

JRC MARS Bulletin

Crop monitoring in Europe

April 2018

Cold and wet conditions delay spring sowing

Winter crops generally faring well

In many parts of Europe, unfavourable weather conditions caused delays to the sowing of spring and summer crops. In most cases, there is still time to complete sowing within a suitable window without significant impact on yields.

After the severe cold spell that occurred at the end of February and the beginning of March, central and eastern Europe were under the influence of another cold spell in the second half of March, with minimum temperatures below $-8\text{ }^{\circ}\text{C}$. Such conditions caused delays to the start of spring sowing and hampered the growth and development of winter crops, but did not cause substantial damage to the crops.

Overly wet conditions were recorded in western and central Italy, France, the United Kingdom, throughout the Balkan

region and in northern and north-eastern Greece. The excess of rain caused delays to spring and summer crop sowing in large parts of France, Italy, the United Kingdom, Hungary, Romania, Bulgaria and the Balkans.

In other parts of Europe, delays were caused by a combination of prolonged periods with low temperatures, accompanied by (or alternating with) high precipitation.



Crop	Yield (t/ha)				
	Avg Syrs	March Bulletin	MARS 2017 forecasts	% Diff 17/Syrs	% Diff March
TOTAL CEREALS*	5,55	5,64	5,66	+1,9	+0,4
Total Wheat	5,73	5,94	5,97	+4,2	+0,5
<i>soft wheat</i>	5,97	6,20	6,23	+4,4	+0,5
<i>durum wheat</i>	3,40	3,52	3,52	+3,7	+0,0
Total Barley	4,91	5,02	5,03	+2,5	+0,2
<i>spring barley</i>	4,25	4,27	4,27	+0,5	+0,0
<i>winter barley</i>	5,79	6,05	6,08	+5,0	+0,5
Rye	3,93	3,83	3,89	-1,2	+1,6
Triticale	4,23	4,28	4,32	+2,2	+0,9
Rape and turnip rape	3,28	3,28	3,33	+1,5	+1,5

Issued: 13 April 2018

* Grain maize is included in the calculation.

1

Agrometeorological overview

2

Remote sensing — observed canopy conditions

3

Country analysis

4

Crop yield forecasts

5

Pastures in Europe — regional monitoring

6

Atlas

1. Agrometeorological overview

1.1 Areas of concern

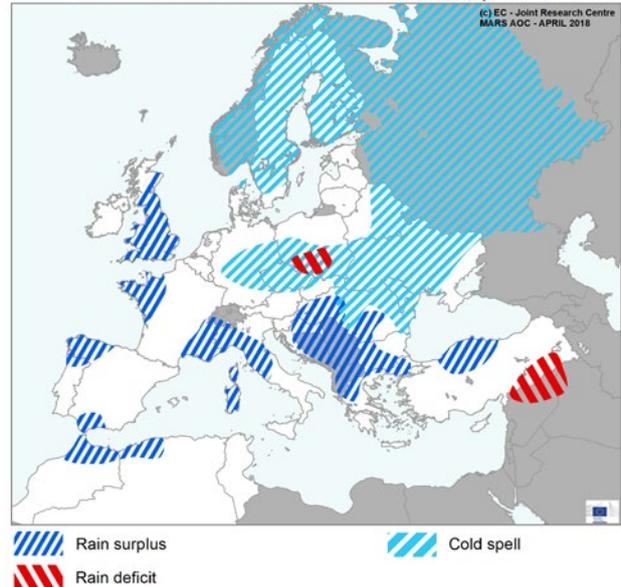
The abundant precipitation (in large parts of Spain, Italy, France and the United Kingdom) and the cold spell (the entire central and eastern regions of Europe) that occurred at the end of February and the beginning of March have already been reported in the March Bulletin and therefore are not considered here.

In the northern and southern regions of the Iberian peninsula and in northern Morocco, abundant precipitation continued during March. This surplus was generally still beneficial and enabled the soil moisture and water levels in irrigation reservoirs to recover from the 2017 drought. Overly wet conditions were recorded in western and central Italy, in south-eastern France, throughout the Balkan region and in northern and north-eastern Greece. The excess of rain caused delays to spring and summer crop sowing in many regions of France, Italy, the United Kingdom, Hungary, Romania, Bulgaria and the Balkans.

Dry conditions are limited to a small region in southern Poland and in south-eastern Turkey.

During the second half of March, central and eastern Europe was under the influence of a cold spell, with minimum temperatures below $-8\text{ }^{\circ}\text{C}$ (in eastern Germany, Poland, the Czech Republic, Slovakia, north-eastern Romania, Ukraine and Russia). Such conditions caused delays to the start of spring sowing and hampered the growth and development of winter crops, but did not cause substantial damage to the crops.

AREAS OF CONCERN - EXTREME WEATHER EVENTS



1.2 Meteorological review (1 March to 10 April)

Colder-than-usual thermal conditions (considering the review period as a whole) were typical in northern, eastern and central Europe, where temperature anomalies of $-1\text{ }^{\circ}\text{C}$ to $-4\text{ }^{\circ}\text{C}$ (locally $-7\text{ }^{\circ}\text{C}$) were experienced. The first and last dekads of March were particularly cold. In most of central Europe; 15-25 cold days ($T_{\min} < 0\text{ }^{\circ}\text{C}$) were reported, whereas further east and north the number of cold days exceeded 25 days. In the north-western side of the British Isles and in the western regions of the Iberian peninsula, the temperatures also remained below average, by $1-2\text{ }^{\circ}\text{C}$.

A severe cold spell occurred during late February to early March, representing the coldest period of this winter in most of Europe. During this period, minimum air temperatures of between $-10\text{ }^{\circ}\text{C}$ and $-15\text{ }^{\circ}\text{C}$ were recorded in eastern France and Germany, but in central and south-eastern Europe the minimum temperatures on the coldest days fell to below $-15\text{ }^{\circ}\text{C}$ or even below $-20\text{ }^{\circ}\text{C}$. In the Scandinavian peninsula, the Baltic countries, Belarus and most of Ukraine and Russia, the minimum temperatures dropped well below $-20\text{ }^{\circ}\text{C}$.

After a milder period, **a second cold spell** caused frosts during the second half of March in most of Europe, except the Mediterranean coastal regions. Severe frost events ($T_{\min} < -8\text{ }^{\circ}\text{C}$) were reported in eastern Germany, Poland, the Czech Republic,

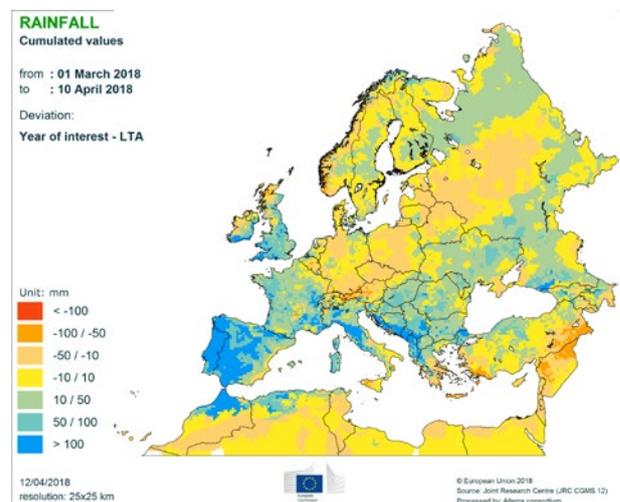
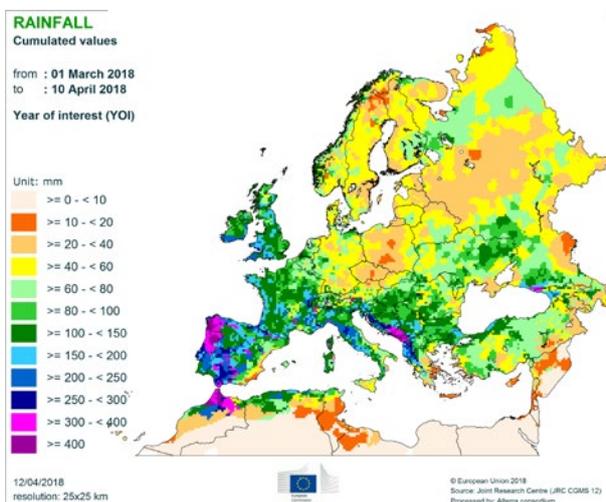
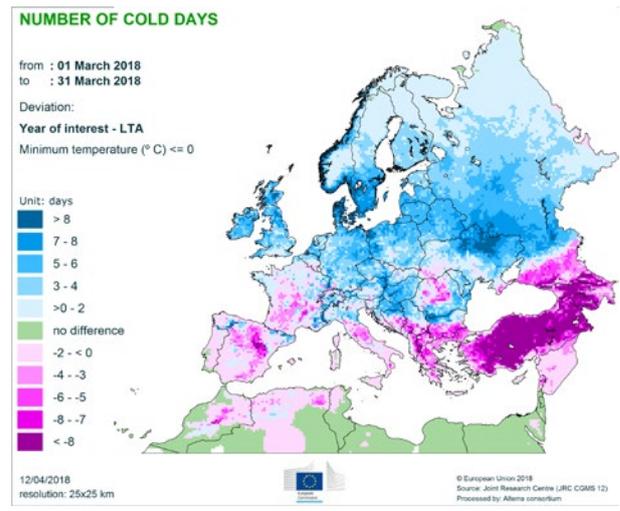
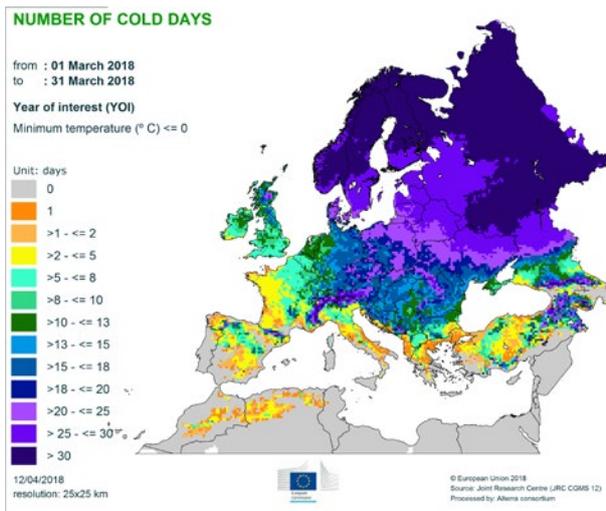
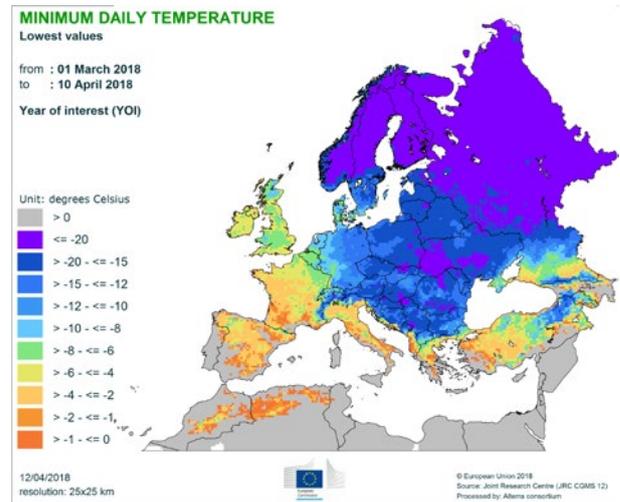
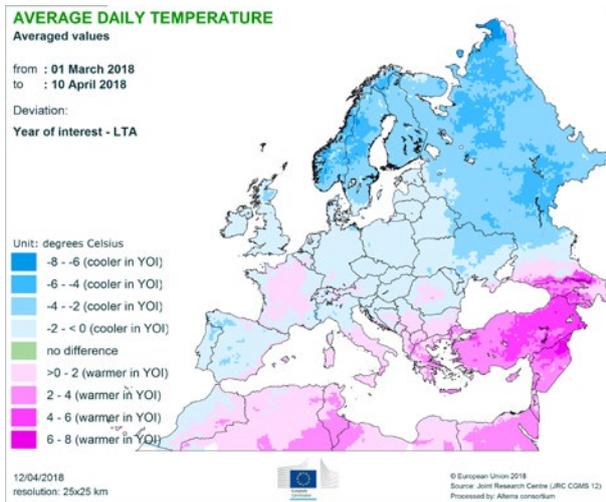
Slovakia, north-eastern Romania and eastern Europe, except the southernmost parts of Ukraine and Russia.

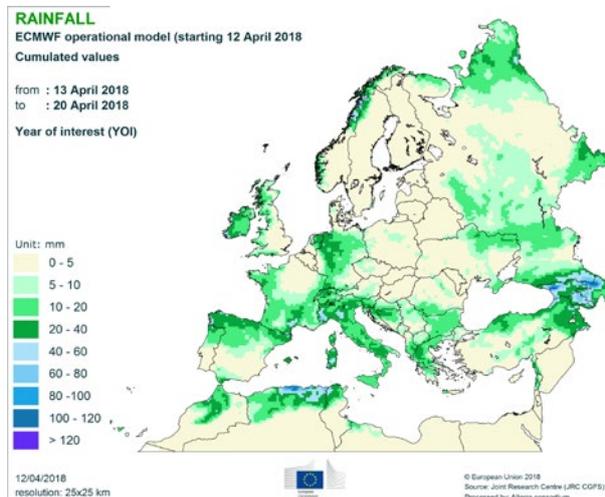
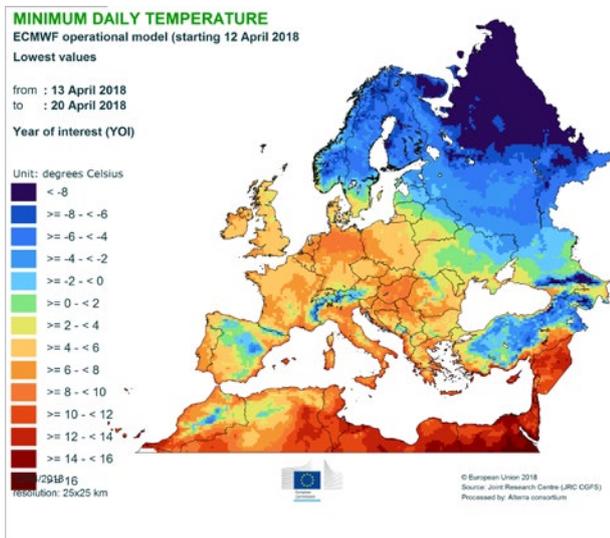
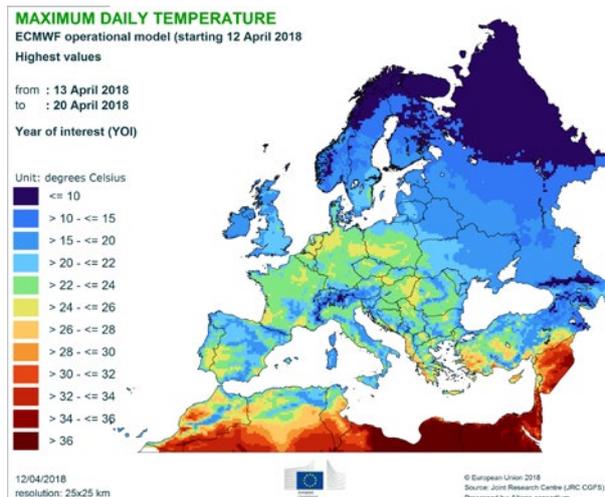
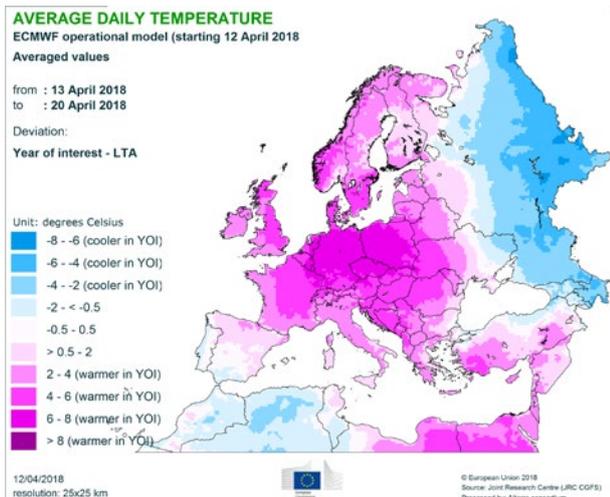
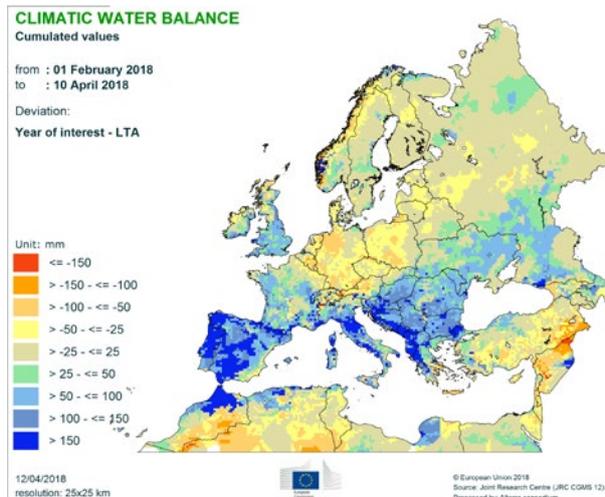
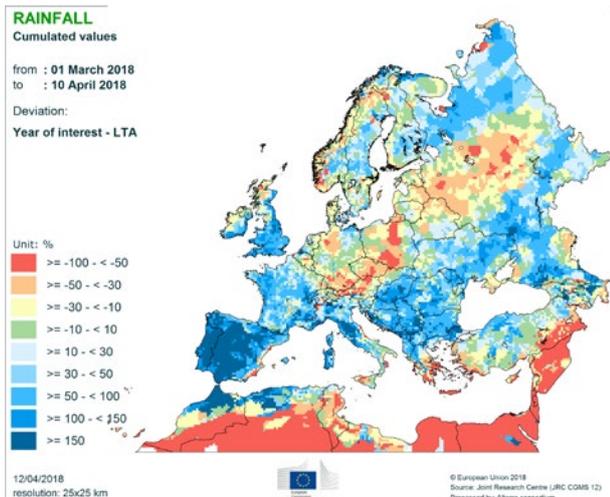
Warmer-than-usual weather conditions, with temperature anomalies of $3-6\text{ }^{\circ}\text{C}$, were experienced in Turkey and in the east Mediterranean and Caucasus regions, where this review period was one of the warmest in our records (since 1975). Above-seasonal temperatures also characterised Greece and Albania, resulting in positive thermal anomalies of $1-2\text{ }^{\circ}\text{C}$ for the period as a whole, despite the perceptible effect of the abovementioned cold spells in March.

Above-average precipitation occurred in most parts of the British Isles, France and the Iberian, Apennine, Balkan and Scandinavian peninsulas as well as in the Carpathian Basin. Distinctly wetter-than-usual weather conditions were also experienced along the northern coastline of the Maghreb region, in Ukraine and in northern and central Turkey as well as in large areas of southern and northern Russia. The precipitation surplus typically reached 25-100 mm in these areas, but in Spain, Portugal, the western Balkan region and northernmost Morocco the precipitation anomalies exceeded 200 mm. In early March and during the second half of March, a snow blanket covered most of central, south-eastern, eastern and northern Europe.

Drier-than-usual weather conditions prevailed in western Scotland, western Norway, southern Germany, some regions of Poland, the Czech Republic and Austria, as well as in the areas surrounding the Aegean Sea, in south-eastern Turkey

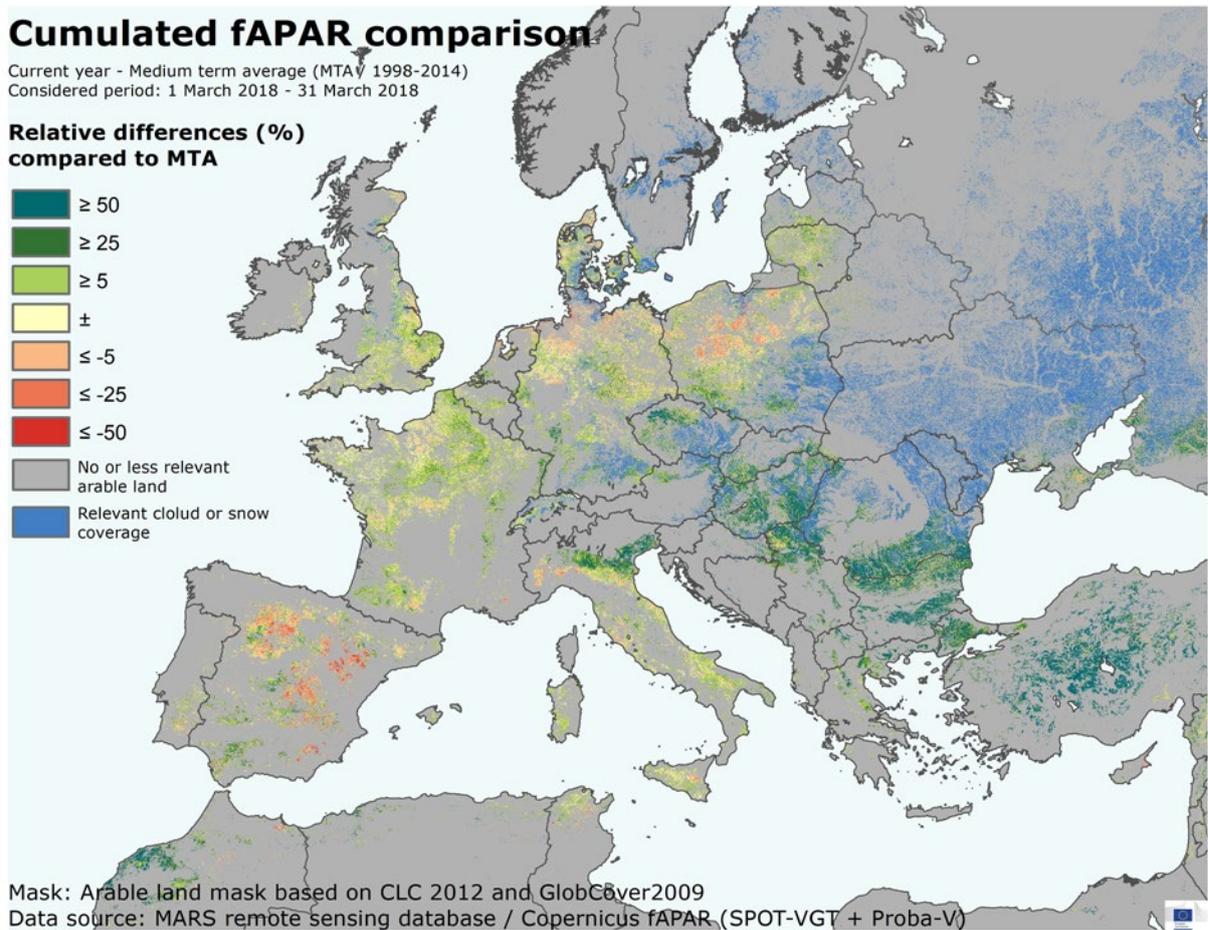
and in a wide belt of central Russia. In most of these regions, precipitation remained 50 % or more below the seasonal average, and cumulative precipitation did not reach 40 mm during the analysis period.





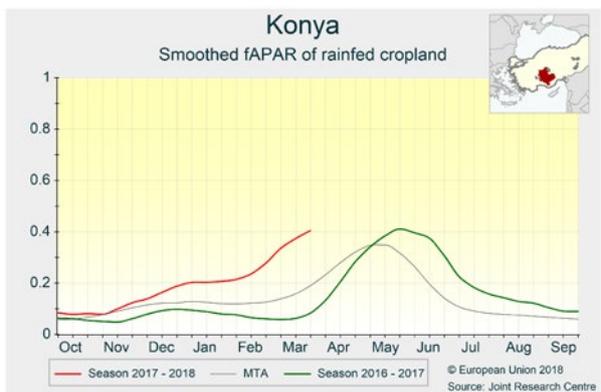
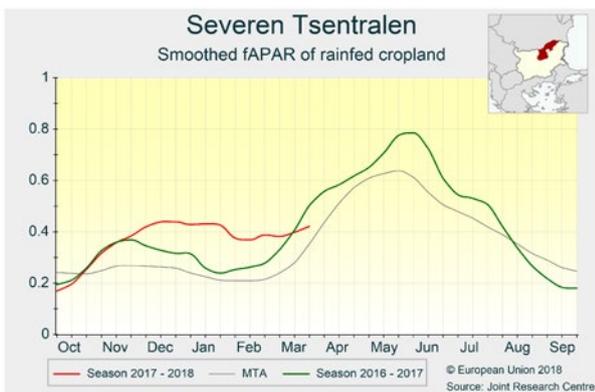
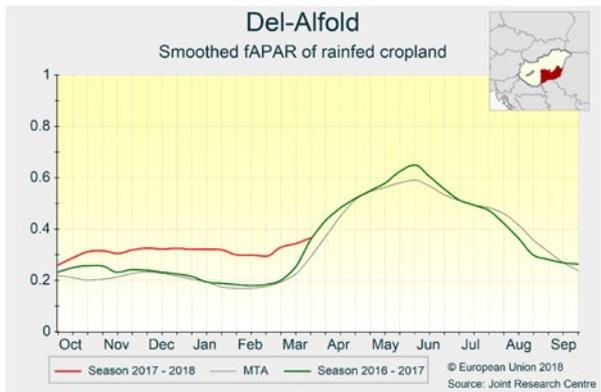
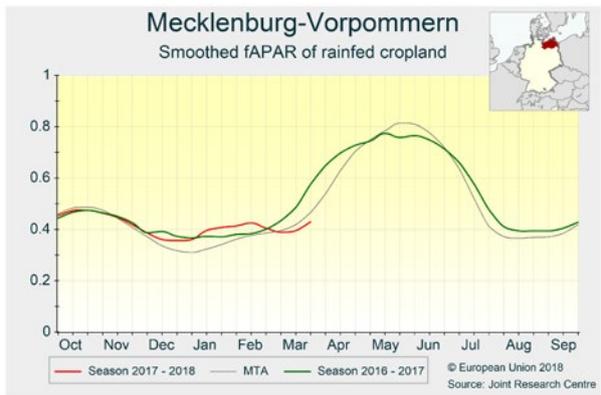
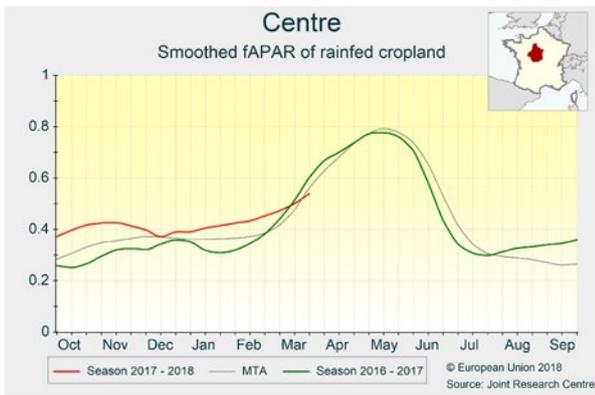
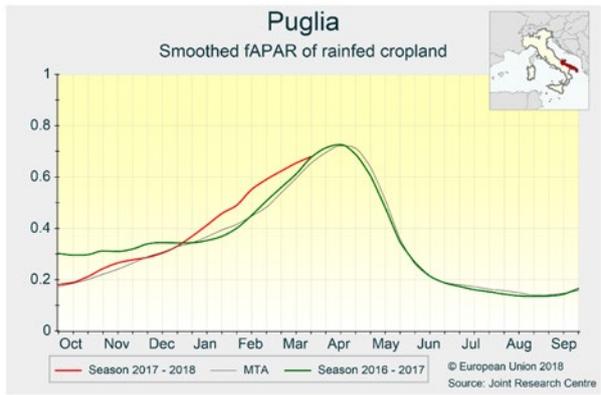
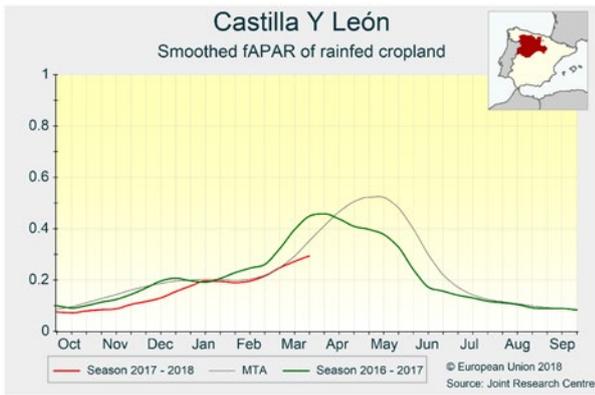
2. Remote sensing — observed canopy conditions

Early biomass accumulation in south-eastern Europe



The map displays the differences between the fraction of absorbed photosynthetically active radiation (fAPAR) cumulative from 1 to 31 March 2018 and the medium-term average (1998-2014) 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 the northern regions of **Spain** (e.g. in *Castilla y León*), the cold temperatures in March led to delayed stages in winter crop development. Southern regions of Spain experienced favourable temperatures and the leaf area expansion is now higher than average. In southern **Italy**, winter crops are well developed with slightly advanced stages (e.g. in *Puglia*) thanks to the above-average winter temperatures and good soil moisture conditions. In northern Italy, winter crop development, which was advanced as a result of the warm winter, slowed down because of the fresh temperatures in March. In the same period, abundant precipitation restored good soil moisture levels. In **France**, the weather in March was colder than average, with a surplus of precipitation, especially in central and western regions. Such weather conditions slowed

down the winter crop development (e.g. in *Centre*), which was advanced, to near average. Similar conditions occurred in the **United Kingdom**. In **Germany**, the growth of winter crops is proceeding at an average or slightly delayed pace (e.g. in *Mecklenburg-Vorpommern*). In **Poland**, winter crops are just exiting from dormancy (e.g. in *Wielkopolskie*). Crop growth is thus delayed, as marked by the red anomalies shown in the map. Similar conditions are observed in most of central Europe (**Czech Republic, Slovakia, Austria**). Many of the areas marked in blue, in eastern-central, eastern and northern Europe, were still covered with snow during most of the period considered, or satellite observations were compromised by persistent cloud coverage. In **Hungary**, the winter was milder than usual, and favoured early crop development, especially in southern regions (e.g. in *Dél-Alföld*). In **Bulgaria** and southern **Romania**, winter crops, in spite of late frost events in March, are in a favourable condition, with significant advances in development (e.g. in *Severin Tsentralen*). Similar crop conditions are present in the main agricultural region of central **Turkey** (*Konya*), while in most of **Ukraine** crops are still in winter dormancy.



3. Country analysis

3.1 Sowing conditions

Spring barley

Sowing delayed across Europe

In many parts of Europe, unfavourable weather conditions caused delays to the sowing of spring barley.

In Spain, the EU's largest spring barley producer, sowing was complete by the end of December. Spring barley crops are now at the heading phase and the crop status is currently average.

In most other parts of Europe, unfavourable weather conditions caused delays to the sowing of spring barley. In the United Kingdom and France, these delays were significant and occurred as a consequence of an excess of soil moisture. Abundant rainfall, particularly in March, made fields inaccessible for preparing seedbeds until the end of that month. Weather conditions have been more favourable since then. In both countries sowing is now under way and is expected to be completed by mid April. Nevertheless, these delays might have a negative impact on yields.

In Poland and Denmark, an unusually cold period from the second half of February until the end of March hampered the smooth progress of sowing, which usually starts by mid March. In the first dekad of April, weather conditions improved, with a general increase in temperatures, which opens a favourable window for sowing. No major impact on yields is expected. In Germany, the Benelux countries, the Czech Republic, Slovakia and the Black Sea region, low temperatures, accompanied by (or alternating with) high precipitation, also caused delays, but current weather conditions should permit sowing to be finished shortly.

In the Baltic Sea region (Finland, Sweden, Estonia, Latvia and Lithuania), sowing has not yet started; it usually takes place from the second half of April.

Sugar beet and potatoes

Delays to sugar beet sowing in the main producing regions

Over-wet topsoils and colder-than-usual weather conditions have caused delays to the sowing of sugar beet in the main EU sugar beet-producing regions.

In March, below-average temperatures did not allow the adequate warming of the soil, hampering a timely start to the sugar beet sowing campaign. Additionally, precipitation was typically above average and frequent, leading to restricted field accessibility and inadequate soil conditions for sowing in several countries. In the main EU sugar beet-producing regions of Germany, the sowing of sugar beet has been delayed by 1 to 2 weeks; this is primarily because of persistently very wet soil conditions. This is not a serious concern yet, as it is still early in the campaign and the situation started improving in early April. In Poland, soil temperatures remained below 5 °C until late March, causing a similar delay, but in April perceptible warming started and the sowing progress

speeded up thanks to the drier soil conditions. In France, the above-average precipitation during winter, which continued in March, also resulted in wet seedbed conditions, significantly hampering the start and progress of sowing works. Sowing is also set back and suffering from similar difficulties in most of the United Kingdom, the Benelux countries, Austria, Hungary, Slovakia, Croatia, Romania and southern Ukraine. In Italy and northern Spain, the sowing of sugar beet was less problematic; however, the early development of the seedlings was negatively affected by heavy rains in Spain and low temperatures in Italy. In Turkey, above-average temperatures and dry periods between the rainy periods supported the timely sowing of sugar beet.

With regard to potatoes, the sowing of early varieties faced similar difficulties as described above for sugar beet. The main sowings have just started.

Maize

Sowing delayed in southern Europe

Rainfall has caused delays to maize sowing in Spain, Italy, France and the Black Sea region. In central Europe, the sowing window will start around mid April.

Weather conditions were particularly humid in southern Europe during March, when soil preparatory works for maize usually take place. In **Romania** and **Bulgaria**, the sowing window usually starts at the end of March, but this year the over-wet conditions experienced by those countries since February have prevented access to fields. As a consequence, maize sowing has not yet started and will be delayed until at least the second half of April. Similar conditions have been observed in northern **Turkey**. In the main producing regions of **Hungary**, soil moisture is adequate, but the cold spell during the last 2 weeks of March prevented sowing from starting early; however, it should be able to start by mid April.

In the main producing regions of **Italy** (*Veneto*, Po valley), wet conditions since mid February have caused some delays to sowing, which usually starts at the end of March. Similar conditions were observed in southern France (*Aquitaine*); however, these conditions have improved since the end of March, and maize sowing could start in mid April. In southern **Spain** (*Andalucía*), soil preparatory works were postponed until the first half of April, as the soil moisture was too high after exceptionally high precipitation during the first half of March.

In **Germany** and **Austria**, the sowing window usually opens in mid April. However, weather conditions since the end of March have been rather favourable for seedbed preparation and crop emergence, as the soil moisture is adequate and temperatures are above average. This could have possibly enabled sowing to start early this year, in the second week of April. In southern **Poland**, it is still too early for maize sowing, which usually starts during the second half of April.

Sunflower

Sowing delayed in the Black Sea region

Sowing of sunflower has started in south-western Europe, Spain and Italy, but is currently delayed in south-eastern Europe on account of the high soil moisture in Bulgaria, Romania and Hungary.

In Bulgaria, where sowing had started at the end of March, exceptional rainfall recorded in mid March was followed by snow. The snow cover lasted until the end of March, and the rain surplus, in addition to the melting snow, substantially delayed the earliest sowing. Soils are currently wet and farmers are having to wait before restarting sowing. The current positive temperature anomaly is favourable and might accelerate the completion of the sowing. In Romania, where sowing started in the first dekad of April, conditions are similar and the soils

are too wet; nevertheless, the delay might be less significant than in Bulgaria. In Hungary, the delay will also probably be less prominent.

In Spain, sowing is nearly completed in *Andalucía* and should start on schedule in *Castilla y León* and *Castilla-La Mancha* as, currently, nothing is expected to hamper the sowing. In southern Italy, apart from the cold spell observed at the end of March, which slightly delayed the earliest sowing, conditions are good. Weather conditions are currently optimal in all regions and no further delays are expected.

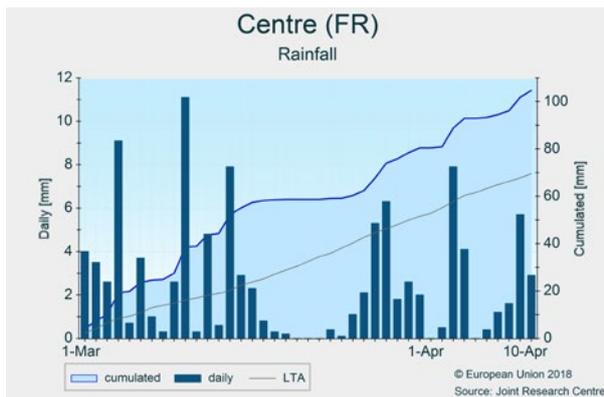
For the other producing countries, further north, the sowing is starting later in the year.

3.2 European Union

France

Spring crop sowing substantially delayed

Carrying on from this winter's weather conditions, cumulative rainfall since 1 March has been above the seasonal average and half of the days were rainy. Global radiation was 5-10 % below average. Temperature sums are close to the seasonal average despite the colder-than-usual conditions during the second half of March. The wet conditions hampered some of the field work; spring barley and sugar beet sowings are delayed by 2 weeks, with expected negative effects on yields. The disease pressure on winter crops weakened as a result of the below-average temperature recorded during the second half of March, but septoria leaf blotch (a fungal leaf disease) and eyespot (a fungal disease responsible for lodging) are observed in a large part of the fields. Some poorly drained fields have been affected by anoxia, but the extent of the impact is expected to be minor. There is currently no real widespread concern for winter cereals and the yield potential has clearly not been affected by the wet conditions and radiation deficit observed this winter or by the cold spell observed at the end of February. Thus, yield forecasts are unchanged and still follow the historical trend.



Germany

Sowing delayed by wet conditions

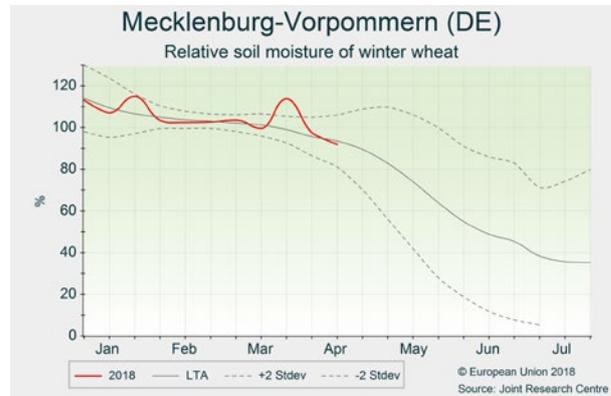
The temperature regime has been fluctuating heavily since the beginning of March, with very low (early March and 17-22 March) to very high (early April) temperatures. Most areas in the north-east have temperature sum deficits of 20-30 %, compared with the long-term average (LTA). Precipitation was particularly abundant in the north-east (a 30 % surplus compared with the LTA) and locally in the centre. The south and north-west were drier than usual. Soil moisture in *Mecklenburg-Vorpommern* and *Brandenburg* was particularly high by the end of March, causing problems with heavy sowing machines.

Despite a recent recovery in the first dekad of April, winter crop development is delayed in the northern half of the country. Crop development is average in most other areas and is locally slightly advanced in the south of the country. In the north, crops are frequently weaker on account of the bad autumn weather conditions.

As a result of the wet field conditions, often impeding field access, the start of sowing of spring cereals and spring crops

was delayed. Weather conditions improved in the first dekad of April and are promising for the coming period.

Sugar beet sowing has started and was expected to be intensified in the second week of April. Compared with 2016 and 2017, sowing is delayed by about 1 week and 10 days, respectively.

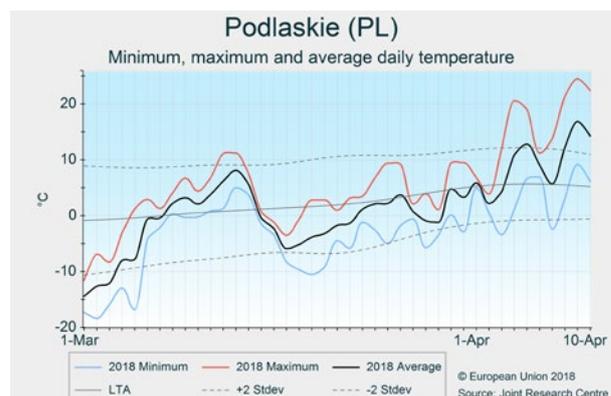


Poland

Rapeseed potentially damaged by cold wave in March

After the cold spell at the beginning of March (see previous Bulletin), temperatures climbed to above the LTA during the second week. However, another cold wave occurred during the second and third dekads of March. Temperatures below -10 °C were recorded in many regions of the country. Although the minimum temperatures were higher than those recorded at the beginning of the month, the negative effect of cold conditions was exacerbated locally by limited snow cover and strong winds. This may have resulted in some damage to rapeseed, especially in some northern and central regions (e.g. in parts of *Mazowieckie* and *Podlaskie*). Overall, for winter crops the outlook is that conditions will be close to average, and our previous forecast (based on trends) has been maintained. The development of rapeseed needs to be monitored during the coming months in order to assess any potential damage due to frost conditions observed during March.

Since the beginning of the year, precipitation has been below the LTA in the majority of the country; however, modelled soil water levels are around the LTA. Low temperatures in March resulted in delayed spring crop sowing throughout the country. However, the recent increase in temperature and adequate soil water levels have created favourable conditions for the sowing of spring crops.



United Kingdom and Ireland

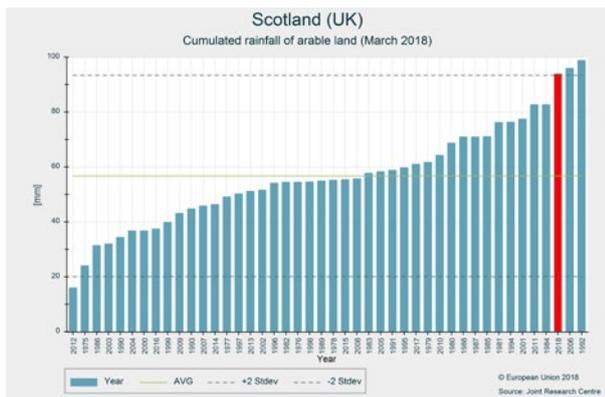
Wet conditions restrict field access

After a relatively cold start, near-average mean temperatures prevailed in the southern United Kingdom, but below-average temperatures persisted in the northern part of the United Kingdom and in Ireland.

Precipitation during the review period continued to be above average. March was the wettest of the last 17 years in *South East England* and of the last 12 years in the main agricultural areas of *Scotland*.

Cumulative global radiation was generally below average.

On account of the wet weather conditions, farmers had few opportunities to enter their fields, with a consequent restricted access for the application of fertilisers, spraying of winter crops and preparation of seedbeds for spring crops. Nevertheless, winter crops are generally in good condition and, as the temperatures increase and soil moisture improves in April, conditions may quickly become favourable for winter cereals and the completion of spring sowing. The sowing of spring barley has started later than in previous years, but is currently well under way and sugar beet drilling is nearly concluded. Therefore, the yield forecasts for winter and spring crops are maintained close to the historical trend.



Spain and Portugal

Favourable winter crop conditions thanks to rainfall in March

The abundant precipitation during the first half of March across the Iberian peninsula was crucial to prevent water stress on winter cereals after an unusually dry winter. Thanks to this rainfall, soil moisture is currently substantially higher than usual, indicating a favourable scenario for winter crops during the rest of April. Temperatures during the second half of March were lower than usual, leading to a slight deceleration of crop development: winter cereals are close to flowering in southern regions (*Alentejo*, *Andalucía*), whereas in the north (*Castilla y León*, *Aragón*) they are still heading. In all the main producing regions, winter crops conditions are favourable. As it is still early in the season, our forecasts remain in line with the historical trend and close to the 5-year average. Sunflower sowing is under way in the south, slightly later than usual, whereas in the north the summer crop sowing windows will

open shortly. The recent rainfall has substantially increased water storage in all the main catchments, and the expectations for the irrigation campaign for summer crops have largely improved, even though storage levels are still slightly below the average of the last 10 years.



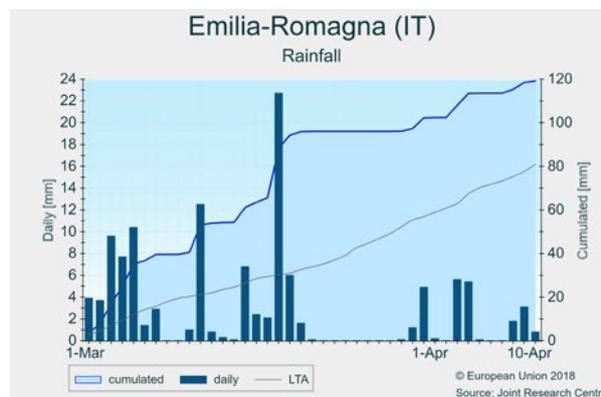
Italy

Average conditions

After the cold temperatures during the first week of March, from 18 to 26 March colder-than-usual temperatures occurred in the whole peninsula, most markedly in *Emilia-Romagna*, where minimum temperatures fell below zero; however, this occurred for 1 day only and had no consequences for most crops. Some damage was reported locally in *Emilia-Romagna* and *Lombardia* to recently emerged sugar beet stands. After this period, temperatures quickly returned to around the LTA. The resulting thermal sum (base temperature 0 °C) from 1 March to 10 April is still higher than the LTA, with the exception of the *Emilia-Romagna* provinces.

Precipitation was higher than usual in the whole country during the analysis period and in general has been since the beginning of the year. In general, growing conditions for winter cereals have been adequate and development is around the LTA.

Maize and sunflower sowing has started in their main areas of cultivation, the Po Valley for maize and *Toscana* for sunflower. Sugar beet was sown in mid March. Overall, conditions have been favourable for germination and crop establishment.

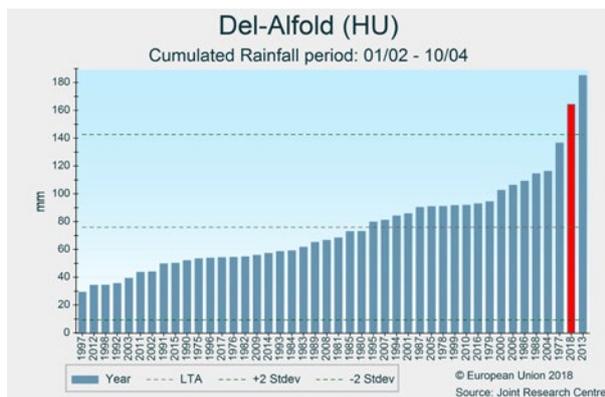


Hungary

Over-wet soil conditions hampered spring sowing

Colder-than-usual conditions dominated in March. The first days of the month and the period around 20 March were particularly cold, with severe frost events and daily temperatures 10 °C below the LTA. Only the periods from 9 to 16 March and the first dekad of April were warmer than usual. Precipitation was abundant, considering the review period (1 March to 10 April) as a whole. Rainfall totals in most areas reached 60-140 mm, meaning a 30-90 mm rainfall surplus compared with the seasonal average.

As February was also wet, field preparation and the sowing of spring crops suffered delays in several areas due to the high soil moisture levels. Waterlogging and inland inundation are likely to have occurred in central and southern parts of the country. Spraying and fertilisation were also hampered by the difficulty in gaining access to fields. After the successful wintering of winter cereals, the cold weather of early spring slowed down the crop development and growth. Nevertheless, general crop conditions are still near or above average for this period of the season.



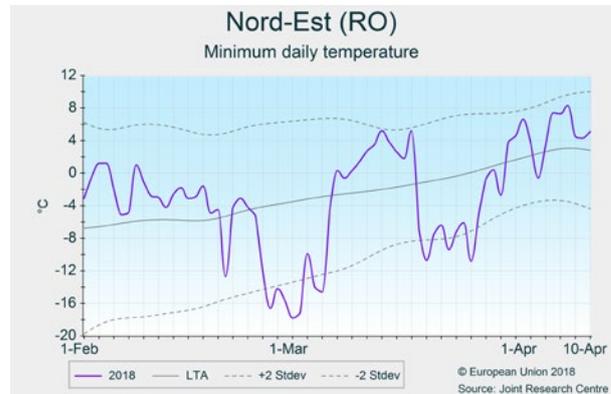
Romania

Fair outlook despite adverse cold and wet March

Between 25 February and 3 March, Romania experienced a severe cold spell, with minimum temperatures approaching or reaching – 20 °C on the coldest days. After a milder-than-usual period from 7 to 17 March, a second abrupt cold spell was experienced, which lasted until 27 March. Minimum temperatures during the second cold spell remained above – 10 °C in most regions, except in the north-eastern regions, where minimum temperatures of between – 12 °C and – 16 °C may have caused damage to partly dehardened winter cereals and rapeseed crops.

Rainfall continued well above average. The period since 1 February was one of the wettest in our records (since 1975). The precipitation sum of the review period (1 March to 10 April) typically exceeded 100 mm, but reached 150-200 mm in south-central Romania, resulting in a 50-100 mm surplus compared with the LTA. This water excess caused waterlogging and inland inundation problems in flat areas with clayey soils. Overall, despite cold and over-wet weather

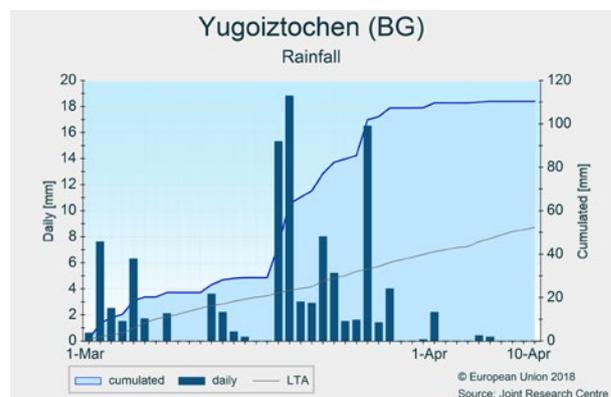
conditions, winter crops are in fairly good shape. The sowing of spring crops has suffered considerable delay, though the situation seems to have improved in the first dekad of April. The yield forecast for winter crops was revised slightly upwards, while the outlook for spring and summer crops match the trend.



Bulgaria

Persistent wet conditions

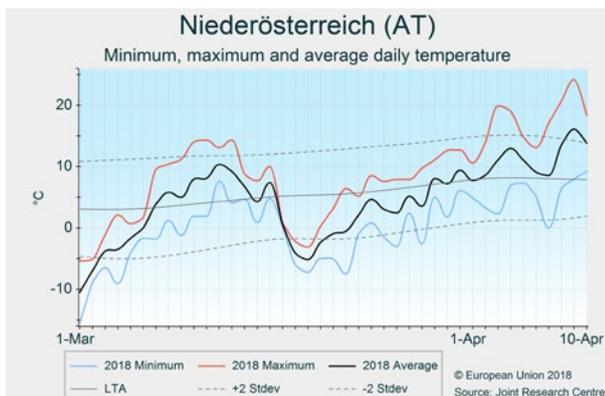
Considering the whole review period (1 March to 10 April), colder-than-usual thermal conditions were typical in northern Bulgaria while the southern regions proved to be slightly warmer than average. The thermal conditions indicated high temporal variability. The first days and last dekad of March were quite cold with severe frost events, whereas in the second dekad of March and early April daily temperatures mostly exceeded the LTA. In March, precipitation totals typically reached twice the seasonal average, as 80-100 mm was measured, but locally in *Yugoiztochen* as much as 150-190 mm occurred. In early and late March, a thick snow cover (up to 20-40 cm in depth) formed. The excessive precipitation and the melting snow cover resulted in over-wet soil conditions and local waterlogging problems. Precipitation levels decreased after 1 April, but soil conditions improved only slowly. Winter crops in areas that are not affected by waterlogging are in good condition thanks to the mild winter. The wet topsoil conditions also caused substantial delays in the sowing campaigns for sunflower, potato and maize; on the other hand, soils are now well replenished.



Austria, Slovakia and the Czech Republic

Pronounced cold spells in March

March was colder than usual, with temperature anomalies between 1 °C and 4 °C below the LTA. March started with pronounced cold spells, with minimum temperatures regionally dropping below – 15 °C. Locally, temperatures even dropped below – 20 °C. According to our simulations, frost kill was very limited because of hardened winter crops and protective snow cover. During the second cold spell in mid March, minimum temperatures between – 10 °C and – 15 °C were recorded in the western half of the Czech Republic. The cold weather anomaly at the end of February and March delayed the development of winter crops, thus cancelling the effect of the warm weather anomaly during the first half of winter. Precipitation conditions were spatially highly variable. Northern Austria and the eastern half of the Czech Republic have recorded between 10 mm and 30 mm since the beginning of March. Recorded cumulates varied between 30 mm in western Slovakia and nearly 100 mm in southern Austria. Dry and warm conditions prevailed during the first dekad of April, which was favourable for field preparations and the start of summer crop sowing. The winter crop yield outlook is currently in line with the long-term trend.

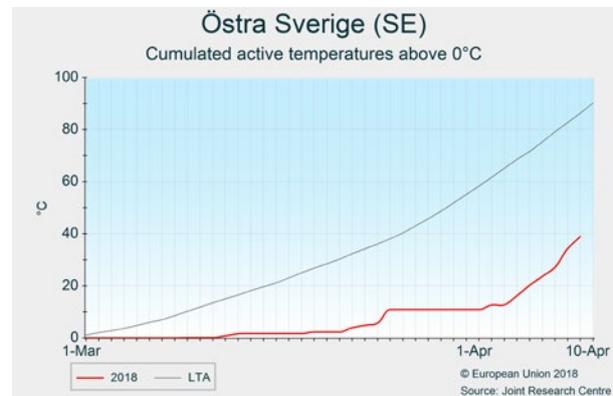


Denmark and Sweden

Cold conditions delay crops' development

Colder-than-usual temperatures prevailed in March and at the beginning of April, with minimum temperatures reaching – 7 °C, – 12 °C and – 13 °C in Denmark, *Södra Sverige* and *Östra Sverige* on 18 March, respectively. As a consequence, cumulative active temperatures ($T_{base} = 0$ °C) remained below the long-term average (46 %, 58 % and 66 % lower in Denmark, *Södra Sverige* and *Östra Sverige*, respectively), resulting in a delay in the development of winter cereals. After 4 April, temperatures increased and remained above average until the end of the review period in both countries. Rainfall was close to average in Denmark and *Södra Sverige*. Dry conditions occurred during the last 2 weeks of March in *Östra Sverige*, but cumulative rainfall increased again at the end of the review period as a result of significant precipitation at the beginning of April. Radiation was below average in Denmark and *Södra Sverige*.

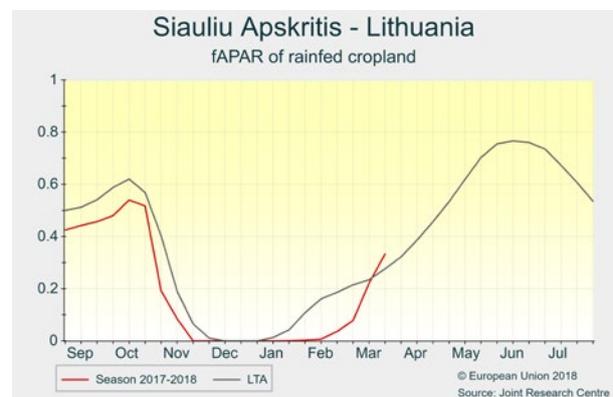
In summary, temperatures in March were unfavourable for spring sowings. However, weather conditions improved at the beginning of April. The delayed development of winter cereals may be compensated for as the season progresses. The forecasts from the previous Bulletin are maintained and are close to the historical trend.



Finland, Lithuania, Latvia and Estonia

Adequate conditions to start the spring sowing campaign

Colder-than-usual temperatures have marked the weather during March in all countries. In April, the Baltic countries have so far benefited from warm weather, while cold conditions have remained in Finland. The fAPAR signal in the Baltic countries suggests that winter crops have finished dormancy in relatively optimal conditions. The low fAPAR signal in Finland suggests that regrowth after winter dormancy has not started yet. Cold conditions across all countries during March did not allow farmers to start the sowing campaign earlier than usual, which would have been beneficial. Indeed, the large surface area of winter crops that could not be sown on account of the rainy autumn in the Baltic countries — around 20-30 % according to local Lithuanian sources — a priori suggests the possibility of an increase in the area to be cultivated during spring. In the southern countries of the region, weather conditions in April have allowed the start of the spring sowing phase under adequate conditions. Our current forecast is based on historical averages and trend values.



Belgium, the Netherlands and Luxembourg

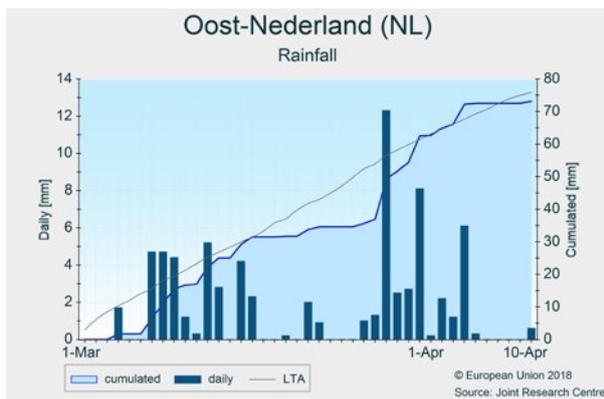
Spring sowing delayed

The 1 March to 10 April period of review presented large temperature fluctuations. The first days of March were marked by the end of the cold spell that had started at the end of February; another, much milder, cold spell occurred between 16 and 22 March. On the other extreme, maximum temperatures reached or exceeded 20 °C between 7 and 10 April. Active temperature sums ($T_{base} = 0$ °C) for the period as a whole were around the LTA.

Precipitation was above or close to average, with a high frequency of precipitation events in between the cold spells in March and during the first week of April.

Winter crops are generally in good condition thanks to the mild conditions in autumn and most of winter. The cold spells caused a standstill in crop development, without producing significant damage.

Spring sowing activities have started with considerable delay because of successive cold and wet conditions. Spring barley sowing was possible in the second half of February and the last week of March, but significant sugar beet and early potato sowing started only after 5 April.



Greece and Cyprus

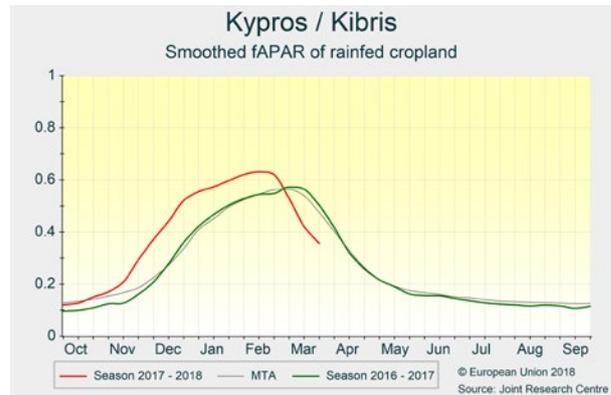
Excessive rain in north-eastern regions

In central Greece, temperatures have been significantly above the average, with maximum daily temperatures that peaked at 25 °C around 15 March. Around 20 March several cloudy and rainy days occurred and led to a drop in temperatures. Overall, winter crop development is advanced.

In north and north-eastern regions, the March temperature pattern was similar to that in central Greece but with intense rains at the end of the month. Total precipitation was generally above 50 mm and there were floods in the easternmost regions (*Evros, Rodopi*), where precipitation was above 100 mm. The over-wet conditions caused limited damage to winter crops and delays to the sowing of summer crops.

In Cyprus, temperatures in March and April were constantly above the average with maximum temperatures exceeding 26 °C. Such weather conditions, coupled with only 2 rainy days

at the end of March (total rain: 15 mm), reduced soil moisture levels and accelerated barley development. The consequent shortening of the grain filling reduced yield expectations.



Slovenia and Croatia

Wet conditions have delayed sowing of summer crops

The period as a whole was characterised by colder-than-usual weather conditions due to cold spell events at the beginning and during the middle of March. The minimum temperature at the beginning of March dropped below -15 °C (locally even below -20 °C) in large parts of northern and eastern Slovenia and in eastern Croatia. Nevertheless, because winter crops were still hardened and covered by a protective snow layer, our model simulations indicate an absence of frost kill. Colder-than-usual weather nullified the effect of the warm weather anomaly during the first half of the winter, bringing the phenological stage of winter crops close to the LTA. Above-average precipitation cumulates were recorded in large parts of Croatia and Slovenia. The cold weather anomaly and precipitation cumulates above 100 mm have delayed field preparations for the sowing of summer crops in the major agricultural regions. Winter crops are generally in good condition; however, as a result of wet conditions, field operations, including fertilisation, are locally difficult to perform.

The winter crop yield outlook is currently in line with the long-term trend.

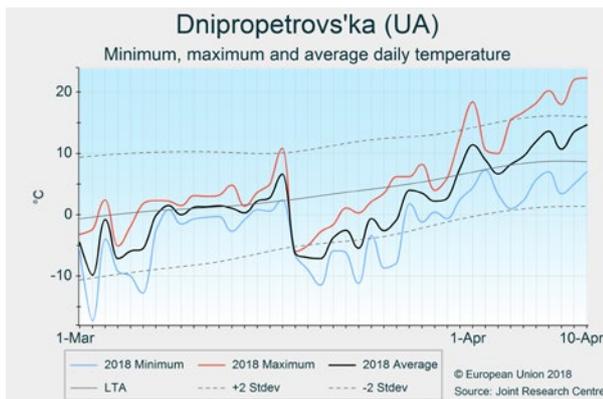


3.3 Black Sea area

Ukraine

Yields revised down because of extended winter conditions

A thick snow cover was observed this winter for nearly all arable lands until the end of March, when it started to melt thanks to the mild conditions during the last week of the month and the first dekad of April. Precipitation has been far above the average because of exceptionally high rainfall in mid March. This started to cause a decrease in snow depth, but the precipitation turned to snowfall again, prolonging the winter conditions. The relatively low temperatures and the snow cover maintained the winter crops in dormancy and delayed their growth, which will negatively affect the yields of winter cereals. The sowing of spring barley is delayed compared with previous years and thus the yield potential is also expected to be affected. The current wet conditions are expected to cause further delay to the spring sowing as well as to other field interventions, such as the application of fertilisers. Yield forecasts have been revised downwards compared with the last Bulletin, and are now slightly below the historical trend.



Turkey

Winter crops maintain very advanced development in central Turkey

March and April temperatures in central Turkey (e.g. in *Konya* and *Ankara*) were constantly above the average (4 °C/6 °C), and led to anomalies in the temperature sum (30 % to 60 % above LTA). Notwithstanding the high temperatures, soil moisture remained optimal because of the wet winter and several rainy days in March. The winter crops benefited from these weather conditions: biomass accumulation was optimal and phenological development is advanced by about 1 month. Along the Black Sea coast (e.g. in *Kastamonu*) the abundant precipitation (70 % above LTA) mitigated temperature anomalies but delayed the maize sowing.

In south-eastern regions (e.g. in *Şanlıurfa* and *Mardin*), the weather was drier than usual: cumulative precipitation varying between 20 mm and 60 mm was recorded in this period. The relatively high temperatures and the reduced precipitation contribute to the continuation of the long-lasting climatic drought, which has existed since last summer and was only partly mitigated by a wet February. Nevertheless, biomass of winter crops is still optimal and phenological development is well advanced (1 month). Rain is needed in the coming weeks, although current forecasts do not suggest any. In any case, irrigation will play a major role in maintaining good yield prospects in the south-eastern regions.



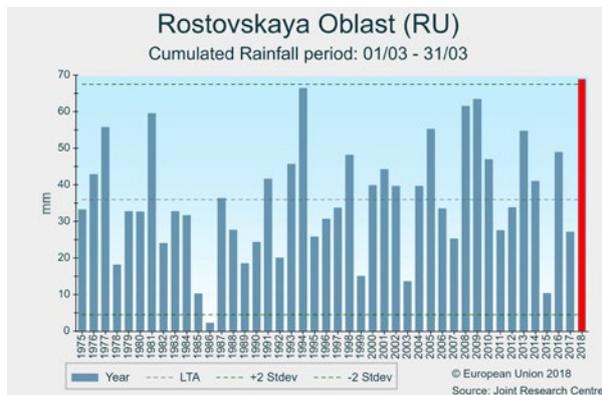
3.4 European Russia and Belarus

European Russia

Spring sowing campaign had a delayed start

Across most of Russia, daily temperatures remained under the LTA almost constantly during the review period (1 March to 10 April), resulting in a negative thermal anomaly of 2-5 °C. By contrast, the main arable lands of the *North Caucasian okrug* and the southern regions of the *Southern okrug* experienced near-average or slightly warmer-than-usual thermal conditions. In the southern half of Russia, abundant precipitation was recorded until the end of March. In fact, this March was among the wettest on record there, with precipitation totals of 50 mm to 100 mm. In and along the Caucasus mountains, even higher cumulates of 150-200 mm were recorded. Early April, however, was characterised by dry conditions in most of Russia.

The spring sowing campaign has started in the southern regions of Russia, but suffered delays because of quite wet topsoil conditions, while northwards the cold weather and the snow cover made sowing practically impossible until early April. In the *Southern* and *North Caucasian okrugs* the winter wheat is developing, with growth and photosynthetic activity mostly at above-average levels, as indicated by remote sensing indicators and crop model simulations. Because of the cold weather conditions, a deep snow blanket covered the winter wheat-producing regions of the *Central*, *Volga* and northern regions of the *Southern okrugs* until late March to early April. This long-lasting snow cover probably caused thinning and dying of winter cereals there, and spring resowing of the affected fields is expected.



Belarus

Average conditions

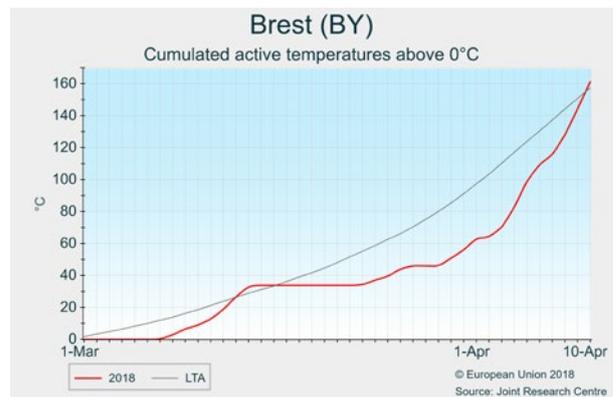
Colder-than-usual temperatures were recorded in the beginning and during the last 2 weeks of March, with a negative peak on 18 March. The lowest values were recorded in the *Gomel* (- 17 °C), *Mogilev* (- 18.2 °C) and *Vitebsk* (- 16.7 °C) regions. The snow cover that was still present in most of the country protected the winter crops from frost damage.

Since the beginning of March, precipitation has been well above the LTA in the *Gomel*, *Mogilev* and *Minsk* regions.

As a consequence of the predominantly low temperatures in March, the phenological development of winter wheat slowed down and was below the LTA. The higher-than-usual temperature during the beginning of April, which is forecast to continue in the second dekad, may overturn the situation.

These thermal conditions, combined with good water availability, should favour the start of spring cereal and summer crop sowing (normally beginning of April until early May).

Overall, this picture provides an outlook close to average conditions, and our previous forecast (based on the historical trend) has been maintained.



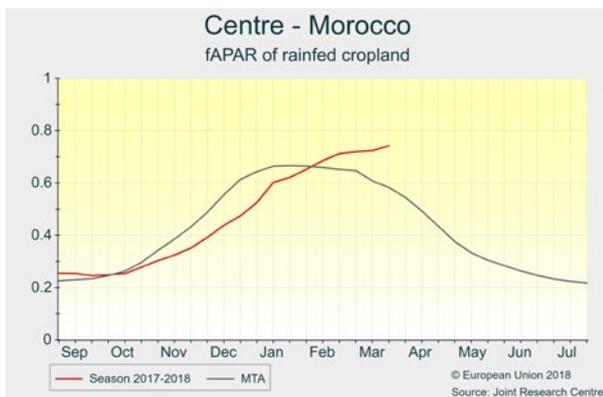
3.5 Maghreb

Morocco, Algeria and Tunisia

Continued good conditions in Morocco and northern Tunisia; some relief in Algeria

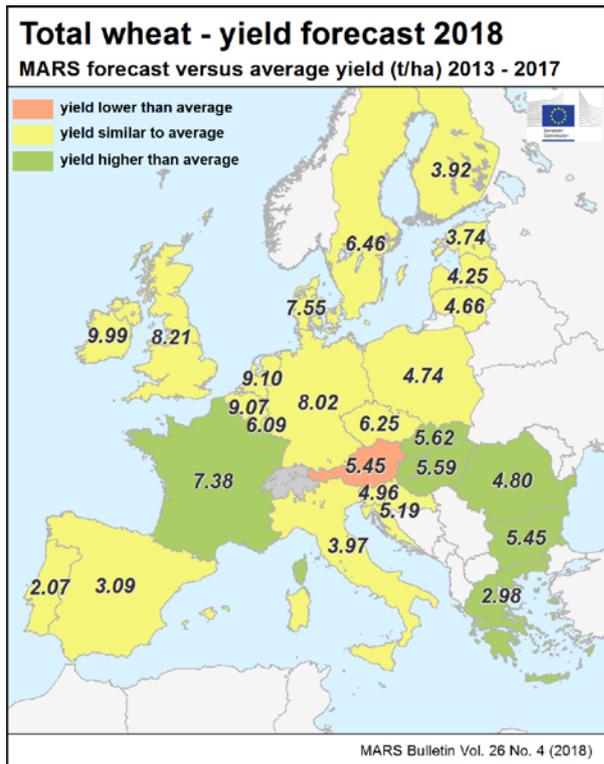
In Morocco, rain during March was unusually abundant, especially in northern agricultural regions. This has boosted plant growth during flowering, and corroborates the positive anomaly in biomass accumulation (fAPAR signal). Our yield forecasts have slightly increased, remaining above average. However, it is important to watch out for possible pest and disease pressure associated with the more humid conditions. In Tunisia, the outlook is similarly positive in northern regions where most wheat is concentrated. In southern regions, which had suffered from scarce precipitation since January, rains at the end of March brought relief to crops and helped to improve soil water stocks for the beginning of flowering in relevant-producing regions such as *Le Kef*.

In Algeria, the mixed outlook among coastal (more positive) and interior (more negative outlook) provinces remains. Winter cereals in the whole country have benefited from abundant rains in March, especially in interior parts and some eastern regions. However, in those regions, the fAPAR signal still indicates below-average conditions for winter cereals in the current phase of heading and therefore our yield forecast for Algeria remains below the historical average.

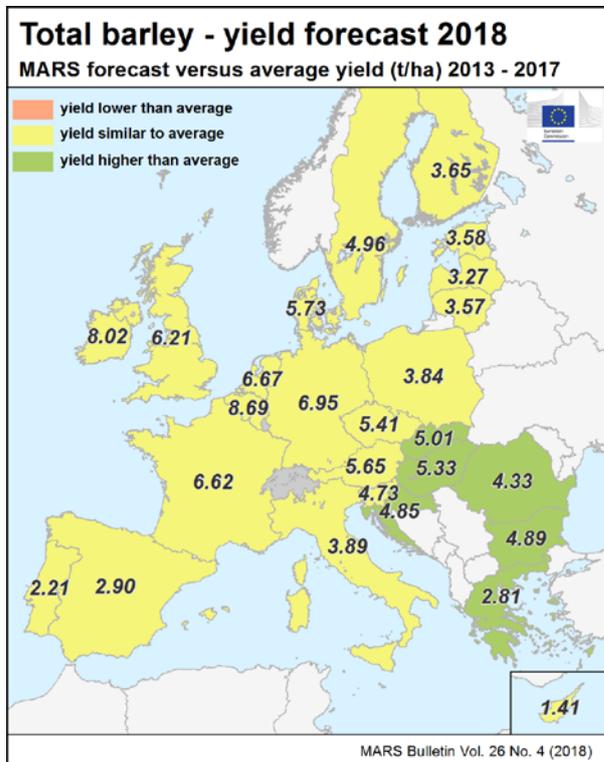


4. Crop yield forecasts

Country	TOTAL WHEAT (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	5,73	5,85	5,97	+4,2	+2,0
AT	5,68	5,12	5,45	-4,2	+6,4
BE	8,73	9,27	9,07	+3,9	-2,2
BG	4,57	5,26	5,45	+19	+3,5
CY	-	-	-	-	-
CZ	6,13	5,62	6,25	+1,9	+11
DE	8,00	7,64	8,02	+0,3	+5,0
DK	7,70	8,21	7,55	-2,0	-8,0
EE	3,84	4,20	3,74	-2,5	-11
ES	3,07	2,39	3,09	+0,5	+29
FI	3,96	4,07	3,92	-1,2	-3,8
FR	6,98	7,25	7,38	+5,7	+1,8
GR	2,84	2,93	2,98	+5,2	+1,7
HR	5,19	5,95	5,19	+0,2	-13
HU	5,06	5,44	5,59	+11	+2,7
IE	9,88	10,1	9,99	+1,1	-1,5
IT	3,82	3,86	3,97	+3,7	+2,9
LT	4,67	4,82	4,66	-0,3	-3,4
LU	5,88	5,48	6,09	+3,7	+11
LV	4,29	4,79	4,25	-0,9	-11
MT	-	-	-	-	-
NL	8,96	9,07	9,10	+1,6	+0,4
PL	4,67	4,90	4,74	+1,4	-3,2
PT	2,04	2,05	2,07	+1,1	+0,7
RO	3,93	4,88	4,80	+22	-1,5
SE	6,68	6,99	6,46	-3,4	-7,6
SI	4,99	5,03	4,96	-0,6	-1,4
SK	5,24	4,73	5,62	+7,2	+19
UK	8,20	8,16	8,21	+0,2	+0,6



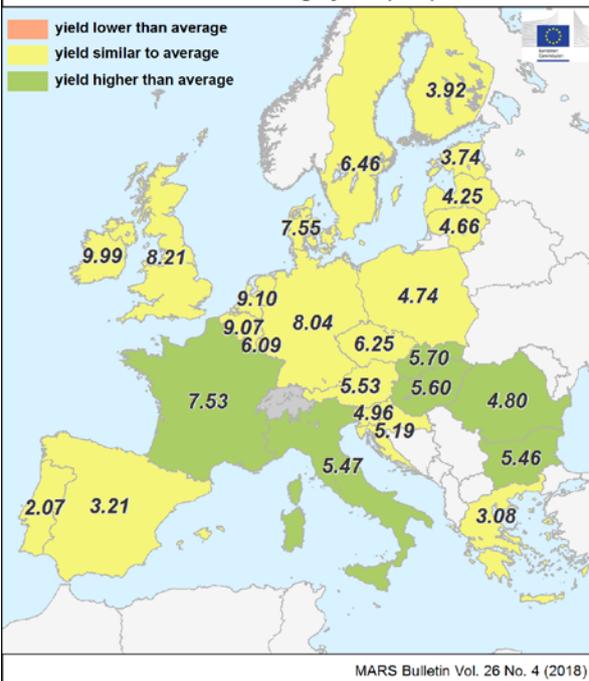
Country	TOTAL BARLEY (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	4,91	4,89	5,03	+2,5	+2,8
AT	5,64	5,60	5,65	+0,3	+0,9
BE	8,39	8,89	8,69	+3,5	-2,3
BG	4,12	4,78	4,89	+19	+2,3
CY	1,44	1,81	1,41	-1,9	-22
CZ	5,29	5,16	5,41	+2,4	+4,8
DE	6,94	6,93	6,95	+0,1	+0,3
DK	5,86	6,00	5,73	-2,2	-4,5
EE	3,55	4,10	3,58	+0,9	-13
ES	2,91	2,26	2,90	-0,3	+29
FI	3,67	4,04	3,65	-0,7	-9,8
FR	6,37	6,33	6,62	+3,9	+4,5
GR	2,64	2,69	2,81	+6,4	+4,4
HR	4,47	4,98	4,85	+8,6	-2,5
HU	4,74	5,27	5,33	+13	+1,1
IE	8,04	8,27	8,02	-0,2	-3,0
IT	3,81	3,93	3,89	+1,9	-1,1
LT	3,60	3,65	3,57	-0,6	-2,0
LU	-	-	-	-	-
LV	3,31	3,32	3,27	-1,2	-1,5
MT	-	-	-	-	-
NL	6,66	6,06	6,67	+0,1	+10
PL	3,79	3,96	3,84	+1,3	-3,0
PT	2,18	1,90	2,21	+1,4	+16
RO	3,63	4,52	4,33	+20	-4,1
SE	5,03	5,29	4,96	-1,3	-6,3
SI	4,63	4,81	4,73	+2,3	-1,6
SK	4,64	4,54	5,01	+8,0	+11
UK	6,20	6,09	6,21	+0,2	+2,0



Country	SOFT WHEAT (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	5,97	6,12	6,23	+4,4	+1,9
AT	5,74	5,22	5,53	-3,8	+5,9
BE	8,73	9,27	9,07	+3,9	-2,2
BG	4,58	5,27	5,46	+19	+3,5
CY	-	-	-	-	-
CZ	6,13	5,62	6,25	+1,9	+11
DE	8,02	7,66	8,04	+0,3	+4,9
DK	7,70	8,21	7,55	-2,0	-8,0
EE	3,84	4,20	3,74	-2,5	-11
ES	3,18	2,30	3,21	+0,8	+39
FI	3,96	4,07	3,92	-1,2	-3,8
FR	7,10	7,36	7,53	+6,0	+2,2
GR	2,99	3,15	3,08	+3,0	-2,1
HR	5,19	5,95	5,19	+0,2	-13
HU	5,06	5,47	5,60	+11	+2,4
IE	9,88	10,14	9,99	+1,1	-1,5
IT	5,15	5,49	5,47	+6,2	-0,4
LT	4,67	4,82	4,66	-0,3	-3,4
LU	5,88	5,48	6,09	+3,7	+11
LV	4,29	4,79	4,25	-0,9	-11
MT	-	-	-	-	-
NL	8,96	9,07	9,10	+1,6	+0,4
PL	4,67	4,90	4,74	+1,4	-3,2
PT	2,04	2,05	2,07	+1,1	+0,7
RO	3,93	4,88	4,80	+22	-1,5
SE	6,68	6,99	6,46	-3,4	-7,6
SI	4,99	5,03	4,96	-0,6	-1,4
SK	5,30	4,79	5,70	+7,7	+19
UK	8,20	8,16	8,21	+0,2	+0,6

Soft wheat - yield forecast 2018

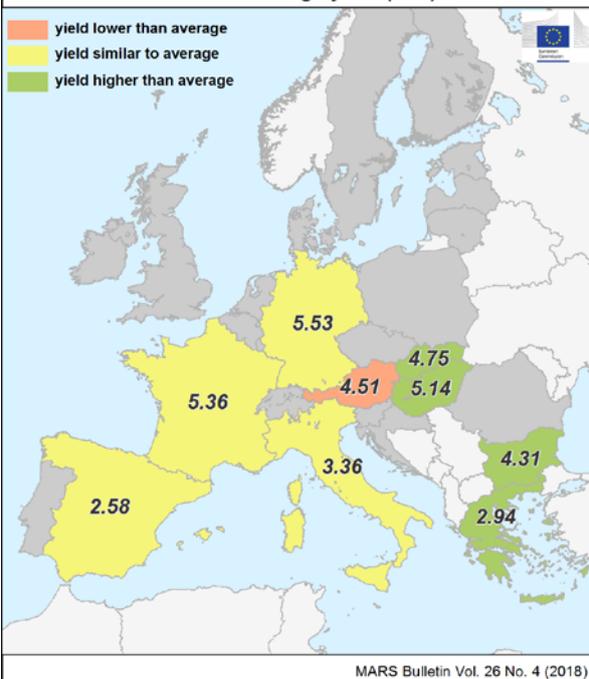
MARS forecast versus average yield (t/ha) 2013 - 2017



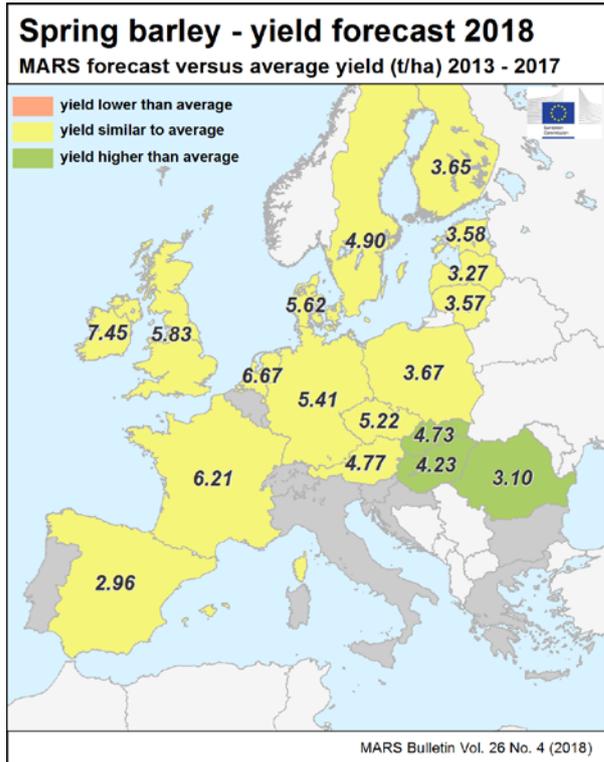
Country	DURUM WHEAT (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	3,40	3,51	3,52	+3,7	+0,3
AT	4,74	4,02	4,51	-4,8	+12
BE	-	-	-	-	-
BG	3,71	4,36	4,31	+16	-1,3
CY	-	-	-	-	-
CZ	-	-	-	-	-
DE	5,55	5,76	5,53	-0,3	-3,9
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	2,54	2,73	2,58	+1,5	-5,6
FI	-	-	-	-	-
FR	5,18	5,73	5,36	+3,6	-6,4
GR	2,77	2,85	2,94	+6,3	+3,1
HR	-	-	-	-	-
HU	4,78	4,71	5,14	+7,5	+9,2
IE	-	-	-	-	-
IT	3,26	3,23	3,36	+2,9	+3,9
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	-	-	-	-	-
RO	-	-	-	-	-
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	4,40	4,26	4,75	+7,9	+11
UK	-	-	-	-	-

Durum wheat - yield forecast 2018

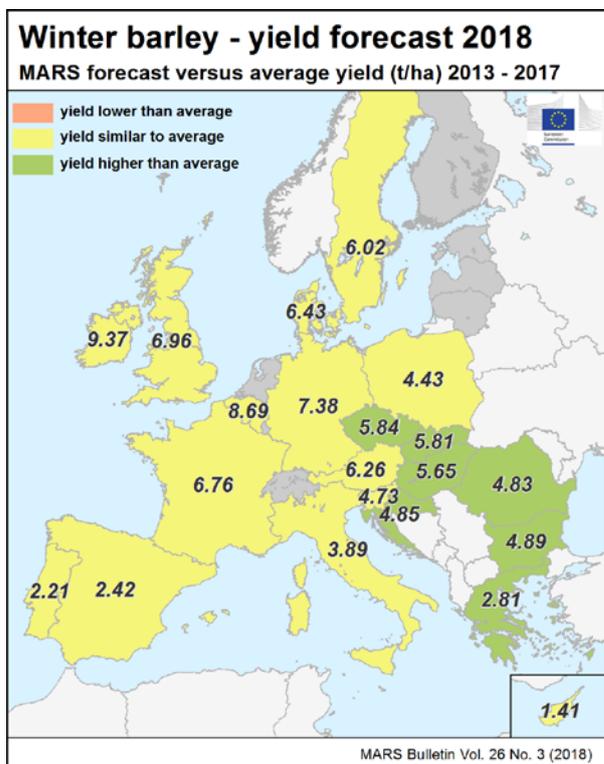
MARS forecast versus average yield (t/ha) 2013 - 2017



Country	SPRING BARLEY (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	4,25	4,06	4,27	+0,5	+5,2
AT	4,65	3,99	4,77	+2,5	+20
BE	-	-	-	-	-
BG	-	-	-	-	-
CY	-	-	-	-	-
CZ	5,19	4,90	5,22	+0,5	+6,4
DE	5,49	5,40	5,41	-1,6	+0,0
DK	5,72	5,82	5,62	-1,7	-3,4
EE	3,55	4,10	3,58	+0,9	-13
ES	2,99	2,29	2,96	-1,0	+29
FI	3,67	4,04	3,65	-0,7	-9,8
FR	5,97	5,91	6,21	+3,9	+5,1
GR	-	-	-	-	-
HR	-	-	-	-	-
HU	3,75	4,37	4,23	+13	-3,3
IE	7,48	7,80	7,45	-0,3	-4,5
IT	-	-	-	-	-
LT	3,60	3,65	3,57	-0,6	-2,0
LU	-	-	-	-	-
LV	3,31	3,32	3,27	-1,2	-1,5
MT	-	-	-	-	-
NL	6,63	5,93	6,67	+0,5	+13
PL	3,63	3,77	3,67	+1,2	-2,5
PT	-	-	-	-	-
RO	2,66	3,31	3,10	+17	-6,5
SE	4,97	5,22	4,90	-1,4	-6,0
SI	-	-	-	-	-
SK	4,49	4,26	4,73	+5,3	+11
UK	5,76	5,60	5,83	+1,1	+4,1



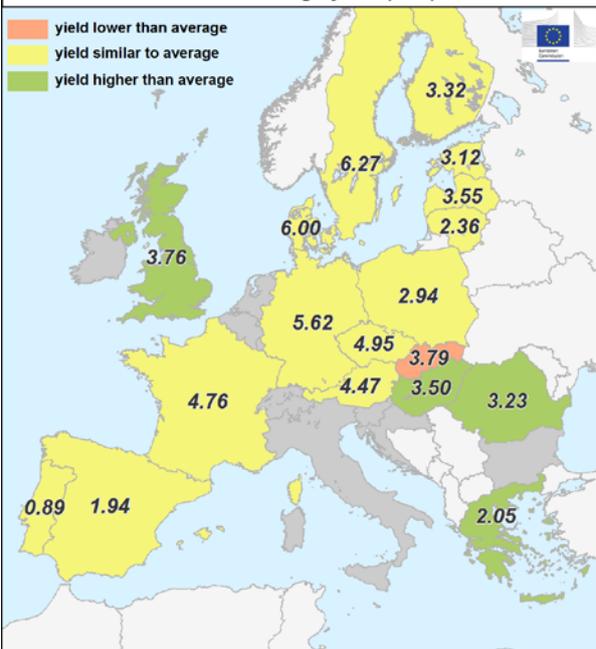
Country	WINTER BARLEY (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	5,79	5,99	6,08	+5,0	+1,6
AT	6,33	6,59	6,26	-1,1	-5,0
BE	8,39	8,89	8,69	+3,5	-2,3
BG	4,12	4,78	4,89	+19	+2,3
CY	1,44	1,81	1,41	-1,9	-22
CZ	5,51	5,78	5,84	+6,1	+1,1
DE	7,36	7,35	7,38	+0,3	+0,4
DK	6,55	6,80	6,43	-1,9	-5,5
EE	-	-	-	-	-
ES	2,41	2,00	2,42	+0,2	+21
FI	-	-	-	-	-
FR	6,51	6,48	6,76	+3,9	+4,3
GR	2,64	2,69	2,81	+6,4	+4,4
HR	4,47	4,98	4,85	+8,6	-2,5
HU	5,02	5,44	5,65	+12	+3,9
IE	9,33	9,10	9,37	+0,4	+2,9
IT	3,81	3,93	3,89	+1,9	-1,1
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	4,38	4,66	4,43	+1,1	-5,1
PT	2,18	1,90	2,21	+1,4	+16
RO	3,95	4,90	4,83	+22	-1,4
SE	6,12	6,44	6,02	-1,6	-6,6
SI	4,63	4,81	4,73	+2,3	-1,6
SK	5,17	5,27	5,81	+12	+10
UK	6,98	6,97	6,96	-0,2	-0,2



Country	RYE (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	3,93	3,77	3,89	-1,2	+3,2
AT	4,37	3,46	4,47	+2,2	+29
BE	-	-	-	-	-
BG	-	-	-	-	-
CY	-	-	-	-	-
CZ	4,89	4,84	4,95	+1,1	+2,1
DE	5,66	5,01	5,62	-0,7	+12
DK	6,11	6,60	6,00	-1,8	-9,1
EE	3,15	3,93	3,12	-0,9	-21
ES	2,00	1,21	1,94	-3,2	+61
FI	3,41	3,96	3,32	-2,6	-16
FR	4,64	4,59	4,76	+2,6	+3,7
GR	1,79	1,91	2,05	+14	+7,3
HR	-	-	-	-	-
HU	2,99	3,32	3,50	+17	+5,3
IE	-	-	-	-	-
IT	-	-	-	-	-
LT	2,33	2,44	2,36	+1,3	-3,3
LU	-	-	-	-	-
LV	3,60	4,07	3,55	-1,4	-13
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	2,98	3,08	2,94	-1,2	-4,5
PT	0,87	0,85	0,89	+1,8	+3,5
RO	2,55	3,20	3,23	+26	+1,0
SE	6,24	6,61	6,27	+0,5	-5,1
SI	-	-	-	-	-
SK	3,95	4,45	3,79	-4,1	-15
UK	2,63	1,42	3,76	+43	+165

Rye - yield forecast 2018

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

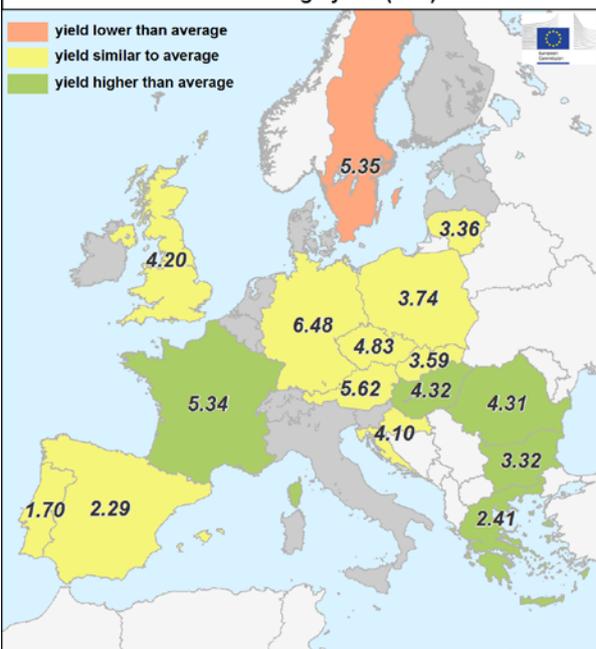


MARS Bulletin Vol. 26 No. 4 (2018)

Country	TRITICALE (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	4,23	4,25	4,32	+2,2	+1,7
AT	5,45	5,16	5,62	+3,0	+8,9
BE	-	-	-	-	-
BG	3,11	3,40	3,32	+6,7	-2,5
CY	-	-	-	-	-
CZ	4,81	4,83	4,83	+0,4	-0,1
DE	6,44	5,96	6,48	+0,6	+8,8
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	2,25	1,81	2,29	+1,7	+26
FI	-	-	-	-	-
FR	5,09	5,20	5,34	+4,9	+2,7
GR	2,21	2,22	2,41	+9,1	+8,7
HR	4,06	4,50	4,10	+0,9	-8,8
HU	4,03	3,97	4,32	+7,3	+9,0
IE	-	-	-	-	-
IT	-	-	-	-	-
LT	3,36	3,26	3,36	-0,0	+3,0
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	3,74	3,93	3,74	+0,2	-4,8
PT	1,64	1,48	1,70	+3,7	+15
RO	3,68	4,39	4,31	+17	-1,8
SE	5,60	5,79	5,35	-4,4	-7,5
SI	-	-	-	-	-
SK	3,72	3,56	3,59	-3,7	+0,8
UK	4,30	4,50	4,20	-2,5	-6,8

Triticale - yield forecast 2018

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

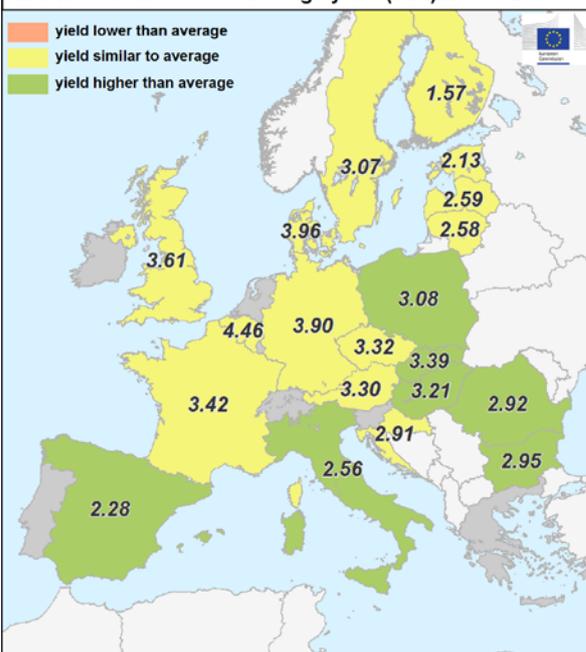


MARS Bulletin Vol. 26 No. 4 (2018)

Country	RAPE AND TURNIP RAPE (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	3,28	3,25	3,33	+1,5	+2,6
AT	3,34	2,89	3,30	-1,2	+14
BE	4,44	5,50	4,46	+0,4	-19
BG	2,72	2,84	2,95	+8,5	+4,0
CY	-	-	-	-	-
CZ	3,44	2,90	3,32	-3,3	+15
DE	3,82	3,28	3,90	+1,9	+19
DK	3,96	4,16	3,96	-0,0	-5,0
EE	2,10	2,16	2,13	+1,5	-1,5
ES	2,17	1,61	2,28	+5,0	+42
FI	1,54	1,63	1,57	+1,7	-4,0
FR	3,43	3,82	3,42	-0,3	-10
GR	-	-	-	-	-
HR	2,86	2,79	2,91	+1,5	+4,2
HU	2,95	2,56	3,21	+8,7	+25
IE	-	-	-	-	-
IT	2,42	2,66	2,56	+5,5	-3,8
LT	2,50	3,03	2,58	+3,0	-15
LU	-	-	-	-	-
LV	2,56	2,41	2,59	+1,1	+7,2
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	2,95	3,00	3,08	+4,7	+2,8
PT	-	-	-	-	-
RO	2,68	2,86	2,92	+8,7	+1,9
SE	3,19	3,36	3,07	-3,6	-8,5
SI	-	-	-	-	-
SK	3,07	3,04	3,39	+10	+11
UK	3,49	3,88	3,61	+3,4	-6,9

Rapeseed - yield forecast 2018

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



MARS Bulletin Vol. 26 No. 4 (2018)

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

Sources: 2013-2018 data come from DG Agriculture short-term outlook data (dated March 2018, received on 26.3.2018), Eurostat Eurobase (last update: 27.3.2018) and EES (last update: 15.11.2017).

2018 yields come from MARS Crop Yield Forecasting System (output up to 10.4.2018).

NA = data not available.

Country	WHEAT (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
BY	3,60	3,71	3,75	+4,2	+1,2
DZ	1,62	1,57	1,63	+0,3	+3,2
MA	1,86	1,91	1,96	+5,0	+2,6
TN	1,91	1,90	1,98	+3,7	+4,4
TR	2,71	2,78	3,00	+11	+7,9
UA	3,93	4,11	4,26	+8,2	+3,5

Country	BARLEY (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
BY	3,31	3,46	3,62	+9,2	+4,6
DZ	1,35	1,27	1,32	-2,1	+4,1
MA	1,25	1,50	1,34	+7,5	-11
TN	1,12	1,21	1,16	+2,7	-4,5
TR	2,58	2,40	2,68	+4,1	+12
UA	2,95	3,31	3,24	+9,8	-2,2

Country	GRAIN MAIZE (t/ha)				
	Avg Syrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
BY	5,46	5,33	5,56	+1,8	+4,2
DZ	-	-	-	-	-
MA	-	-	-	-	-
TN	-	-	-	-	-
TR	9,21	9,40	9,62	+4,5	+2,3
UA	6,07	5,44	6,13	+1,0	+13

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

Sources: 2013-2017 data come from USDA, DSASI-MADR Algeria , INRA Maroc, CNCT Tunisie, Turkish Statistical Institute (TurkStat), Eurostat Eurobase (last update: 27.3.2018), State Statistics Service of Ukraine, FAO and PSD-online 2018 yields come from MARS Crop Yield Forecasting System (output up to 10.4.2018)

5. Pastures in Europe — regional monitoring

Favourable conditions in most of the EU

Overall, positive pasture conditions are prevailing across the EU in the initial stages of development after a predominantly mild winter. In **Romania, Hungary** and **Bulgaria**, pasture regrowth after winter started in March. The significant rainfall registered in the main pasture areas will benefit biomass formation during April. Furthermore, in **France**, weather conditions have been favourable for pasture growth, particularly along the Atlantic coastline (e.g. in *Bretagne* and *Poitou-Charentes*), where mild winter temperatures led to early development of grasslands beginning in January, interrupted only by a cold spell at the end of February. In the *Dehesa* area of **Spain** and **Portugal**, abundant precipitation registered during the first half of March was essential for pasture productivity to partly recover after a very dry winter; soil moisture is now high and the outlook until the end of April is very favourable.

In some regions of north-western Europe (the northern **Netherlands**, northern **Germany**, **Denmark**, **Ireland** and **Scotland**), where grasslands had started to regrow after January, the cold spell registered in the last week of February stopped biomass formation. The growth of grasslands resumed in mid March and has progressively been recovering to average levels. In central and southern **United Kingdom**, pasture conditions are average.

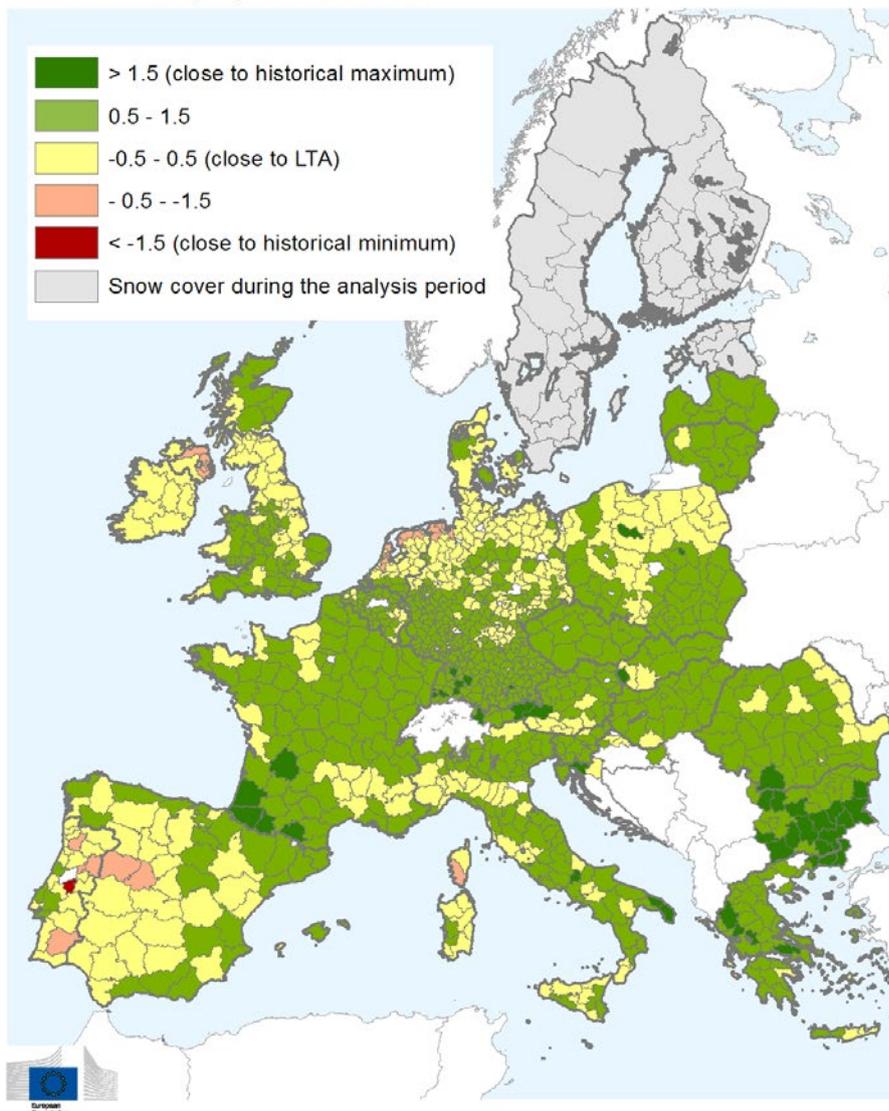
In central Europe (the **Czech Republic**, **Slovakia** and **Austria**) and the Baltic countries, pasture development has not yet started after the winter period. In most regions of these countries, winter temperatures were less cold than usual; this led to less loss of vegetation greenness than usual from December to March, which is positively reflected in the Pasture Productivity Index.

Relative index of pasture productivity

Period of analysis: 1 February - 31 March 2018

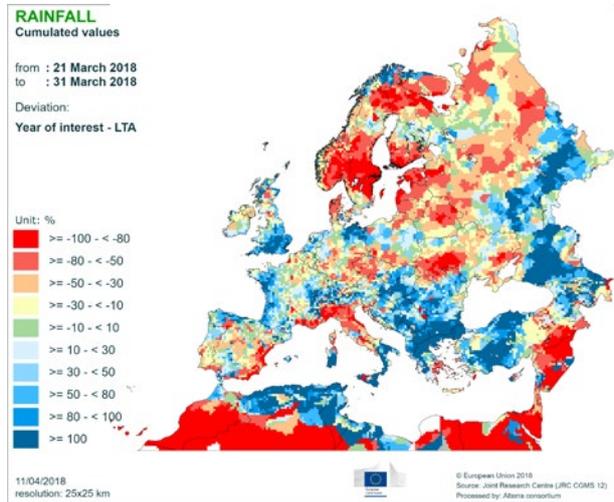
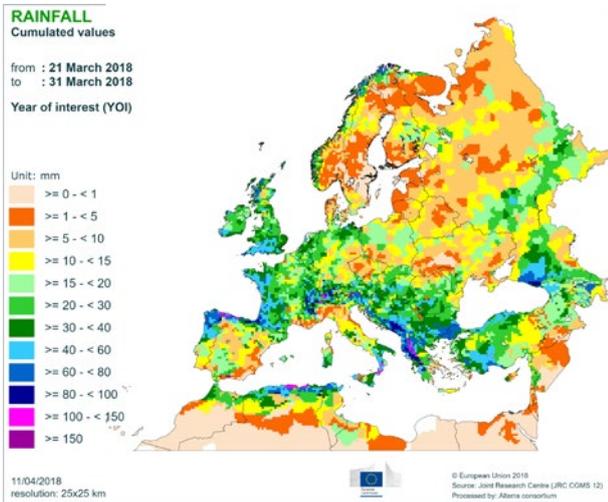
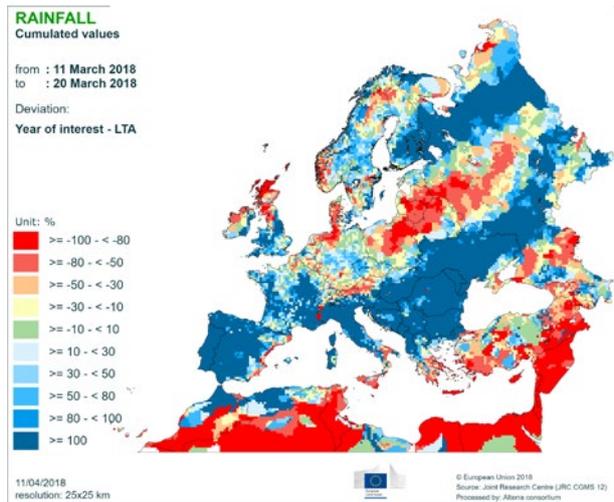
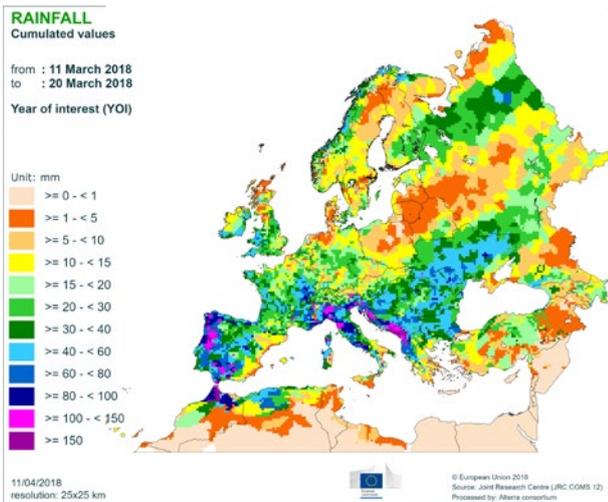
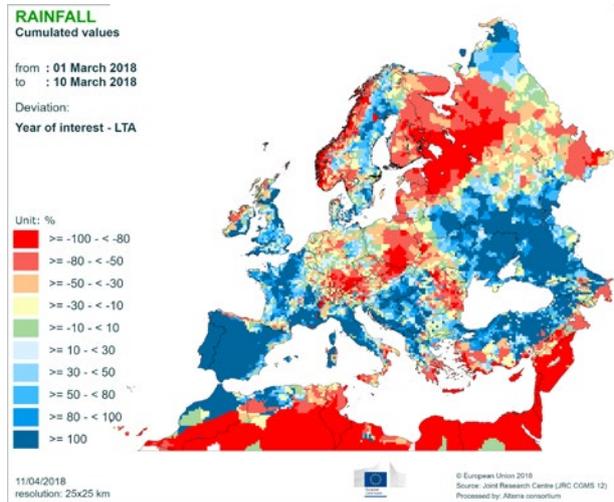
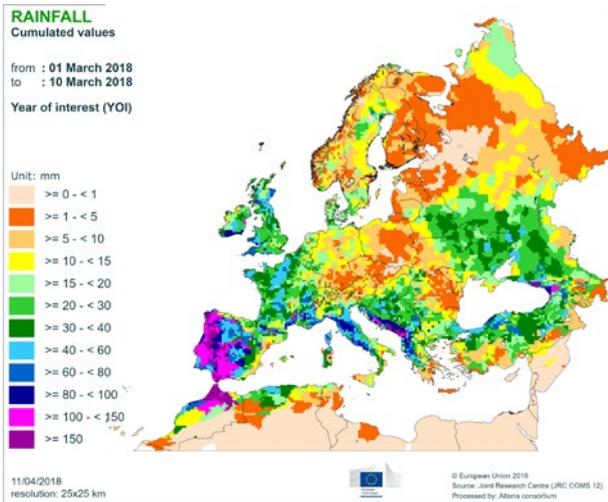
Index based on Copernicus GEOV2 fAPAR 10-day product.

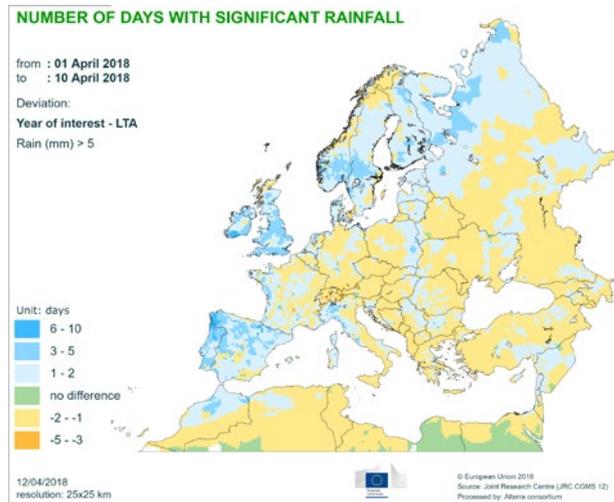
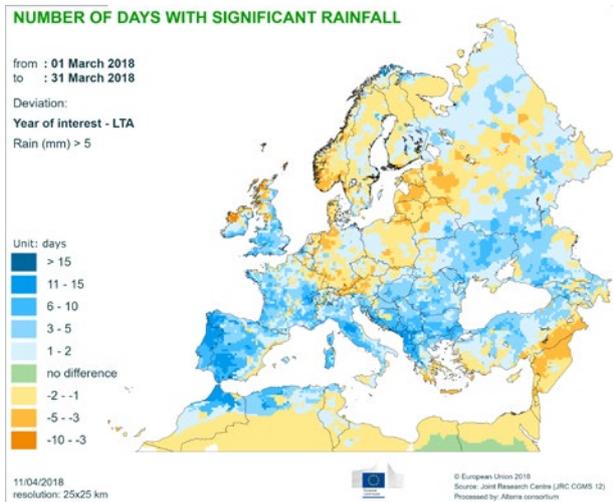
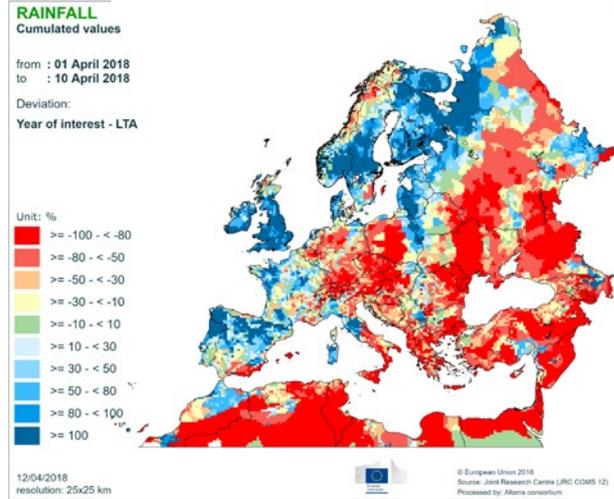
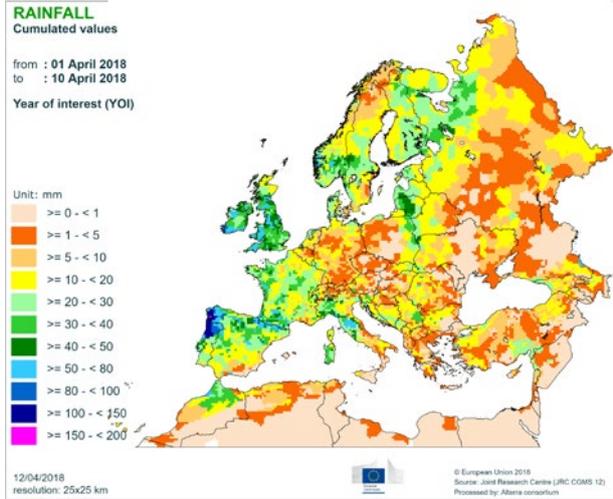
Historical archive (LTA) from 1999 to 2017



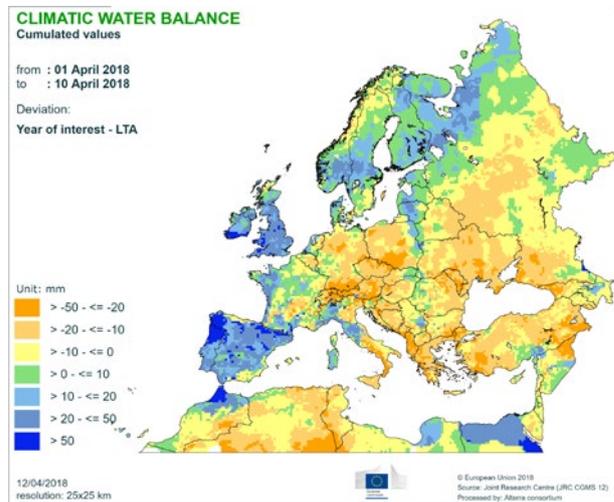
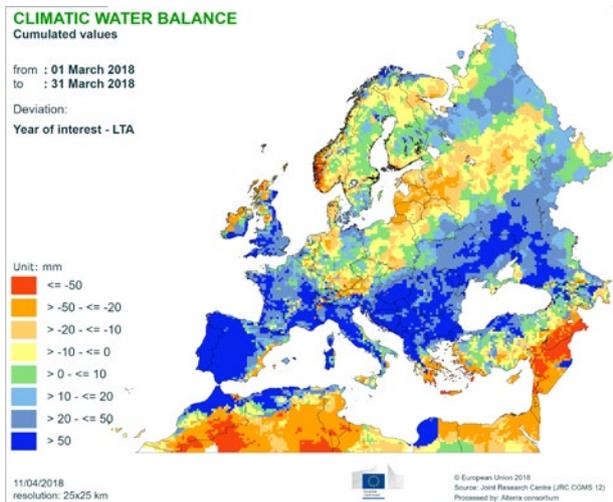
6. Atlas

Precipitation

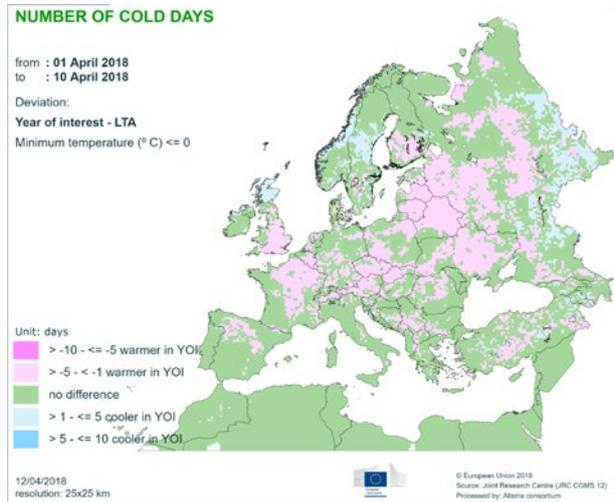
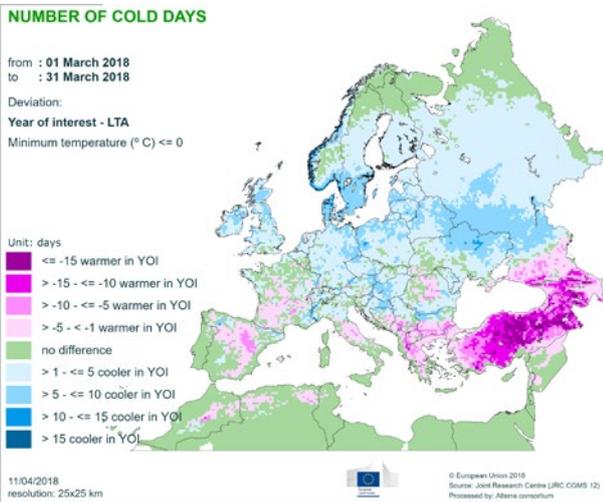
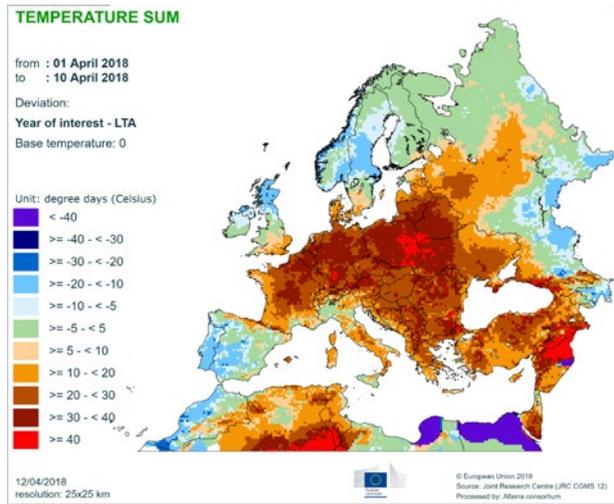
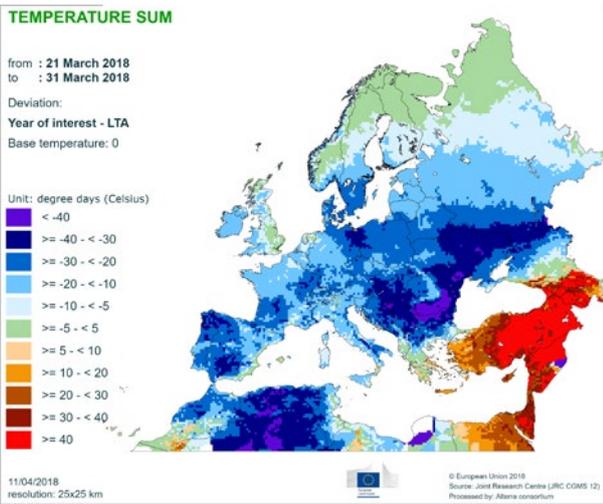
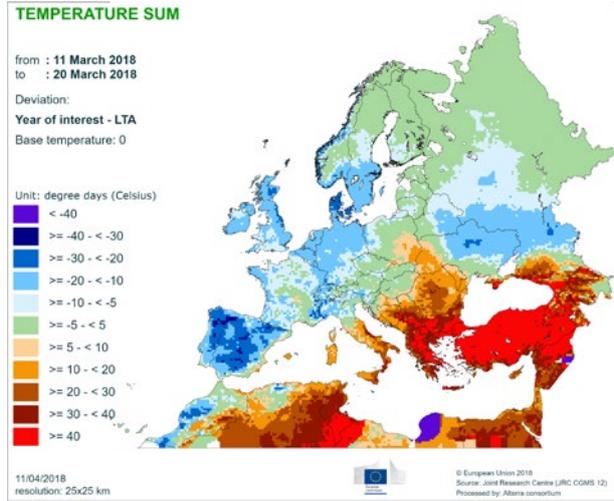
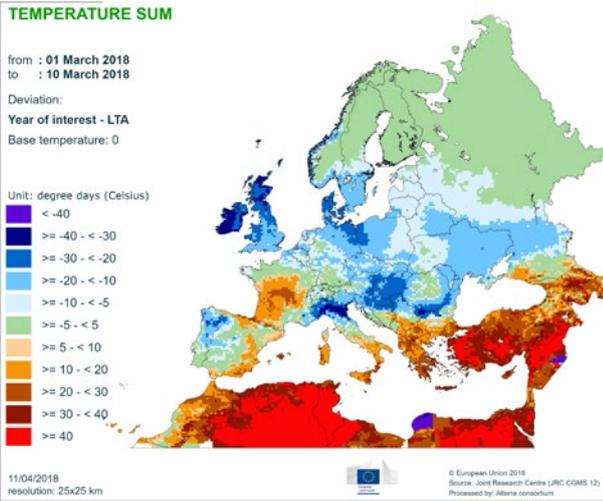




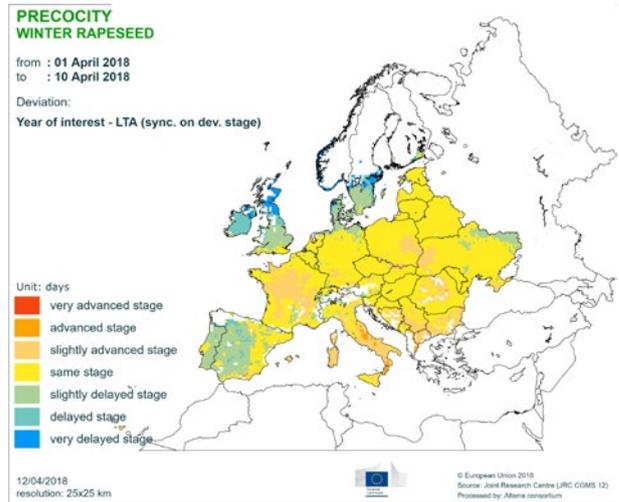
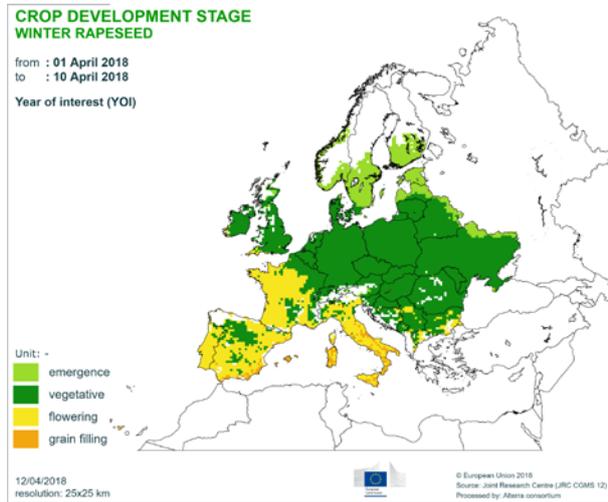
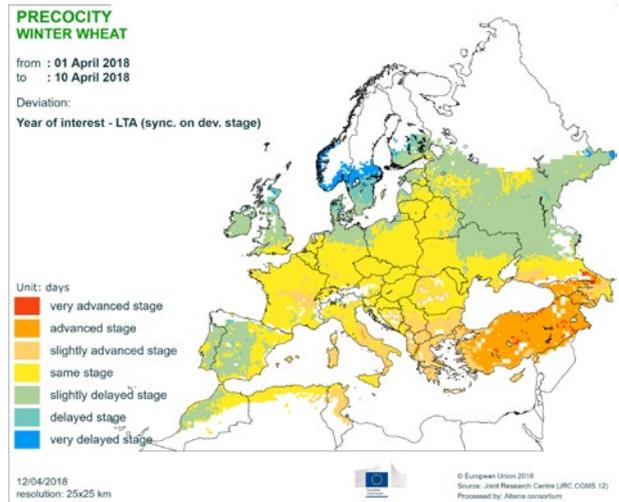
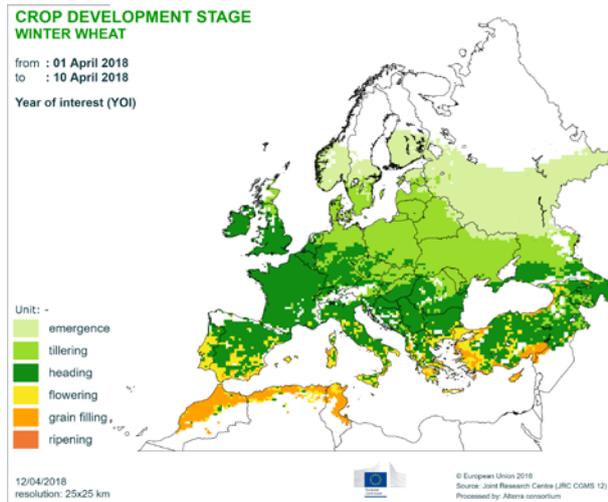
Climatic water balance



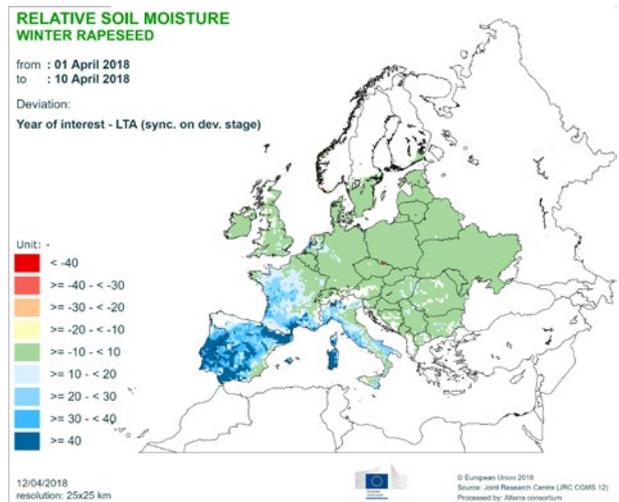
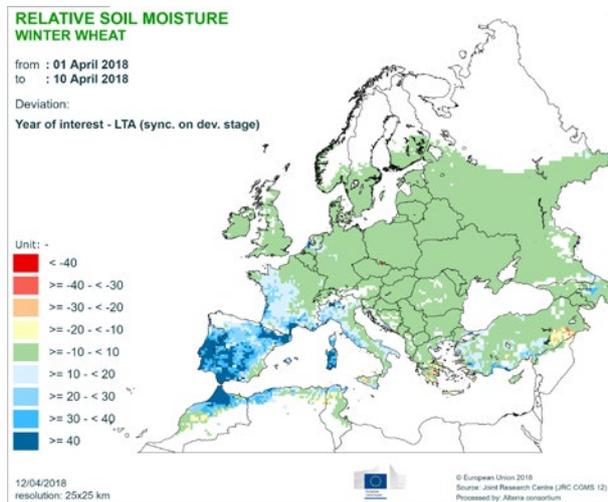
Temperature regime



Crop development stages and precocity



Relative soil moisture



JRC MARS Bulletins 2018

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

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

JRC MARS Bulletins are available at:
<https://ec.europa.eu/jrc/en/mars/Bulletins>
<http://agri4cast.jrc.ec.europa.eu/>

Analysis and reports

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

Reporting support

Prepress projects, I. Biavetti

Editors

M. van den Berg, S. Niemeyer, M. van der Velde

Data production

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

Contact

JRC D5/MARS4CAST
JRCMARSBULLETIN@ec.europa.eu

*MARS stands for Monitoring Agricultural Resources

Legal notice:

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of this publication.

Disclaimer:

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

Technical note:

The long-term average (LTA) used within this bulletin as a reference is based on an archive of data covering 1975–2016.

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