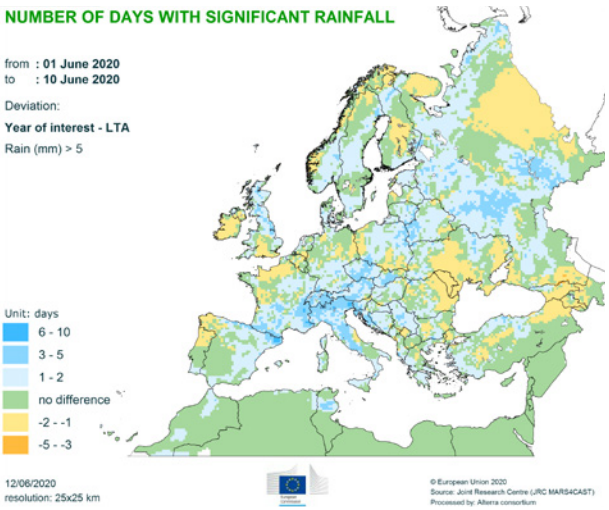


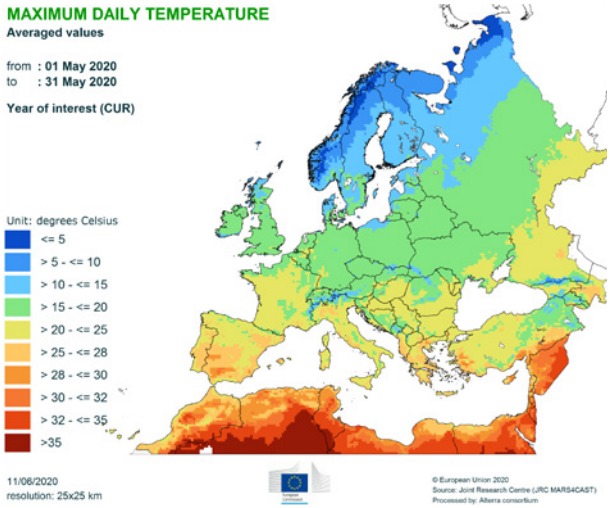
Weather events

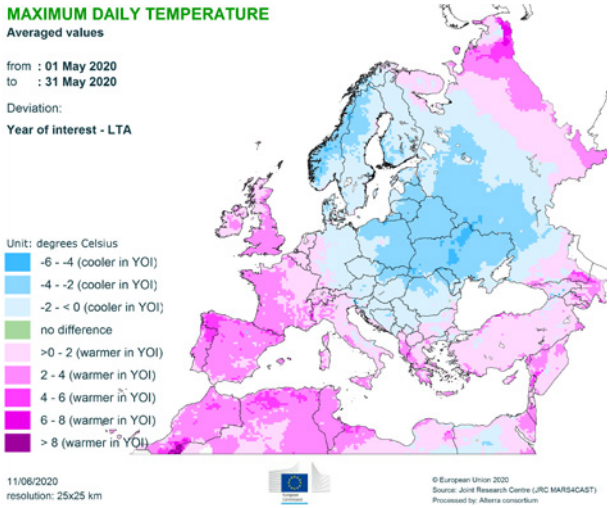


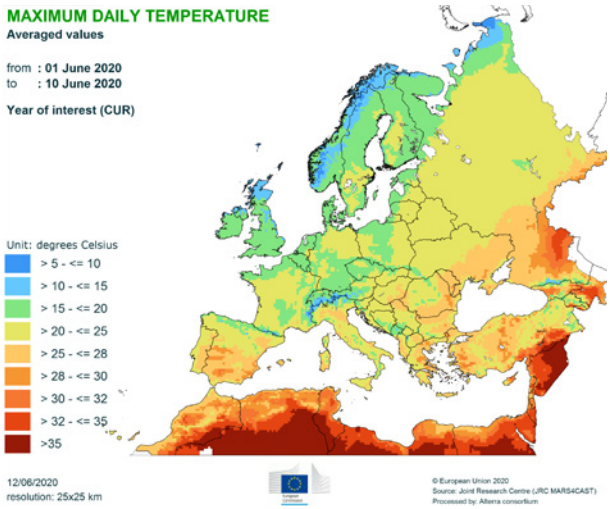


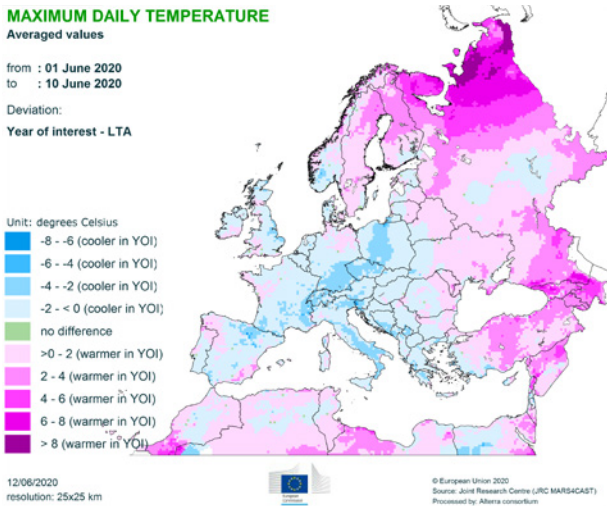


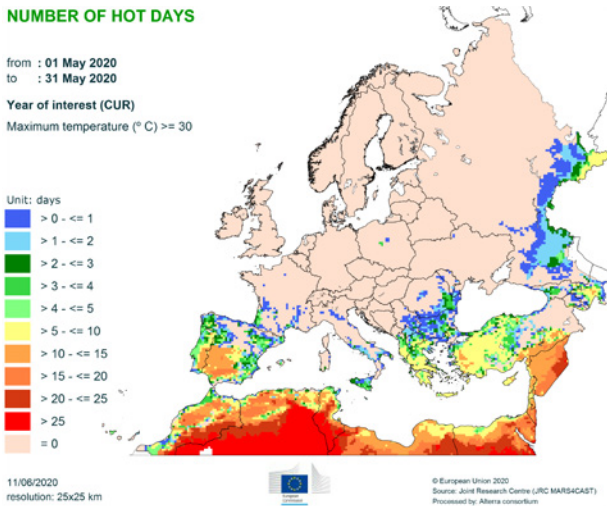


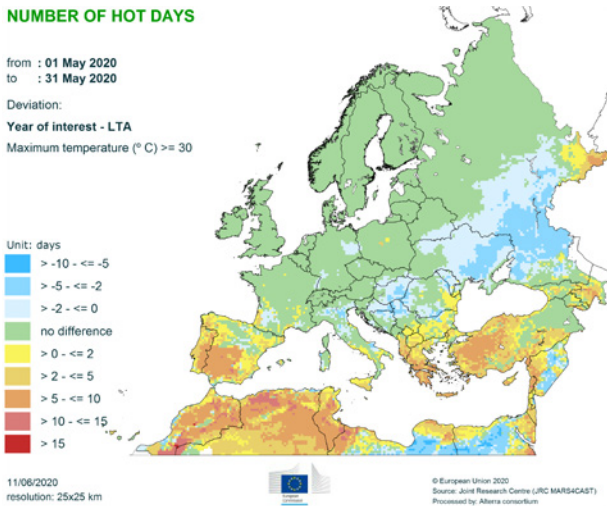

MAXIMUM DAILY TEMPERATURE
Averaged values
from : 01 May 2020
to : 31 May 2020
Year of interest (CUR)
Unit: degrees Celsius
<= 5
> 5 - <= 10
> 10 - <= 15
> 15 - <= 20
> 20 - <= 25
> 25 - <= 28
> 28 - <= 30
> 30 - <= 32
> 32 - <= 35
>35
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

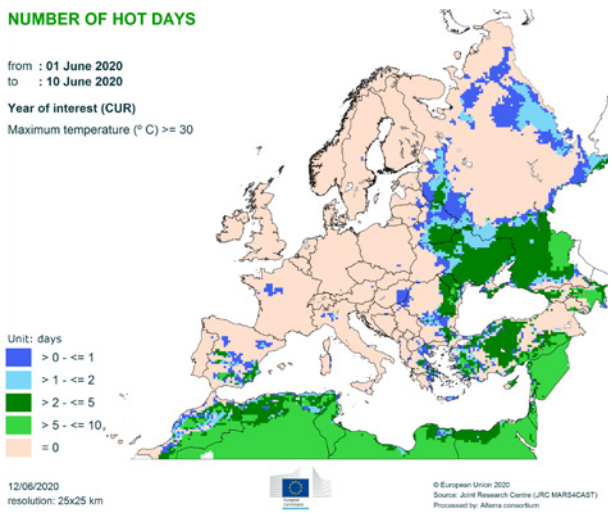

MAXIMUM DAILY TEMPERATURE
Averaged values
from : 01 May 2020
to : 31 May 2020
Deviation:
Year of interest - LTA
Unit: degrees Celsius
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
-2 - < 0 (cooler in YOI)
no difference
>0 - 2 (warmer in YOI)
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
> 8 (warmer in YOI)
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

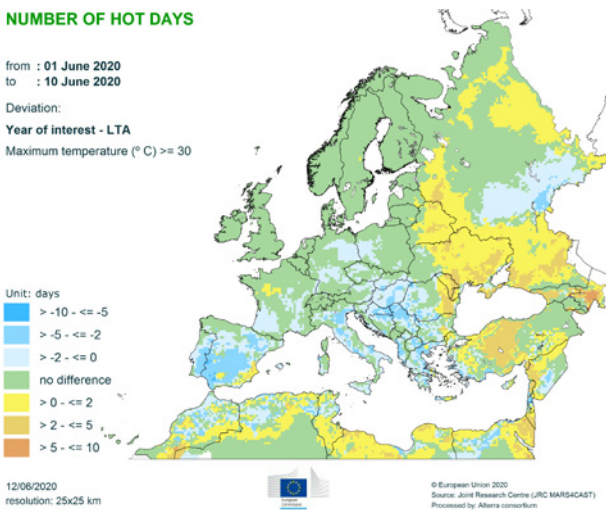

MAXIMUM DAILY TEMPERATURE
Averaged values
from : 01 June 2020
to : 10 June 2020
Year of interest (CUR)
Unit: degrees Celsius
> 5 - <= 10
> 10 - <= 15
> 15 - <= 20
> 20 - <= 25
> 25 - <= 28
> 28 - <= 30
> 30 - <= 32
> 32 - <= 35
>35
12/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


MAXIMUM DAILY TEMPERATURE
Averaged values
from : 01 June 2020
to : 10 June 2020
Deviation:
Year of interest - LTA
Unit: degrees Celsius
-8 - -6 (cooler in YOI)
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
-2 - < 0 (cooler in YOI)
no difference
>0 - 2 (warmer in YOI)
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
> 8 (warmer in YOI)
12/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

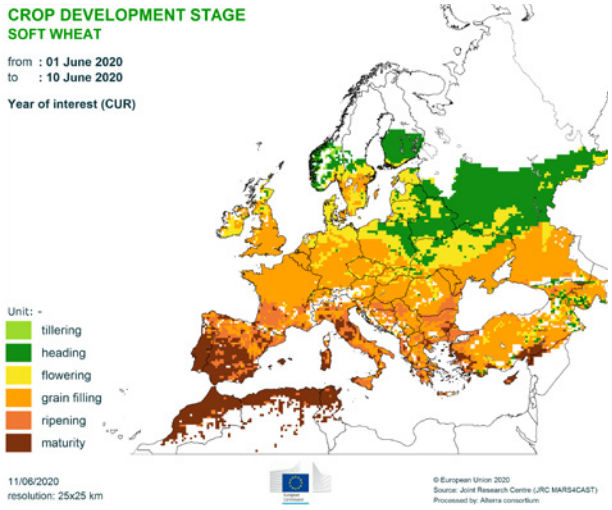

NUMBER OF HOT DAYS
from : 01 May 2020
to : 31 May 2020
Year of interest (CUR)
Maximum temperature (° C) >= 30
Unit: days
> 0 - <= 1
> 1 - <= 2
> 2 - <= 3
> 3 - <= 4
> 4 - <= 5
> 5 - <= 10
> 10 - <= 15
> 15 - <= 20
> 20 - <= 25
> 25
= 0
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

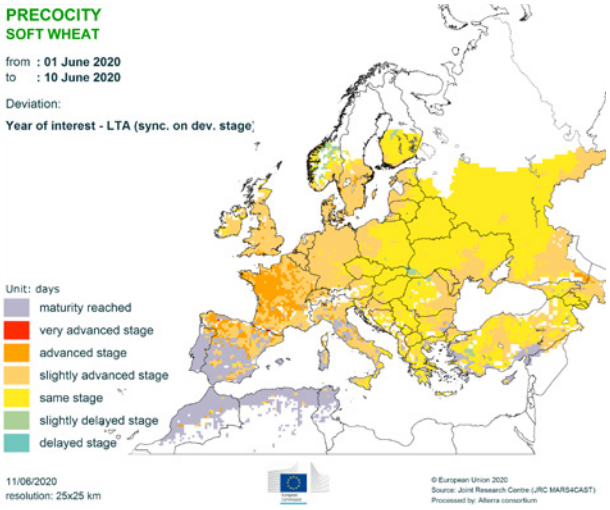

NUMBER OF HOT DAYS
from : 01 May 2020
to : 31 May 2020
Deviation:
Year of interest - LTA
Maximum temperature (° C) >= 30
Unit: days
> -10 - <= -5
> -5 - <= -2
> -2 - <= 0
no difference
> 0 - <= 2
> 2 - <= 5
> 5 - <= 10
> 10 - <= 15
> 15
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

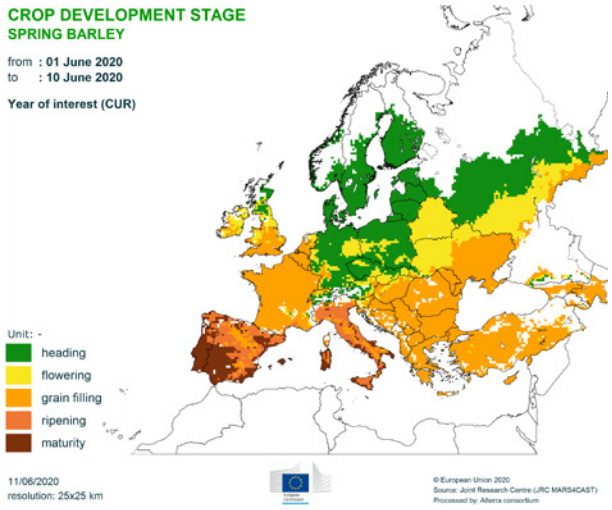


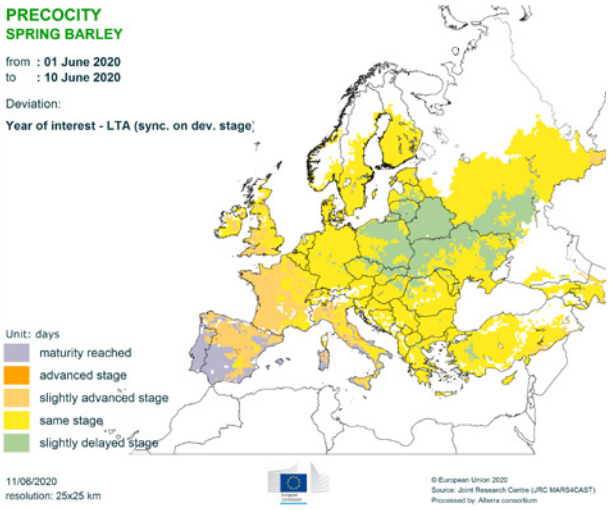


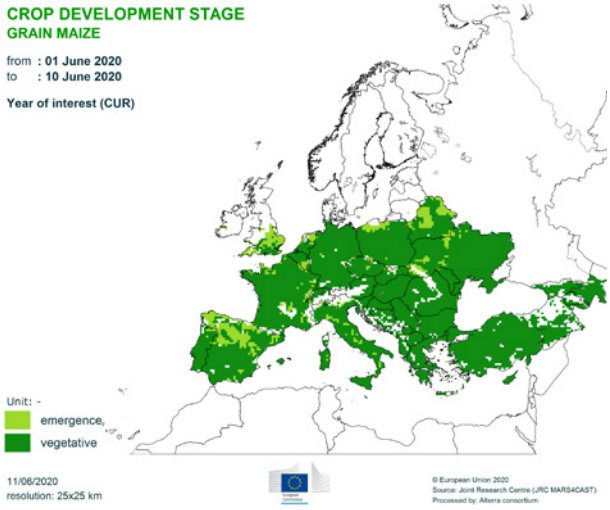
Crop development stages and precocity

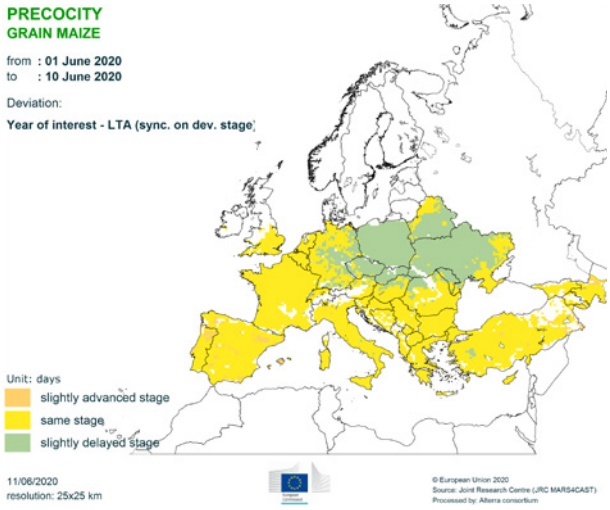


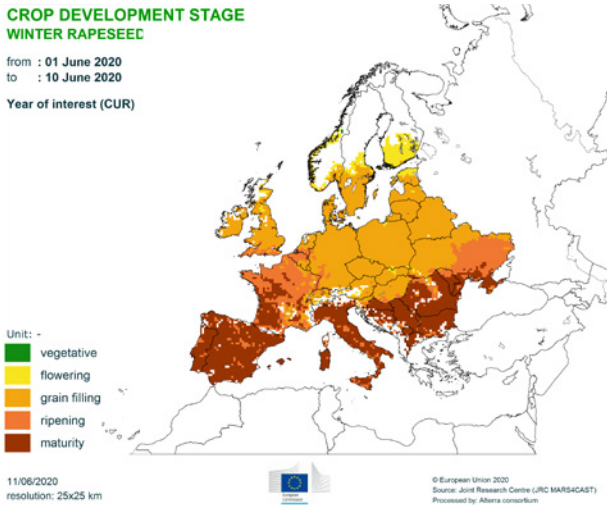


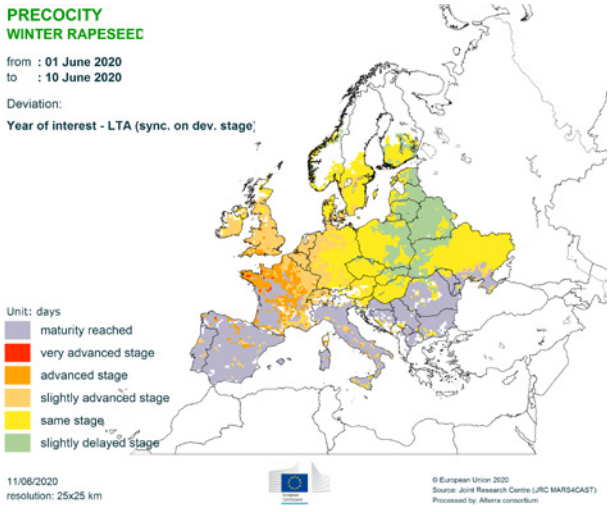


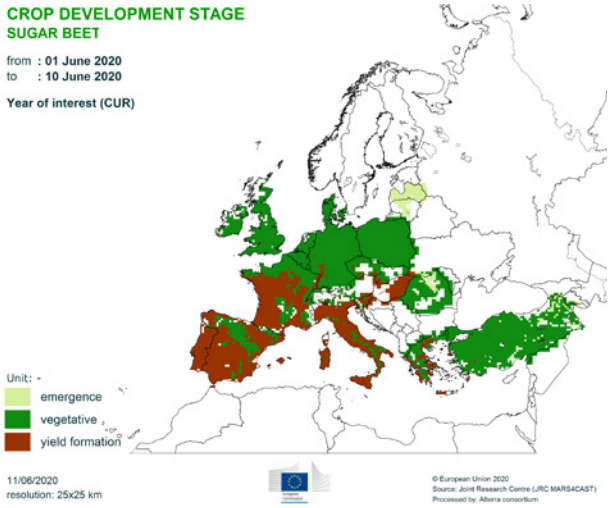


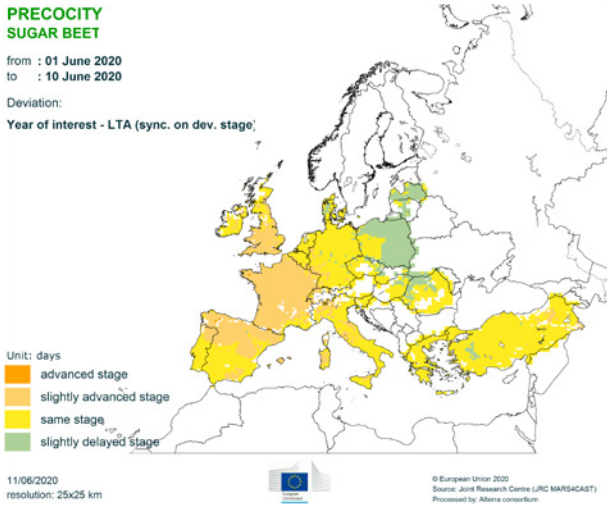

CROP DEVELOPMENT STAGE
GRAIN MAIZE
from : 01 June 2020
to : 10 June 2020
Year of interest (CUR)
Unit: -
emergence
vegetative
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


PRECOCITY
GRAIN MAIZE
from : 01 June 2020
to : 10 June 2020
Deviation:
Year of interest - LTA (sync. on dev. stage)
Unit: days
slightly advanced stage
same stage
slightly delayed stage
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

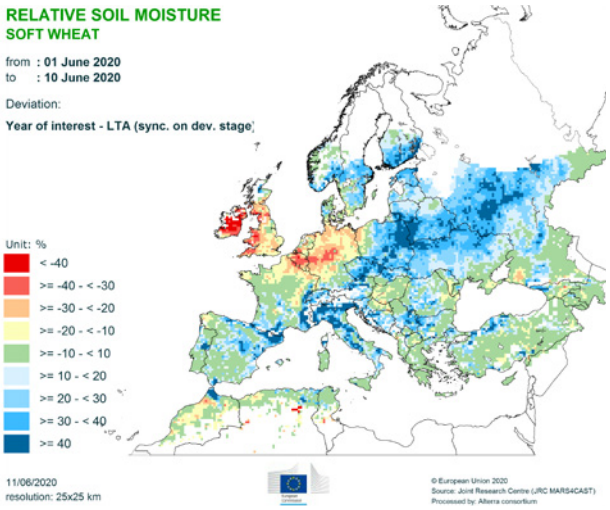

CROP DEVELOPMENT STAGE
WINTER RAPESEED
from : 01 June 2020
to : 10 June 2020
Year of interest (CUR)
Unit: -
vegetative
flowering
grain filling
ripening
maturity
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

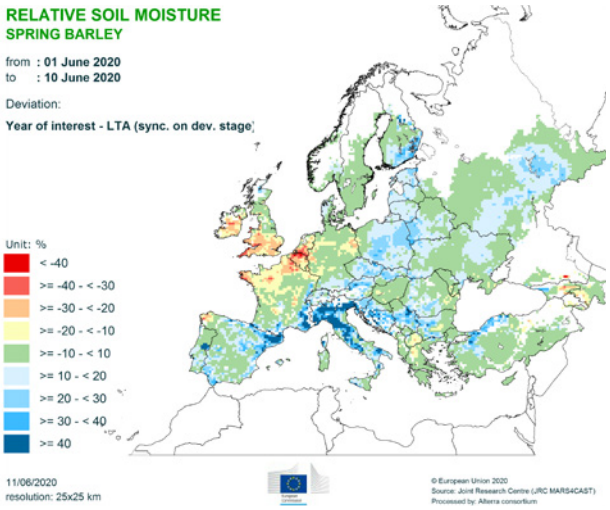

PRECOCITY
WINTER RAPESEED
from : 01 June 2020
to : 10 June 2020
Deviation:
Year of interest - LTA (sync. on dev. stage)
Unit: days
maturity reached
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

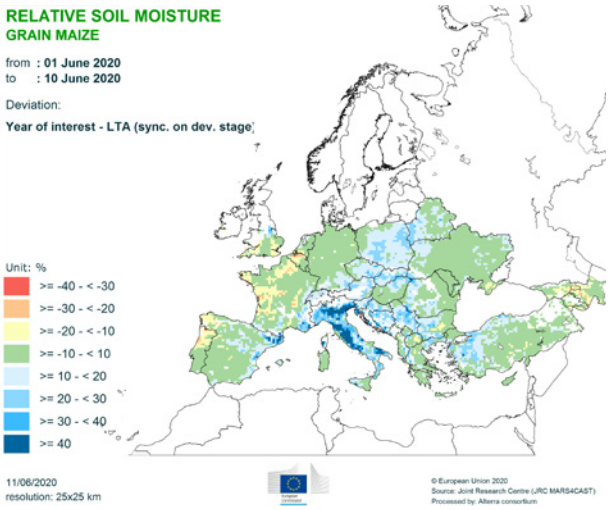

CROP DEVELOPMENT STAGE
SUGAR BEET
from : 01 June 2020
to : 10 June 2020
Year of interest (CUR)
Unit: -
emergence
vegetative
yield formation
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

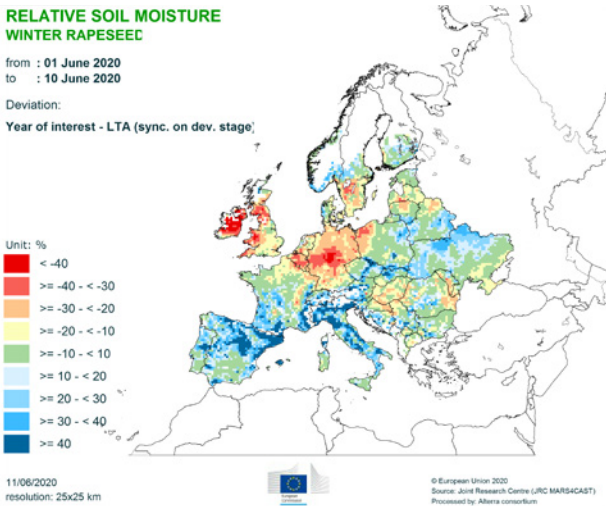

PRECOCITY
SUGAR BEET
from : 01 June 2020
to : 10 June 2020
Deviation:
Year of interest - LTA (sync. on dev. stage)
Unit: days
advanced stage
slightly advanced stage
same stage
slightly delayed stage
11/06/2020
resolution: 25x25 km
© European Union 2020
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

Relative soil moisture

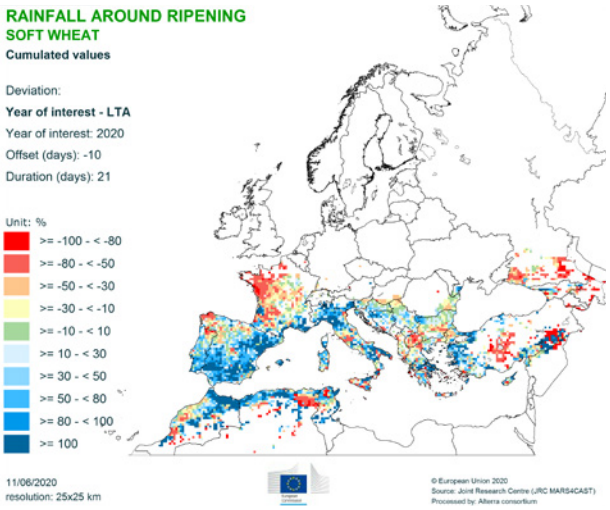


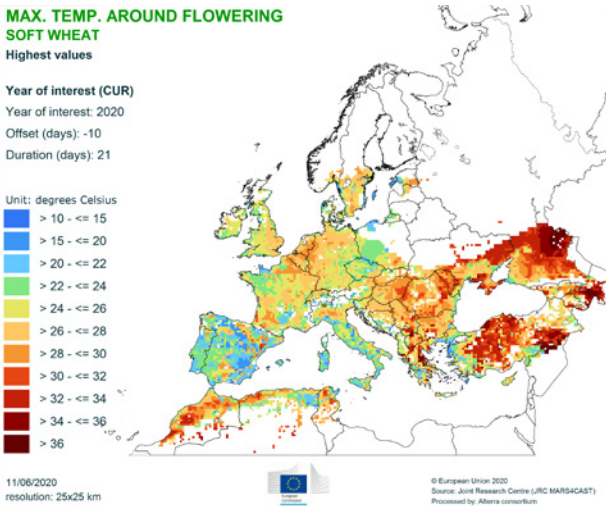


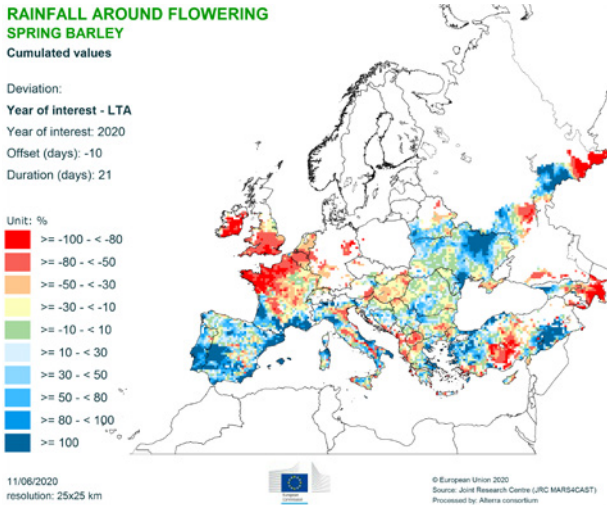


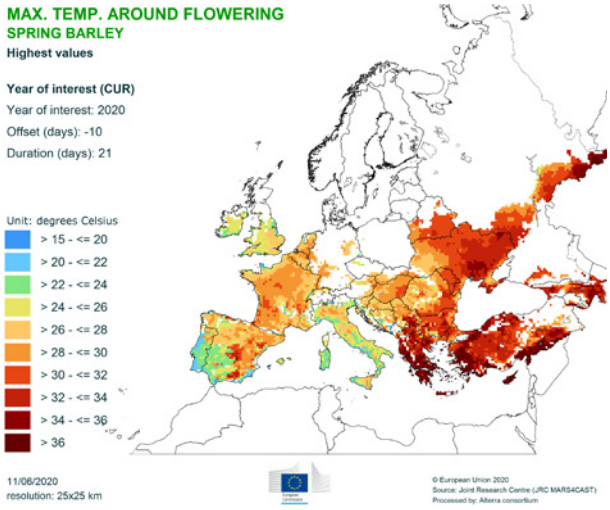


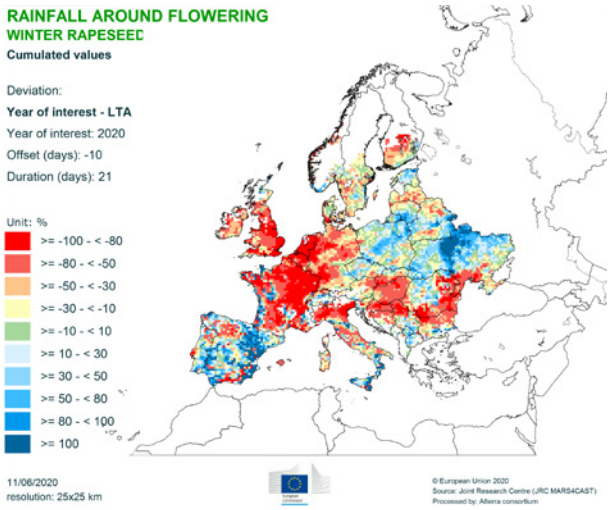
Precipitation and temperatures around flowering

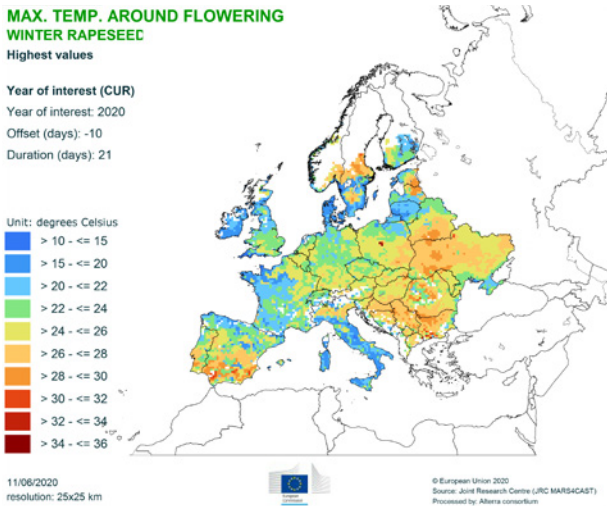




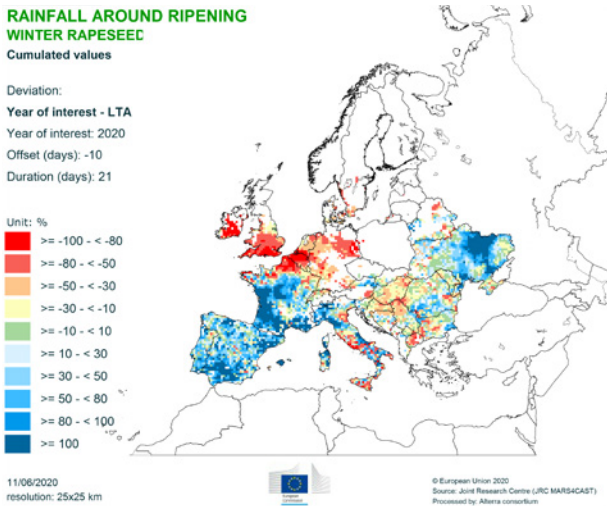


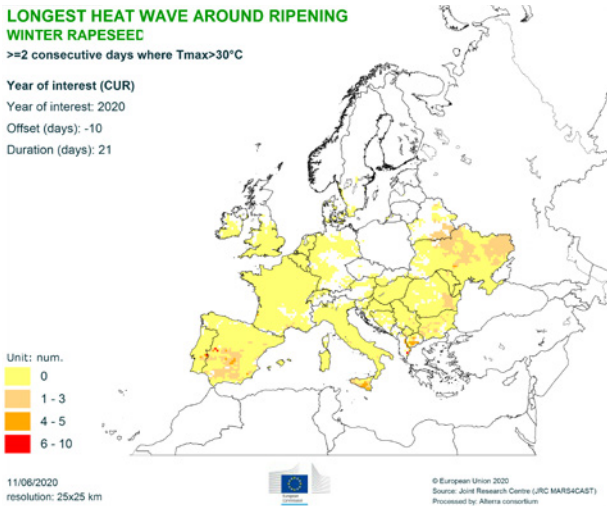




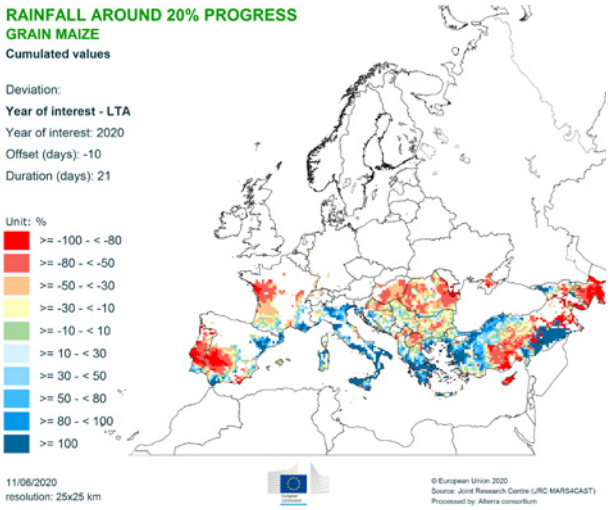


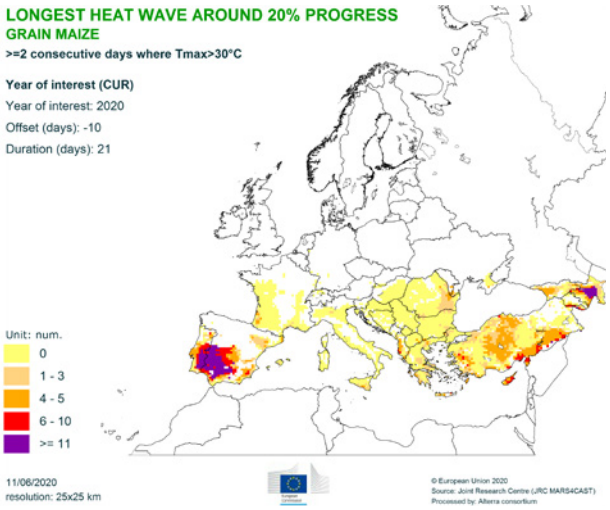
Precipitation and longest heatwave around ripening





Maize: precipitation and temperatures around crop development





KJ-AW-20-006-EN-N

JRC MARS Bulletins 2020

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

The current JRC MARS Bulletin – Crop monitoring in Europe is a JRC–European Commission publication from MARS4CAST (JRC Unit D5 – Directorate for Sustainable Resources).

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

Analysis and reports
B. Baruth, S. Bassu, A. Bussay, A. Ceglar, I. Cerrani, Y. Chemin, P. De Palma, D. Fumagalli, R. Lecerf, G. Manfron, L. Nisini, L. Panarello, G. Ronchetti, L. Seguini, A. Toreti, M. van den Berg, M. van der Velde, Z. Zajac, A. Zucchini

Reporting support
SeproTec, I. Biavetti, G. Mulhern

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

Data production
MARS4CAST (JRC Unit D5), WENR (NL), MeteoGroup (NL), VITO (BE)

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

Technical note
The long-term average (LTA) used within this bulletin as a reference is based on an archive of data covering 1979–2019.

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

Publications Office of the European Union

ISSN Print 2443-826X
ISSN PDF 2443-8278