Online version
Issued: 27 August 2018

JRC MARS Bulletin Vol 26 No 8

European Commission

JRC MARS Bulletin

Crop monitoring in Europe

August 2018

Yield forecasts revised further downwards

Grain maize still positive due to good performance in south-eastern Europe

Yield forecasts of winter and spring cereals were revised further downwards at EU level, mainly due to continued exceptionally warm and/or dry weather conditions in northern and central Europe. The forecasts for durum wheat, winter barley and rapeseed underwent only minor adjustments, as harvesting of these crops had mostly been finished by the end of the previous review period.

The yield forecast for grain maize was revised slightly downwards at EU level but remains above the 5-year average: Sharp downward revisions in central Europe as well as in France were counterbalanced by strong upward revisions in south-eastern Europe, where weather conditions were particularly favourable, especially in Romania and Bulgaria.

For sugar beet and potatoes, which are less grown in south-eastern Europe, the balance was distinctly negative: For both crops the yield forecast at EU level is currently below the 5-year average. The forecast for green maize (i.e. fodder maize), was even more strongly reduced, by 8.4% to 10% below the 5-year average.

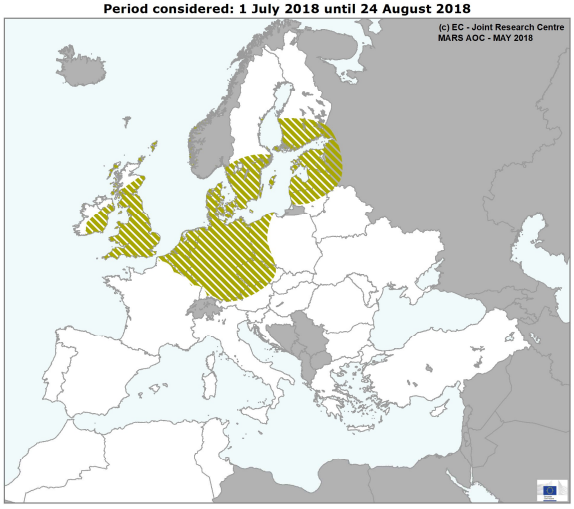
Pasture productivity – as inferred from remote sensing indicators – was at its lowest level since the start of our observations (in 1999) in large parts of central and northern Europe as well as in north-eastern France.

Content:

Covers the period from 1 July until 20 August

AREAS OF CONCERN - SPRING CROPS

Period considered: 1 July 2018 until 24 August 2018



Storage organs impacted

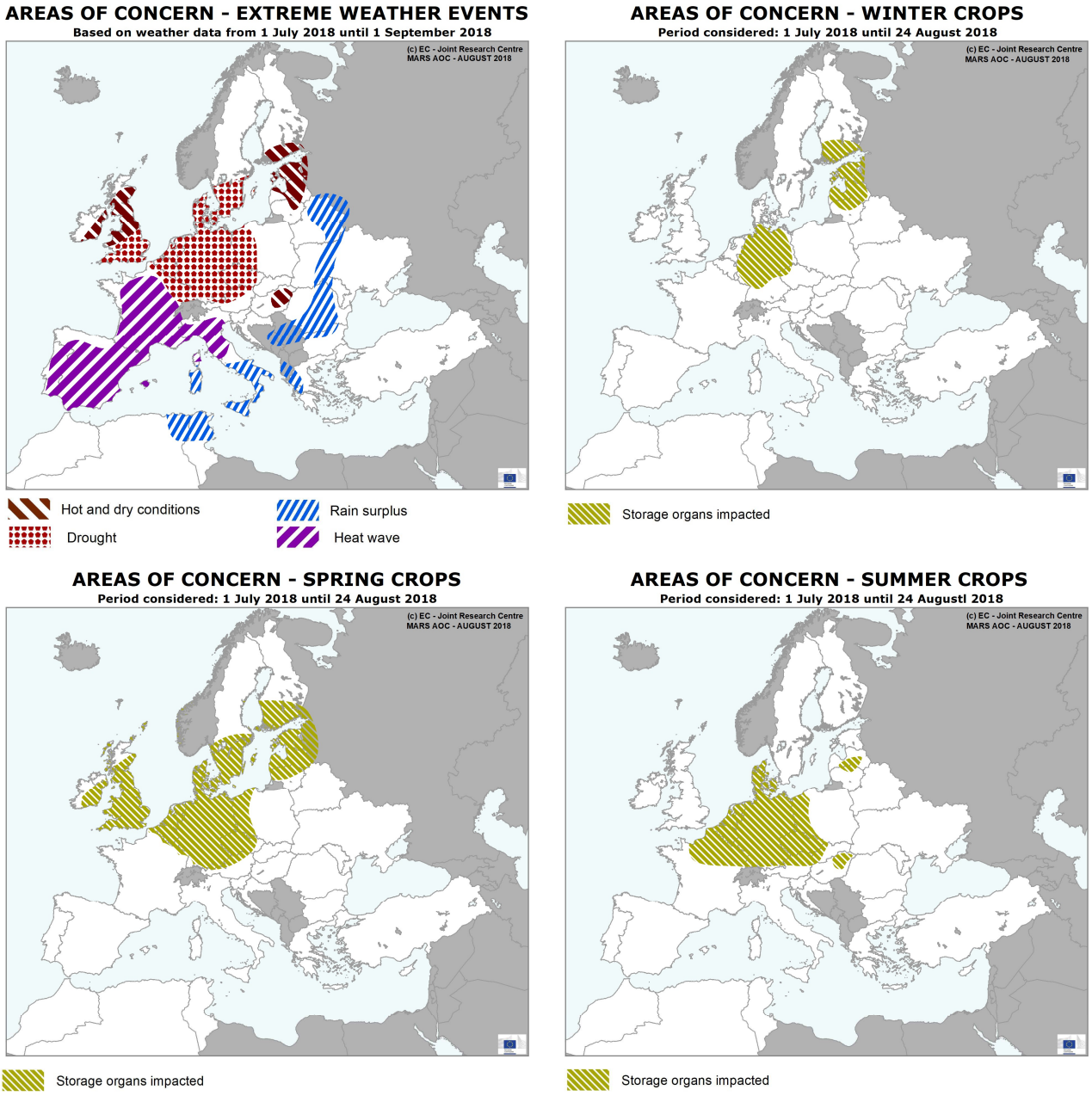
Crop	Yield (t/ha)				
	Avg 5yrs	July Bulletin	MARS 2018 forecasts	% Diff 18/5yrs	% Diff July
TOTAL CEREALS	5.56	5.38	**5.29**	-4.8	-1.7
Total Wheat	5.73	5.59	**5.49**	-4.2	-1.8
soft wheat	5.97	5.82	**5.70**	-4.5	-2.1
durum wheat	3.39	3.48	**3.47**	+2.3	-0.3
Total Barley	4.91	4.74	**4.71**	-4.0	-0.6
spring barley	4.25	4.13	**4.07**	-4.3	-1.5
winter barley	5.79	5.60	**5.61**	-3.1	+0.2
Grain maize	7.30	7.64	**7.57**	+3.6	-0.9
Rye	3.93	3.48	**3.37**	-14	-3.2
Triticale	4.23	4.10	**4.04**	-4.5	-1.5
Rape and turnip rape	3.29	2.89	**2.87**	-13	-0.7
Potato	33.5	33.3	**31.1**	-6.9	-6.6
Sugar beet	74.6	77.9	**73.8**	-1.1	-5.2
Sunflower	2.12	2.47	**2.45**	+16	-0.8

Issued: 24 August 2018

Joint Research Centre

1. Agro-meteorological overview

1.1 Areas of concern



NB Events or impacts already covered in the July Bulletin are not repeated.in the maps above.

During the period reviewed (1 July to 24 August), warmer-than-usual weather conditions prevailed (or continued to prevail), throughout almost all of Europe. Daily mean temperature anomalies (with respect to the LTA) were mainly between +0.5°C and +4°C. The most pronounced positive thermal anomalies (> 2°C) were experienced in France, Benelux, Germany, the southern UK, Scandinavia, the Baltic countries, Poland, the Czech Republic and Slovakia.

In Spain, central and northern Italy, and France, a heatwave occurred during the last 10 days of July and the first 10 days of August. These conditions affected summer crops in northern France, shortening the grain-filling period with more negative effects on non-irrigated crops, as is often the case for green maize.

Drought conditions continued in the southern United Kingdom, Germany, Denmark, Sweden, Benelux, western Poland, the Czech Republic and northern Austria, until (or

beyond) the harvest of winter and spring crops. The resulting early end of the phenological cycle with a consequent shortening of the grain-filling period caused a further decrease in yield expectations. Summer crops were negatively affected during the late vegetative stages and yield formation in these countries, in which most of the EU production of sugar beet, potatoes and green maize is concentrated.

In the northern United Kingdom and Ireland, temperatures and rain deficits were less critical, but still affected the grain filling of spring crops. Similar conditions occurred in Finland and the Baltic countries, where, after a period of prolonged rain deficit, high temperatures led to a shortening of the grain filling of both winter and spring crops. Hot and dry conditions also affected summer crops in eastern Hungary.

A distinct precipitation surplus occurred in southern Italy, Tunisia and parts of the Balkan region, Romania, Bulgaria, Moldova, Ukraine and Belarus. In most of these regions, the surplus precipitation had no significant negative impact on crops.

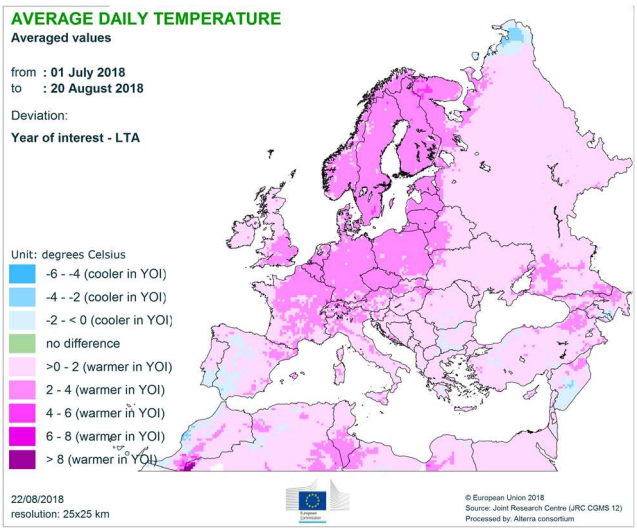
1.2. Meteorological review (1 July – 20 August)

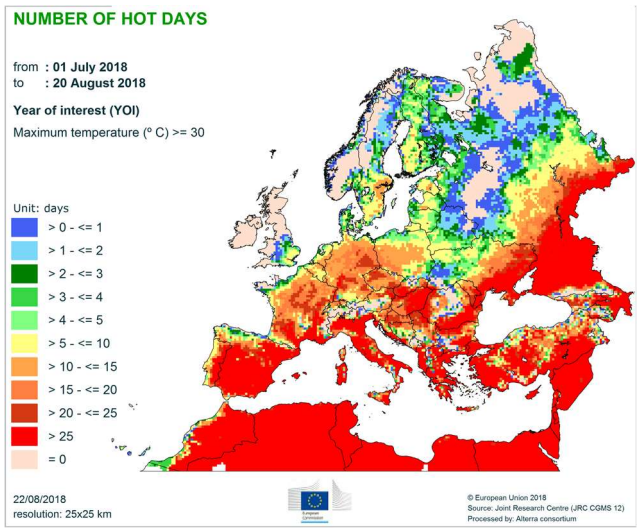
Warmer-than-usual weather conditions characterised almost the whole of Europe. Daily mean temperatures typically exceeded the long-term average by between 0.5°C and 4°C. The most pronounced positive thermal anomalies (> 2°C) were experienced in France, Germany, southern UK, Poland, the Czech Republic and Slovakia as well as in the Benelux, Baltic and Scandinavian states. The incidence of hot days (T_{max} > 30°C) exceeded the seasonal average by 5-25 days in the large triangle from Italy to eastern Spain and up to southern Finland. This frequent occurrence of hot days is particularly unusual/extreme in Scandinavia, where daily maximum temperatures reached record levels. The number of hot days also considerably exceeded the average in southern Ukraine, Russia, western Turkey and several parts of Mediterranean Africa.

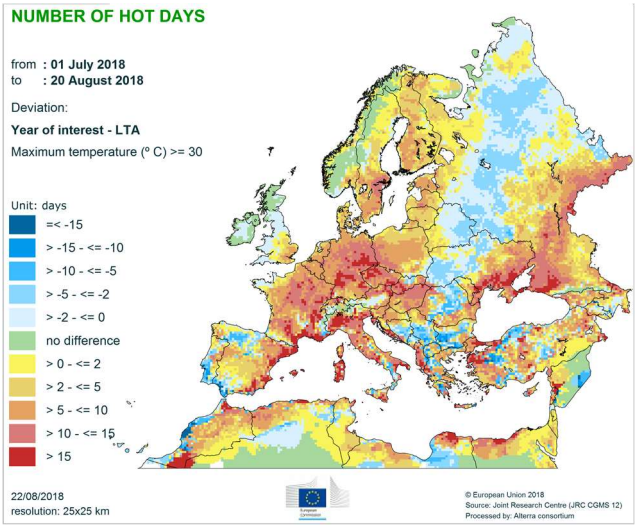
Drier-than-usual conditions prevailed in Germany, north-eastern France, the UK, Ireland, the Benelux countries, large parts of central Europe, the surrounding areas of the Baltic Sea, and many regions of eastern Ukraine and European Russia (e.g. Central and Volga okrugs). The rainfall deficit mostly reached 30-100 mm in these regions during the period under analysis.

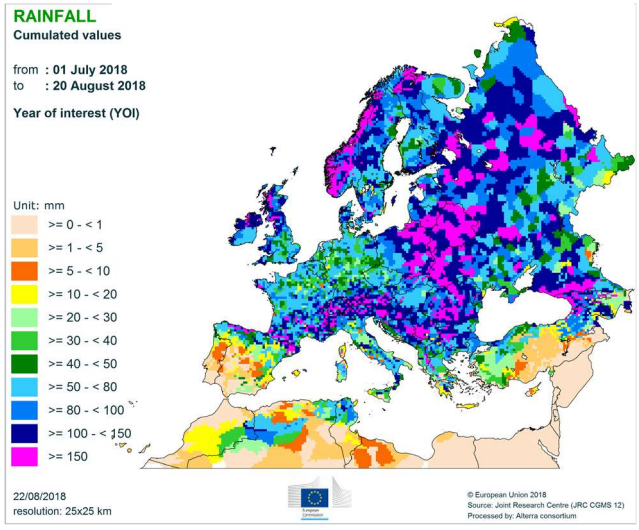
Climatic water balance has been strongly negative since the beginning of May in the areas around the North Sea and the Baltic Sea, in the northern half of central Europe and some spots in central and southern Russia. This long-lasting water deficit has had considerable negative effects not only on crop production and grasslands, but also in decreasing the levels of water in reservoirs, rivers and lakes, and lowering groundwater tables.

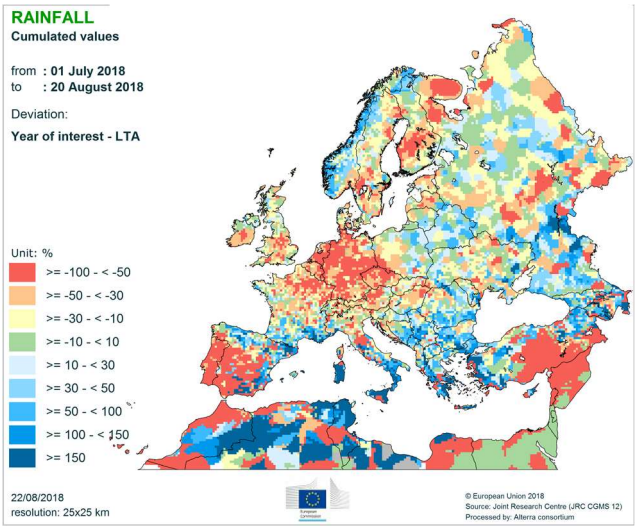
Wetter-than-usual conditions occurred in the northern and eastern part of the Iberian Peninsula, southern France, southern Italy, the eastern side of Poland, the Balkan region and eastern Romania. Cumulative precipitation anomalies exceeded the LTA by > 50% in these areas, with absolute values typically exceeding 80 mm. Above-average rainfall was also measured in western Scotland, Norway, Belarus, north-eastern and north-western Turkey, and extended areas in southern Russia and the Maghreb region.

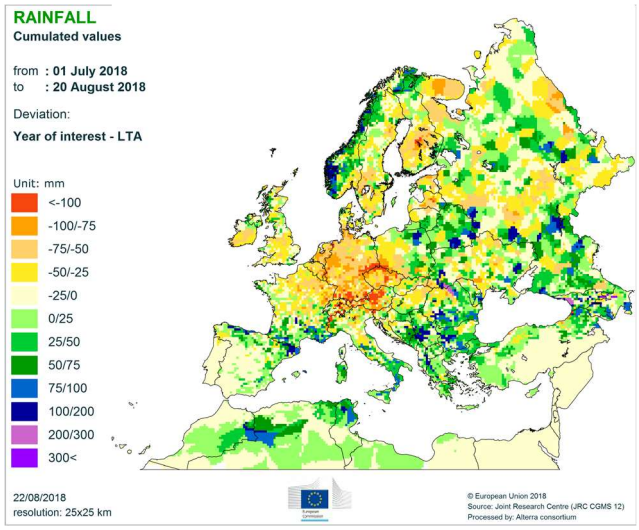

AVERAGE DAILY TEMPERATURE
Averaged values
from : 01 July 2018
to : 20 August 2018
Deviation:
Year of interest - LTA
Unit: degrees Celsius
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
-2 - < 0 (cooler in YOI)
no difference
>0 - 2 (warmer in YOI)
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
> 8 (warmer in YOI)
22/08/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

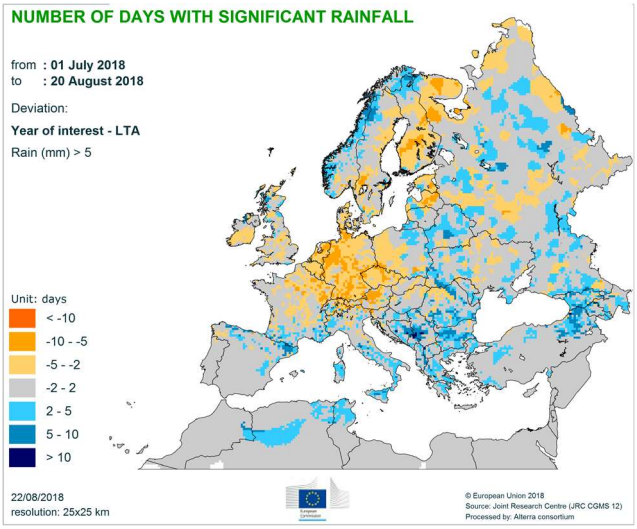

NUMBER OF HOT DAYS
from : 01 July 2018
to : 20 August 2018
Year of interest (YOI)
Maximum temperature (° C) >= 30
Unit: days
> 0 - <= 1
> 1 - <= 2
> 2 - <= 3
> 3 - <= 4
> 4 - <= 5
> 5 - <= 10
> 10 - <= 15
> 15 - <= 20
> 20 - <= 25
> 25
= 0
22/08/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

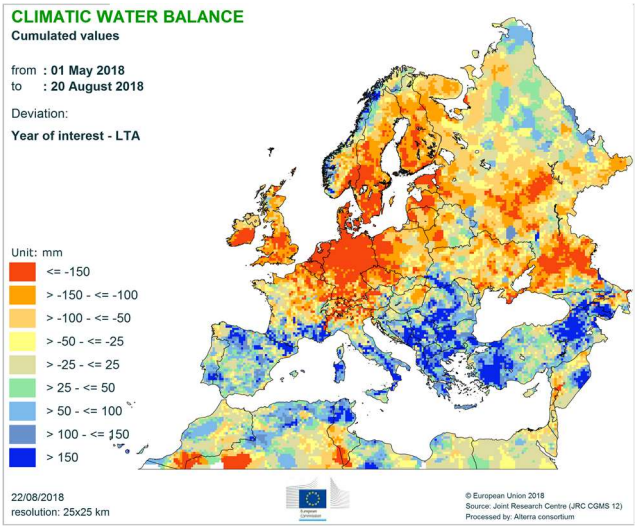

NUMBER OF HOT DAYS
from : 01 July 2018
to : 20 August 2018
Deviation:
Year of interest - LTA
Maximum temperature (° C) >= 30
Unit: days
=< -15
> -15 - <= -10
> -10 - <= -5
> -5 - <= -2
> -2 - <= 0
no difference
> 0 - <= 2
> 2 - <= 5
> 5 - <= 10
> 10 - <= 15
> 15
22/08/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 July 2018
to : 20 August 2018
Year of interest (YOI)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
22/08/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 July 2018
to : 20 August 2018
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 100
>= 100 - < 150
>= 150
22/08/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 July 2018
to : 20 August 2018
Deviation:
Year of interest - LTA
Unit: mm
<-100
-100/-75
-75/-50
-50/-25
-25/0
0/25
25/50
50/75
75/100
100/200
200/300
300<
22/08/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium





1.3 Weather forecast 24-31 August

Weather conditions in the forecast period will be driven by a large-scale atmospheric trough extending from the North Sea towards the Mediterranean and moving towards its eastern part. A series of fast cyclonic disturbances will also influence weather conditions in northern Europe and the British Isles.

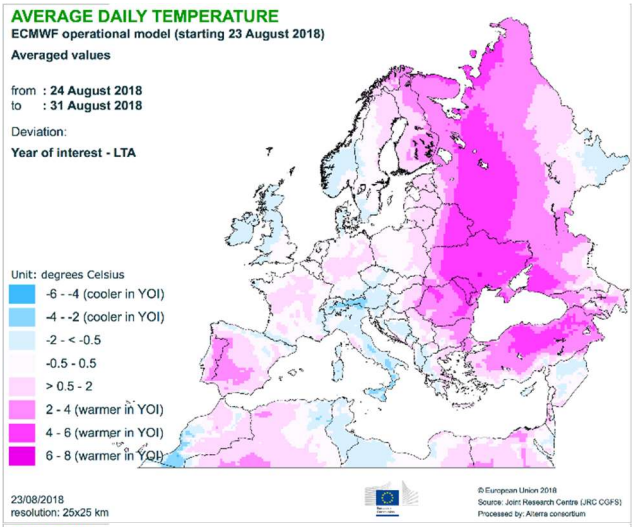
Warmer-than-usual weather conditions in eastern Europe and Russia, where daily mean temperature anomalies (with respect to the LTA) will be mainly between 2°C and 6°C. Positive mean daily temperature anomalies (ranging from 2°C to 4°C) are also forecast in a large region of the Iberian Peninsula. In France and Germany, large areas will experience slightly warmer-than-usual conditions. In the Black Sea region as well as in the Iberian Peninsula, daily maximum temperatures above 30°C are forecast for almost the entire forecast period.

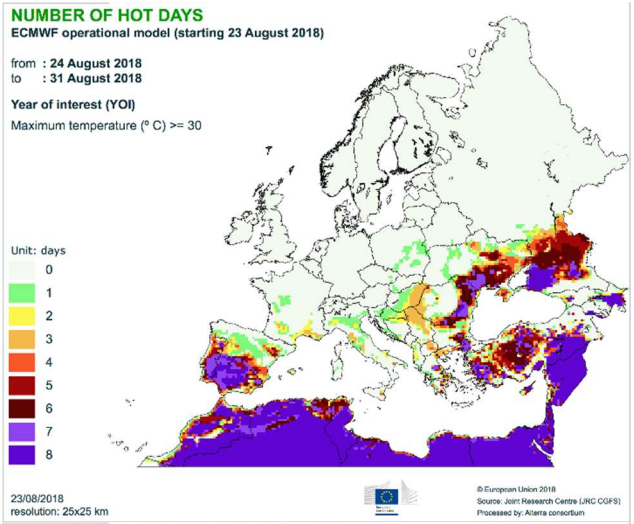
Slightly colder-than-usual weather conditions in the Italian Peninsula and the Alps, the Balkans, the British Isles and southern Scandinavia. In these regions, daily mean temperature anomalies (with respect to the LTA) are forecast to remain between 0 and -2°C.

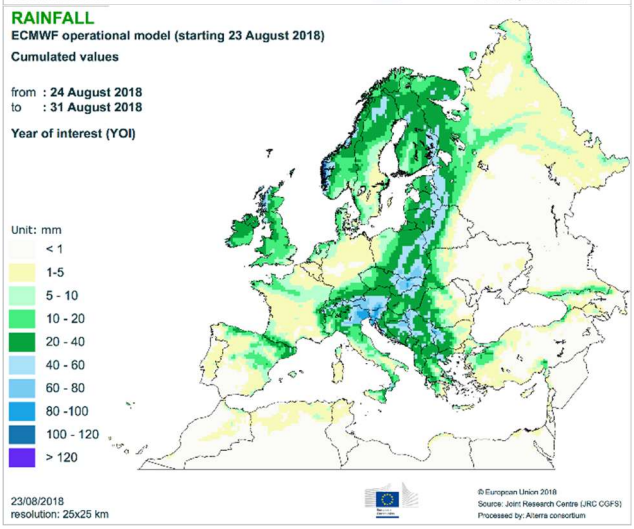
Precipitation of 10-60 mm accumulated in the analysed period is forecast in a large belt from northern Europe, through the Baltic region and central Europe, to the central Mediterranean region. Cumulative precipitation of 10-40 mm is forecast in the UK and Ireland.

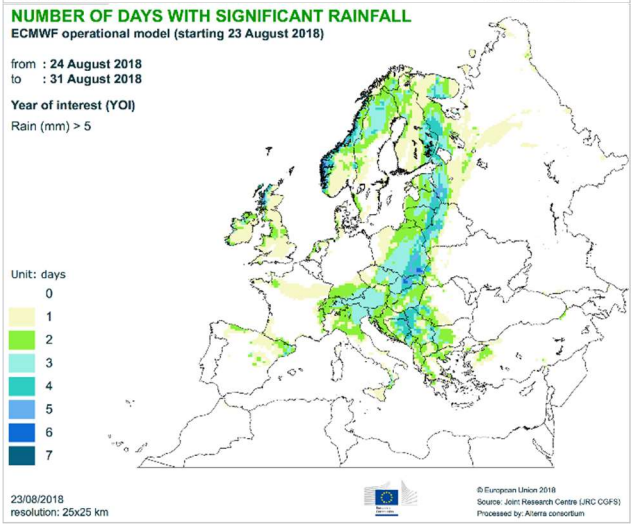
Less than 5 mm of precipitation is forecast in the rest of Europe.

The long-range weather forecast for the next three months (September-November) shows very likely warmer-than-usual weather conditions in the Mediterranean region, the UK, and central, eastern and northern Europe.


AVERAGE DAILY TEMPERATURE
ECMWF operational model (starting 23 August 2018)
Averaged values
from : 24 August 2018
to : 31 August 2018
Deviation:
Year of interest - LTA
Unit: degrees Celsius
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
-2 - < -0.5
-0.5 - 0.5
> 0.5 - 2
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
23/08/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGFS)
Processed by: Alterra consortium

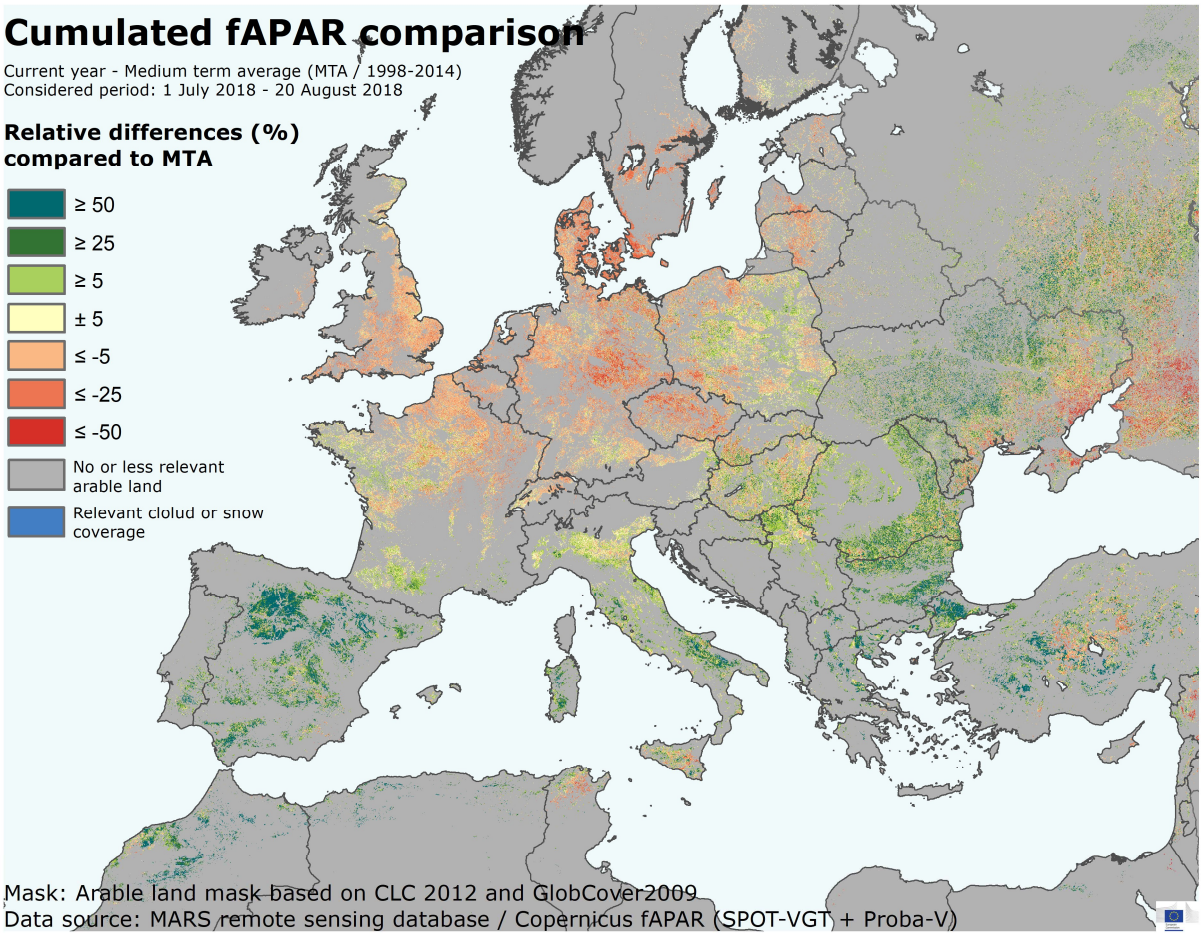

NUMBER OF HOT DAYS
ECMWF operational model (starting 23 August 2018)
from : 24 August 2018
to : 31 August 2018
Year of interest (YOI)
Maximum temperature (° C) >= 30
Unit: days
0
1
2
3
4
5
6
7
8
23/08/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGFS)
Processed by: Alterra consortium


RAINFALL
ECMWF operational model (starting 23 August 2018)
Cumulated values
from : 24 August 2018
to : 31 August 2018
Year of interest (YOI)
Unit: mm
< 1
1-5
5 - 10
10 - 20
20 - 40
40 - 60
60 - 80
80 -100
100 - 120
> 120
23/08/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGFS)
Processed by: Alterra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
ECMWF operational model (starting 23 August 2018)
from : 24 August 2018
to : 31 August 2018
Year of interest (YOI)
Rain (mm) > 5
Unit: days
0
1
2
3
4
5
6
7
23/08/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGFS)
Processed by: Alterra consortium

2. Remote Sensing - Observed canopy conditions

Drought led to critical end of season in central and northern Europe



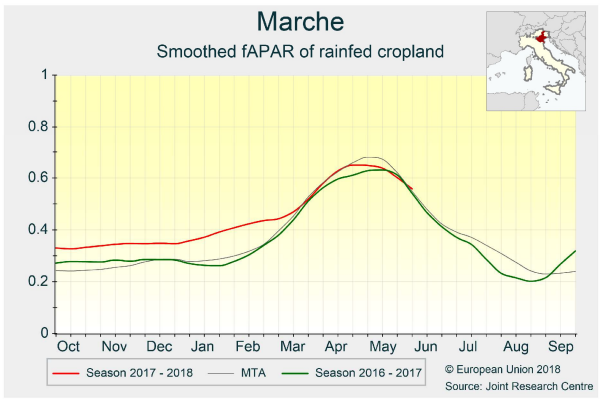
The map displays differences between the fraction of absorbed photosynthetically active radiation (fAPAR), computed from remote sensing imagery between 1 July and 20 August 2018, and the medium-term average (1998-2014) of fAPAR for the same period. Positive anomalies (in shades of green) reflect above-average canopy density, while negative anomalies (in shades of red) reflect below-average biomass accumulation.

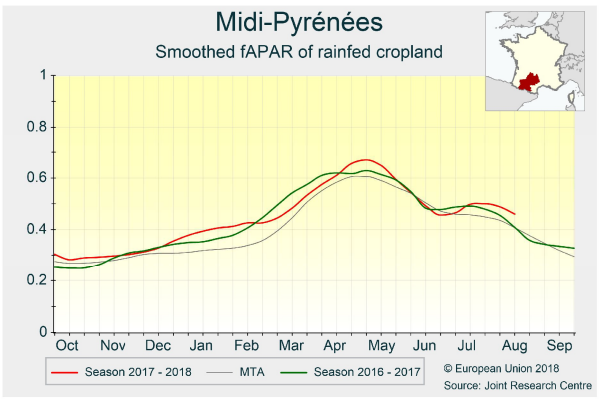
In **Spain**, the positive anomalies represent the optimal and late end of the winter crops' season. In northern **Italy,** summer crops' biomass accumulation is around average: the impact of the heatwave that occurred during early grain filling of summer crops was mitigated by irrigation (e.g. *Veneto*). In southern **France,** warm temperatures, coupled with favourable precipitation, led to optimal canopy development of summer crops (e.g. *Midi-Pyrénées*). Crop conditions are quite the opposite in central and northern EU agricultural regions, where lasting drought conditions have compromised the grain filling of winter crops — now harvested — and have significantly reduced summer crops' biomass accumulation (e.g. *Champagne-Ardenne*), where not irrigated. In the **United Kingdom** (e.g. *East Anglia*), in the late stages of the winter and spring crops' season, crops senesced early as a result of the dry and hot conditions; the rainfall in late July brought little or no relief, as crop maturity had already been reached. In **Germany**, a strong deficit in photosynthetic activity, initially confined to the northern regions, is now observed throughout the country. The drought conditions affected summer crops: vegetative growth is reduced (e.g. *Oberpfalz*) and early senescence is occurring in unirrigated fields. Similar conditions are observed in the **Benelux** countries, **Austria** and the **Czech Republic.** In **Poland,** rains in July mitigated the dry conditions and allowed summer crops to recover in most of the regions shown in green on the map. In **Denmark,** southern **Sweden** (e.g. *Sydsverige*), **Finland**, **Estonia**, **Latvia** and **Lithuania** drought led to early senescence of spring and winter crops.

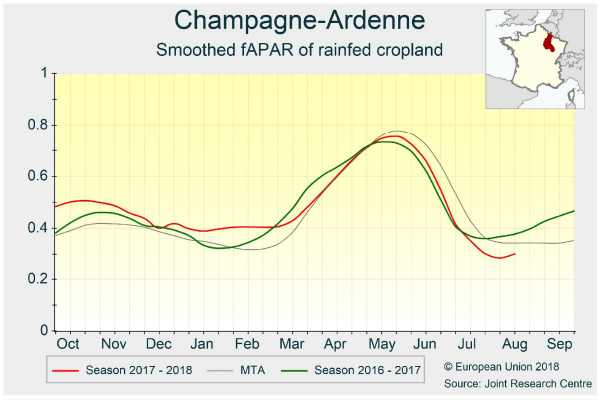
In **Hungary Bulgaria** and **Romania**, crop biomass is above the average: warm and humid weather conditions boosted summer crops' growth in July. Summer crops'

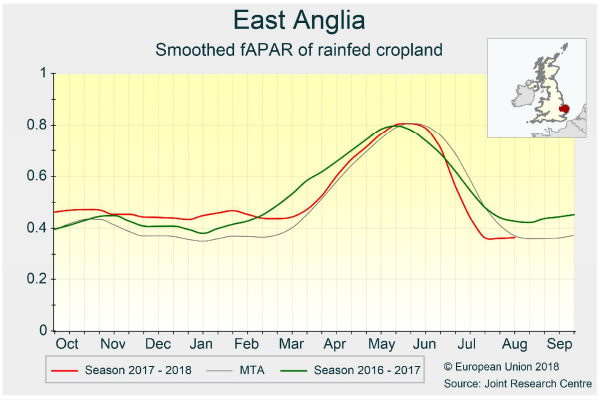
grain filling started in early August under favourable conditions.

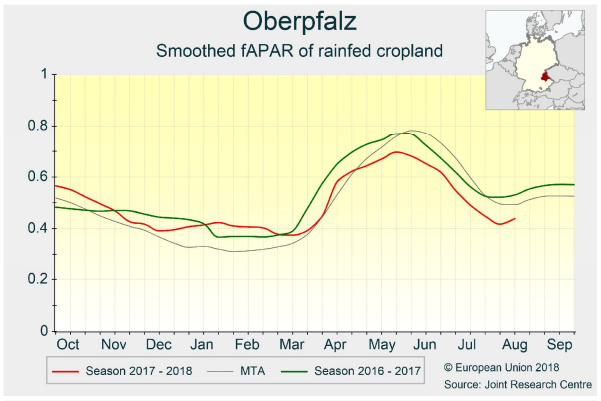
In **Ukraine**, summer crops' biomass was above average levels (e.g. *Vynnits'ka*). Most of the regions received average and well-distributed precipitation in July and the resulting green biomass accumulation was optimal. In August, the rain stopped, summer crops passed the flowering stage, and grain formation started under very favourable conditions. In south-eastern Ukraine and southern **Russia** the effect (in red on the map) of the early senescence of winter crops is still visible.

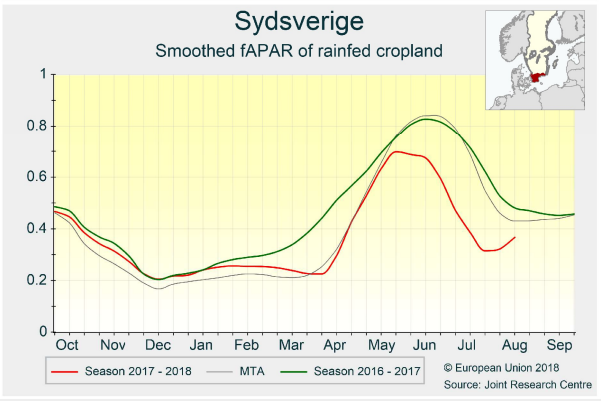


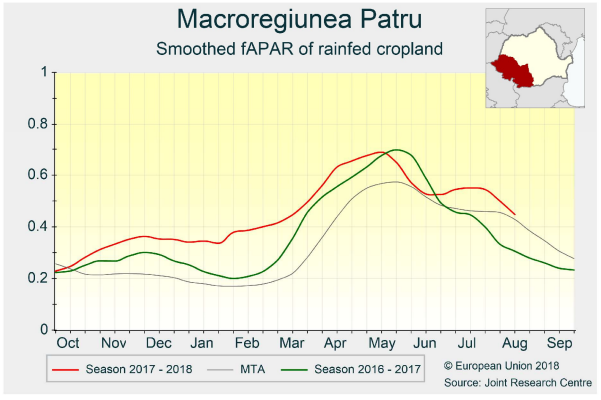


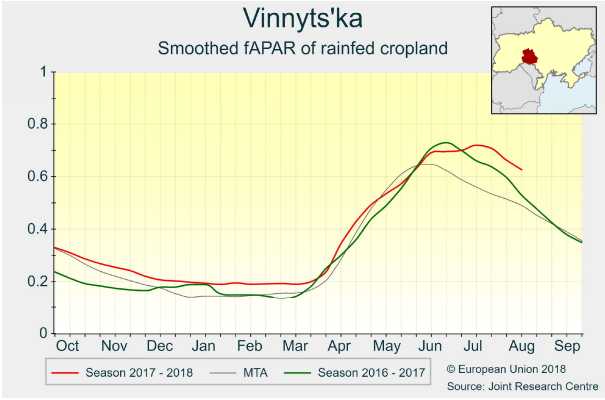












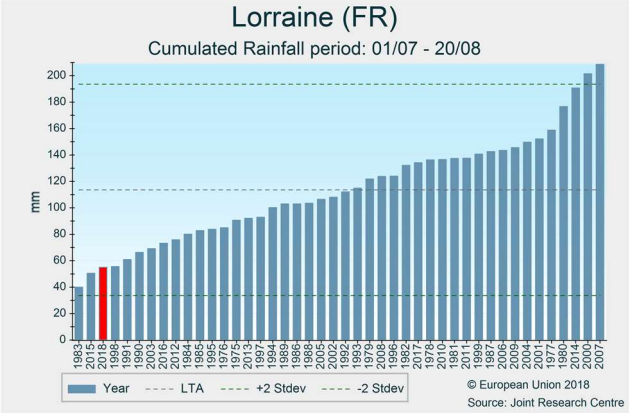
3. Country analysis

3.1 European Union

France

Heat and rain deficit degrading crop conditions in the north

While substantial rainfall was observed in the southern regions, which faced only two weeks of heat at the end of July and the beginning of August, the soil water reserve was substantially depleted in the north, the north-east being the most impacted (*Alsace*, *Lorraine* and *Champagne-Ardennes*). Cumulative rainfall in the north was below average, and, since the beginning of July, temperatures have been largely above average, thus increasing crop water demand. The yield forecasts are not optimistic considering the hot and dry conditions observed from *Basse-Normandie* to *Franche-Comté* and all the northern regions. Yield losses expected in the north are somewhat compensated for by the fairly good conditions observed in the south (note that in the south summer crops were exposed to unfavourable conditions around sowing and are still vulnerable, particularly those that were sown late). On balance, the yield forecasts for all the main summer crops are revised downwards at country level. With the exception of sunflower, the yield forecasts are below the five-year average and well below last year.



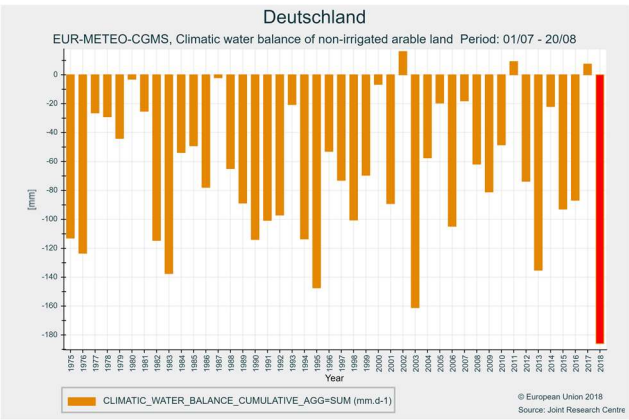
Germany

Drought now throughout the whole country

Temperatures were around 2-4°C above the long-term average in almost all of the country. The rainfall was, in most parts, less than 50% of the LTA. All regions were affected by the dry conditions, but to a lesser degree in the north-east, *Rheinland-Pfalz, Saarla*nd and the southern part of *Bayern*. The climatic water balance, according to our model calculations, exhibits the lowest values in our records since 1975 for the period under review as well as for the period since 1st of March closely followed by 2003.

The harvest of small grain cereals is concluded in all regions. As a result of the drought, which further accelerated leaf senescence and caused early maturation, yield forecasts are further revised downwards for soft and durum wheat, triticale and rye.

Summer crops, in contrast to winter and spring crops, are affected by drought in almost all regions of the country. All forecasts are revised downwards. Green maize is already being harvested. Many poor stands of what was planned to be grain maize have been cut as green maize (also to alleviate the existing lack of roughage). Note that the yield forecast of grain maize in our tables refers to the originally estimated acreage. Accounting for the re-dedication of grain maize to roughage will probably result in higher yields from a smaller harvested area.



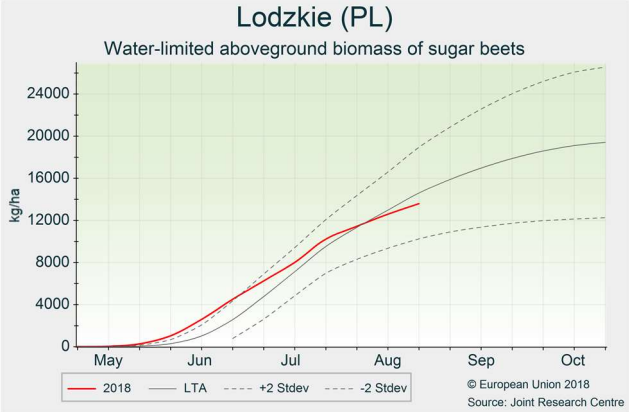
Poland

Slightly below-average outlook for summer crops

The period under review was characterised by warm weather conditions, with temperatures above 30°C recorded at the end of July and the beginning of August. After a long period of substantial water deficit, the second dekad of July was characterised by very high and intense precipitation in most of the country (with the exception of the west and south-east). Rainfall in August was very variable. At the end of the period under review, a substantial water deficit was still present in western regions (*Lubuskie*, *Wielkopolskie* and *Zachodniopomorskie*).

Harvesting of winter crops commenced in the second dekad of July, i.e. around two weeks earlier than usual. Heavy rain in the second dekad of July hampered harvesting operations, caused yield losses and impaired grain quality. The harvest of the main winter and spring cereals has now been completed.

The rainfall was beneficial for summer crops. Nevertheless, our model simulations indicate that water-limited biomass of potatoes is much lower than average. The yield expectations for maize, potatoes and sugar beet are slightly below the 5 year average.



The United Kingdom and Ireland

Yield forecast revised downwards for spring barley, potatoes and sugar beet

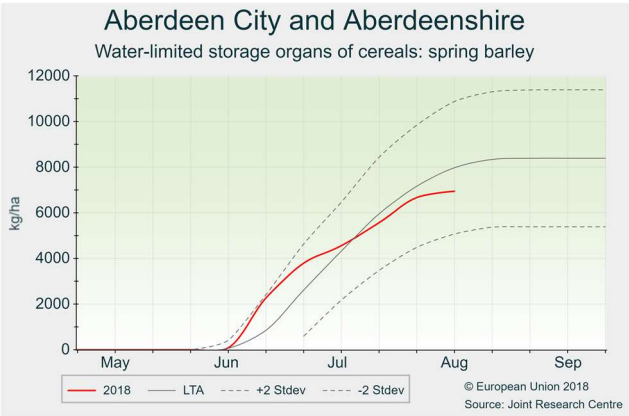
Above-average temperatures prevailed in both the UK and Ireland until the second dekad of August, when temperatures dropped to below-average levels. Rainfall continued to be below average, but precipitation levels in general increased from the second dekad of July.

The wheat harvest started in mid-July, about 10 days earlier than usual, and is nearly complete. Field observations report generally good quality but highly variable yields, depending on region and soil type.

For spring barley the duration of the grain-filling period was negatively affected by the exceptionally warm summer temperatures, which further reduced yield potentials already affected by the dry conditions, particularly of the later drilled crops. Spring barley harvest started in the last week of July but spring barley crops vary greatly in their maturity owing to their different sowing dates.

Dry weather negatively affected potato and sugar beet crops, and yield reductions are likely to be significant, particularly for potato crops.

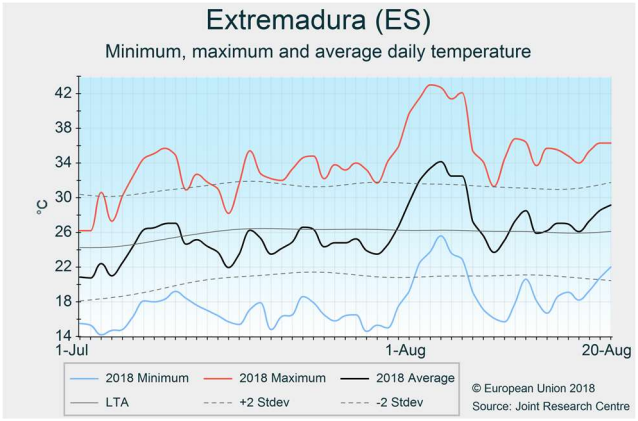
The yield forecasts of the July Bulletin remained practically unchanged for winter cereals, i.e. a few per cent below the five-year average. The forecasts for spring barley, potatoes and sugar beet were revised downwards.



Spain and Portugal

Summer crops progressing adequately

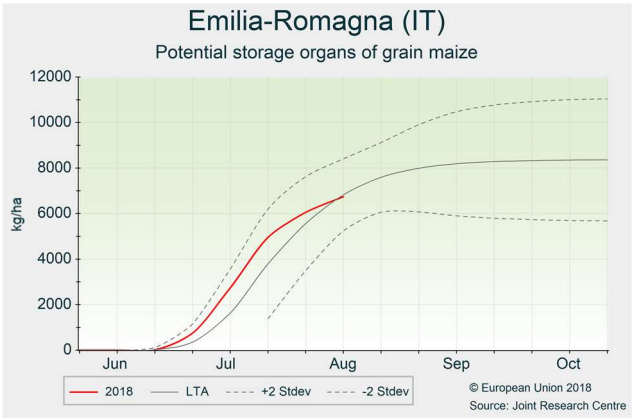
Weather conditions have been warmer than usual in the eastern half of the Iberian Peninsula since July. In western regions, temperatures have been below average, except during the first dekad of August, when maximum temperatures exceeded 40°C in *Alentejo*, *Extremadura* and some provinces of *Andalucía*. Winter crop harvesting was completed with some delays (e.g. *Castilla y León*) and yields were high. Sunflower crops are ripening, with a positive yield outlook, thanks to above-average rainfall throughout the season in the main producing regions. The irrigation campaign for maize is progressing adequately and yield expectations are average.



Italy

Yield forecasts slightly reduced owing to heat stress

The summer crop season is proceeding under unfavourable weather conditions due to the heatwave that occurred from 25 July to 11 August. In northern agricultural regions, temperatures oscillated above the average from late July (with three to five days with T_{max} > 35°C) while precipitation was scarce, especially in the central Po Valley (-50% compared to the LTA considering the whole period of analysis). In central Italy, hot and dry weather conditions were even more intense: up to 10 days with T_{max} > 35°C in *Toscane* and around -60% of rain compared to the LTA in *Umbria*. Such weather conditions accelerated grain maize and sunflower's phenological development. The grain-filling period of grain maize was slightly shortened; irrigation mitigated canopy temperatures and prevented severe heat stress. Where there was no irrigation, usually in marginally productive areas, significant yield losses are expected. Sunflower is not irrigated, but the heat stress affected only the final stages of yield formation and yield losses are limited.

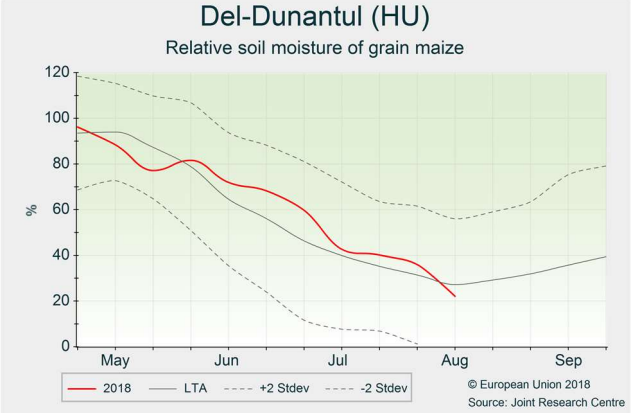


Hungary

Hot and dry conditions lower yield expectations for potatoes and sugar beet

Near-average thermal conditions characterised the first two dekads of July, but since 20 July temperatures have exceeded the LTA by 2-4°C. Areas along the north-western border and in the eastern half of the country were particularly warm, with the number of hot days (T_{max} > 30°C) reaching 18-23. High temperatures are reflected in the highly advanced crop development, but had a negative impact on the biomass accumulation of potatoes and sugar beet. After a slow start due to excessive rainfall (see July Bulletin), harvesting of winter and spring cereals practically finished in the first dekad of August without major additional hiccups.

The soil moisture was adequate during the flowering and early grain-filling periods of maize and sunflower; however, precipitation since late July has been insufficient to cover crop water demands in eastern regions. The yield outlook for potatoes and sugar beet was revised downwards, but the positive forecast for grain maize and sunflower is maintained assuming that — at country level — the positive effects of the predominantly favourable conditions in western regions outweigh the yield reduction in eastern regions.



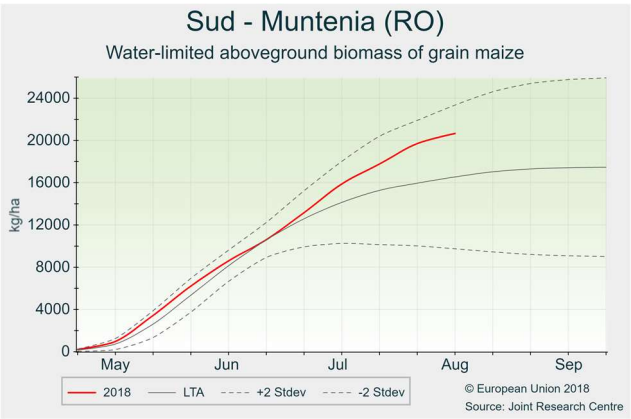
Romania

Good maize and sunflower yield outlook

Daily temperatures fluctuated around the average in July, but the first half of August was 1-2°C warmer than usual. Following the very wet June and July, August has so far been much drier, with only 1-25 mm total precipitation and large areas without any rain. Considering the period under review as a whole, only some areas in the *Nord-Vest* region were drier than usual.

The frequent rains in July hampered the harvesting of winter and spring cereals and caused yield losses and reduced grain quality.

Maize, sunflower and sugar beet crops benefited from the abundant water supply. In these crops, biomass accumulation is exceptionally high and our yield forecasts have been revised further upwards. The yield forecast for potatoes was revised downwards, as yield formation and tuber health were negatively affected by the wet conditions in July and the water deficit in August.



Bulgaria

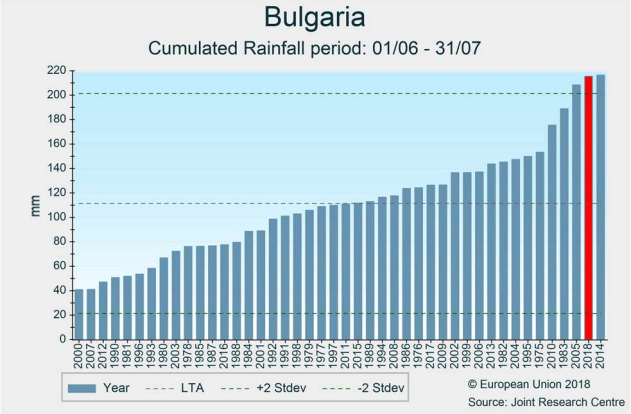
Very high yield potential for maize and sunflower

Daily temperatures fluctuated closely around the LTA, with an overall slight (< 1°C) positive thermal anomaly for the period under review as a whole.

Cumulative precipitation in June and July was the second highest in our records (just below the 2014 record level). In July, only the north-eastern part of Bulgaria experienced near- or moderately below-average rainfall. The first half of August was dry throughout the country (1-15 mm of rainfall).

The harvesting of winter crops continued to be hampered until the beginning of August, when the dry weather facilitated its completion. The yield forecast for winter cereals remains unchanged, but grain quality was negatively affected by the excessive wetness in July.

The abundant and frequent rainfall provided an adequate water supply for summer crops during the flowering and early grain-filling periods. Our simulation model results indicate above-average leaf area and biomass accumulation. Consequentially, the yield forecasts for maize and sunflower are close to record levels. The forecast for potatoes is below the historical trend because the overly wet conditions constrained photosynthesis and yield formation and increased the pressure from pests and diseases.

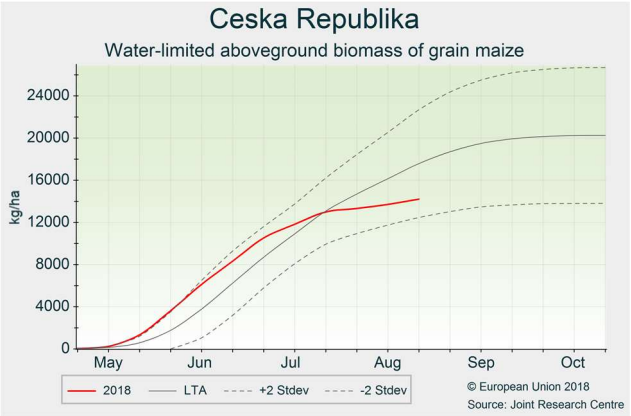


Austria, Slovakia and the Czech Republic

Reduced summer crop yield expectations

Normal temperatures during the first half of July were followed by a distinct warm weather anomaly after mid-July. The longest heatwave, with up to 18 consecutive days with daily maximum temperatures above 30°C (occasionally reaching > 35°C), was recorded in north-western Austria, western Slovakia and the northern part of the Czech Republic. The period between 15 July and 20 August was the warmest in our records in the Czech Republic. This period was accompanied by a substantial rainfall deficit in the Czech Republic and upper Austria.

While winter cereals have mainly been harvested, without negative impacts from drought, summer crops have struggled with the hot and dry conditions in the Czech Republic, some parts of western Slovakia and upper Austria. Consequently, the yield outlook for summer crops has been revised downwards in the Czech Republic and Slovakia. For the Czech Republic, the grain maize yield forecast is now even more distinctly below the five-year average. For Austria and Slovakia, the yield forecast remains slightly above the five-year average.



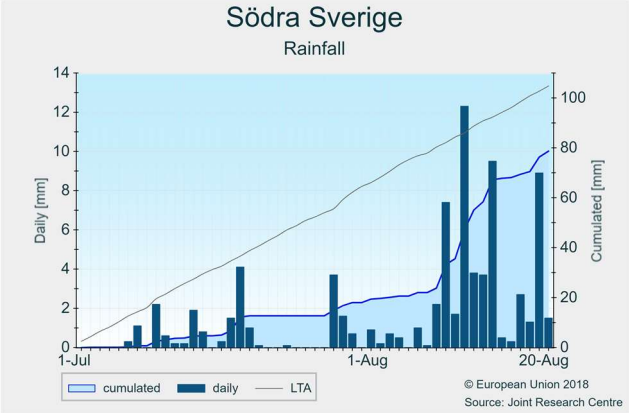
Denmark and Sweden

Rain arrives too late for winter and spring cereals

Above-average temperatures continued to prevail in both countries throughout the period under review. Daily average temperatures dropped below the LTA only for a few days in mid-August in both countries. Maximum temperatures reached the highest value of 32°C in mid-July in *Östra Sverige*.

Rainfall continued to be below average, but it increased in amount and frequency from the beginning of August. These rains came too late to improve yields, but they are making the ongoing cereal harvest more difficult.

The harvest of rapeseed is nearly completed, and reported yields are below the five-year average. Cereal harvests started in July, about 14 days earlier than usual, with low expectations. Our yield forecasts for winter and spring cereals remain at the same level as in the July Bulletin, well below the five-year average. The yield forecasts for sugar beet and potatoes also remain below average, with little change compared with those of the July Bulletin.



Finland, Lithuania, Latvia and Estonia

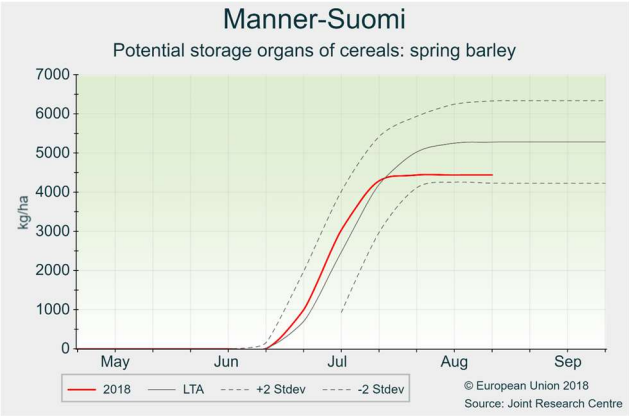
Early maturation reduces winter and spring crop yields

After a colder-than-usual beginning to July, above-average temperatures returned, and July became one of the warmest ever in our records for Finland.

Precipitation levels continued to be lower than usual for the review period (1 July to 20 August) in Finland, Estonia and Latvia, whereas average values were registered in Lithuania.

The exceptionally warm weather, prevailing since May, advanced the development of cereal crops by about two weeks with a consequent reduction in the duration of grain filling, which negatively affected yield potentials. In Finland, harvest started at the end of July for winter cereals and at the beginning of August for spring cereals. In Lithuania, harvesting of grain crops is practically concluded.

Due to the accelerated grain filling, the forecasts for winter and spring cereals as well as for rapeseed have been revised further downwards.



Belgium, the Netherlands and Luxembourg

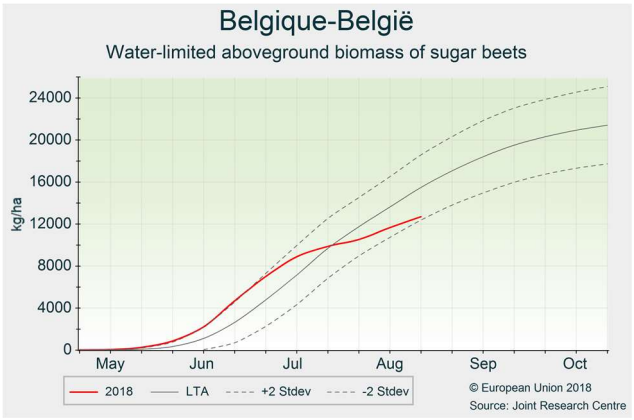
Outlook for summer crops revised downwards

The exceptionally warm and drier-than-usual conditions that dominated the weather since May continued until around 10 August. Rainfall since then has been around or above the LTA, but soil moisture content remains close to critical levels. Depending on the region, the 1 July to 20 August period as a whole was the warmest, or one of the warmest and driest in our records (since 1975).

Harvesting of winter crops and spring barley proceeded without problems and the yield forecasts remain unchanged.

Grain maize, green maize, potatoes and sugar beet were significantly impacted by the drought. Many farmers have access to irrigation but not enough to cover the water needs of all crops; moreover, in many regions water-use restrictions were imposed. Green maize, grain maize and potatoes are the most seriously affected crops.

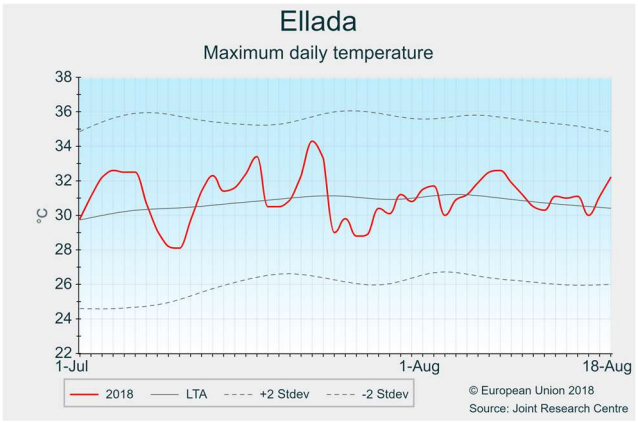
Sugar beet has a good capacity to recover growth when conditions improve. Fair yields are still possible thanks to the excellent growth during the first part of the season. The yield forecast for sugar beet is currently close to the five-year average. Yield forecasts for potatoes, green maize and grain maize were revised more markedly downwards and are now distinctly below the five-year average.



Greece and Cyprus

Positive outlook for summer crops

The period under review was warm and rainy. In July, in many regions, maximum daily temperatures fluctuated around the average. In *Anatoliki* and *Kentriki*, positive temperature anomalies were around 1-2°C. In *Thessalia* and southern Greece conditions were warmer, with maximum temperatures reaching 3-4°C above average. In August, temperatures have remained close to the LTA, and maximum temperatures were mostly below 32°C. Rainy episodes mainly took place in July and cumulative precipitation remains 40-70 mm above average. Summer crops benefited from these (by Greek standards) relatively mild weather conditions. Simulation model results show above-average biomass accumulation for grain maize and sunflower, which are currently in the grain-filling stages. Therefore, the overall outlook is positive and yield forecasts for summer crops were revised upwards, remaining above the five-year average.

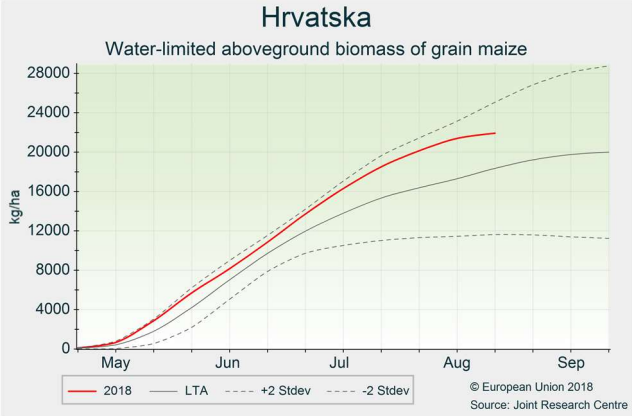


Slovenia and Croatia

Good maize yield outlook in Croatia

Seasonal temperature conditions during the first half of July were followed by a distinct warm weather anomaly, which lasted until the end of the review period. In the most important agricultural areas, the duration of the longest heatwave, with maximum temperatures reaching up to 34°C, was between five and eight days. Rainfall cumulates were close to or above the long-term-average in most regions, except in western Slovenia and some coastal areas of Croatia, where a rain deficit prevailed. In south-eastern Slovenia and eastern Croatia, several heavy rainfall events occurred, with daily cumulates up to 80 mm, partly in the form of hail.

Winter cereals have been harvested. Maize and sunflower crops are advanced in development and close to maturity. The grain maize yield forecast remains unchanged, above the five-year average, in Croatia. The yield forecast for Slovenia has been reduced but remains close to the five-year average.



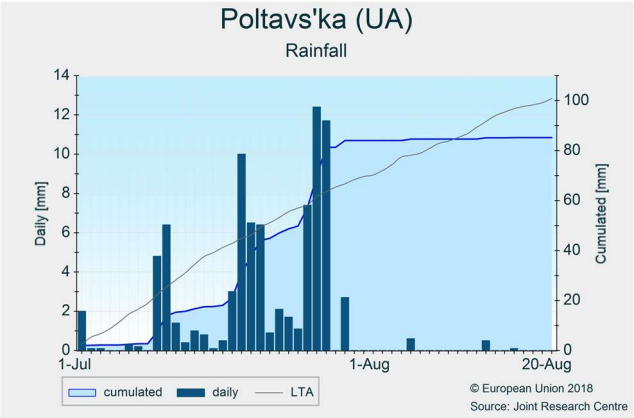
3.2 Black Sea Area

Ukraine

Positive yield outlook for summer crops

Cumulative rainfall for the period of analysis was close to the LTA, with frequent and substantial (in some regions very intense) rainfall in July, whereas August remained practically dry. Temperatures stayed slightly above average for the period of analysis. A period of very hot weather occurred during the second dekad of August. Overall, these weather conditions have been favourable for grain maize. Conditions for soybean have been somewhat less than optimal, considering the hot weather in the main producing regions (e.g. in *Poltavs'ka*). Sunflower is expected to be more seriously impacted by the hot temperatures and intense rainfall, particularly in *Zaporyz'ka*, which experienced prolonged dry weather followed by very intense rainfall during the second half of July.

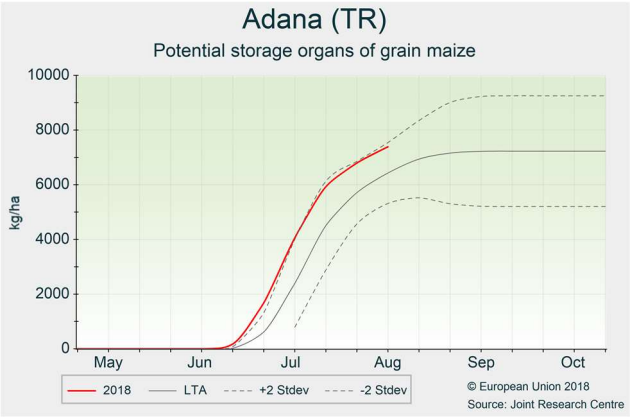
Grain maize and soybean yield forecasts have been revised upwards and are above the five-year average but below record levels as the season started after a long dry period in spring, which slightly limited growth at the beginning of the season.



Turkey

Positive outlook for maize

The harvest of winter crops ended in July under favourable dry conditions. High yield forecasts are confirmed for both wheat and barley. In July and in the first 20 days of August, temperatures were almost average; only central Turkey in July and south-eastern Turkey in August experienced slightly warmer-than-usual conditions (+1°C). No precipitation occurred in the main maize-growing regions: *Konya, Adana* and south-eastern regions (e.g. *Sanlurfia*). Overall, these weather conditions have been favourable for maize growth, as it is entirely sustained by irrigation. Spring and early summer rains were quite abundant and water reservoirs are at levels sufficient to sustain optimal maize growth. In central and southern regions (e.g. *Adana*), maize is nearing the end of the grain-filling phase; in the south-eastern region, maize flowering began in early August.



3.3 European Russia and Belarus

European Russia

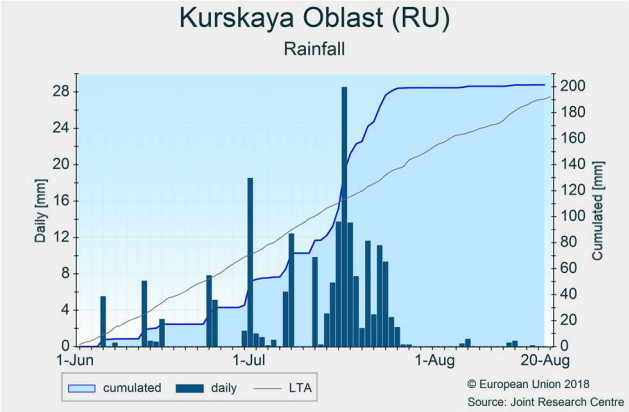
Decreased yield expectations for grain maize

European Russia experienced warmer-than-usual weather during the review period, with temperature anomalies typically between 1 and 3°C in the southern regions and along the Kazakh border. The first half of July and the period between 25 July and 7 August were extremely warm in these areas, and the number of hot days (T_{max} > 30°C) exceeded the average by 6-18 days.

Dry conditions continued until mid-July in the southern areas of the Central and Volga Okrugs, whereas elsewhere near- or above-average precipitation was experienced. The period from 16 to 26 July was exceptionally rainy in southern Russia (up to 180 mm precipitation), which was then followed by relatively dry weather until the end of the review period.

The dry weather conditions adversely affected the yield formation of winter and spring cereals in southern and western Russia where the main producing regions are located. The wet period in July hampered harvesting operations, decreased grain quality and incurred yield losses locally. In late July harvesting speeded up and has since progressed well. Yield expectations are close to or slightly below the five-year average.

Rainfall in July was favourable for grain maize, mitigating the deficient water supply during the flowering/early grain-filling periods, but the situation is still delicate.

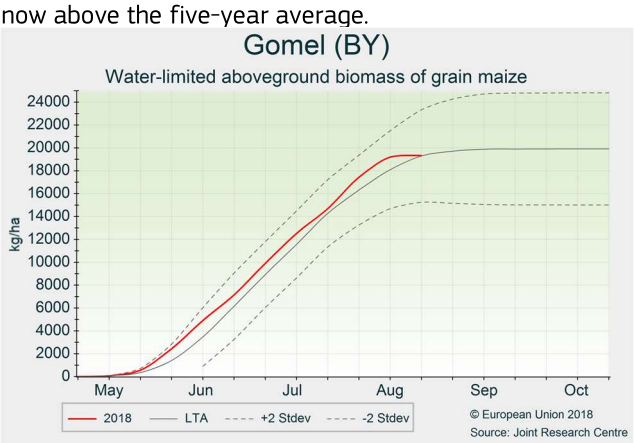


Belarus

Positive expectations for grain maize

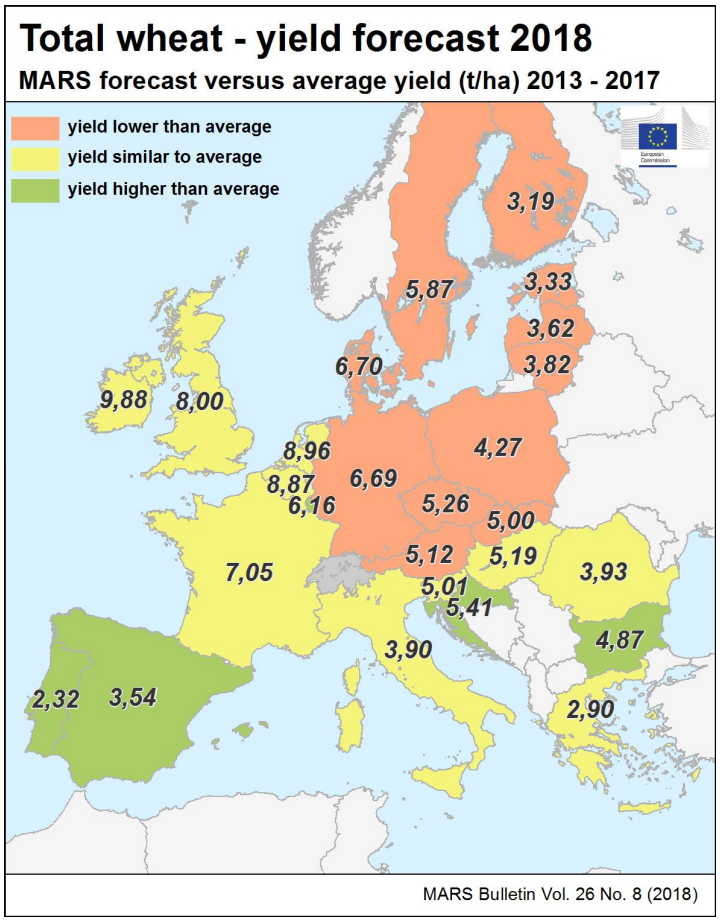
After a cold beginning of July, temperatures increased and remained significantly above the long-term average until the end of the current period of analysis. Precipitation was substantial and intense in July, especially during the second dekad. Consequently, the harvest of winter and spring crops was delayed, with negative impacts on the grain quality.

The positive thermal anomaly and high soil moisture levels were favourable for grain maize development and biomass formation. Overall, the yield expectations for wheat and barley are close to the average and are unchanged compared with last month's Bulletin, while our yield forecast for grain maize was revised upwards and is now above the five-year average.

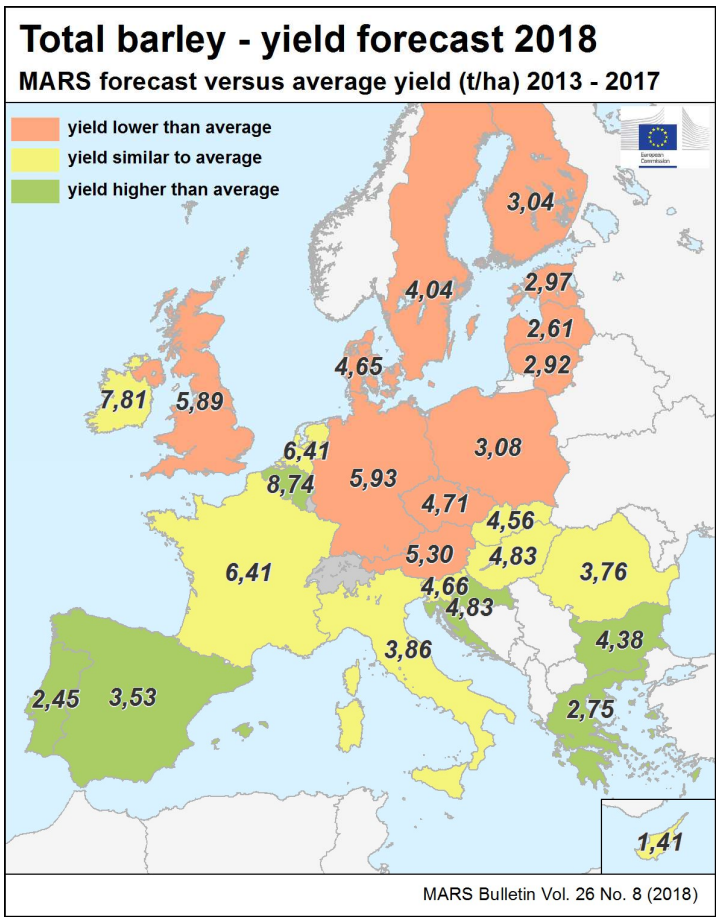


4. Crop yield forecasts

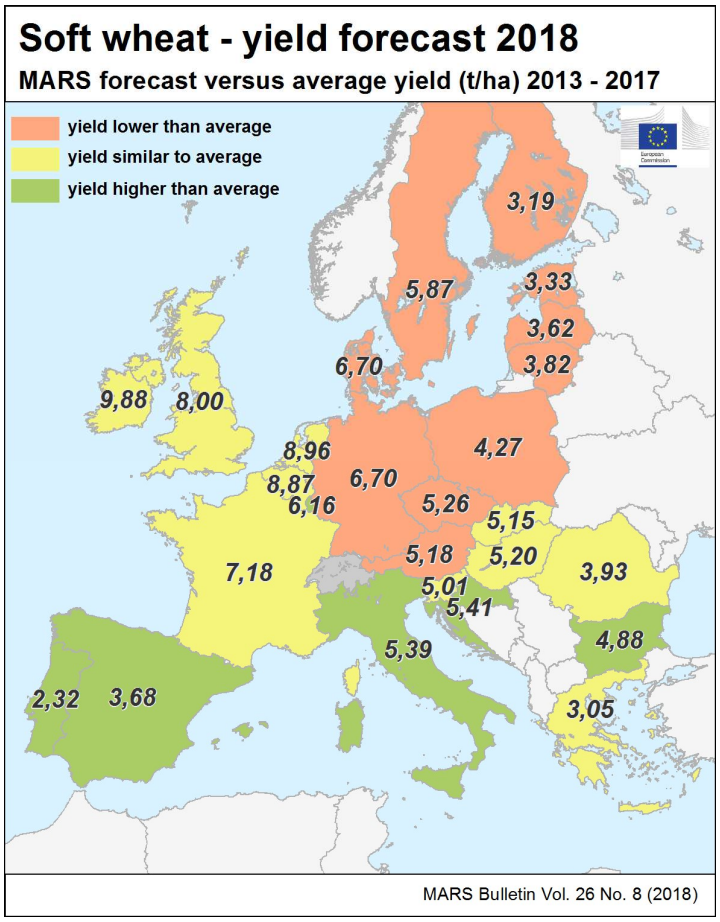
Country	TOTAL WHEAT (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	5.73	5.84	**5.49**	-4.2	-6.2
AT	5.63	4.85	**5.12**	-9.0	+5.4
BE	8.56	8.37	**8.87**	+3.6	+5.9
BG	4.59	5.35	**4.87**	+6.2	-8.8
CY	-	-	**-**	-	-
CZ	6.14	5.67	**5.26**	-14	-7.3
DE	8.00	7.64	**6.69**	-16	-13
DK	7.71	8.24	**6.70**	-13	-19
EE	3.84	4.20	**3.33**	-13	-21
ES	3.07	2.41	**3.54**	+15	+47
FI	3.99	4.13	**3.19**	-20	-23
FR	6.98	7.24	**7.05**	+0.9	-2.7
GR	2.84	2.93	**2.90**	+2.4	-0.9
HR	5.14	5.95	**5.41**	+5.2	-9.1
HU	5.06	5.44	**5.19**	+2.6	-4.7
IE	9.89	10.2	**9.88**	+0.0	-2.8
IT	3.82	3.86	**3.90**	+1.8	+1.0
LT	4.67	4.82	**3.82**	-18	-21
LU	5.88	5.48	**6.16**	+4.9	+12
LV	4.29	4.79	**3.62**	-16	-24
MT	-	-	**-**	-	-
NL	8.97	9.09	**8.96**	+0.0	-1.4
PL	4.67	4.90	**4.27**	-8.7	-13
PT	2.01	2.05	**2.32**	+15	+13
RO	3.93	4.88	**3.93**	+0.0	-19
SE	6.68	6.99	**5.87**	-12	-16
SI	4.99	5.03	**5.01**	+0.4	-0.5
SK	5.24	4.74	**5.00**	-4.5	+5.5
UK	8.20	8.16	**8.00**	-2.4	-2.0



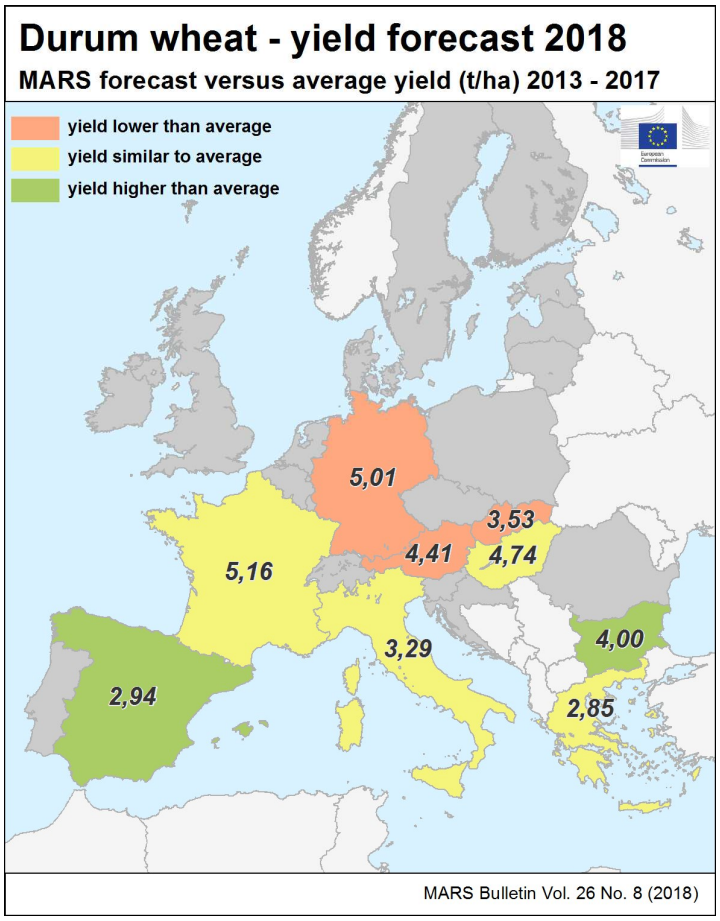
Country	TOTAL BARLEY (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	4.91	4.89	**4.71**	-4.0	-3.8
AT	5.64	5.60	**5.30**	-6.0	-5.3
BE	8.35	8.67	**8.74**	+4.6	+0.8
BG	4.10	4.68	**4.38**	+6.6	-6.5
CY	1.44	1.81	**1.41**	-2.0	-22
CZ	5.30	5.22	**4.71**	-11	-10
DE	6.94	6.93	**5.93**	-15	-14
DK	5.86	6.00	**4.65**	-21	-23
EE	3.55	4.10	**2.97**	-16	-28
ES	2.91	2.26	**3.53**	+21	+56
FI	3.68	4.08	**3.04**	-17	-25
FR	6.37	6.33	**6.41**	+0.8	+1.4
GR	2.64	2.69	**2.75**	+4.2	+2.3
HR	4.36	4.98	**4.83**	+11	-3.0
HU	4.74	5.28	**4.83**	+1.9	-8.5
IE	8.05	8.36	**7.81**	-3.0	-6.5
IT	3.81	3.93	**3.86**	+1.1	-1.9
LT	3.60	3.65	**2.92**	-19	-20
LU	-	-	**-**	-	-
LV	3.31	3.32	**2.61**	-21	-21
MT	-	-	**-**	-	-
NL	6.67	6.09	**6.41**	-3.8	+5.3
PL	3.79	3.96	**3.08**	-19	-22
PT	2.06	1.90	**2.45**	+19	+29
RO	3.63	4.52	**3.76**	+3.8	-17
SE	5.02	5.29	**4.04**	-20	-24
SI	4.63	4.81	**4.66**	+0.8	-3.0
SK	4.64	4.53	**4.56**	-1.8	+0.7
UK	6.20	6.09	**5.89**	-4.9	-3.3



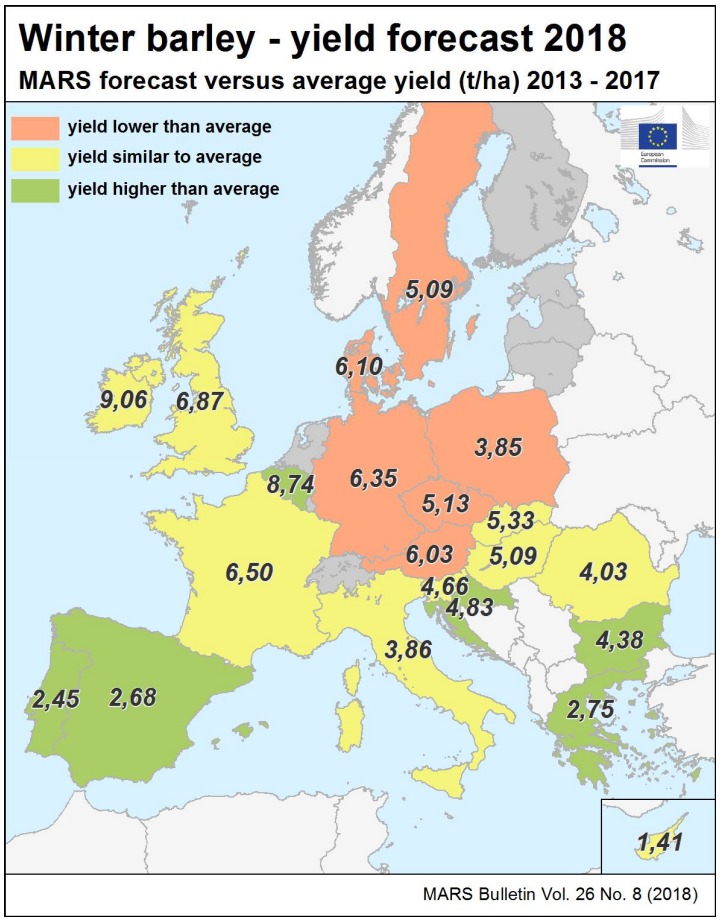
Country	SOFT WHEAT (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	5.97	6.11	**5.70**	-4.5	-6.7
AT	5.68	4.92	**5.18**	-8.9	+5.1
BE	8.56	8.37	**8.87**	+3.6	+5.9
BG	4.60	5.36	**4.88**	+6.2	-8.9
CY	-	-	-	-	-
CZ	6.14	5.67	**5.26**	-14	-7.3
DE	8.02	7.66	**6.70**	-16	-13
DK	7.71	8.24	**6.70**	-13	-19
EE	3.84	4.20	**3.33**	-13	-21
ES	3.19	2.32	**3.68**	+16	+58
FI	3.99	4.13	**3.19**	-20	-23
FR	7.10	7.36	**7.18**	+1.1	-2.5
GR	2.99	3.15	**3.05**	+1.9	-3.1
HR	5.14	5.95	**5.41**	+5.2	-9.1
HU	5.06	5.47	**5.20**	+2.7	-5.0
IE	9.89	10.2	**9.88**	+0.0	-2.8
IT	5.15	5.49	**5.39**	+4.6	-1.8
LT	4.67	4.82	**3.82**	-18	-21
LU	5.88	5.48	**6.16**	+4.9	+12
LV	4.29	4.79	**3.62**	-16	-24
MT	-	-	-	-	-
NL	8.97	9.09	**8.96**	+0.0	-1.4
PL	4.67	4.90	**4.27**	-8.7	-13
PT	2.01	2.05	**2.32**	+15	+13
RO	3.93	4.88	**3.93**	+0.0	-19
SE	6.68	6.99	**5.87**	-12	-16
SI	4.99	5.03	**5.01**	+0.4	-0.5
SK	5.30	4.80	**5.15**	-2.7	+7.4
UK	8.20	8.16	**8.00**	-2.4	-2.0



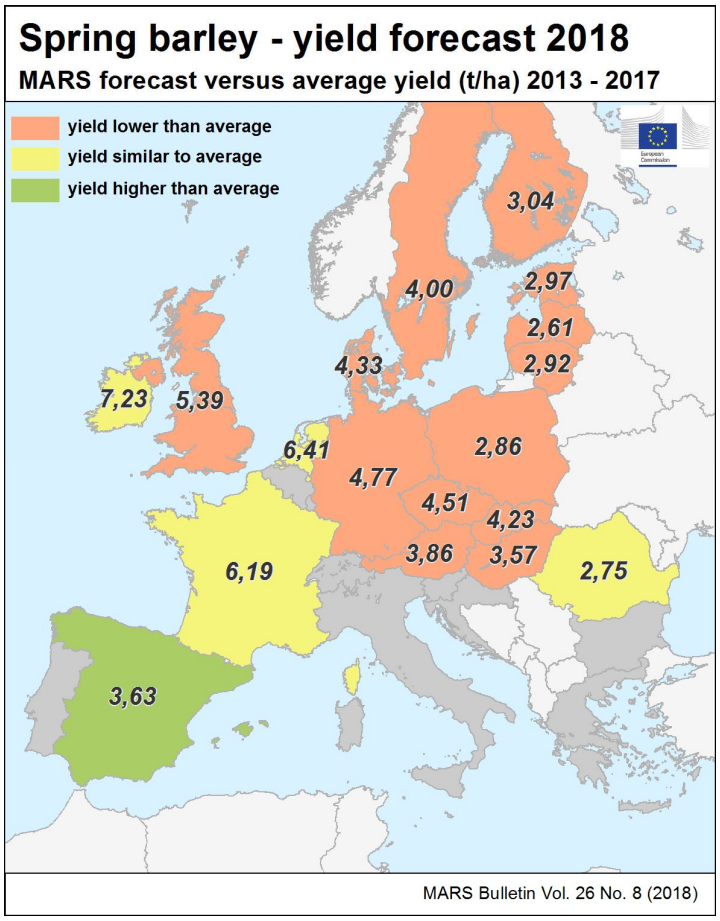
Country	DURUM WHEAT (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	3.39	3.50	**3.47**	+2.3	-0.8
AT	4.74	4.02	**4.41**	-7.0	+10
BE	-	-	-	-	-
BG	3.67	4.17	**4.00**	+8.8	-4.2
CY	-	-	-	-	-
CZ	-	-	-	-	-
DE	5.55	5.76	**5.01**	-9.6	-13
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	2.54	2.73	**2.94**	+16	+7.5
FI	-	-	-	-	-
FR	5.15	5.59	**5.16**	+0.1	-7.8
GR	2.77	2.85	**2.85**	+3.0	-0.1
HR	-	-	-	-	-
HU	4.78	4.71	**4.74**	-0.8	+0.8
IE	-	-	-	-	-
IT	3.26	3.23	**3.29**	+0.8	+1.7
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	-	-	-	-	-
RO	-	-	-	-	-
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	4.41	4.30	**3.53**	-20	-18
UK	-	-	-	-	-



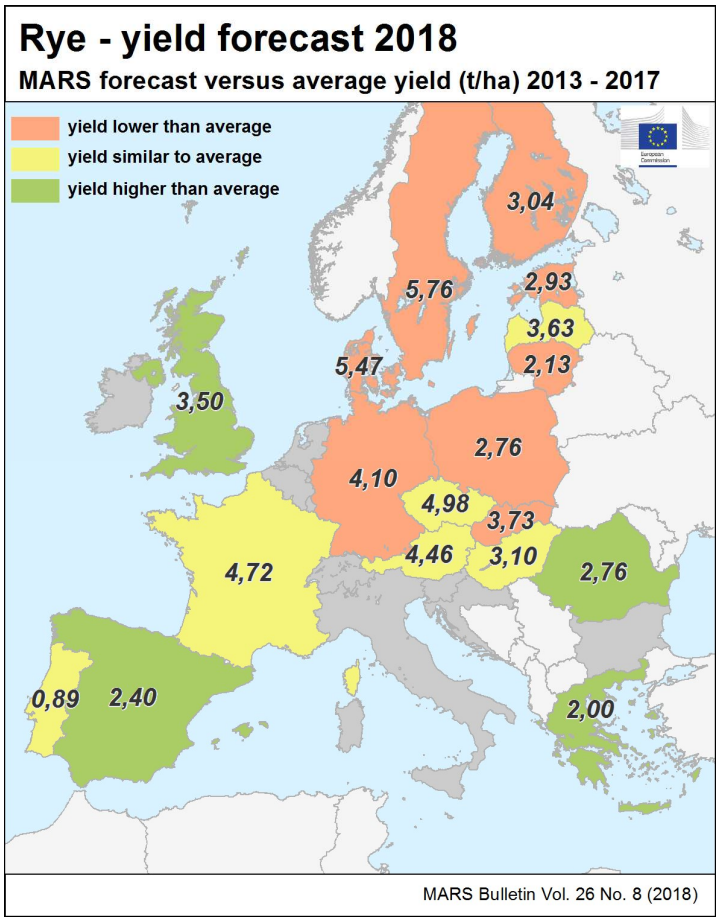
Country	WINTER BARLEY (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	5.79	5.98	**5.61**	-3.1	-6.2
AT	6.33	6.59	**6.03**	-4.7	-8.5
BE	8.35	8.67	**8.74**	+4.6	+0.8
BG	4.10	4.68	**4.38**	+6.6	-6.5
CY	1.44	1.81	**1.41**	-2.0	-22
CZ	5.52	5.85	**5.13**	-7.2	-12
DE	7.35	7.35	**6.35**	-14	-14
DK	6.54	6.78	**6.10**	-6.7	-10
EE	-	-	-	-	-
ES	2.41	2.00	**2.68**	+11	+34
FI	-	-	-	-	-
FR	6.51	6.48	**6.50**	-0.1	+0.3
GR	2.64	2.69	**2.75**	+4.2	+2.3
HR	4.36	4.98	**4.83**	+11	-3.0
HU	5.02	5.44	**5.09**	+1.3	-6.5
IE	9.33	9.11	**9.06**	-2.9	-0.5
IT	3.81	3.93	**3.86**	+1.1	-1.9
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	4.38	4.66	**3.85**	-12	-17
PT	2.06	1.90	**2.45**	+19	+29
RO	3.95	4.90	**4.03**	+1.9	-18
SE	6.11	6.42	**5.09**	-17	-21
SI	4.63	4.81	**4.66**	+0.8	-3.0
SK	5.17	5.26	**5.33**	+3.0	+1.3
UK	6.98	6.97	**6.87**	-1.6	-1.5



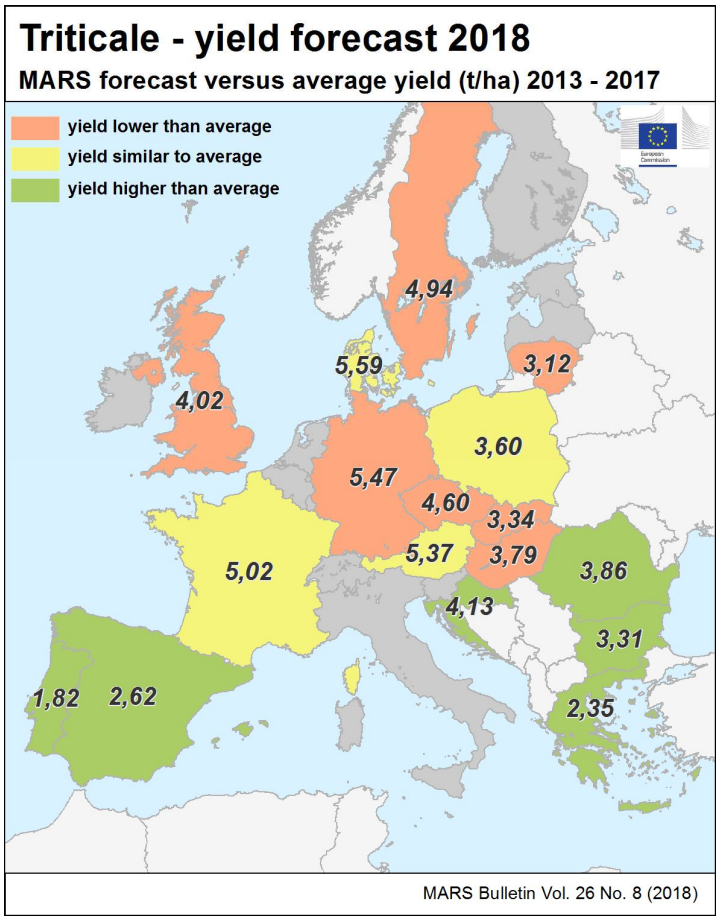
Country	SPRING BARLEY (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	4.25	4.07	**4.07**	-4.3	+0.1
AT	4.65	3.99	**3.86**	-17	-3.4
BE	-	-	-	-	-
BG	-	-	-	-	-
CY	-	-	-	-	-
CZ	5.21	4.96	**4.51**	-13	-9.1
DE	5.49	5.40	**4.77**	-13	-12
DK	5.71	5.82	**4.33**	-24	-26
EE	3.55	4.10	**2.97**	-16	-28
ES	2.99	2.29	**3.63**	+22	+59
FI	3.68	4.08	**3.04**	-17	-25
FR	5.97	5.91	**6.19**	+3.6	+4.8
GR	-	-	-	-	-
HR	-	-	-	-	-
HU	3.75	4.37	**3.57**	-5.0	-18
IE	7.50	7.93	**7.23**	-3.6	-8.9
IT	-	-	-	-	-
LT	3.60	3.65	**2.92**	-19	-20
LU	-	-	-	-	-
LV	3.31	3.32	**2.61**	-21	-21
MT	-	-	-	-	-
NL	6.67	6.09	**6.41**	-3.8	+5.3
PL	3.63	3.77	**2.86**	-21	-24
PT	-	-	-	-	-
RO	2.66	3.31	**2.75**	+3.3	-17
SE	4.97	5.21	**4.00**	-20	-23
SI	-	-	-	-	-
SK	4.49	4.25	**4.23**	-5.7	-0.6
UK	5.76	5.60	**5.39**	-6.4	-3.6



Country	RYE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	3.93	3.76	**3.37**	-14	-10
AT	4.37	3.46	**4.46**	+2.0	+29
BE	-	-	-	-	-
BG	-	-	-	-	-
CY	-	-	-	-	-
CZ	4.90	4.92	**4.98**	+1.4	+1.2
DE	5.66	5.01	**4.10**	-28	-18
DK	6.09	6.49	**5.47**	-10	-16
EE	3.15	3.93	**2.93**	-7.1	-26
ES	2.00	1.22	**2.40**	+20	+96
FI	3.34	3.93	**3.04**	-8.8	-23
FR	4.64	4.59	**4.72**	+1.7	+2.8
GR	1.79	1.91	**2.00**	+12	+4.9
HR	-	-	-	-	-
HU	2.99	3.32	**3.10**	+3.7	-6.6
IE	-	-	-	-	-
IT	-	-	-	-	-
LT	2.33	2.44	**2.13**	-8.5	-13
LU	-	-	-	-	-
LV	3.60	4.07	**3.63**	+0.7	-11
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	2.98	3.08	**2.76**	-7.3	-10
PT	0.87	0.85	**0.89**	+2.1	+4.2
RO	2.55	3.20	**2.76**	+8.0	-14
SE	6.25	6.65	**5.76**	-7.8	-14
SI	-	-	-	-	-
SK	3.97	4.52	**3.73**	-5.9	-17
UK	2.63	1.42	**3.50**	+33	+147



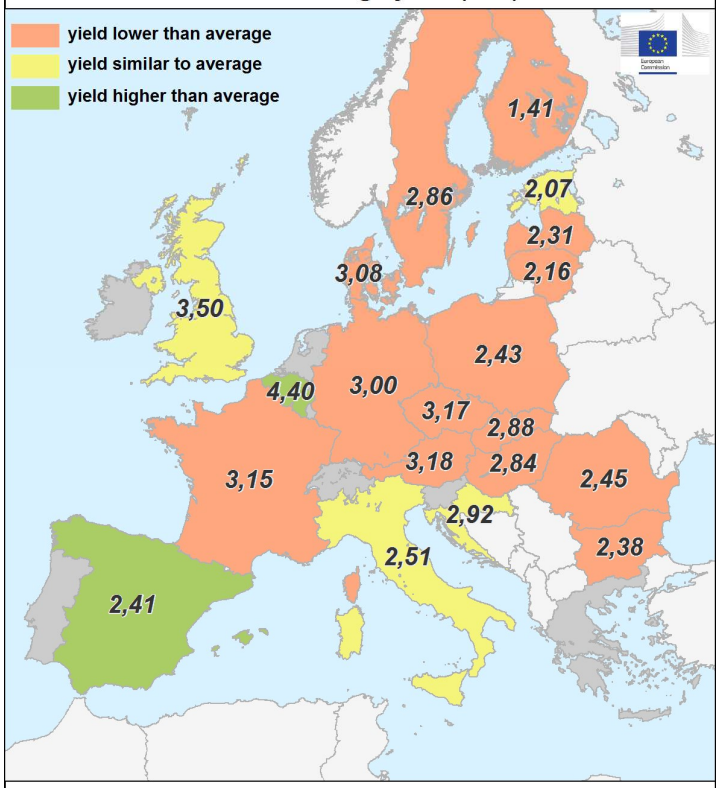
Country	TRITICALE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	4.23	4.26	**4.04**	-4.5	-5.0
AT	5.45	5.16	**5.37**	-1.5	+4.1
BE	-	-	-	-	-
BG	3.07	3.17	**3.31**	+8.0	+4.5
CY	-	-	-	-	-
CZ	4.82	4.89	**4.60**	-4.5	-5.8
DE	6.44	5.96	**5.47**	-15	-8.2
DK	5.81	6.58	**5.59**	-3.8	-15
EE	-	-	-	-	-
ES	2.26	1.84	**2.62**	+16	+42
FI	-	-	-	-	-
FR	5.09	5.20	**5.02**	-1.3	-3.4
GR	2.21	2.22	**2.35**	+6.5	+6.1
HR	3.92	4.50	**4.13**	+5.4	-8.2
HU	4.03	3.97	**3.79**	-6.0	-4.5
IE	-	-	-	-	-
IT	-	-	-	-	-
LT	3.36	3.26	**3.12**	-7.3	-4.5
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	3.74	3.93	**3.60**	-3.7	-8.5
PT	1.63	1.48	**1.82**	+12	+23
RO	3.68	4.39	**3.86**	+4.8	-12
SE	5.60	5.81	**4.94**	-12	-15
SI	-	-	-	-	-
SK	3.71	3.47	**3.34**	-10	-3.6
UK	4.30	4.50	**4.02**	-6.6	-11



Country	RAPE AND TURNIP RAPE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	3.29	3.29	**2.87**	-13	-13
AT	3.34	2.88	**3.18**	-5.0	+10
BE	4.22	4.26	**4.40**	+4.3	+3.2
BG	2.75	2.98	**2.38**	-14	-20
CY	-	-	-	-	-
CZ	3.44	2.91	**3.17**	-7.9	+8.9
DE	3.82	3.27	**3.00**	-22	-8.2
DK	3.96	4.18	**3.08**	-22	-26
EE	2.11	2.24	**2.07**	-2.2	-7.8
ES	2.16	1.56	**2.41**	+12	+55
FI	1.54	1.65	**1.41**	-8.7	-15
FR	3.43	3.83	**3.15**	-8.4	-18
GR	-	-	-	-	-
HR	2.88	2.80	**2.92**	+1.3	+4.3
HU	3.17	3.44	**2.84**	-10	-18
IE	-	-	-	-	-
IT	2.42	2.66	**2.51**	+3.6	-5.5
LT	2.51	3.00	**2.16**	-14	-28
LU	-	-	-	-	-
LV	2.67	2.91	**2.31**	-13	-20
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	2.95	3.00	**2.43**	-18	-19
PT	-	-	-	-	-
RO	2.66	2.79	**2.45**	-8.0	-12
SE	3.18	3.30	**2.86**	-10	-13
SI	-	-	-	-	-
SK	3.05	2.99	**2.88**	-5.6	-3.5
UK	3.49	3.85	**3.50**	+0.3	-9.1

Rapeseed - yield forecast 2018

MARS forecast versus average yield (t/ha) 2013 - 2017

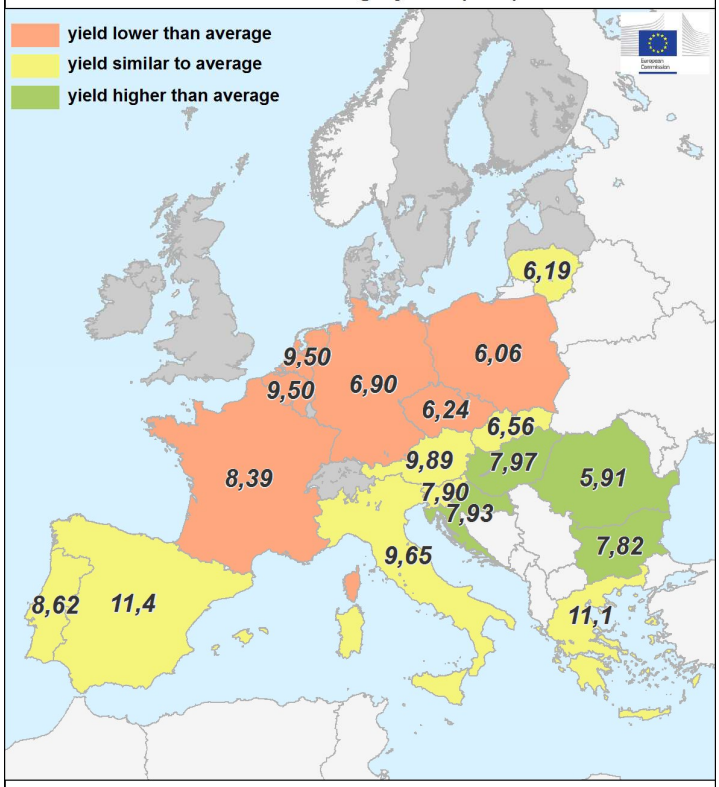


MARS Bulletin Vol. 26 No. 8 (2018)

Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	7.30	7.87	**7.57**	+3.6	-3.9
AT	9.76	10.0	**9.89**	+1.3	-0.6
BE	11.0	12.3	**9.50**	-14	-22
BG	6.24	6.44	**7.82**	+25	+22
CY	-	-	-	-	-
CZ	7.56	6.84	**6.24**	-17	-8.8
DE	9.74	10.5	**6.90**	-29	-35
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	11.2	11.2	**11.4**	+1.8	+1.8
FI	-	-	-	-	-
FR	9.02	10.3	**8.39**	-7.0	-18
GR	10.8	9.92	**11.1**	+2.6	+11
HR	7.16	6.33	**7.93**	+11	+25
HU	6.84	6.89	**7.97**	+17	+16
IE	-	-	-	-	-
IT	9.71	9.30	**9.65**	-0.6	+3.7
LT	6.29	5.74	**6.19**	-1.6	+7.9
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	10.5	13.4	**9.50**	-9.8	-29
PL	6.43	7.15	**6.06**	-5.7	-15
PT	8.45	9.24	**8.62**	+2.0	-6.7
RO	4.55	5.95	**5.91**	+30	-0.7
SE	-	-	-	-	-
SI	8.00	7.11	**7.90**	-1.2	+11
SK	6.36	5.68	**6.56**	+3	+16
UK	-	-	-	-	-

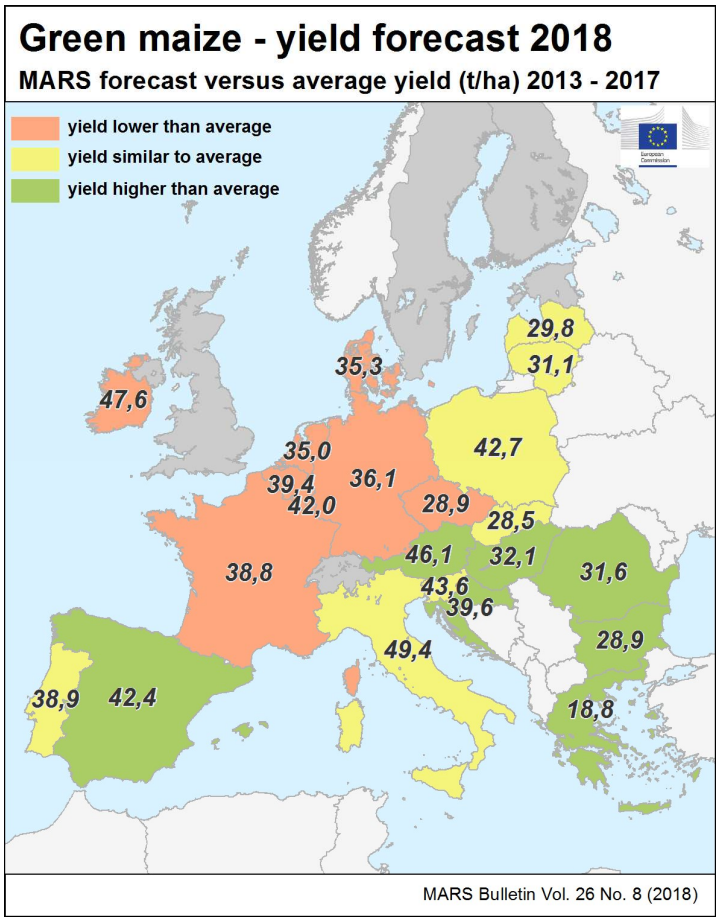
Grain maize - yield forecast 2018

MARS forecast versus average yield (t/ha) 2013 - 2017

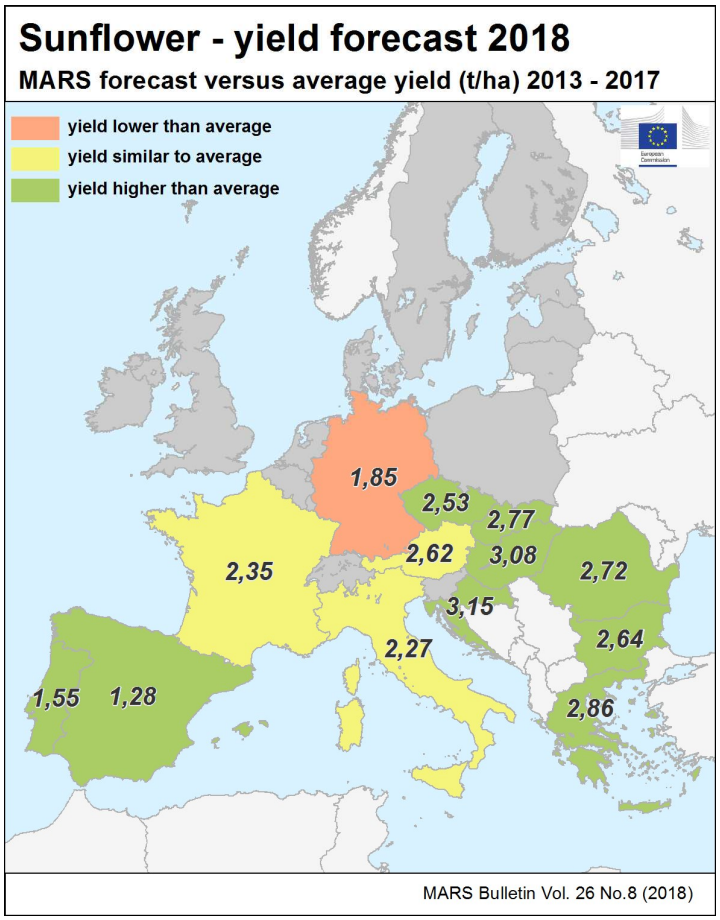


MARS Bulletin Vol. 26 No. 8 (2018)

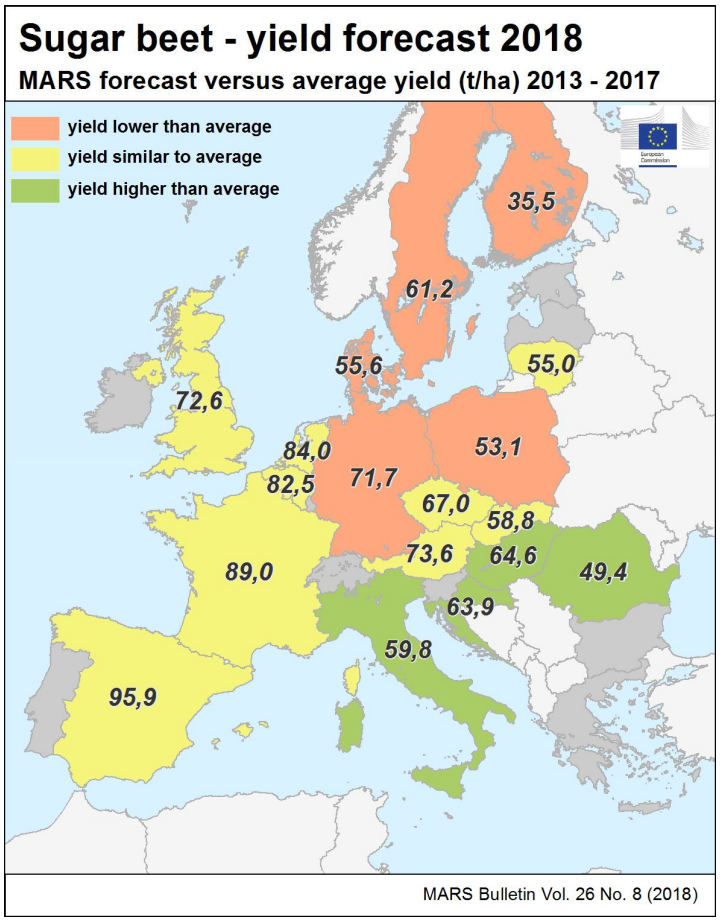
Country	GREEN MAIZE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU*	41.8	43.7	**37.7**	-9.8	-14
AT	44.0	45.0	**46.1**	+4.7	+2.4
BE	43.4	44.6	**39.4**	-9.2	-12
BG	21.1	21.3	**28.9**	+37	+36
CY	-	-	**-**	-	-
CZ	35.5	34.8	**28.9**	-19	-17
DE	43.7	47.5	**36.1**	-17	-24
DK	37.1	38.7	**35.3**	-4.7	-8.8
EE	-	-	**-**	-	-
ES	40.4	38.9	**42.4**	+4.8	+8.9
FI	-	-	**-**	-	-
FR	41.9	45.3	**38.8**	-7.3	-14
GR	17.1	20.9	**18.8**	+9.7	-10
HR	36.1	32.4	**39.6**	+9.9	+22
HU	27.7	30.4	**32.1**	+16	+5.5
IE	51.4	55.7	**47.6**	-7.3	-15
IT	51.0	NA	**49.4**	-3.2	NA
LT	30.1	26.5	**31.1**	+3.4	+18
LU	47.5	55.8	**42.0**	-12	-25
LV	30.8	31.1	**29.8**	-3.4	-4.4
MT	-	-	**-**	-	-
NL	42.7	48.9	**35.0**	-18	-28
PL	44.1	NA	**42.7**	-3.0	NA
PT	39.2	35.5	**38.9**	-0.6	+9.6
RO	25.5	27.7	**31.6**	+24	+14
SE	-	-	**-**	-	-
SI	43.0	39.8	**43.6**	+1.6	+10
SK	27.9	25.3	**28.5**	+2.4	+13
UK	-	-	**-**	-	-



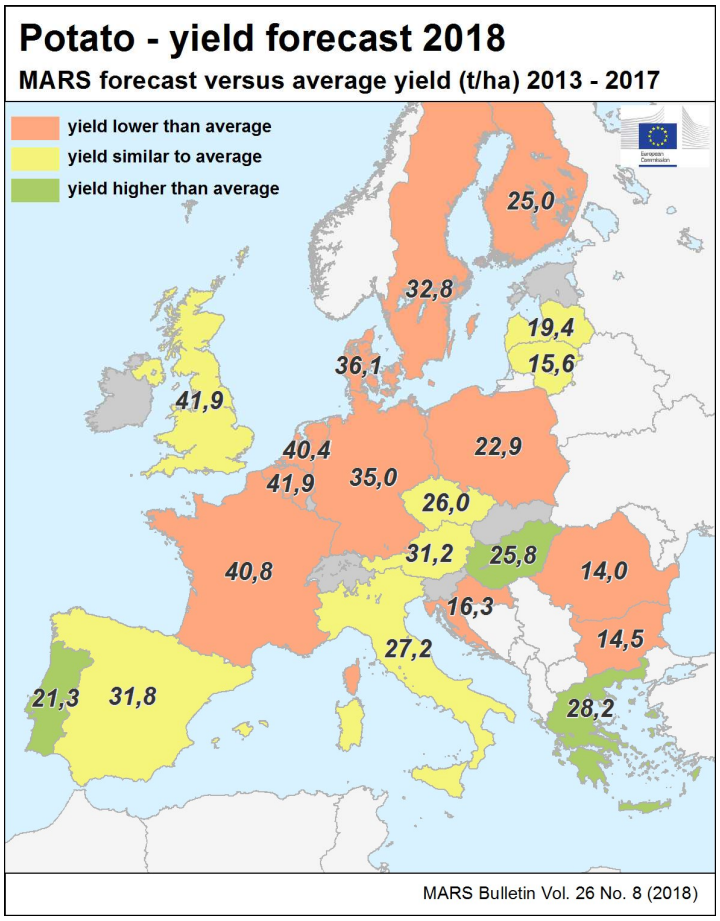
Country	SUNFLOWER (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	2.12	2.45	**2.45**	+16	-0.1
AT	2.54	2.33	**2.62**	+3.2	+13
BE	-	-	**-**	-	-
BG	2.26	2.29	**2.64**	+17	+15
CY	-	-	**-**	-	-
CZ	2.36	2.46	**2.53**	+7.3	+2.9
DE	2.13	2.20	**1.85**	-13	-16
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	1.13	1.24	**1.28**	+13	+3.6
FI	-	-	**-**	-	-
FR	2.27	2.79	**2.35**	+3.5	-16
GR	2.69	2.85	**2.86**	+6.1	+0.2
HR	2.93	3.12	**3.15**	+7.7	+1.2
HU	2.74	2.95	**3.08**	+12	+4.3
IE	-	-	**-**	-	-
IT	2.22	2.13	**2.27**	+2.2	+6.4
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	-	-	**-**	-	-
PT	1.12	1.19	**1.55**	+39	+31
RO	2.17	2.97	**2.72**	+25	-8.4
SE	-	-	**-**	-	-
SI	-	-	**-**	-	-
SK	2.54	2.51	**2.77**	+9.3	+11
UK	-	-	**-**	-	-



Country	SUGAR BEETS (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	74.6	81.1	**73.8**	-1.1	-9.0
AT	73.3	70.1	**73.6**	+0.4	+4.9
BE	81.4	93.7	**82.5**	+1.3	-12
BG	-	-	-	-	-
CY	-	-	-	-	-
CZ	64.9	66.6	**67.0**	+3.3	+0.7
DE	75.5	83.8	**71.7**	-5.1	-14
DK	65.6	71.4	**55.6**	-15	-22
EE	-	-	-	-	-
ES	93.0	95.0	**95.9**	+3.0	+0.9
FI	38.7	36.6	**35.5**	-8.2	-2.8
FR	89.6	95.1	**89.0**	-0.7	-6.5
GR	-	-	-	-	-
HR	61.1	NA	**63.9**	+4.7	NA
HU	61.4	NA	**64.6**	+5.1	NA
IE	-	-	-	-	-
IT	57.3	NA	**59.8**	+4.3	NA
LT	55.3	55.8	**55.0**	-0.5	-1.5
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	84.0	93.3	**84.0**	+0.1	-10
PL	56.8	57.6	**53.1**	-6.5	-7.8
PT	-	-	-	-	-
RO	40.5	40.8	**49.4**	+22	+21
SE	65.8	63.2	**61.2**	-7.1	-3.2
SI	-	-	-	-	-
SK	58.5	55.0	**58.8**	+0.6	+6.9
UK	71.3	NA	**72.6**	+1.8	NA



Country	POTATO (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	33.4	35.3	**31.1**	-6.9	-12
AT	30.9	28.4	**31.2**	+0.7	+10
BE	46.3	47.6	**41.9**	-9.6	-12
BG	15.5	17.8	**14.5**	-6.1	-18
CY	-	-	-	-	-
CZ	26.8	29.4	**26.0**	-3.0	-12
DE	44.5	46.8	**35.0**	-21	-25
DK	42.3	43.7	**36.1**	-15	-18
EE	-	-	-	-	-
ES	31.5	31.9	**31.8**	+1.1	-0.4
FI	27.1	28.9	**25.0**	-7.9	-13
FR	43.4	44.4	**40.8**	-6.0	-8.1
GR	26.8	28.3	**28.2**	+5.5	-0.1
HR	17.0	NA	**16.3**	-4.1	NA
HU	24.7	NA	**25.8**	+4.5	NA
IE	-	-	-	-	-
IT	26.9	NA	**27.2**	+1.1	NA
LT	15.8	12.3	**15.6**	-1.3	+27
LU	-	-	-	-	-
LV	18.8	NA	**19.4**	+3.2	NA
MT	-	-	-	-	-
NL	43.6	46.0	**40.4**	-7.4	-12
PL	23.9	25.3	**22.9**	-4.3	-9.4
PT	19.7	21.7	**21.3**	+7.9	-1.8
RO	15.9	18.2	**14.0**	-12	-23
SE	34.7	34.7	**32.8**	-5.3	-5.4
SI	-	-	-	-	-
SK	-	-	-	-	-
UK	42.4	NA	**41.9**	-1.1	NA



Country	WHEAT (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
BY	3.59	3.65	**3.76**	+4.6	+2.9
TR	2.71	2.78	**2.92**	+7.7	+5.1
UA	3.93	4.11	**3.90**	-1.0	-5.2

Country	BARLEY (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
BY	3.25	3.14	**3.16**	-2.7	+0.7
TR	2.58	2.40	**2.76**	+7.1	+15
UA	2.98	3.31	**2.90**	-2.8	-13

Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
BY	5.39	5.00	**6.16**	+14	+23
TR	9.21	9.40	**9.52**	+3.4	+1.3
UA	6.07	5.44	**6.28**	+3.5	+16

Note: Yields are forecast for crops with more than 10000 ha per country.

Sources: 2018 yields come from MARS CROP YIELD FORECASTING SYSTEM (output up to 20/08/2018)

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

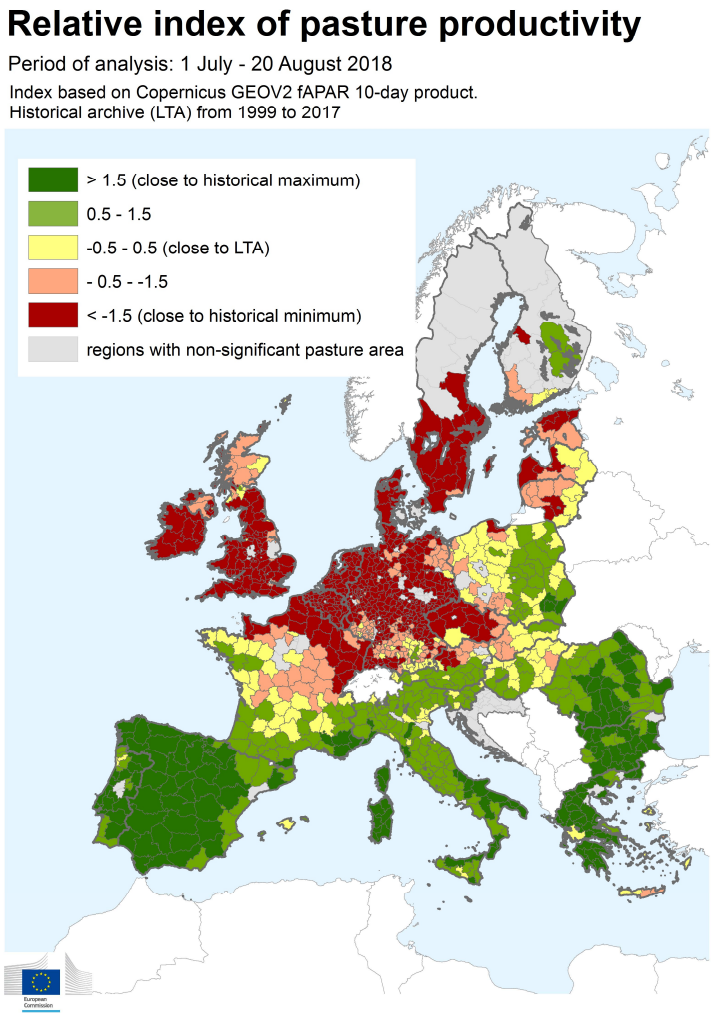
EU. 2013-2018 data come from DG AGRICULTURE short term Outlook data (dated July 2018, received on 31/07/2018), EUROSTAT Eurobase (last update: 13/08/2018) and EES (last update: 15/11/2017)

Non-EU. 2013-2017 data come from USDA, Turkish Statistical Institute (TurkStat), EUROSTAT Eurobase (last update: 13/08/2018), State Statistics Service of Ukraine, FAO and PSD-online

NA = Data not available.

5. Pastures in Europe – regional monitoring

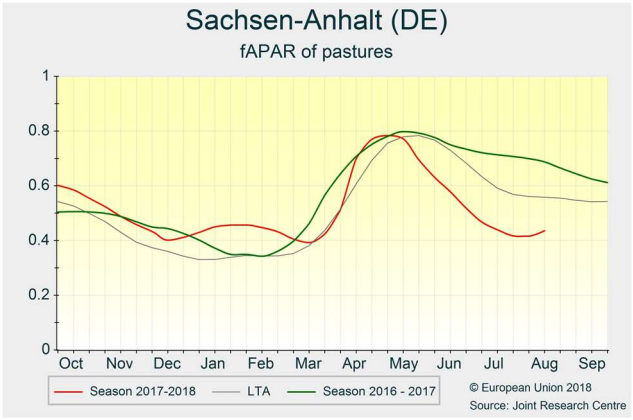
Exceptionally low pasture productivity in the northern half of Europe

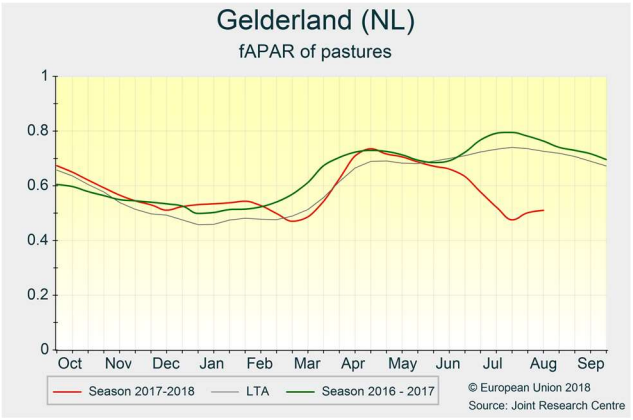


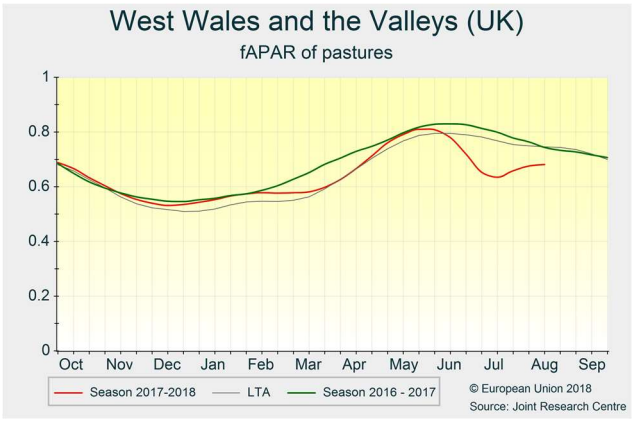
Exceptionally dry and hot conditions have affected the northern half of Europe since mid-June, leading to severe limitations to pasture growth in summer. The most affected areas are central and northern **Germany** (*Sachsen-Anhalt, Weser-Ems, Schleswig-Holstein*), the **Benelux** countries, **Denmark**, southern **Sweden**, **Ireland** and the **UK**, north-eastern **France** (*e.g. Champagne-Ardenne, Picardie, Alsace*) and the **Czech Republic**. In all these areas, marked in red in the pasture productivity index map, the photosynthetic activity of grasslands and fodder crops presents a sharp decrease since May-June. Pasture biomass production from July to the first half of August in these countries is the lowest since the start of observations (in 1999). Only in Ireland and the western UK (e.g. *Wales*), after the driest June of the last 40 years, has precipitation since mid-July been close to average, which has favoured a slight recovery of pasture photosynthetic activity.

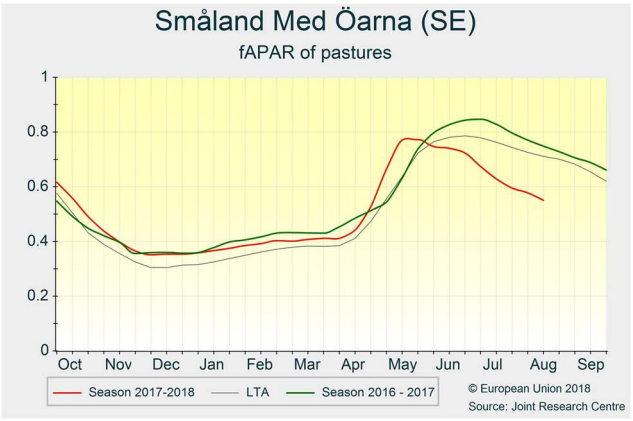
In **Latvia**, **Lithuania** and **Estonia**, weather conditions were also unfavourable for pasture productivity: unusually high temperatures and scarce precipitation during most of the summer. Nevertheless, some significant rainfall events since the last week of June have prevented severe constraints. Biomass production since July has been above seasonal values in the main grassland areas of eastern **Poland.** There, substantial precipitation in mid-July has been critical to support satisfactory production rates.

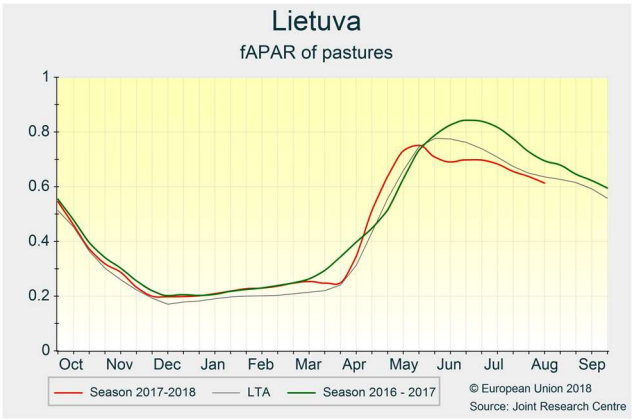
In **Spain**, southern and western **France**, **Italy**, **Austria**, **Romania**, **Hungary** and **Bulgaria** the pasture growing season is positive. Weather conditions in southern Europe have been unusually humid, which has favoured above-average biomass production rates.

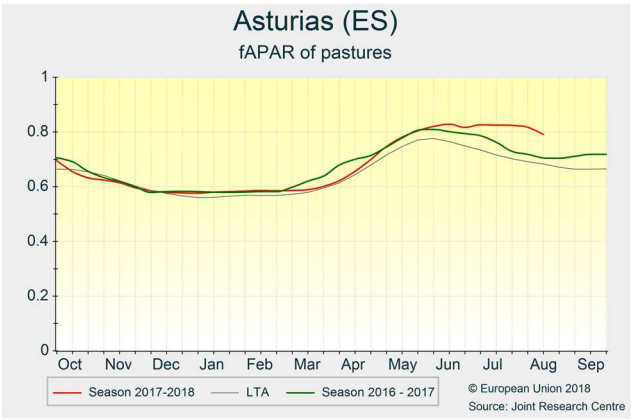

Sachsen-Anhalt (DE)
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre

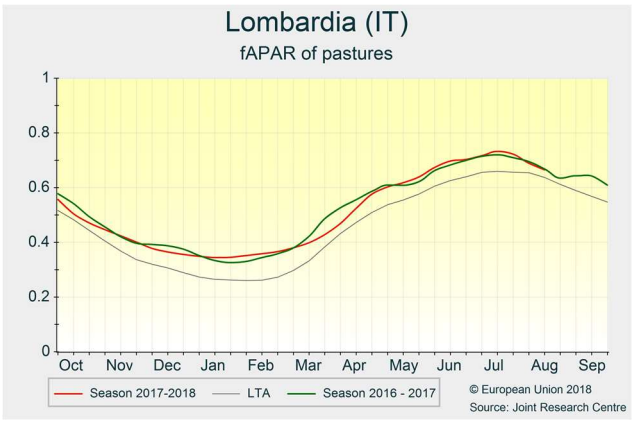

Gelderland (NL)
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre

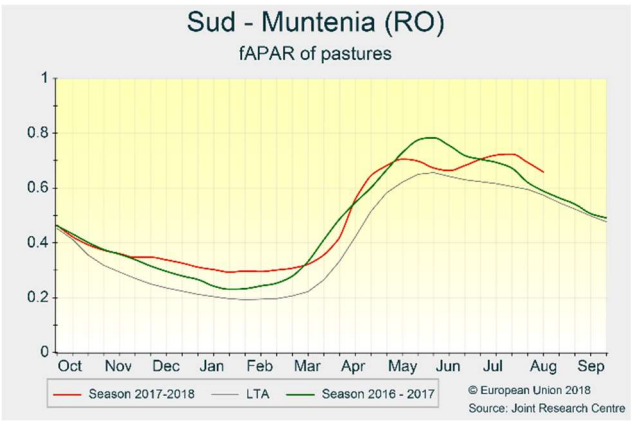

West Wales and the Valleys (UK)
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre


Småland Med Öarna (SE)
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre


Lietuva
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre

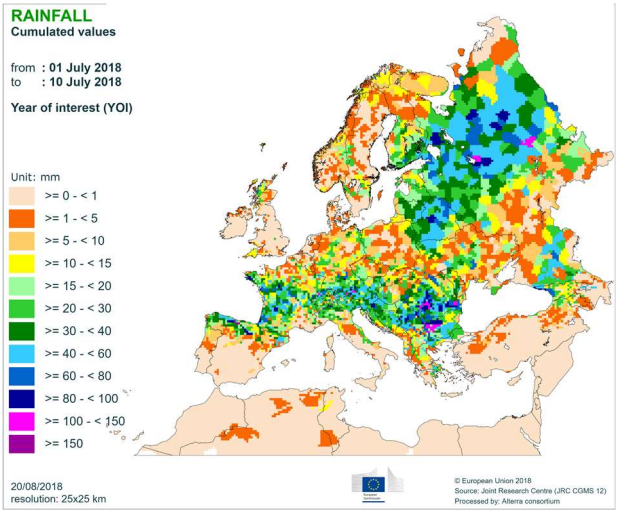

Asturias (ES)
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre

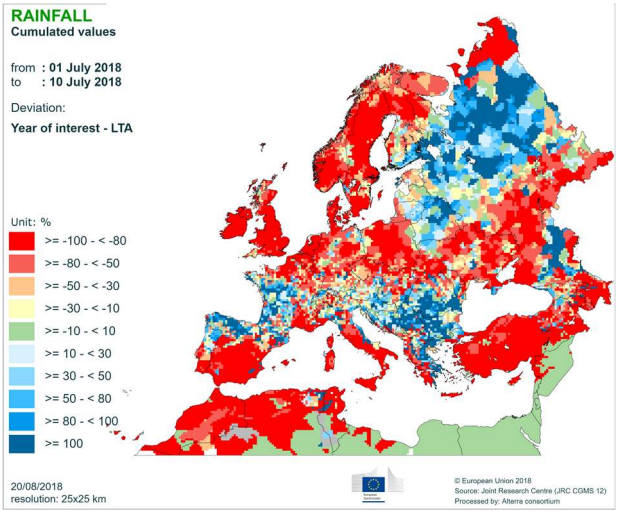

Lombardia (IT)
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre

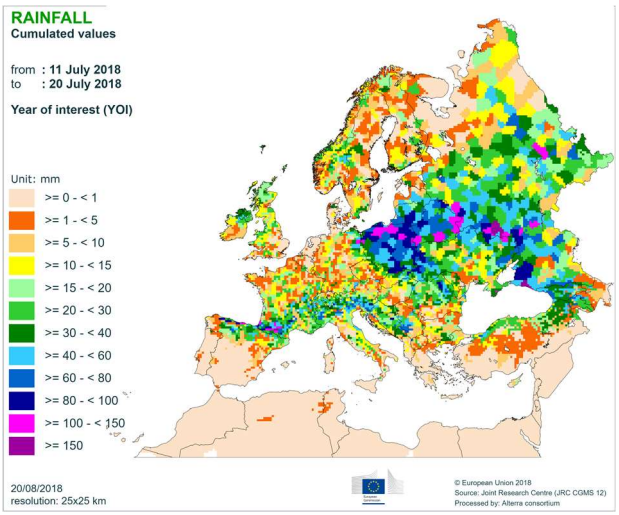

Sud - Muntenia (RO)
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre

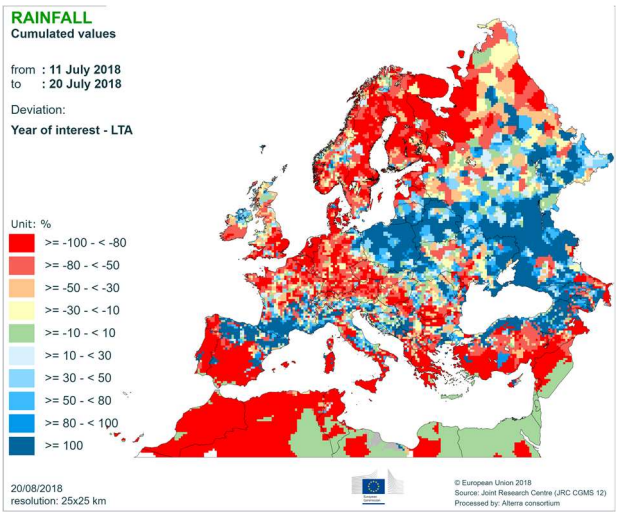
5. Atlas

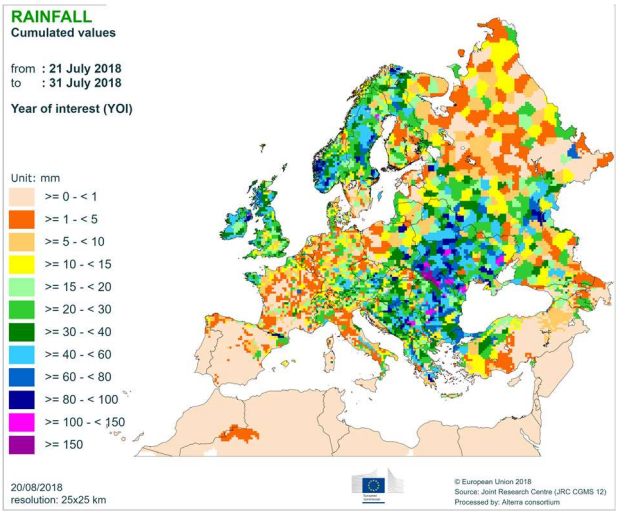
Precipitation

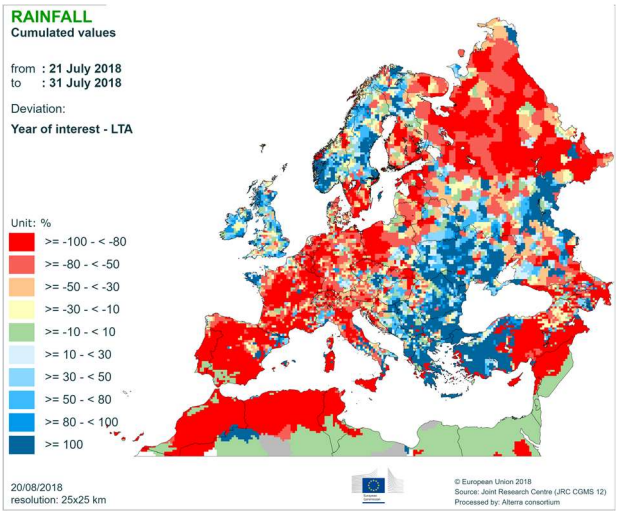


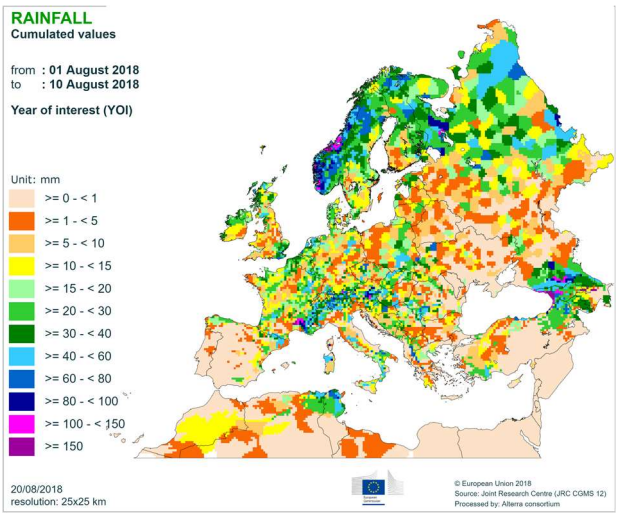


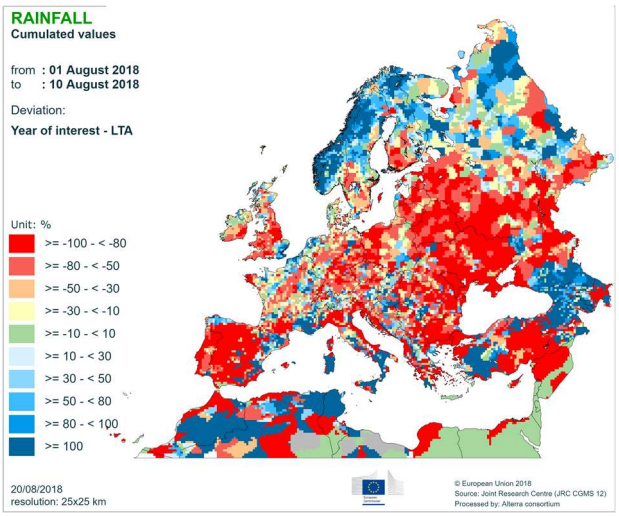


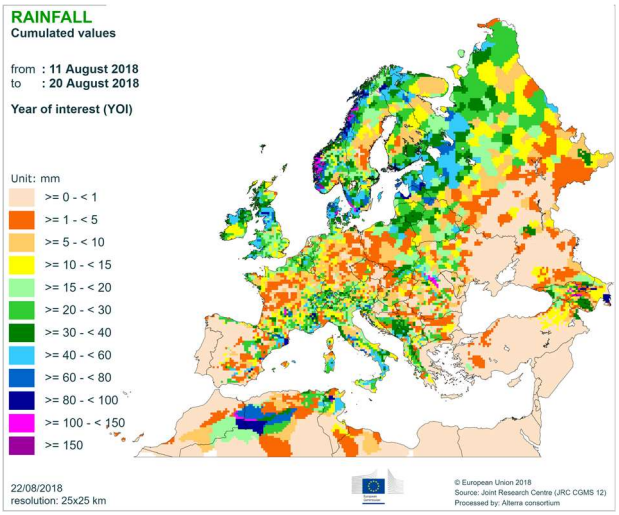


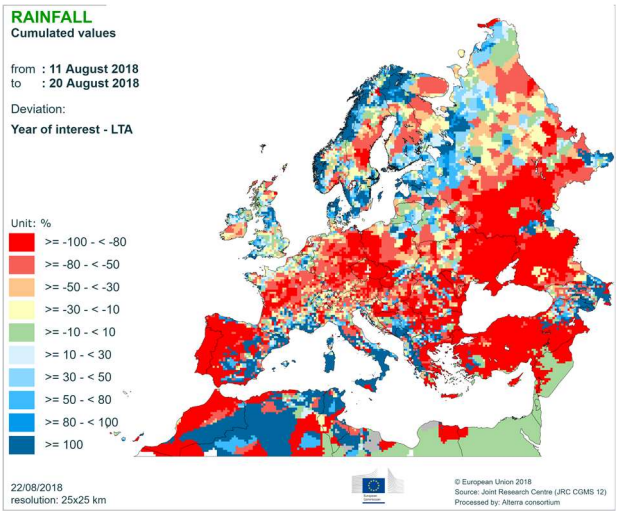




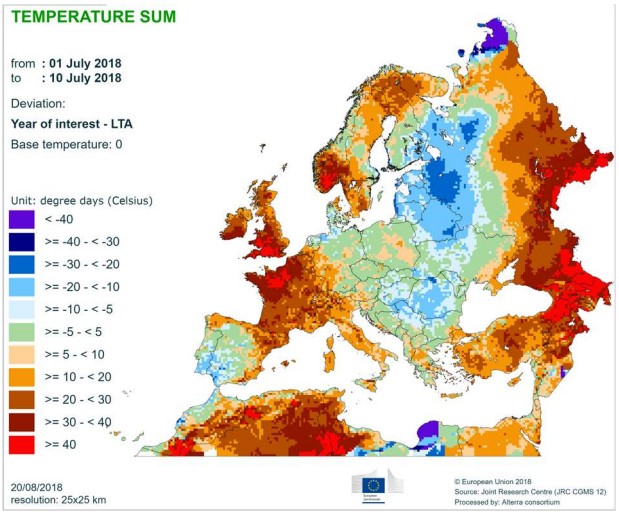


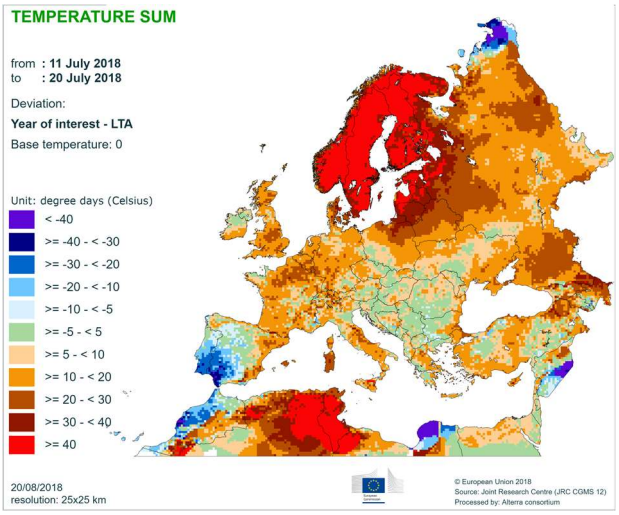


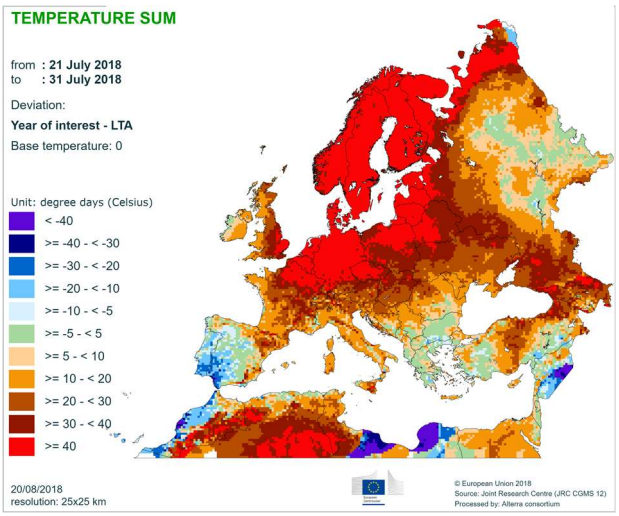


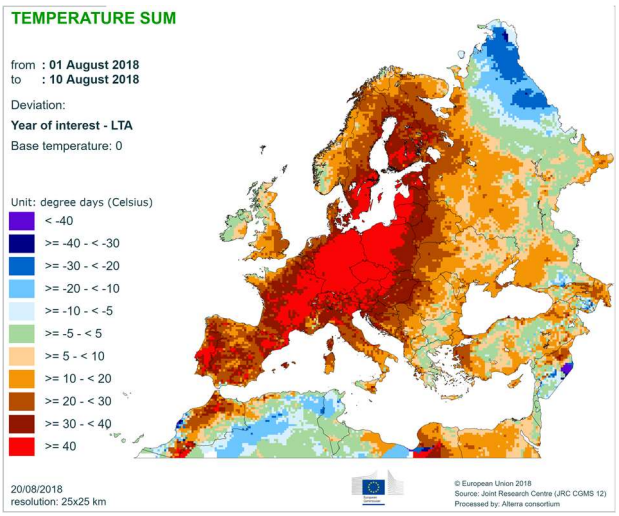


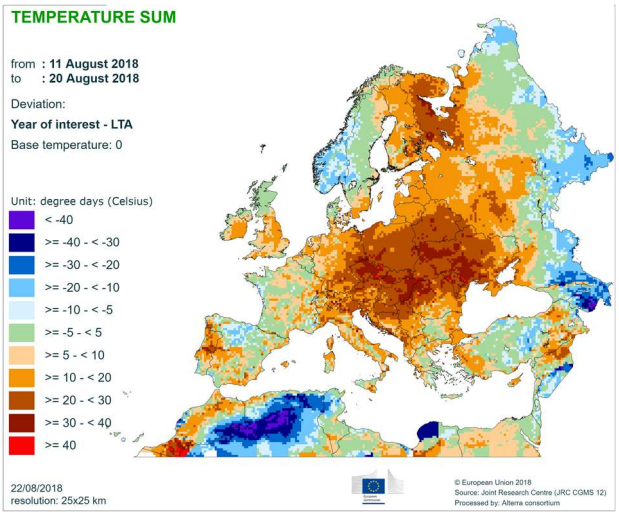
Temperature regime

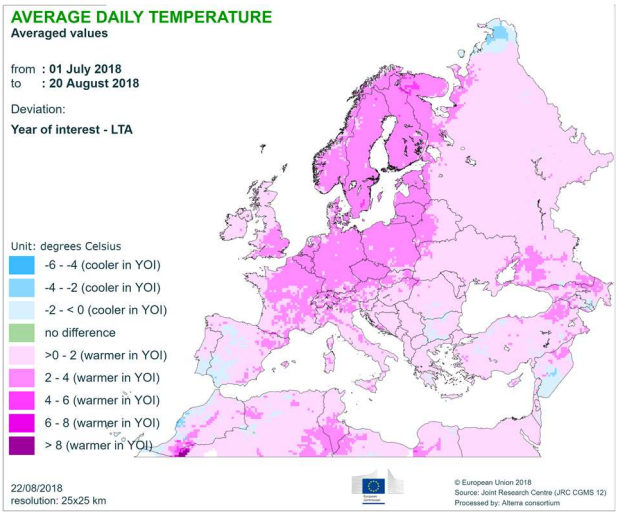




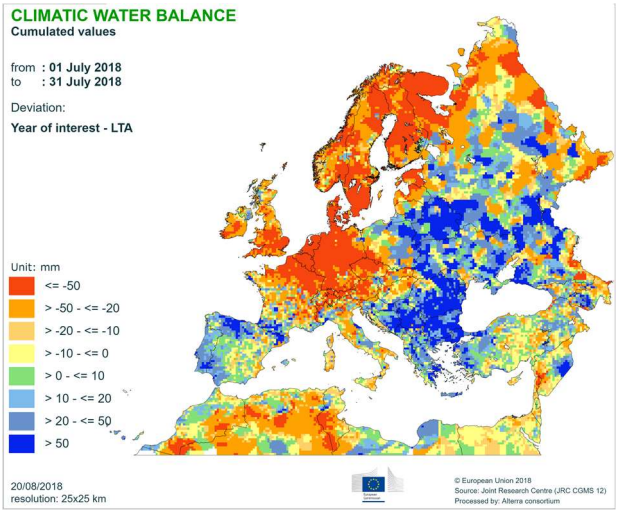


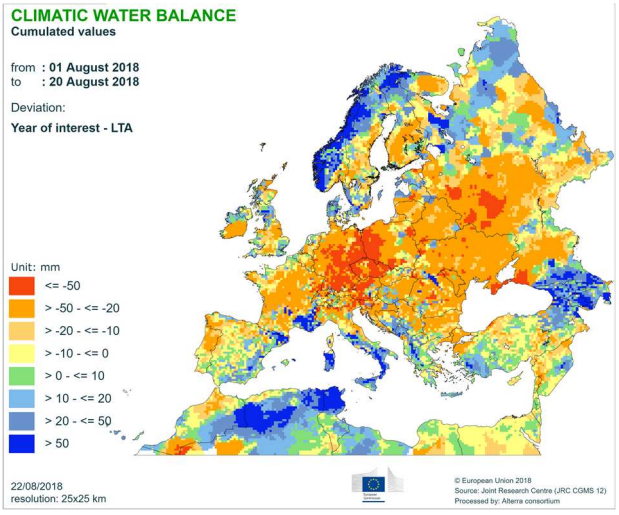




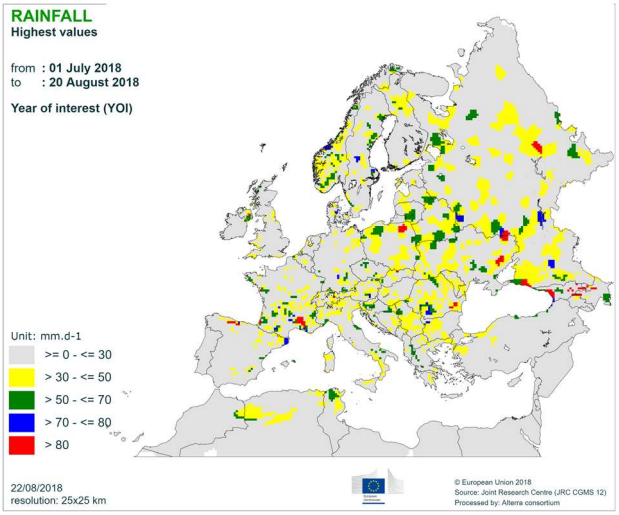


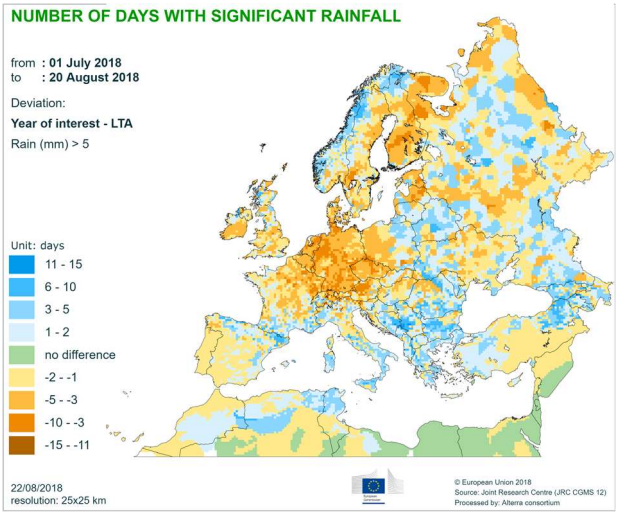
Climatic water balance

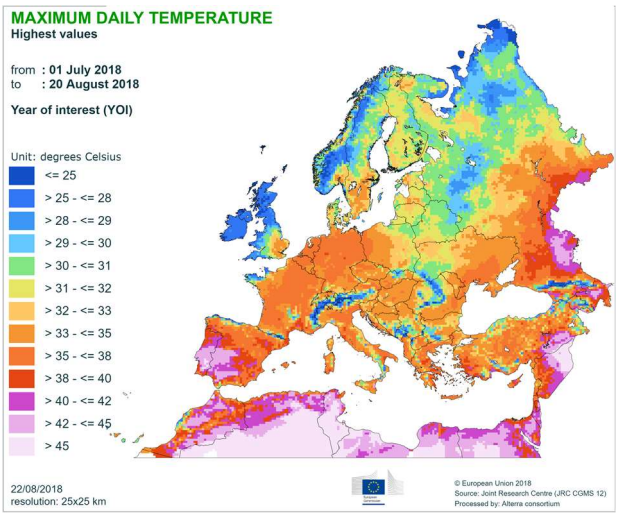


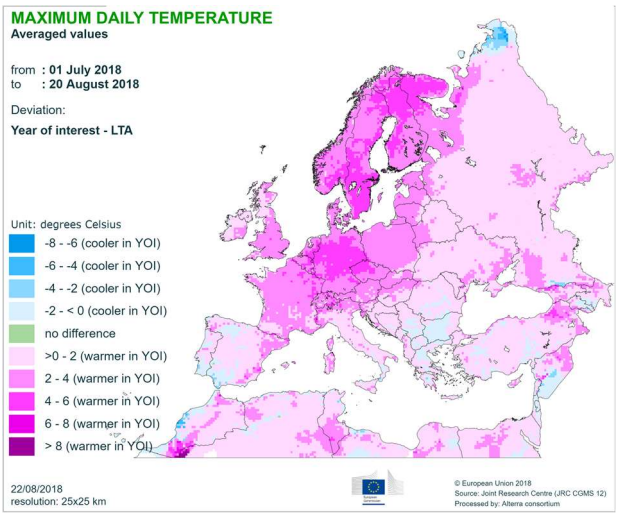


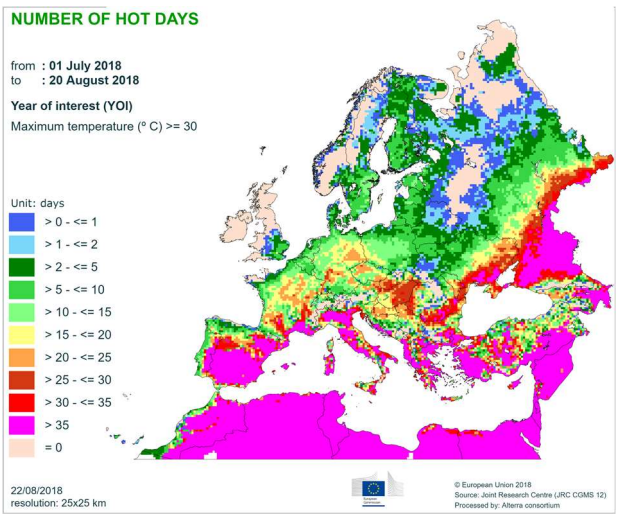
Weather events

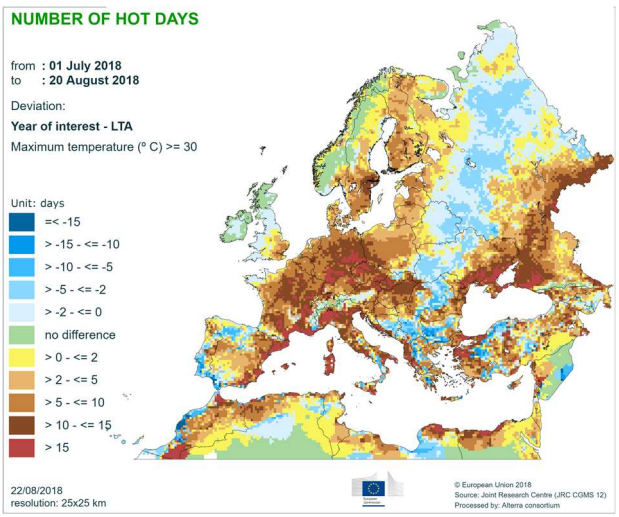




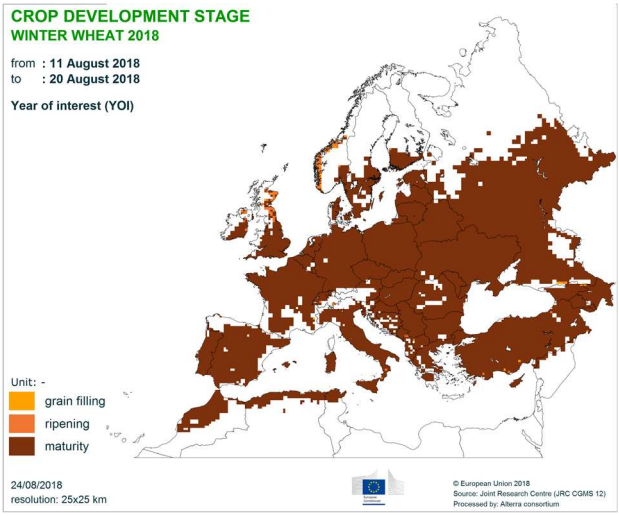


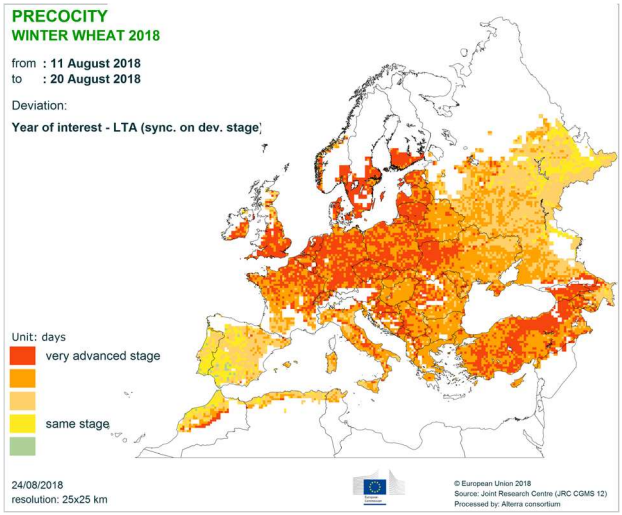


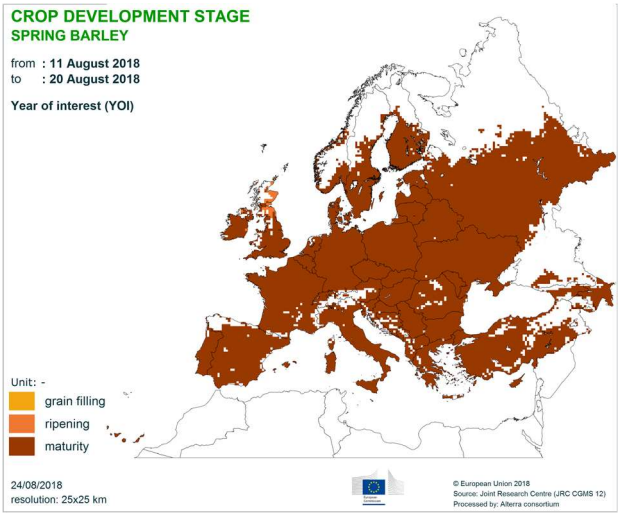


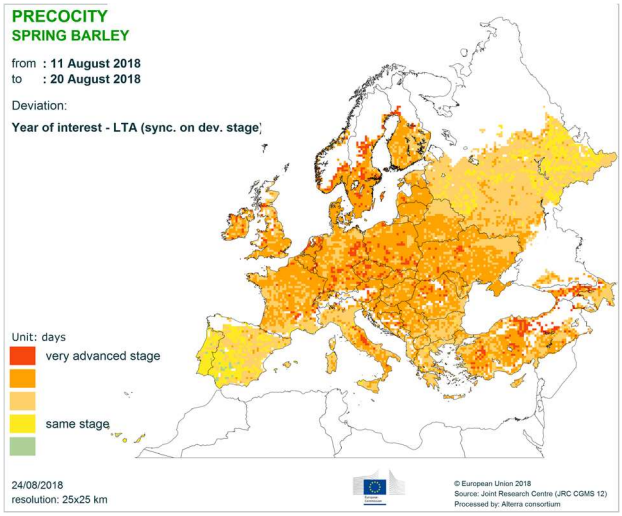


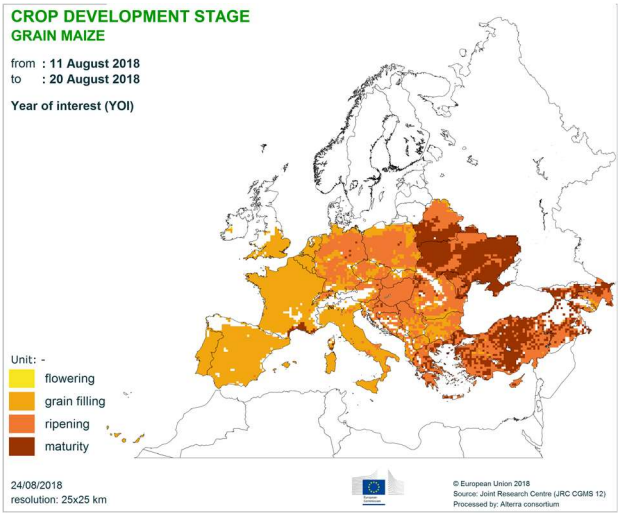
Crop development stages and precocity

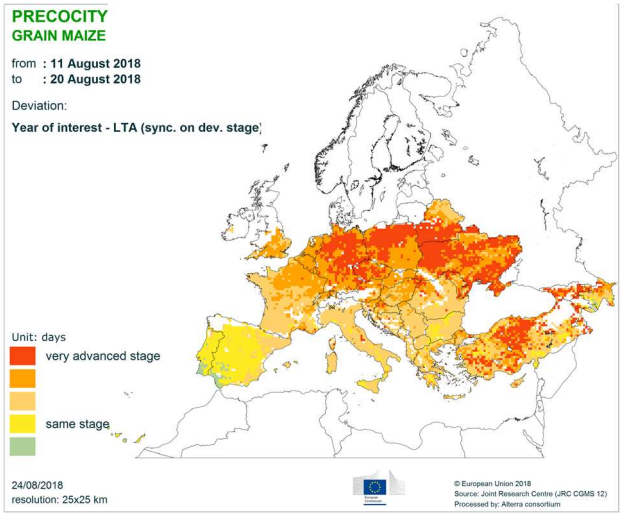


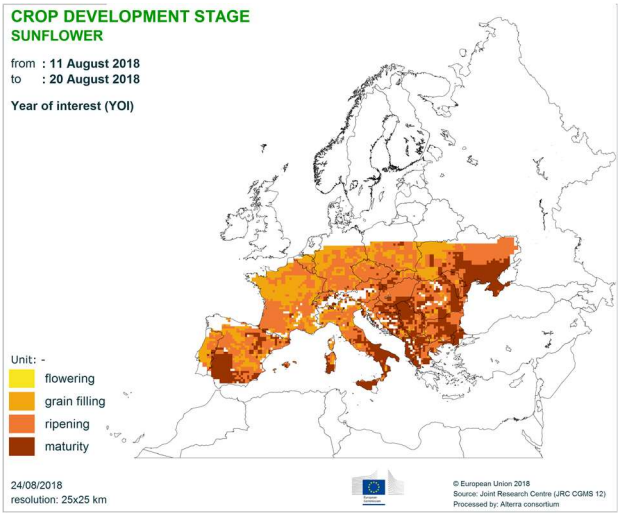


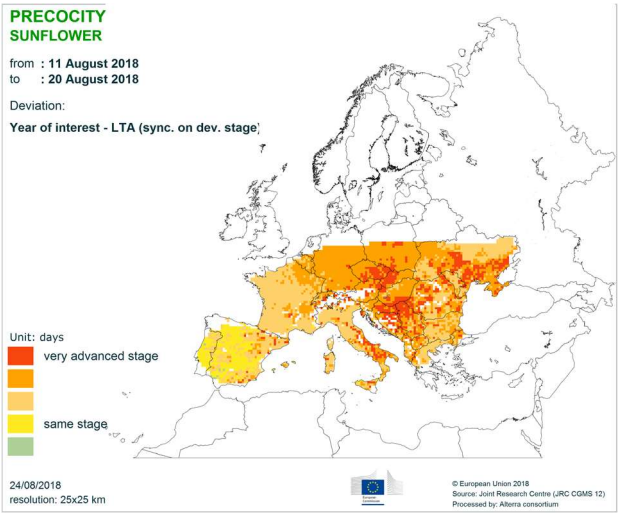




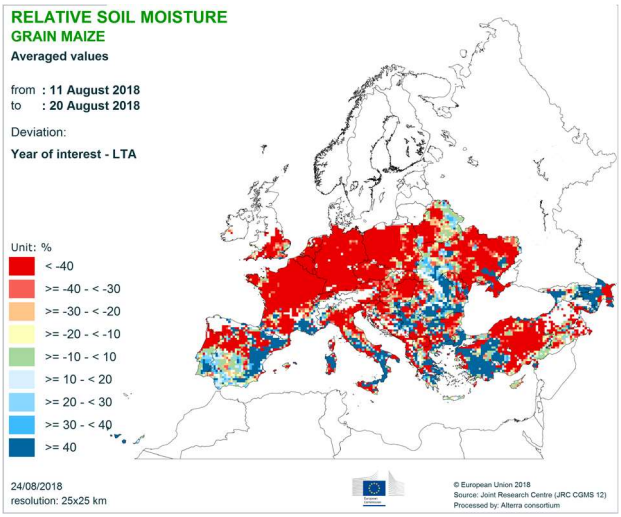


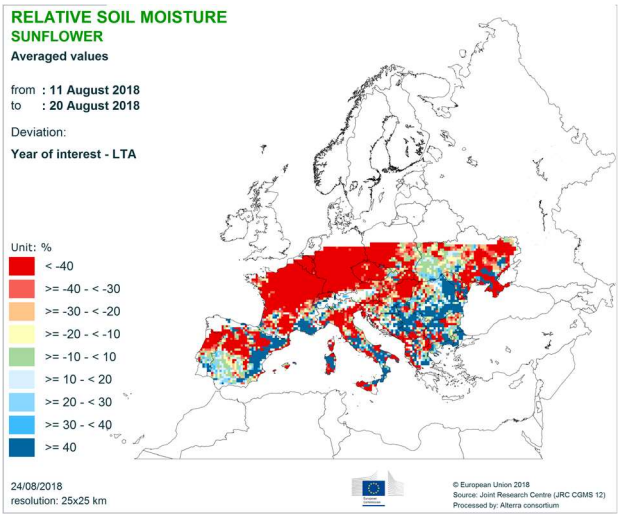




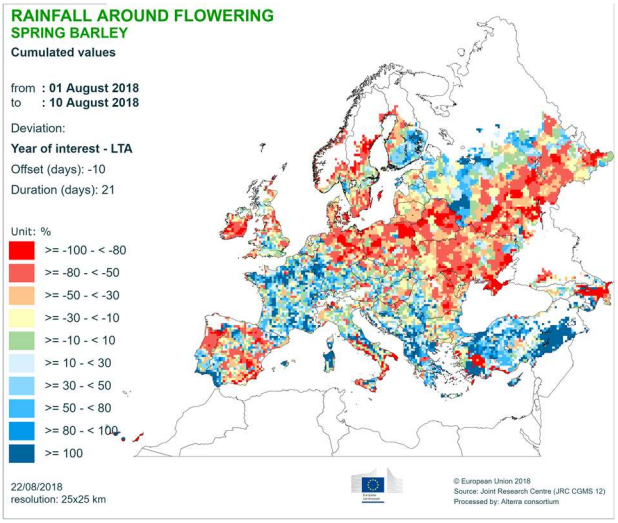


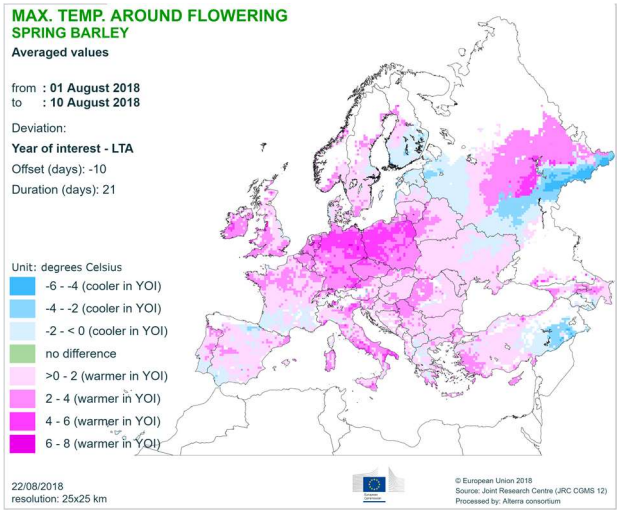
Relative soil moisture

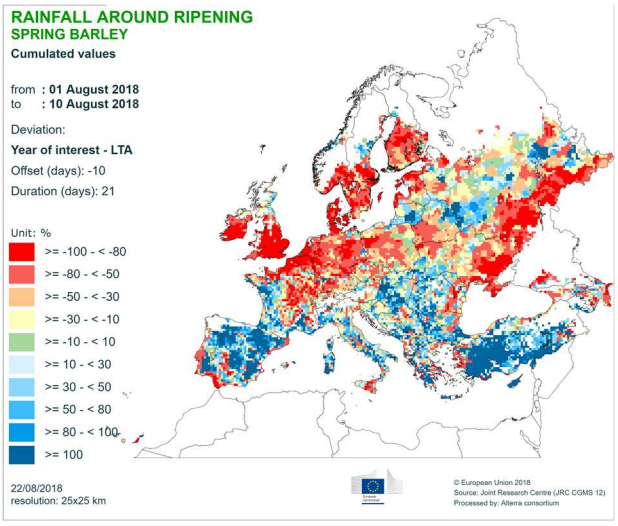


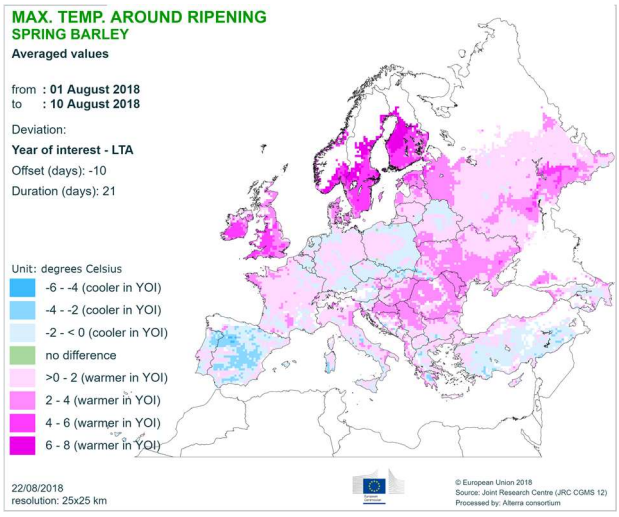


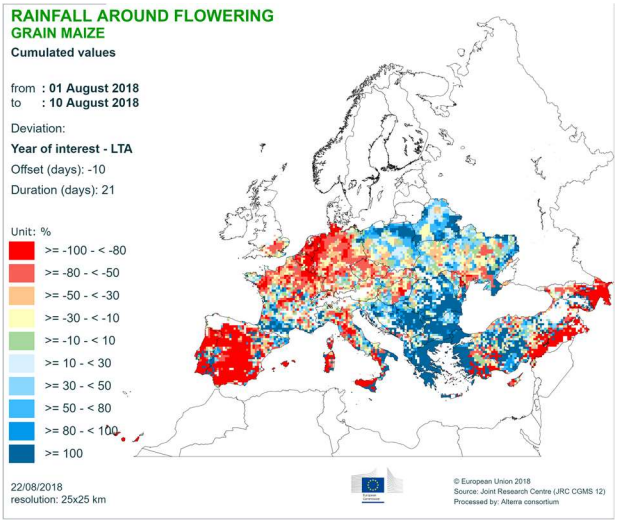
Precipitation and temperature anomalies around flowering and ripening

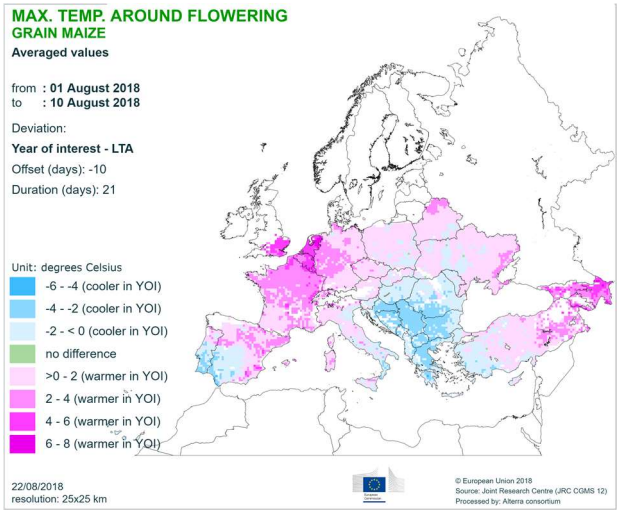


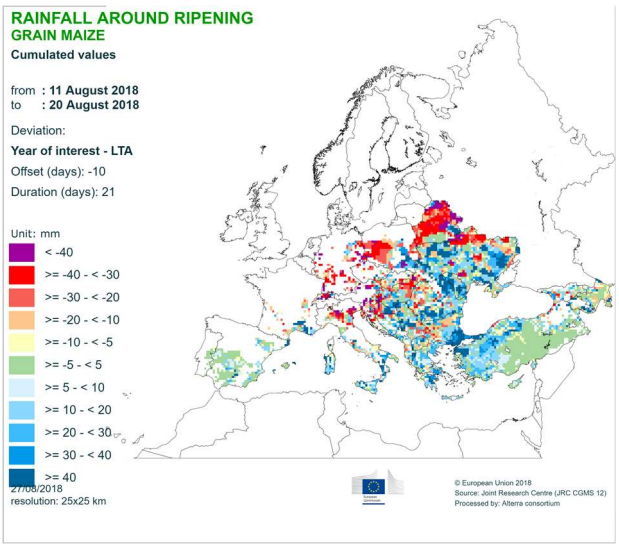


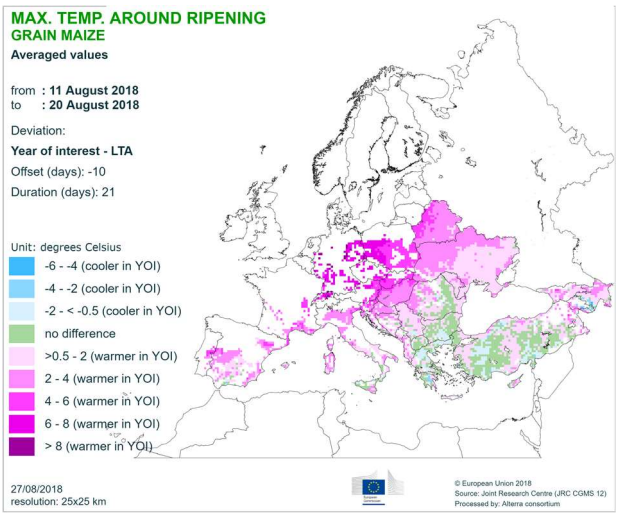




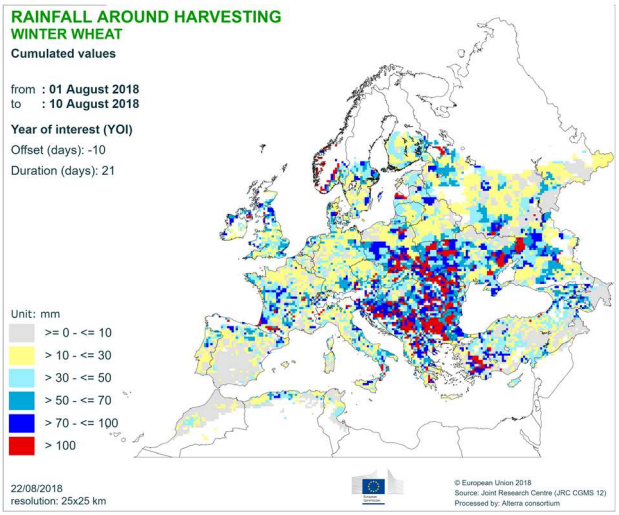


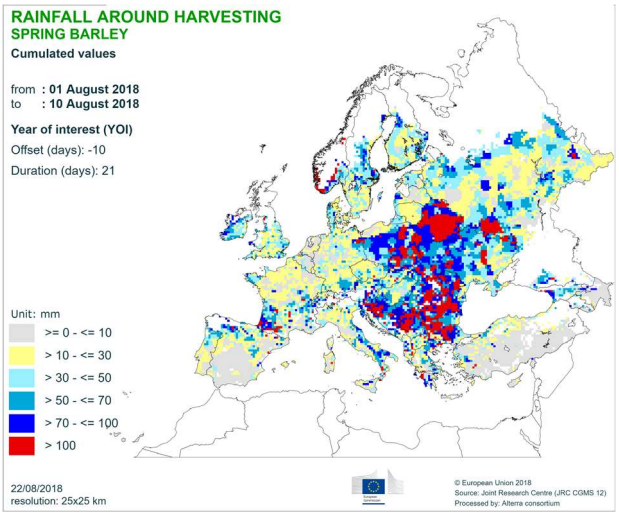


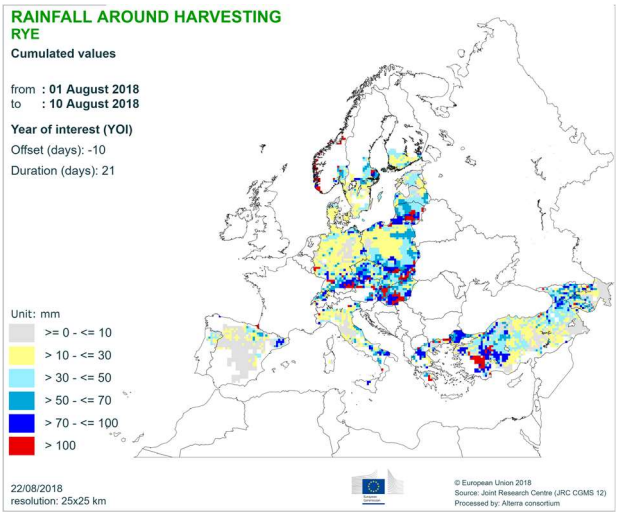


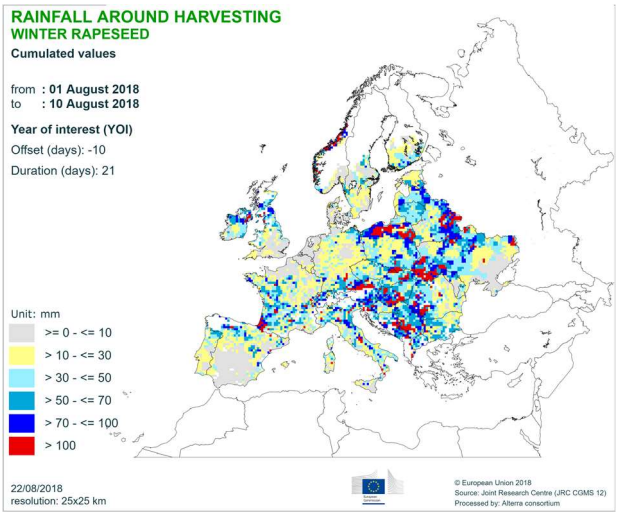


Precipitation around harvesting









JRC MARS Bulletins 2018

Date	Publication	Reference
22 Jan	Agromet. analysis	Vol. 26 No 1
19 Feb	Agromet analysis, durum wheat update and yield forecast	Vol. 26 No 2
19 Mar	Agromet analysis, yield forecast, pasture analysis	Vol. 26 No 3
16 Apr	Agromet analysis, remote sensing, yield forecast, sowing conditions, pasture analysis	Vol. 26 No 4
22 May	Agromet analysis, remote sensing, yield forecast, sowing update, pasture analysis,	Vol. 26 No 5
18 Jun	Agromet analysis, remote sensing, yield forecast, pasture update, rice analysis	Vol. 26 No 6
23 Jul	Agromet analysis, remote sensing, yield forecast, harvesting conditions, pasture update	Vol. 26 No 7
27 Aug	Agromet analysis, remote sensing, yield forecast, pasture update, harvesting update	Vol. 26 No 8
17 Sep	Agromet analysis, remote sensing, yield forecast, harvesting update	Vol. 26 No 9
22 Oct	Agromet analysis, remote sensing, yield forecast, rice analysis, harvesting update, sowing conditions	Vol. 26 No 10
26 Nov	Agromet analysis and yield forecast, harvesting update, sowing updates	Vol. 26 No 11
17 Dec	Agromet analysis	Vol. 26 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

A. Bussay, S. Bassu, A. Ceglar, I. Cerrani, D. Fumagalli, S. Garcia Condado, R. Lecerf, R. Lopez, G. Manfron, L. Nisini, L. Panarello, L. Seguini, A. Toreti, M. van den Berg, M. van der Velde, C. Weissteiner, Z. Zajac, A. Zucchini

Reporting support

Prepress projects

Edition

M. van den Berg, S. Niemeyer, B. Baruth

Data production

MARS4CAST (JRC Unit D5), WENR (NL), MeteoGroup (NL), VITO (BE) and CMCC (IT)

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 1975-2017.