European Commission

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Period covered: 1 July -18 August
Issued: 21 August 2017

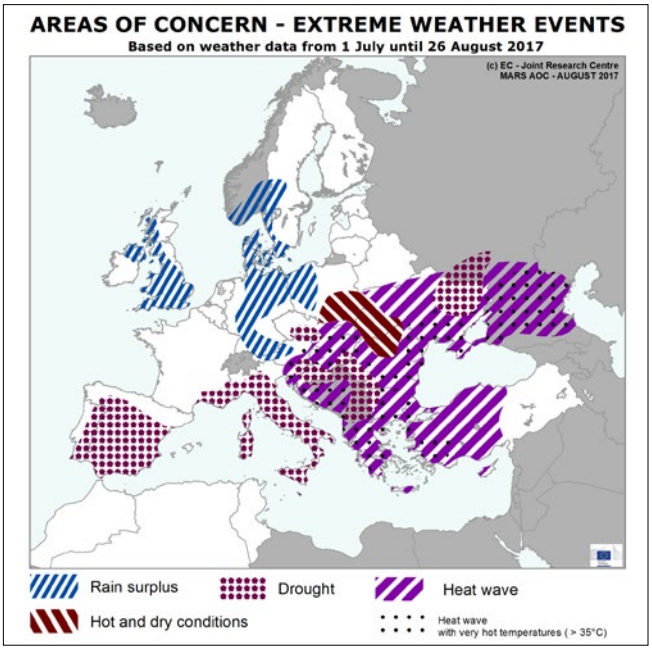
JRC MARS Bulletin
Crop monitoring in Europe
August 2017

Slightly improved outlook for summer crops

Rain mitigates impacts of heatwaves in south-eastern Europe

In large parts of the Mediterranean region, central and eastern Europe, heatwaves and low precipitation continued in July and at the beginning of August. However, summer crops in Austria, Hungary, central Romania, Bulgaria and Greece benefited from adequate rainfall, which mitigated negative effects from the hot conditions. In western and northern Europe, mild temperatures and average to above-average rainfall since the second half of July also benefited summer crops, but frequent rains hampered the harvesting of spring and winter cereals and raised quality concerns.

On balance, at the EU level, the forecast for grain maize has been slightly revised upwards and is now just above the 5-year average but below last year's yield, as marked downward revisions for Italy, and Slovakia were more than compensated for by upward revisions for Romania, Hungary, Austria, Bulgaria France and Germany. The forecasts for green maize, sunflower and sugar beet have also been revised upwards. The yield forecast for winter cereals has remained stable at EU level: downward revisions of soft wheat yields in Germany, the UK, and Ireland (mainly due to the difficult conditions around harvesting) have been compensated for by an upward revision for France.



Crop	Yield (t/ha)				
	Avg 5yrs	April Bulletin	MARS 2017 forecasts	% Diff 17/5yrs	% Diff April
TOTAL CEREALS	5.30	5.27	**5.29**	- 0.3	+ 0.4
Total Wheat	5.60	5.61	**5.61**	+ 0.1	+ 0.0
soft wheat	5.84	5.85	**5.85**	+ 0.2	+ 0.0
durum wheat	3.33	3.41	**3.44**	+ 3.3	+ 0.9
Total Barley	4.83	4.71	**4.74**	- 2.0	+ 0.6
spring barley	4.22	3.94	**3.97**	- 6.0	+ 0.8
winter barley	5.68	5.73	**5.73**	+ 0.9	+ 0.0
Grain maize	6.89	6.83	**6.93**	+ 0.6	- 1.5
Rye	3.89	3.82	**3.81**	- 2.2	- 0.3
Triticale	4.20	4.18	**4.20**	- 0.2	+ 0.5
Rape and turnip rape	3.24	3.21	**3.27**	+ 0.8	+ 1.9
Potato	32.6	33.5	**33.3**	+ 2.2	- 0.7
Sugar beet	72.0	73.8	**74.7**	+ 3.7	+ 1.2
Sunflower	1.94	2.04	**2.07**	+ 6.3	+ 1.5

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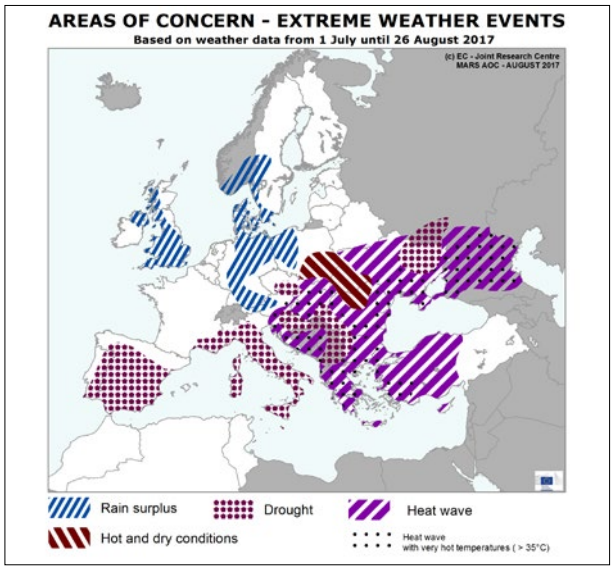
Joint Research Centre

1. Agro-meteorological overview

1.1. Areas of concern

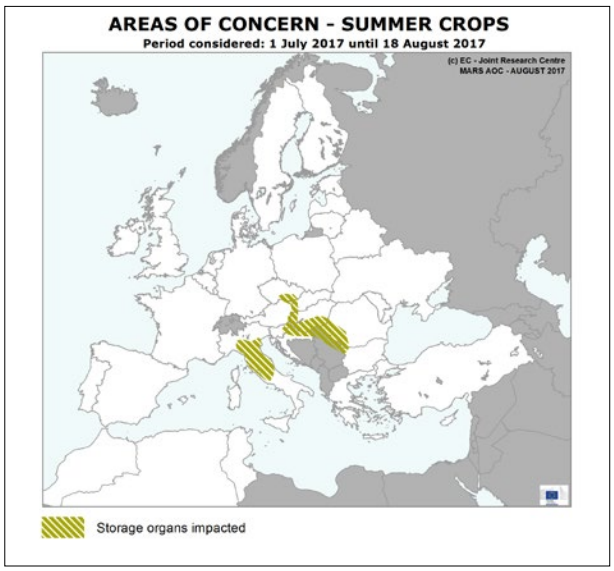
In Mediterranean regions and eastern Europe, heatwaves and low precipitation continued in July and at the beginning of August, as shown in the areas-of-concern maps below. Concerns for winter crops (the Czech Republic, Slovakia and Austria) and summer crops (Spain, Greece, northern Ukraine) that were reported in the July bulletin are not mapped again.

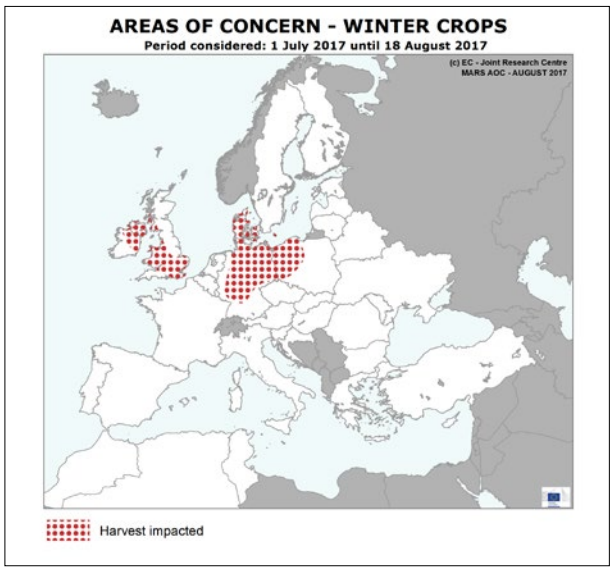


The drought in the **Iberian Peninsula** is still ongoing. Water for irrigation has been sufficient to maintain irrigated crops in good shape but reservoirs are running low and concerns could rise in the coming weeks if no rain comes.

In **Italy**, the drought, which in July was limited to central regions, is now evident even in the Po valley. In both central and northern regions, irrigated summer crops suffered from a shortening of the grain-filling stage, while non-irrigated crops present early senescence. In the **United Kingdom**, **Denmark**, most of **Germany** and western **Poland**, the winter crop cycle ended at the end of July but harvest activities were hampered by persistent rains, with possible impacts on grain quality.

In the **Czech Republic** and **Slovakia**, the scarce rains of July and August did not alleviate the drought conditions and summer crops faced a shortening of the grain-filling stage. Drought conditions are even more marked along the Danube valley in **Serbia**, **Hungary**, western **Romania**, **Slovenia** and **Croatia**, with an associated acceleration of the grain-filling stage, and locally early crop senescence is observed. In central **Romania**, **Bulgaria**, **Greece** and **Ukraine**, two to four heatwaves have occurred since the beginning of July, generally accelerating the phenological development of the summer crops, yet without causing major concerns thanks to adequate moisture supply.





1.2. Meteorological review (1 July-15 August)

Warmer-than-usual weather conditions, with mean temperature anomalies between 1 °C and 5 °C above the long-term average, were dominant in the southern half of the Iberian Peninsula, most of Italy, Austria, the Czech Republic, the southern half of Poland, Slovakia, Hungary, Romania, the Balkan Peninsula, Turkey, most of Ukraine, southern Russia and large areas in the Maghreb countries. The most pronounced positive thermal anomalies were recorded in central and southern Italy, the western half of the Balkan Peninsula, southern Hungary and south-western Romania, as well as in western Turkey, southern Russia and the Maghreb countries, where this period of review was among the three warmest on our records.

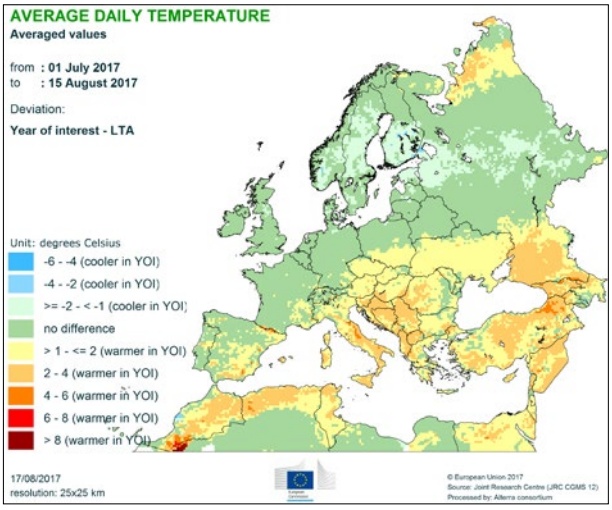
Extreme heatwaves occurred in the Iberian Peninsula, south-eastern France, Italy, Romania, Hungary, most of the Balkan Peninsula, Ukraine, Turkey and southern Russia, as well as in the Maghreb countries. In the most affected regions, the number of hot days (T_{max} > 30 °C) was 7-20 days higher than usual and on the warmest days maximum temperatures reached 37-47 °C. More than five **hot days** were also recorded in France, southern Germany, the Czech Republic, southern Poland, northern Ukraine, southern Belarus and a wide belt in central Russia. In southern Europe, typically four or five successive heatwaves occurred during the review period.

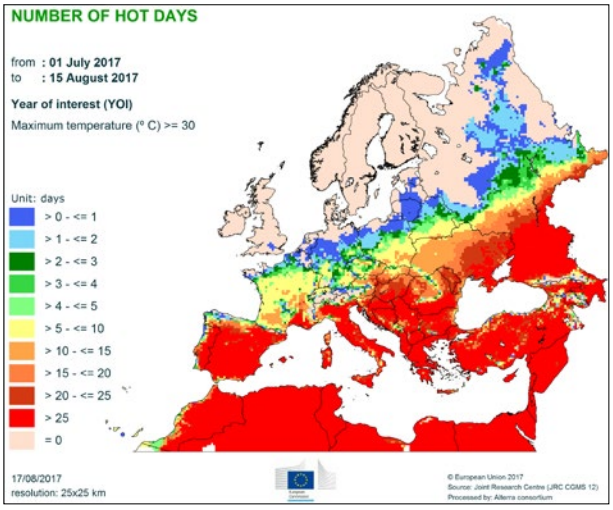
Colder-than-usual weather conditions, with mean temperature anomalies between – 2 °C and – 1 °C, occurred in considerable areas of the Scandinavian Peninsula (southern Norway, Sweden and southern Finland), parts of the Baltic countries and some regions of Russia between the Baltic Sea and the southern Urals.

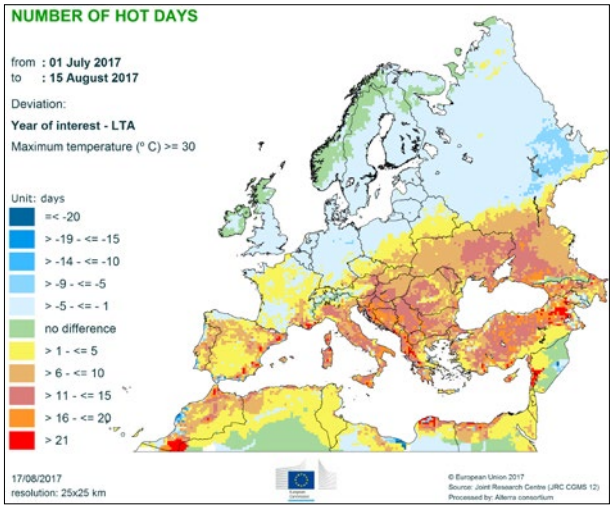
Drier-than-usual weather conditions prevailed in southern France, Italy, the western Balkan region, the Carpathian Basin, south-eastern Poland, eastern Sweden, western and eastern Ukraine and southern Russia.

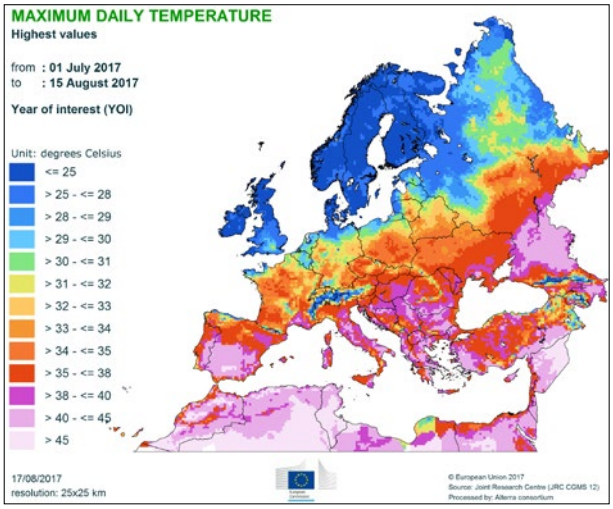
Dry conditions with less than 20 mm of cumulative rainfall occurred in the southern and western Iberian Peninsula, some coastal areas of the Italian and Balkan Peninsulas, most of Turkey and southern Russia close to the Caspian Sea, as well as in the Maghreb region.

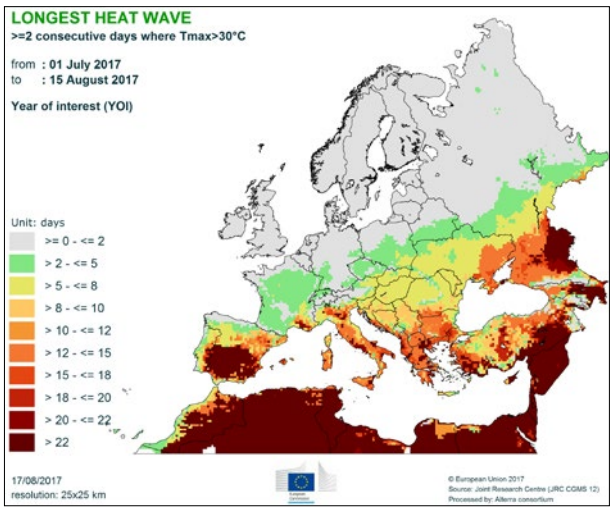
Wetter-than-usual conditions, with water surpluses exceeding 50 mm more than average cumulative precipitation, characterised the majority of the British Isles, western Scandinavia, the Netherlands, Germany, Austria, western Poland, south-eastern Romania, northern Bulgaria, some parts of eastern Greece and large parts of north- and central-eastern European Russia.

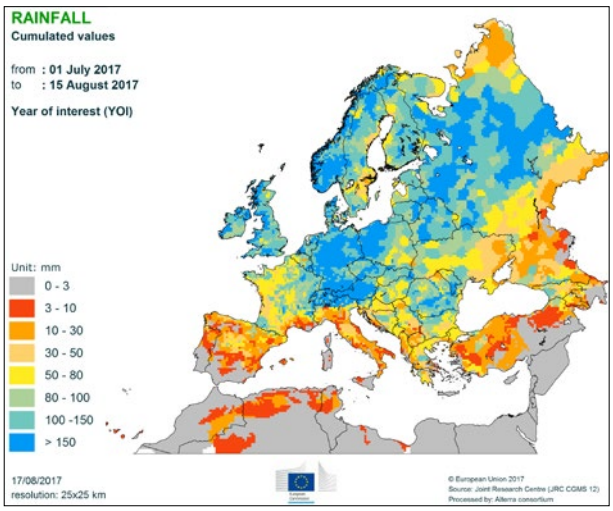


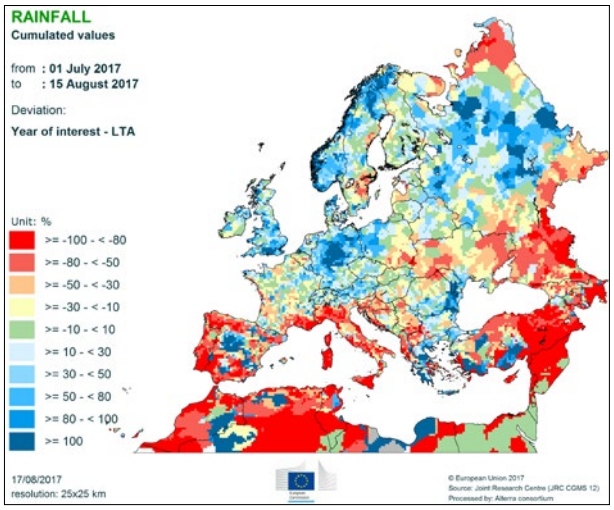


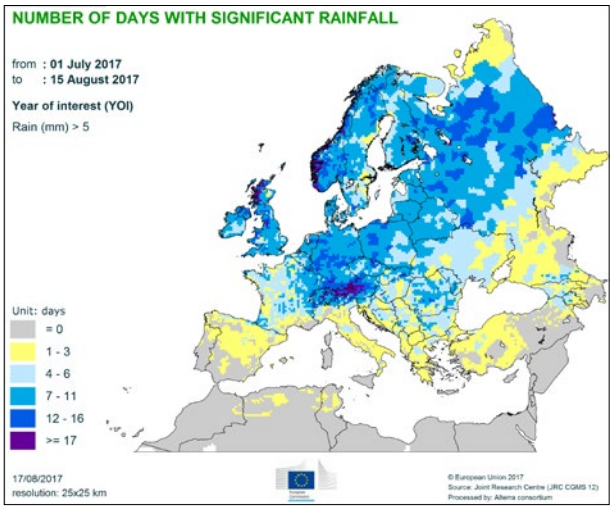

NUMBER OF HOT DAYS
from : 01 July 2017
to : 15 August 2017
Deviation:
Year of interest - LTA
Maximum temperature (° C) >= 30
Unit: days
=< -20
> -19 - <= -15
> -14 - <= -10
> -9 - <= -5
> -5 - <= - 1
no difference
> 1 - <= 5
> 6 - <= 10
> 11 - <= 15
> 16 - <= 20
> 21
17/08/2017
resolution: 25x25 km
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


MAXIMUM DAILY TEMPERATURE
Highest values
from : 01 July 2017
to : 15 August 2017
Year of interest (YOI)
Unit: degrees Celsius
<= 25
> 25 - <= 28
> 28 - <= 29
> 29 - <= 30
> 30 - <= 31
> 31 - <= 32
> 32 - <= 33
> 33 - <= 34
> 34 - <= 35
> 35 - <= 38
> 38 - <= 40
> 40 - <= 45
> 45
17/08/2017
resolution: 25x25 km
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

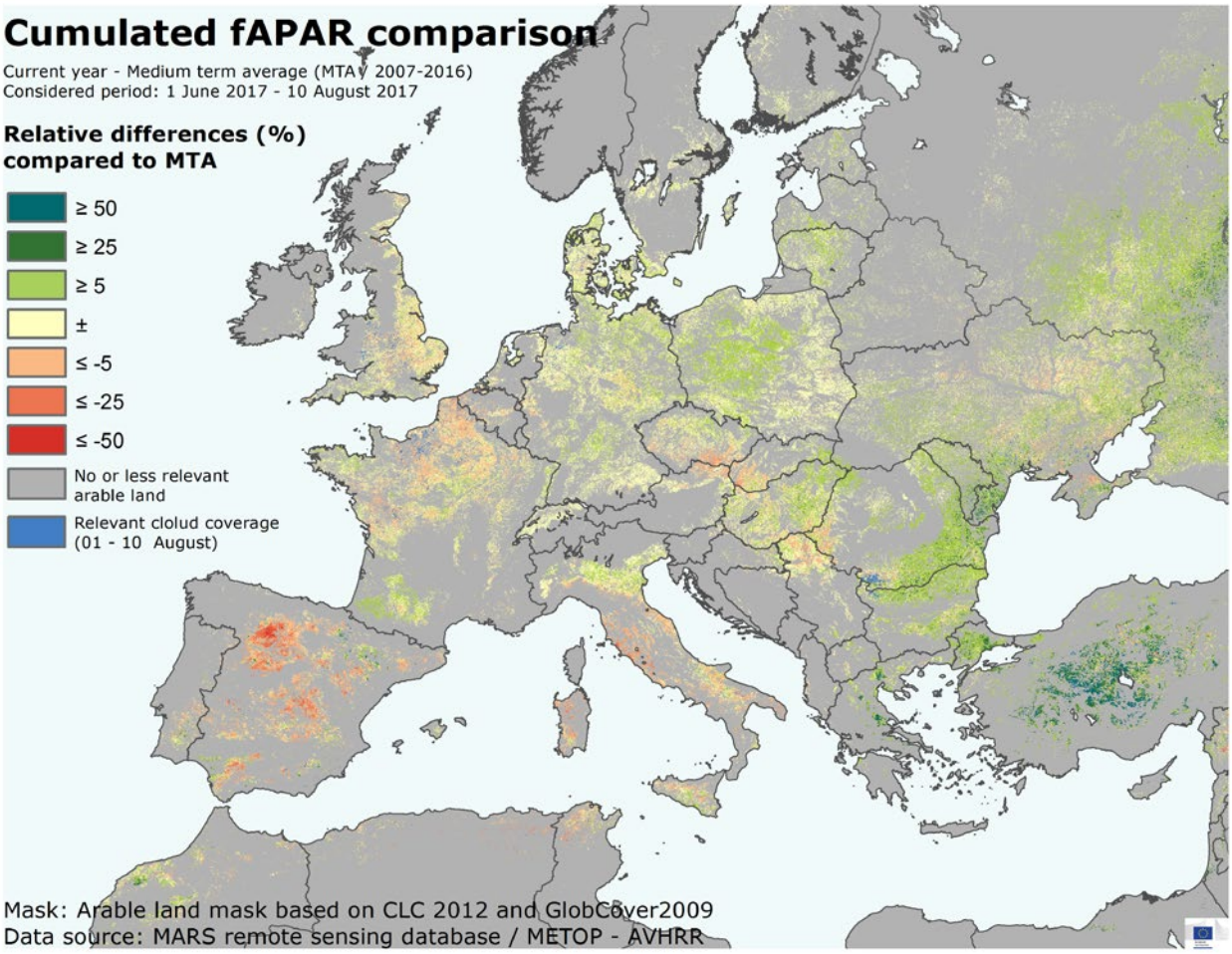

LONGEST HEAT WAVE
>=2 consecutive days where Tmax>30°C
from : 01 July 2017
to : 15 August 2017
Year of interest (YOI)
Unit: days
>= 0 - <= 2
> 2 - <= 5
> 5 - <= 8
> 8 - <= 10
> 10 - <= 12
> 12 - <= 15
> 15 - <= 18
> 18 - <= 20
> 20 - <= 22
> 22
17/08/2017
resolution: 25x25 km
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 July 2017
to : 15 August 2017
Year of interest (YOI)
Unit: mm
0 - 3
3 - 10
10 - 30
30 - 50
50 - 80
80 - 100
100 -150
> 150
17/08/2017
resolution: 25x25 km
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 July 2017
to : 15 August 2017
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
17/08/2017
resolution: 25x25 km
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 July 2017
to : 15 August 2017
Year of interest (YOI)
Rain (mm) > 5
Unit: days
= 0
1 - 3
4 - 6
7 - 11
12 - 16
>= 17
17/08/2017
resolution: 25x25 km
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

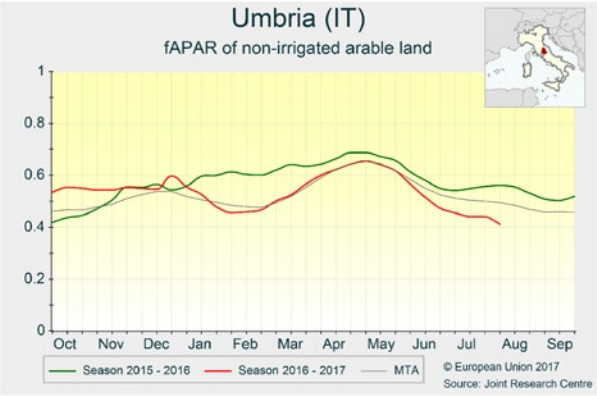
2. Observed canopy conditions by remote sensing

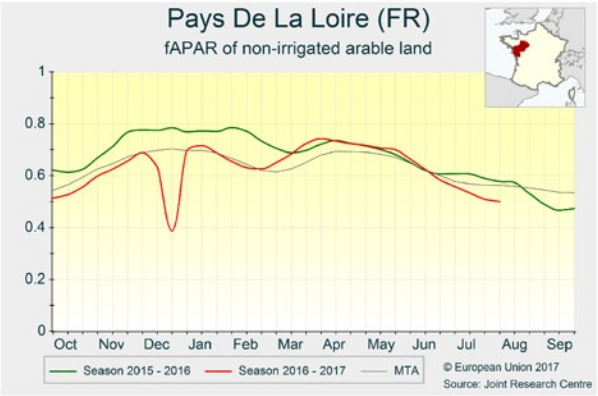


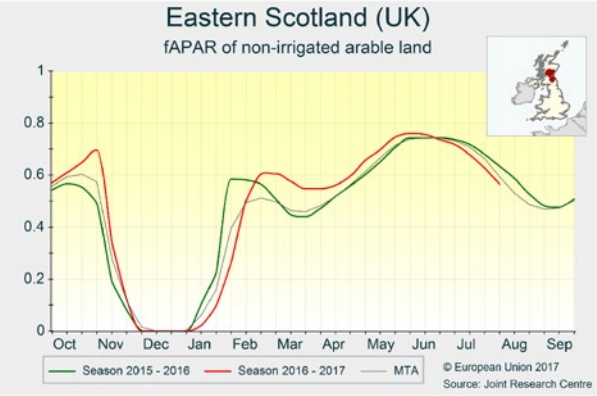
The map displays the differences between the fraction of absorbed photosynthetically active radiation (fAPAR) from 1 June to 10 August 2017, and the medium-term average (MTA, 2007-2016) for the same period. Positive anomalies (in green) reflect above-average biomass accumulation or delayed crop development, while negative anomalies (in red) reflect below-average biomass accumulation or advanced crop development.

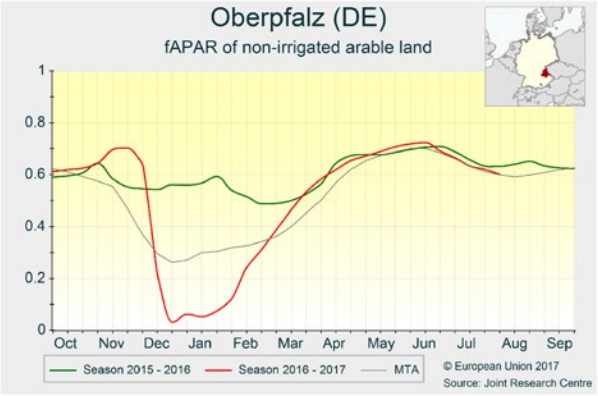
The map summarises the growing conditions since June throughout Europe. In **Spain** are visible, in green and yellow, the irrigated regions where maize, now at grain filling, has average to good biomass accumulation; highlighted in red are the regions where drought drastically reduced (non-irrigated) winter crop yields. In **Italy**, the low fAPAR values in the central regions (e.g. Umbria) display the effects of a persisting drought. In the Po valley, where most of the fields are irrigated, fAPAR anomalies indicate average biomass accumulation with slightly accelerated development. In **France**, the north-western regions present an early end of the maize season due to the higher-than-usual temperatures, which accelerated phenological development during summer (e.g. Pays de la Loire). In eastern **France**, **Belgium** and western **Germany**, the winter crop season ended early, at the beginning of July. In the **United Kingdom**, in southern and northern regions, crops reached (or are reaching) maturity slightly early compared with an average year (e.g. Eastern Scotland). In southern **Germany**, rain at the end of July compensated for a drier-than-usual summer, to the benefit of summer crops, which maintained average biomass accumulation. In eastern **Germany** and western **Poland**, summer crops were slightly favoured by warm weather, and overall biomass accumulation is now just above the average. In eastern **Poland** and in the **Baltic countries**, the initial delay in development, as a consequence of the low spring temperatures, was maintained during summer, and winter crops reached maturity at the end of July, later than usual (e.g. Mazowieckie). In central Europe (**Austria**, **Slovakia**, the **Czech Republic**) the winter crop season ended under suboptimal conditions (e.g. Jihovýchod) due to the two heatwaves that occurred in July and shortened the grain-filling period. In **Hungary** and western **Romania**, persistent hot temperatures accelerated the phenological development of summer crops, slightly shortening the grain-filling period (e.g. Macroregiunea Patru). In central and eastern **Romania** and in **Bulgaria**, summer crop development is not accelerated and crops are developing towards the end of grain filling under optimal conditions. In **Ukraine**, the summer has been drier than usual, but soil moisture has

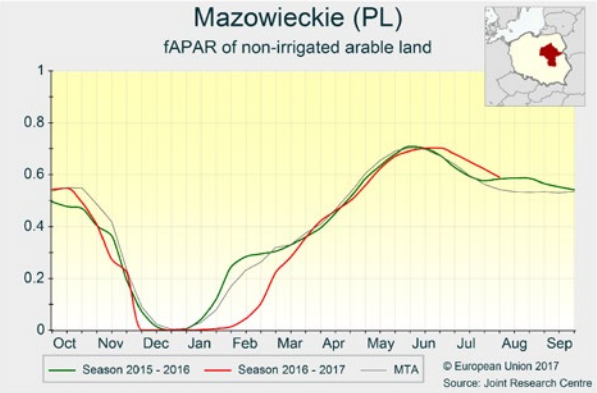
been sufficient to maintain average to good summer crop growth, as shown by fAPAR (e.g. Ternopil's'ka). In central **Turkey**, the map displays a strong positive anomaly due to the considerable delay in the winter cereal season: in those regions, harvest ended at the end of July, almost one month later than in an average year.

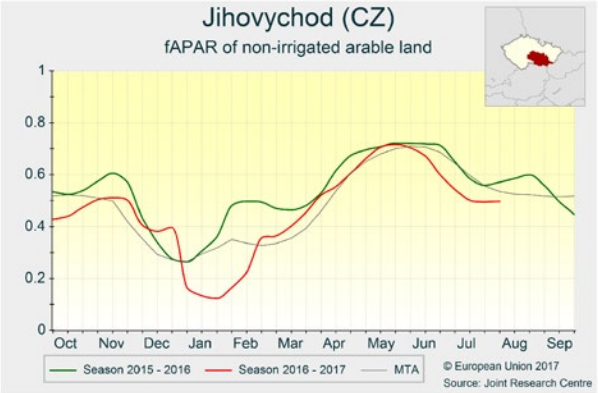


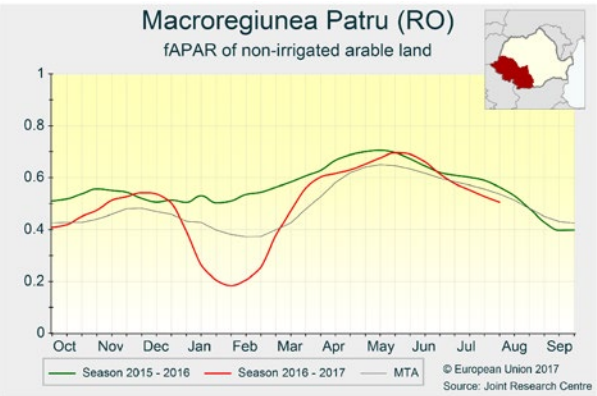


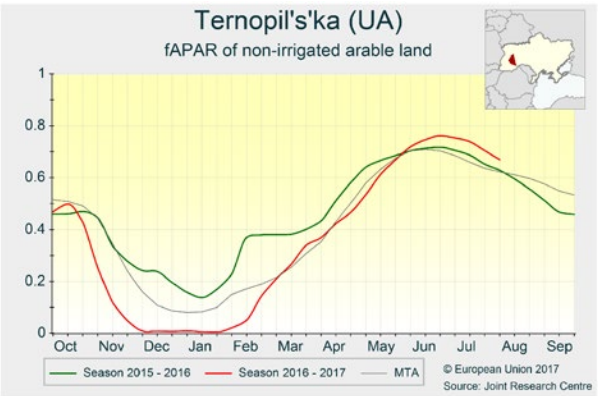










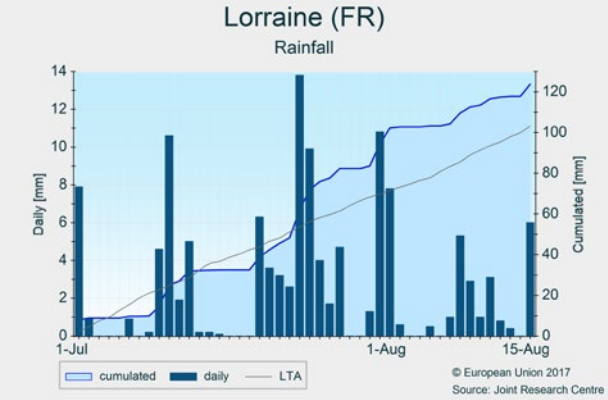


3. Country analysis

3.1. European Union

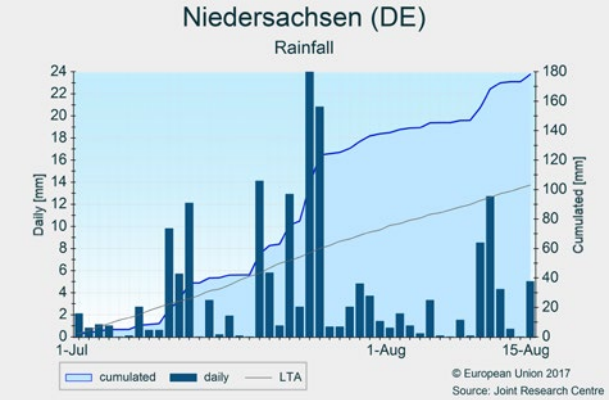
France

Since the beginning of July, rainfall has been near average, and a small rain surplus was even recorded in *Lorraine* and *Champagne-Ardennes*. The rainfall was particularly beneficial in *Lorraine* and *Pays de la Loire*, the regions most affected by the drought caused by a low winter recharge and a rain deficit in spring. Temperatures until the second dekad of July were largely above the average, but no consequences for crop yields are expected. Following the rainfall, grain maize and green maize conditions are favourable, but yield forecasts are close to the average, considering that the ongoing irrigation restrictions will limit the yields of irrigated maize. Green maize is strongly advanced compared with an average year, and the harvest has already started in *Lorraine* and *Pays de la Loire*. Sugar beet and potato yields are forecast to be slightly above the average, as the rainfall during the period of analysis was beneficial and the small rain deficit since sowing has limited disease pressure.



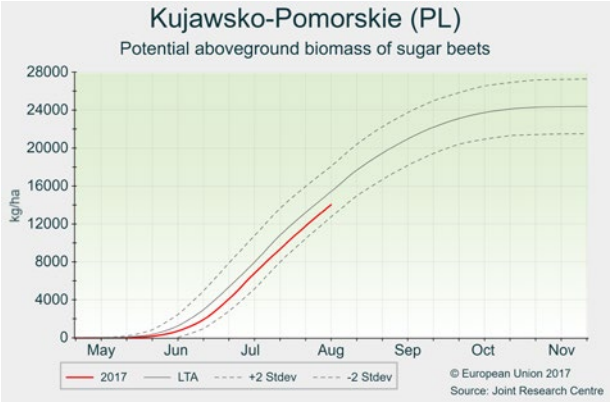
Germany

The period under review is characterised by unstable weather conditions with high rainfall amounts and fewer hot days than usual. July especially was very wet, with several extreme rainfall events and continuous rain predominantly occurring in the northern half of the country. Agricultural damage — including flooded areas, waterlogging, hampered harvesting operations and deteriorating grain quality — is reported from *Niedersachsen* in particular, but northern *Thüringen*, northern *Hessen*, *Sachsen-Anhalt* and *Brandenburg* were also affected. Temperatures showed large fluctuations, with maximum temperatures ranging from 13 °C to 36 °C. The pattern of bad weather alternating with a few sunny days continued into August. The forecast for soft wheat has been revised downwards to take into account the difficult weather conditions. For summer crops, the rainfall and the absence of extreme temperatures is considered positive.



Poland

Slightly warmer-than-usual temperatures have prevailed since the beginning of July. Rainfall in July was higher than usual in the west, whereas the eastern and southern regions were somewhat drier than usual. Heavy rainfall during the first dekad of August in the north-western regions (with the exception of Zachodniopomorskie) hampered winter cereal harvesting. In general, however, harvest operations are well advanced. Initial information from the field indicates satisfactory yields (around average), with quality occasionally negatively affected by the abundant rains. Conditions observed so far have been favourable to grain maize crops, which are at the grain-filling stage. However, the warm temperatures and almost continuous rainfall during the flowering phase (around the second to third dekads of July) created increased risks of the spread and development of fungal diseases. The outlook for sugar beet has improved somewhat compared to the last bulletin as the crop has partially recovered from the negative conditions during the first part of the growing season.

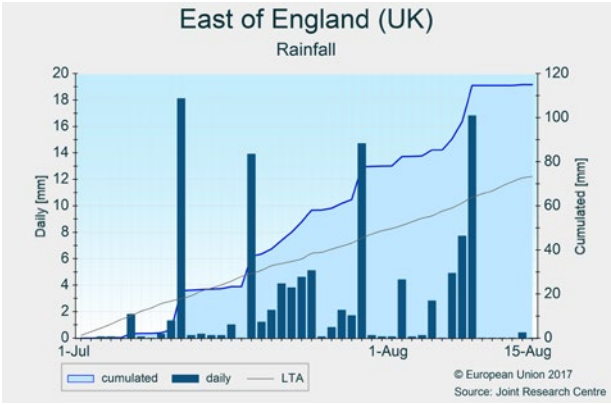


United Kingdom and Ireland

Above-average temperatures prevailed in the UK and Ireland during the first two dekads of July; below-average temperatures have prevailed since then.

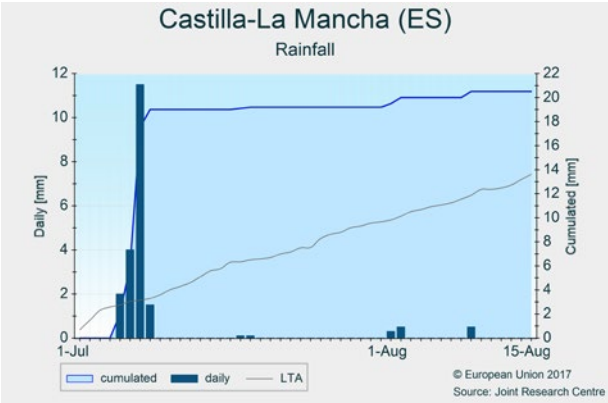
After a relatively dry first dekad of July, rainfall increased substantially, reaching cumulative levels that were above average in the UK and close to the average in Ireland. The frequent rainfall events have hampered the harvesting of winter and spring cereals, negatively affecting grain quality. Harvesting is still underway, and field results suggest around average or slightly above-average yields, in line with our forecast. However, field results reported for winter barley are very variable, and often below expectations, so far without a clear explanation. The forecast for winter barley in Ireland has consequently been revised downwards.

Oilseed rape was harvested with good yields. Sugar beet and potatoes are in good shape, and the forecasts for these crops remain close to or slightly above the 5-year average.



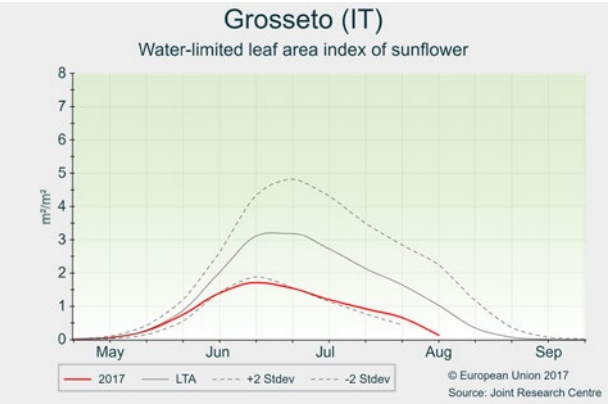
Spain and Portugal

Warm conditions prevailed over the Iberian Peninsula from July until the first week of August, with daily averages 2-3 °C above seasonal values. No significant precipitation was registered in most regions, with the exception of the northern coast of Spain and the centre (*Madrid*, the south of *Castilla y León* and the north of *Castilla-La Mancha*), where heavy thunderstorms were registered in the second week of July. The outlook for summer crops is average. Rainfall in July slightly improved sunflower conditions during grain filling. Remote sensing indicates that maize, potatoes and sugar beet have not suffered major irrigation restrictions so far.



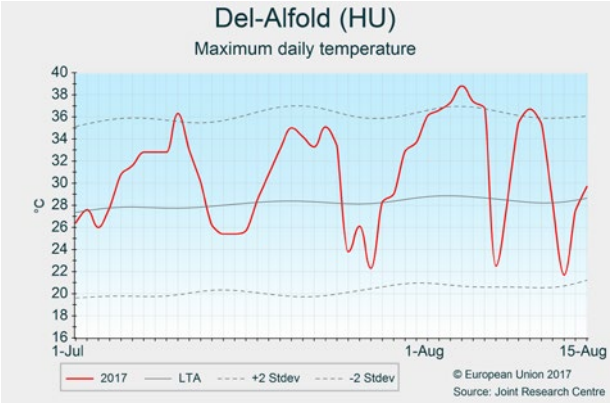
Italy

Dry and warmer-than-usual conditions have continued across Italy. Some of the most important grain-maize-producing regions, such as *Cremona*, *Ferrara* and *Rovigo*, were affected by three heatwaves. After 6 August, thunderstorms hit some important grain-maize-producing areas, including the province of Torino, the western provinces of *Emilia Romagna* and southern *Veneto*. Co-occurring hailstorms may have caused local damage. Grain maize crops are now in the middle of the grain-filling stage. Although grain maize is mostly irrigated in Italy, the hot and dry conditions that have prevailed so far have had a negative overall impact on production, and have increased the risk of fungus infection and mycotoxin contamination. Our yield forecast is further decreased. The yield expectation has also further decreased for sunflowers, because of the very dry conditions in the main regions for this crop (*Toscana* and *Le Marche*) during the growing season so far.



Hungary

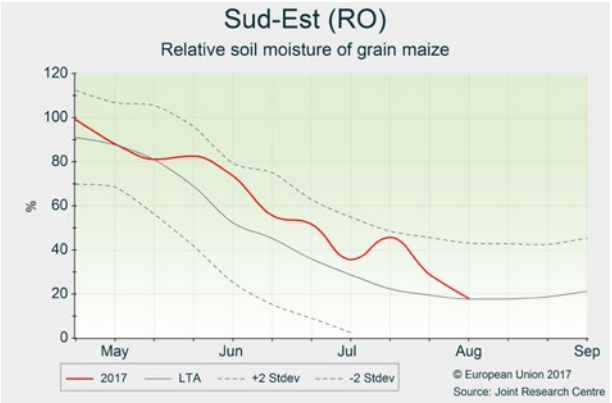
During the review period, four heatwaves occurred in Hungary and the positive thermal anomaly for the period as a whole reached 1-2.5 °C. The number of hot days (T_{max} > 30 °C) exceeded the average by 7-15 days. The hot weather shortened the grain-filling period of summer crops and led to early leaf senescence. Rain was slightly below normal but well distributed over time, thus keeping soil moisture above critical levels. The satisfactory water supply for maize and sunflower crops mitigated the negative effect of the heatwaves, and biomass accumulation is still average. Consequently, our yield forecast has been slightly revised upwards compared with the July estimate. The harvest of winter cereals progressed well and the yield outlook is above the 5-year average, but remains below the record level of 2016.



Romania

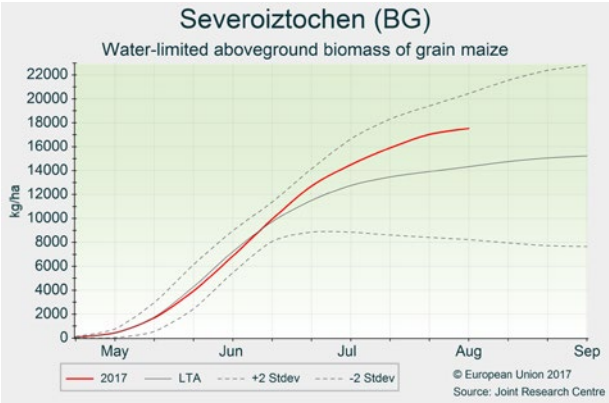
Since mid June, weather conditions have been characterised by regularly alternating warmer- and colder-than-usual periods, finally resulting in four heatwaves and five to fifteen more hot days (T_{max} > 30 °C) than usual. Precipitation totals substantially exceeded the long-term average in the main crop-producing south-eastern regions (in particular, the first and last dekad of July were exceptionally wet). By contrast, the *Centru* region and the areas along the northern border tended to be drier than usual.

Water supply conditions for summer crops have been mostly adequate along the Danube and Black Sea coast; in these regions, biomass accumulation is above average, especially in the case of grain maize. However, western and north-eastern Romania suffered from different degrees of water scarcity, and biomass accumulation is average to below average. Considering our model simulations and remote sensing information, our yield forecast at national level has been moderately revised upwards, particularly for maize.



Bulgaria

During the review period, 20 to 40 hot days (T_{max} > 30 °C) were experienced. During heatwaves, the daily maximum temperatures typically reached 33-36 °C but values up to 41 °C were recorded in the first dekad of July. As the heatwaves alternated with colder-than-usual periods, the average temperature for the period as a whole was 1-2 °C higher than usual. Precipitation moderately exceeded the average, but some areas in the *Yugoiztochen* and *Yugozapaden* regions were drier than usual. The abundant rains maintained the soil moisture content at average or above-average level. The progress of harvesting winter wheat and winter barley was considerably delayed by rains during the first dekad of July. Biomass accumulation of summer crops exceeds the average in the main maize- and sunflower-producing regions. Therefore, our yield forecast has been maintained at well above the 5-year average.

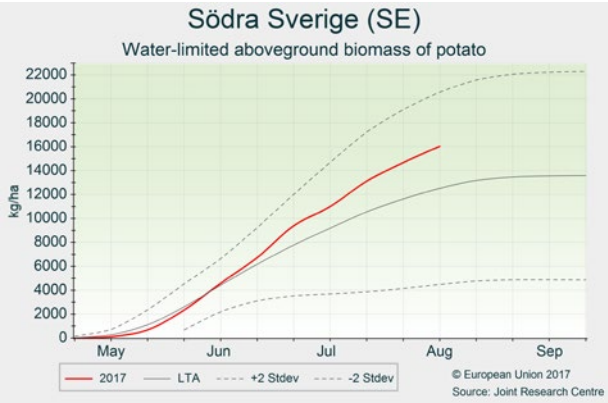


Austria, Slovakia and the Czech Republic

For the period as a whole, temperatures exceeded the long-term average by 1-2 °C. Most agricultural areas were affected by three heatwaves from the beginning of July, with maximum temperatures on the hottest days reaching between 33 °C and 38 °C. Because of the advanced development stage of grain maize, the maximum heatwave intensity coincided with the beginning of the grain-filling period. Rainfall occurred mainly in the form of thunderstorms, with high spatial variability. Cumulative amounts were above the long-term average in the western half of Austria and in eastern parts of the Czech Republic, and close to or slightly below the long-term average elsewhere. Soil moisture levels in the most drought-affected regions (*Jihomoravsky*, *Niederösterreich*, *Bratislavský kraj*, *Západné Slovensko*) remain low. The grain maize yield outlook remains below the 5-year average in the Czech Republic and Slovakia, and well below last year's levels in all three countries.

Denmark and Sweden

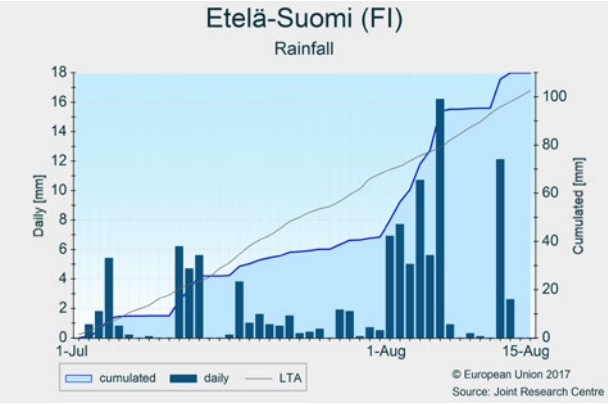
Below-average temperatures prevailed in both countries throughout the review period.
In Denmark, rainfall was below average during the first two dekads of July, after which it increased to above-average levels. This rainfall was beneficial to summer crops but hampered the harvesting of winter cereals and rapeseed. In Sweden, after a much drier-than-usual July, rainfall returned to average levels in August, but remained well below average in *Östra Sverige*.
All cereals present above-average accumulation of biomass and storage organs, and models show below-average yields for winter cereals only in *Östra Sverige*. Good yields are forecast for rapeseed. The first harvests of winter wheat started with positive yields and normal protein levels, while the harvest of spring barley is expected to take off during the coming weeks. Our yield forecast for winter and spring cereals remains positive.



Sugar beet and potato crops continue to show above-average growth. The forecast remains mainly unchanged from the July bulletin, i.e. close to average in both countries.

Finland, Lithuania, Latvia and Estonia

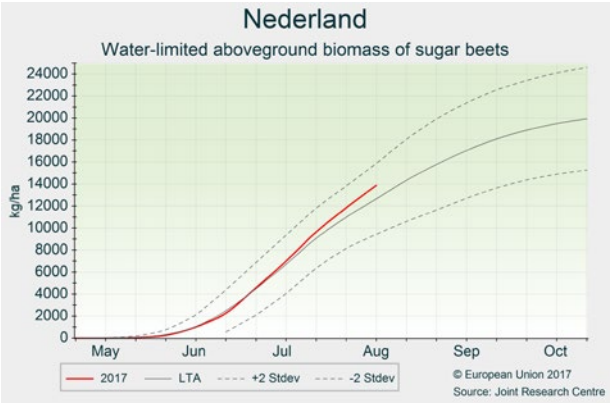
In the Baltic countries, July was marked by chilly conditions but temperatures returned to average or above average in August. The excessively wet conditions (and associated pest and disease pressures) experienced in Latvia and Lithuania during the first half of July were followed by a period of moderate, less-frequent rains. In Estonia, however, heavy thunderstorms in August may have caused crop damage. Rain-free days during August allowed harvesting to start in Lithuania and Latvia, with around one week's delay. Yield forecasts remain practically unchanged, from close to the 5-year average for winter crops to below the 5-year average for spring crops.
In Finland, chilly conditions have prevailed during most of the review period. These weather conditions are likely to extend the grain filling and ripening of spring crops, which were already delayed (by two to three weeks).



The forecasts for these crops have been revised slightly downwards but are still close to the 5-year average.

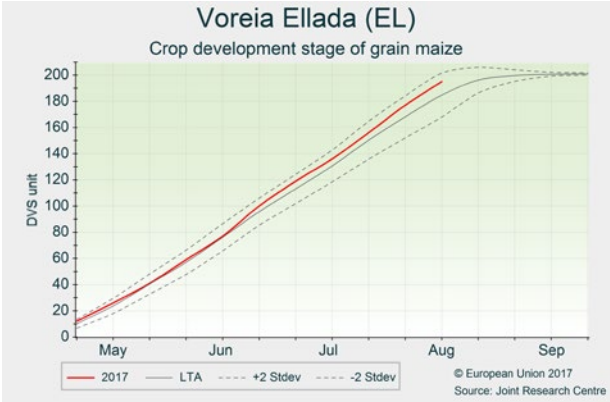
Belgium, the Netherlands and Luxembourg

Temperatures fluctuated around the seasonal average, with above-average values predominating in July and below-average values in August.
Rainfall events were frequent and regularly distributed, resulting in near- or above-average cumulative amounts in most of the region. However, in the western half of Belgium, rainfall was below average.
The harvesting of winter cereals has practically finished, about two weeks early compared with an average season. Harvesting operations generally proceeded well, albeit in 'stop-start' mode because of the frequent rains. Reports from the field of grain yield and quality are generally cautiously positive.
Summer crops benefited from the mild weather conditions and improved water supply. However, in large parts of Belgium, soil water content remains close to critical. Yield forecasts for winter crops have been maintained. The forecasts for sugar beet, grain maize, green maize and potatoes have been slightly increased.



Greece and Cyprus

In Greece, daily maximum temperatures fluctuated around 35 °C during the first half of July, slightly above the average. Around 15 July, unusual precipitation occurred — 60 mm in three days in *Kentriki Makedonia*, 90 mm in *Thessalia* — and the temperatures dropped drastically (Tmax in *Thessalia* around 18 °C). Since mid July, two heatwaves have occurred: the first at the end of July (Tmax around 35 °C) and the second during the first days of August (Tmax > 35 °C). Irrigated summer crops suffered no significant impact: the hot temperatures should have been mitigated by irrigation practices. The grain maize yield forecast remains below the 5-year average, while the forecast for sunflowers remains above the 5-year average.



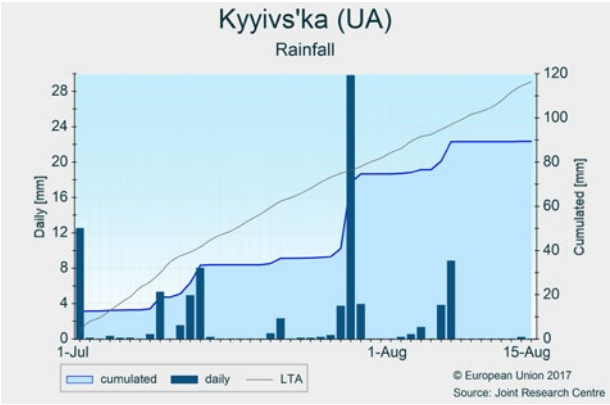
Slovenia and Croatia

With positive thermal anomalies of 2-4 °C, the period since the beginning of July has been among the five warmest in our records. Several heatwaves occurred, the most intense and longest at the end of July and beginning of August. Maximum temperatures between 38 °C and 40 °C (locally even above 40 °C) were recorded in eastern Croatia, the coastal part of Croatia and south-western Slovenia. Hot temperatures and the strong rainfall deficit have led to severe drought conditions in these regions. The sensitive stage of flowering for grain maize had already occurred during the first half of July and in many regions coincided with a heatwave with maximum temperatures above 35 °C. Hot and dry weather after flowering has further worsened growing conditions. Consequently, our maize yield outlook is well below last year's and below the 5-year average.

3.2. Black Sea Area

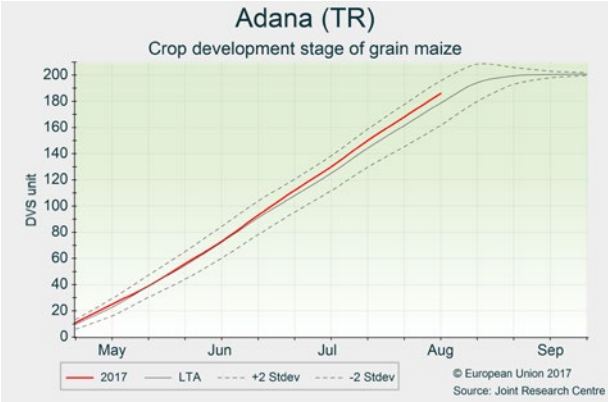
Ukraine

Aggregate rainfall during the period of analysis is close to the average in central Ukraine, but a slight deficit was recorded in eastern and western oblasts. Temperatures were close to the average until the second dekad of July and have been well above average since then. The rainfall recorded in central Ukraine was beneficial to grain maize, as it limited the impact of water stress. Maize yield is forecast to be slightly below the 5-year average. The harvest conditions for winter wheat and barley have been favourable, as there have been large windows without substantial rainfall. Wheat and barley yields are forecast to be above the 5-year average but below last year's record levels.



Turkey

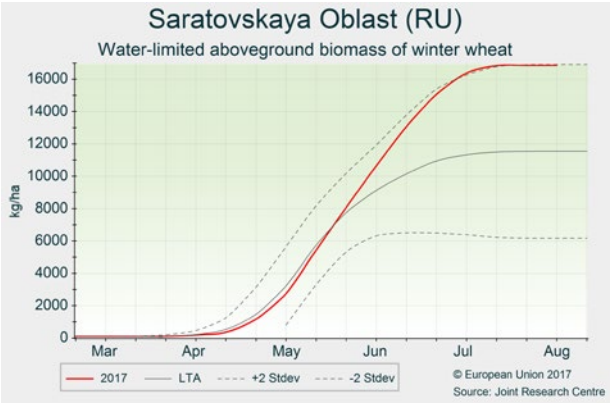
In central Anatolia, the weather in July was slightly hotter than usual, with maximum temperatures around 32 °C. Higher temperatures occasionally occurred along the western Aegean coast. Locally, crops benefited from sparse rains: up to 20 mm. In the whole Anatolia region, winter crops reached maturity and harvest was completed by the end of the month under favourable conditions. In Aegean regions (Adan), temperatures in July and August were generally slightly above average and maize development is slightly further advanced than in an average year. In south-eastern regions, maximum temperatures were generally between 35 °C and 40 °C; however, such temperatures were mitigated by irrigation and no impact is expected on grain-maize yield. The winter barley yield forecast remains slightly above the 5-year average, while the forecast for winter wheat is revised upwards thanks to the favourable end of season. The grain-maize yield is expected to be a record, slightly higher than last year.



3.3. European Russia and Belarus

European Russia

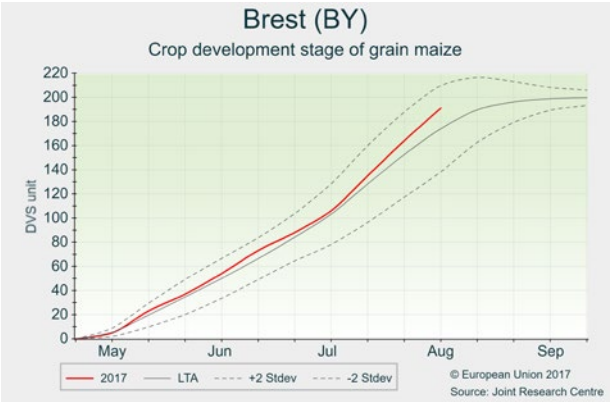
During the review period (1 July-15 August), near-normal thermal conditions characterised most of European Russia. Only the areas between the Black Sea and the Caspian Sea presented a substantial positive thermal anomaly (1-3 °C on average) and a number of hot days (Tmax > 30 °C) that exceeded the long-term average by 6-13 days. Abundant precipitation occurred in the central and northern regions, while southern Russia experienced sparse rains in July and no rain at all during the first half of August. In this cropping season, the biomass accumulation of winter wheat and spring barley has been exceptionally high because of the near-optimal water supply. The yield forecast is near a record high. The analysis of remote sensing images confirms these positive expectations. Harvesting has progressed well in southern Russia, but was slowed down by frequent and abundant rainfall in the central and eastern regions.



The yield outlook for maize is also positive, thanks to sufficient water supply during the flowering and early grain-filling period, which provided good conditions for biomass accumulation.

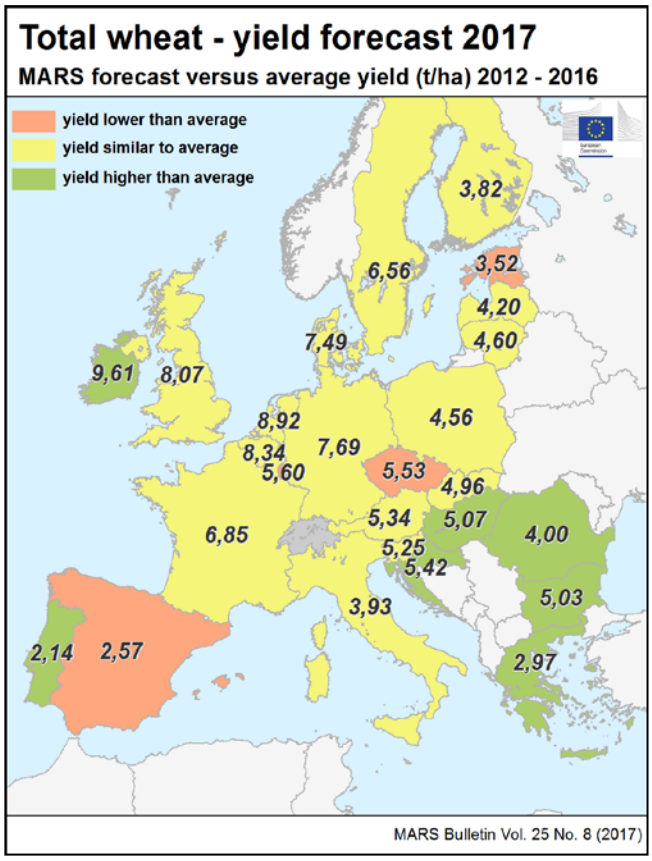
Belarus

Temperatures were slightly cooler than usual, in conjunction with higher-than-usual rainfall across the country during July. Since then, rainfall has been around the long-term average, with temperatures up to 9 °C higher than usual (e.g. the average temperature was 27 °C, compared with the long-term average of 18 °C, and a maximum temperature of 34 °C was recorded in Brest). Winter wheat reached maturity at the end of July, and yield expectations are in line with the historical trend, slightly above the 5-year average. Grain-maize development is in the second half of the grain-filling stage. The substantially higher-than-usual temperatures recorded during the two first dekads of August have accelerated grain-maize development and could result in early maturation, with consequent lower dry matter accumulation in kernels.

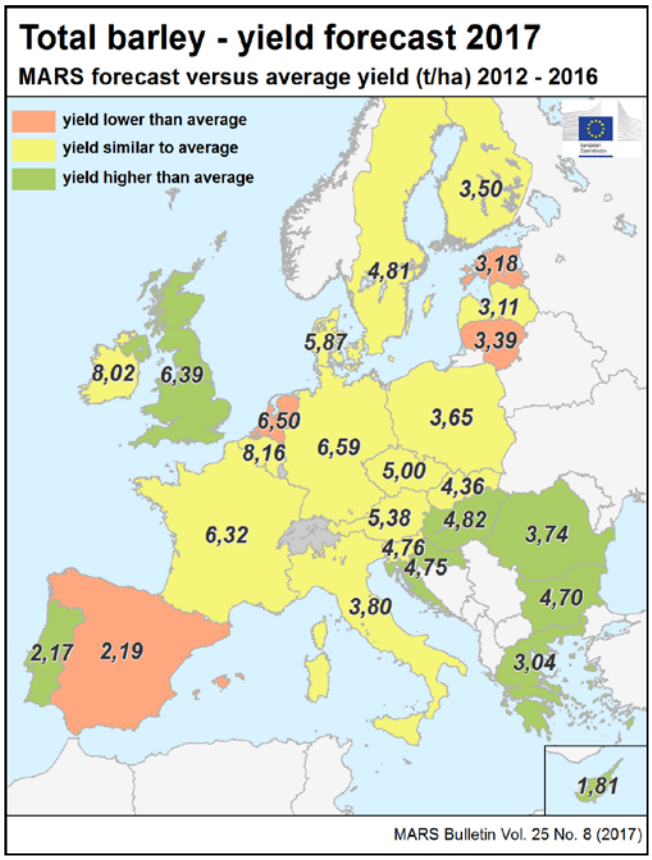


4. Crop yield forecasts

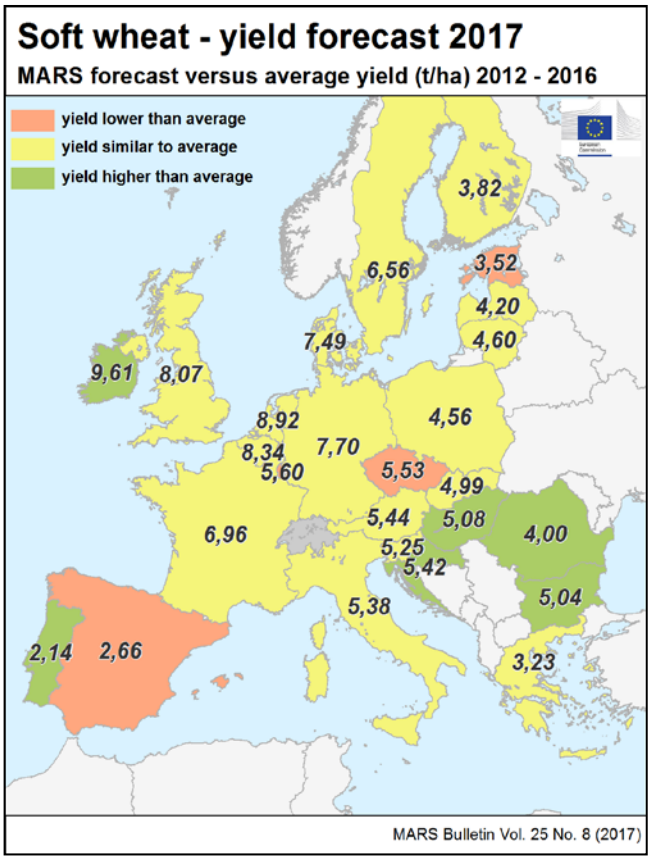
Country	TOTAL WHEAT (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	5.60	5.35	**5.61**	+ 0.1	+ 4.8
AT	5.48	6.22	**5.34**	- 2.4	- 14
BE	8.53	6.71	**8.34**	- 2.3	+ 24
BG	4.28	4.75	**5.03**	+ 18	+ 6.0
CY	-	-	**-**	-	-
CZ	5.88	6.50	**5.53**	- 6.0	- 15
DE	7.94	7.64	**7.69**	- 3.3	+ 0.6
DK	7.54	7.21	**7.49**	- 0.6	+ 4.0
EE	3.77	2.77	**3.52**	- 6.7	+ 27
ES	3.07	3.53	**2.57**	- 16	- 27
FI	3.89	3.77	**3.82**	- 1.9	+ 1.3
FR	6.94	5.30	**6.85**	- 1.4	+ 29
GR	2.83	2.35	**2.97**	+ 5.1	+ 27
HR	5.01	5.50	**5.42**	+ 8.1	- 1.4
HU	4.72	5.38	**5.07**	+ 7.4	- 5.6
IE	9.11	9.54	**9.61**	+ 5.5	+ 0.8
IT	3.96	4.20	**3.93**	-0.9	- 6.5
LT	4.66	4.36	**4.60**	- 1.2	+ 5.5
LU	5.95	5.07	**5.60**	- 6.0	+ 10
LV	4.20	4.30	**4.20**	- 0.1	-2 .5
MT	-	-	**-**	-	-
NL	8.89	8.01	**8.92**	+ 0.4	+ 11
PL	4.53	4.54	**4.56**	+ 0.7	+ 0.4
PT	1.82	2.31	**2.14**	+ 18	- 7.6
RO	3.50	3.93	**4.00**	+ 15	+ 1.7
SE	6.53	6.32	**6.56**	+ 0.4	+ 3.8
SI	5.08	5.19	**5.25**	+ 3.3	+ 1.1
SK	4.95	5.92	**4.96**	+ 0.2	- 16
UK	7.87	7.89	**8.07**	+ 2.5	+ 2.3



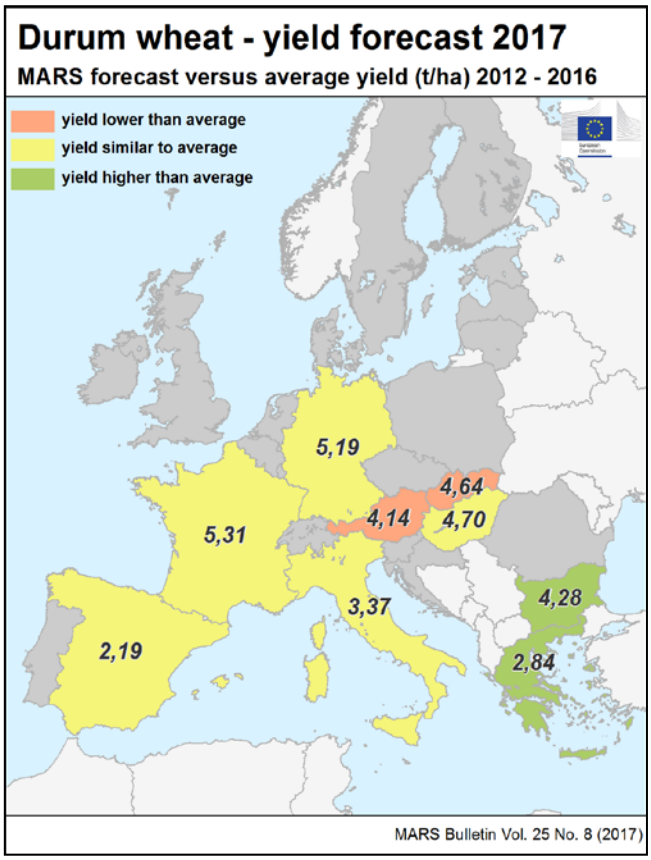
Country	TOTAL BARLEY (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	4.83	4.86	**4.74**	- 2.0	- 2.6
AT	5.39	6.12	**5.38**	- 0.2	- 12
BE	8.21	6.34	**8.16**	- 0.7	+ 29
BG	3.90	4.32	**4.70**	+ 21	+ 8.7
CY	1.72	0.70	**1.81**	+ 5.8	+ 159
CZ	5.08	5.66	**5.00**	- 1.5	- 12
DE	6.79	6.69	**6.59**	- 2.9	- 1.4
DK	5.78	5.59	**5.87**	+ 1.6	+ 5.1
EE	3.39	2.64	**3.18**	- 6.4	+ 20
ES	2.91	3.62	**2.19**	- 25	- 39
FI	3.57	3.59	**3.50**	- 2.0	- 2.4
FR	6.45	5.41	**6.32**	- 2.0	+ 17
GR	2.79	2.31	**3.04**	+ 9.0	+ 32
HR	4.46	4.72	**4.75**	+ 6.3	+ 0.6
HU	4.43	5.14	**4.82**	+ 8.9	- 6.3
IE	7.71	7.82	**8.02**	+ 4.0	+ 2.6
IT	3.81	4.13	**3.80**	- 0.2	- 8.0
LT	3.55	3.13	**3.39**	- 4.4	+ 8.2
LU	-	-	**-**	-	-
LV	3.22	2.96	**3.11**	- 3.6	+ 4.9
MT	-	-	**-**	-	-
NL	6.77	6.53	**6.50**	- 4.0	- 0.5
PL	3.71	3.72	**3.65**	- 1.6	- 1.7
PT	2.04	2.62	**2.17**	+ 6.3	- 17
RO	3.23	3.80	**3.74**	+ 16	- 1.5
SE	4.89	4.80	**4.81**	- 1.6	+ 0.1
SI	4.61	4.78	**4.76**	+ 3.3	- 0.4
SK	4.31	5.13	**4.36**	+ 1.1	- 15
UK	6.10	5.93	**6.39**	+ 4.8	+ 7.8



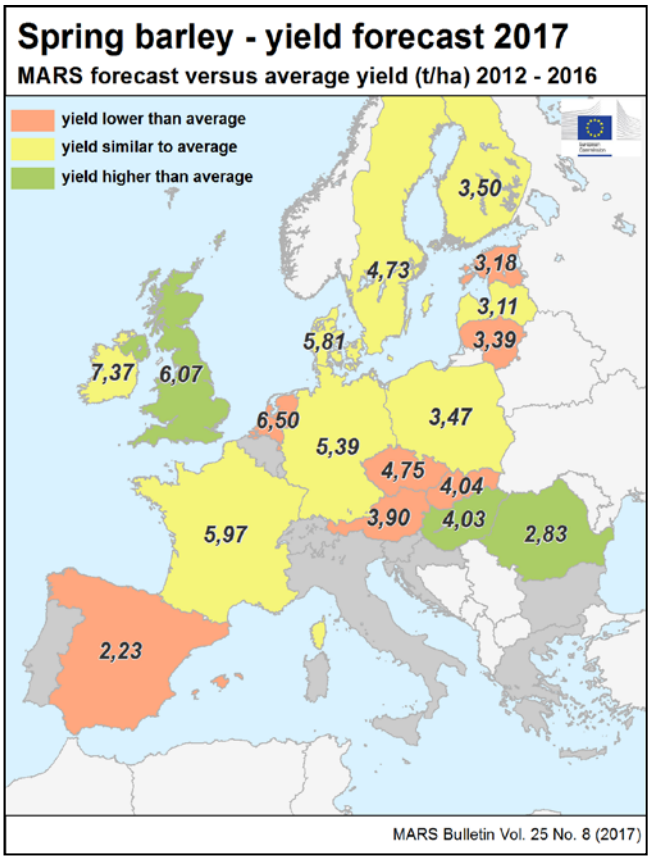
Country	SOFT WHEAT (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	5.84	5.56	**5.85**	+ 0.2	+ 5.1
AT	5.52	6.29	**5.44**	- 1.5	- 14
BE	8.53	6.71	**8.34**	- 2.3	+ 24
BG	4.29	4.75	**5.04**	+ 17	+ 6.0
CY	-	-	-	-	-
CZ	5.88	6.50	**5.53**	- 6.0	- 15
DE	7.96	7.66	**7.70**	- 3.3	+ 0.5
DK	7.54	7.21	**7.49**	- 0.6	+ 4.0
EE	3.77	2.77	**3.52**	- 6.7	+ 27
ES	3.25	3.84	**2.66**	- 18	- 31
FI	3.89	3.77	**3.82**	- 1.9	+ 1.3
FR	7.07	5.38	**6.96**	- 1.6	+ 29
GR	3.10	2.33	**3.23**	+ 4.0	+ 39
HR	5.01	5.50	**5.42**	+ 8.1	- 1.4
HU	4.72	5.39	**5.08**	+ 7.6	- 5.7
IE	9.11	9.54	**9.61**	+ 5.5	+ 0.8
IT	5.51	5.65	**5.38**	- 2.4	- 4.8
LT	4.66	4.36	**4.60**	- 1.2	+ 5.5
LU	5.95	5.07	**5.60**	- 6.0	+ 10
LV	4.20	4.30	**4.20**	- 0.1	- 2.5
MT	-	-	-	-	-
NL	8.89	8.01	**8.92**	+ 0.4	+ 11
PL	4.53	4.54	**4.56**	+ 0.7	+ 0.4
PT	1.82	2.31	**2.14**	+ 18	- 7.6
RO	3.50	3.93	**4.00**	+ 15	+ 1.7
SE	6.53	6.32	**6.56**	+ 0.4	+ 3.8
SI	5.08	5.19	**5.25**	+ 3.3	+ 1.1
SK	4.95	5.94	**4.99**	+ 0.9	- 16
UK	7.87	7.89	**8.07**	+ 2.5	+ 2.3



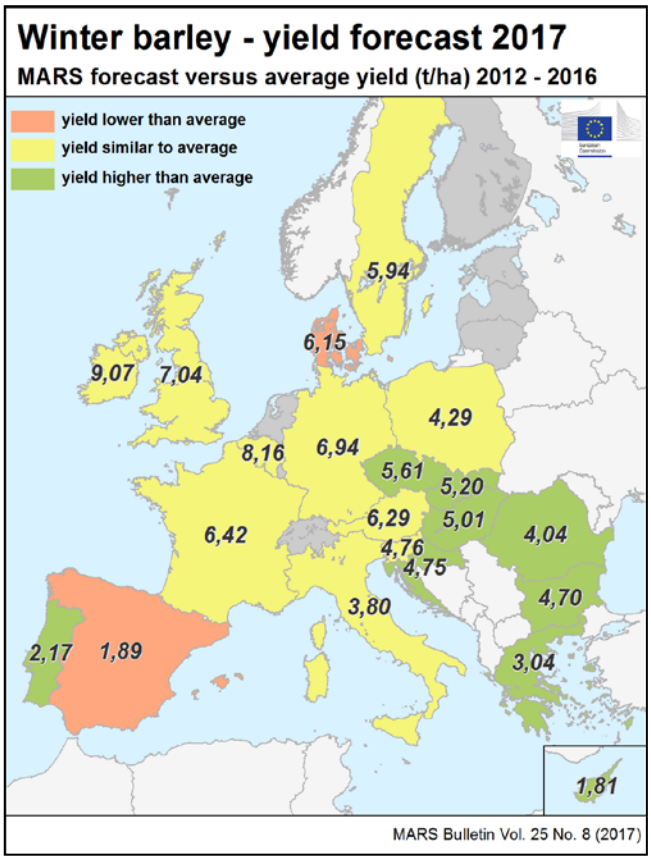
Country	DURUM WHEAT (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	3.33	3.42	**3.44**	+ 3.3	+ 0.5
AT	4.65	5.33	**4.14**	- 11	- 22
BE	-	-	-	-	-
BG	3.28	4.03	**4.28**	+ 30	+ 6.1
CY	-	-	-	-	-
CZ	-	-	-	-	-
DE	5.36	5.32	**5.19**	- 3.2	- 2.4
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	2.16	2.29	**2.19**	+ 1.4	- 4.6
FI	-	-	-	-	-
FR	5.13	4.24	**5.31**	+ 3.5	+ 25
GR	2.70	2.36	**2.84**	+ 5.4	+ 21
HR	-	-	-	-	-
HU	4.64	4.97	**4.70**	+ 1.1	- 5.6
IE	-	-	-	-	-
IT	3.28	3.65	**3.37**	+ 2.9	- 7.5
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	-	-	-	-	-
RO	-	-	-	-	-
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	4.87	5.70	**4.64**	- 4.7	- 19
UK	-	-	-	-	-



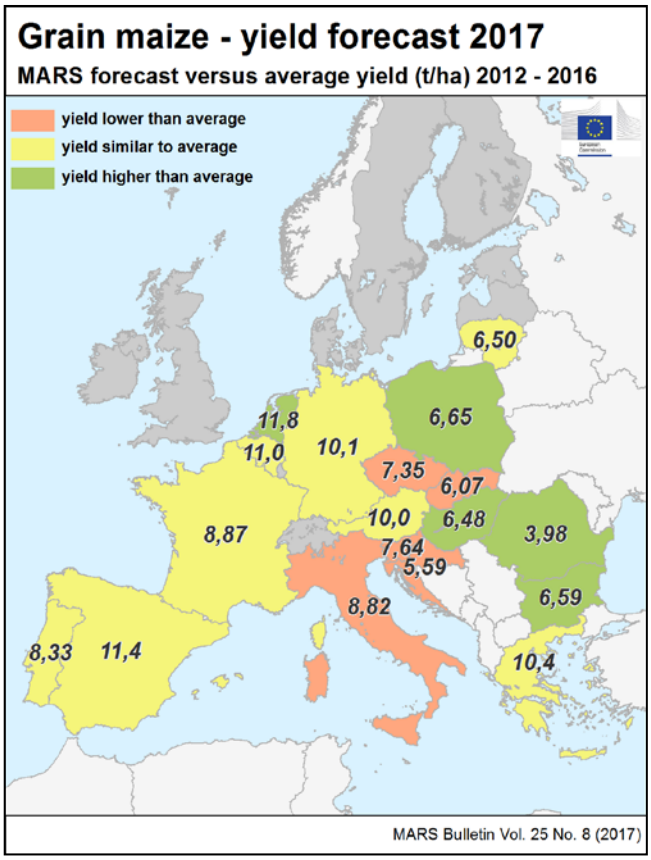
Country	SPRING BARLEY (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	4.22	4.34	**3.97**	- 6.0	- 8.4
AT	4.49	5.31	**3.90**	- 13	- 27
BE	-	-	-	-	-
BG	-	-	-	-	-
CY	-	-	-	-	-
CZ	5.05	5.45	**4.75**	- 5.9	- 3
DE	5.55	5.24	**5.39**	- 2.9	+ 2.8
DK	5.64	5.48	**5.81**	+ 2.9	+ 5.9
EE	3.39	2.64	**3.18**	- 6.4	+ 20
ES	3.00	3.74	**2.23**	- 26	- 40
FI	3.57	3.59	**3.50**	- 2.0	- 2.4
FR	6.16	5.00	**5.97**	- 3.1	+ 20
GR	-	-	-	-	-
HR	-	-	-	-	-
HU	3.55	4.18	**4.03**	+ 14	- 3.5
IE	7.17	7.29	**7.37**	+ 2.9	+ 1.1
IT	-	-	-	-	-
LT	3.55	3.13	**3.39**	- 4.4	+ 8.2
LU	-	-	-	-	-
LV	3.22	2.96	**3.11**	- 3.6	+ 4.9
MT	-	-	-	-	-
NL	6.77	6.53	**6.50**	- 4.0	- 0.5
PL	3.59	3.58	**3.47**	- 3.2	- 3.1
PT	-	-	-	-	-
RO	2.44	2.80	**2.83**	+ 16	+ 1.2
SE	4.83	4.74	**4.73**	-2.1	-0.2
SI	-	-	-	-	-
SK	4.21	5.03	**4.04**	- 4.0	- 20
UK	5.66	5.61	**6.07**	+ 7.3	+ 8.2



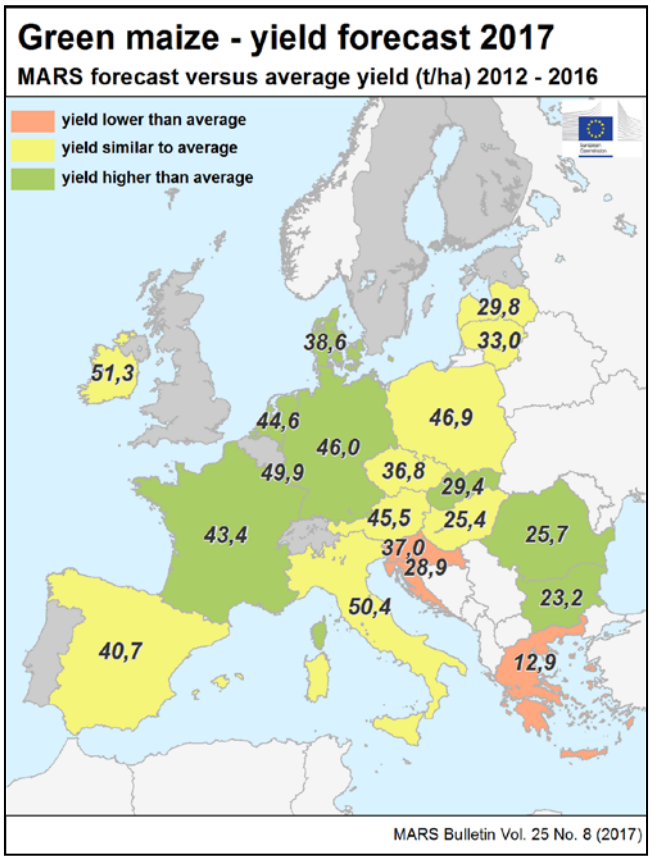
Country	WINTER BARLEY (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	5.68	5.54	**5.73**	+ 0.9	+ 3.4
AT	6.08	6.59	**6.29**	+ 3.5	- 4.5
BE	8.21	6.34	**8.16**	- 0.7	+ 29
BG	3.90	4.32	**4.70**	+ 21	+ 8.7
CY	1.72	0.70	**1.81**	+ 5.8	+ 159
CZ	5.17	6.13	**5.61**	+ 8.7	- 8.4
DE	7.20	7.07	**6.94**	- 3.7	- 1.9
DK	6.46	6.17	**6.15**	- 4.7	- 0.3
EE	-	-	-	-	-
ES	2.37	2.66	**1.89**	- 20	- 29
FI	-	-	-	-	-
FR	6.56	5.53	**6.42**	- 2.1	+ 16
GR	2.79	2.31	**3.04**	+ 9.0	+ 32
HR	4.46	4.72	**4.75**	+ 6.3	+ 0.6
HU	4.74	5.31	**5.01**	+ 5.6	- 5.7
IE	9.16	8.64	**9.07**	- 0.9	+ 5.1
IT	3.81	4.13	**3.80**	- 0.2	- 8.0
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	4.23	4.46	**4.29**	+ 1.2	- 3.9
PT	2.04	2.62	**2.17**	+ 6.3	-1 7
RO	3.52	4.13	**4.04**	+ 15	- 2.1
SE	6.09	5.77	**5.94**	- 2.5	+ 2.9
SI	4.61	4.78	**4.76**	+ 3.3	- 0.4
SK	4.73	5.37	**5.20**	+ 10	- 3.1
UK	6.88	6.43	**7.04**	+ 2.4	+ 10



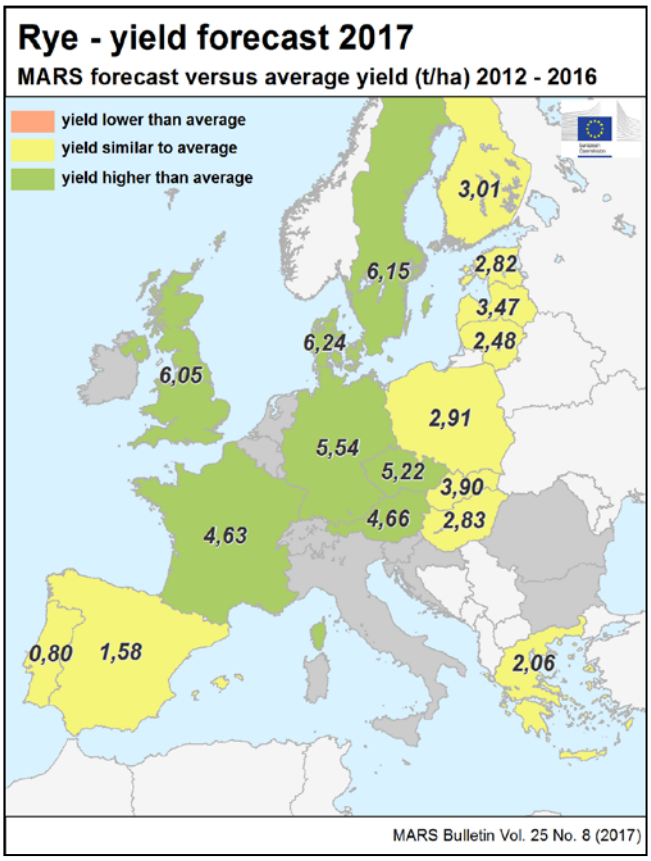
Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	6.89	7.15	**6.93**	+ 0.6	- 3.0
AT	9.92	11.2	**10.0**	+ 1.2	- 10
BE	10.6	9.23	**11.0**	+ 3.0	+ 19
BG	5.66	5.45	**6.59**	+ 16	+ 21
CY	-	-	-	-	-
CZ	7.74	9.79	**7.35**	- 5.0	- 25
DE	9.77	9.65	**10.1**	+ 3.8	+ 5.1
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	11.1	11.1	**11.4**	+ 2.0	+ 1.8
FI	-	-	-	-	-
FR	8.82	8.19	**8.87**	+ 0.5	+ 8.3
GR	10.8	10.1	**10.4**	- 3.5	+ 3.0
HR	6.46	8.41	**5.59**	- 14	- 34
HU	6.15	8.61	**6.48**	+ 5.3	- 25
IE	-	-	-	-	-
IT	9.45	10.4	**8.82**	- 6.7	- 15
LT	6.32	6.91	**6.50**	+ 2.8	- 5.9
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	10.2	7.84	**11.8**	+ 15	+ 51
PL	6.35	7.29	**6.65**	+ 4.7	- 8.8
PT	8.28	8.03	**8.33**	+ 0.5	+ 3.7
RO	3.65	3.49	**3.98**	+ 9.1	+ 14
SE	-	-	-	-	-
SI	8.00	9.54	**7.64**	- 4.5	- 20
SK	6.44	8.53	**6.07**	- 5.8	- 29
UK	-	-	-	-	-



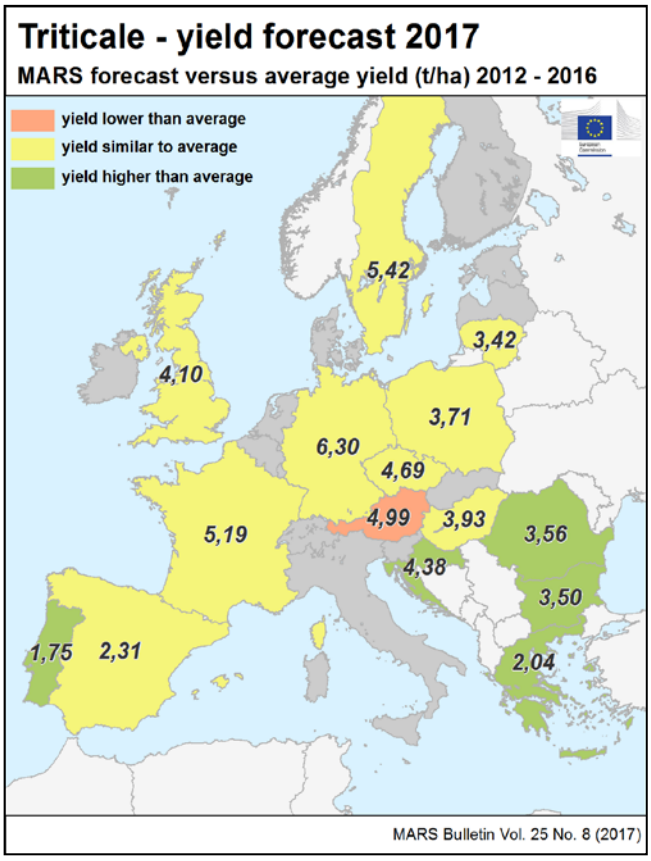
Country	GREEN MAIZE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	41.9	41.2	**43.9**	+ 4.8	+ 6.6
AT	44.7	49.3	**45.5**	+ 1.8	- 7.8
BE	-	-	-	-	-
BG	20.2	24.0	**23.2**	+ 15	- 3.4
CY	-	-	-	-	-
CZ	36.5	40.7	**36.7**	+ 0.6	- 10
DE	43.5	43.1	**46.0**	+ 5.9	+ 6.8
DK	36.0	30.6	**38.6**	+ 7.0	+ 26
EE	-	-	-	-	-
ES	41.3	40.8	**40.7**	- 1.5	- 0.4
FI	-	-	-	-	-
FR	41.2	35.6	**43.3**	+ 5.3	+ 22
GR	15.2	11.0	**12.8**	- 16	+ 17
HR	34.4	42.3	**28.9**	- 16	- 32
HU	25.7	32.5	**25.4**	- 1.2	- 22
IE	50.5	49.5	**51.3**	+ 1.6	+ 3.7
IT	51.0	53.4	**50.4**	- 1.1	- 5.5
LT	32.0	32.7	**33.0**	+ 3.1	+ 0.7
LU	45.6	42.3	**49.9**	+ 9.4	+ 18
LV	29.5	33.1	**29.8**	+ 1.2	- 9.8
MT	-	-	-	-	-
NL	42.2	40.9	**44.6**	+ 5.6	+ 9.1
PL	45.2	49.3	**46.9**	+ 3.8	- 4.9
PT	-	-	-	-	-
RO	23.9	24.5	**25.7**	+ 7.2	+ 4.8
SE	-	-	-	-	-
SI	42.8	48.7	**37.0**	- 13	- 24
SK	28.1	34.9	**29.4**	+ 4.4	- 16
UK	-	-	-	-	-



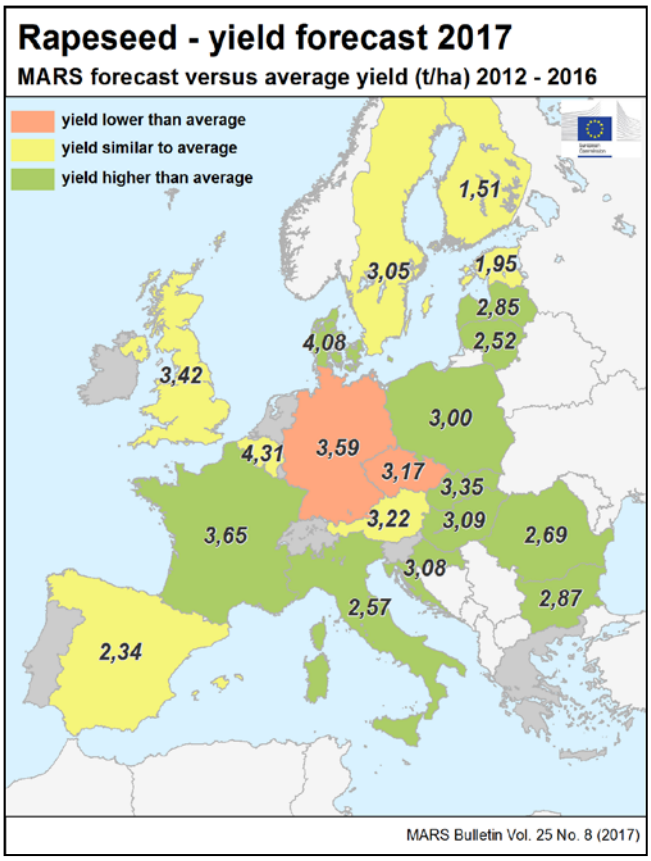
Country	RYE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	3.89	3.90	**3.81**	- 2.2	- 2.3
AT	4.49	5.05	**4.66**	+ 3.7	- 7.8
BE	-	-	-	-	-
BG	-	-	-	-	-
CY	-	-	-	-	-
CZ	4.88	4.98	**5.22**	+ 7.0	+ 4.8
DE	5.71	5.56	**5.54**	- 3.0	- 0.4
DK	5.97	5.80	**6.24**	+ 4.5	+ 7.7
EE	3.06	2.61	**2.82**	- 7.9	+ 7.8
ES	2.01	2.50	**1.58**	- 22	- 37
FI	3.19	3.38	**3.01**	- 5.7	- 11
FR	4.75	3.97	**4.63**	- 2.7	+ 17
GR	1.87	1.48	**2.06**	+ 9.9	+ 39
HR	-	-	-	-	-
HU	2.77	3.03	**2.83**	+ 1.9	- 6.6
IE	-	-	-	-	-
IT	-	-	-	-	-
LT	2.44	2.38	**2.48**	+ 1.8	+ 4.2
LU	-	-	-	-	-
LV	3.48	3.94	**3.47**	- 0.1	- 12
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	2.91	2.89	**2.91**	-0.1	+ 0.6
PT	0.85	0.90	**0.80**	- 5.5	- 11
RO	-	-	-	-	-
SE	6.19	6.12	**6.15**	- 0.7	+ 0.5
SI	-	-	-	-	-
SK	3.70	3.78	**3.90**	+ 5.6	+ 3.4
UK	3.49	1.90	**6.05**	+ 74	+ 218



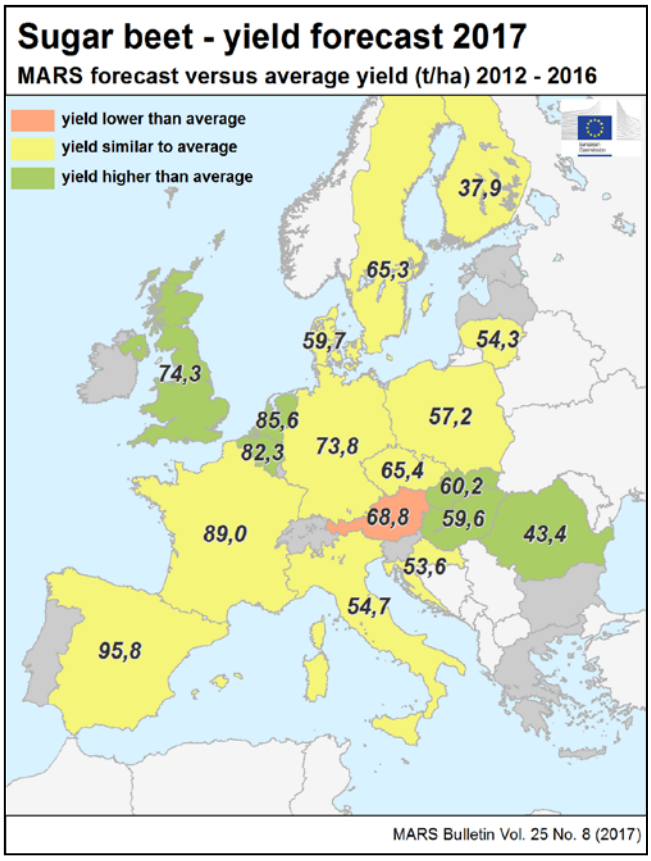
Country	TRITICALE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	4.20	3.99	**4.20**	- 0.2	+ 5.1
AT	5.44	5.88	**4.99**	- 8.3	- 15
BE	-	-	-	-	-
BG	2.95	3.06	**3.50**	+ 18	+ 14
CY	-	-	-	-	-
CZ	4.70	4.88	**4.69**	- 0.3	- 3.9
DE	6.49	6.05	**6.30**	- 3.0	+ 4.0
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	2.25	2.41	**2.31**	+ 2.9	- 4.3
FI	-	-	-	-	-
FR	5.17	4.33	**5.19**	+ 0.4	+ 20
GR	1.75	1.75	**2.04**	+ 17	+ 16
HR	4.01	4.10	**4.38**	+ 9.1	+ 6.9
HU	3.86	4.14	**3.93**	+ 1.6	-5.1
IE	-	-	-	-	-
IT	-	-	-	-	-
LT	3.43	3.28	**3.42**	- 0.4	+ 4.2
LU	-	-	-	-	-
LV	-	-	-	-	
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	3.64	3.64	**3.71**	+ 2.0	+ 2.0
PT	1.53	1.95	**1.75**	+ 14	- 10
RO	3.24	2.90	**3.56**	+ 10	+ 23
SE	5.61	5.23	**5.42**	- 3.4	+ 3.5
SI	-	-	-	-	-
SK	-	-	-	-	-
UK	4.08	3.91	**4.10**	+ 0.4	+ 4.8



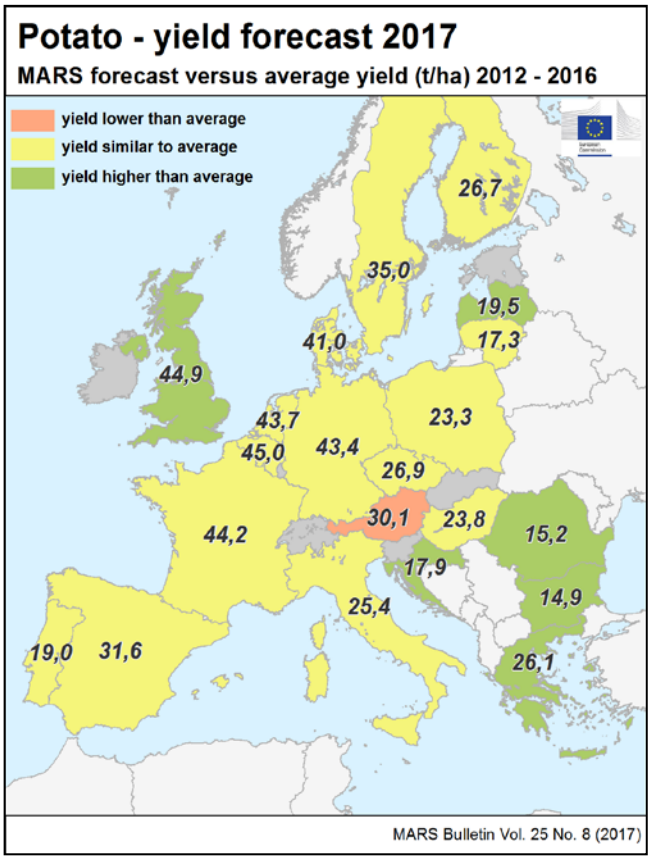
Country	RAPE AND TURNIP RAPE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	3.24	3.00	**3.27**	+ 0.8	+ 8.8
AT	3.26	3.58	**3.22**	- 1.4	- 10
BE	4.15	3.44	**4.31**	+ 3.9	+ 25
BG	2.58	2.95	**2.87**	+ 11	- 2.9
CY	-	-	-	-	-
CZ	3.41	3.46	**3.17**	- 6.9	- 8.3
DE	3.90	3.45	**3.59**	- 8.1	+ 3.8
DK	3.88	3.10	**4.08**	+ 5.2	+ 32
EE	2.02	1.46	**1.95**	- 3.6	+ 33
ES	2.36	2.58	**2.34**	- 0.7	- 9.1
FI	1.49	1.54	**1.51**	+ 1.5	- 2.0
FR	3.29	2.77	**3.65**	+ 11	+ 31
GR	-	-	-	-	-
HR	2.88	3.11	**3.08**	+ 6.9	- 0.9
HU	2.95	3.44	**3.09**	+ 4.9	- 10
IE	-	-	-	-	-
IT	2.37	2.57	**2.57**	+ 8.4	+ 0.0
LT	2.39	2.60	**2.52**	+ 5.3	- 3.1
LU	-	-	-	-	-
LV	2.61	2.83	**2.85**	+ 9.1	+ 0.6
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	2.88	2.68	**3.00**	+ 4.3	+ 12
PT	-	-	-	-	-
RO	2.54	2.84	**2.69**	+ 5.6	- 5.4
SE	3.10	2.89	**3.05**	- 1.5	+ 5.5
SI	-	-	-	-	-
SK	2.88	3.46	**3.35**	+ 16	- 3.2
UK	3.40	3.07	**3.42**	+ 0.6	+ 12



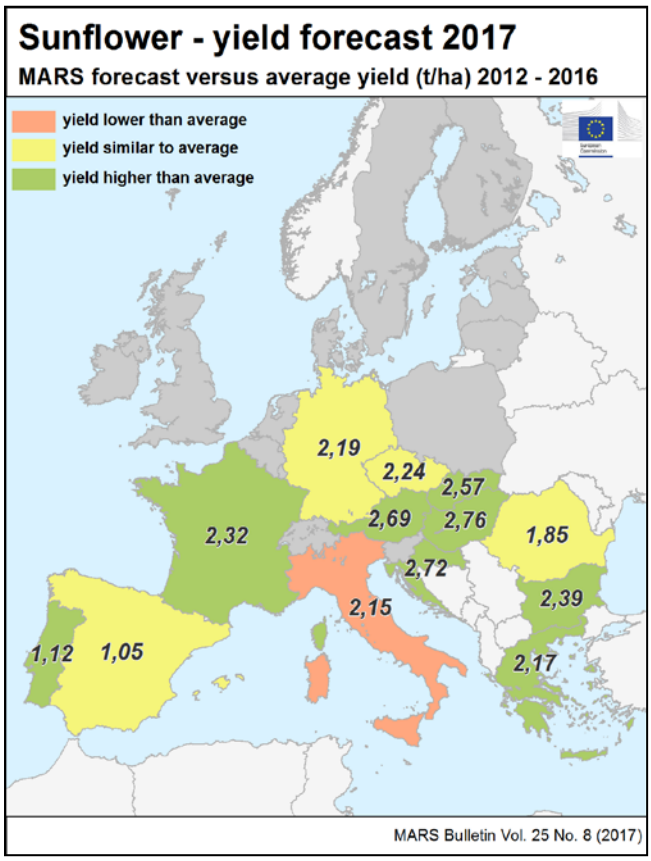
Country	SUGAR BEETS (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	72.0	74.4	**74.7**	+ 3.7	+ 0.4
AT	71.8	81.3	**68.8**	- 4.2	- 15
BE	77.2	72.5	**82.3**	+ 6.5	+ 14
BG	-	-	-	-	-
CY	-	-	-	-	-
CZ	64.2	67.8	**65.4**	+ 1.8	- 3.6
DE	72.1	76.2	**73.8**	+ 2.3	- 3.2
DK	60.9	51.3	**59.7**	- 2.1	+ 16
EE	-	-	-	-	-
ES	92.5	95.7	**95.8**	+ 3.6	+ 0.1
FI	38.1	37.3	**37.9**	- 0.6	+ 1.5
FR	87.4	83.9	**89.0**	+ 1.9	+ 6.1
GR	-	-	-	-	-
HR	52.1	NA	**53.6**	+ 2.9	NA
HU	57.2	67.5	**59.6**	+ 4.2	- 12
IE	-	-	-	-	-
IT	55.6	NA	**54.7**	- 1.5	NA
LT	54.1	61.3	**54.3**	+ 0.3	- 11
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	80.6	77.8	**85.6**	+ 6.2	+ 10
PL	55.9	65.8	**57.2**	+ 2.3	- 13
PT	-	-	-	-	-
RO	37.5	39.9	**43.3**	+ 16	+ 8.6
SE	63.9	65.0	**65.3**	+ 2.2	+ 0.4
SI	-	-	-	-	-
SK	56.8	70.2	**60.2**	+ 5.9	- 14
UK	71.0	66.0	**74.3**	+ 4.6	+ 13



Country	POTATO (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	32.6	33.9	**33.3**	+ 2.2	- 2.0
AT	31.4	36.2	**30.1**	- 4.0	- 17
BE	45.9	38.2	**45.0**	- 2.0	+ 18
BG	13.3	13.6	**14.9**	+ 12	+ 10
CY	-	-	-	←···	-
CZ	26.5	29.9	**26.9**	+ 1.4	- 10
DE	44.1	44.4	**43.4**	- 1.6	- 2.4
DK	41.8	42.4	**41.0**	- 2.0	- 3.2
EE	-	-	-	-	-
ES	30.9	30.7	**31.5**	+ 2.2	+ 2.9
FI	26.6	27.1	**26.7**	+ 0.5	- 1.5
FR	42.7	39.0	**44.2**	+ 3.3	+ 13
GR	25.0	27.5	**26.1**	+ 4.2	- 5.0
HR	17.2	NA	**17.9**	+ 4.2	NA
HU	24.1	24.6	**23.8**	- 1.1	- 3.3
IE	-	-	-	-	-
IT	26.2	NA	**25.4**	- 3.2	NA
LT	16.8	16.0	**17.3**	+ 2.9	+ 8.1
LU	-	-	-	-	-
LV	18.6	18.8	**19.5**	+ 4.7	+ 3.8
MT	-	-	-	-	-
NL	43.4	42.9	**43.7**	+ 0.6	+ 1.9
PL	23.8	28.5	**23.3**	- 2.1	- 18
PT	18.7	18.8	**19.0**	+ 1.9	+ 1.0
RO	14.3	14.2	**15.2**	+ 6.0	+ 6.7
SE	34.3	35.7	**35.0**	+ 2.2	- 2.0
SI	-	-	-	-	-
SK	-	-	-	-	-
UK	42.1	45.0	**44.9**	+ 6.7	- 0.3



Country	SUNFLOWER (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	1.94	2.06	**2.07**	+ 6.3	+ 0.2
AT	2.53	3.29	**2.69**	+ 6.4	- 19
BE	-	-	-	-	-
BG	2.15	2.20	**2.39**	+ 11	+ 8.6
CY	-	-	-	-	-
CZ	2.32	2.85	**2.24**	- 3.7	- 22
DE	2.18	2.14	**2.19**	+ 0.4	+ 2.6
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	1.05	0.99	**1.05**	- 0.4	+ 5.4
FI	-	-	-	-	-
FR	2.18	2.16	**2.32**	+ 6.2	+ 7.1
GR	1.95	2.11	**2.17**	+ 12	+ 3.0
HR	2.55	2.81	**2.72**	+ 6.5	- 3.2
HU	2.55	2.95	**2.76**	+ 8.4	- 6.4
IE	-	-	-	-	-
IT	2.26	2.42	**2.15**	- 4.8	- 11
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	0.93	1.30	**1.12**	+ 21	- 14
RO	1.83	1.92	**1.85**	+ 0.8	- 4.0
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	2.47	2.94	**2.57**	+ 4.2	- 13
UK	-	-	-	-	-



Country	WHEAT (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
BY	3.66	3.71	**3.69**	+ 1.0	- 0.4
TR	2.69	2.71	**2.85**	+ 5.8	+ 5.1
UA	3.69	4.21	**4.01**	+ 8.6	- 4.8

Country	BARLEY (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
BY	3.44	3.50	**3.61**	+ 5.0	+ 3.1
TR	2.63	2.48	**2.69**	+ 2.3	+ 8.3
UA	2.73	3.30	**3.31**	+ 21	+ 0.4

Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
BY	5.26	5.33	**5.04**	- 4.0	- 5.4
TR	8.83	9.42	**9.73**	+ 10	+ 3.3
UA	5.84	6.60	**5.83**	- 0.2	- 12

Note: Yields are forecast for crops with more than 10 000 ha per country.

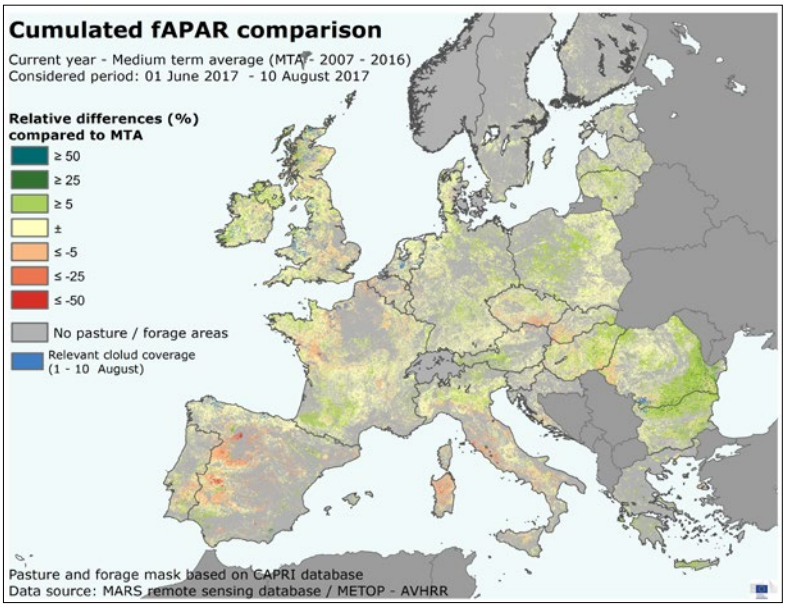
Sources: 2017 yields come from MARS Crop Yield Forecasting System (output up to 10 August 2017). For EU Member States the reported humidity levels are generally between 65 and 70 %.
* The EU figures do not include green maize forecasts for Belgium, Portugal, Sweden and the United Kingdom since recent data on yields were not available.
EU. 2012-2017 data come from DG Agriculture and Rural Development short-term outlook data (dated July 2017, received on 31 July 2017),Eurostat Eurobase (last update: 2 August 2017) and EES (last update: 14 July 2017).
Non-EU. 2012-2016 data come from USDA, Turkish Statistical Institute (TurkStat), Eurostat Eurobase (last update: 2 August 2017), State Statistics Service of Ukraine, FAO and PSD online.

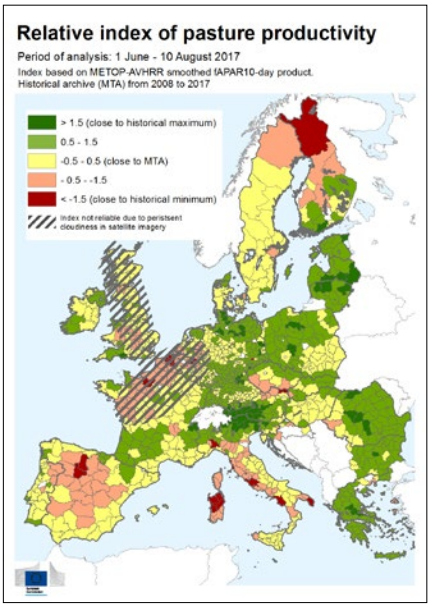
NA = Data not available.

5. Pastures in Europe — regional monitoring

Drought constrains biomass production in Italy

The conditions for pastures and fodder maize have deteriorated in many parts of northern Italy because of the lack of precipitation. Conditions were favourable for pasture growth in central and eastern Europe, with the exception of the south of the Czech Republic and north-eastern Austria. Grassland conditions improved in the Baltic Sea region.





Methodological note

The relative index of pasture productivity is a synthetic indicator of biomass formation based on the integration of the fAPAR (fraction of absorbed photosynthetically active radiation) remote sensing product, for pasture areas at country level over a certain period of interest (in this bulletin, from 1 June to 10 August). The spatial aggregation from remote sensing image pixels to a country-level index was made using a pastures mask from the Common Agricultural Policy Regionalised Impact model (CAPRI, http://www.capri-model.org). The index shows the relative position of the current season within the historical series from 2008 to 2016, and its values range approximately from 3 to 3. A value of 0 indicates that biomass production in the current season is similar to the long-term average. Values higher than 2 and below – 2 indicate that biomass production in the current season is close to, respectively, the historical maximum and minimum of the 2008-2015 period.

Drought affects pasture growth in the Iberian Peninsula and Italy

Exceptionally high temperatures and lack of rainfall in the *Dehesa* area between **Spain** and **Portugal** in most of spring led to an early end of the grassland season, in June, about one month earlier than usual. In the Cantabrian coastline region (*Asturias*, *Cantabri*a, *Galicia*, *País Vasco*), weather conditions in spring and summer were not as dry as in the rest of the peninsula, and pasture productivity since June is close to the medium-term average.

In most of **Italy**, the dry and hot conditions observed in late spring are persisting during summer, constraining pasture productivity. More recently, pasture conditions have particularly deteriorated in the north, in the provinces along the *Po* valley (e.g. *Alessandria*, *Piacenza*, *Parma*), where grasslands and fodder-maize areas exhibit a severe decrease in biomass production. Only in the northernmost provinces close to the Alps do grasslands present a positive status, thanks to sufficient rainfall in July.

Favourable conditions in north-western Europe

The weather has been more humid than usual in the **UK** and **Ireland** since mid July, with temperatures slightly lower than usual. Therefore, soil moisture has significantly increased, favouring grassland productivity, and depicting a positive outlook for the second half of August and September. Nevertheless, the Pasture Productivity Index presents negative values in some areas (reddish colours on the maps) that do not correspond to a decrease in biomass production, but are a consequence of an artefact in remote sensing images due to persistent cloudiness since mid July.
A similar artefact caused by low quality of remote sensing observations is noticed in northern **France** and **Belgium**, where cloudiness has been continuous since mid July. Cumulative precipitation in that period has been below seasonal values, but evaporative demand has also been lower than usual because of the mild temperatures. Therefore, pasture conditions are probably close to the medium-term average, but this can be confirmed only once clean satellite imagery is available.
In the southern half of **France**, biomass production in the main grassland areas is above the average, thanks to sufficient precipitation and slightly higher-than-usual temperatures in July and the first half of August. Weather conditions were also favourable for pasture growth in the **Netherlands**, following abundant precipitation in July.

High biomass production in most of central Europe

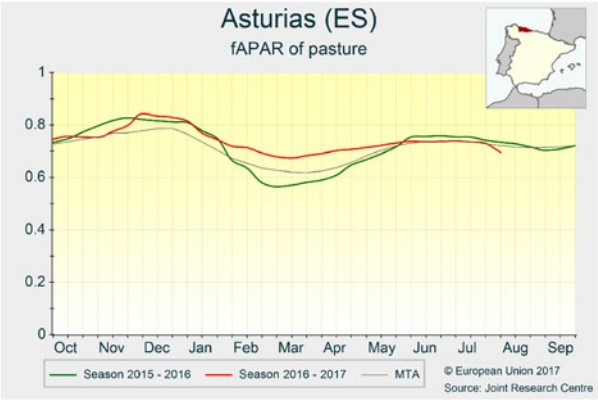
Abundant precipitation and temperatures close to seasonal values in July and August favoured high biomass production rates in the main grassland and fodder-maize areas of **Germany**. Soil moisture has increased — especially in the south-east (e.g. *Niederbayern*, *Oberbayern*), where May and June were rather dry — which also suggests a positive outlook until the end of the summer. Pasture conditions are also favourable in **Slovakia** and the north of the **Czech Republic**, thanks to sufficient rainfall in July and the first half of August.
By contrast, in the south of the Czech Republic (*Jihovýchod*, *Jihozápad*) and the north-east of Austria (*Weinviertel*), exceptionally high temperatures since June have led to a sharp decrease in photosynthetic activity in grasslands. Heavy rainfall in the third week of July brought some relief to the region, but the expectations for the second half of August remain below average.
In central and western regions of **Austria**, grassland growth is exceptionally high, thanks to the abundant rainfall and above-average temperatures registered since July.

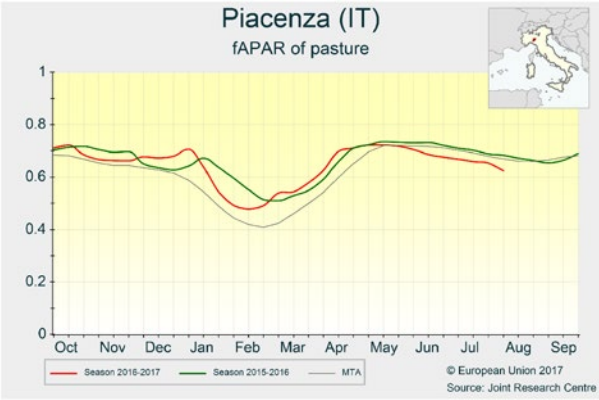
Grassland growth accelerates in the Baltic Sea area

After a delayed start to the growing season due to unusually low temperatures in April and May, grassland growth increased progressively from June onwards in **Lithuania**, **Latvia**, **Estonia** and southern **Finland**. In all these countries, temperatures in July were slightly lower than usual, but sufficient to support above-average biomass formation. Soil moisture in these countries is adequate and the outlook for the end of August is positive. Pasture growth is also favourable in **Sweden** and **Denmark**, thanks to the substantial rainfall registered at the end of July and in the first week of August.
In **Poland**, central and northern grassland areas exhibited high biomass production levels from July to mid August, favoured by humid weather conditions. By contrast, in the south-east (e.g. Podkarpackie, Małopolskie), cumulative rainfall since July has been exceptionally low, leading to emerging water stress. Precipitation in the second half of August will be needed to avoid significant damage in that area.

Positive pasture season in Romania and Bulgaria, average conditions in Hungary

Above-average temperatures and sufficient precipitation in **Romania** and **Bulgaria** have led to a significant increase in biomass production rates since June. The status of grasslands is particularly favourable in the Danube basin, where soil moisture has been unusually high thanks to abundant rainfall in June. Only on the border between Romania and Hungary (e.g. *Arad*, *Timis*, *Észak-Alföld*) has an early senescence of pastures been observed since mid July, due to the hot temperatures (daily maxima persistently above 30 °C) and scarce rainfall in June and July.
In central and western **Hungary**, grassland productivity has been close to the medium-term average. The considerable precipitation at the end of June and July was critical to prevent water stress after a rather dry end to the spring. Presently, evaporative demand in grasslands is high, as weather conditions are unusually warm. Rainfall in the second half of August will be needed to maintain the current average production levels.


Asturias (ES)
fAPAR of pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre


Piacenza (IT)
fAPAR of pasture
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0.8
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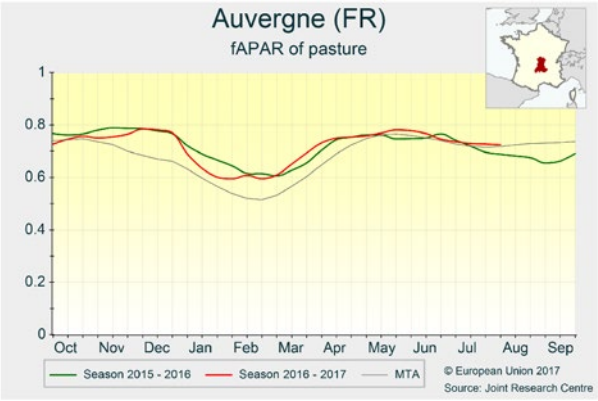
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2016-2017
Season 2015-2016
MTA
© European Union 2017
Source: Joint Research Centre


Auvergne (FR)
fAPAR of pasture
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0.8
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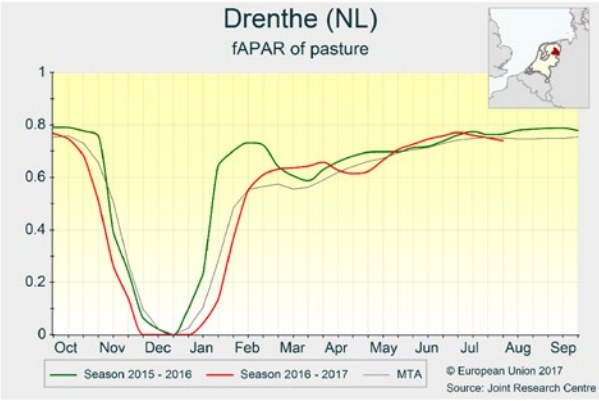
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre


Drenthe (NL)
fAPAR of pasture
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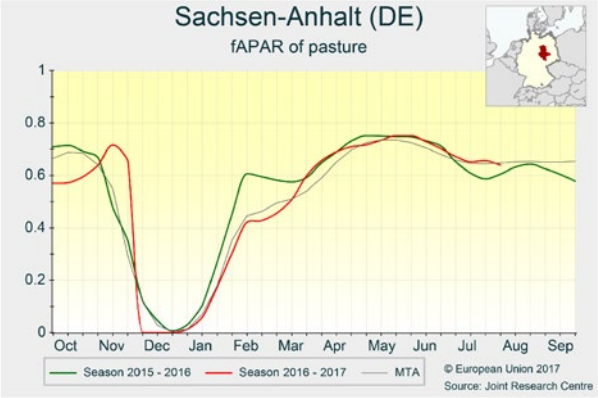
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre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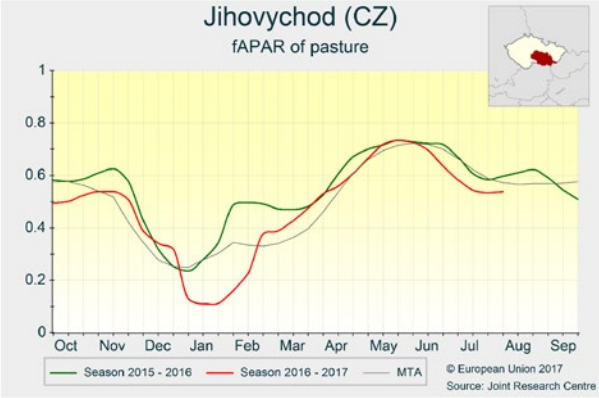
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre


Jihovychod (CZ)
fAPAR of pasture
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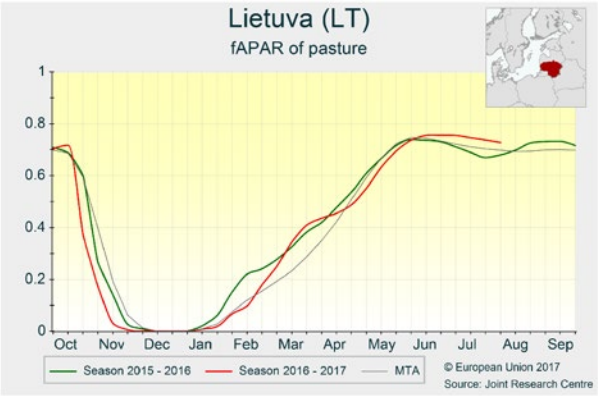
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre


Lietuva (LT)
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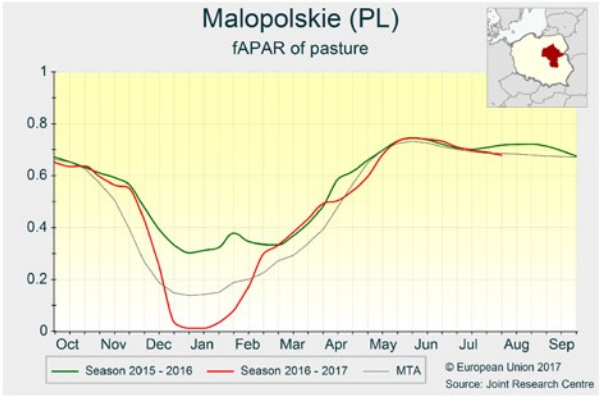
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre


Malopolskie (PL)
fAPAR of pasture
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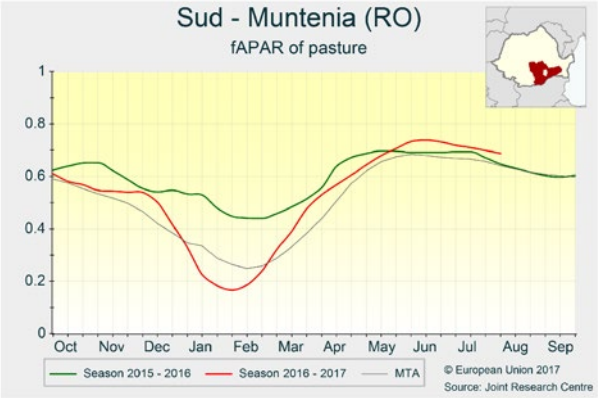
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre


Sud - Muntenia (RO)
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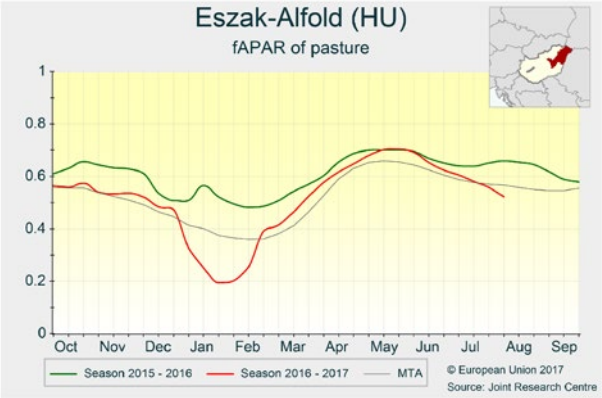
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre


Eszak-Alfold (HU)
fAPAR of pasture
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0.4
0.2
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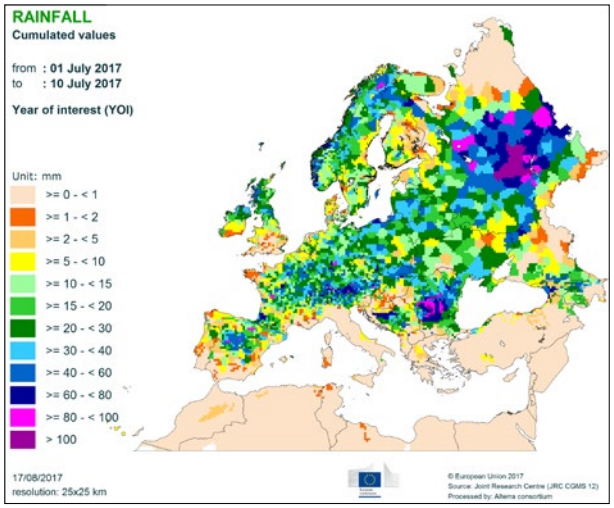
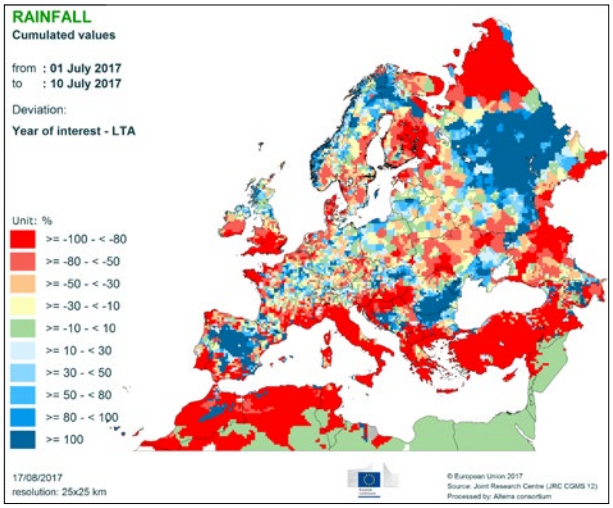
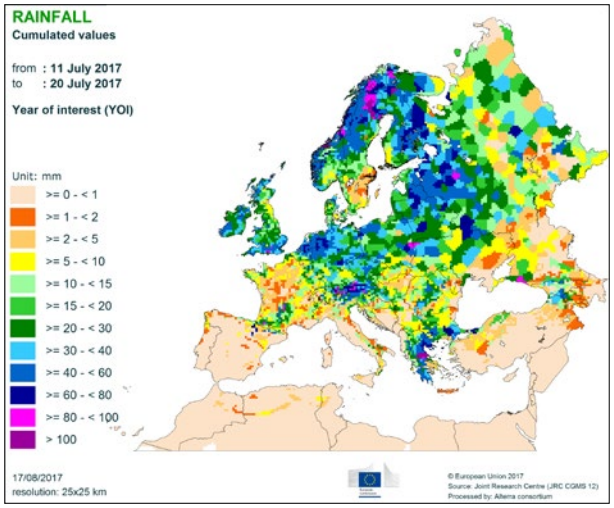
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre

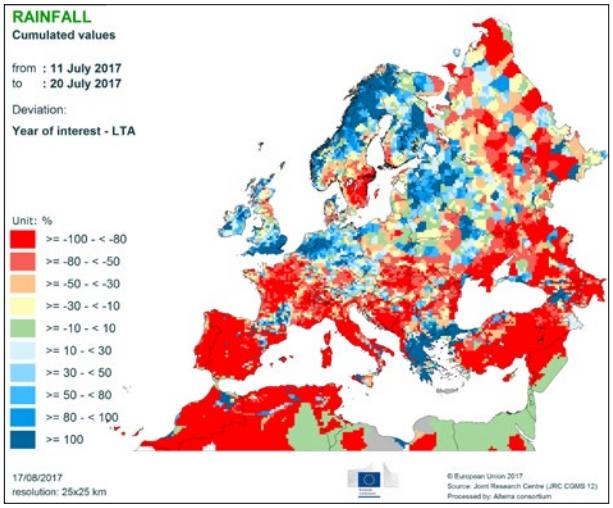
6. Atlas

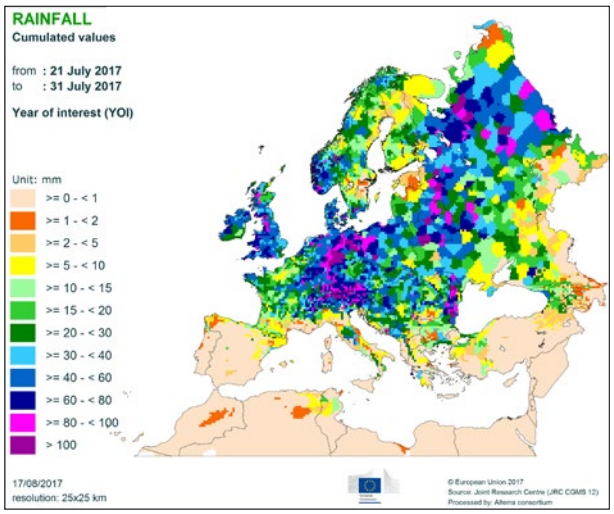
Precipitation

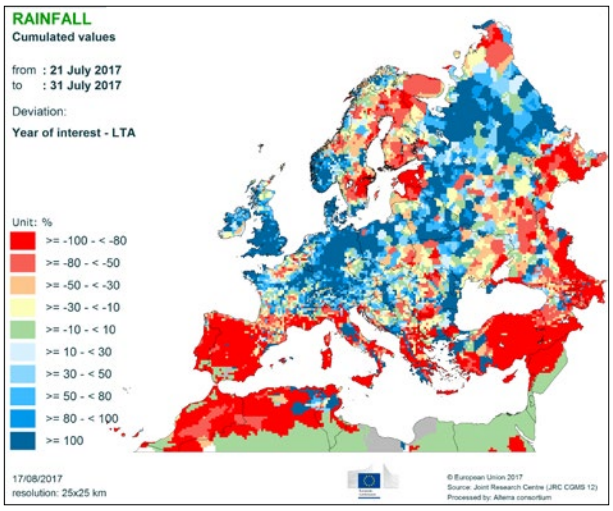


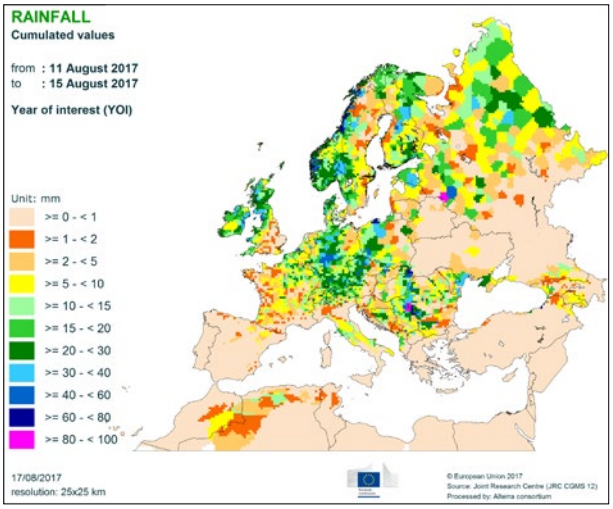


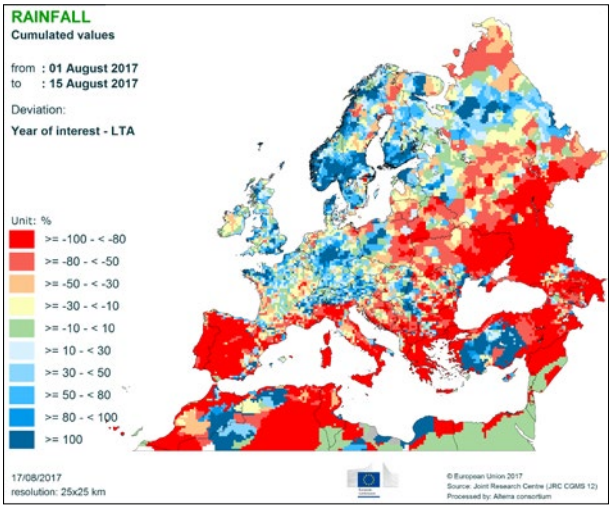




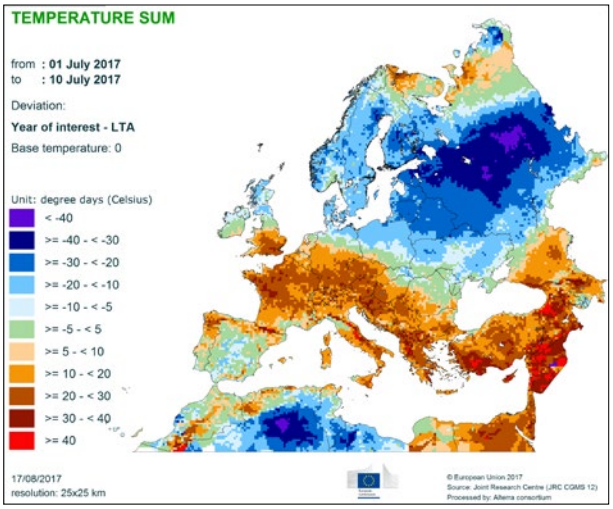


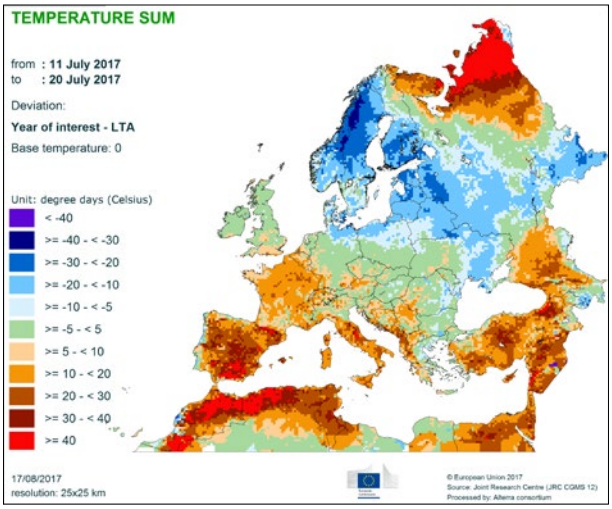


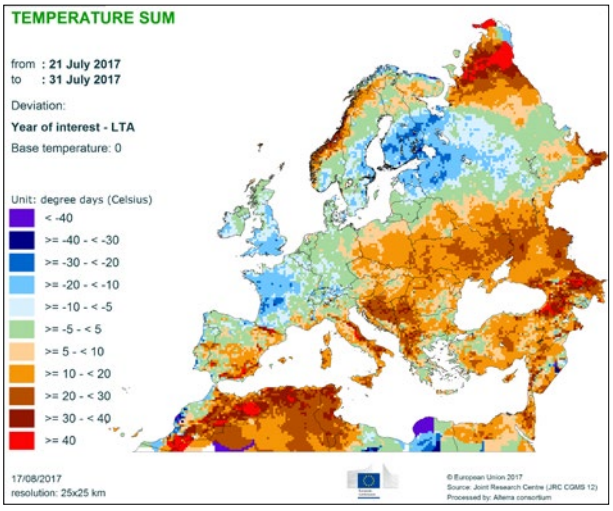


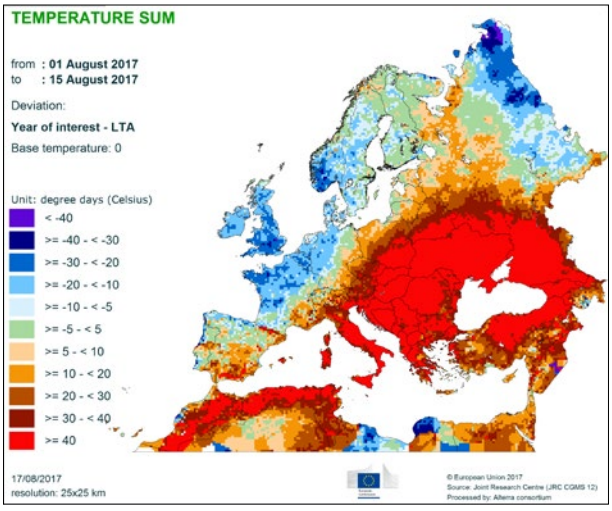


Precipitation regime









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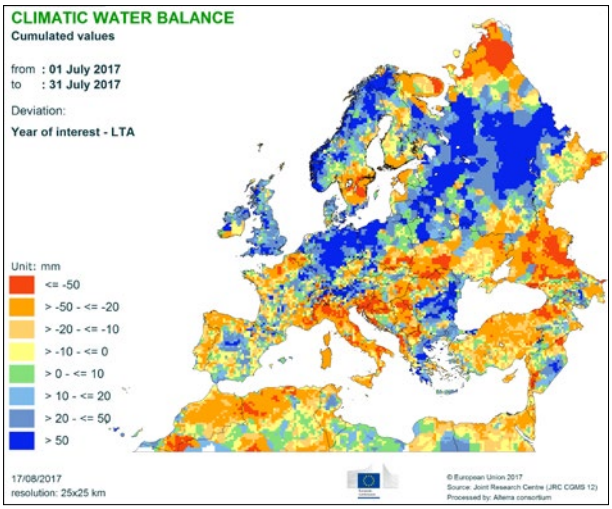
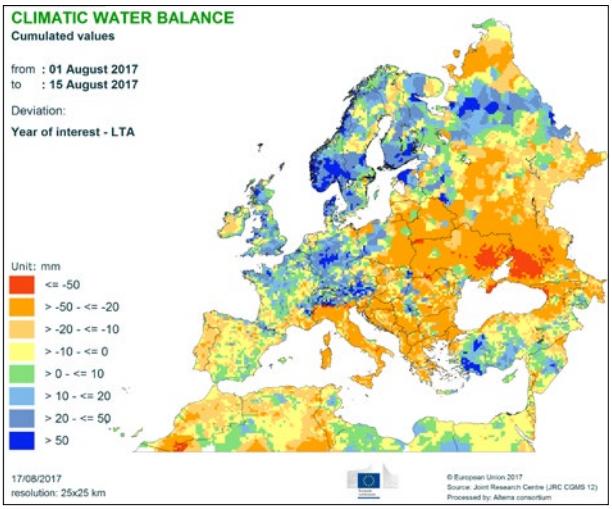
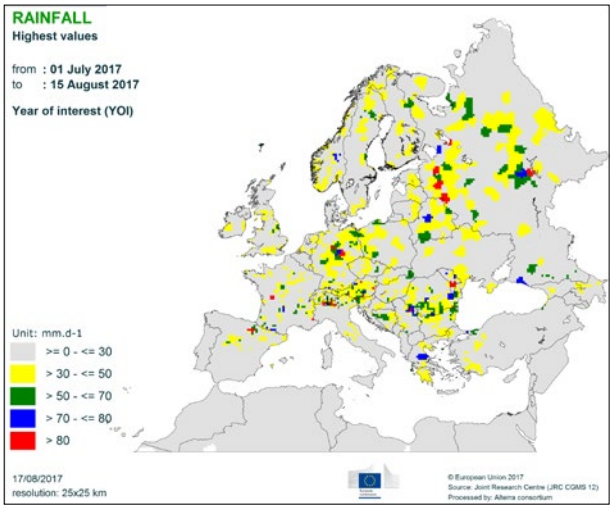
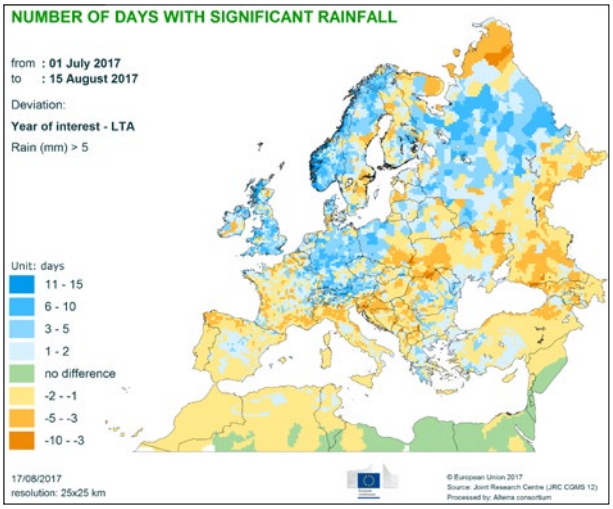
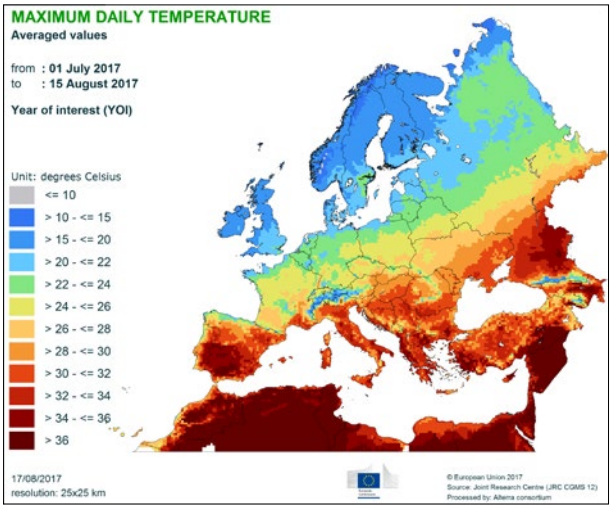


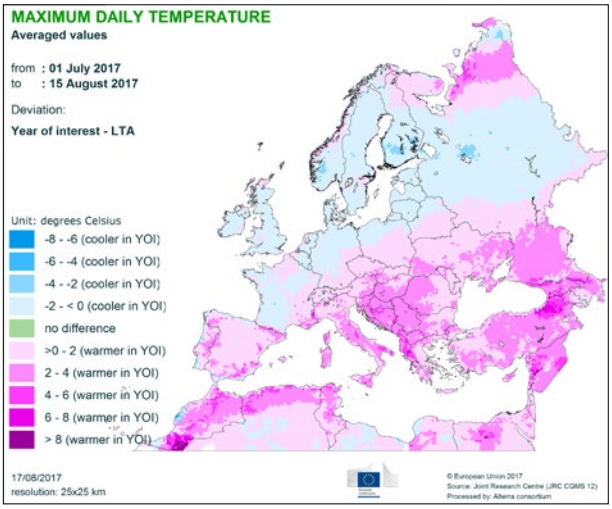


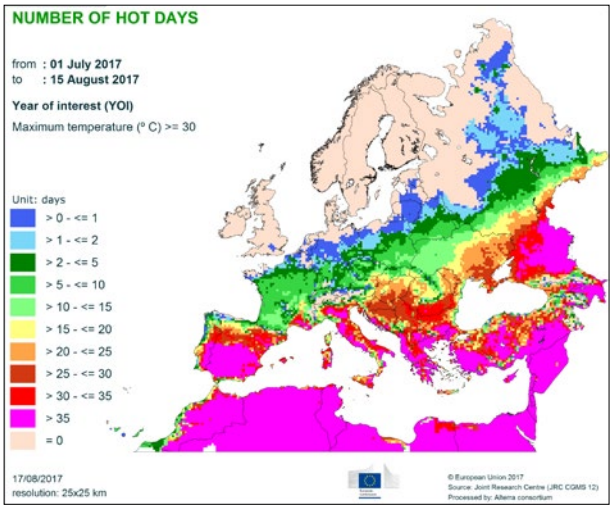
Weather events

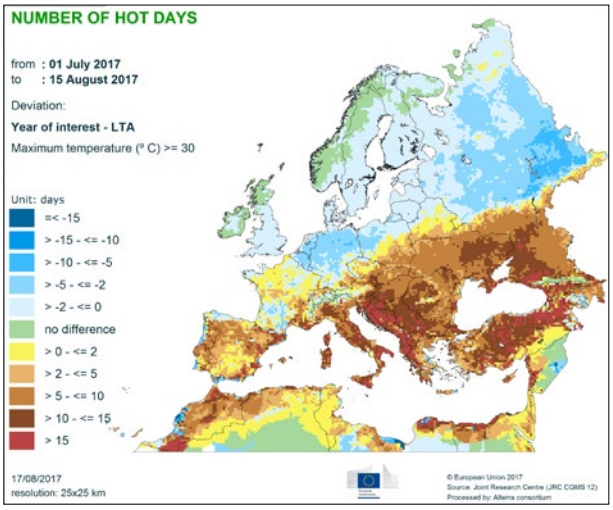




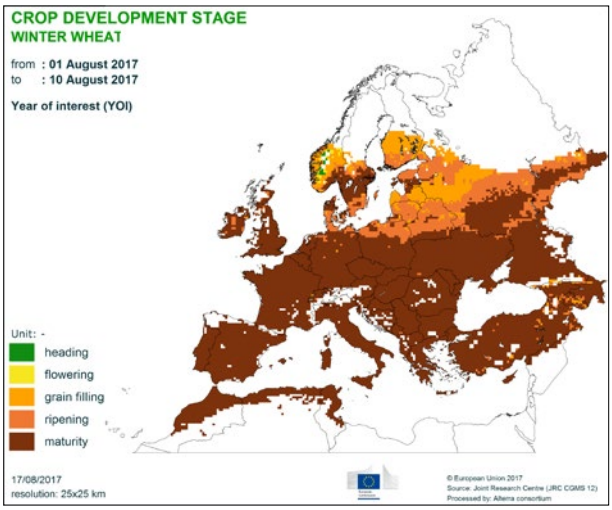


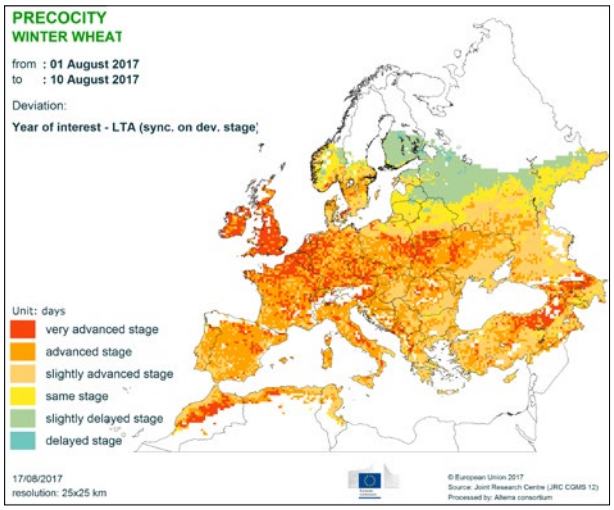


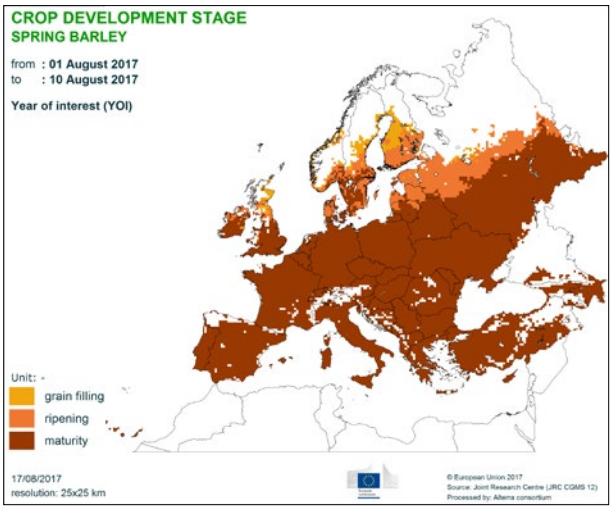


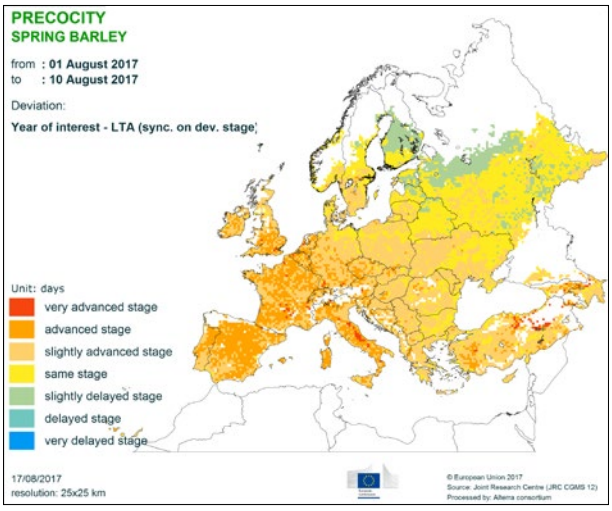


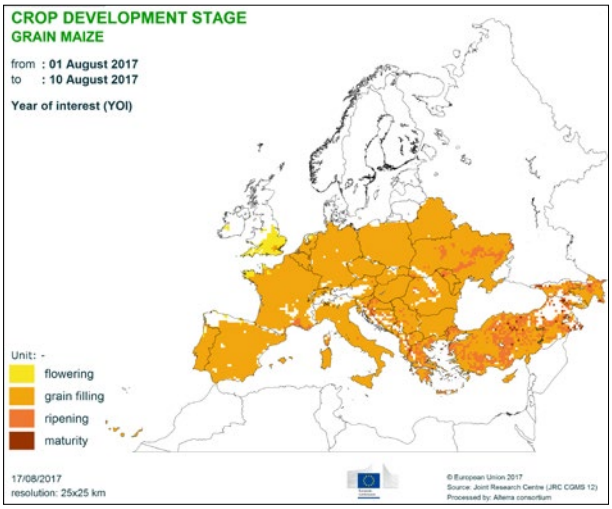
Crop development stages and precocity

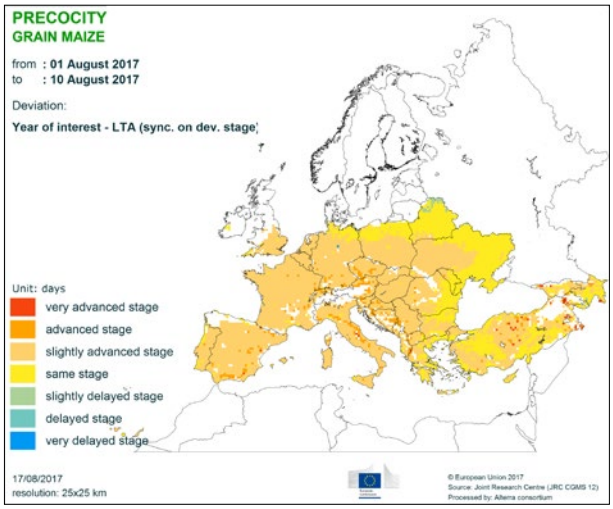


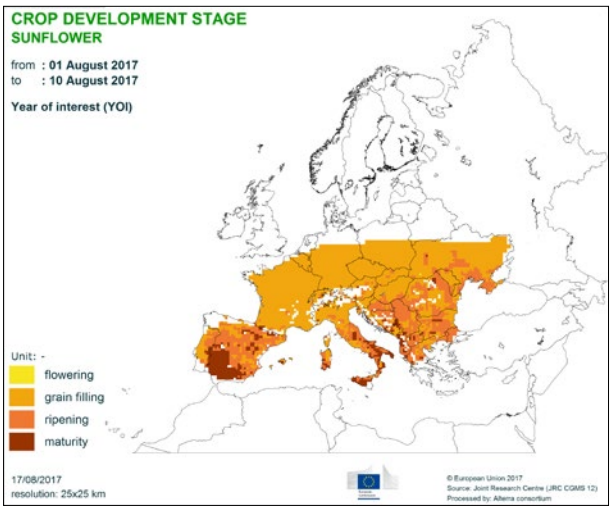


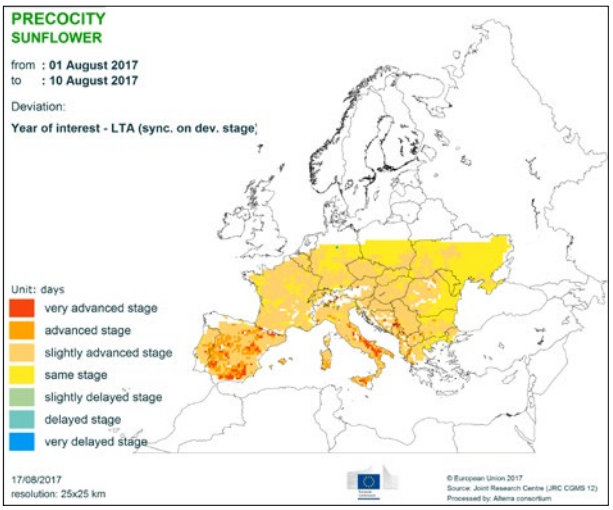




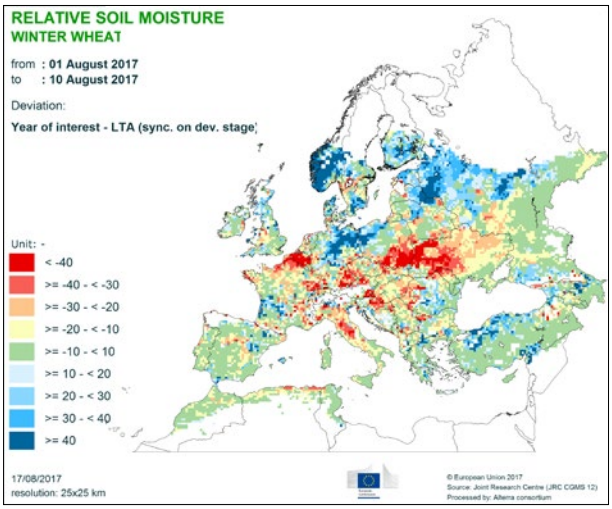


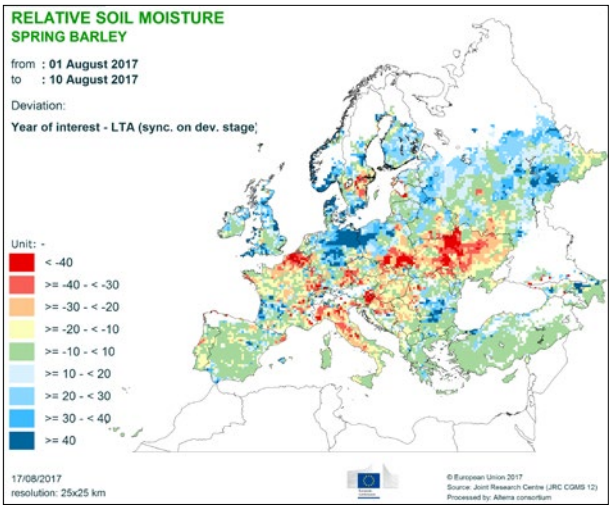


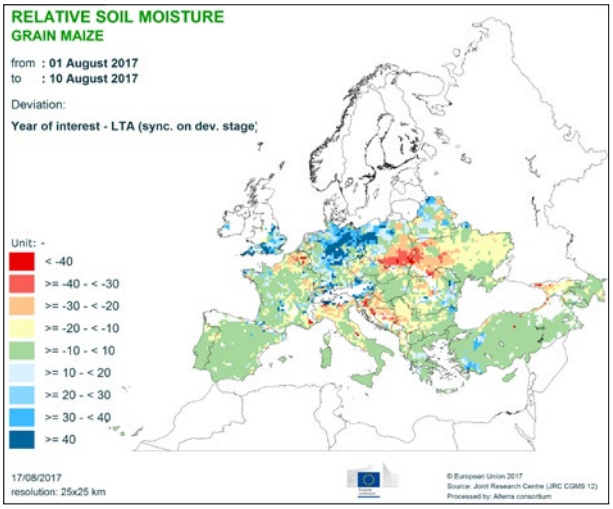


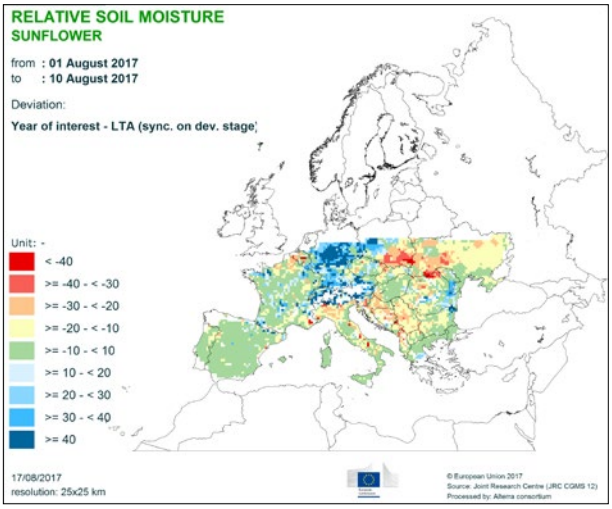


Relative soil moisture

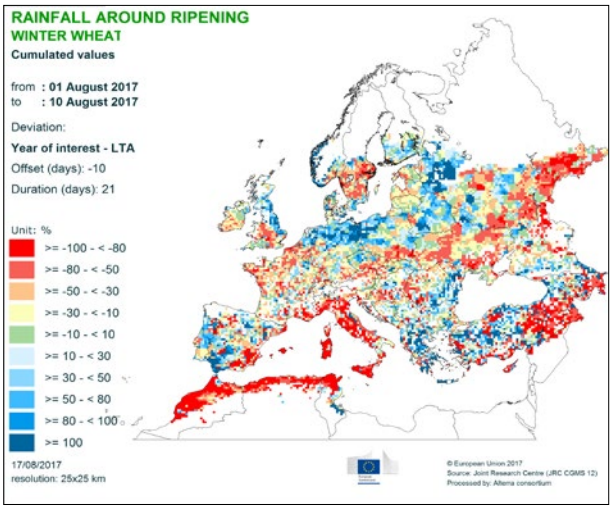


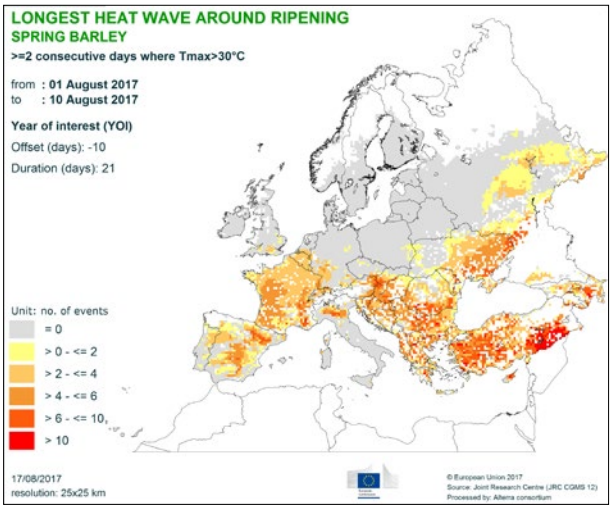


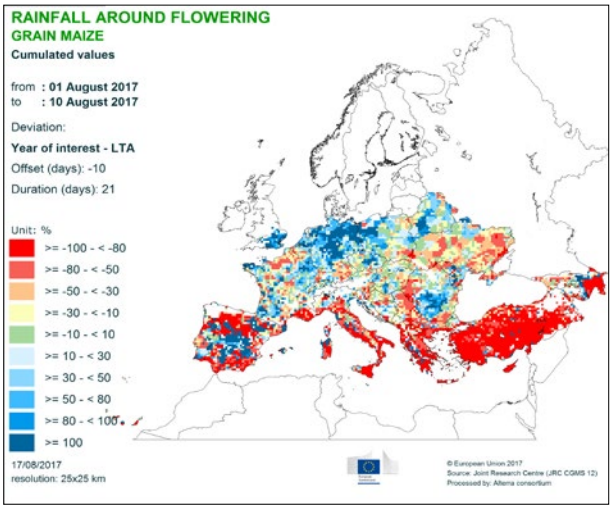


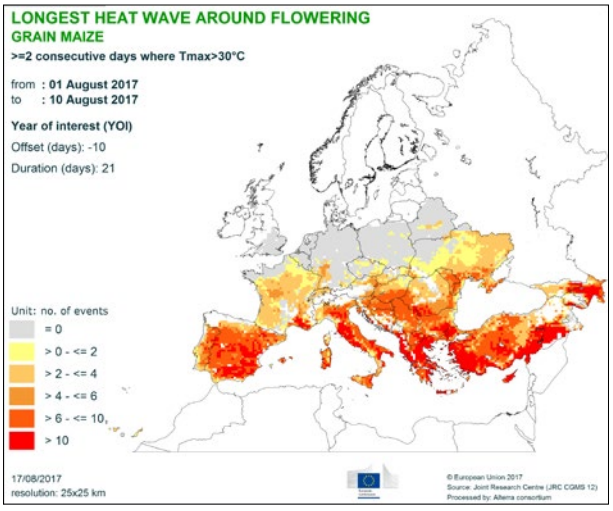


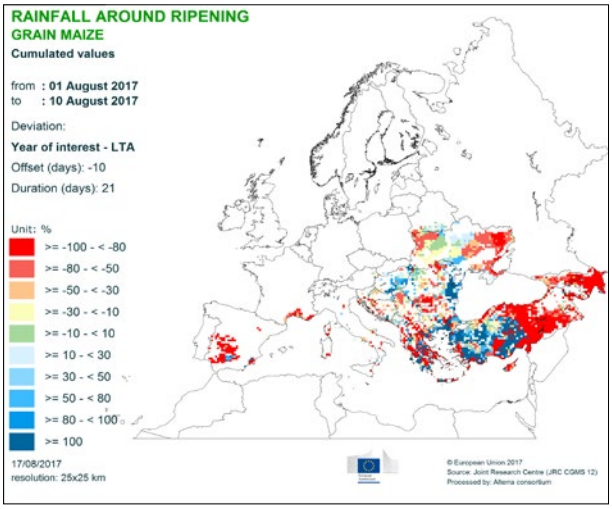
Precipitation and longest heatwave around certain crop development stages

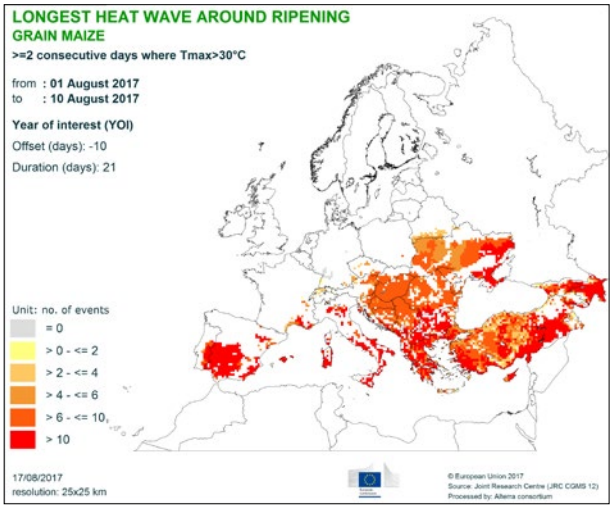




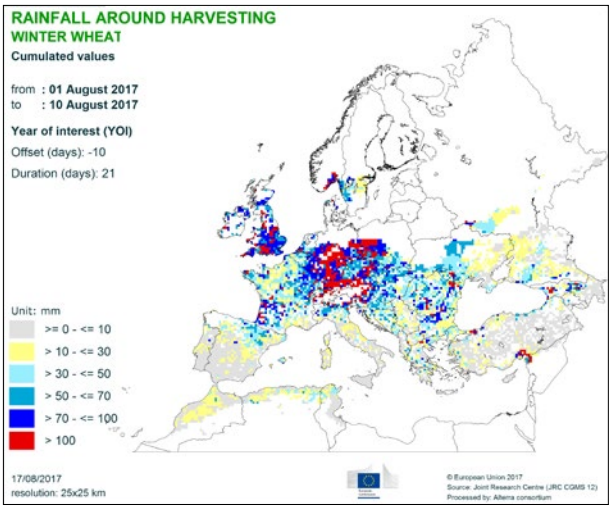


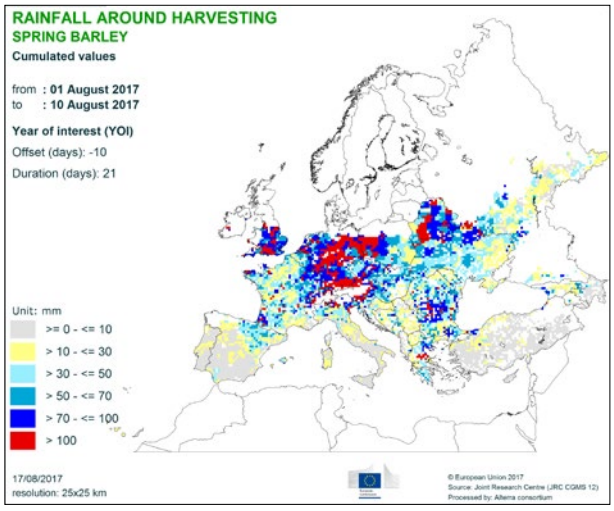


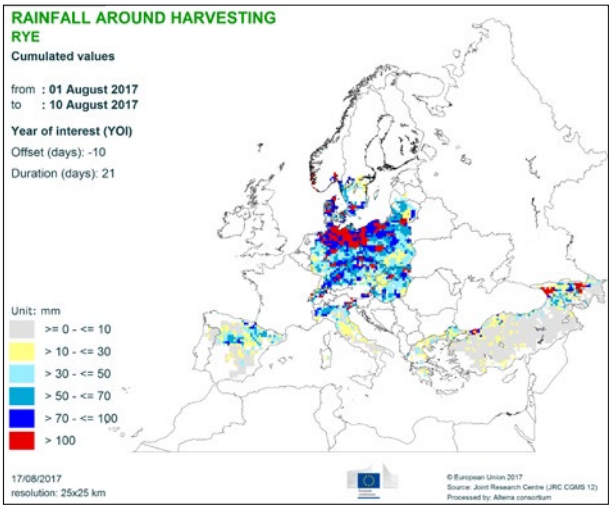


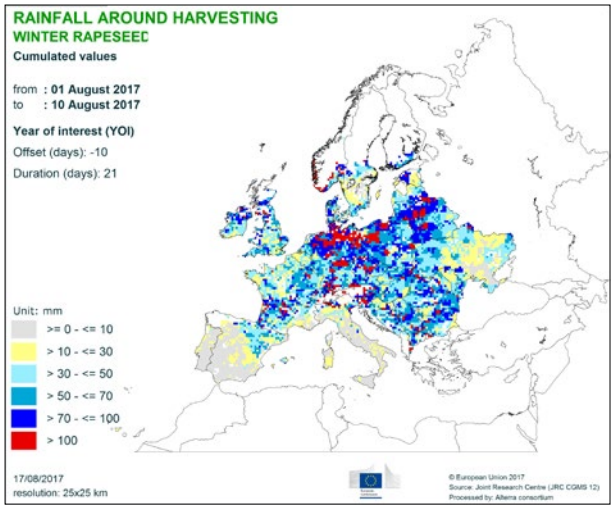


Precipitation around harvesting









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

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*MARS stands for Monitoring Agricultural Resources

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The LTA used within this bulletin as a reference is based on an archive of data covering 1975-2015.

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