JRC MARS Bulletin Vol. 26 No 6

European Commission

Period covered: 1 May 2018-12 June 2018
Issued: 18 June 2018

JRC MARS Bulletin
Crop monitoring in Europe
June 2018

Yield forecasts revised downwards

Exceptionally warm in the north and east; wet in the south

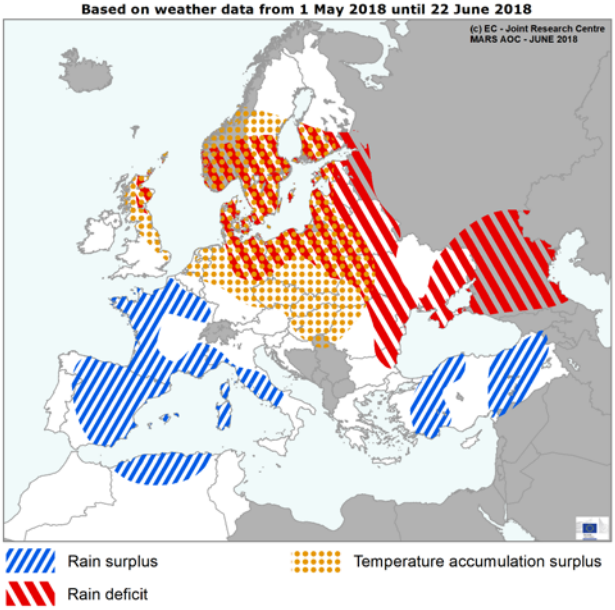
At EU level, yield forecasts for all winter crops, grain maize, and sunflower were revised downwards, mainly as a consequence of unusually warm and dry conditions in central, eastern and northern Europe. A noteworthy upward revision was made for Spain.

Abundant and locally very intense precipitation in central Italy and France caused lodging, water logging and increased pressure of pests and diseases. In France, fusarium head blight is of particular concern. Abundant rain in Spain and Turkey was mainly beneficial to crops.

In large parts of central, eastern and northern Europe, warm temperatures, coupled with a persistent precipitation deficit affected winter crops during flowering or grain filling (e.g. Germany) or at heading (Denmark and Sweden). Spring crops are affected in Sweden, Denmark, central and northern Poland, Latvia, Estonia and Finland. In Hungary, Romania and Bulgaria, where winter crops have entered the ripening phase, below-optimal water supply combined with high temperatures limited biomass accumulation during grain filling and caused early ripening.

AREAS OF CONCERN - EXTREME WEATHER EVENTS

Based on weather data from 1 May 2018 until 22 June 2018



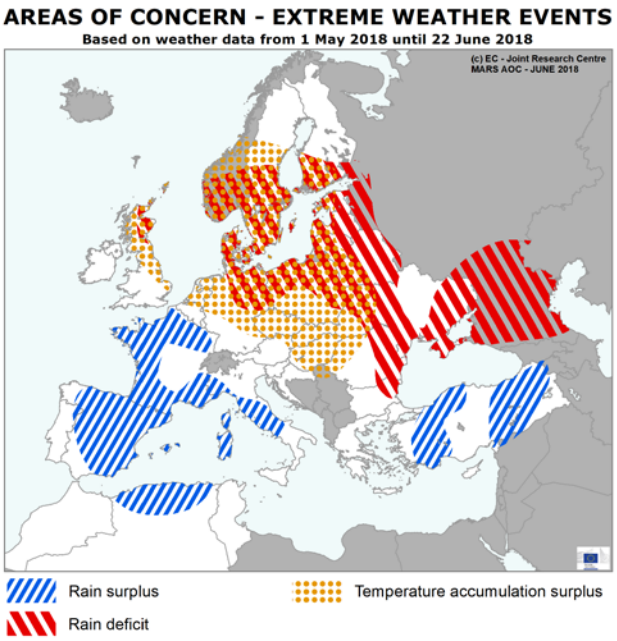
Crop	Yield (t/ha)				
	Avg 5yrs	May Bulletin	MARS 2018 forecasts	% Diff 18/5yrs	% Diff May
TOTAL CEREALS	5,56	5,64	**5,50**	-1,0	-2,5
Total Wheat	5,73	5,93	**5,79**	+1,1	-2,4
soft wheat	5,97	6,19	**6,04**	+1,2	-2,4
durum wheat	3,40	3,56	**3,52**	+3,5	-1,1
Total Barley	4,91	5,04	**4,98**	+1,5	-1,2
spring barley	4,25	4,31	**4,40**	+3,3	+2,1
winter barley	5,79	6,05	**5,80**	+0,1	-4,1
Grain maize	7,30	7,64	**7,35**	+0,7	-3,8
Rye	3,93	3,83	**3,71**	-5,6	-3,1
Triticale	4,22	4,29	**4,25**	+0,6	-0,9
Rape and turnip rape	3,29	3,19	**3,05**	-7,4	-4,4
Potato	33,6	34,5	**34,5**	+2,6	-0,1
Sugar beet	74,8	76,1	**77,5**	+3,6	+1,8
Sunflower	2,12	2,31	**2,27**	+7,2	-1,7

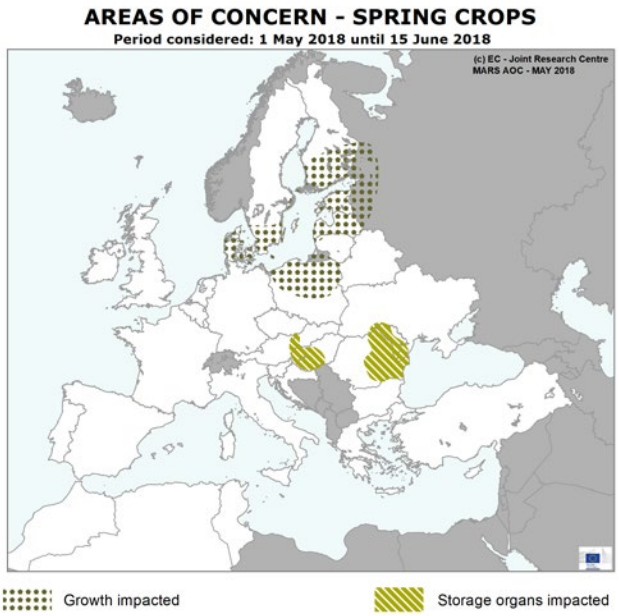
Issued: 15 June 2018

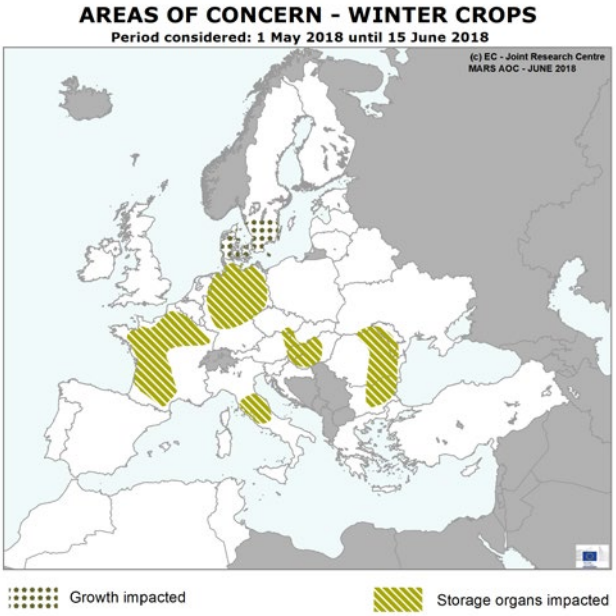
Joint Research Centre

1. Agrometeorological overview

1.1 Areas of concern







The negative impacts of warm and dry weather on flowering rapeseed crops and the vegetative growth of winter cereals in central Europe were already mentioned in the May bulletin and are not repeated here.

In Turkey, Spain, central Italy and France, precipitation was abundant, frequent and locally very intense. In central Italy and France, these conditions caused lodging, waterlogging and increased pressure of pests and diseases during late flowering and grain filling. The impacts on crop yields depend on many location-specific factors. In Spain and Turkey, the precipitation excess was mainly beneficial.

In central, eastern and northern Europe, temperatures remained clearly above the long-term average (by up to 4 °C) with the strongest anomalies recorded in northern Germany, Denmark, Norway and Sweden. In most of these regions, the warm temperatures were coupled with a persistent precipitation deficit: soil moisture depleted and affected winter crops during grain filling (Germany) or at heading (Denmark and Sweden). Spring crops' growth is affected in Sweden, Denmark, central and northern Poland, Latvia, Estonia and Finland.

In central Europe, most notably in Hungary, winter and spring crops are affected at the most sensitive stages by the very warm temperature: winter and spring crops' grain-filling period results shortened.

In eastern and north-eastern Romania and in Bulgaria, the persistent rain deficit (combined with above-average temperatures) shortened winter and spring crops' grain filling, reducing yield expectations.

A significant rain deficit is observed in Ukraine and southern Russia; impacts on crops are still limited but rains are urgently needed.

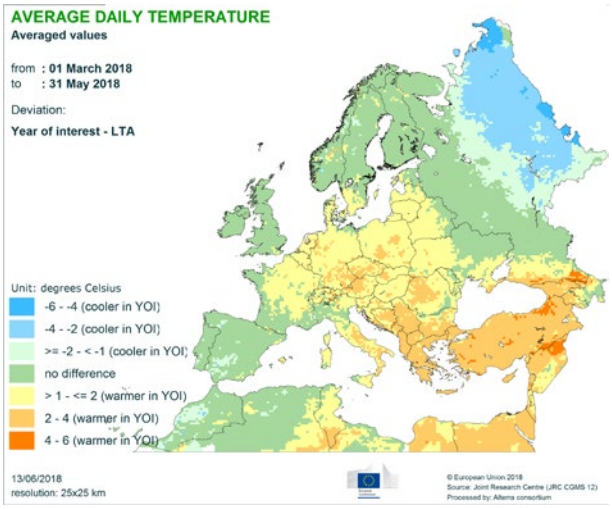
1.2 Agro-meteorological overview — spring 2018 (March, April, May)

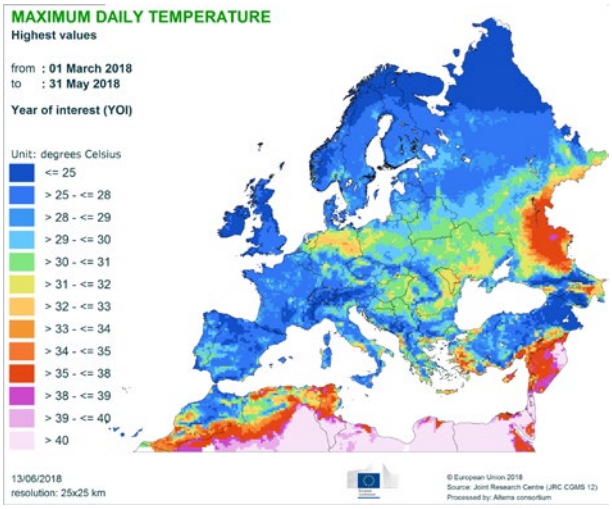
A severe cold spell occurred during late February and early March. During this period, minimum air temperatures between – 10 °C and – 15 °C were recorded in eastern France and Germany, and in central and south-eastern Europe minimum temperatures on the coldest days decreased below – 15 °C or even – 20 °C. In the Scandinavian Peninsula, the Baltic countries, Belarus and most of Ukraine and Russia, minimum temperatures dropped well below – 20 °C. After a milder period, **a second cold spell** caused frost during the second half of March in most of Europe except the Mediterranean coastal regions. Severe frost events (T_{min} < – 8 °C) were reported in eastern Germany, Poland, the Czech Republic, Slovakia and north-eastern Romania, and in eastern Europe except for the southernmost parts of Ukraine and Russia.

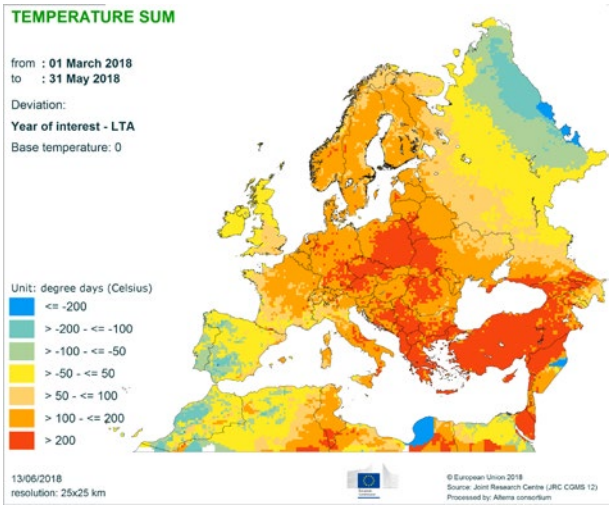
Warmer-than-usual weather conditions during March and the beginning of April, with temperature anomalies of between + 3 °C and + 6 °C, were experienced in Turkey, the east Mediterranean and the Caucasian region, where this review period was one of the warmest in our records (since 1975). For major parts of central and south-eastern Europe, the temperatures recorded were **the highest on our records** for the period between the beginning of April and mid-May. On the warmest days, maximum temperatures reached above 30 °C in Romania, northern Serbia, Ukraine and southern European Russia. Unusually warm weather was recorded during the second half of May in northern Europe, with air temperatures exceeding the long-term average by up to 8 °C. Northern Germany experienced maximum temperatures up to 33 °C; temperatures up to 30 °C were also recorded in southern parts of Scandinavia. In addition, in the southern part of European Russia the second half of May was characterised by maximum temperatures above 35 °C, while temperatures above 30 °C were recorded in many regions of south-eastern Europe, central Europe and Ukraine.

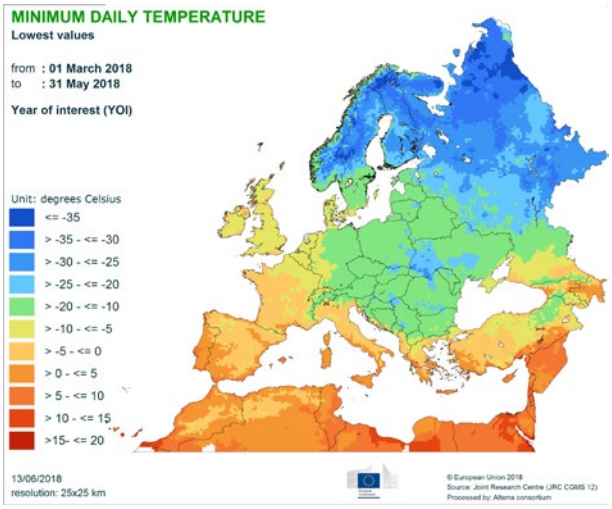
Drier-than-usual weather conditions were recorded in major parts of central, eastern and northern Europe, with rainfall cumulates between 20 % and 50 % below seasonal values. In absolute terms, the rainfall cumulates in spring did not exceed 100 mm in major parts of Scandinavia, Poland, the Czech Republic, eastern Germany and eastern Romania, and in large areas of eastern Europe.

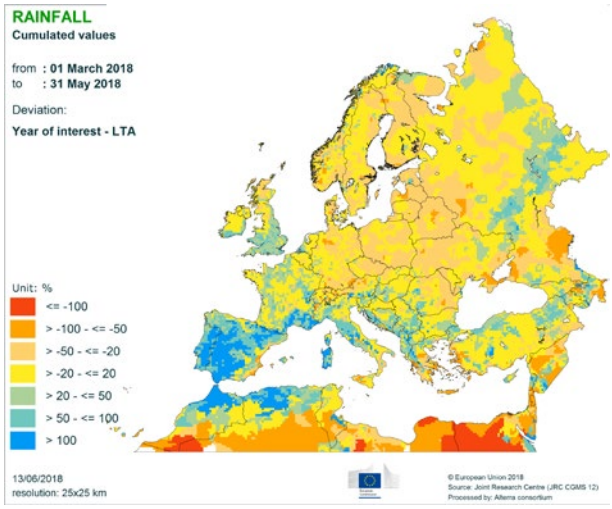
Wetter-than-usual conditions characterised spring in western Europe, the Iberian Peninsula, Italy (except Sicily) and major parts of south-eastern Europe. Rainfall cumulates regionally exceeded 300 mm, especially in the west of the Iberian Peninsula, southern France, northern Italy and the western Balkans. Frequent severe storm events, accompanied with hail, occurred in many of the abovementioned regions.

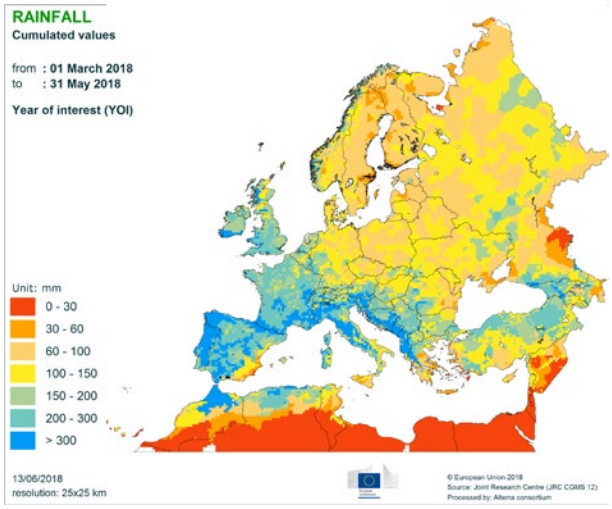


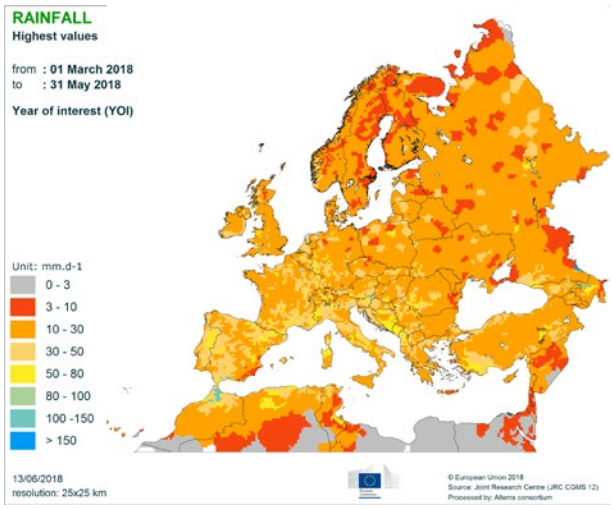


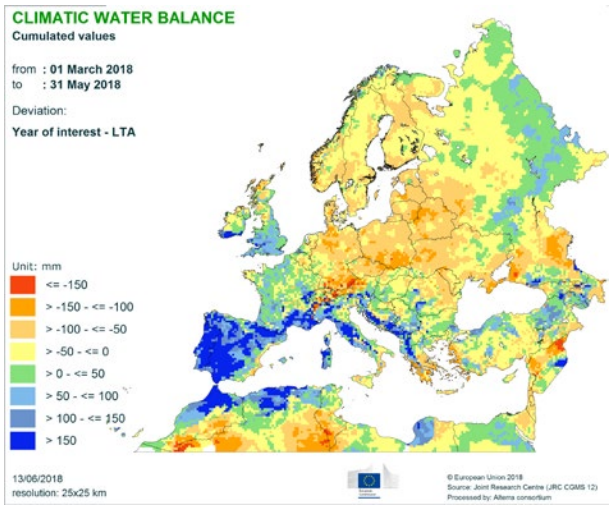





RAINFALL
Cumulated values
from : 01 March 2018
to : 31 May 2018
Deviation:
Year of interest - LTA
Unit: %
<= -100
> -100 - <= -50
> -50 - <= -20
> -20 - <= 20
> 20 - <= 50
> 50 - <= 100
> 100
13/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 March 2018
to : 31 May 2018
Year of interest (YOI)
Unit: mm
0 - 30
30 - 60
60 - 100
100 - 150
150 - 200
200 - 300
> 300
13/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


RAINFALL
Highest values
from : 01 March 2018
to : 31 May 2018
Year of interest (YOI)
Unit: mm.d-1
0 - 3
3 - 10
10 - 30
30 - 50
50 - 80
80 - 100
100 -150
> 150
13/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


CLIMATIC WATER BALANCE
Cumulated values
from : 01 March 2018
to : 31 May 2018
Deviation:
Year of interest - LTA
Unit: mm
<= -150
> -150 - <= -100
> -100 - <= -50
> -50 - <= 0
> 0 - <= 50
> 50 - <= 100
> 100 - <= 150
> 150
13/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

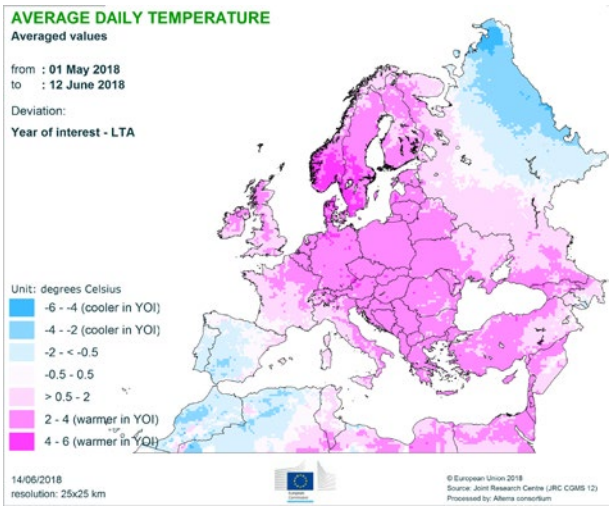
1.3. Meteorological review (1 June-12 June)

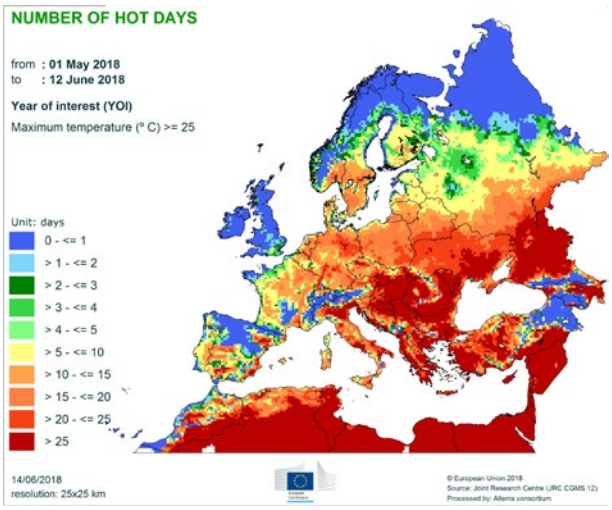
Warmer-than-usual weather conditions in Europe. Daily mean temperature anomalies (with respect to the LTA) mainly ranged from + 0.5 °C to + 4 °C. In central Europe, 10-20 days (locally up to 25 days) with daily maximum temperatures above 25 °C were observed, while in south-eastern Europe more than 25 days with daily maximum temperature exceeding 25 °C were recorded. In all of Europe except the west/south-west, the sum of active temperature (with base temperature at 0 °C) over the analysis period was 100-150 °C higher than the LTA (i.e. 20-30 % higher than the LTA). In large areas of central and northern Europe, these anomalies reached between + 150 °C and + 200 °C (i.e. 30-40 % higher than the LTA) and locally up to + 250 °C.

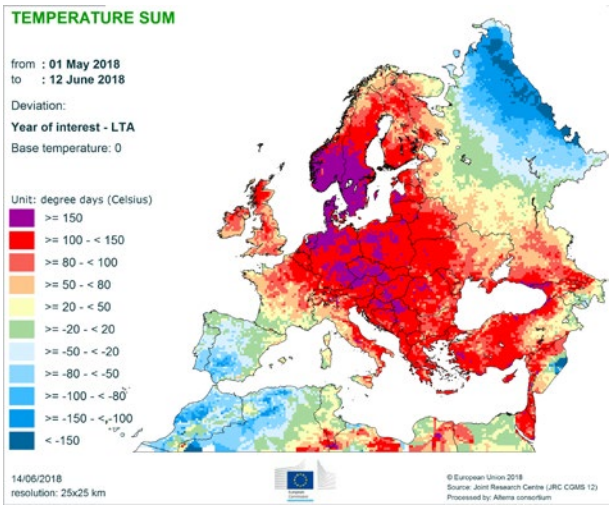
Colder-than-usual weather conditions in most of the Iberian Peninsula, with daily mean temperature anomalies (with respect to the LTA) ranging from –0.5 °C to – 2 °C. The sum of active temperatures (with base temperature at 0 °C) was 20-80 °C lower than the LTA. Locally in south-western Spain, anomalies below – 80 °C in the active sum of temperatures were recorded.

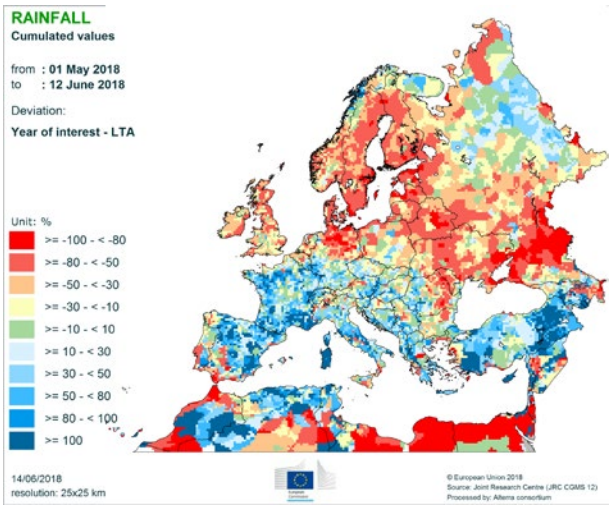
Wetter-than-usual conditions in western Europe and the Mediterranean, where cumulative precipitation in the analysed period ranged above 120 mm, representing more than 80 % above the LTA. Several intense rainfall events, with daily precipitation above 15 mm, were recorded.

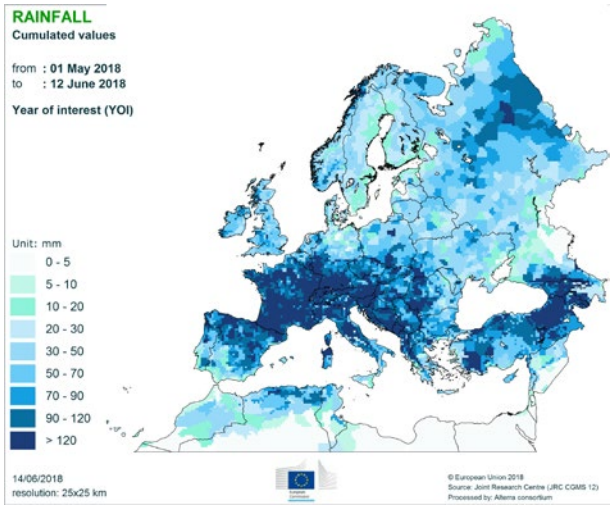
Drier-than-usual conditions in large areas of eastern and northern Europe including northern Germany and Denmark. Overall, total precipitation in the analysed period remained below 70 mm, with local exceptions, and the deficit in cumulative precipitation ranged between – 30 % and – 100 % of the LTA.

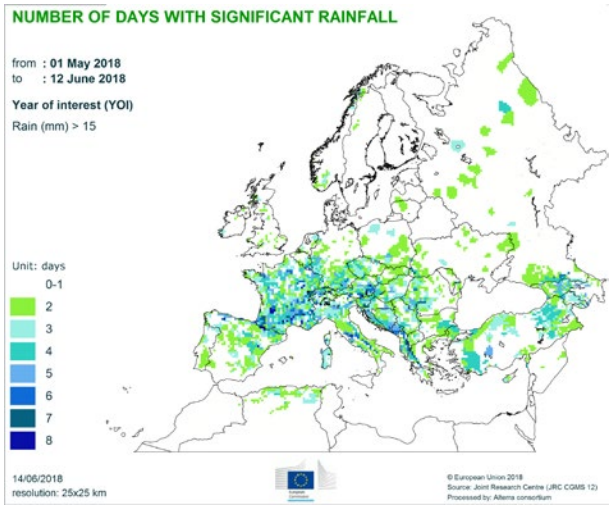






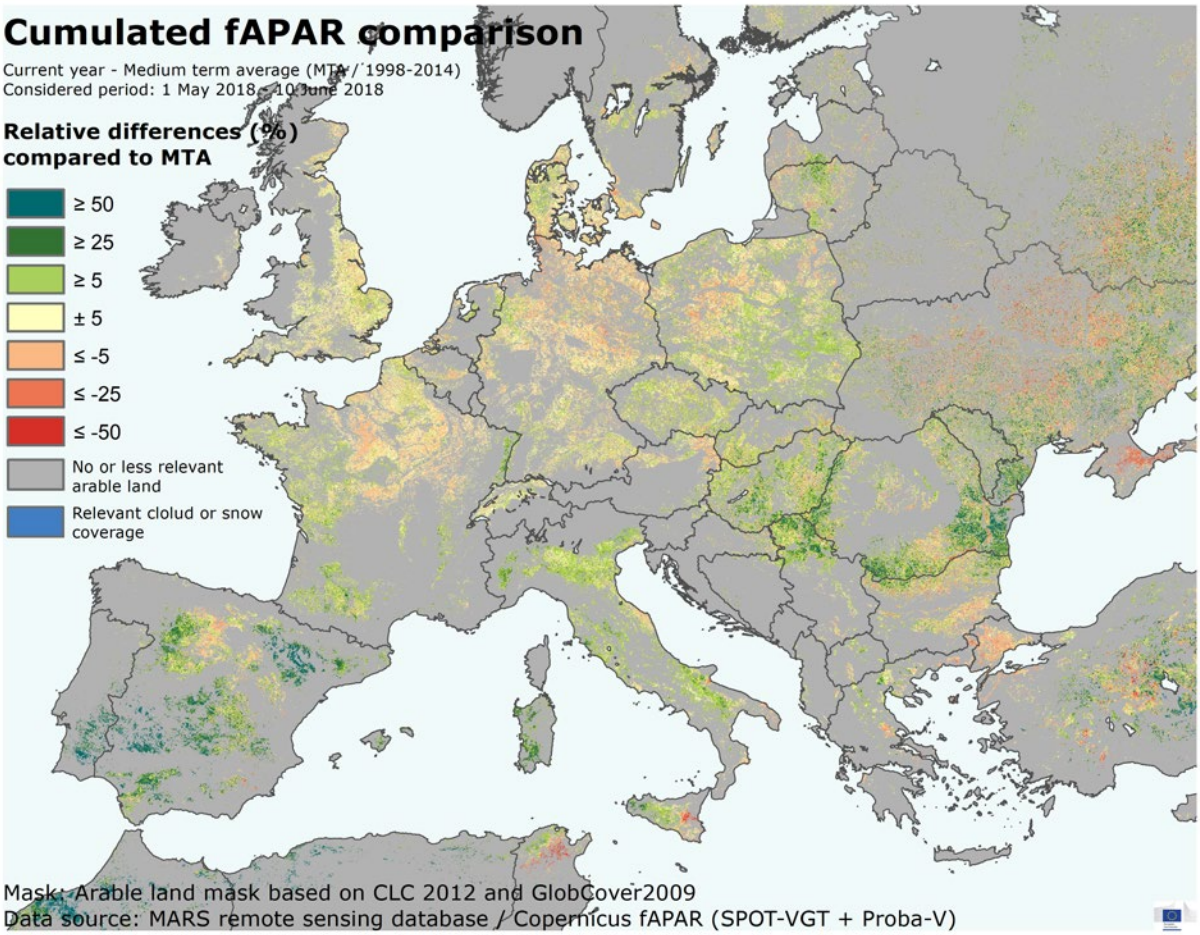



RAINFALL
Cumulated values
from : 01 May 2018
to : 12 June 2018
Year of interest (YOI)
Unit: mm
0 - 5
5 - 10
10 - 20
20 - 30
30 - 50
50 - 70
70 - 90
90 - 120
> 120
14/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 May 2018
to : 12 June 2018
Year of interest (YOI)
Rain (mm) > 15
Unit: days
0-1
2
3
4
5
6
7
8
14/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

2. Remote sensing — observed canopy conditions

Dry weather affects biomass accumulation in northern regions



The map displays the differences between the fraction of Absorbed Photosynthetically Active Radiation (fAPAR) cumulated from 1 March to 10 June 2018, and the medium-term average (MTA, 1998-2014) for the same period. Positive anomalies (in green) reflect above-average canopy density or advanced crop development, while negative anomalies (in red) reflect below-average biomass accumulation or delayed crop development.

The map displays the differences between the fraction of absorbed photosynthetically active radiation (fAPAR), cumulative from 1 May to 31 May 2018, and the medium-term average (1998-2014) of fAPAR for the same period. Positive anomalies (in green) reflect above-average canopy density or early crop development, while negative anomalies (in red) reflect below-average biomass accumulation or late crop development.

In **Spain**, the winter crop grain filling is proceeding under optimal conditions throughout the country, thanks to the abundant and well-distributed rains in May (e.g. in *Castilla la Mancha*). In southern regions, the winter crop season has ended and harvesting activities have started.

In southern **Italy**, winter crops have almost reached maturity. The favourable spring development was followed by sub-optimal conditions in May during the late grain-filling stages. In northern Italy, winter crops entered the grain-filling phase in May with favourable biomass accumulation, but frequent and abundant rains caused crop lodging and favoured pests and diseases, mostly in the central-eastern regions (e.g. in *Marche*).

In **France**, similar conditions are observed in central and northern regions, with over-wet conditions that jeopardised crops at the beginning of grain filling (e.g. in *Centre*; the relatively low fAPAR signal in May could have been affected by cloudy observations).

In the **UK**, the warm and dry May favoured crop development, which is proceeding in line with the average (e.g. in *East Anglia*).

In northern **Germany**, winter crops suffered from the high temperatures and reduced precipitation that occurred during May. Such weather conditions have shortened the grain-filling stage and accelerated crop senescence (e.g. in *Mecklenburg-Vorpommern*).

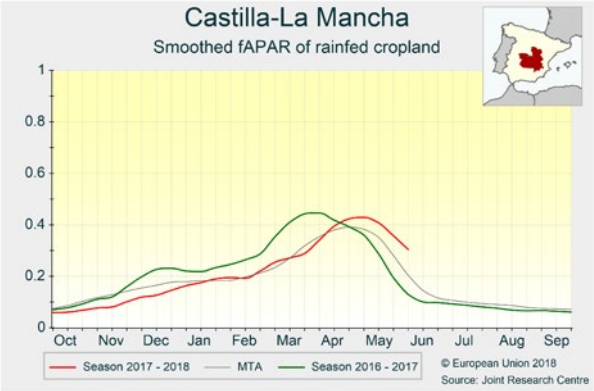
In **Poland**, the warm spring continued, as well as the reduced precipitation. In a large part of the country, the increased crop water demand was not supported by adequate soil moisture, affecting crop growth just before the flowering of winter crops (e.g. in *Kujawsko-Pomorskie*).

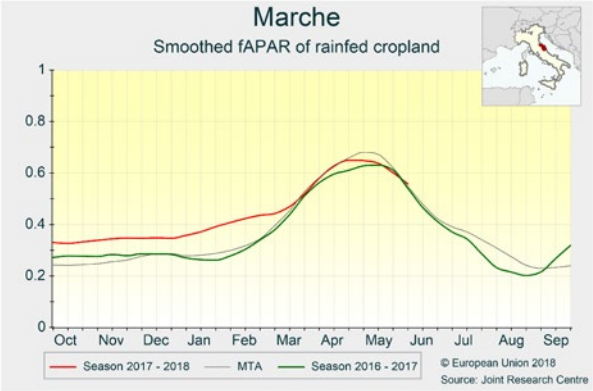
In central Europe (the **Czech Republic**, **Slovakia** and **Austria**), winter crops entered the flowering and grain-filling

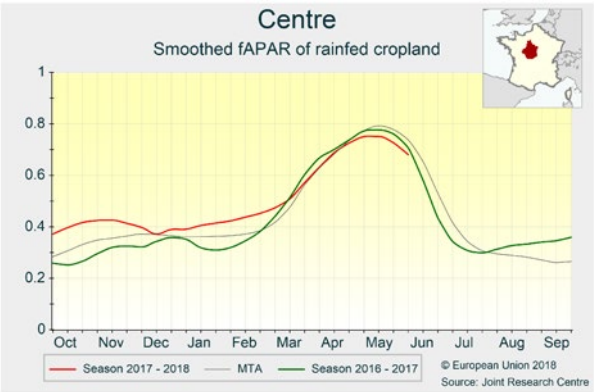
phases under low soil moisture conditions that have locally accelerated crop senescence.

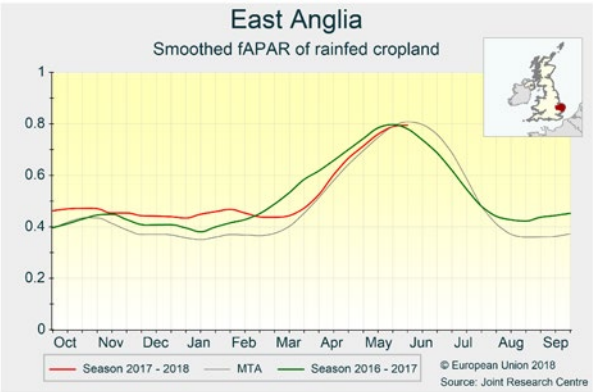
In **Hungary**, **Bulgaria** and **Romania**, crop biomass remains above average, despite sub-optimal weather in May. Shortening of the crop season (affecting grain filling) is visible in the north-eastern and central regions of Romania (e.g. *Nord-Est*), but is masked by summer crop growth in south-eastern regions.

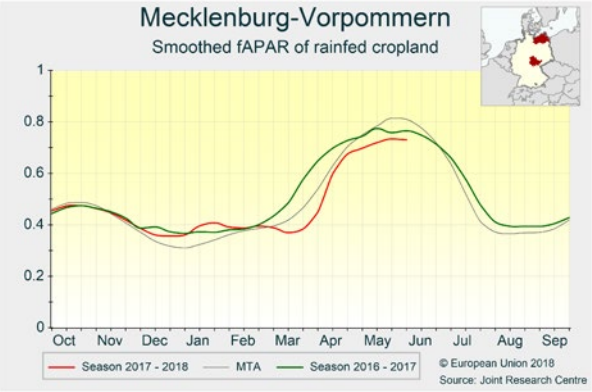
In **Ukraine**, crop conditions are suffering from the prolonged dry and warm conditions: in western regions, crop biomass accumulation is sub-optimal while, in southern regions, winter crops' grain-filling period is shortened. (e.g. in *Khersons'ka*).

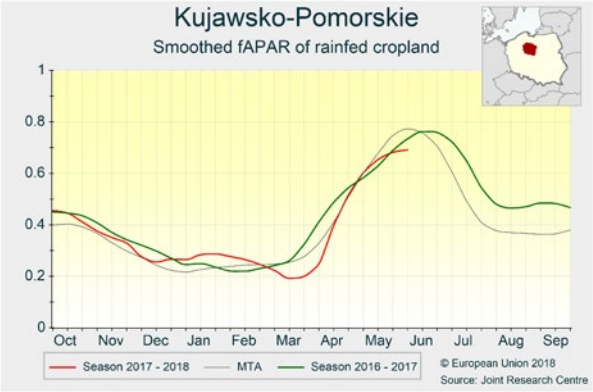


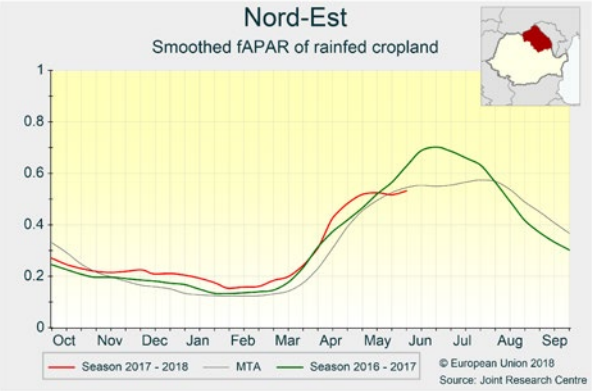


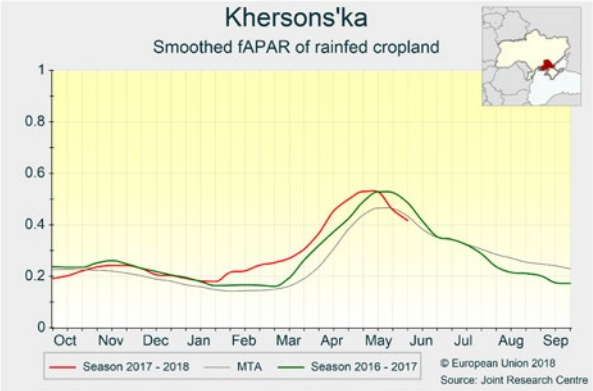





Mecklenburg-Vorpommern
Smoothed fAPAR of rainfed cropland
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017 - 2018
MTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre


Kujawsko-Pomorskie
Smoothed fAPAR of rainfed cropland
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
MTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre


Nord-Est
Smoothed fAPAR of rainfed cropland
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
MTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre


Khersons'ka
Smoothed fAPAR of rainfed cropland
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
MTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre

3. Country analysis

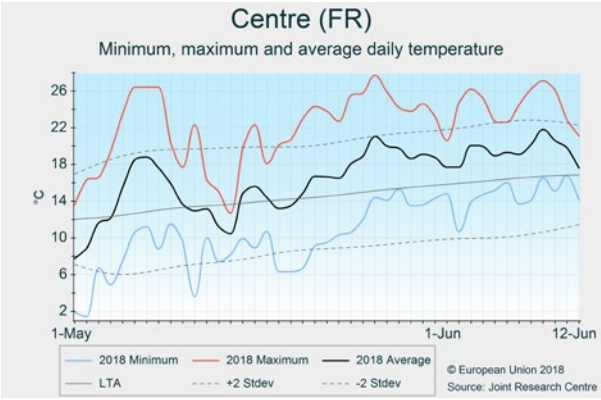
3.1 European Union

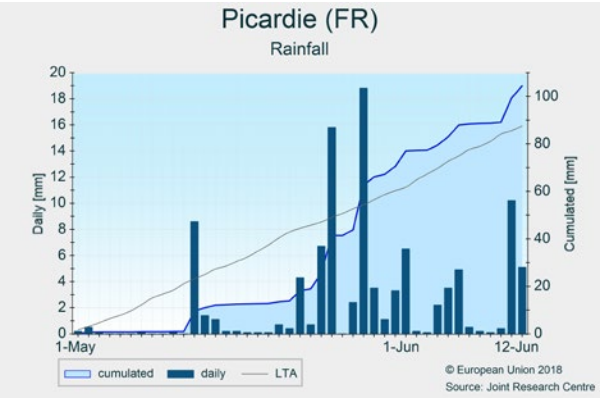
France

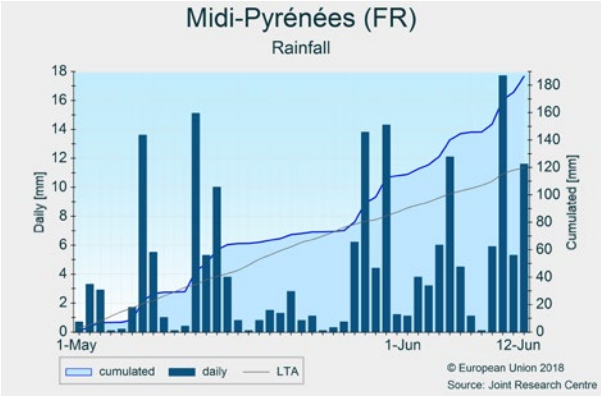
Wet and warm weather degrading crop conditions

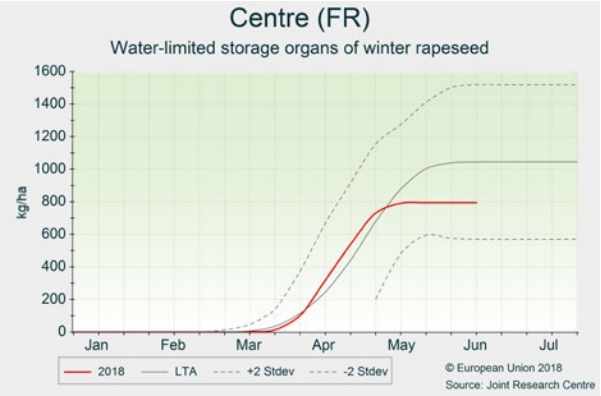
The weather has been warm and thundery for the period under analysis. Since mid-May, intense rainfall has been common, as have hailstorms, strong winds and localised flooding. These adverse weather conditions damaged fields locally. The main area of concern is the impact of Fusarium *head blights on wheat. The yield forecasts for wheat, barley and rapeseed have been revised down.*

While temperatures oscillated around the average during the first two dekads of May, a positive thermal anomaly (+ 3 °C above the seasonal values) was observed in the latter half of the month. Cumulative rainfall during the period under analysis was above average in the southernmost regions and close to average in the rest of the country. Most of the rain fell during thunderstorms, so the spatial and temporal distribution of rainfall was uneven. Downpours were observed around the time of flowering of soft and durum wheat (last dekad of May) and brought more than 40 mm of rain in a large part of the country, while temperatures were largely above the average, thus creating ideal conditions for the spread of *Fusarium* head blight (FHB) and of other diseases mentioned in the last Bulletin. FHB can considerably impact both the yields and the quality of the grain. The first signs of FHB have been reported in the *Bulletin de santé du vegetal* ([1]) in several regions. The extent of FHB and the damage it is likely to inflict are difficult to assess considering that some cultivars are more sensitive to blight than others, that the spread of FHB depends on factors including the previous crop cultivated and the management of residues, the application of fungicides and their efficiency, local meteorological conditions, and the phenological stage of the crops (the most advanced crops will be less affected). In addition to FHB, thunderstorms locally contributed to lodging and grain losses in those fields that were exposed to intense rain and wind. Potato crops are currently highly exposed to mildew. Some damage as a result of the hailstorms and thunderstorms was observed on grain maize, sunflower and soybean crops, but the weather conditions for the period of analysis are not critical to these crops, which, as they are still at the vegetative stage, will be able to compensate for the damage incurred. The yield forecasts for wheat, barley and rapeseed have been revised down, considering the high disease pressure and the losses as a result of thunderstorms. The forecasts for wheat and barley are now just below or equal to last year's levels; for rapeseed it is – 15 % compared with last year's very high level and almost 5 % below the 5-year average.









([1]) http://agriculture.gouv.fr/bulletins-de-sante-du-vegetal

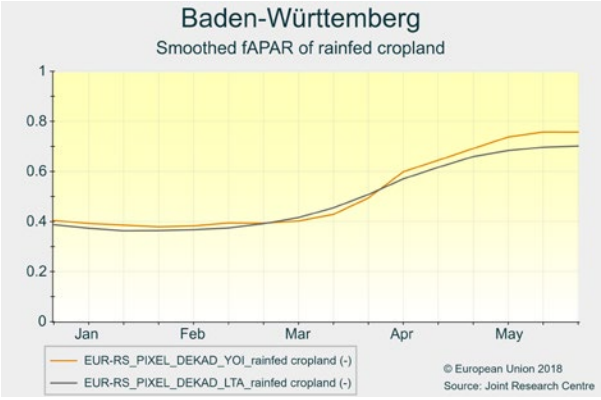
Germany

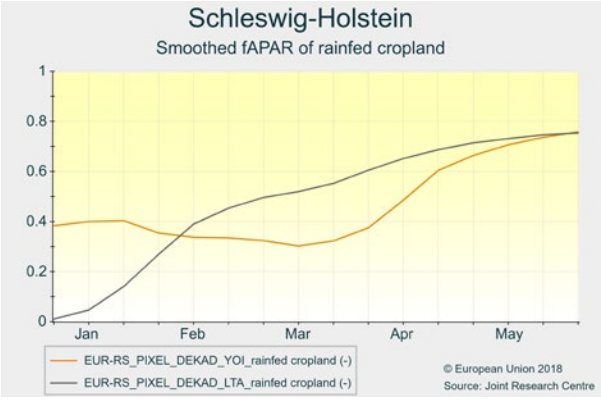
Yield forecasts for winter crops revised downwards

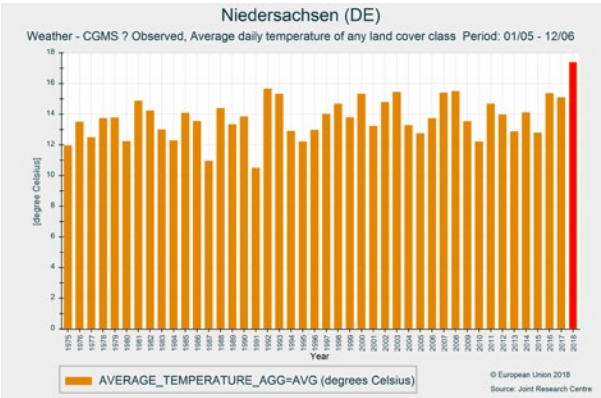
Very hot and drier-than-usual conditions have accelerated crop development, particularly in northern and eastern regions. Yield forecasts of winter barley, rye, triticale and rapeseed have been lowered significantly.

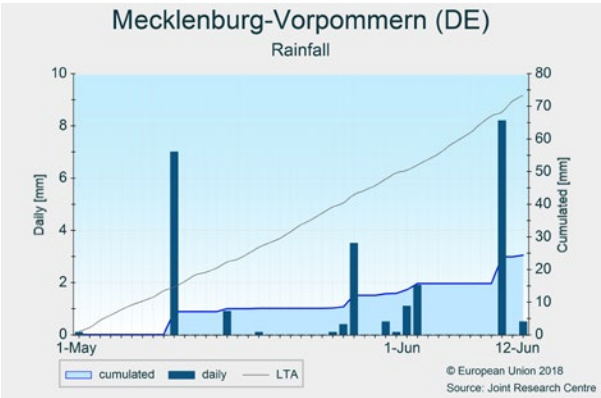
This period, Germany experienced the warmest temperatures recorded for the country in the MARS database since 1975: on average 3.4 °C above the long-term average (LTA). Thermal anomalies ranged from + 2.9 °C in *Rheinland-Pfalz* to + 3.85 °C in *Niedersachsen*. Eastern Germany experienced two heatwaves that led to water shortages (e.g. in *Brandenburg*). The heat was accompanied by sparse rainfall, in particular in the north and east of the country (in large parts of *Niedersachsen* rainfall was observed to be > 60 mm below the LTA for the period) and in the south close to the Austrian/Czech borders. Locally, areas were hit by heavy thunderstorms. Only western and southern regions (in part *Nordrhein-Westfalen, Thüringen, Sachsen-Anhalt*) received around average rainfall. High levels of positive radiation have accelerated crop development. Winter cereals are in an advanced stage of development (e.g. barley, grain filling; wheat, flowering or early grain filling depending on the region and varieties). The hot and dry conditions are expected to have an impact on cereal and rapeseed crop yields, in particular on lighter soils, where the grain-filling phase is likely to be shortened. Remote-sensing-based plant vigour assessments, expressed as a fraction of absorbed photosynthetically active radiation (fAPAR), show the most positive status in the south-west and west regions, while northern and eastern regions (Niedersachsen, Schleswig-Holstein, Mecklenburg-Vorpommern) experienced deficits compared with the LTA until the end of May.

Yields of rapeseed, winter barley, rye and triticale have been revised downwards as a result of heat stress, water shortages and late vegetation recovery in northern Germany.









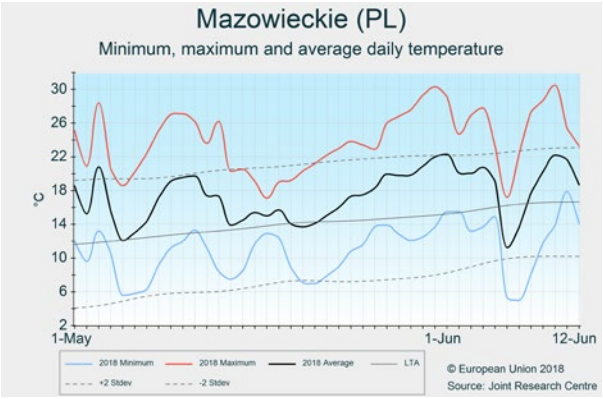
Poland

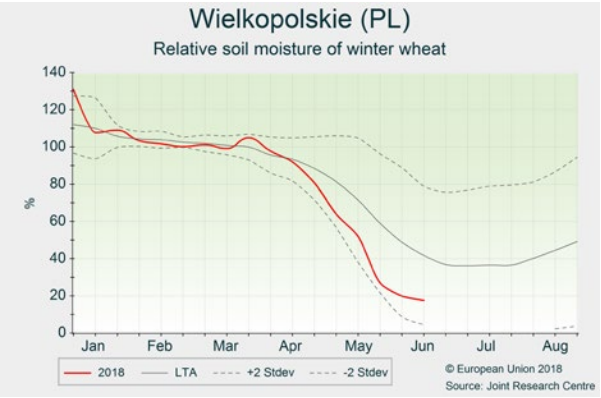
Dry conditions negatively affected spring crops and rapeseed

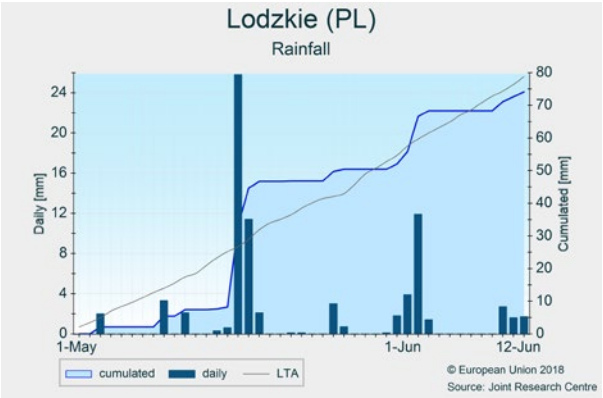
Temperatures were far above the long-term average while precipitation was below average. This resulted in soil water depletion, affecting spring crops and rapeseed, especially on lighter soils. Yield forecasts for winter crops remain close to the 5-year average.

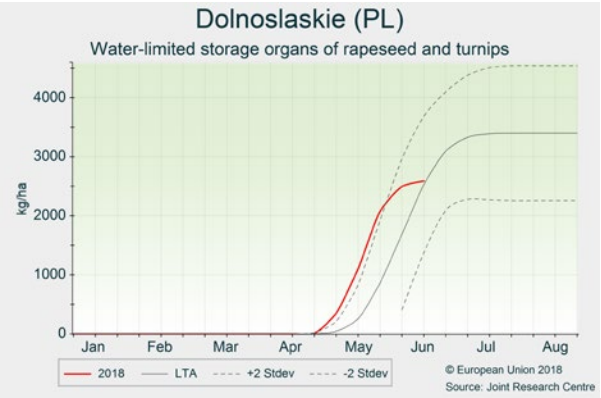
The higher-than-average temperatures observed in May continued until the beginning of June. During the first dekad of June, maximum temperatures above 30 °C were recorded in several regions. Rainfall was below the historical average in many regions, prolonging the rain deficit observed since the beginning of the year. As a consequence, soil water levels decreased further during the period of the analysis, and are now much lower than average for most of the regions (e.g. *Wielkopolskie*, *Mazowieckie*, *Lubuskie*) and have started to affect crop growth negatively.

The development of winter, spring and summer crops is advanced compared with an average year thanks to the above-average temperatures. For rapeseed, dry conditions coincided with the flowering period, which negatively affects yield formation, especially for plants with shallow root systems due to wet conditions in autumn. The dry conditions may also have negatively affected the biomass accumulation of winter wheat, which is currently at the flowering stage. The water deficit also had an impact on spring crops and summer crops. Our yield forecasts for spring barley and rapeseed are revised downwards from the last bulletin. The outlook for winter crops (excluding rapeseed) and summer crops is currently still close to the 5-year average; however, it is critical that soil moisture be replenished during the next few weeks to maintain a fair outlook.









United Kingdom and Ireland

Continued positive outlook despite warm and dry May

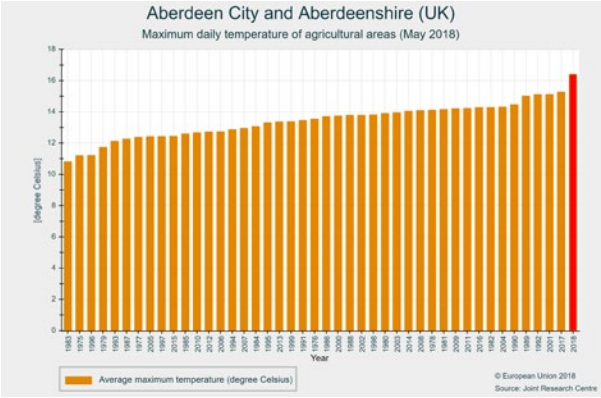
Warm conditions fostered crop development and growth in both countries. Recurring dry periods in May depleted soil moisture, particularly in the northern UK, without significantly affecting crop growth. Winter and spring crops are generally in good condition.

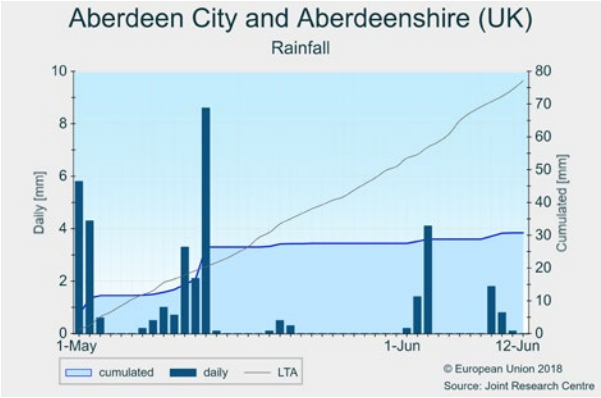
The review period (1 May to 12 June) was characterised by above-average temperatures in both countries. Below-average temperatures occurred for only a few days in the second dekad of May. In Scotland, May 2018 was the warmest May of the last 40 years, breaking last year's record. However, daily maxima stayed below 25 °C.

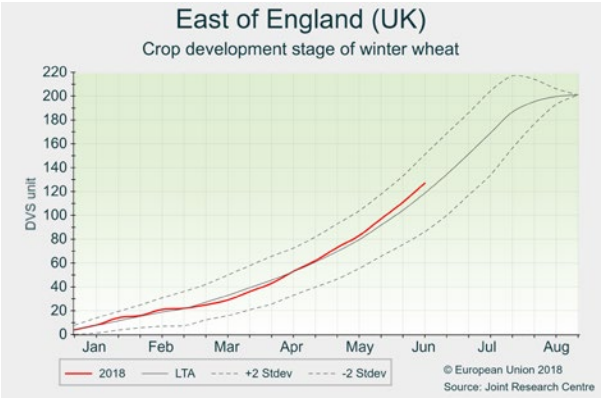
Whereas wet conditions characterised the weather since the beginning of the year, dry conditions started occurring from mid-May onwards with some small rain events falling at the beginning of June and at the end of the review period. As a consequence, cumulative rainfall reached below average values at the end of the review period in both countries. Soil water levels were depleted, particularly in the northern UK, but this has not been observed to have affected crop growth significantly. Radiation was markedly above average in the UK and close to average in Ireland.

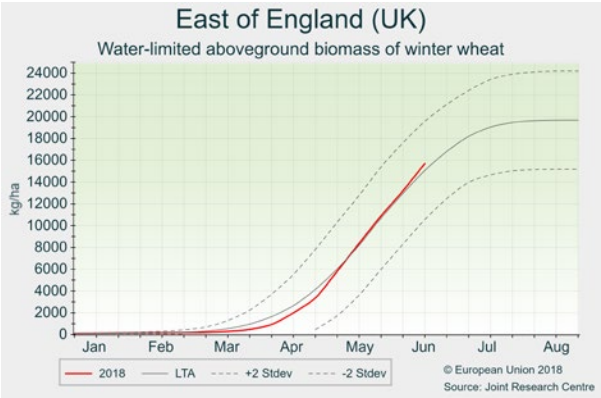
Spring sowing was completed in mid-May and conditions were favourable for accelerated development. Spring crops, despite their variable start, are in good condition. Winter cereals are also advanced in their development: most of them are at ear emergence and modelled biomass accumulation of winter cereals is generally close to average.

The yield forecasts remain close to the 5-year average.









Spain and Portugal

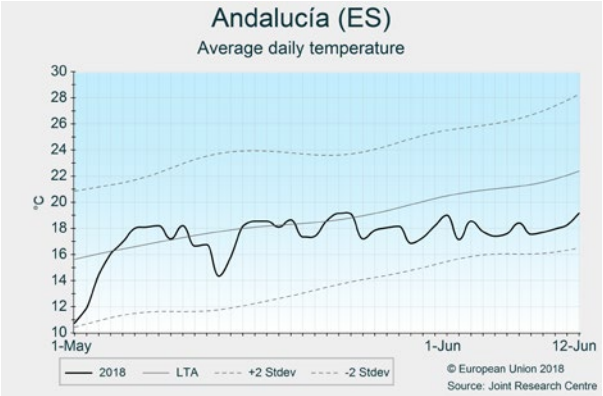
High yield expectations for winter crops

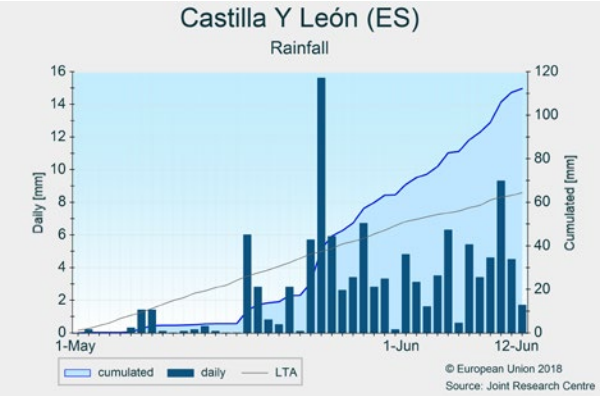
Winter cereals grain filling is progressing under highly favourable conditions thanks to above-average rainfall since mid-May. Yield potentials are high. Weather conditions are also positive for maize and sunflower, which in most of the regions are still in the vegetative phase.

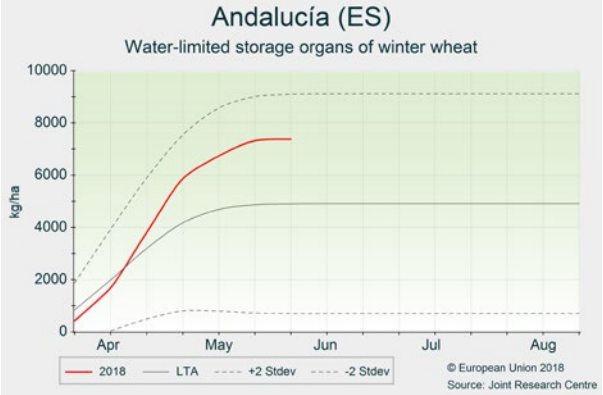
Unusually humid conditions persist in most of the Iberian Peninsula. Rainfall since mid-May has been abundant in central and northern regions (Castilla La Mancha, Castilla y León), where cumulative precipitation since 1 May was 80 % above the LTA. Temperatures in May and June were slightly below average in practically all regions, with the exception of the eastern Mediterranean coastline.

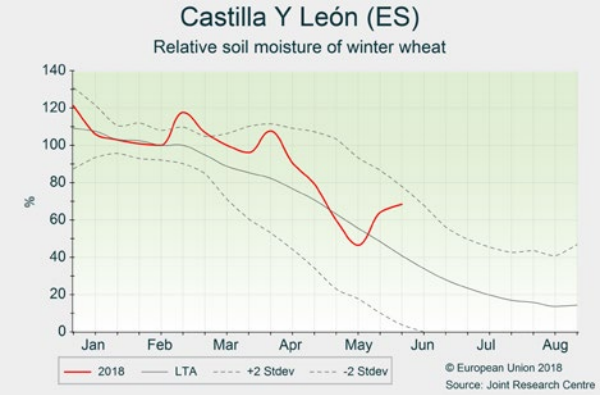
These weather conditions have been highly positive for winter cereals. They are now in the grain-filling stage across the peninsula, except in the south (Alentejo, Andalucia), where winter cereals are close to physiological maturity and harvests will start shortly. Soil moisture in central and northern regions is significantly above average, leading to high yield formation rates. Moreover, the prevailing mild temperatures will contribute to extend the grain-filling period, further increasing yield potentials. Yield expectations for wheat and barley have therefore been revised up from our previous bulletin and are significantly higher than the average of the last 5 years.

Summer crop conditions are also favourable. The humid spring experienced so far benefits vegetative growth of sunflower crops in the main producing regions. Maize is in the initial development stage after an adequate emergence, and water reserves should be sufficient to support the summer irrigation campaign.









Italy

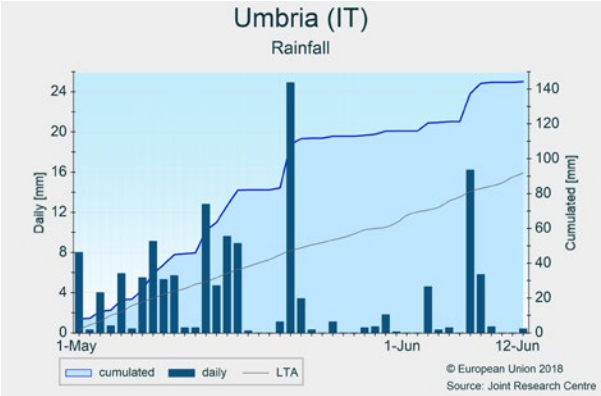
Seasonal weather

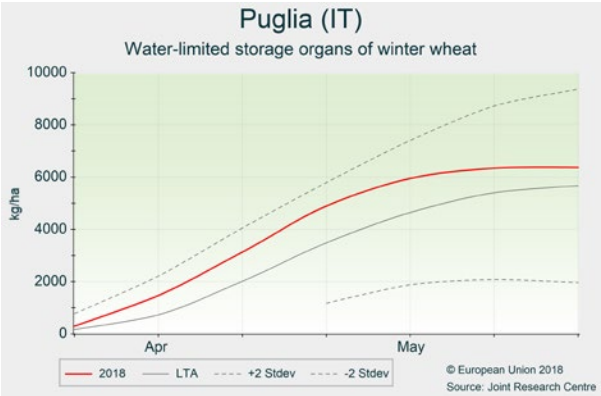
In southern Italy, winter crops reached maturity. In central and northern Italy, warm and wet weather increased pressure from pests and diseases while local intense rains have caused lodging problems. The general outlook remains close to average.

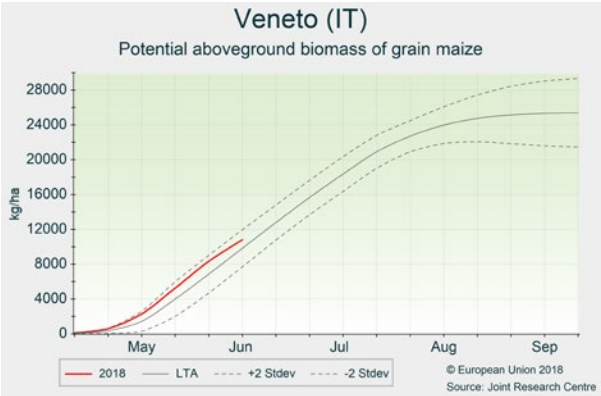
Seasonal temperatures prevailed during the first 2 dekads of May, after which they moved to above the LTA (+ 2 °C to 3 °C) in southern and north-eastern Italy, with peak temperatures recorded in *Puglia* (31 °C) and *Campania* (32 °C). May was generally wetter than usual, and northern and central Italy received more than 100 mm of precipitation (western Po Valley, *Toscana*, *Umbria* and northern *Sardegna*). In June, unseasonal precipitation was observed in *Emilia Romagna*, *Toscana*, *Umbria*, *Marche* and *Sardegna.* In contrast, *Sicilia* experienced dry conditions throughout the period of analysis.

Winter crops have mixed conditions. In southern regions, after a very favourable spring, durum wheat and barley have seen yield expectations reduced because of the repeated warm anomalies (*Puglia*) or suboptimal soil moisture (*Sicilia*). In northern and central regions, the weather was mostly favourable for crop growth but in May pest and disease pressure increased and heavy rains have caused crop lodging. In central Italy, below-average radiation during grain filling is likely to have slightly reduced grain weight.

In northern Italy, the summer crops season continues under favourable conditions; biomass accumulation is above average. In central Italy, the excess of precipitation slowed down sunflowers' biomass accumulation and locally damaged it.







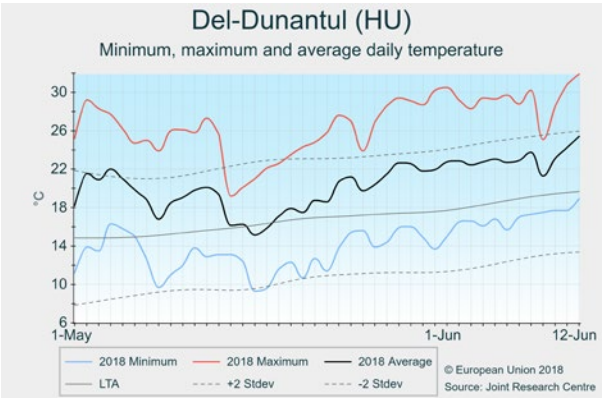
Hungary

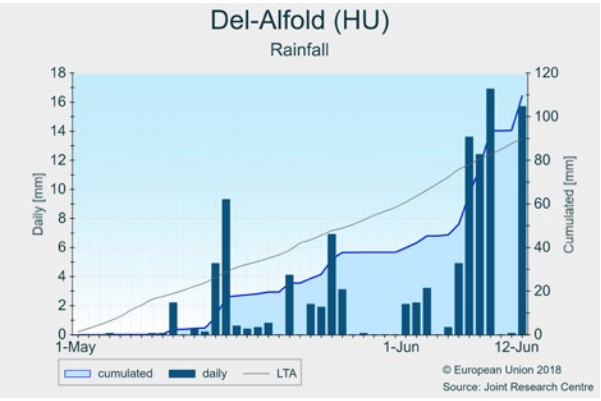
Shortened grain-filling period

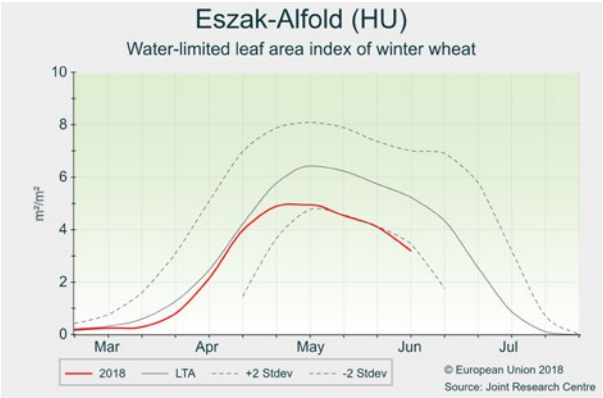
During the review period (1 May to 12 June), distinctly warmer-than-usual thermal conditions and soil moisture deficits characterised Hungary, leading to early leaf senescence and reduced biomass accumulation of winter crops. Our yield forecast for winter cereals was revised downwards.

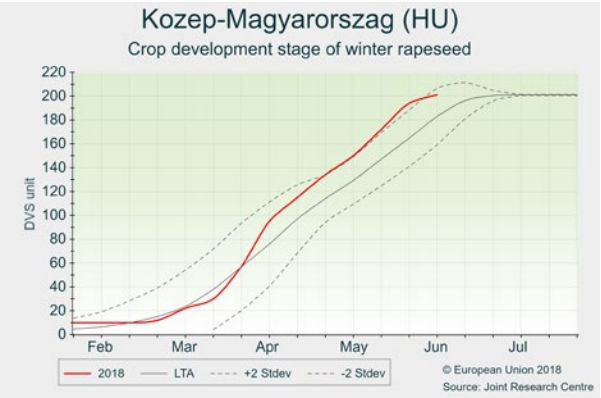
After the exceptionally warm April, daily temperatures continued fluctuating 3-4 °C above the long-term average in May and June, so far. Along the southern and eastern borders of Hungary, 4-12 hot days (T_{max} > 30 °C) were experienced. As a consequence, phenological development of winter cereals is advanced by 1 to 3 weeks compared with an average year, and the start of harvesting is expected to occur much earlier than usual. After a dry April, precipitation increased in the second dekad of May, and the first dekad of June was quite rainy, so the rainfall totals for the review period were close to the LTA, albeit with considerable local differences.

The increased evaporative demand of the winter crops and moderate rain led to a further decrease in soil moisture content for the grain-filling period, especially in the central and eastern regions of Hungary. Sub-optimal water supply compromised the biomass accumulation. High temperatures accelerated the senescence of the leaves and hastened ripening. Additionally, considering the above-average pest and disease pressure, our previous optimistic yield forecast was revised downwards. Summer crop growth and development has been adequate so far, although the soils have been dryer than usual until now.









Romania

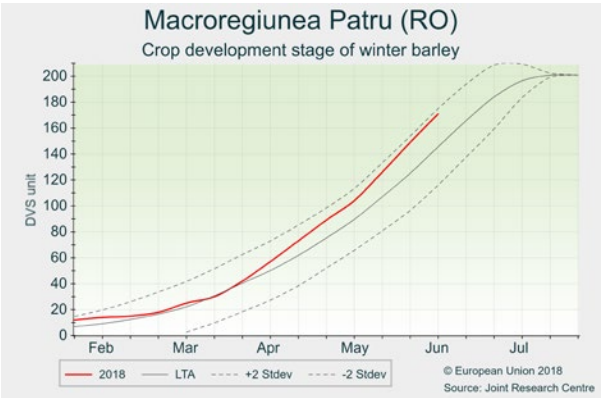
Yield forecast of winter crops revised down

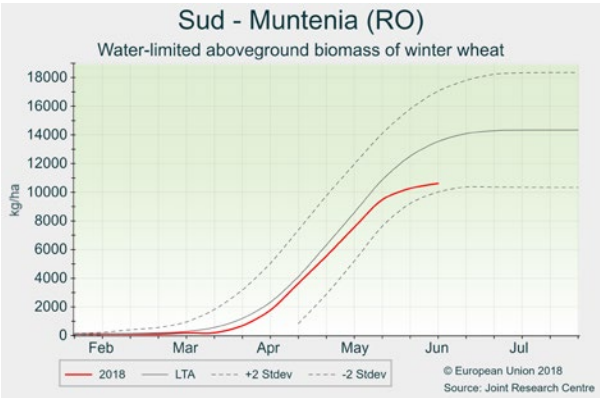
Warmer-than-usual weather accelerated the crop development and adversely shortened the grain-filling period of winter cereals and rapeseed. Beneficial rainfall kept the soil moisture content above the average in western Romania, but the eastern part of the country suffered from precipitation deficit. The yield outlook of winter crops was reduced. The situation is also delicate for summer crops.

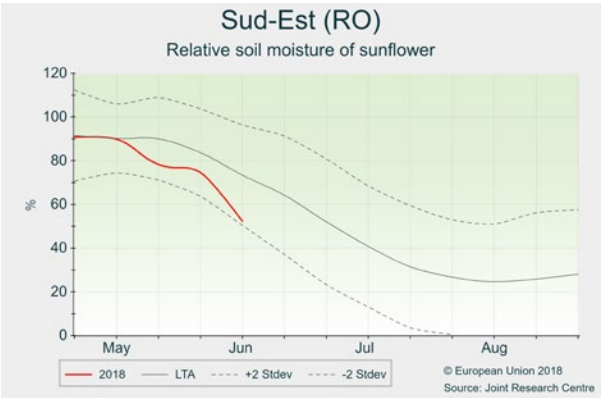
Daily temperatures fluctuated mainly above the average during the current period of analysis (1 May to 12 June). The number of hot days (T_{max} > 30 °C) totalled 3-14, which is two to three times as many as usual. During the review period, abundant precipitation was recorded in western Romania, exceeding the average by 15-60 mm and providing adequate soil moisture supply. In the same period, rainfall remained mostly below average in the central and eastern regions, where the total precipitation deficit has reached 20-90 mm since 1 May.

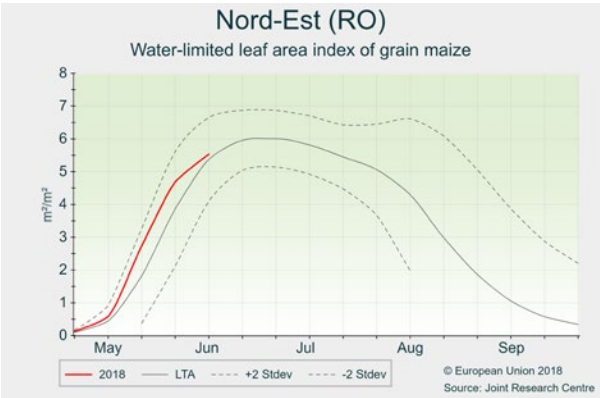
The outstandingly warm period recorded from early April onwards greatly accelerated crop development and shortened the time of yield formation (reproductive phase) for winter cereals.

Our simulation results show high water-limited biomass of winter crops along the western border (in *Macroregiunea Patru* and *Nord-Vest* regions), but in the eastern half of Romania (e.g. *Sud-Muntenia*, *Sud-Est* and *Nord-Est*) biomass development is at or below average due to the restricted water supply. Therefore, our May yield forecast for winter cereals was revised down in June to the level of the 5-year average or even slightly below. During the review period, the soil moisture content for summer crops decreased sharply to below-normal levels in eastern Romania, although the biomass weight and leaf area are adequate so far. The yield forecast for grain maize was also revised downward, but remains positive. The potential of summer crops will depend substantially on the amount of the rainfall arriving until the start of flowering.









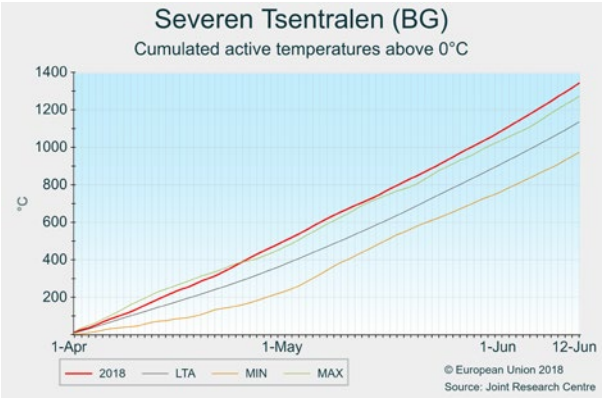
Bulgaria

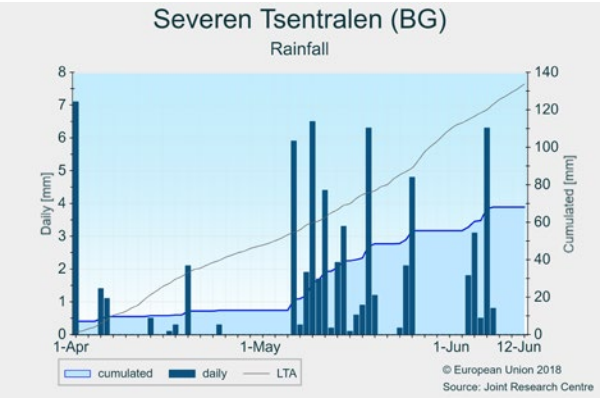
Lower yield expectations for winter cereals

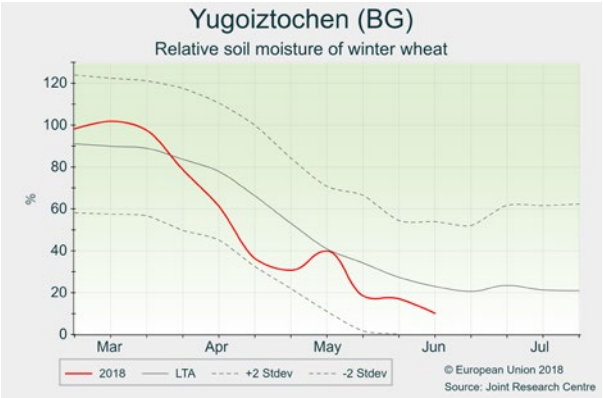
Temperatures significantly and persistently exceeded the average, causing a shortening of the grain-filling period of winter crops. Yield formation was further affected by water stress, as near- or below-average rainfall was unable to maintain soil moisture at adequate levels in the main agricultural regions.

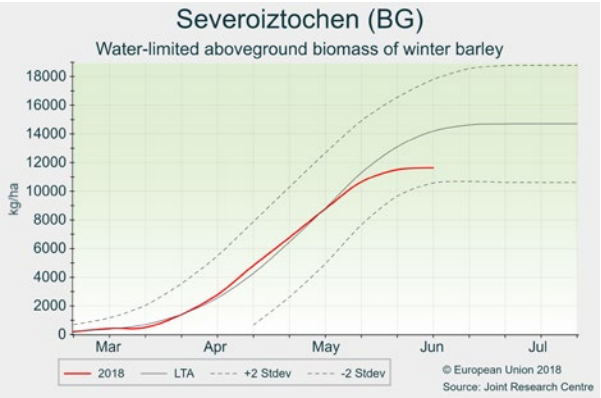
Since the beginning of April, exceptionally warm conditions have prevailed in Bulgaria. The temperature sum from 1 April until 12 June (T_{base} = 0 °C) exceeded the average by 150-270 °Cd and even exceeded the historical maximum. Precipitation was unevenly distributed in space and time. Rainfall totals mostly remained between 40 mm and 90 mm, somewhat exceeding the average in *Yugoiztochen* and eastern *Severoiztochen*; rainfall in *Yugozapaden* and western *Severoiztochen* was below the LTA.

Hot weather unfavourably shortened the grain-filling period of winter crops, reducing the time for biomass accumulation. The phenological development of winter crops became advanced by 10-20 days for mid-June. Consequently, the start of the harvest will be earlier than usual. Water supply was below optimal. Biomass accumulation has therefore decreased to below-average level. Additionally, warm and moist conditions probably increased the pest and disease pressure. The yield outlook for winter crops has been revised downwards. The sowing of summer crops was delayed but crop development later was faster than usual. Soil moisture levels under summer crops are decreasing quickly, increasing the risk that limited water supply will negatively affect flowering and yield formation in July.









Austria, Slovakia and the Czech Republic

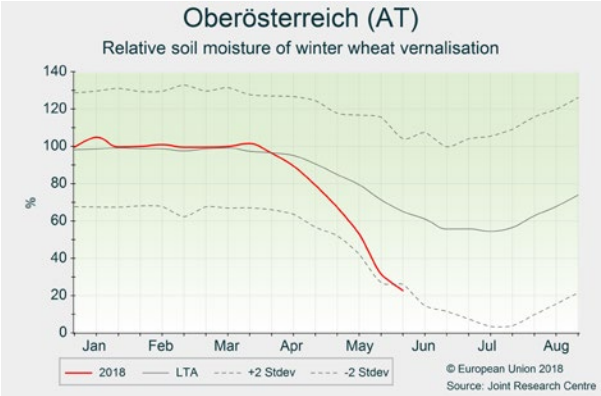
Winter cereals yield outlook revised downwards

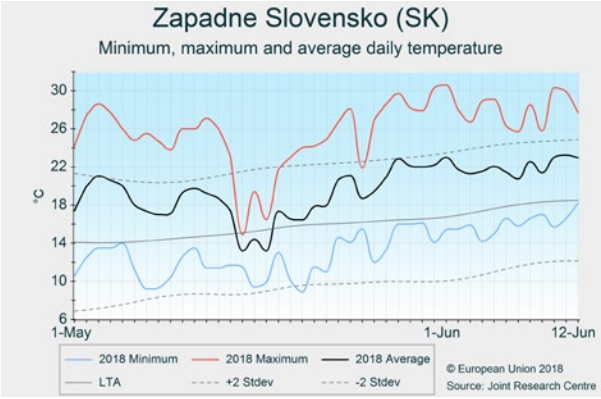
High temperatures affected winter wheat during flowering in parts of Austria and the Czech Republic. Dry conditions prevailed in northern Austria, whereas abundant rainfall in the south of the country caused local waterlogging. Winter wheat yield forecasts were revised moderately downwards for Austria and the Czech Republic and slightly upwards for Slovakia.

The previously observed warm weather anomaly continued in May and the first dekad of June, with average daily temperatures exceeding the long-term average by between 2 °C and 4 °C. Maximum air temperatures exceeded 30 °C for up to 5 days in northern Austria, Slovakia and the northern half of the Czech Republic. Dry conditions prevailed in *Oberösterreich*, where cumulative rainfall did not exceed 50 mm during the analysis period. A lower rainfall deficit was recorded in eastern parts of the Czech Republic and Slovakia.

In contrast, a rainfall surplus was recorded in south-eastern Austria and south-western Slovakia. *Steiermark* and *Karnten* registered more than 150 mm of rainfall, often in the form of thunderstorms, with accompanying strong winds and hail.

The warm weather anomaly has accelerated crop development and is shortening the grain-filling stage of winter cereals. High air temperatures affected winter wheat during flowering in northern Austria and parts of the Czech Republic. Moreover the below-average level of rainfall in northern Austria has caused a soil moisture deficit, affecting the grain-filling of winter cereals. However, abundant rainfall in southern Austria caused local flooding and waterlogging, limiting field accessibility and lowering the crop yield potentials. Consequently, the outlook for winter cereal yields has been revised downwards for Austria and the Czech Republic. The outlook for summer crops remains at the long-term trend values.





Denmark and Sweden

Rain needed to maintain positive outlook

Winter and spring cereals are in good condition but adequate rainfall is urgently needed. The yield forecasts for spring and winter crops are slightly revised downwards.

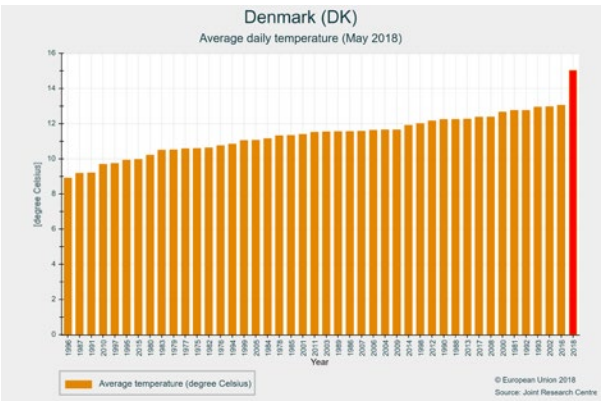
Warmer-than usual temperatures characterised the review period in both countries. Maximum temperatures nearly reached 30 °C at the beginning of June in *Östra Sverige*.

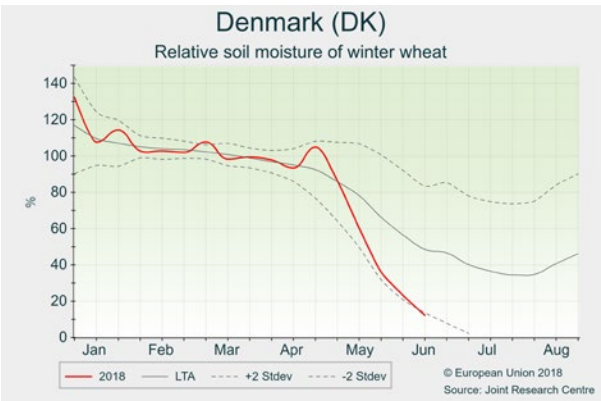
Cumulative rainfall over the review period was markedly below the long-term average in both countries. The number of days with significant rainfall was one of the lowest since 1975. Solar radiation was among the highest in our records.

Winter cereals are now close to entering the flowering phase, and adequate rainfall and mild temperatures are needed to maintain high yield potentials in cereal crops.

Winter and spring cereals are in good condition. Our model suggests advanced development and close-to-average biomass accumulation. However, warm temperatures caused increased evapotranspiration, which, combined with the low levels of rainfall, caused soil moisture levels to drop well below average values and, according to our models, started to limit crop growth in the second half of May. Therefore, the yield forecasts of spring and winter cereals are slightly revised downwards. The development of rapeseed is advanced, while crop models indicate below-average leaf area expansion and biomass accumulation in both countries. Therefore, the forecast for rapeseed was also slightly revised downwards.

The yield forecasts for potato and sugar beet remain close to the 5-year average.





Finland, Lithuania, Latvia and Estonia

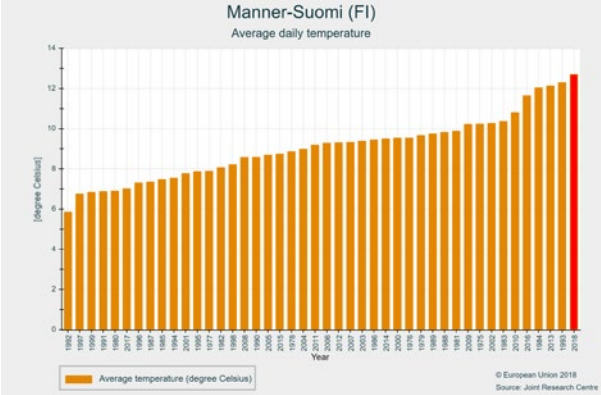
Accelerated crop development and dry conditions in Finland and Baltic countries

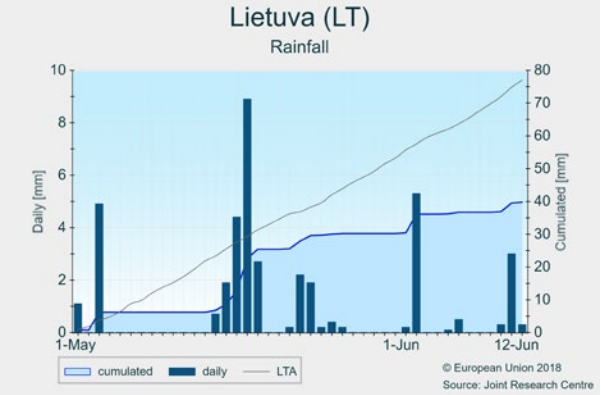
High temperatures accelerated crop development. Crops are in good condition but depleting soil moisture conditions have started to affect growth. Rain and mild temperatures during the coming weeks could help to recover crop growth and maintain yield potentials.

Warmer-than-usual temperatures characterised the period of analysis. The month of May was the warmest in our records (of the last 40 years) in Finland and all the Baltic countries. In Lithuania, maximum temperatures reached 29 °C for a few days. At the beginning of June, average temperatures fell below average and returned to average values at the end of the review period. Rainfall was well below average in all the countries, and characterised by relatively long dry periods interrupted by small precipitation events, mainly concentrated at the beginning of May, in mid-May and at the beginning of June. Compared with other agricultural regions, central Lithuania was less affected by the rain deficit.

Spring sowing activities were concluded at the end of May and dry conditions were reported to locally affect the germination of spring cereals. The extent of the impact depends on soil type and on the time of sowing; the crops sown earlier are generally in good shape.

Despite the abovementioned constraints, winter crops are generally in good condition, with ears already emerged. Rain and mild temperatures during the coming weeks could help to recover crop growth. As a consequence, the yield forecasts for spring and winter crops are maintained close to the 5-year average. The forecast for wheat in Lithuania, where conditions were predominantly favourable, was slightly revised upwards.





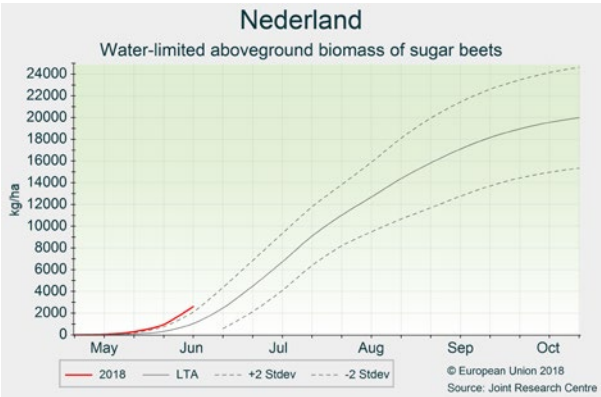
Belgium, the Netherlands and Luxembourg

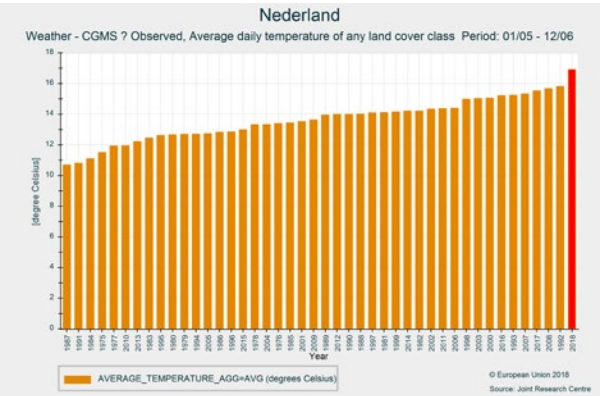
Continued positive outlook despite relatively dry conditions and local downpours

Exceptionally warm and sunny weather conditions and near-adequate water supply in most regions favoured growth and development of winter cereals towards flowering as well as an early establishment of sugar beet and potato crops. Damage to emerging stands by torrential rains raised concerns locally.

The period of analysis (1 May to 12 June) as a whole was the warmest in our records (since 1975) in all three countries. However, maximum temperatures mostly remained below 25 °C and exceeded 30 °C only for 1 or 2 days in southern and eastern parts of the Netherlands. Cumulative rainfall was modestly below-average in the Netherlands and northern Belgium, and above-average in southern Belgium and Luxembourg. Rainfall events were often in the form of thunderstorms.

Winter crop development and biomass accumulation continued at an advanced pace; water supply in the Netherlands and Belgium was less than optimal, but overall the crops are in good condition. Potato and sugar beet crops fully benefited from the warm and sunny conditions, and canopy closure occurred earlier than usual despite the delayed sowings. The yield forecasts for winter crops remain unchanged or are slightly revised downwards, but remain above-the 5-year average. The yield forecast for sugar beet is revised upwards, while potatoes remain unchanged and are still based on the historical trend. The yield formation in both summer and winter crops would benefit from continued high sunshine levels, accompanied by milder temperatures and more regular rainfall in the coming weeks.





Greece and Cyprus

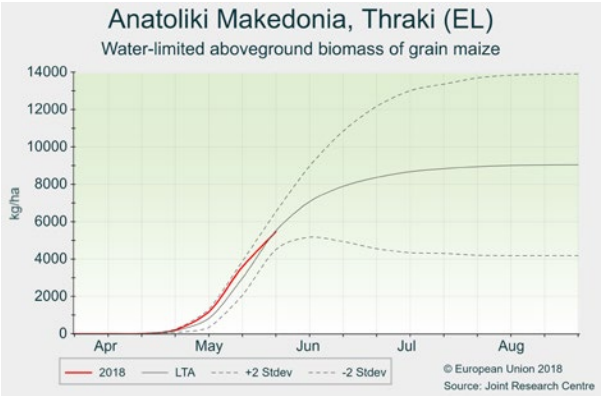
Hot weather. Winter crop yield outlook remains above average.

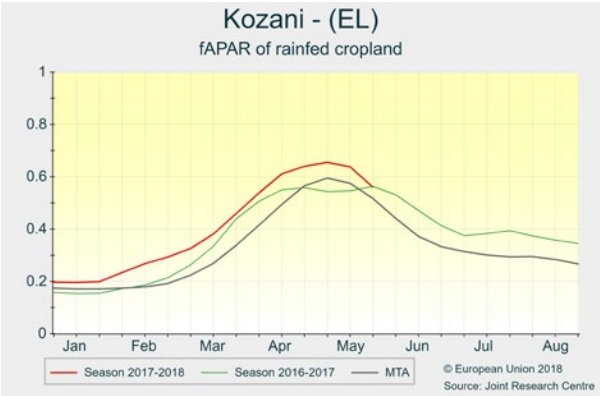
In Greece, above-average precipitation helped to satisfy the increased crop water needs caused by the high temperatures. The yield outlook for winter cereals remains positive and the prospect for summer crops is average. In Cyprus, harvest is ongoing with a slightly below-average yield outlook.

Since 1 April, temperatures have been systematically 3 °C to 4 °C above average in Greece, leading to the highest mean daily average and maximum values for the period as a whole (1 May to 12 June) in our database. In June, maximum temperatures exceeded 30 °C for more than nine consecutive days in *Thessalia* and *Kentriki.* The hot weather was coupled with abundant rains, relatively well distributed during May in the major producing regions of winter cereals in central and northern Greece (around 40 % above the LTA). In the eastern regions of *Anatoliki* (e.g. *Evros*), rains were scarcer.

The generalised and persistently high temperatures have rapidly increased plant water needs, which could mostly be satisfied by adequate levels of water stocks, as a result of the rainy May. In northern-central regions (e.g. *Kozani*), winter cereals entered the grain-filling phase under positive conditions. The above-average prospect is also maintained in *Thessalia* and *Kentriki*, where the more advanced winter cereals reached maturity and harvest started without major concerns. Crop model outputs and remote-sensing data indicate that summer crops are in the vegetative growth phase, in slightly above-seasonal conditions in *Kentriki* but slightly below average in *Anatoliki*. At country level, the yield forecasts for maize and sunflower are average.

In Cyprus, harvest is ongoing without any particular obstacles. Yield expectations for this season are slightly below average because of the warm and dry conditions experienced during the spring that constrained the formation of grains.





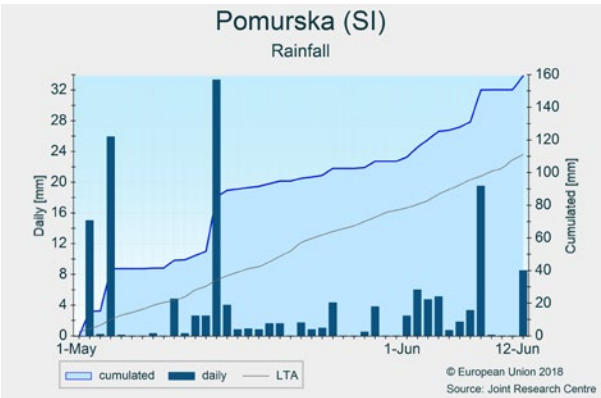
Slovenia and Croatia

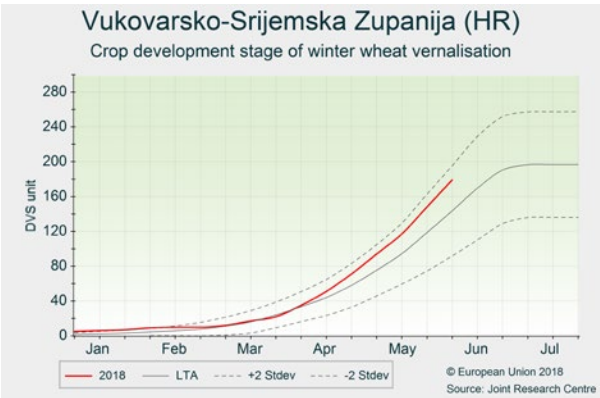
Positive outlook despite local damage from heavy rainfall and hail

Warmer-than-usual weather continued during the analysis period. A rainfall surplus was experienced in the main agricultural regions, except in south-western Slovenia and eastern Croatia. Frequent heavy rainfall, accompanied with hail locally, caused substantial crop damage. The crop yield outlook for winter cereals remains above the 5-year average.

The warm weather anomaly continued in May and the first dekad of June, with average daily temperature exceeding the long-term average by between + 2 °C and + 4 °C. Maximum air temperatures up to 33 °C were recorded. Rainfall was average or above average with the exception of several areas in eastern Croatia, where a slight rainfall deficit was recorded. Rainfall cumulates exceeded 150 mm in large parts of Slovenia and western Croatia. Locally, weather conditions were often characterised by intensive rainfall events accompanied with strong winds and hail.

Crop development is advanced as a consequence of the warm weather anomaly, which has also caused a shortening of the grain-filling period. Nevertheless, in the absence of drought conditions over major agricultural areas, the winter crop yield outlook remains above the 5-year average. Exceptions are south-western Slovenia and some areas in eastern Croatia, where the lack of soil moisture is starting to affect plant growth. Heavy rain and hail events locally caused substantial damage or complete dieback of summer crops; quantification of the impact on crops is very difficult, since both the area and the yields are affected. The summer crops' yield outlook currently still remains at the long-term-trend values and will be revisited in the next bulletin.





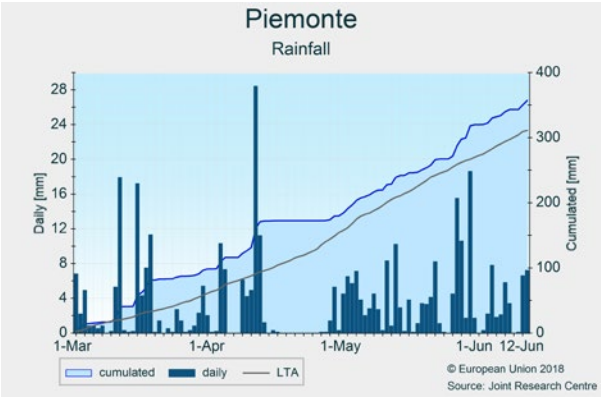
3.2 European Union — rice producing countries

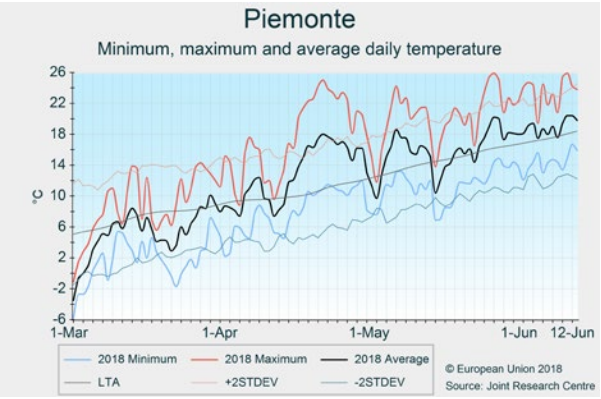
After the beginning of the season and during all the initial stages of rice growth, several rain events took place over the main rice-producing regions of Europe. Rains were generally of low intensity and uniformly distributed in time. Cumulative rainfall has been above the long-term average in almost all the regions of interest. Rain profiles generally did not affect agro-practices but led to local sowing delays in Italy, the Iberian Peninsula, Hungary and Romania. Temperature profiles are higher than usual, except in Portugal and western Spain. Rice crops are currently (mid-June) passing through the tillering stages. Adequate water and temperature conditions, information inferred from remote-sensed observations, and simulation model results have led to rice yield forecasts that are in line with or slightly above the last 5-year average for all the rice-producing countries of Europe.

Italy

Frequent rains caused sowing delays

In Italy, weather conditions in April and May were sub-optimal for rice sowing. Frequent and abundant rains, especially at the beginning of April, hampered field preparation and sowing activities in the main rice districts in *Piemonte* and *Lombardia*. A favourable sowing window occurred between 20 and 30 April. In May, rain events were less intense but quite frequent and did not favour late sowing. Temperatures since mid-April have been predominantly above the LTA. This positive thermal trend characterised all the northern and central Italian rice districts and has accelerated rice growth and development, recovering a large portion of the delays incurred during the sowing period.

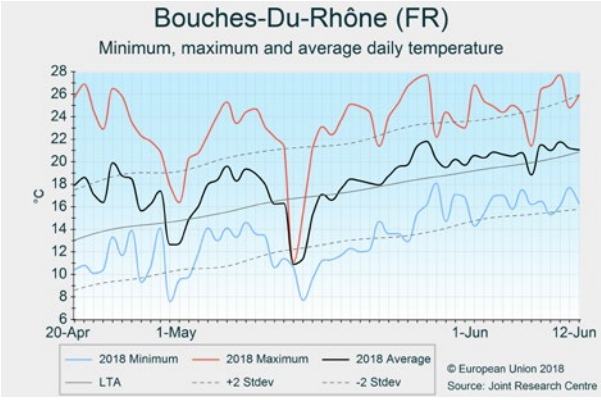


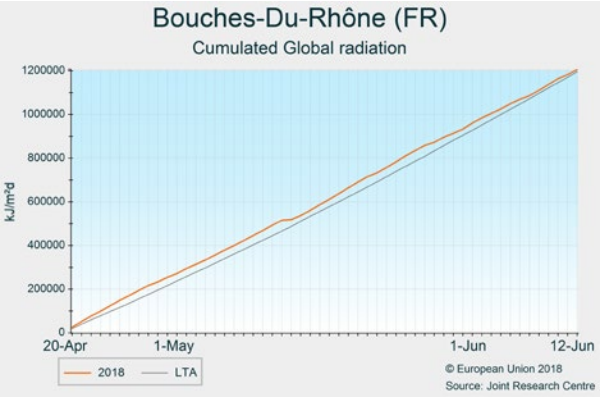


France

Beneficial sowing conditions

Above-average temperatures were observed during the sowing period, which took place from 20 April to 15 May. Daily average temperatures remained above 12 °C (minimum temperature for rice growth) throughout this period, except on 13 May, when a temperature of 11 °C was recorded. After 13 May, temperatures followed the seasonal values. No delays were experienced during sowing. Conditions during emergence and early growth followed the long-term average.

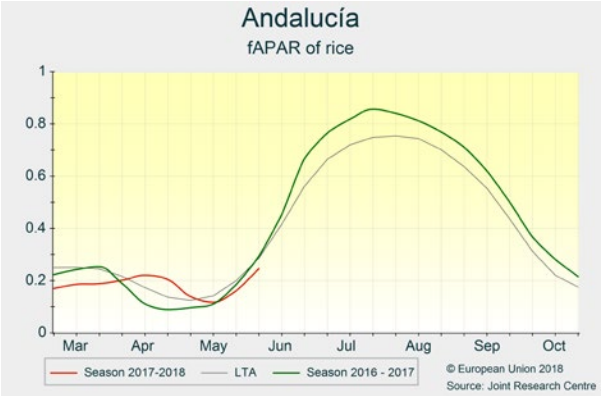


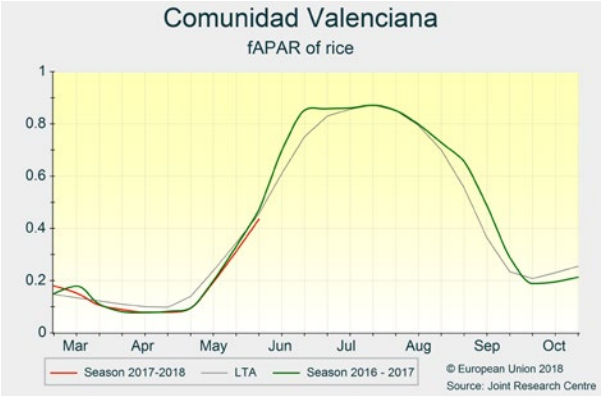


Spain and Portugal

Average crop development

Lower-than-usual temperatures and abundant precipitation registered in the western half of the Iberian Peninsula led to a slight delay to sowing in the main rice areas of *Andalucía*, *Extremadura* and *Alentejo*. Crop emergence, as revealed by remote sensing images, occurred during the second half of May, about 10 days later than in an average year. In eastern Spain (*Cataluña*, *Comunidad Valenciana*), rice is in the tillering phase. Crop emergence took place in the first half of May under favourable conditions, and early growth phases benefited from higher-than-usual temperatures in the second half of the month. Remote sensing imagery indicates that crop status is currently close to the average. Water stored in the reservoirs and aquifers in the main producing regions has significantly increased from the low levels observed in winter thanks to a very humid spring across the peninsula. No major restrictions are expected for the summer irrigation campaign.

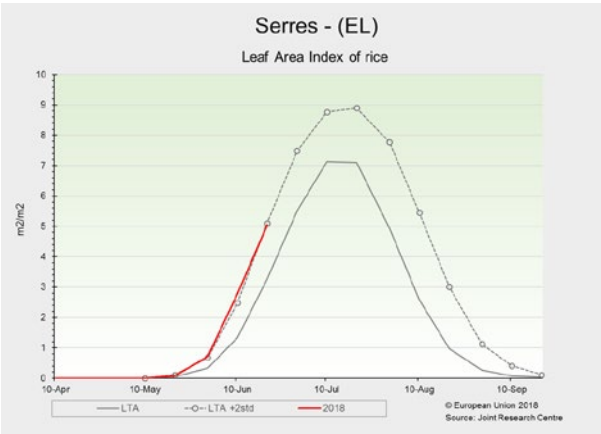




Greece

Overall, positive outlook

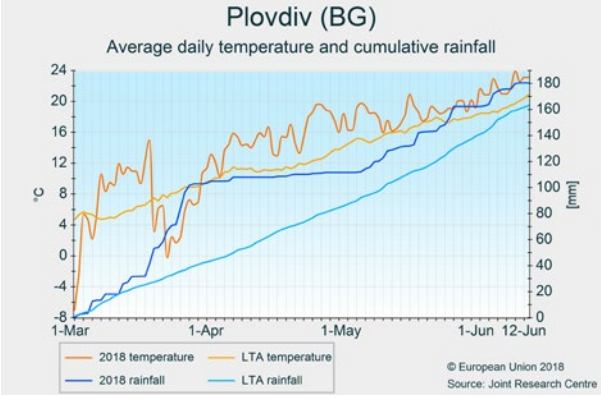
Overall, meteorological conditions have been favourable in the main rice-producing regions of Greece (*Thessaloniki* and *Serres*). In May, warmer-than-usual temperatures were coupled with well-distributed and abundant rains, especially in Serres. Since the beginning of June, rains have been very scarce while temperatures have remained above average. Rice is under vegetative growth, reaching the first stages of tillering in *Thessaloniki* and the advanced tillering stage in *Serres* (around 1 dekad of difference). The rainy events observed in May increased the potential of fungal infection; however, this remains at far-from-critical levels. Simulated growth indicators are above average, and remote sensing imagery also indicates advanced growth and above-average biomass accumulation. The yield outlook is therefore above the 5-year average.

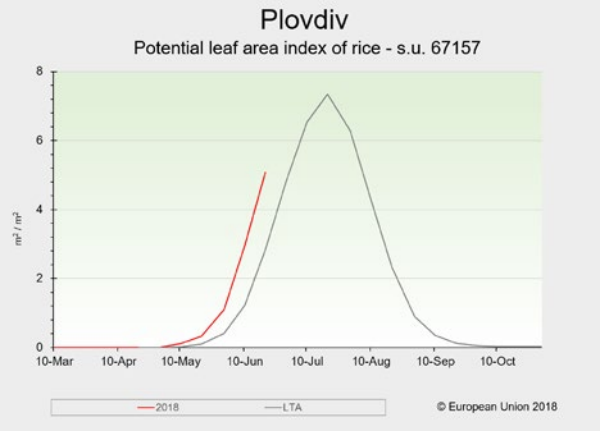


Bulgaria

Good crop growth condition at the beginning of the season

In Bulgaria, the beginning of the rice-growing season in the main rice districts (Plovdiv, Pazardzhik, Stara Zagora) was characterised by few and moderate rain events and warm temperature profiles. Cumulative rainfall and temperatures, to date, are above the long-term average. The climatic conditions set a promising scenario for rice crop growth and development during the emergence and beginning of tillering. These conditions are also depicted in our model simulations, which show above-average leaf area development and biomass accumulation. The yield forecast is above the 5-year-average value.

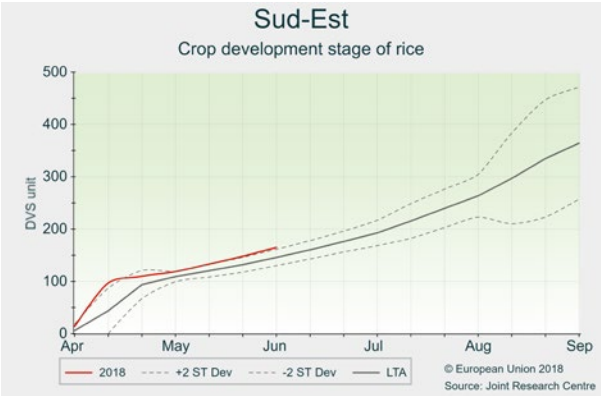


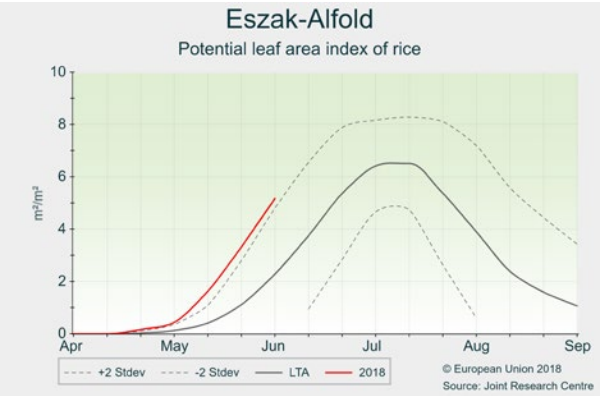


Romania and Hungary

Yield expectation above the 5-year average

In April, the sowing of rice suffered delays due to unfavourable wet soil conditions, but later the progress of sowing accelerated and it caught up in mid-May. Rice crop establishment has been adequate thanks to persistently above-average temperatures in May and early June. No frost events occurred in May. Cumulative rainfall remained under the long-term average from mid-April until early June in all rice-producing regions of Romania and Hungary but rainfall increased considerably in the first dekad of June. The analysis of our rice model simulation results suggest a positive picture in both Romania and Hungary. Rice crops are still in the early vegetative phase in the second dekad of June. Weather conditions were also adequate for early biomass accumulation and the extension of the crop canopy. The result of the current analysis indicates yield expectations exceeding the historical trend in both countries. However, as this is the very early stage of the rice season, the rice forecast has considerable uncertainty.





3.3 Black Sea area

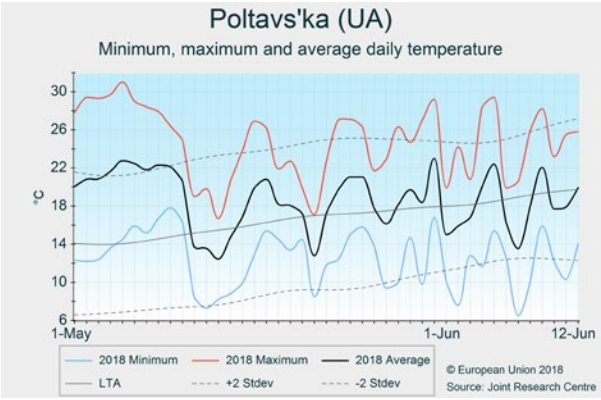
Ukraine

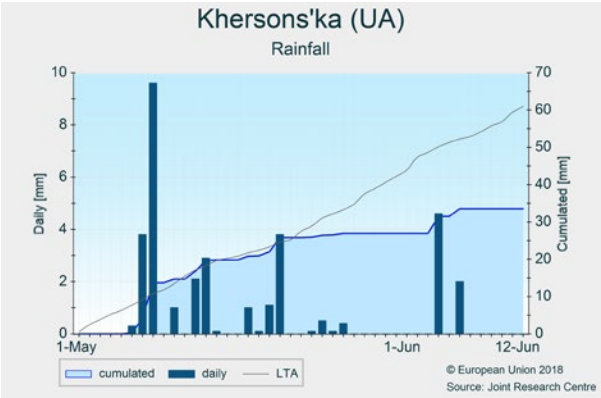
Dry weather degrading crop conditions

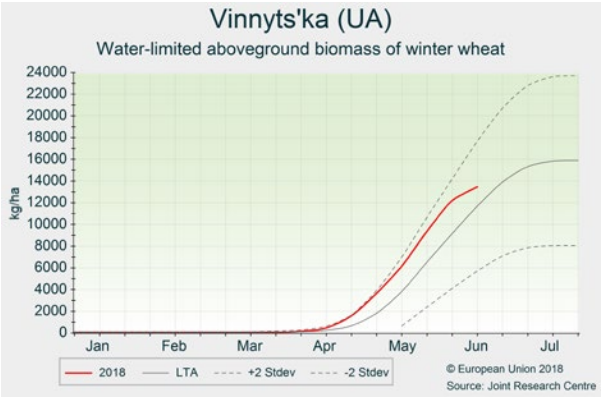
The dry weather observed this spring slightly affected winter crops and is currently impacting the biomass formation of summer crops. The yield outlook for winter cereals is slightly below last year but might decrease further if hot and dry weather persist during the grain-filling stage.

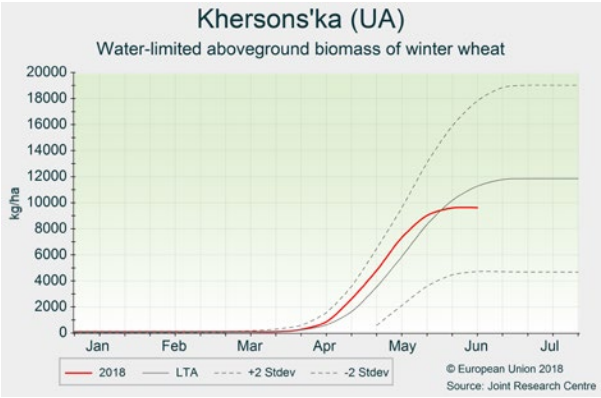
The period under analysis was characterised by only a few events of significant rainfall that fell during thunderstorms. The cumulative rainfall distribution is spatially uneven and a large part of the country received less than 50 % of its seasonal cumulative values. These dry conditions follow a month (April) that was already exceptionally warm and dry. After the first dekad of May, which was substantially warmer than average, temperatures returned to seasonal levels. Winter crops and spring barley are currently well advanced compared with an average year, despite the late start of spring.

Topsoils are currently dry, leading to negative impacts on summer crop biomass formation, but the soil condition might still improve depending on rainfall during the coming weeks. Winter crops, which have their rooting system already well developed, received sufficient water, except in the southernmost regions where kastanozems, with less favourable properties, prevail, particularly in Khersons'ka. The dry conditions are anticipated to impact the yields in southernmost regions. Moreover, the lack of rain is expected to have lowered the efficiency of fertilisers in all regions, with an additional (albeit slightly) negative effect on yields. Concern about a possible heat wave during the grain filling stage of winter cereals and spring barley, which might reduce further the yield outlook, are still valid as the weather forecast shows an average temperature + 4 °C above the average and no substantial rainfall for the next 10 days (until 23 June).









Turkey

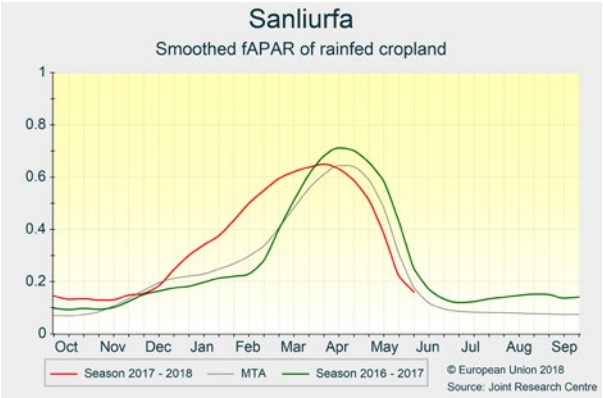
Favourable conditions for grain filling

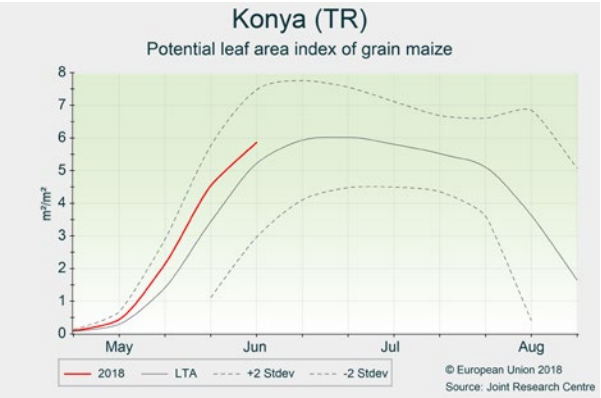
Winter crops benefited from above-average rainfall in May in both central Anatolia and south-eastern regions. Hot temperatures in June slightly shortened the grain-filling stage. There is no concern for grain maize.

In central Turkey (*Konya*, *Ankara*, *Kirikkale* and *Kayseri*), the review period was wetter than usual, (60-95 mm of precipitation, i.e. + 30 % in southern *Konya*, to + 70 % in *Ankara*, compared with the LTA). These weather conditions restored soil moisture to optimal levels, although, since mid-May, temperatures have remained 2 °C to 4 °C above the LTA and maximum temperatures peaked at 30 °C in the first days of June. In the central-western regions (*Konya* and *Ankara*), winter crops' grain filling developed under favourable conditions in May. In June, the hot weather slightly accelerated the crops' senescence. In central-eastern regions, (*Kirikkale* and *Kayseri*) winter crops are well developed: they completed flowering in mid-May and grain filling started under favourable conditions.

In the south-eastern regions (*Gaziantep*, *Şanliurfa* and *Mardin*), May was much wetter than usual, with 70 mm to 120 mm rain (> + 100 % compared with the LTA), while temperatures followed the seasonal trend. Crops reached maturity in June under very favourable conditions in *Şanliurfa* and Gaziantep. In *Mardin*, where dry weather in April had already affected crops , yield losses were partially mitigated by the unseasonal rains.

In the main grain maize-producing regions (*Adana*, *Konya*), sufficient water in the reservoirs for irrigation and warm temperatures have favoured maize leaf area expansion.





3.4 European Russia and Belarus

European Russia

Rainfall deficit in southern Russia

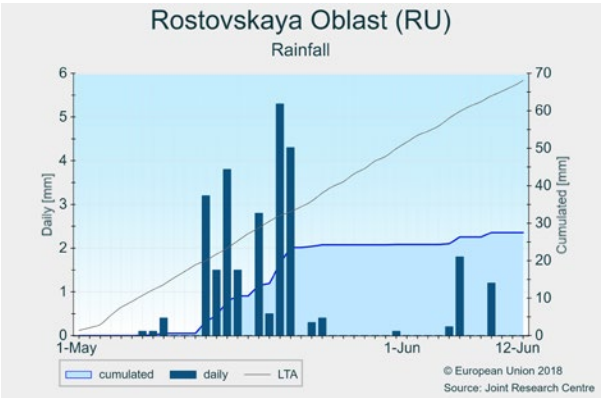
In May, rainfall decreased in most of Russia, allowing the completion of the spring sowing campaign. In southern Russia, above-average temperatures and moderate rainfall led to a quick decrease in soil moisture levels, although the water supply for winter crops mostly remained adequate. Yield expectations for winter cereals are below last year's record level, but still positive.

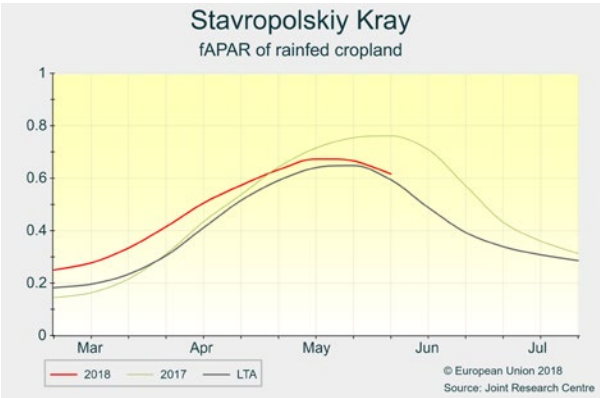
South-western Russia and the regions along the western border were 1-4 °C warmer than usual, considering the review period (1 May to 12 June) as a whole, while below-average temperatures prevailed in the eastern areas, along the Ural Mountains, resulting in a negative thermal anomaly in the range of – 1 °C to – 4 °C.

In general, below-average rainfall was experienced in western Russia and the areas between the Black and Caspian Seas. In some important winter-wheat-producing areas (e.g. in *Rostovskaya*, *Volgogradskaya*, *Saratovkaya*, *Krasnodarskiy* and *Stavropol* regions), the rainfall totals reached only 5-25 mm during the review period. In contrast, eastern Russia was excessively wet.

The development of winter cereals became advanced in the regions north of the Caucasus. During May, soil moisture content decreased quickly under winter cereals in southern Russia, but the water supply of winter wheat remained adequate in most areas, and the negative impacts on biomass accumulation and canopy expansion have been limited so far. The yield potential is still at or above average but below last year's exceptional level. Satellite images confirm this picture.

In early May, the progress of the sowing campaign of spring cereals accelerated and caught up by mid- or late May. Cold weather conditions were unfavourable for early development of spring cereals in the northern and eastern regions of European Russia, but the water supply has been adequate. The sowing of grain maize also suffered delay during spring (especially in the Central and Volga okrugs) and a decrease in the sowing area is probable, as the optimal sowing window is relatively short. Biomass accumulation and leaf area expansion are typically below average because of delayed phenological development in the central and eastern areas. In the southern maize-producing regions, the relatively dry conditions are a concern.





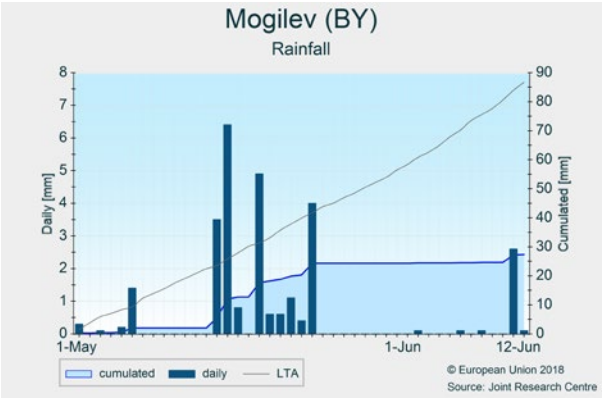
Belarus

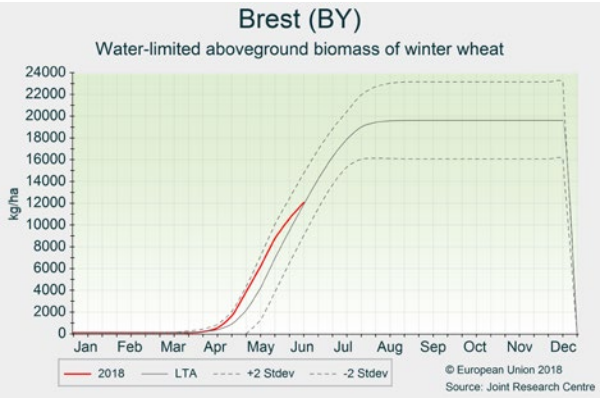
Average expectations for winter cereals

Warm weather conditions favoured a fast development of crops. Low precipitation and high temperatures diminished soil water content, which is noticeably below the average. The dry soil negatively impacted summer crops biomass formation. The current outlook for winter crops is average.

Precipitation was considerably below the long-term average (LTA), while temperatures have been above the average for almost all the analysis period. The lower-than-usual precipitation and warm temperatures decreased the soil moisture to levels considerably below the LTA.

As a consequence of the predominantly high temperatures, the phenological stage of winter crops and spring barley is advanced compared to an average year. The simulated biomass accumulation of wheat and barley is still just above LTA, benefitting from the favourable conditions in early spring. Nevertheless, the soil moisture has decreased strongly and is now close to a critical level. Overall, the yield outlook is close to the average, and our previous forecast, based on the historical trend, is maintained. However, rain will be needed to maintain the current yield forecast of wheat and barley and to resume maize growth in the following weeks.





3.5 Maghreb

Morocco, Algeria and Tunisia

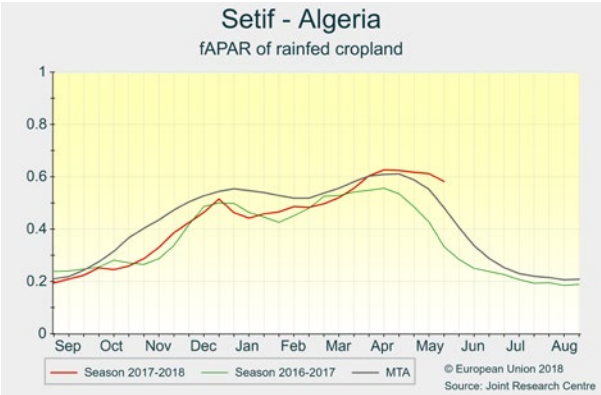
Positive outlook in many agricultural areas of Maghreb

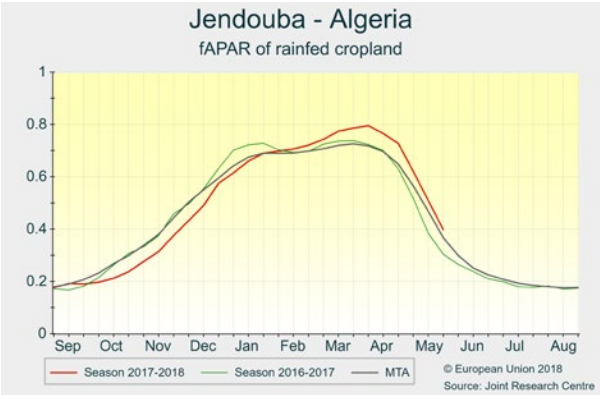
Winter cereals reached maturity in Morocco and Tunisia, which are in full harvest. The yield forecast for all crops in Morocco is significantly above average. Yield forecasts in Tunisia are below average. Beneficial conditions in terms of water stock and thermal weather in Algeria led to maintaining above-average forecasts.

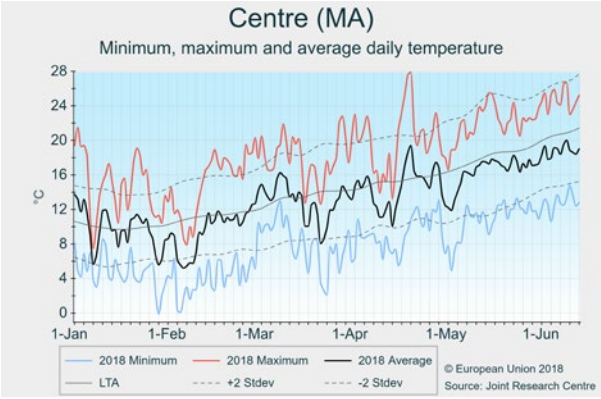
In Morocco, abundant rains and colder-than-usual weather have marked the end of the spring; temperatures were systematically below average through the whole period under review (1 May to 12 June). Winter cereals have reached maturity and harvest is ongoing without major concerns. The prospect for this campaign is very promising and forecasts are substantially above average for all crops.

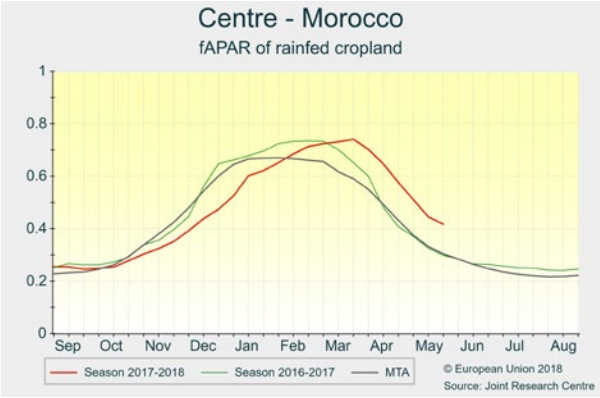
Tunisia is also currently in full harvest with favourable weather, yet the mixed outlook remains. Poor harvest is expected in many central and southern regions (e.g. *Le Kef*, *Silicia*, *Kaouiran*), mainly driven by the low water supply for plant consumption that the winter cereals experienced during most of the vegetative growth and formation of grains as a result of the scarce rains. In contrast, crops in northern regions of *Bizerte*, *Beja* and *Jendouba* — where a significant proportion of the Tunisian's cereals are produced — experienced more positive water stocks through the whole campaign, resulting in above-average yield expectations. However, for the country as a whole, the forecast is below average.

In Algeria, rains were abundant and well distributed, which was coupled with below-average temperatures. In many western regions of Algeria, winter cereals have reached maturity and harvesting has begun with positive prospects. Eastern regions experienced more positive thermal conditions and also good levels of water stocks, which provided beneficial conditions at the end of flowering and during the grain-filling process. Forecasts for all crops remained above average.



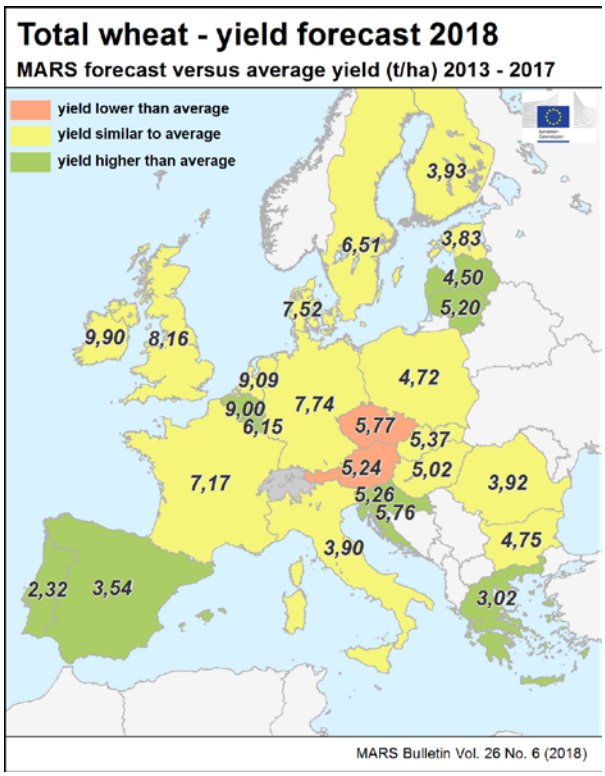




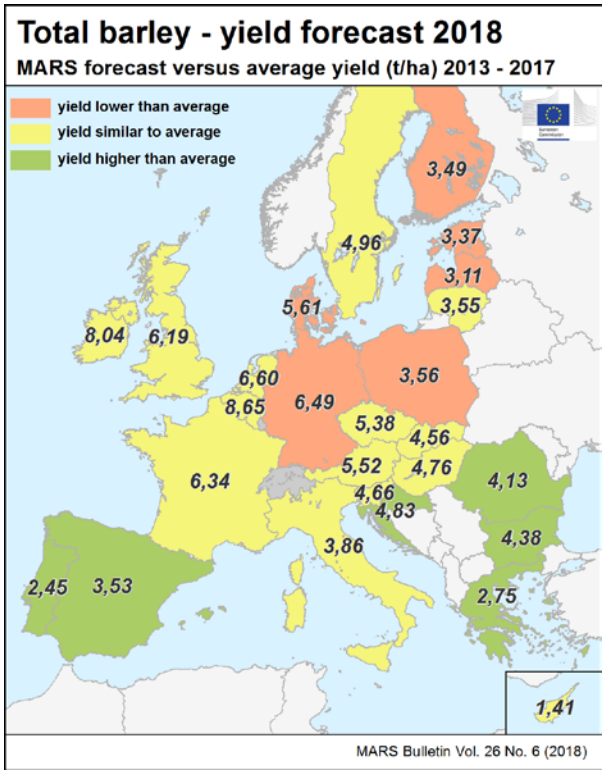


4. Crop yield forecasts

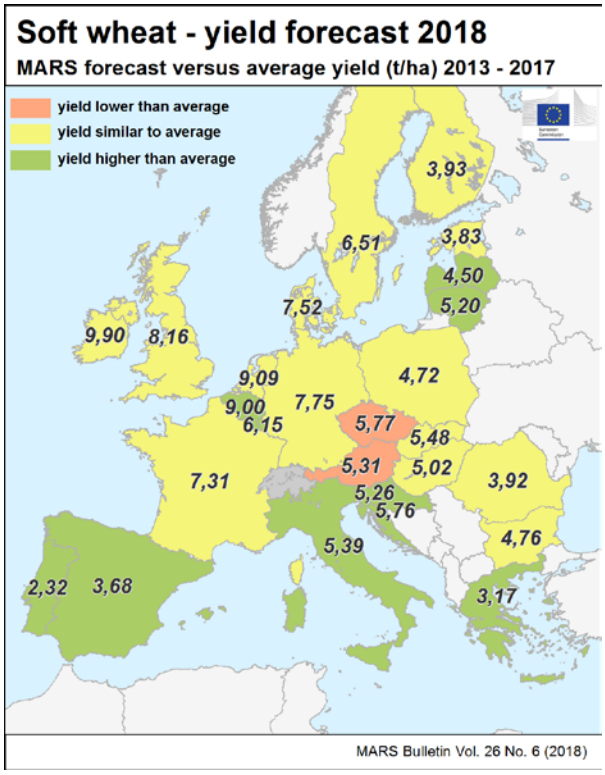
Country	TOTAL WHEAT (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	5,73	5,85	**5,79**	+1,1	-1,0
AT	5,68	5,12	**5,24**	-7,7	+2,4
BE	8,56	8,37	**9,00**	+5,1	+7,4
BG	4,59	5,35	**4,75**	+3,6	-11
CY	-	-	**-**	-	-
CZ	6,14	5,67	**5,77**	-6,1	+1,8
DE	8,00	7,64	**7,74**	-3,3	+1,3
DK	7,71	8,24	**7,52**	-2,5	-8,8
EE	3,84	4,20	**3,83**	-0,3	-8,9
ES	3,07	2,39	**3,54**	+15	+48
FI	3,99	4,13	**3,93**	-1,4	-4,7
FR	6,98	7,25	**7,17**	+2,7	-1,1
GR	2,84	2,93	**3,02**	+6,6	+3,1
HR	5,14	5,95	**5,76**	+12	-3,2
HU	5,06	5,44	**5,02**	-0,8	-7,8
IE	9,89	10,2	**9,90**	+0,1	-2,6
IT	3,82	3,86	**3,90**	+1,8	+1,0
LT	4,67	4,82	**5,20**	+11	+7,8
LU	5,88	5,48	**6,15**	+4,6	+12
LV	4,29	4,79	**4,50**	+4,8	-6,0
MT	-	-	**-**	-	-
NL	8,97	9,09	**9,09**	+1,3	-0,1
PL	4,67	4,90	**4,72**	+0,9	-3,7
PT	2,01	2,05	**2,32**	+15	+13
RO	3,93	4,88	**3,92**	+0,0	-20
SE	6,68	6,99	**6,51**	-2,6	-6,9
SI	4,99	5,03	**5,26**	+5,3	+4,5
SK	5,24	4,73	**5,37**	+2,5	+14
UK	8,20	8,16	**8,16**	-0,4	+0,0



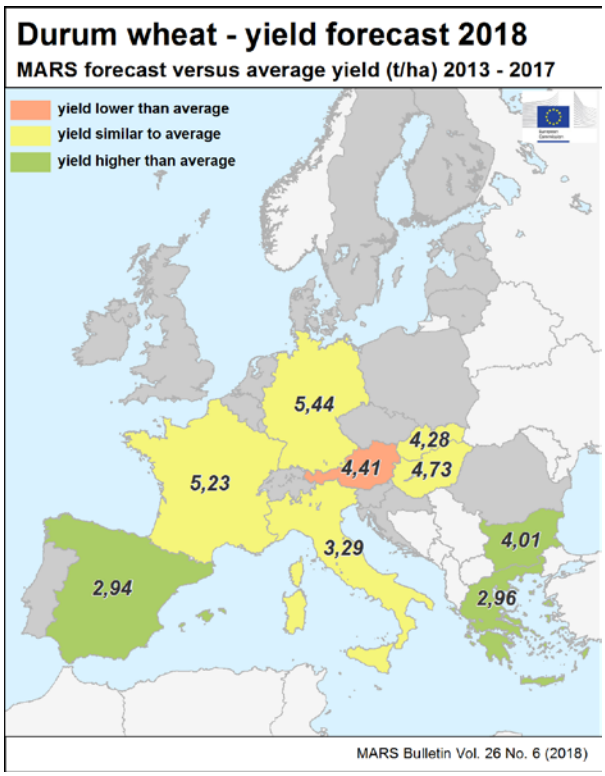
Country	TOTAL BARLEY (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	4,91	4,89	**4,98**	+1,5	+1,8
AT	5,64	5,60	**5,52**	-2,2	-1,5
BE	8,35	8,68	**8,65**	+3,6	-0,3
BG	4,10	4,68	**4,38**	+6,6	-6,5
CY	1,44	1,81	**1,41**	-2,0	-22
CZ	5,30	5,22	**5,38**	+1,5	+3,0
DE	6,94	6,93	**6,49**	-6,5	-6,3
DK	5,86	6,00	**5,61**	-4,3	-6,5
EE	3,55	4,10	**3,37**	-5,2	-18
ES	2,91	2,26	**3,53**	+21	+56
FI	3,68	4,08	**3,49**	-5,1	-14
FR	6,37	6,33	**6,34**	-0,4	+0,2
GR	2,64	2,69	**2,75**	+4,2	+2,3
HR	4,36	4,98	**4,83**	+11	-3,0
HU	4,74	5,27	**4,76**	+0,6	-9,7
IE	8,05	8,36	**8,04**	-0,1	-3,7
IT	3,81	3,93	**3,86**	+1,1	-1,9
LT	3,60	3,65	**3,55**	-1,2	-2,5
LU	-	-	**-**	-	-
LV	3,31	3,32	**3,11**	-6,0	-6,3
MT	-	-	**-**	-	-
NL	6,67	6,09	**6,60**	-0,9	+8,4
PL	3,79	3,96	**3,56**	-6,1	-10
PT	2,06	1,90	**2,45**	+19	+29
RO	3,63	4,52	**4,13**	+14	-8,7
SE	5,02	5,29	**4,96**	-1,3	-6,2
SI	4,63	4,81	**4,66**	+0,8	-3,0
SK	4,64	4,54	**4,56**	-1,9	+0,5
UK	6,20	6,09	6,19	-0,2	+1,6



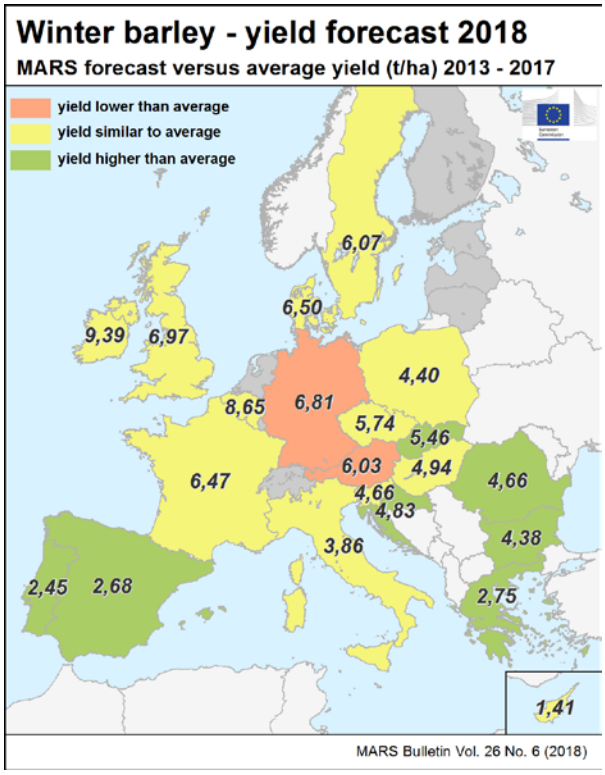
Country	SOFT WHEAT (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	5,97	6,11	**6,04**	+1,2	-1,2
AT	5,74	5,22	**5,31**	-7,5	+1,8
BE	8,56	8,37	**9,00**	+5,1	+7,4
BG	4,60	5,36	**4,76**	+3,5	-11
CY	-	-	**-**	-	-
CZ	6,14	5,67	**5,77**	-6,1	+1,8
DE	8,02	7,66	**7,75**	-3,3	+1,2
DK	7,71	8,24	**7,52**	-2,5	-8,8
EE	3,84	4,20	**3,83**	-0,3	-8,9
ES	3,18	2,30	**3,68**	+16	+60
FI	3,99	4,13	**3,93**	-1,4	-4,7
FR	7,10	7,36	**7,31**	+2,9	-0,7
GR	2,99	3,15	**3,17**	+5,9	+0,7
HR	5,14	5,95	**5,76**	+12	-3,2
HU	5,06	5,47	**5,02**	-0,8	-8,2
IE	9,89	10,2	**9,90**	+0,1	-2,6
IT	5,15	5,49	**5,39**	+4,6	-1,8
LT	4,67	4,82	**5,20**	+11	+7,8
LU	5,88	5,48	**6,15**	+4,6	+12
LV	4,29	4,79	**4,50**	+4,8	-6,0
MT	-	-	**-**	-	-
NL	8,97	9,09	**9,09**	+1,3	-0,1
PL	4,67	4,90	**4,72**	+0,9	-3,7
PT	2,01	2,05	**2,32**	+15	+13
RO	3,93	4,88	**3,92**	+0,0	-20
SE	6,68	6,99	**6,51**	-2,6	-6,9
SI	4,99	5,03	**5,26**	+5,3	+4,5
SK	5,30	4,79	**5,48**	+3,4	+14
UK	8,20	8,16	**8,16**	-0,4	+0,0



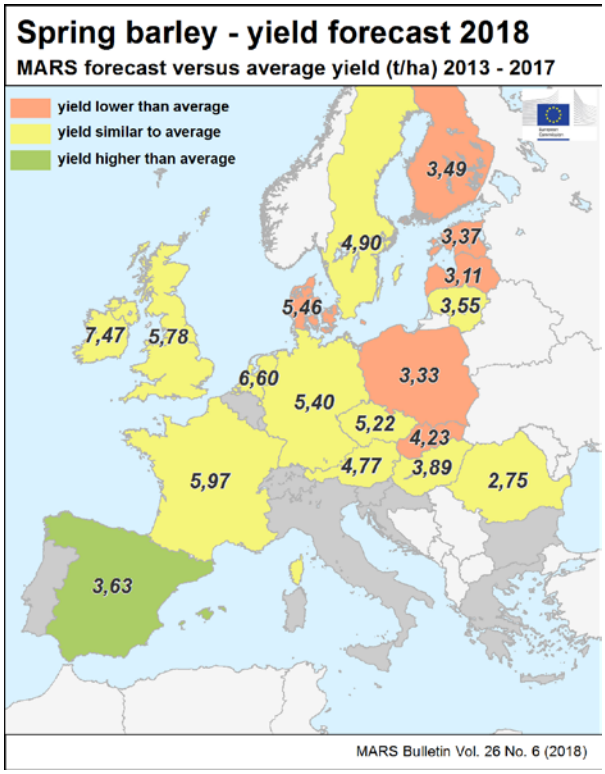
Country	DURUM WHEAT (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	3,40	3,51	**3,52**	+3,5	+0,1
AT	4,74	4,02	**4,41**	-7,0	+10
BE	-	-	**-**	-	-
BG	3,66	4,10	**4,01**	+10	-2,4
CY	-	-	**-**	-	-
CZ	-	-	**-**	-	-
DE	5,55	5,76	**5,44**	-2,0	-5,5
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	2,54	2,73	**2,94**	+16	+7,5
FI	-	-	**-**	-	-
FR	5,18	5,73	**5,23**	+1,0	-8,7
GR	2,77	2,85	**2,96**	+7,1	+3,9
HR	-	-	**-**	-	-
HU	4,78	4,71	**4,73**	-1,0	+0,5
IE	-	-	**-**	-	-
IT	3,26	3,23	**3,29**	+0,8	+1,7
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	-	-	**-**	-	-
PT	-	-	**-**	-	-
RO	-	-	**-**	-	-
SE	-	-	**-**	-	-
SI	-	-	**-**	-	-
SK	4,40	4,26	**4,28**	-2,7	+0,4
UK	-	-	**-**	-	-



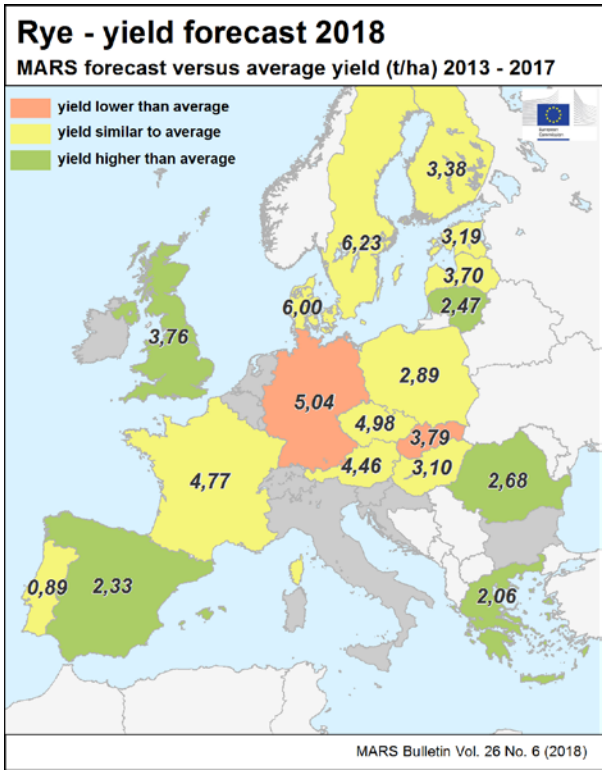
Country	WINTER BARLEY (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	5,79	5,98	**5,80**	+0,1	-3,1
AT	6,33	6,59	**6,03**	-4,7	-8,5
BE	8,35	8,68	**8,65**	+3,6	-0,3
BG	4,10	4,68	**4,38**	+6,6	-6,5
CY	1,44	1,81	**1,41**	-2,0	-22
CZ	5,52	5,85	**5,74**	+3,9	-1,9
DE	7,36	7,35	**6,81**	-7,5	-7,4
DK	6,54	6,78	**6,50**	-0,6	-4,1
EE	-	-	**-**	-	-
ES	2,41	2,00	**2,68**	+11	+34
FI	-	-	**-**	-	-
FR	6,51	6,48	**6,47**	-0,5	-0,1
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	**4,94**	-1,6	-9,1
IE	9,33	9,11	**9,39**	+0,7	+3,1
IT	3,81	3,93	**3,86**	+1,1	-1,9
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	4,38	4,66	**4,40**	+0,3	-5,7
PT	2,06	1,90	**2,45**	+19	+29
RO	3,95	4,90	**4,66**	+18	-5,0
SE	6,11	6,42	**6,07**	-0,6	-5,4
SI	4,63	4,81	**4,66**	+0,8	-3,0
SK	5,17	5,27	**5,46**	+5,6	+3,7
UK	6,98	6,97	**6,97**	-0,1	+0,0



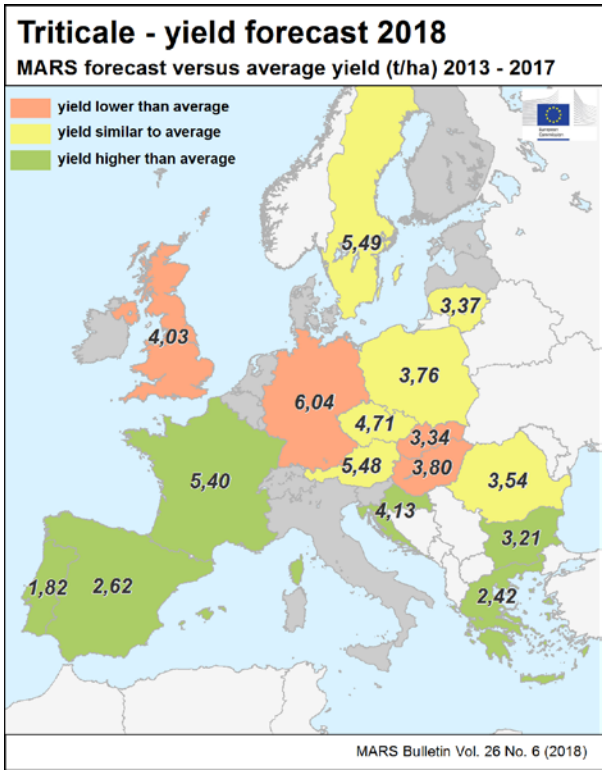
Country	SPRING BARLEY (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	4,25	4,07	**4,40**	+3,3	+8,1
AT	4,65	3,99	**4,77**	+2,5	+20
BE	-	-	**-**	-	-
BG	-	-	**-**	-	-
CY	-	-	**-**	-	-
CZ	5,21	4,96	**5,22**	+0,2	+5,1
DE	5,49	5,40	**5,40**	-1,8	-0,1
DK	5,71	5,82	**5,46**	-4,4	-6,2
EE	3,55	4,10	**3,37**	-5,2	-18
ES	2,99	2,29	**3,63**	+21	+59
FI	3,68	4,08	**3,49**	-5,1	-14
FR	5,97	5,91	**5,97**	-0,1	+1,0
GR	-	-	**-**	-	-
HR	-	-	**-**	-	-
HU	3,75	4,37	**3,89**	+3,6	-11
IE	7,50	7,93	**7,47**	-0,4	-5,8
IT	-	-	**-**	-	-
LT	3,60	3,65	**3,55**	-1,2	-2,5
LU	-	-	**-**	-	-
LV	3,31	3,32	**3,11**	-6,0	-6,3
MT	-	-	**-**	-	-
NL	6,67	6,09	**6,60**	-0,9	+8,4
PL	3,63	3,77	**3,33**	-8,4	-12
PT	-	-	**-**	-	-
RO	2,66	3,31	**2,75**	+3,3	-17
SE	4,97	5,21	**4,90**	-1,4	-6,0
SI	-	-	**-**	-	-
SK	4,49	4,26	**4,23**	-5,7	-0,7
UK	5,76	5,60	**5,78**	+0,4	+3,3



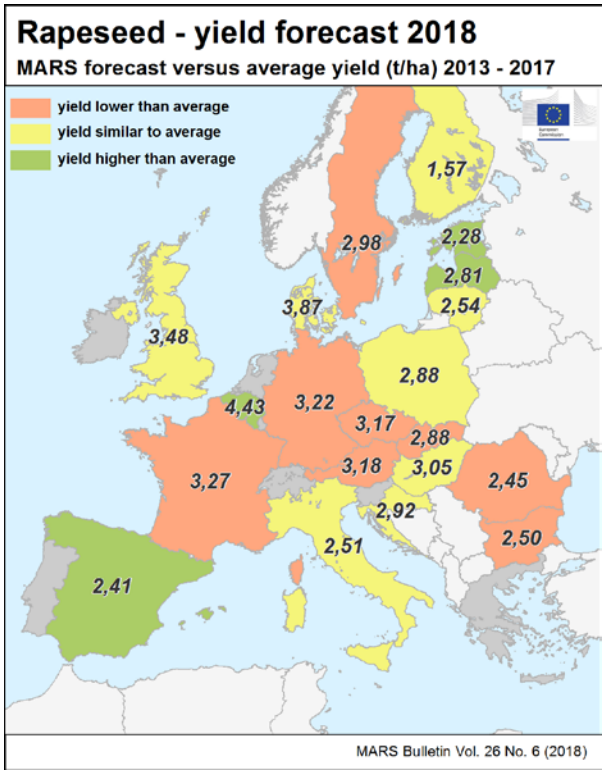
Country	RYE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	3,93	3,76	**3,71**	-5,6	-1,3
AT	4,37	3,46	**4,46**	+2,0	+29
BE	-	-	**-**	-	-
BG	-	-	**-**	-	-
CY	-	-	**-**	-	-
CZ	4,90	4,92	**4,98**	+1,4	+1,2
DE	5,66	5,01	**5,04**	-11	+0,5
DK	6,09	6,49	**6,00**	-1,4	-7,6
EE	3,15	3,93	**3,19**	+1,3	-19
ES	2,00	1,21	**2,33**	+17	+94
FI	3,34	3,93	**3,38**	+1,2	-14
FR	4,64	4,59	**4,77**	+2,8	+3,9
GR	1,79	1,91	**2,06**	+15	+8,1
HR	-	-	**-**	-	-
HU	2,99	3,32	**3,10**	+3,7	-6,6
IE	-	-	**-**	-	-
IT	-	-	**-**	-	-
LT	2,33	2,44	**2,47**	+5,8	+1,0
LU	-	-	**-**	-	-
LV	3,60	4,07	**3,70**	+2,7	-9,0
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	2,98	3,08	**2,89**	-3,0	-6,2
PT	0,87	0,85	**0,89**	+2,1	+4,2
RO	2,55	3,20	**2,68**	+5,0	-16
SE	6,25	6,65	**6,23**	-0,3	-6,4
SI	-	-	**-**	-	-
SK	3,95	4,45	**3,79**	-4,2	-15
UK	2,63	1,42	**3,76**	+43	+165



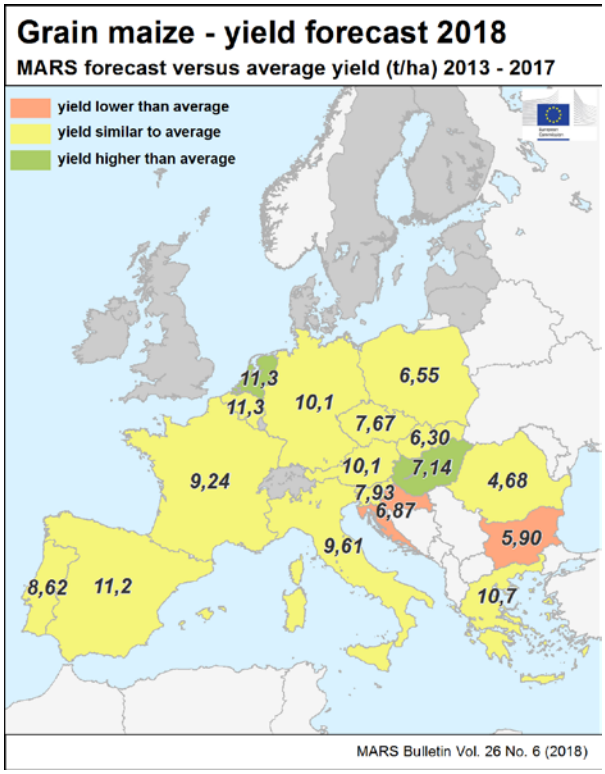
Country	TRITICALE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	4,22	4,25	**4,25**	+0,6	+0,1
AT	5,45	5,16	**5,48**	+0,6	+6,3
BE	-	-	**-**	-	-
BG	3,07	3,17	**3,21**	+4,5	+1,2
CY	-	-	**-**	-	-
CZ	4,82	4,89	**4,71**	-2,3	-3,7
DE	6,44	5,96	**6,04**	-6,2	+1,4
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	2,25	1,81	**2,62**	+16	+44
FI	-	-	**-**	-	-
FR	5,09	5,20	**5,40**	+6,0	+3,8
GR	2,21	2,22	**2,42**	+9,5	+9,1
HR	3,92	4,50	**4,13**	+5,4	-8,2
HU	4,03	3,97	**3,80**	-5,6	-4,1
IE	-	-	**-**	-	-
IT	-	-	**-**	-	-
LT	3,36	3,26	**3,37**	+0,3	+3,4
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	3,74	3,93	**3,76**	+0,7	-4,3
PT	1,63	1,48	**1,82**	+12	+23
RO	3,68	4,39	**3,54**	-3,8	-19
SE	5,60	5,81	**5,49**	-2,0	-5,4
SI	-	-	**-**	-	-
SK	3,72	3,56	**3,34**	-10	-6,0
UK	4,30	4,50	**4,03**	-6,4	-11



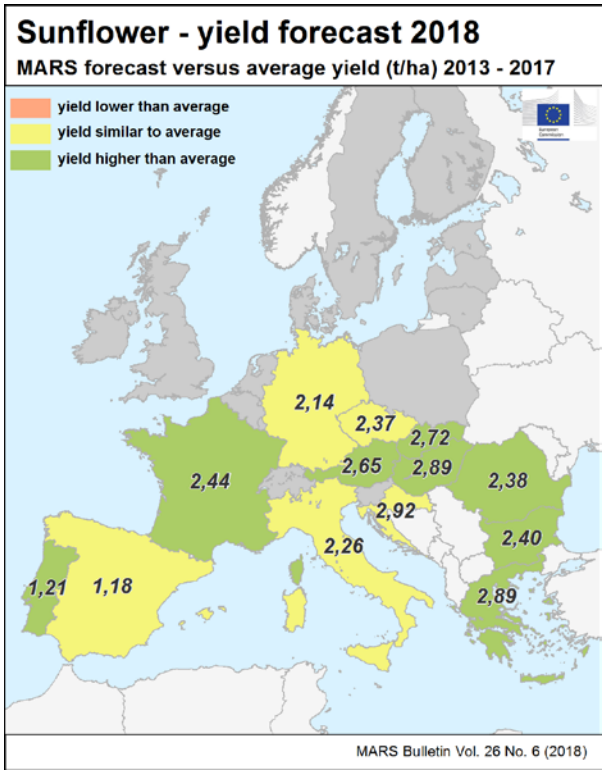
Country	RAPE AND TURNIP RAPE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	3,29	3,29	**3,05**	-7,4	-7,3
AT	3,34	2,89	**3,18**	-5,0	+10
BE	4,22	4,26	**4,43**	+5,0	+3,9
BG	2,75	2,98	**2,50**	-9,3	-16
CY	-	-	**-**	-	-
CZ	3,44	2,91	**3,17**	-7,9	+8,9
DE	3,82	3,27	**3,22**	-16	-1,4
DK	3,96	4,18	**3,87**	-2,2	-7,3
EE	2,11	2,24	**2,28**	+7,9	+1,8
ES	2,16	1,56	**2,41**	+12	+55
FI	1,54	1,65	**1,57**	+1,7	-5,1
FR	3,43	3,84	**3,27**	-4,7	-15
GR	-	-	**-**	-	-
HR	2,88	2,80	**2,92**	+1,3	+4,3
HU	3,17	3,44	**3,05**	-3,8	-11
IE	-	-	**-**	-	-
IT	2,42	2,66	**2,51**	+3,6	-5,5
LT	2,51	3,00	**2,54**	+1,2	-16
LU	-	-	**-**	-	-
LV	2,67	2,91	**2,81**	+5,4	-3,3
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	2,95	3,00	**2,88**	-2,1	-3,9
PT	-	-	**-**	-	-
RO	2,66	2,79	**2,45**	-8,0	-12
SE	3,18	3,30	**2,98**	-6,1	-9,7
SI	-	-	**-**	-	-
SK	3,05	2,99	**2,88**	-5,6	-3,5
UK	3,49	3,85	**3,48**	-0,2	-9,6



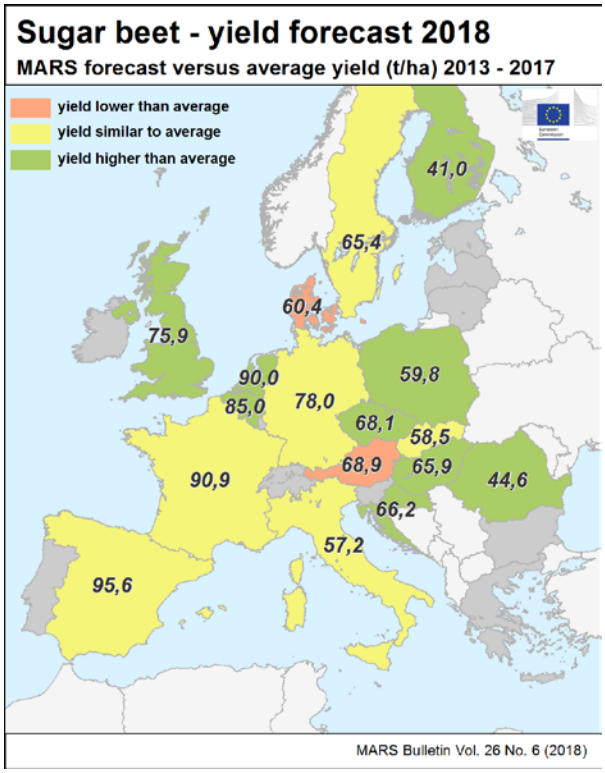
Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	7,30	7,85	**7,35**	+0,7	-6,4
AT	9,76	10,0	**10,1**	+3,0	+1,0
BE	11,0	12,3	**11,3**	+3,1	-7,5
BG	6,24	6,44	**5,90**	-5,6	-8,4
CY	-	-	**-**	-	-
CZ	7,56	6,84	**7,67**	+1,6	+12
DE	9,74	10,5	**10,1**	+3,5	-4,3
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	11,2	11,0	**11,2**	+0,5	+2,4
FI	-	-	**-**	-	-
FR	9,00	10,1	**9,24**	+2,7	-8,7
GR	10,8	9,92	**10,7**	-0,5	+8,1
HR	7,16	6,33	**6,87**	-4,1	+8,6
HU	6,84	6,89	**7,14**	+4,4	+3,5
IE	-	-	**-**	-	-
IT	9,71	9,30	**9,61**	-1,0	+3,3
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	10,5	13,4	**11,3**	+7,0	-16
PL	6,43	7,15	**6,55**	+1,9	-8,4
PT	8,45	9,24	**8,62**	+2,0	-6,7
RO	4,55	5,95	**4,68**	+2,8	-21
SE	-	-	**-**	-	-
SI	8,00	7,11	**7,93**	-0,8	+12
SK	6,37	5,74	**6,30**	-1,2	+10
UK	-	-	**-**	-	-



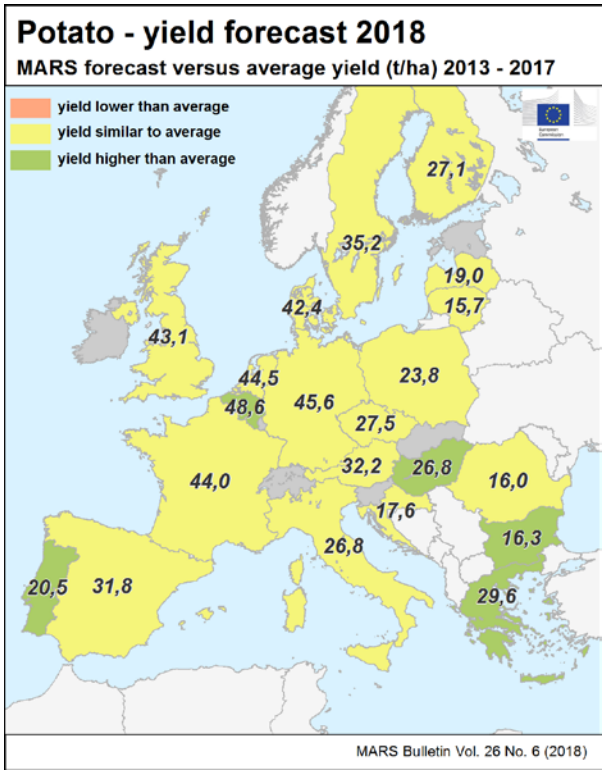
Country	SUNFLOWER (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	2,12	2,45	**2,27**	+7,2	-7,2
AT	2,54	2,33	**2,65**	+4,4	+14
BE	-	-	**-**	-	-
BG	2,26	2,29	**2,40**	+6,2	+4,6
CY	-	-	**-**	-	-
CZ	2,36	2,46	**2,37**	+0,3	-3,8
DE	2,13	2,20	**2,14**	+0,4	-2,7
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	1,13	1,24	**1,18**	+3,6	-5,2
FI	-	-	**-**	-	-
FR	2,27	2,76	**2,44**	+7,5	-12
GR	2,69	2,85	**2,89**	+7,4	+1,4
HR	2,93	3,12	**2,92**	-0,3	-6,4
HU	2,74	2,95	**2,89**	+5,7	-1,9
IE	-	-	**-**	-	-
IT	2,22	2,13	**2,26**	+2,0	+6,2
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	-	-	**-**	-	-
PT	1,12	1,19	**1,21**	+8,3	+1,8
RO	2,17	2,97	**2,38**	+10	-20
SE	-	-	**-**	-	-
SI	-	-	**-**	-	-
SK	2,54	2,51	**2,72**	+7,3	+8,7
UK	-	-	**-**	-	-



Country	SUGAR BEETS (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	74,8	81,4	**77,5**	+3,6	-4,8
AT	73,3	70,1	**68,9**	-6,1	-1,8
BE	81,4	93,7	**85,0**	+4,4	-9,3
BG	-	-	**-**	-	-
CY	-	-	**-**	-	-
CZ	64,9	66,6	**68,1**	+4,9	+2,2
DE	75,5	83,8	**78,0**	+3,3	-6,9
DK	65,6	71,4	**60,4**	-7,9	-15
EE	-	-	**-**	-	-
ES	93,0	95,0	**95,6**	+2,8	+0,7
FI	38,7	36,6	**41,0**	+6,0	+12
FR	89,6	95,1	**90,9**	+1,4	-4,4
GR	-	-	**-**	-	-
HR	61,1	NA	**66,2**	+8,3	NA
HU	61,4	NA	**65,9**	+7,3	NA
IE	-	-	**-**	-	-
IT	57,3	NA	**57,2**	-0,2	NA
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	84,0	93,3	**90,0**	+7,1	-3,6
PL	56,8	57,6	**59,8**	+5,3	+3,9
PT	-	-	**-**	-	-
RO	40,5	40,8	**44,6**	+10	+9,2
SE	65,8	63,2	**65,3**	-0,7	+3,4
SI	-	-	**-**	-	-
SK	58,5	55,0	**58,4**	+0,0	+6,3
UK	71,3	NA	**75,9**	+6,4	NA



Country	POTATO (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	33,6	35,3	**34,5**	+2,6	-2,4
AT	30,9	28,4	**32,2**	+4,0	+13
BE	46,3	47,6	**48,6**	+4,9	+2,2
BG	15,5	17,8	**16,3**	+5,6	-8,2
CY	-	-	**-**	-	-
CZ	26,8	29,4	**27,5**	+2,6	-6,6
DE	44,5	46,8	**45,6**	+2,5	-2,5
DK	42,3	43,7	**42,4**	+0,2	-3,0
EE	-	-	**-**	-	-
ES	31,5	31,9	**31,8**	+1,2	-0,3
FI	27,1	28,9	**27,1**	+0,0	-6,0
FR	43,4	44,4	**43,9**	+1,3	-1,0
GR	26,8	28,3	**29,6**	+11	+4,6
HR	17,0	NA	**17,5**	+3,1	NA
HU	24,7	NA	**26,8**	+8,3	NA
IE	-	-	**-**	-	-
IT	26,9	NA	**26,8**	-0,3	NA
LT	15,8	12,3	**15,7**	-0,8	+28
LU	-	-	**-**	-	-
LV	18,8	NA	**19,0**	+1,1	NA
MT	-	-	**-**	-	-
NL	43,6	46,0	**44,5**	+2,1	-3,2
PL	23,9	25,3	**23,8**	-0,4	-5,8
PT	19,7	21,3	**20,5**	+4,1	-3,8
RO	15,9	18,2	**16,0**	+0,5	-12
SE	34,7	34,7	**35,2**	+1,6	+1,6
SI	-	-	**-**	-	-
SK	-	-	**-**	-	-
UK	44,0	NA	**43,1**	-2,0	NA



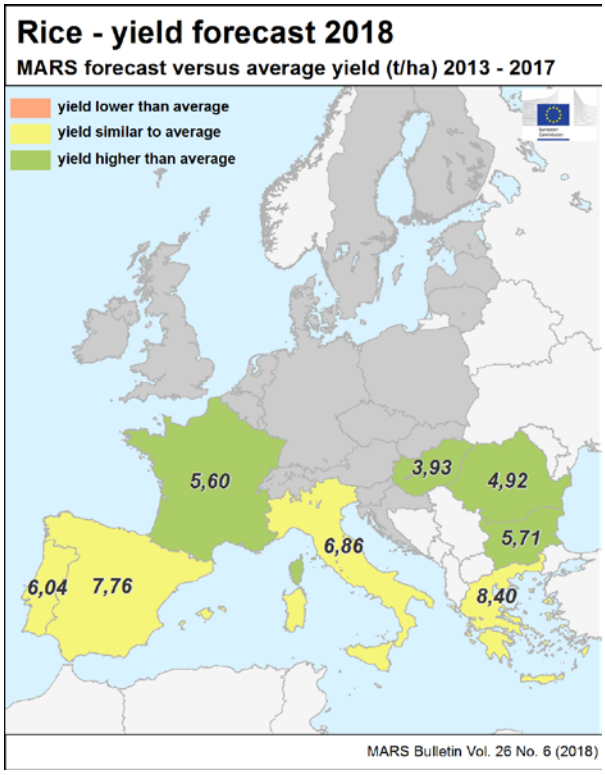
Note: Yields are forecast for crops with more than 10000 ha per country (for rice more than 1000 ha per country).

Sources: 2013-2018 data come from DG AGRICULTURE short term Outlook data (dated May 2018, received on 05/06/2018), EUROSTAT Eurobase (last update: 31/05/2018) and EES (last update: 15/11/2017)

2018 yields come from MARS CROP YIELD FORECASTING SYSTEM (output up to 10/06/2018)

NA = Data not available.

Country	RICE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	6,87	6,85	**7,02**	+2,3	+2,5
AT	-	-	-	-	-
BE	-	-	-	-	-
BG	5,39	5,71	**5,71**	+6,0	+0,0
CY	-	-	-	-	-
CZ	-	-	-	-	-
DE	-	-	-	-	-
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	7,64	7,46	**7,76**	+1,6	+4,0
FI	-	-	-	-	-
FR	5,23	5,87	**5,60**	+7,0	-4,7
GR	8,29	9,00	**8,40**	+1,3	-6,7
HR	-	-	-	-	-
HU	3,42	3,45	**3,93**	+15	+14
IE	-	-	-	-	-
IT	6,76	6,58	**6,86**	+1,4	+4,2
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	5,95	5,81	**6,04**	+1,4	+3,9
RO	4,38	4,89	**4,92**	+13	+0,7
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	-	-	-	-	-
UK	-	-	-	-	-



Note: Yields are forecast for crops with more than 10000 ha per country (for rice more than 1000 ha per country).

Sources: 2013-2018 data come from DG AGRICULTURE short term Outlook data (dated May 2018, received on 05/06/2018), EUROSTAT Eurobase (last update: 31/05/2018) and EES (last update: 15/11/2017)

2018 yields come from MARS CROP YIELD FORECASTING SYSTEM (output up to 10/06/2018)

NA = Data not available.

Country	WHEAT (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
BY	3,59	3,65	**3,75**	+4,6	+2,8
DZ	1,62	1,57	**1,83**	+13	+16
MA	1,86	1,91	**2,14**	+15	+12
TN	1,91	1,90	**1,84**	-3,9	-3,2
TR	2,71	2,78	**2,92**	+7,7	+5,1
UA	3,93	4,11	**3,94**	+0,1	-4,2

Country	BARLEY (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
BY	3,25	3,14	**3,62**	+11	+15
DZ	1,35	1,27	**1,42**	+5,2	+12
MA	1,25	1,50	**1,68**	+34	+12
TN	1,12	1,21	**1,09**	-3,5	-10
TR	2,58	2,40	**2,76**	+7,1	+15
UA	2,98	3,31	**2,91**	-2,4	-12

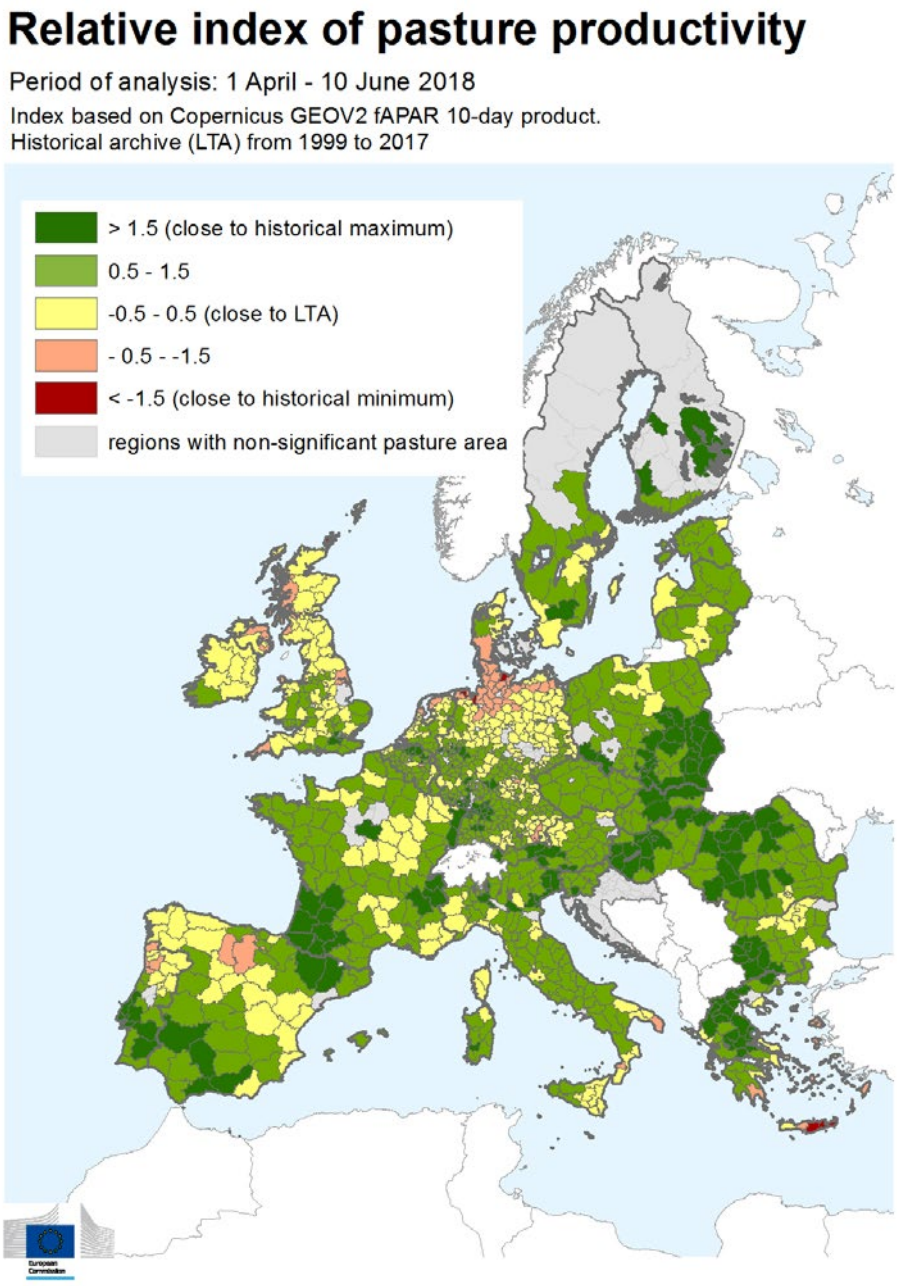
Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
BY	5,39	5,00	**5,52**	+2,5	+10
DZ	-	-	**-**	-	-
MA	-	-	**-**	-	-
TN	-	-	**-**	-	-
TR	9,21	9,40	**9,52**	+3,4	+1,3
UA	6,07	5,44	**6,13**	+1,0	+13

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

Sources: 2013-2017 data come from USDA, DSASI-MADR Algeria , INRA Maroc, Ministère de l'Agriculture et de la Pêche Maritime Maroc, CNCT Tunisie, Ministère de l'agriculture des ressources hydrauliques et de la pêche Tunisie, Turkish Statistical Institute (TurkStat), EUROSTAT Eurobase (last update: 31/05/2018),State Statistics Service of Ukraine, FAO and PSD-online
2018 yields come from MARS CROP YIELD FORECASTING SYSTEM (output up to 10/06/2018)

5. Pastures in Europe — regional monitoring

Above-average biomass production in central and southern Europe



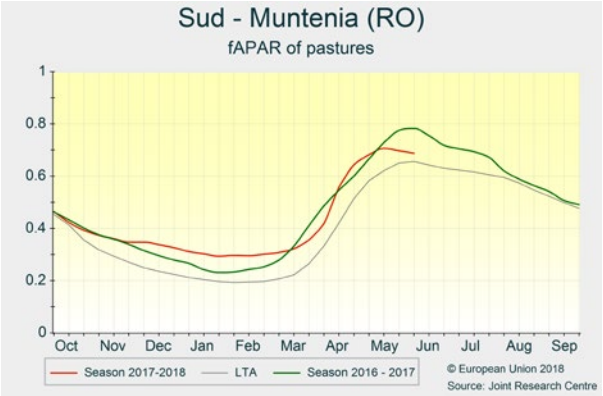
Methodological note

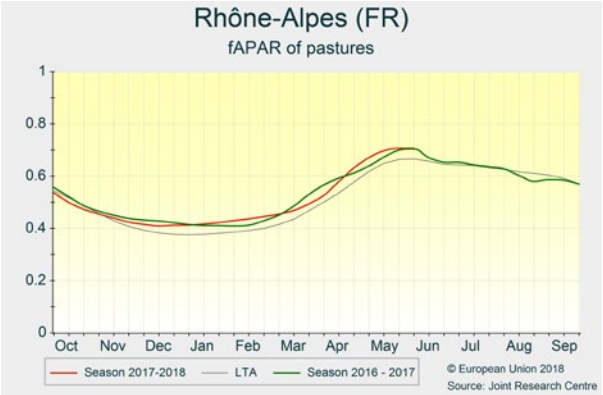
The relative index of pasture productivity is a synthetic indicator of biomass formation based on the integration of the fAPAR (fraction of absorbed photosynthetically active radiation) remote sensing product of pasture areas at country level over a period of interest (in this bulletin, from 1 April to 10 June). 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 1999 to 2017, 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 period 1999-2017.

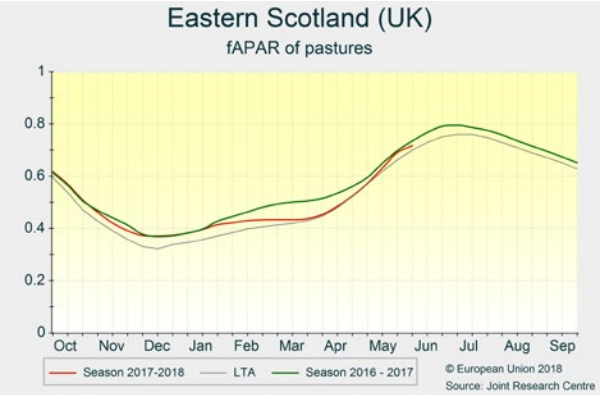
High production rates are observed in the main pasture areas of **Romania**, **Hungary** and **Bulgaria** thanks to the warmer-than-usual temperatures registered in May. Precipitation registered during that period was above the average, with the exception of the easternmost parts of Romania and Bulgaria, where grassland growth may be considerably constrained by water stress in June if dry conditions persist. In **Spain** and **Portugal**, the season is positive: biomass formation rates in the *Dehesa* area are exceptionally high thanks to a humid spring, while grassland growth is slightly above the average along the Cantabrian coastline. Weather conditions are also favouring pasture productivity in **Italy**, **France** and **Benelux**, as May was more humid than usual in most of these regions, and daily temperatures were, on average, 2 °C above seasonal values.

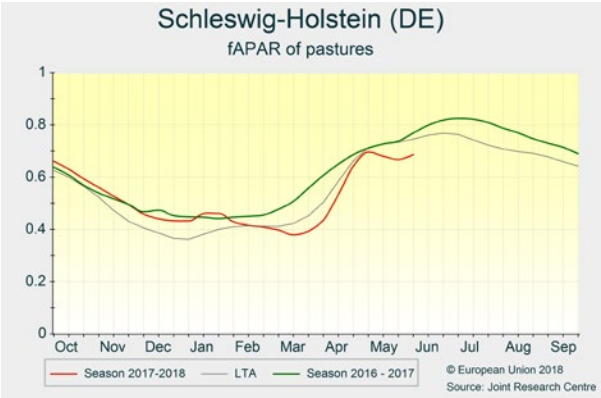
Grassland growth is also above average in the southern **UK** and southern **Ireland**, favoured by above-average temperatures and precipitation during spring. In northern *Scotland*, by contrast, dry conditions since mid-May led to slightly lower levels of biomass formation than the seasonal average. In northern **Germany** (*Schleswig-Holstein*, *Weser-Ems*) and **Denmark**, weather conditions are very dry, with no significant rainfall since the end of April. Grassland productivity in these areas has not fully recovered from the unusually cold start of the season, and the current dry conditions are keeping biomass formation rates below average. In **Austria**, the **Czech Republic**, **Slovakia** and southern **Germany**, the above-average temperatures that prevailed during spring have favoured a rapid vegetative growth of pastures, which is currently above seasonal values. Precipitation since May has been close to the average and the outlook until the end of June is positive.

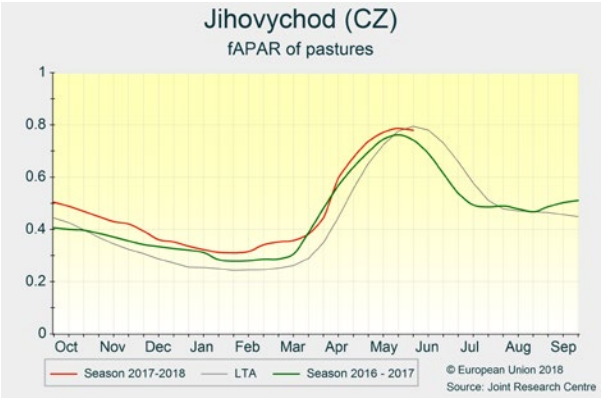
In the Baltic Sea region, pasture productivity is above the average. The exceptionally high temperatures observed since April have led to a sharp increase of biomass formation rates in the main grassland areas of **Sweden**, **Finland**, **Estonia**, **Latvia**, **Lithuania** and **Poland**. However, precipitation since May has been scarce and grassland growth decelerated in the first dekad of June, which indicates emerging water stress. Substantial rainfall during the second half of June is needed to prevent significant damage.

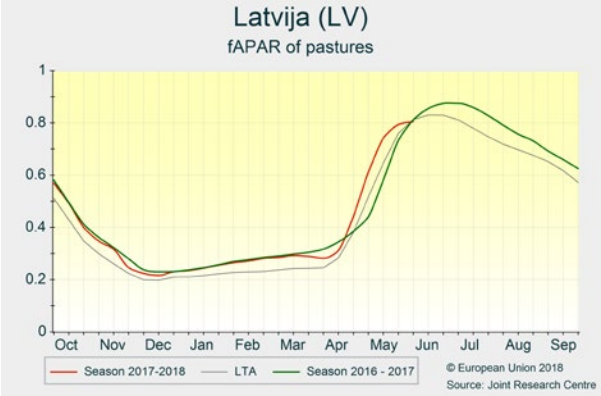


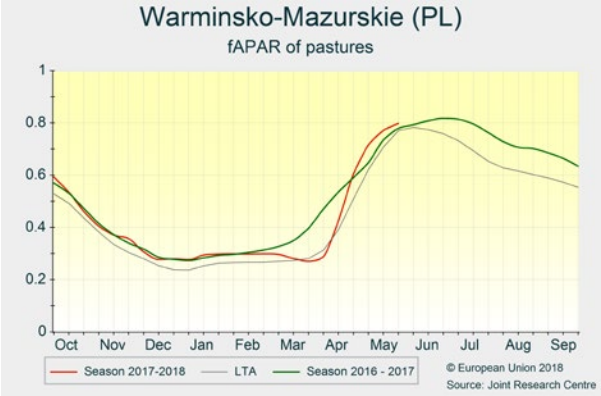





Schleswig-Holstein (DE)
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre

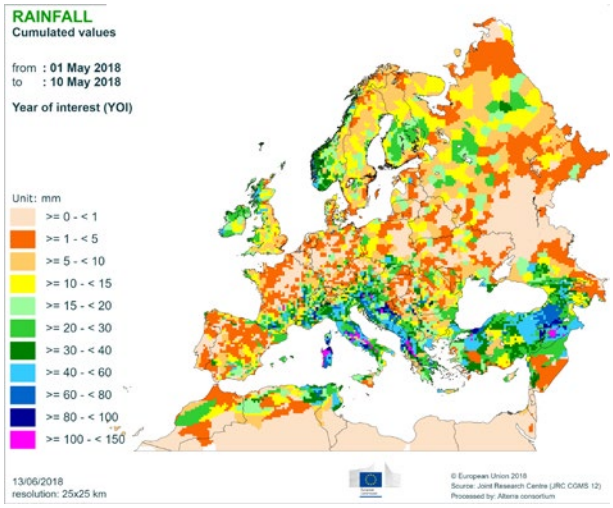

Jihovychod (CZ)
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre

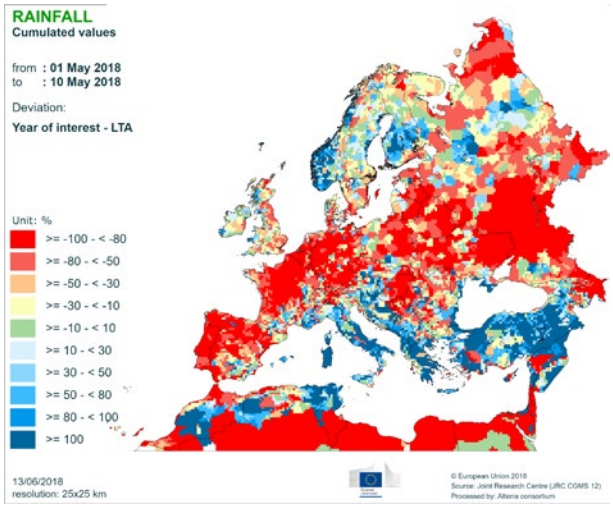

Latvija (LV)
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre

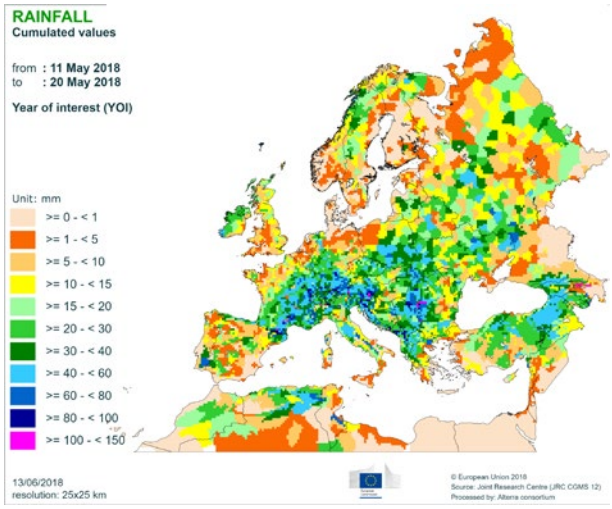

Warminsko-Mazurskie (PL)
fAPAR of pastures
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2017-2018
LTA
Season 2016 - 2017
© European Union 2018
Source: Joint Research Centre

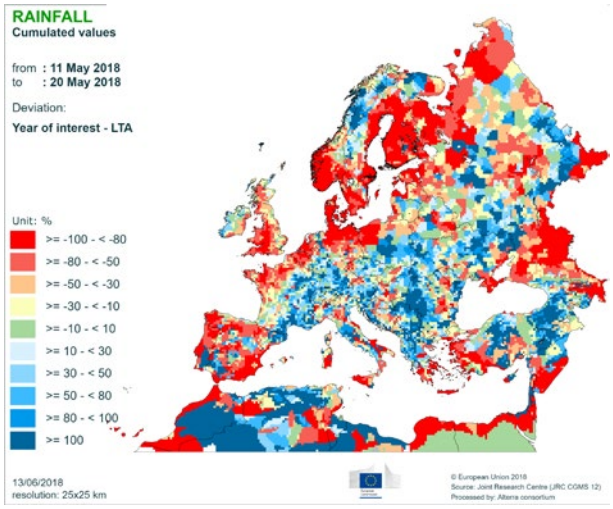
6. Atlas

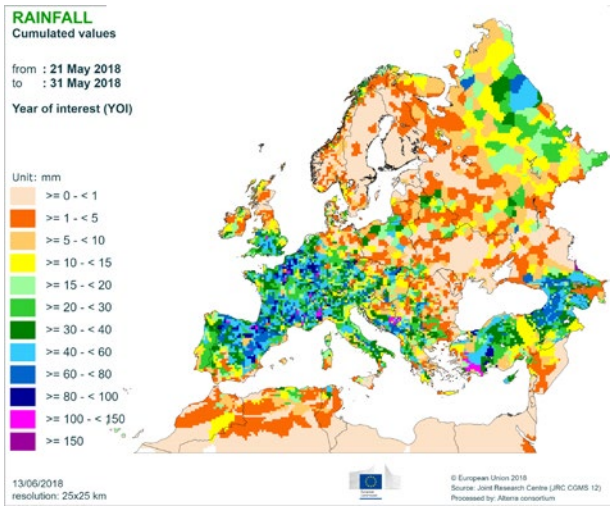
Precipitation

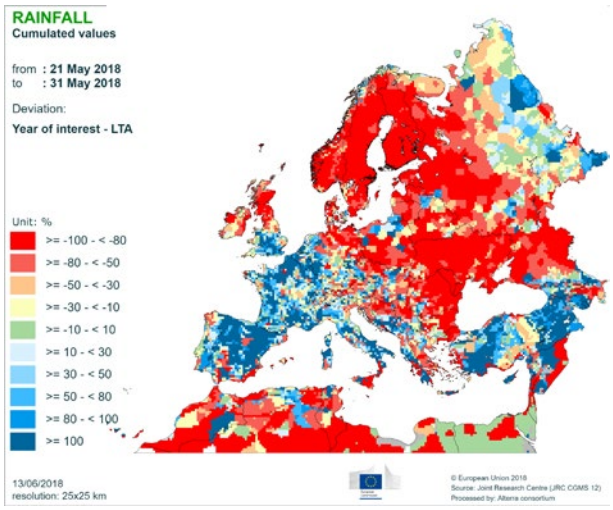


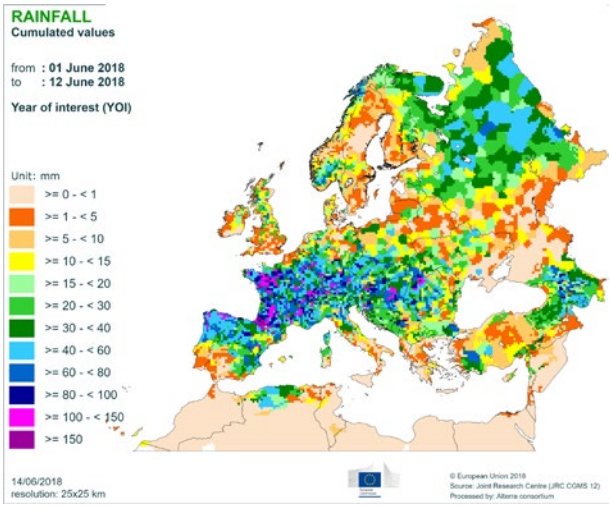


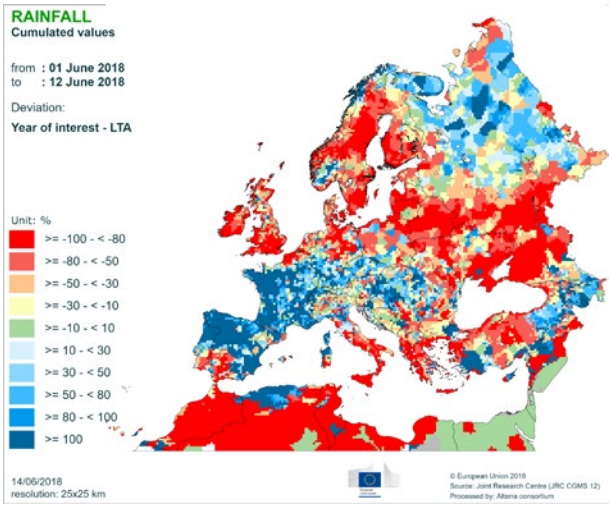




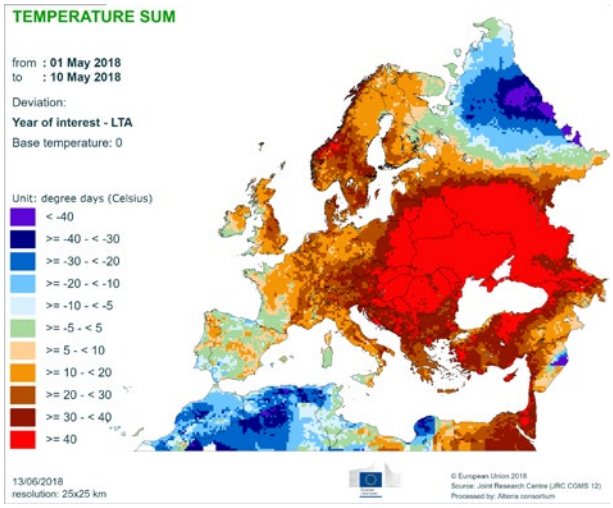


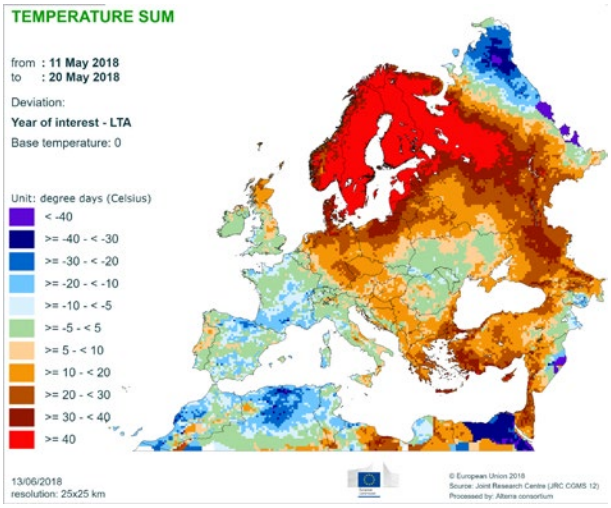


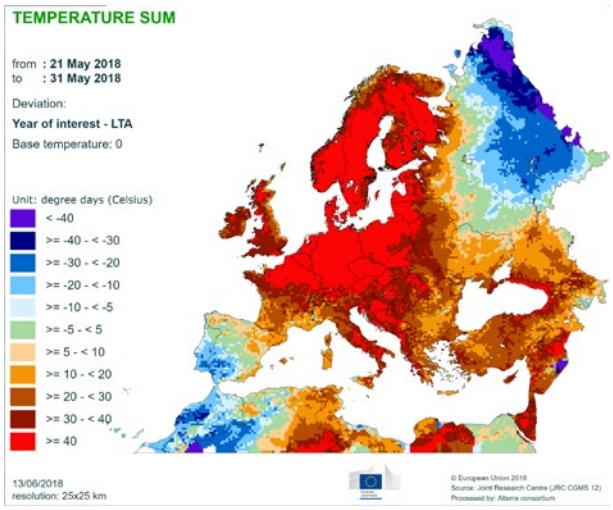

RAINFALL
Cumulated values
from : 01 June 2018
to : 12 June 2018
Year of interest (YOI)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
14/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

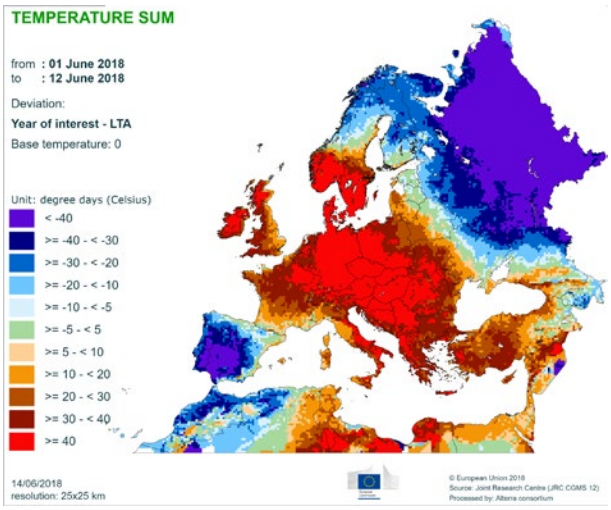

RAINFALL
Cumulated values
from : 01 June 2018
to : 12 June 2018
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
14/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

Temperature regime

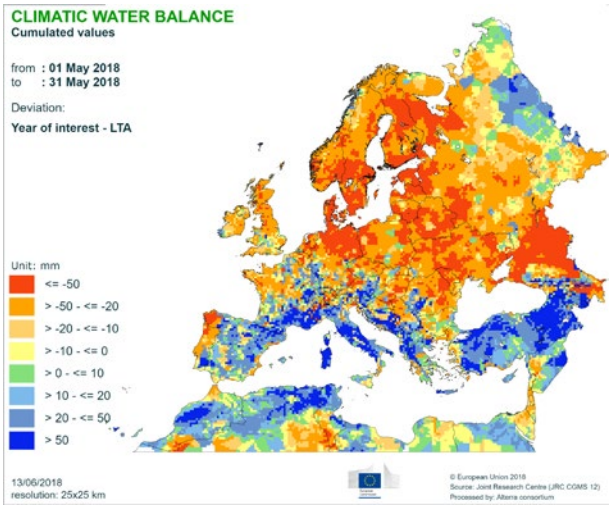


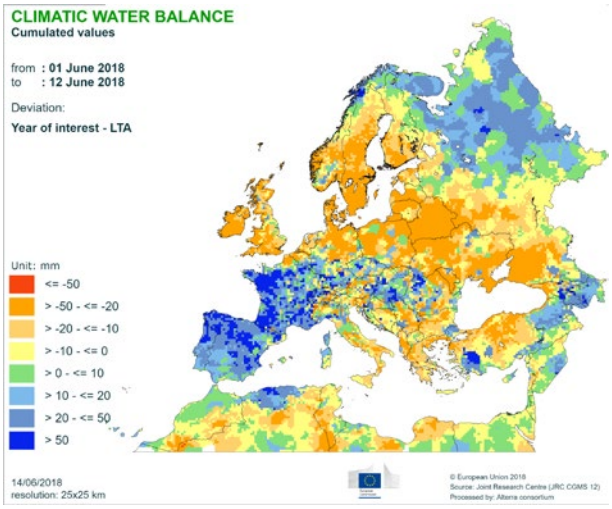




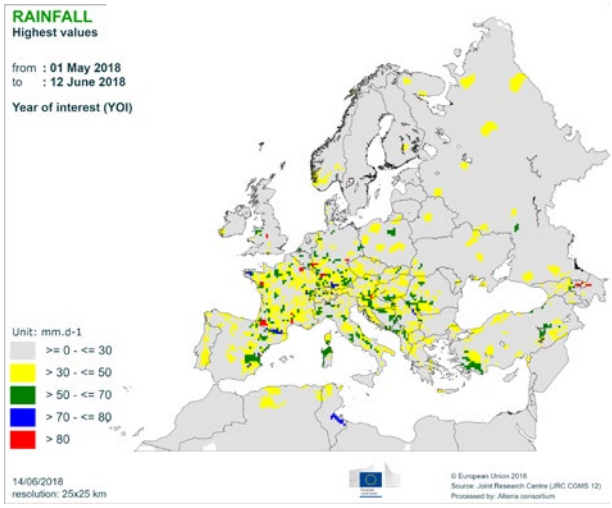


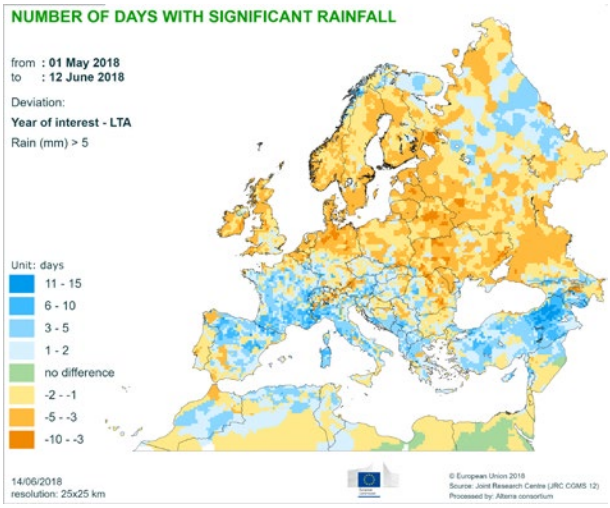
Climatic water balance

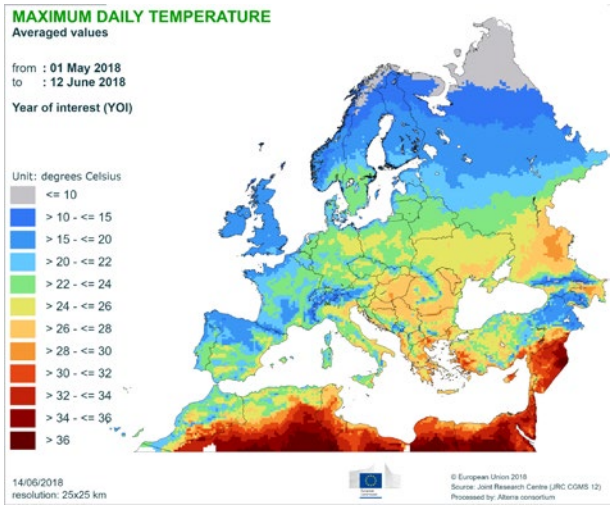


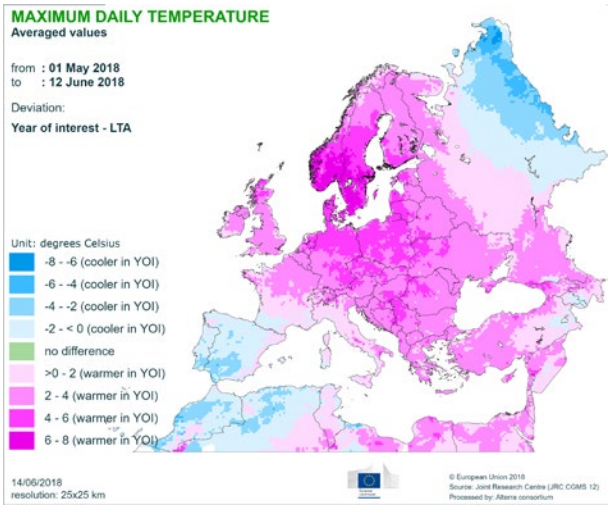


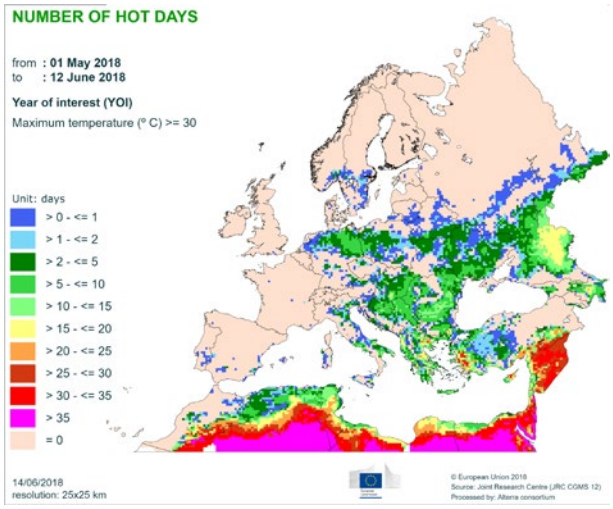
Weather events

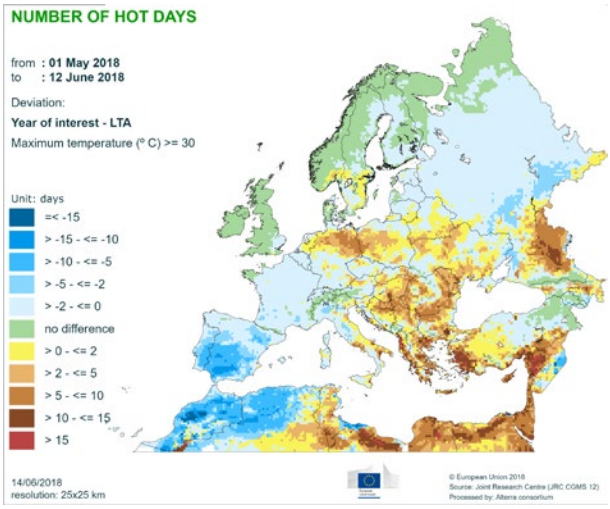




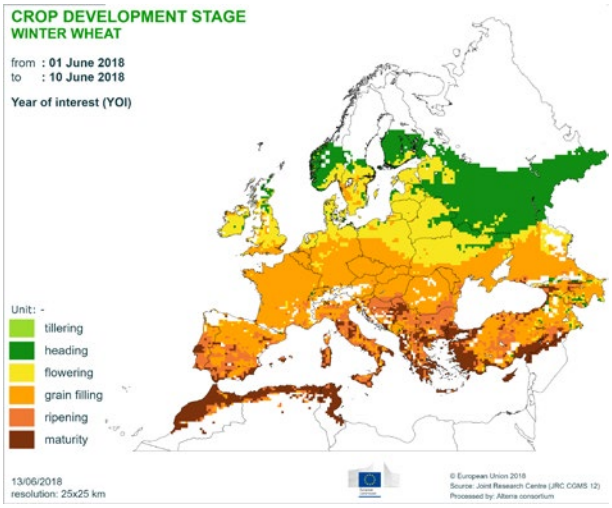


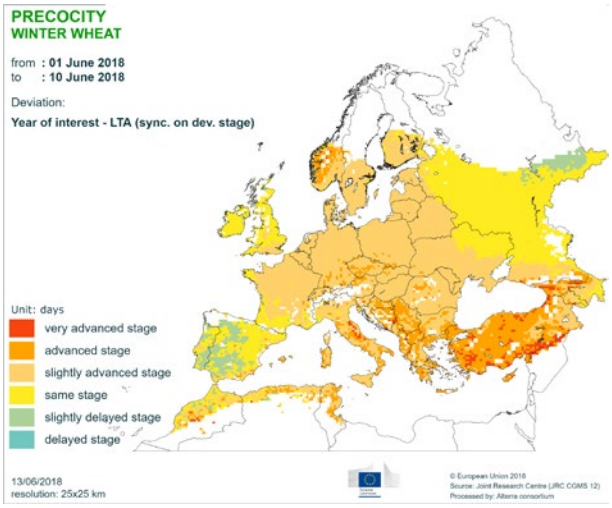


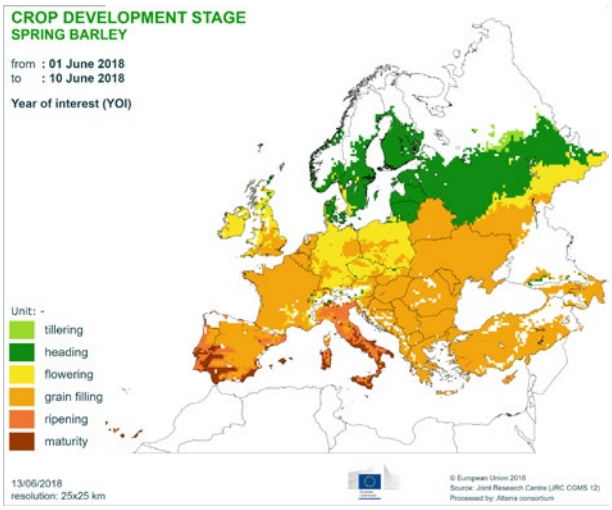


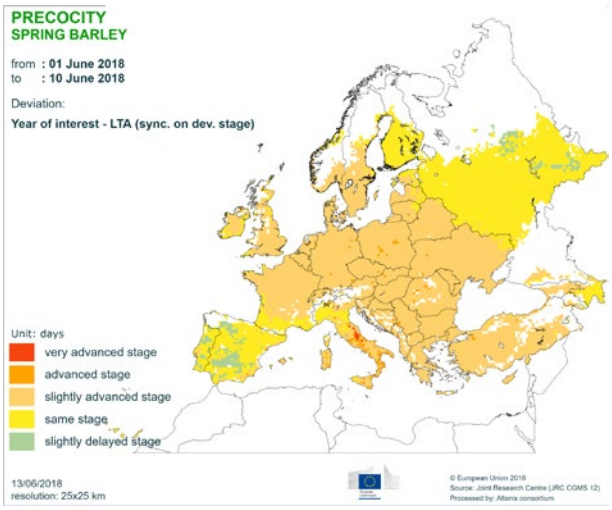


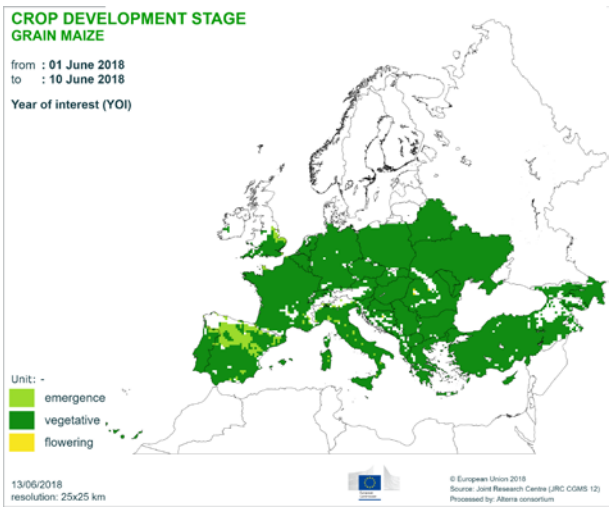
Crop development stages and precocity

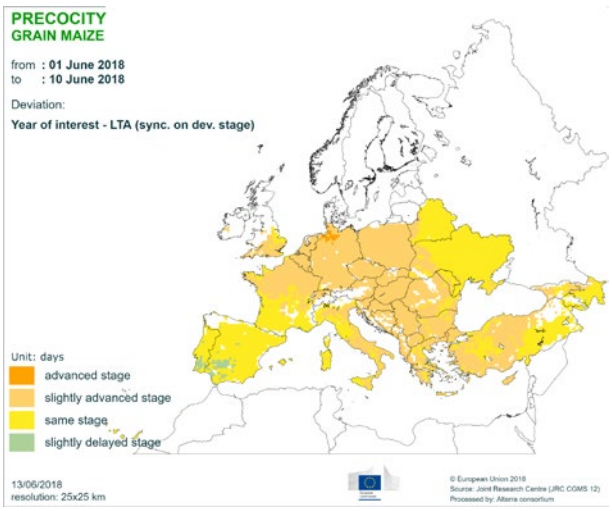


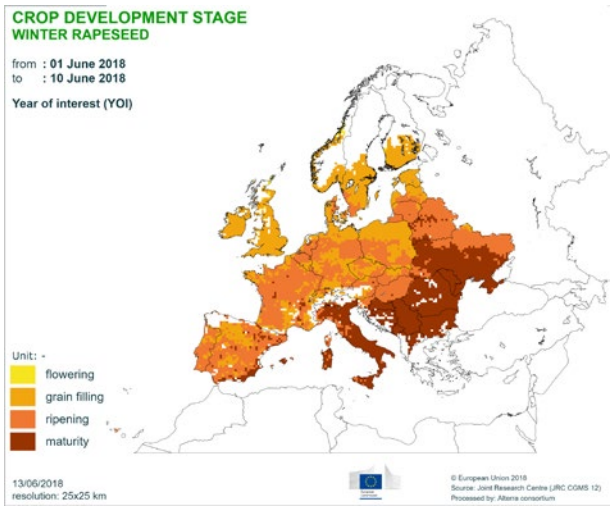


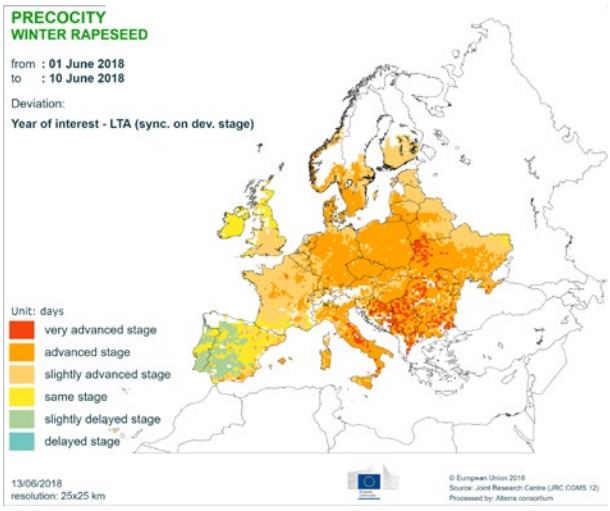


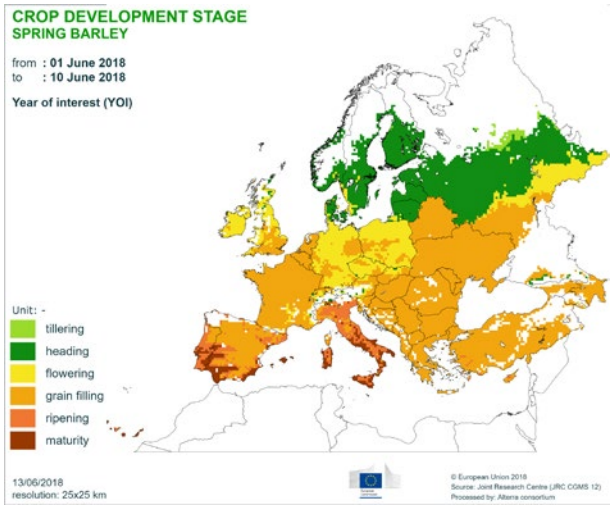


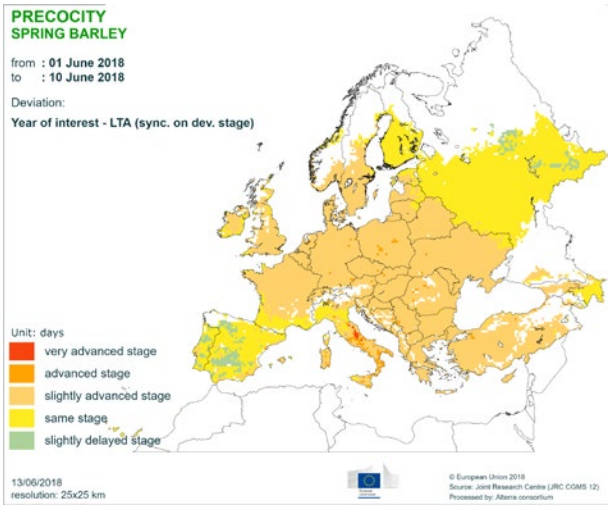




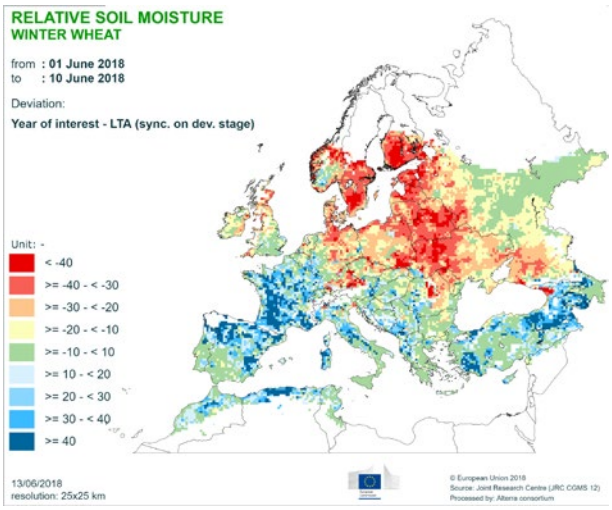

CROP DEVELOPMENT STAGE
WINTER RAPESEED
from : 01 June 2018
to : 10 June 2018
Year of interest (YOI)
Unit: -
flowering
grain filling
ripening
maturity
13/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

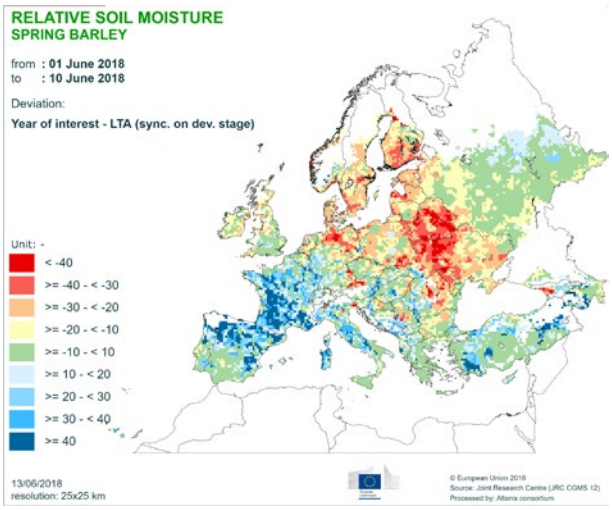

PRECOCITY
WINTER RAPESEED
from : 01 June 2018
to : 10 June 2018
Deviation:
Year of interest - LTA (sync. on dev. stage)
Unit: days
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
delayed stage
13/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

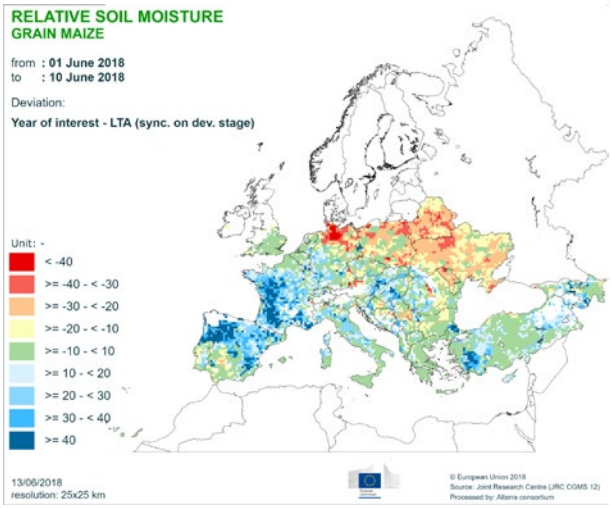

CROP DEVELOPMENT STAGE
SPRING BARLEY
from : 01 June 2018
to : 10 June 2018
Year of interest (YOI)
Unit: -
tillering
heading
flowering
grain filling
ripening
maturity
13/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

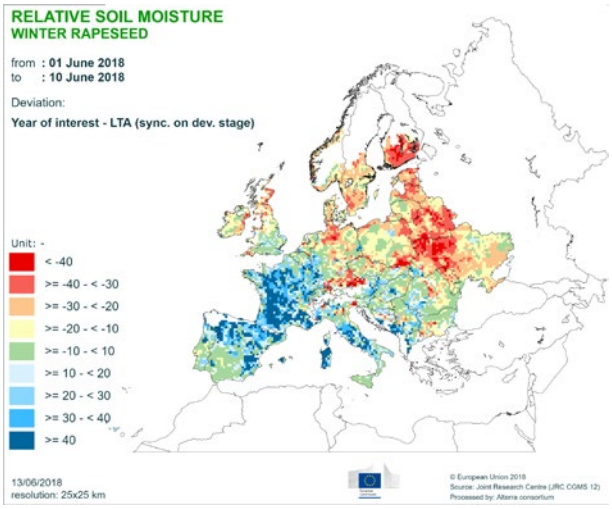

PRECOCITY
SPRING BARLEY
from : 01 June 2018
to : 10 June 2018
Deviation:
Year of interest - LTA (sync. on dev. stage)
Unit: days
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
13/06/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

Relative soil moisture

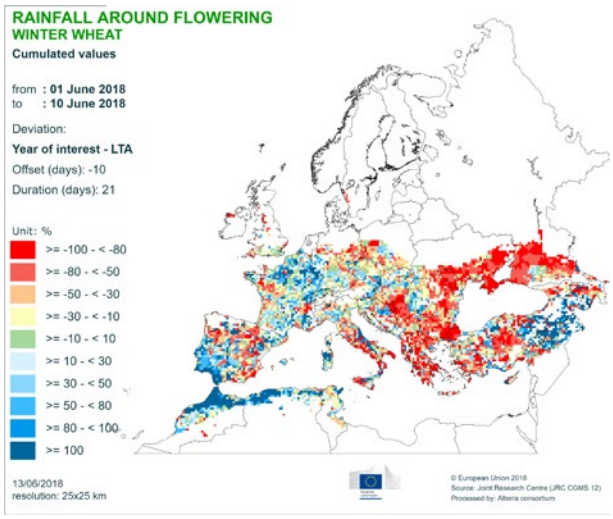


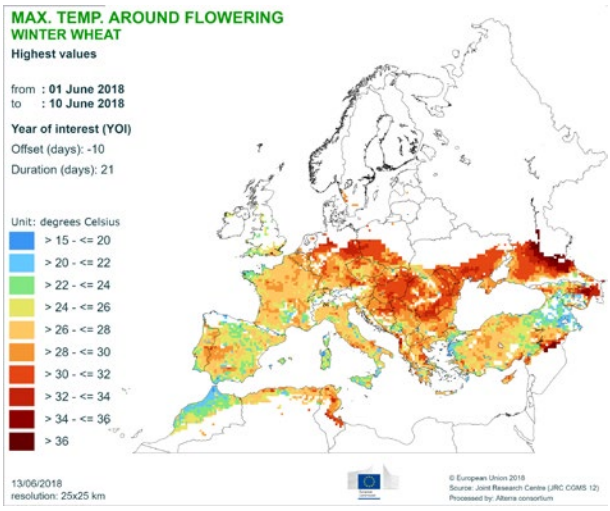


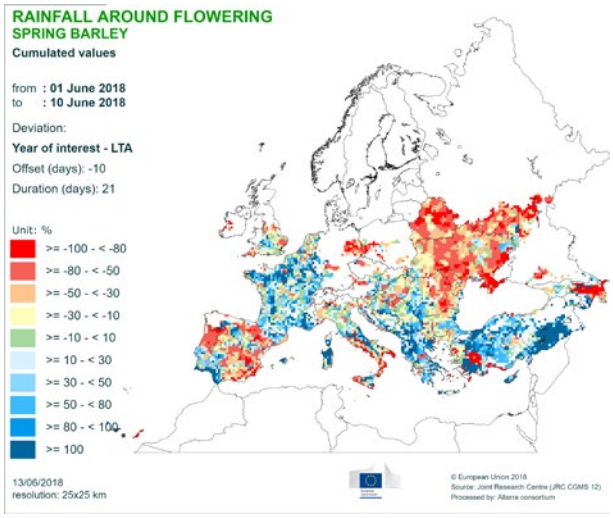


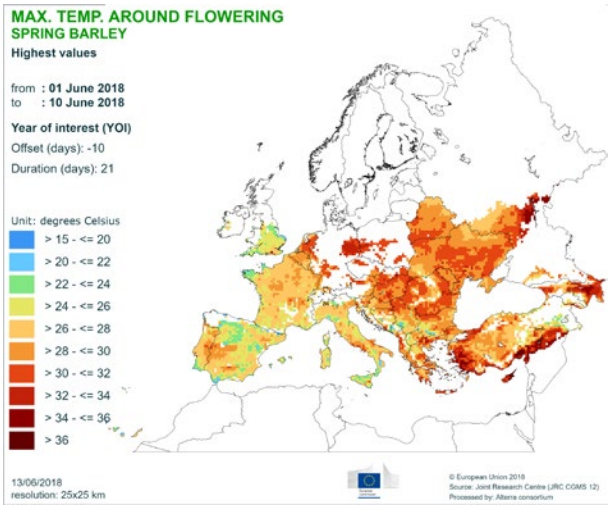


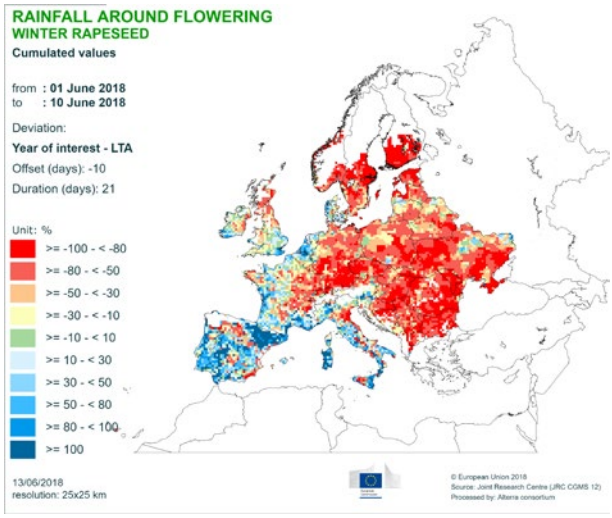
Precipitation and temperatures around flowering

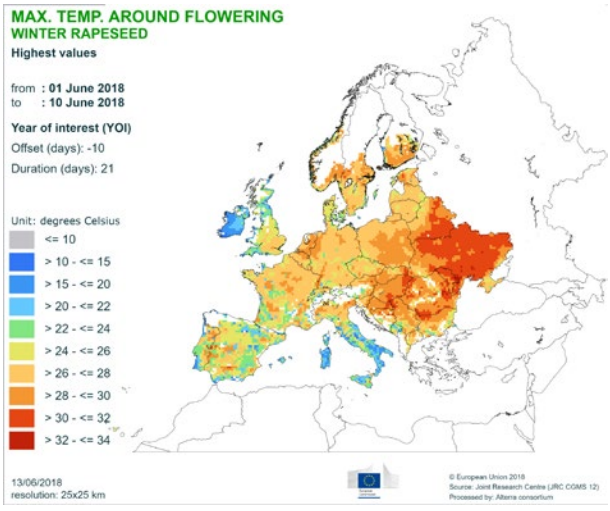




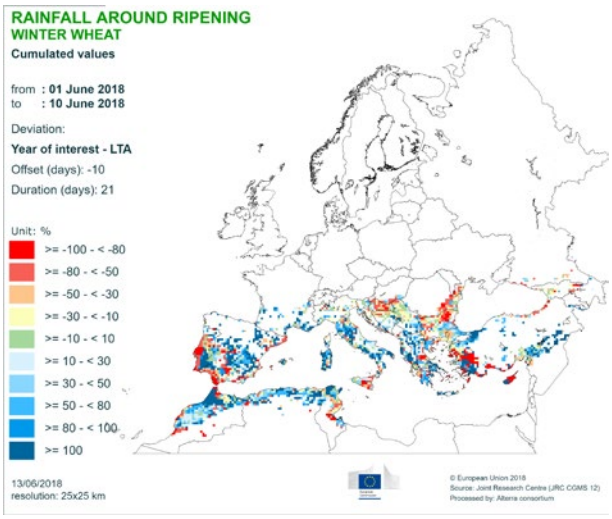


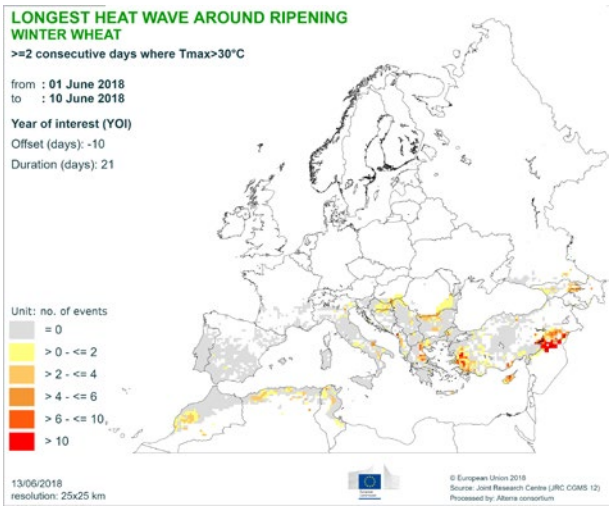


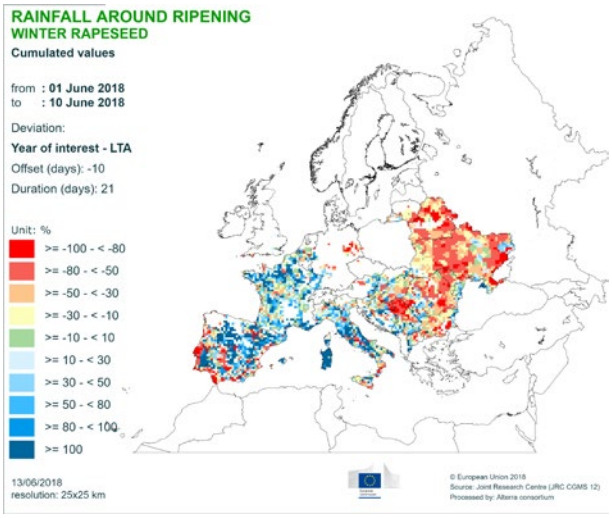


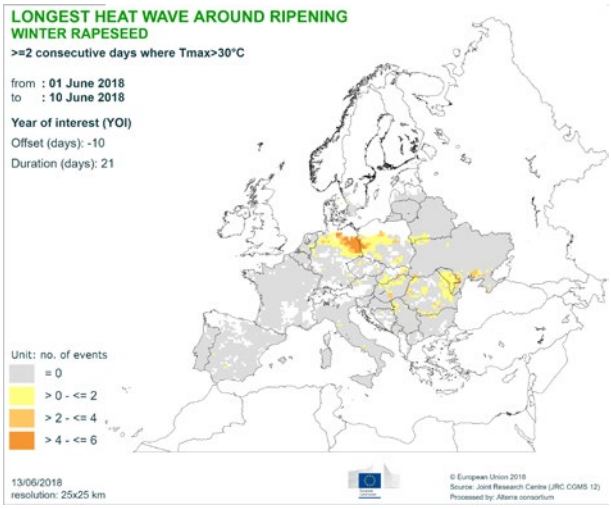


Precipitation and longest heat wave around ripening

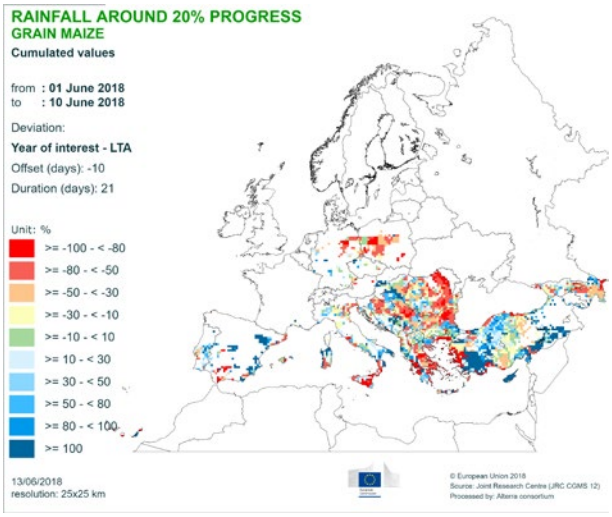


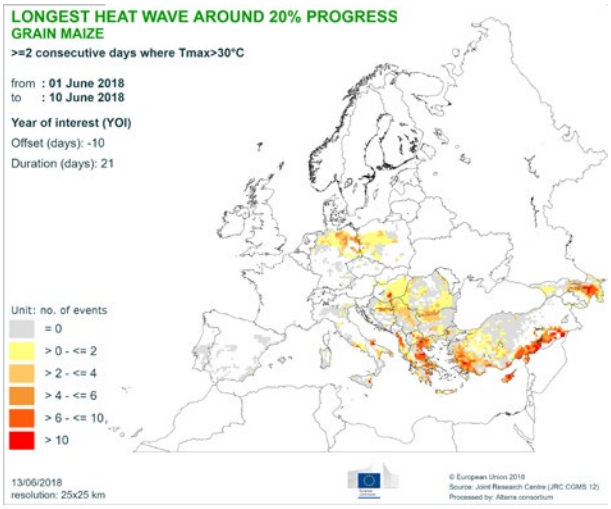






Maize: precipitation and temperatures around crop development





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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

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*MARS stands for Monitoring Agricultural Resources

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The long-term average (LTA) used within this bulletin as a reference is based on an archive of data covering 1975–2017.

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