



JRC MARS Bulletin

Crop monitoring in Europe

March 2018

Overall, a fair start to the season

Frost damage remains limited despite end-of-winter cold spell

Weather conditions have generally been adequate for the wintering and early establishment of winter cereals, despite the unusual weather conditions experienced in large parts of Europe.

During the end of February and the first days of March, central and eastern Europe were under the influence of a cold spell, with minimum temperatures that ranged from below - 10 °C (France, Germany and along the western coast of the Black Sea) down to - 20 °C (the Czech Republic, Slovakia, Hungary, Romania, Bulgaria and the Balkan countries) or even lower (the Baltic countries, Finland, Sweden, Ukraine and Russia).

In western and southern regions of the Iberian peninsula and in northern Morocco, abundant precipitation occurred during the first days of March (> 100 mm). This surplus was beneficial and halted the persistent drought that had been ongoing since spring 2017. A distinct surplus of rain was also recorded in central Italy, along the eastern Adriatic coast and in western and central Greece.

Precipitation remained well below the average in the north-eastern Maghreb region (eastern Algeria and Tunisia) as well as in Poland.

Unusually warm conditions prevailed in Turkey, with February recorded as the warmest in our records (i.e. since 1975).

The yield forecasts for winter crops presented in this bulletin are based mostly on the statistical trends, which are positive in several countries. This is also reflected at EU level, with forecast yields several percentage points above the 5-year average. However, these figures come with a considerable range of uncertainty, as it is still very early in the season.

AREAS OF CONCERN - EXTREME WEATHER EVENTS

Based on weather data from 1 February 2018 until 23 March 2018



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1. Agrometeorological overview

1.1 Meteorological review (1 February to 12 March)

Colder-than-usual weather conditions prevailed in most of Europe.

- In western Europe and the British Isles, mean daily temperature anomalies (with respect to the long-term average, LTA) ranged between $-2\text{ }^{\circ}\text{C}$ and $-0.5\text{ }^{\circ}\text{C}$. In large parts of these regions, more than 20 days with a minimum temperature below $0\text{ }^{\circ}\text{C}$ were recorded, and the lowest values were mainly between $-10\text{ }^{\circ}\text{C}$ and $-5\text{ }^{\circ}\text{C}$.
- In central, eastern and northern Europe, mean temperature anomalies between $-4\text{ }^{\circ}\text{C}$ (locally $-6\text{ }^{\circ}\text{C}$) and $-2\text{ }^{\circ}\text{C}$ were observed. In these regions, almost the entire period under analysis was characterised by daily minimum temperatures below $0\text{ }^{\circ}\text{C}$, while minimum temperatures below $-8\text{ }^{\circ}\text{C}$ were recorded over 8-15 days in most of these regions (> 25 in western Russia and the Scandinavian peninsula).

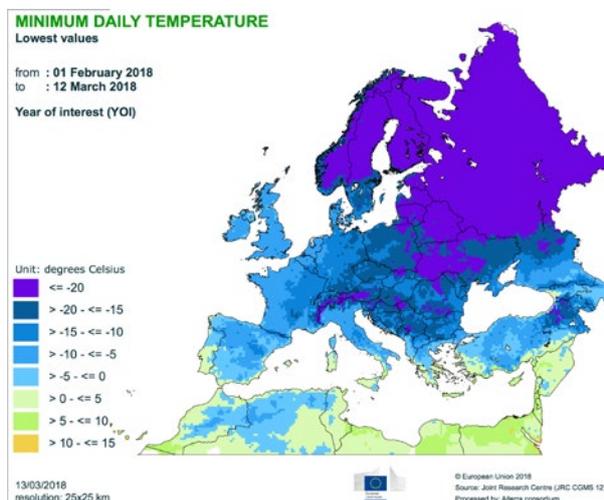
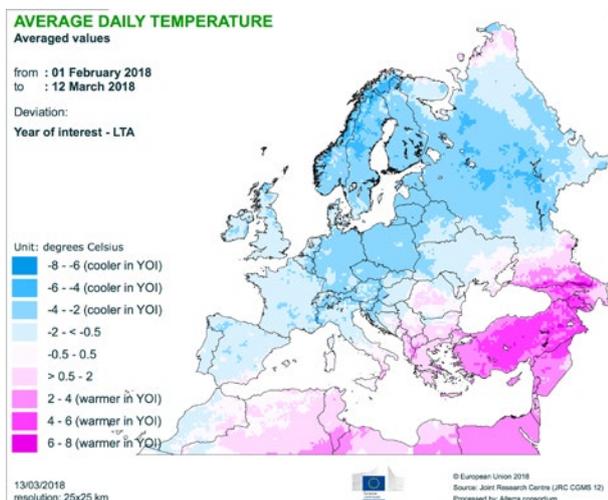
A pronounced cold spell occurred during the second half of February. During this period, minimum air temperatures between $-15\text{ }^{\circ}\text{C}$ and $-10\text{ }^{\circ}\text{C}$ were recorded in the eastern half of France and in central and south-eastern Europe; regionally, minimum temperatures even dropped below $-15\text{ }^{\circ}\text{C}$. Eastern Ukraine, Belarus, the Baltic countries, Scandinavia and north-eastern Europe recorded minimum temperatures well below $-20\text{ }^{\circ}\text{C}$.

Warmer-than-usual weather conditions prevailed in south-eastern Europe and Turkey. Even though south-eastern Europe was affected by the cold spell at the end of February, the period as a whole was characterised by mean daily temperature anomalies (with respect to the LTA) of between $0.5\text{ }^{\circ}\text{C}$ and $2\text{ }^{\circ}\text{C}$. In Turkey, temperature anomalies ranged from $2\text{ }^{\circ}\text{C}$ to $6\text{ }^{\circ}\text{C}$.

Wetter-than-usual weather conditions prevailed in the Iberian peninsula, Italy and south-eastern/eastern Europe. Large areas of these regions were characterised by precipitation anomalies (with respect to the LTA) above 100 %, with cumulative values above 120 mm.

A snow layer covered major parts of central and eastern Europe, the British Isles and the northern part of the Iberian peninsula during the second half of February and the beginning of March.

Drier-than-usual weather conditions prevailed in central, northern and north-eastern Europe. In large areas of these regions, anomalies (with respect to the LTA) of between -80% and -50% were observed, with cumulative precipitation below 40 mm. The analysis period was one of the driest for this time of year in Poland (especially in central parts), where cumulative precipitation reached only 20 mm.



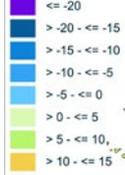
MINIMUM DAILY TEMPERATURE

Lowest values

from : 01 February 2018
to : 12 March 2018

Year of interest (YOI)

Unit: degrees Celsius



13/03/2018
resolution: 25x25 km

© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

NUMBER OF COLD DAYS

from : 01 February 2018
to : 12 March 2018

Year of interest (YOI)

Minimum temperature ($^{\circ}$ C) <= 0

Unit: days



13/03/2018
resolution: 25x25 km

© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

RAINFALL

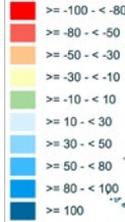
Cumulated values

from : 01 February 2018
to : 12 March 2018

Deviation:

Year of interest - LTA

Unit: %



13/03/2018
resolution: 25x25 km

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Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

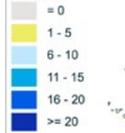
NUMBER OF DAYS WITH SIGNIFICANT RAINFALL

from : 01 February 2018
to : 12 March 2018

Year of interest (YOI)

Rain (mm) > 5

Unit: days



13/03/2018
resolution: 25x25 km

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Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

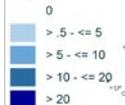
SNOW DEPTH

Highest values

from : 25 February 2018
to : 05 March 2018

Year of interest (YOI)

Unit: cm



07/03/2018
resolution: 25x25 km

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Source: Joint Research Centre (JRC CGFS)
Processed by: Alterra consortium

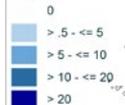
SNOW DEPTH

Averaged values

from : 12 March 2018
to : 12 March 2018

Year of interest (YOI)

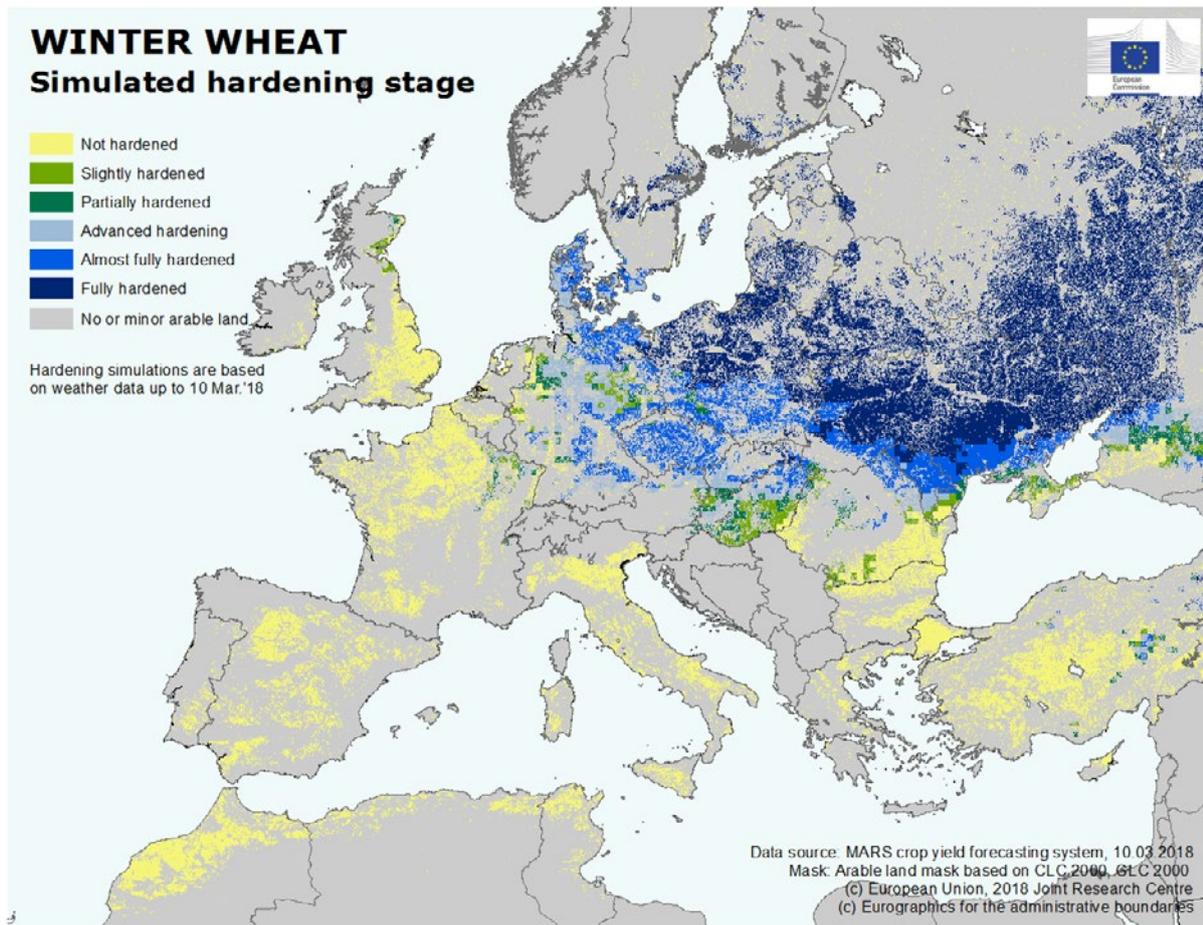
Unit: cm



15/03/2018
resolution: 25x25 km

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Source: Joint Research Centre (JRC CGFS)
Processed by: Alterra consortium

1.2 Winter hardening and frost-kill analysis



Model simulations based on observations up to 10 March indicate winter cereals that are not or are only slightly hardened⁽¹⁾ in France, the United Kingdom and the Benelux countries and in large areas of southern Europe and western Turkey. Winter crops are only partially hardened in western Germany and some areas of the Carpathian Basin and southern Ukraine. In late February, frost tolerance increased in a large region extending from eastern England to southern Ukraine, due to a cold spell. However, in the first dekad of March, de-hardening started at the south-western fringes of this region. The hardening stage is generally advanced or almost fully advanced in eastern Germany, Denmark, south-western Poland, the Czech Republic, Slovakia, Austria and the areas along both sides of the western border of Ukraine. Full hardening is maintained in Finland, the Baltic countries, north-eastern Poland and eastern Europe, except in the abovementioned milder areas.

Our frost-kill model simulation suggests minor frost-kill damage of winter wheat in north-western France, eastern Germany, western Poland, south-eastern Hungary, the Balkan

peninsula, southern Ukraine and Turkey. Moderate damage is probable in south-eastern Russia.

The occurrence of frost damage in eastern Germany and western Poland could have been supported by — besides the low temperatures — absent or very shallow snow cover (see snow depth map below) and an increased vulnerability of crops due to mild thermal conditions in December and January.

Rapeseed, more sensitive to frost than wheat, may have been negatively affected in eastern Germany and Poland. There is also some risk of local damage in the Czech Republic, eastern Hungary, eastern Slovakia, Bulgaria and eastern Romania.

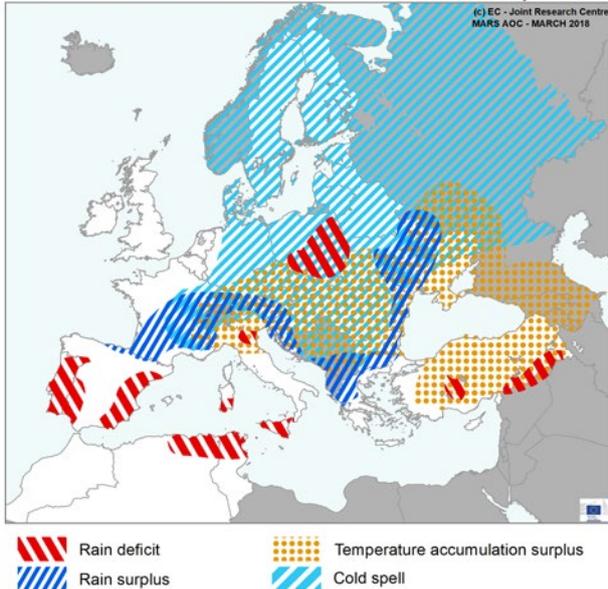
On the basis of the latest medium-range weather forecast, no further frost-kill damage is expected until 20 March.

⁽¹⁾ Hardening is a bio-physiological process in winter cereals that occurs when, in response to cold conditions, the crops transform cellular starch into sugar, thus gaining low-temperature tolerance to survive the harsh winter conditions.

1.3 Winter review (December, January, February)

AREAS OF CONCERN - EXTREME WEATHER EVENTS

Based on weather data from 1 December 2017 until 28 February 2018



The winter was characterised by highly variable temperature conditions. December, January and the first half of February were generally warmer than usual in most of Europe. The most pronounced warm anomalies occurred in eastern Europe (1 °C to 4 °C above the LTA) and north-eastern Europe (4 °C to 6 °C above the LTA). Thermal conditions in large parts of south-eastern Europe and north of the Black Sea were among the warmest on our records for this period.

The coldest period of winter in most of Europe was recorded during the second half of February, which was associated with an incursion of cold polar air mass into central and south-eastern Europe. Air temperature dropped substantially below the normal range of values for the end of winter. Temperatures

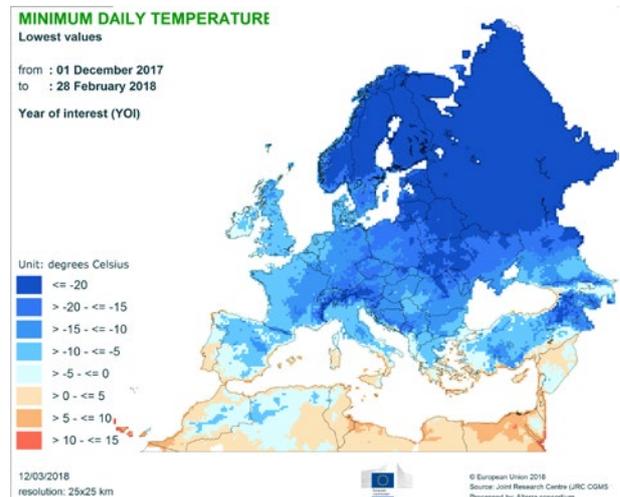
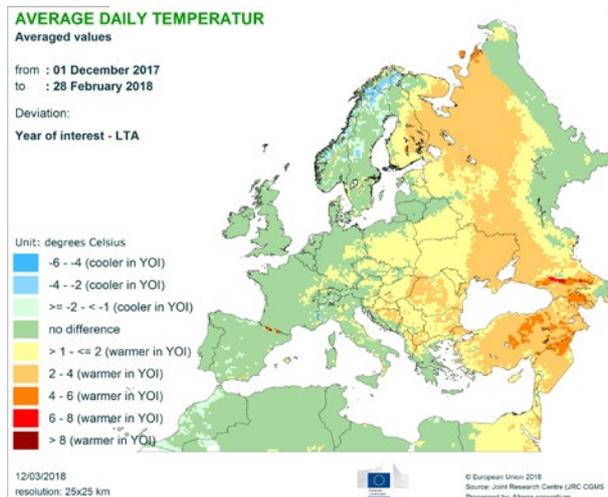
in central Europe were between 4 °C and 6 °C below the LTA, whereas anomalies in the eastern Baltic regions ranged between - 6 °C and - 8 °C (compared to the LTA). Minimum air temperatures between - 15 °C and - 10 °C were recorded in the eastern half of France and central and south-eastern Europe; regionally, the minimum temperature even dropped below - 15 °C. Eastern Ukraine, Belarus, the Baltic regions, Scandinavia and north-eastern Europe recorded minimum temperatures well below - 20 °C.

Weather conditions during the winter as a whole contributed to the temperature surplus in south-eastern Europe, Italy, parts of central Europe and all regions surrounding the Black Sea. The most intensive surplus occurred in Turkey, with more than 150 degree-days above the LTA. Slight negative anomalies in winter temperature sums appeared in the Iberian peninsula and the British Isles.

Drier-than-usual conditions prevailed in southern Poland, parts of eastern Germany and the Czech Republic, southern Italy, the southern part of the Iberian peninsula, western Turkey and northern Scandinavia. The majority of these regions recorded cumulative precipitation between 20 % and 50 % below the normal winter values. The major part of southern Poland and the Czech Republic recorded less than 80 mm of precipitation during the whole winter.

A snow layer was spatially confined mainly to eastern and northern Europe, and to mountainous areas, in December and January. During the second half of February, snow covered major parts of central and eastern Europe, northern Italy, the British Isles and the northern part of the Iberian peninsula.

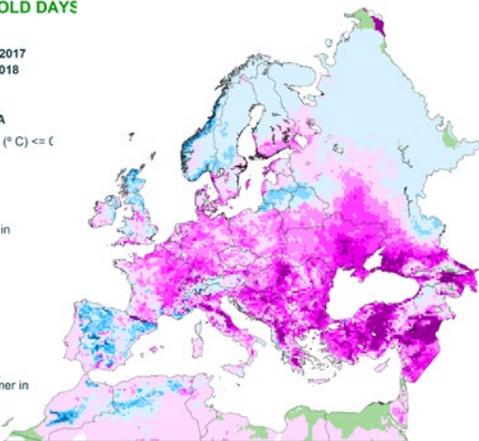
A significant precipitation surplus occurred in most of France, the Alpine areas, south-eastern Europe, Ukraine and the southern part of Scandinavia. In France, precipitation mainly exceeded 200 mm. More than 300 mm was recorded in the Alpine areas, the western Balkans, south-western France and a major part of the British Isles.



NUMBER OF COLD DAYS

from : 01 December 2017
to : 28 February 2018
Deviation:
Year of interest - LTA
Minimum temperature ($^{\circ}\text{C}$) \leq (

- Unit: days
- > 20
 - 15 - 20 . cooler in
 - 10 - 15 . YOI
 - 5 - 10
 - >0 - 5
 - no difference
 - 5 - < 0
 - 10 - -5
 - 15 - -10 . warmer in
 - 20 - -15 . YOI
 - < -20

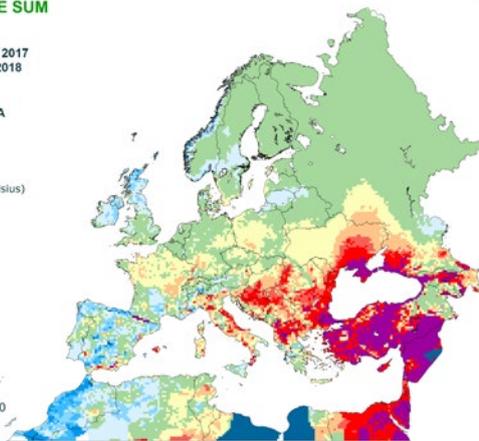


12/03/2018
resolution: 25x25 km
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Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alerna consortium

TEMPERATURE SUM

from : 01 December 2017
to : 28 February 2018
Deviation:
Year of interest - LTA
Base temperature: 0

- Unit: degree days (Celsius)
- ≥ 150
 - $\geq 100 - < 150$
 - $\geq 80 - < 100$
 - $\geq 50 - < 80$
 - $\geq 20 - < 50$
 - $\geq -20 - < 20$
 - $\geq -50 - < -20$
 - $\geq -80 - < -50$
 - $\geq -100 - < -80$
 - $\geq -150 - < -100$
 - < -150



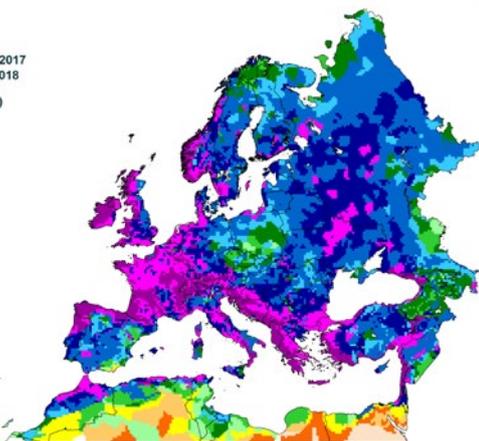
12/03/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alerna consortium

RAINFALL

Cumulated values

from : 01 December 2017
to : 28 February 2018
Year of interest (YOI)

- Unit: mm
- $\geq 0 - < 1$
 - $\geq 1 - < 10$
 - $\geq 10 - < 20$
 - $\geq 20 - < 30$
 - $\geq 30 - < 40$
 - $\geq 40 - < 60$
 - $\geq 60 - < 80$
 - $\geq 80 - < 100$
 - $\geq 100 - < 150$
 - $\geq 150 - < 200$
 - $\geq 200 - < 300$
 - ≥ 300



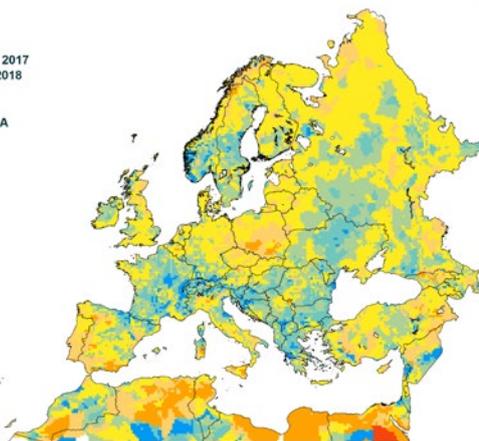
09/03/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alerna consortium

RAINFALL

Cumulated values

from : 01 December 2017
to : 28 February 2018
Deviation:
Year of interest - LTA

- Unit: %
- ≤ -100
 - $> -100 - \leq -50$
 - $> -50 - \leq -20$
 - $> -20 - \leq 20$
 - $> 20 - \leq 50$
 - $> 50 - \leq 100$
 - > 100

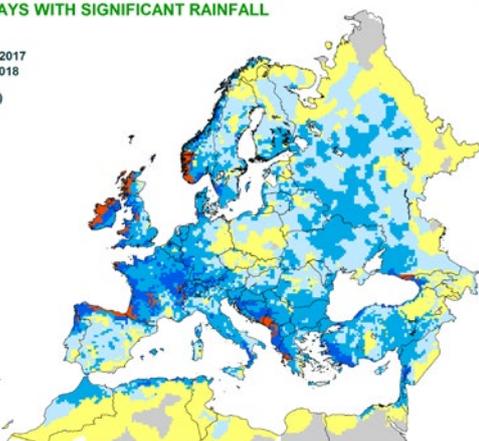


09/03/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alerna consortium

NUMBER OF DAYS WITH SIGNIFICANT RAINFALL

from : 01 December 2017
to : 28 February 2018
Year of interest (YOI)
Rain (mm) $>$ 5

- Unit: days
- = 0
 - 1 - 5
 - 6 - 10
 - 11 - 20
 - 20 - 30
 - ≥ 30



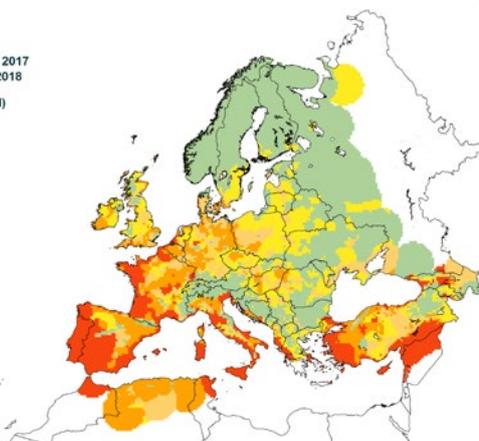
09/03/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alerna consortium

SNOW DEPTH

Highest values

from : 01 December 2017
to : 28 February 2018
Year of interest (YOI)

- Unit: cm
- 0
 - $> 1 - \leq 5$
 - $> 5 - \leq 10$
 - $> 10 - \leq 20$
 - > 20



09/03/2018
resolution: 25x25 km
© European Union 2018
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alerna consortium

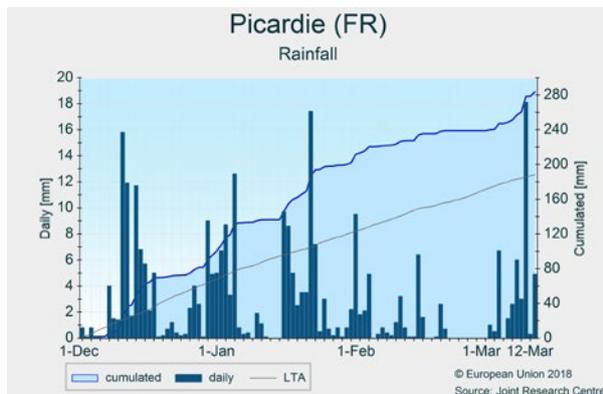
2. Country headlines

2.1 European Union

France

Crop conditions affected by unfavourable weather

A substantial rainfall surplus in December and January caused water logging of some arable land in the northern half of France and damage to winter crops in the most exposed fields. The rainy weather came with a substantial negative radiation anomaly, favouring increased disease pressure, which, depending on weather conditions later in the season, might affect crops. Temperatures remained close to seasonal values in December but January was 3 °C to 4 °C warmer than usual, significantly advancing the tillering stage of winter crops. Temperatures decreased in February and at the end of the month; minimum temperatures dropped below -10 °C in the eastern half of the country. The cold temperatures had an uneven impact on crops, depending on the cultivar, agromanagement, development stage and soil moisture. Overall, the impact on winter cereals is deemed to be minor. Rapeseed leaves froze unevenly but compensation might occur later in the season. Crop yields of winter cereals are forecast to be slightly below the historical trend considering the unusual weather conditions.

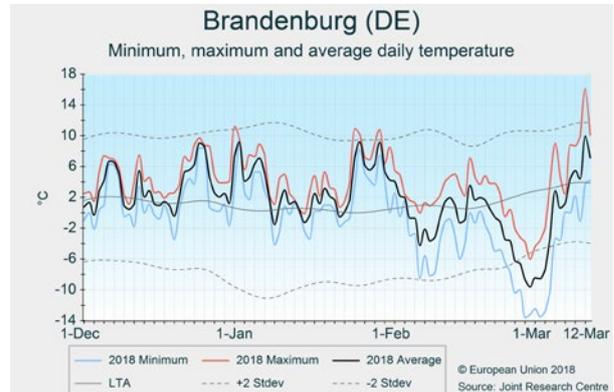


Germany

No major frost damage

After a mild December and January, February was much colder than usual. Nevertheless, the cold spell towards the end of February and at the beginning of March probably did not cause substantial damage to crops in most parts of Germany, thanks to protective snow cover. Locally, in parts of *Brandenburg* and *Sachsen-Anhalt*, this is less certain because of missing snow cover. Precipitation has been scarce since mid-February all over the country. Eastern Germany, especially *Brandenburg*, *Sachsen* and *Thüringen*, exhibits a negative climatic water balance. The rest of the country has benefited from wetter conditions earlier this winter and is currently in

a normal range. Yield forecasts are based on long-term trends at this stage.



Poland

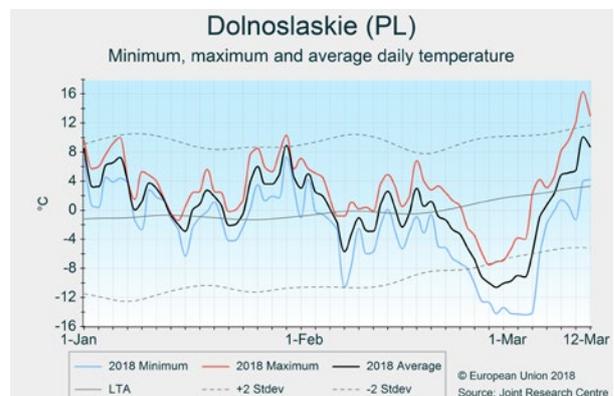
Adequate winter crop growth and development

After excessively wet conditions around sowing and emergence, conditions during winter and spring have been mostly favourable so far, with no major concerns.

Temperatures were around or above the LTA from December until the first half of February; they then dropped during the third week of February, when the minimum daily temperature decreased to below -15 °C in most regions. Thanks to generally good snow cover and good hardening conditions, winter crops generally did not suffer from frost kill. However, in western Poland (*Lubuskie* and *Dolnoslaskie*) crops may have been more affected because of weaker-than-usual hardening and lack of adequate snow cover. Temperatures started increasing again in the first week of March and exceeded the LTA values in the second week of March.

Precipitation was around average across the season throughout the country.

Sowing of spring crops usually starts around mid-March.



United Kingdom and Ireland

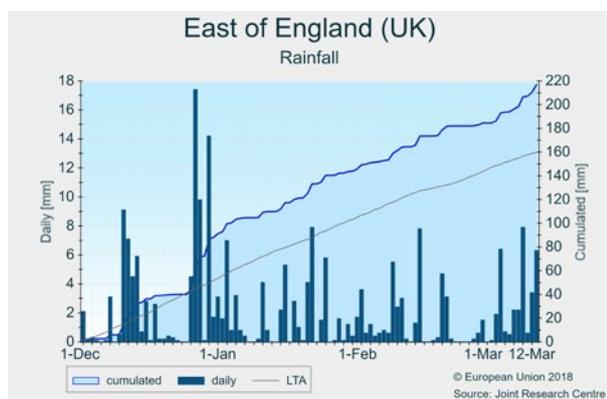
Positive start to the season

The period 1 December to 12 March was characterised by somewhat above-average temperatures, particularly in Ireland and the south-western United Kingdom. A cold spell from the end of February until the beginning of March reached both countries, without damage to crops. The lowest daily minimum temperature in the *South East* of the United Kingdom was about $-8\text{ }^{\circ}\text{C}$ on the last day of February. At the end of the review period, temperatures were generally close to or above average.

Cumulative precipitation during the review period was generally above average.

Frequent rain events in most of the United Kingdom and Ireland caused some delay to field work for spring sowing.

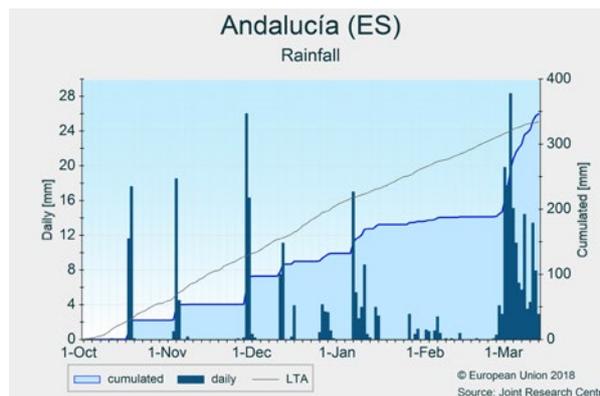
Overall, the conditions so far mark a positive start to the season for winter crops.



Spain and Portugal

Rainfall in the first half of March will improve cereal conditions

The beginning of this season was marked by a persistent drought that hit the western half of the Iberian peninsula after the summer of 2017. Dry conditions delayed the sowing of winter crops until November and December, when some rainfall slightly improved soil moisture conditions, thus favouring adequate crop emergence. January and February were drier than usual in the south and west of the peninsula, which raised concerns that winter cereals could become affected by water stress during the initial phases of tillering. Abundant rainfall during the first half of March — with total precipitation exceeding 100 mm — arrived at the critical moment to avoid possible drought damage, and winter crop conditions should improve considerably in the coming weeks. The yield expectations are around average.



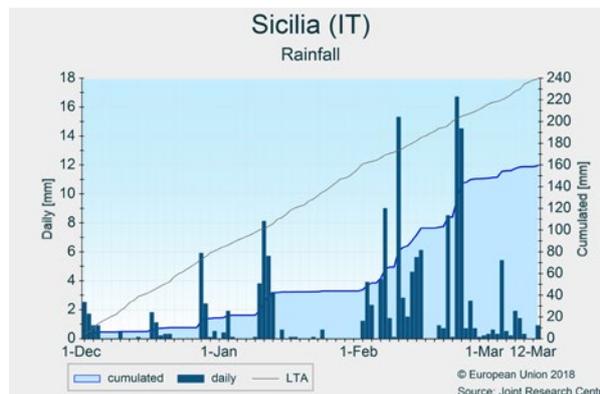
Italy

Rain in February ends dry conditions in Sicily

Overall, conditions in winter were slightly warmer than usual in Italy. Temperatures were close to the LTA in December, higher than usual in January and slightly lower than usual in February. During the first week of March, a cold wave hit northern and central regions but caused no harm to winter crops. The resulting thermal sum from 1 December to 12 March is slightly above the LTA.

In general, winter rainfall accumulation until 12 March is in line with the LTA, with higher accumulations in the western provinces of *Piemonte*, the eastern provinces of *Emilia Romagna* and in *Toscana*, *Marche* and *Umbria*. In Sicily, rainfall accumulation in December and January was the lowest in our records (i.e. since 1976), which started to raise concerns for winter cereals, but the precipitation in February significantly improved the situation.

The yield outlook for winter crops is in line with the trend.

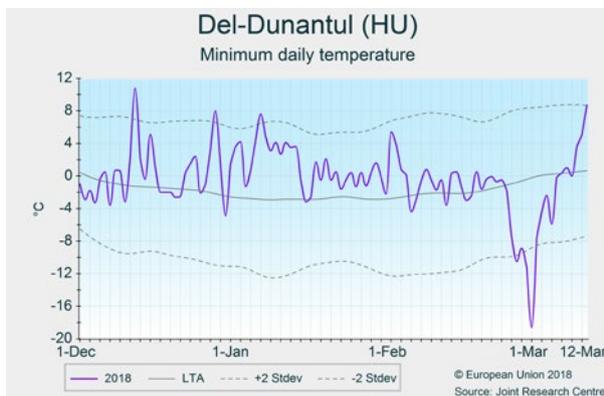


Hungary

Well-wintered crops despite a harsh cold spell in late February and early March

December and January were 2-4 °C milder than usual. Thermal conditions during the first 3 weeks of February were near average, but between 23 February and 6 March the weather was snowy and freezing cold, with minimum temperatures ranging between - 15 °C and - 20 °C. Sufficiently thick snow cover formed, protecting the winter wheat (with only leaf injuries), but the more sensitive rapeseed may have suffered some frost damage locally. Precipitation totals for the review period (1 December to 10 March) are close to the LTA in northern regions, and exceed the LTA by 20-100 mm in southern areas.

The late winter cold period hampered early field activities. In early March, quick melting of the snow cover caused waterlogging, resulting in additional delays to the start of spring barley sowing. Overall, the wintering of crops has been successful so far and provides a promising start to the season.



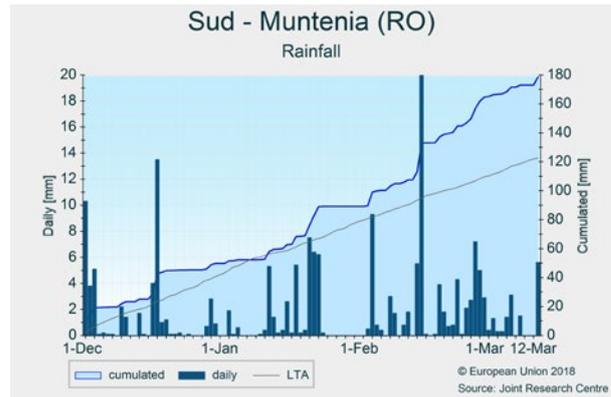
Romania

Extremely cold period at the end of a mild winter

From the beginning of December until mid-February, daily temperatures fluctuated well above the LTA. In the last dekad of February, a sharp drop in temperatures occurred, with minimum temperatures reaching - 15 °C to - 25 °C. Temperatures increased in early March and exceeded the average again after 6 March.

Precipitation was evenly distributed in time. Near-normal totals prevailed in central and eastern Romania. A 30-100 mm surplus was experienced along the Danube and the Hungarian border. In late February, thick snow cover formed, especially in the south-eastern and southern regions. The melted snow replenished soil water levels, but may locally have caused waterlogging problems.

The dormancy period of winter crops has persisted for longer than usual because of the extraordinary late February cold. Harsh frosts coupled with shallow snow cover (particularly in central-eastern Romania) may have negatively affected the more sensitive rapeseed. The current yield forecast is based on the trend at this very early stage of the cropping season.

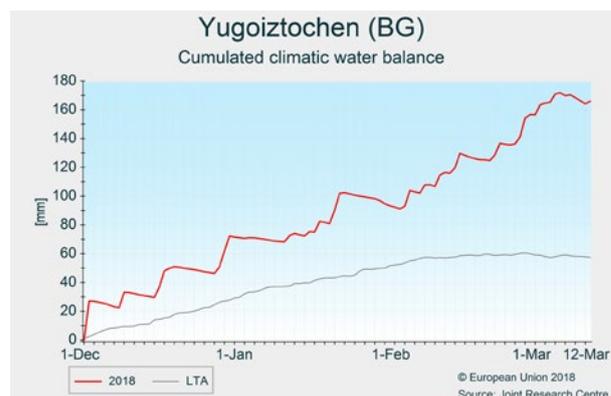


Bulgaria

Adequate winter crop conditions

Since the beginning of December, mild weather conditions have prevailed in Bulgaria, with a 2-4 °C positive thermal anomaly. The exception occurred during the last days of February and the first days of March, which was among the coldest end-of-winter periods in our 43-year climatological record. The most severe frosts reached between - 12 °C and - 21 °C.

Precipitation totals during the review period (1 December to 12 March) exceeded the LTA in the northern half of the country, typically by 30-50 %, while in the southern regions it exceeded the LTA by 50-100 %, except in some parts of north-eastern and southern Bulgaria, which were drier than usual. Soil moisture levels are adequate for the regrowth of winter crops and for the start of the spring sowing campaign. Weather conditions were appropriate for the successful wintering of rapeseed and winter cereals. Thick snow cover protected the crops against severe frost events. Therefore, no significant frost kill is likely to have occurred.

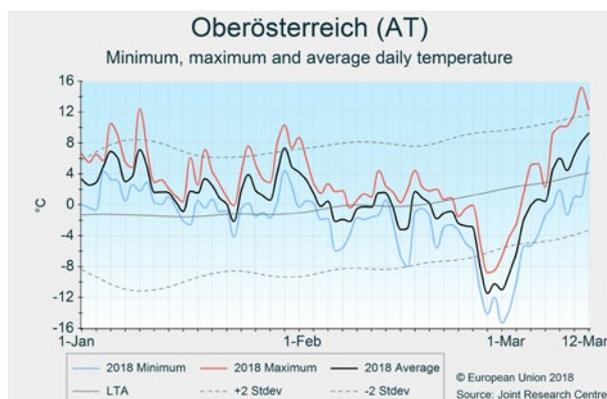


Austria, Slovakia and the Czech Republic

Mild winter interrupted by pronounced cold spell

December and January were characterised by a substantial warm weather anomaly, with temperatures exceeding the LTA by between 2 °C and 4 °C. January was among the warmest in our records in Austria. Temperatures during the first two dekads of February were around the LTA. The coldest period of the winter was recorded at the end of February and the beginning of March. Minimum temperatures in the main agricultural areas ranged between - 20 °C and - 10 °C. Nevertheless, according to our simulations, frost damage to winter cereals was limited because of protective snow cover. Temperatures returned to normal towards the end of the first dekad of March. Precipitation since the beginning of winter has been around the LTA, with a mild precipitation deficit in the eastern Czech Republic, northern Austria and north-eastern Slovakia.

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



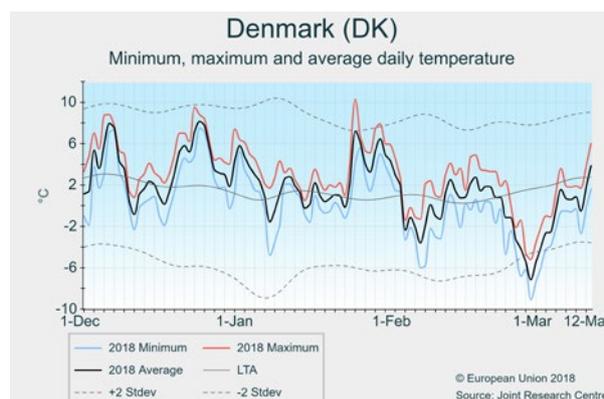
Denmark and Sweden

Adequate thermal conditions for cereal crops

Warmer-than-usual temperatures prevailed in December and January in both countries, but in February temperatures dropped below zero at the beginning and end of the month, reaching the lowest daily minimum temperatures of - 9 °C and - 15.5 °C respectively in Denmark and *Östra Sverige*, on the last day of the month. From the beginning of March, temperatures gradually increased until they reached close-to-normal values at the end of the review period. Only minor frost-kill damage can be expected so far, as cereal crops were almost fully hardened during the cold spell and protected by snow cover throughout both countries.

Precipitation was significantly above average in Sweden and close to average in Denmark, whereas global radiation was well below average in Sweden and close to average in Denmark.

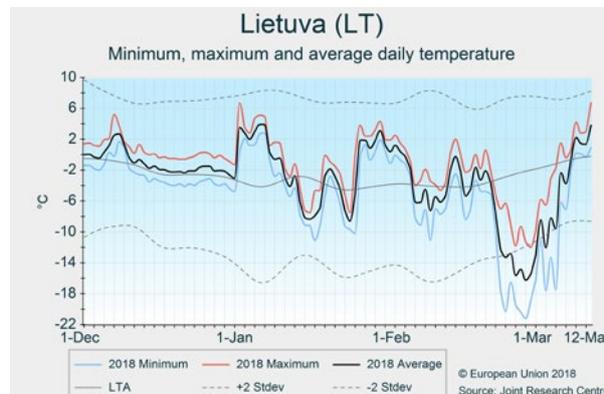
Overall, the generally mild conditions in both countries were favourable to winter crops, and good yields are expected.



Finland, Lithuania, Latvia and Estonia

Mild winter with minor frost-kill damage

Winter conditions were warmer than usual (by about 2-3 °C) from December until mid February, but temperatures were sufficiently low to accomplish full hardening of winter crops before the arrival of the cold spell that hit the region from 18 February to 9 March. Minimum temperatures during the cold spell reached values below - 20 °C for at least 5 consecutive days. Nevertheless, no frost-kill damage was detected by our simulations, as snow cover in most parts helped to protect crops. Regrowth after winter dormancy has not yet started. Our yield forecasts are based on historical trends and the 5-year average. It is still too early for the sowing of spring crops.



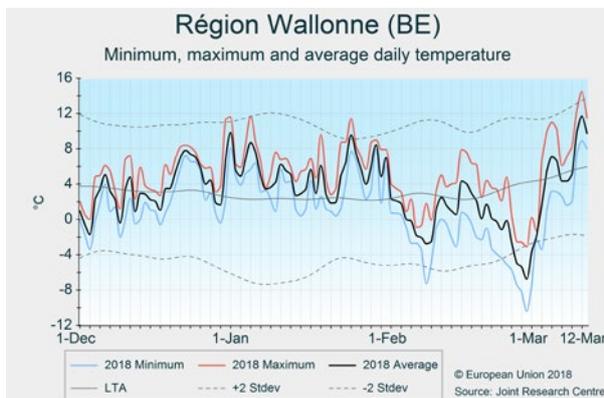
Belgium, the Netherlands and Luxembourg

Fair start to the season

The period of review (1 December to 12 March) presented large temperature fluctuations. December started colder than usual; January was one of the mildest on our records, and February one of the coldest (i.e. since 1975). The greatest contrasts occurred in southern Belgium and Luxembourg. The last days of February and the first days of March were particularly cold for this time of year, but minimum temperatures remained above $-12\text{ }^{\circ}\text{C}$ in most agricultural areas.

Precipitation was well above average in the coastal provinces of Belgium and the south-western Netherlands, as well as in Luxembourg and south-eastern Belgium. It was close to average in other parts. The second week of December was particularly wet.

Despite the extremes, these conditions have overall been adequate for winter crops. Early spring sowing activities are delayed because of the recent cold spell and the forecast of colder-than-usual weather in the coming days.

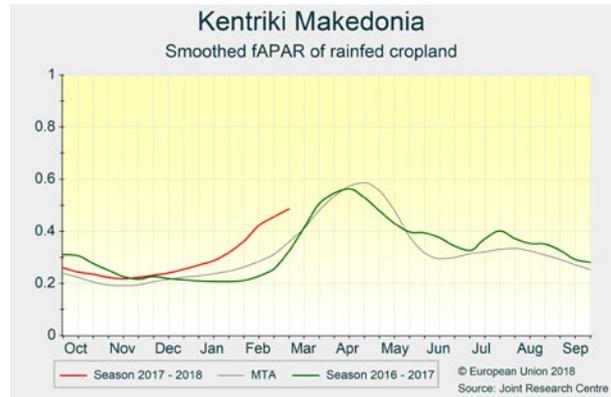


Greece and Cyprus

Mild winter favours early crop development

In north-eastern and central-eastern regions (*Antoliki Makedonia* and *Larissa*), winter temperatures gradually moved from slightly below average in December to slightly above average in February, which, together with adequate soil water conditions, favoured the early growth of winter crops. In central and western regions (e.g. *Trikala*), excessive precipitation in February (> 50 % compared with the seasonal average) locally slowed down crop growth but without compromising possible recovery. Soft wheat and barley yield forecasts are currently slightly below the 5-year average, while the forecast for durum wheat is distinctly above the 5-year average.

In Cyprus, average winter temperatures and relatively abundant precipitation sustained early crop emergence and favourable biomass development. Yield expectations for barley are very positive.



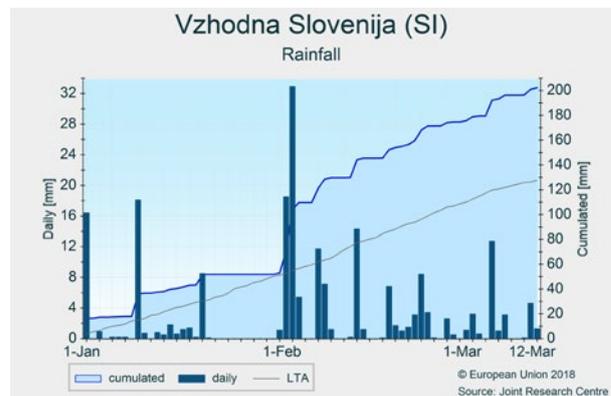
Slovenia and Croatia

Substantial temperature variations

With average temperatures between $2\text{ }^{\circ}\text{C}$ and $4\text{ }^{\circ}\text{C}$ above the LTA, the first 2 months of winter were among the warmest on our records (i.e. since 1975). The warm winter anomaly was interrupted by a cold spell from the end of February until the beginning of March. The coldest days saw minimum temperatures between $-20\text{ }^{\circ}\text{C}$ and $-15\text{ }^{\circ}\text{C}$ in the main agricultural areas. During the cold spell, a thick snow layer protected winter crops against frost kill.

Precipitation since the beginning of the winter has been well above the seasonal average. Cumulative precipitation exceeded 300 mm in western Slovenia, central Croatia and Mediterranean areas. In eastern Slovenia and eastern Croatia, cumulative precipitation between 200 mm and 300 mm was recorded.

The winter crops yield outlook currently follows the historical trend.

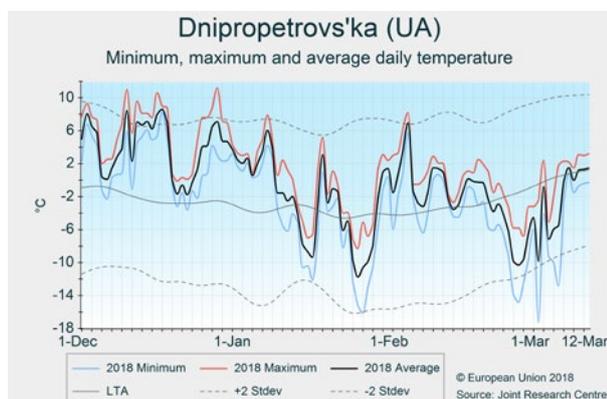


2.2 Black Sea area

Ukraine

Beneficial weather conditions for winter crops so far

From December to mid-January, temperatures were 4 °C above the average, which is very mild compared with the seasonal norm. During the second half of winter, temperatures dropped significantly below average during three cold spells: in mid-January, at the end of January and at the end of February. These were accompanied by substantial snowfall; thus, almost all arable land was covered by relatively thick snow from mid-January onwards, protecting crops and soil against the low temperatures and possible frost damage. Thermal conditions during the following weeks will determine whether there is successful regrowth of the dormant winter crops. Persistent snow cover could delay crop development and eventually have negative impacts on yields.



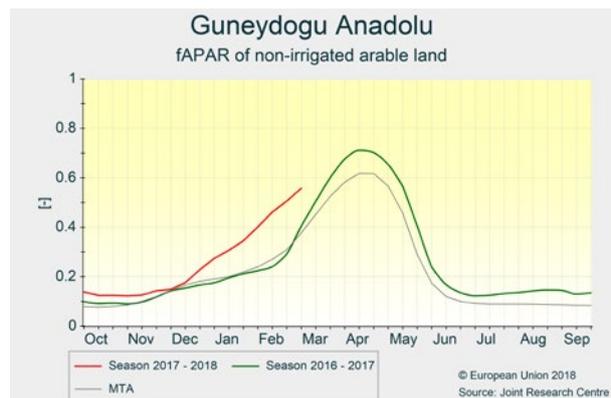
Turkey

Winter crops favoured by mild and rainy winter

In central Turkey (*Bati and Orta Anadolu*), weather conditions in December were optimal for the newly emerged winter crops, with few cold days and around-average precipitation. Favourable weather conditions continued in January (with average temperatures 4-6 °C above the average for the period) and in February. As a result, winter crop regrowth has already started, up to 1 month earlier than usual.

In the south-eastern region (*Guneydogu Anadolu*), temperatures in December (6-8 °C above the average) favoured the germination and emergence of soft and durum wheat. In January, rain that was more abundant than usual restored soil moisture that had suffered a long-lasting deficit since the summer of 2017. Warm and wetter-than-usual weather continued in February and the beginning of March, contributing to the warmest winter since 1975. Crops profited from such conditions and developed earlier than usual.

Yield expectations for winter crops are positive and above the 5-year average.



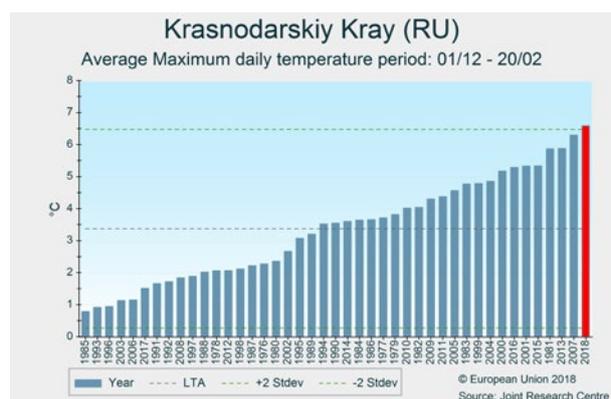
2.3 European Russia and Belarus

European Russia

Successful wintering so far

December and the first half of January presented a 3-6 °C positive thermal anomaly, making this period one of the warmest on our records (i.e. since 1975) in south-western areas of European Russia. In contrast, the last dekad of February and the first dekad of March were exceptionally cold, with daily temperatures 3-12 °C below the LTA, and with severe frosts (typically $-30\text{ }^{\circ}\text{C} < T_{min} < -12\text{ }^{\circ}\text{C}$), except in the warmer southernmost regions.

Considering the review period as a whole (1 December to 12 March), precipitation was generally 20-60 % above seasonal levels in the central, southern and north Caucasian *okrugs*. Elsewhere precipitation remained around average. Since late January, deep snow cover has formed over most of Russia. Therefore, only moderate winter frost-kill damage is so far expected, primarily in areas along the Kazakh border (southern and Volga *okrugs*). It is still early, however, and regrowth in spring will depend strongly on temperature conditions in the coming weeks.



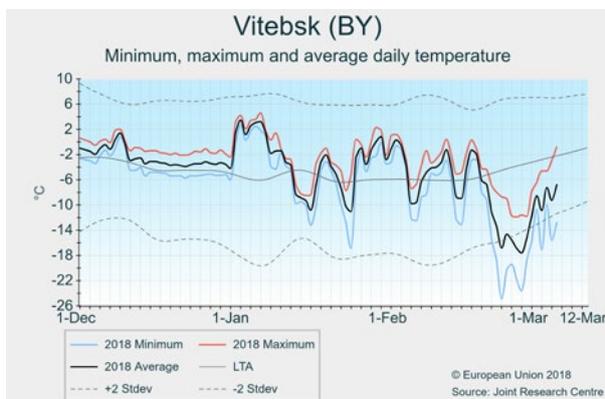
Belarus

Adequate winter crop growth and development

After locally excessively wet conditions around sowing and emergence of winter crops, conditions during winter and spring have been favourable so far, with no major concerns. Temperatures were mainly above or around the LTA from December until the last week of February. During the last week of February and the first week of March, temperatures dropped significantly, with minimum values reaching $-25\text{ }^{\circ}\text{C}$ (in Vitebsk). Thanks to homogeneous snow cover these temperatures did not negatively affect crops. Temperatures returned to average in the second week of March.

Precipitation was around average throughout the season in central and western regions of the country. Higher-than-usual rainfall accumulation was recorded in *Gomel* and *Mogilev*.

The yield outlook for winter crops is in line with the historical trend.

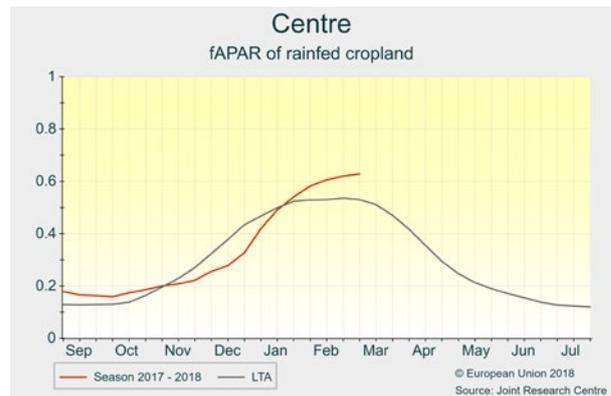


2.4 Maghreb

Morocco, Algeria and Tunisia

Outlook fairly good in Morocco and Tunisia but rain needed in Algeria

In Morocco, most of the winter cereals were sown later than usual, in December, when the autumn rainy period was concentrated. This resulted in a delay to the growing cycle (as reflected in the fAPAR signal). However, since then winter cereals have benefited from well-distributed rainfall during the vegetative period (December-March), and the outlook is positive. Tunisia's main producing regions (i.e. northern and coastal regions) have so far experienced similar positive conditions in terms of water supply. Central regions, in contrast, have experienced low precipitation and rain is needed to sustain crop growth. In Algeria, the campaign in most of the winter cereal-producing regions has been marked by low precipitation. Here, too, water availability is below average and rain is needed to sustain crop development. Our current yield forecasts are in line with the average in Morocco and Tunisia, but slightly below the trend in Algeria.



3. Crop yield forecasts

| Country | TOTAL WHEAT (t/ha) | | | | |
|---------|--------------------|------|---------------------|----------|--------|
| | Avg 5yrs | 2017 | MARS 2018 forecasts | %18/5yrs | %18/17 |
| EU | 5,73 | 5,85 | 5,94 | +3,7 | +1,5 |
| AT | 5,68 | 5,12 | 5,54 | -2,5 | +8,1 |
| BE | 8,73 | 9,27 | 9,07 | +3,9 | -2,2 |
| BG | 4,57 | 5,26 | 5,40 | +18 | +2,5 |
| CY | - | - | - | - | - |
| CZ | 6,13 | 5,62 | 6,03 | -1,7 | +7,3 |
| DE | 8,00 | 7,64 | 7,94 | -0,8 | +3,9 |
| DK | 7,70 | 8,21 | 7,56 | -1,9 | -7,9 |
| EE | 3,84 | 4,20 | 3,74 | -2,5 | -11 |
| ES | 3,07 | 2,39 | 3,07 | -0,2 | +28 |
| 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 | 3,02 | +6,7 | +3,2 |
| HR | 5,20 | 5,95 | 5,19 | -0,1 | -13 |
| HU | 5,05 | 5,44 | 5,58 | +10 | +2,5 |
| IE | 9,88 | 10,1 | 9,88 | -0,1 | -2,6 |
| IT | 3,83 | 3,86 | 3,97 | +3,7 | +2,9 |
| LT | 4,67 | 4,82 | 4,40 | -5,9 | -8,9 |
| LU | 5,88 | 5,48 | 6,09 | +3,6 | +11 |
| LV | 4,29 | 4,79 | 4,25 | -0,9 | -11 |
| MT | - | - | - | - | - |
| NL | 8,96 | 9,07 | 9,11 | +1,6 | +0,4 |
| PL | 4,67 | 4,90 | 4,74 | +1,4 | -3,2 |
| PT | 2,04 | 2,05 | 2,08 | +2 | +1,4 |
| RO | 3,92 | 4,88 | 4,77 | +22 | -2,1 |
| SE | 6,68 | 6,99 | 6,60 | -1,2 | -5,5 |
| SI | 4,93 | 4,71 | 4,96 | +0,6 | +5,4 |
| SK | 5,24 | 4,73 | 5,62 | +7,2 | +19 |
| UK | 8,20 | 8,16 | 8,19 | -0,1 | +0,3 |

| Country | TOTAL BARLEY (t/ha) | | | | |
|---------|---------------------|------|---------------------|----------|--------|
| | Avg 5yrs | 2017 | MARS 2018 forecasts | %18/5yrs | %18/17 |
| EU | 4,91 | 4,89 | 5,02 | +2,2 | +2,5 |
| 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 | 4,87 | +18 | +2,0 |
| CY | 1,44 | 1,81 | 1,81 | +26 | -0,2 |
| CZ | 5,29 | 5,16 | 5,46 | +3,2 | +5,7 |
| DE | 6,94 | 6,93 | 6,84 | -1,5 | -1,3 |
| 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 | 2,59 | -2,0 | -3,9 |
| HR | 4,43 | 4,98 | 4,83 | +8,9 | -3,0 |
| HU | 4,73 | 5,27 | 5,33 | +13 | +1,1 |
| IE | 8,04 | 8,27 | 8,01 | -0,4 | -3,1 |
| IT | 3,81 | 3,94 | 3,89 | +1,9 | -1,3 |
| 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 | 3,79 | 3,96 | 3,84 | +1,3 | -3,0 |
| PT | 2,18 | 1,90 | 2,19 | +0,2 | +15 |
| RO | 3,62 | 4,52 | 4,36 | +20 | -3,5 |
| 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 | 6,20 | +3,8 | +1,4 |
| AT | 5,74 | 5,22 | 5,63 | -2,1 | +7,8 |
| BE | 8,73 | 9,27 | 9,07 | +3,9 | -2,2 |
| BG | 4,58 | 5,27 | 5,41 | +18 | +2,6 |
| CY | - | - | - | - | - |
| CZ | 6,13 | 5,62 | 6,03 | -1,7 | +7,3 |
| DE | 8,02 | 7,66 | 7,96 | -0,8 | +3,8 |
| DK | 7,70 | 8,21 | 7,56 | -1,9 | -7,9 |
| 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 | 2,93 | -2,0 | -6,9 |
| HR | 5,20 | 5,95 | 5,19 | -0,1 | -13 |
| HU | 5,06 | 5,47 | 5,59 | +11 | +2,2 |
| IE | 9,88 | 10,14 | 9,88 | -0,1 | -2,6 |
| IT | 5,15 | 5,49 | 5,47 | +6,1 | -0,4 |
| LT | 4,67 | 4,82 | 4,40 | -5,9 | -8,9 |
| LU | 5,88 | 5,48 | 6,09 | +3,6 | +11 |
| LV | 4,29 | 4,79 | 4,25 | -0,9 | -11 |
| MT | - | - | - | - | - |
| NL | 8,96 | 9,07 | 9,11 | +1,6 | +0,4 |
| PL | 4,67 | 4,90 | 4,74 | +1,4 | -3,2 |
| PT | 2,04 | 2,05 | 2,08 | +1,8 | +1,4 |
| RO | 3,92 | 4,88 | 4,77 | +22 | -2,1 |
| SE | 6,68 | 6,99 | 6,60 | -1,2 | -5,5 |
| SI | 4,93 | 4,71 | 4,96 | +0,6 | +5,4 |
| SK | 5,29 | 4,79 | 5,70 | +7,7 | +19 |
| UK | 8,20 | 8,16 | 8,19 | -0,1 | +0,3 |

| 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 | 5,61 | +1,1 | -2,6 |
| DK | - | - | - | - | - |
| EE | - | - | - | - | - |
| ES | 2,54 | 2,73 | 2,47 | -2,7 | -9,5 |
| FI | - | - | - | - | - |
| FR | 5,18 | 5,73 | 5,36 | +3,6 | -6,4 |
| GR | 2,77 | 2,85 | 3,07 | +11 | +7,4 |
| HR | - | - | - | - | - |
| HU | 4,78 | 4,71 | 4,88 | +2,1 | +3,7 |
| 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 | - | - | - | - | - |

| 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 | 6,05 | +4,4 | +1,0 |
| 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 | 4,87 | +18 | +2,0 |
| CY | 1,44 | 1,81 | 1,81 | +26 | -0,2 |
| CZ | 5,51 | 5,78 | 5,99 | +8,8 | +3,6 |
| DE | 7,36 | 7,35 | 7,24 | -1,6 | -1,5 |
| DK | 6,55 | 6,80 | 6,43 | -1,9 | -5,6 |
| 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 | 2,59 | -2,0 | -3,9 |
| HR | 4,43 | 4,98 | 4,83 | +8,9 | -3,0 |
| HU | 5,02 | 5,44 | 5,65 | +13 | +3,9 |
| IE | 9,33 | 9,10 | 9,33 | +0,0 | +2,5 |
| IT | 3,81 | 3,94 | 3,89 | +1,9 | -1,3 |
| LT | - | - | - | - | - |
| LU | - | - | - | - | - |
| LV | - | - | - | - | - |
| MT | - | - | - | - | - |
| NL | - | - | - | - | - |
| PL | 4,38 | 4,66 | 4,43 | +1,1 | -5,1 |
| PT | 2,18 | 1,90 | 2,19 | +0,2 | +15 |
| RO | 3,95 | 4,90 | 4,87 | +23 | -0,6 |
| SE | 6,12 | 6,44 | 6,05 | -1,1 | -6,1 |
| 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 | -0,3 | -0,2 |

| Country | RYE (t/ha) | | | | |
|-----------|------------|------|---------------------|----------|--------|
| | Avg Syrs | 2017 | MARS 2018 forecasts | %18/5yrs | %18/17 |
| EU | 3,93 | 3,77 | 3,83 | -2,7 | +1,6 |
| AT | 4,37 | 3,46 | 4,50 | +2,8 | +30 |
| BE | - | - | - | - | - |
| BG | - | - | - | - | - |
| CY | - | - | - | - | - |
| CZ | 4,89 | 4,84 | 4,95 | +1,1 | +2,1 |
| DE | 5,66 | 5,01 | 5,43 | -4,2 | +8,3 |
| DK | 6,11 | 6,60 | 5,93 | -3,0 | -10 |
| 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 | 2,01 | +12 | +5,4 |
| HR | - | - | - | - | - |
| HU | 2,99 | 3,32 | 3,49 | +17 | +5,0 |
| 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 | 0,87 | +0,0 | +1,9 |
| RO | 2,55 | 3,20 | 3,22 | +26 | +0,5 |
| SE | 6,24 | 6,61 | 6,30 | +0,9 | -4,8 |
| SI | - | - | - | - | - |
| SK | 3,95 | 4,45 | 3,79 | -4,1 | -15 |
| UK | 2,63 | 1,42 | 3,76 | +43 | +165 |

| Country | TRITICALE (t/ha) | | | | |
|-----------|------------------|------|---------------------|----------|--------|
| | Avg Syrs | 2017 | MARS 2018 forecasts | %18/5yrs | %18/17 |
| EU | 4,23 | 4,25 | 4,28 | +1,4 | +0,9 |
| AT | 5,45 | 5,16 | 5,47 | +0,3 | +6,0 |
| BE | - | - | - | - | - |
| BG | 3,11 | 3,40 | 3,27 | +5,2 | -3,8 |
| CY | - | - | - | - | - |
| CZ | 4,81 | 4,83 | 4,83 | +0,4 | -0,1 |
| DE | 6,44 | 5,96 | 6,34 | -1,6 | +6,4 |
| DK | - | - | - | - | - |
| EE | - | - | - | - | - |
| ES | 2,25 | 1,81 | 2,29 | +1,7 | +26 |
| FI | - | - | - | - | - |
| FR | 5,09 | 5,20 | 5,34 | +4,8 | +2,7 |
| GR | 2,21 | 2,22 | 2,40 | +8,8 | +8,5 |
| HR | 4,05 | 4,50 | 4,07 | +0,6 | -10 |
| HU | 4,03 | 3,97 | 4,04 | +0,3 | +1,8 |
| IE | - | - | - | - | - |
| IT | - | - | - | - | - |
| LT | 3,36 | 3,26 | 3,45 | +2,5 | +5,7 |
| LU | - | - | - | - | - |
| LV | - | - | - | - | - |
| MT | - | - | - | - | - |
| NL | - | - | - | - | - |
| PL | 3,74 | 3,93 | 3,74 | +0,2 | -4,8 |
| PT | 1,64 | 1,48 | 1,67 | +2,0 | +13 |
| RO | 3,68 | 4,39 | 4,32 | +17 | -1,7 |
| SE | 5,60 | 5,79 | 5,45 | -2,7 | -5,9 |
| SI | - | - | - | - | - |
| SK | 3,72 | 3,56 | 3,59 | -3,7 | +0,8 |
| UK | 4,30 | 4,50 | 4,10 | -4,7 | -8,9 |

| Country | RAPE AND TURNIP RAPE (t/ha) | | | | |
|-----------|-----------------------------|------|---------------------|----------|--------|
| | Avg 5yrs | 2017 | MARS 2018 forecasts | %18/5yrs | %18/17 |
| EU | 3,28 | 3,25 | 3,28 | -0,2 | +0,8 |
| AT | 3,34 | 2,89 | 3,30 | -1,2 | +14 |
| BE | 4,44 | 5,50 | 4,46 | +0,5 | -19 |
| BG | 2,72 | 2,84 | 2,91 | +6,8 | +2,3 |
| CY | - | - | - | - | - |
| CZ | 3,44 | 2,90 | 3,32 | -3,3 | +15 |
| DE | 3,82 | 3,28 | 3,70 | -3,3 | +13 |
| DK | 3,96 | 4,16 | 3,95 | -0,2 | -5,1 |
| EE | 2,10 | 2,16 | 2,13 | +1,5 | -1,5 |
| ES | 2,18 | 1,61 | 2,30 | +5,9 | +43 |
| FI | 1,54 | 1,63 | 1,57 | +1,7 | -4,0 |
| FR | 3,43 | 3,82 | 3,42 | -0,2 | -11 |
| GR | - | - | - | - | - |
| HR | 2,86 | 2,79 | 3,02 | +5,4 | +8,1 |
| HU | 2,95 | 2,56 | 3,10 | +4,9 | +21 |
| 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 | 2,86 | +6,5 | -0,2 |
| 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 | 3,58 | +2,4 | -7,8 |

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

Sources: 2013-2018 data come from DG AGRICULTURE short term Outlook data (dated February 2018, received on 01/03/2018), EUROSTAT Eurobase (last update: 01/03/2018) and EES (last update: 15/11/2017).

2018 yields come from MARS CROP YIELD FORECASTING SYSTEM (output up to 10/03/2018).

NA = Data not available.

| Country | WHEAT (t/ha) | | | | |
|---------|--------------|------|---------------------|----------|--------|
| | Avg Syrs | 2017 | MARS 2018 forecasts | %18/5yrs | %18/17 |
| BY | 3,68 | 3,71 | 3,81 | +3,5 | +2,8 |
| DZ | 1,63 | NA | 1,64 | +0,6 | NA |
| MA | 1,85 | NA | 1,87 | +1,0 | NA |
| TN | 1,92 | NA | 1,93 | +0,5 | NA |
| TR | 2,71 | NA | 2,90 | +7,2 | NA |
| UA | 3,93 | 4,11 | 4,38 | +11 | +6,5 |

| Country | BARLEY (t/ha) | | | | |
|---------|---------------|------|---------------------|----------|--------|
| | Avg Syrs | 2017 | MARS 2018 forecasts | %18/5yrs | %18/17 |
| BY | 3,44 | 3,46 | 3,62 | +5,3 | +4,6 |
| DZ | 1,37 | NA | 1,34 | -2,1 | NA |
| MA | 1,20 | NA | 1,23 | +2,2 | NA |
| TN | 1,11 | NA | 1,12 | +0,9 | NA |
| TR | 2,63 | NA | 2,65 | +0,7 | NA |
| UA | 2,95 | 3,31 | 3,32 | +13 | +0,2 |

| Country | GRAIN MAIZE (t/ha) | | | | |
|---------|--------------------|------|---------------------|----------|--------|
| | Avg Syrs | 2017 | MARS 2018 forecasts | %18/5yrs | %18/17 |
| BY | 5,33 | 5,33 | 5,50 | +3,2 | +3,3 |
| DZ | - | - | - | - | - |
| MA | - | - | - | - | - |
| TN | - | - | - | - | - |
| TR | 9,17 | NA | 10,2 | +11 | NA |
| 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,CNCT Tunisie,Turkish Statistical Institute (TurkStat), EUROSTAT Eurobase (last update: 01/03/2018),State Statistics Service of Ukraine, FAO and PSD-online.

2018 yields come from MARS CROP YIELD FORECASTING SYSTEM (output up to 10/03/2018).

NA = Data not available.

4. Pastures in Europe — regional monitoring

Favourable start to the season in most of the EU

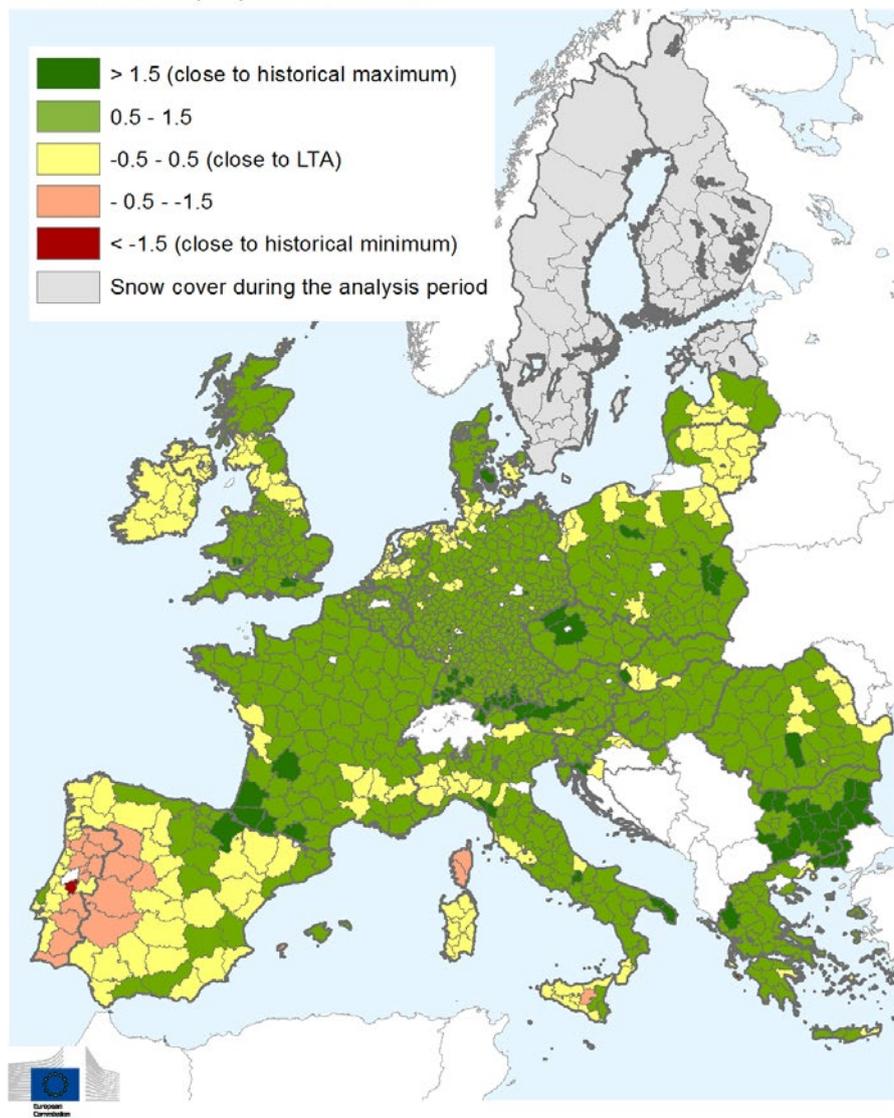
The mild weather conditions in December and January, with average temperatures 2-4 °C above seasonal values, has led to higher-than-usual photosynthetic activity in pastures across most of the EU. The main exception is the Dehesa area in the western half of the Iberian peninsula, where dry conditions in autumn 2017 delayed the regrowth of pastures, which normally takes place after the summer, until November-December. The abundant rainfall registered during the first half of March in that area has considerably benefited pasture condition, and a substantial increase in biomass formation rates is expected for the coming weeks.

Relative index of pasture productivity

Period of analysis: 1 January - 10 March 2018

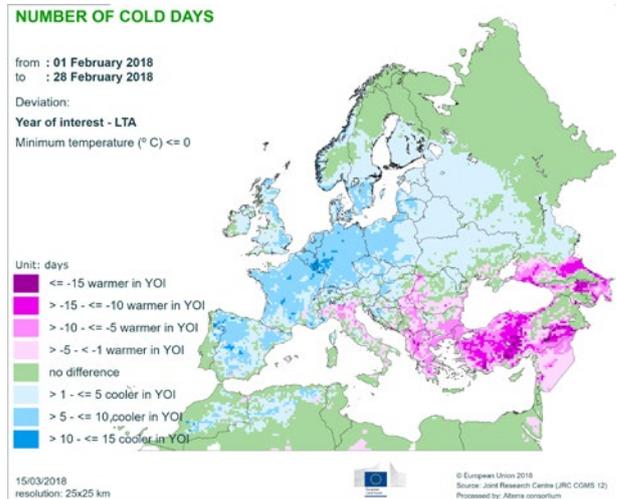
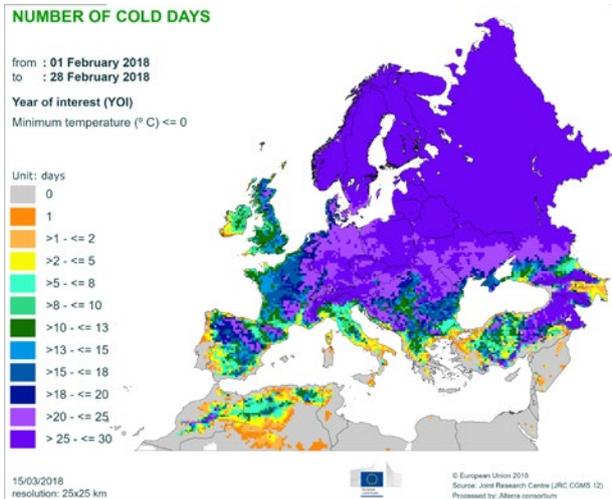
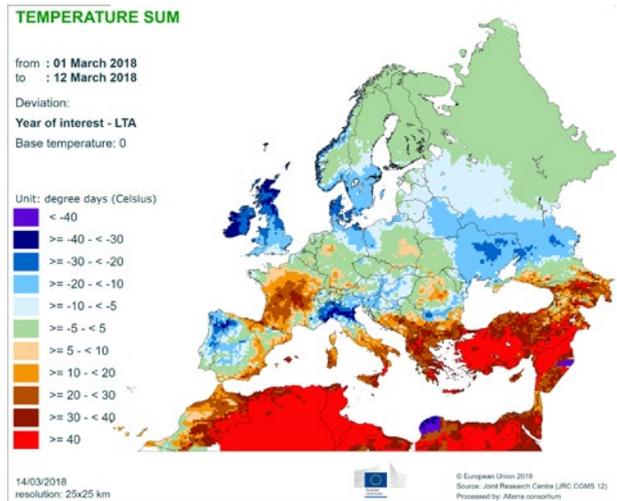
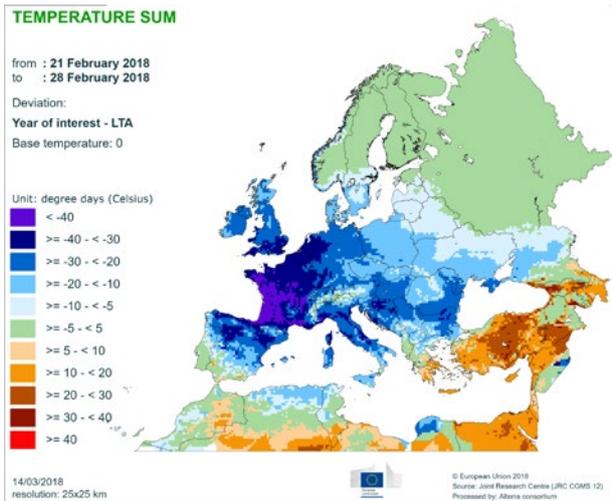
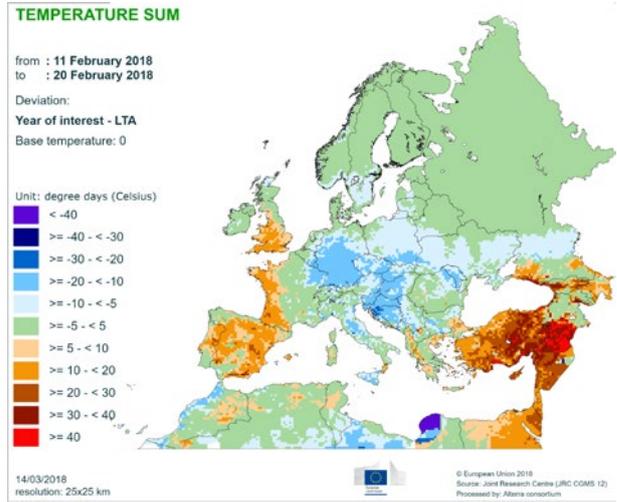
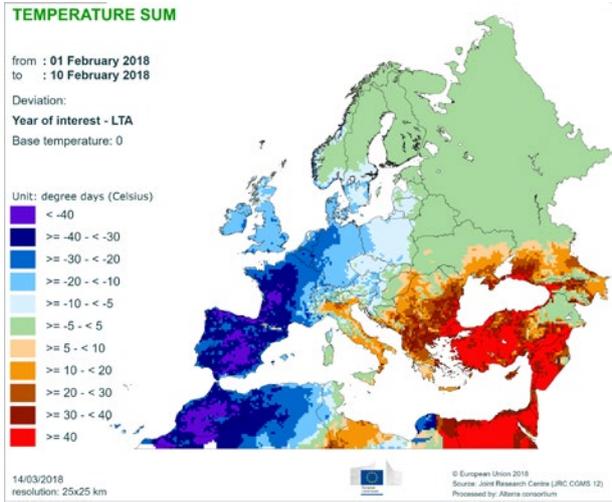
Index based on Copernicus GEOV2 fAPAR 10-day product.

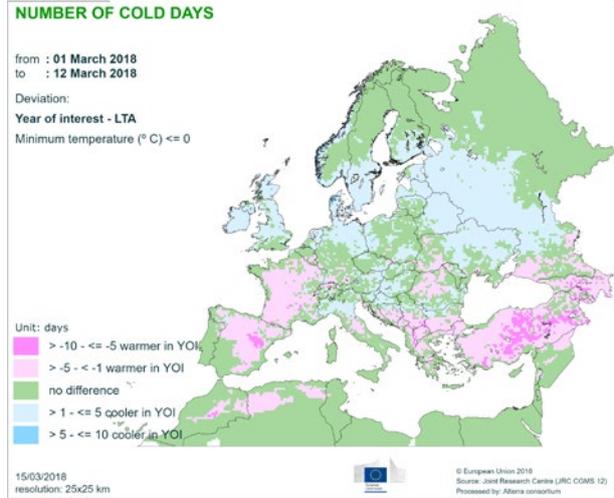
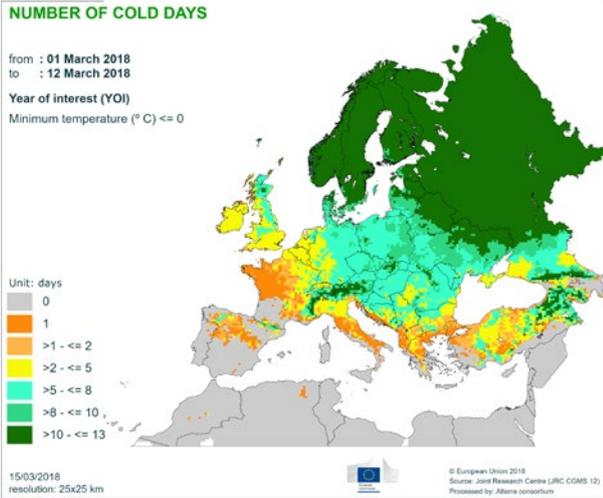
Historical archive (LTA) from 1999 to 2017



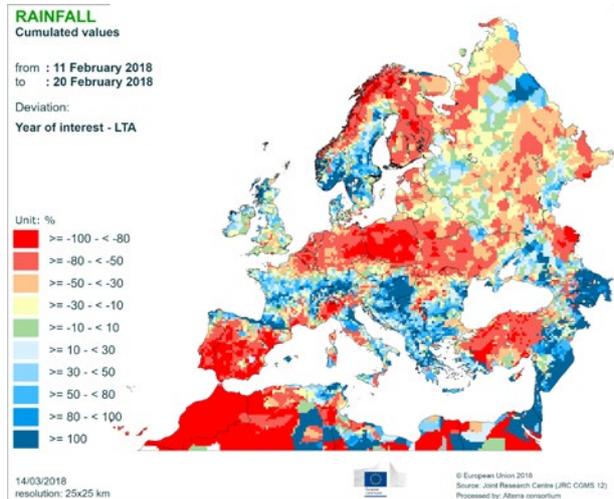
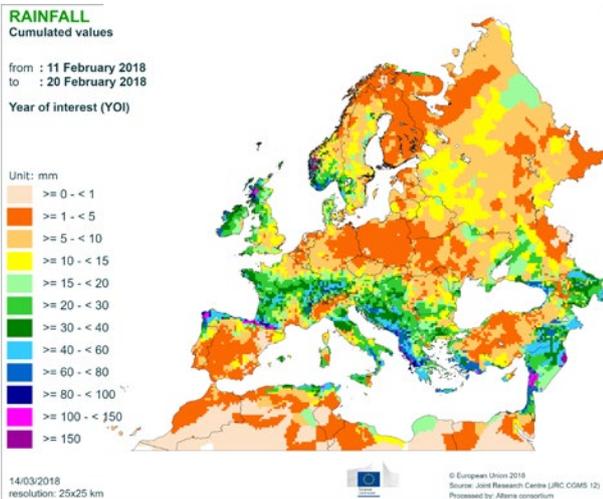
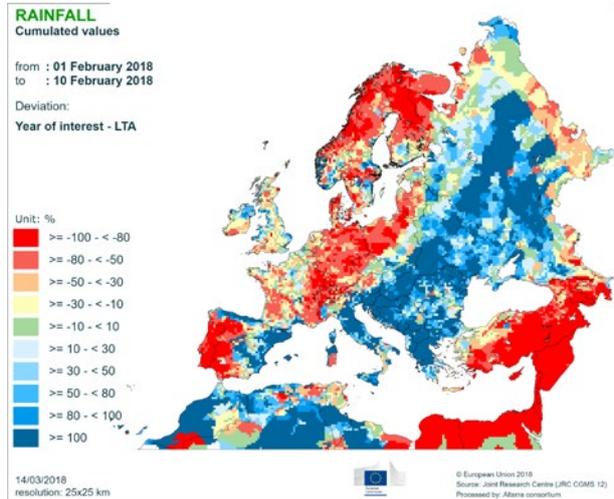
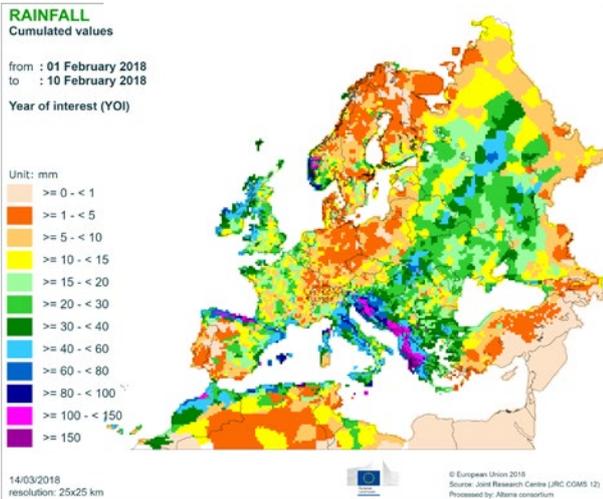
5. Atlas

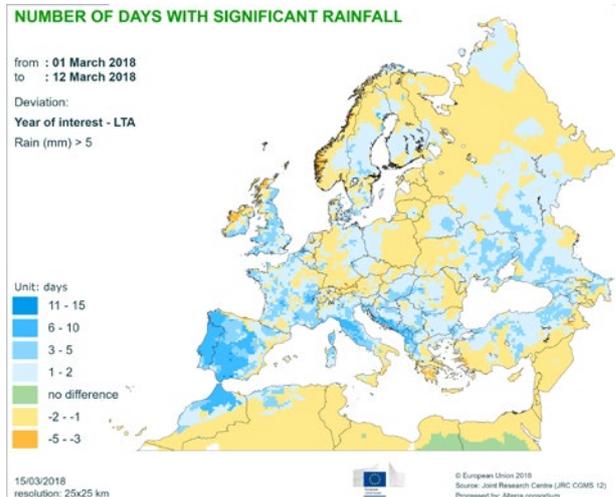
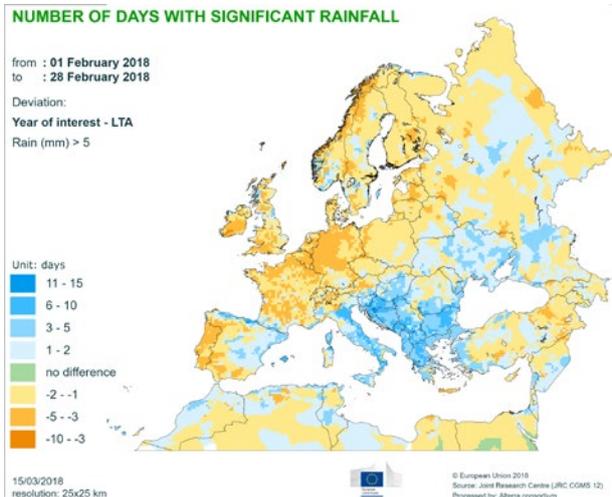
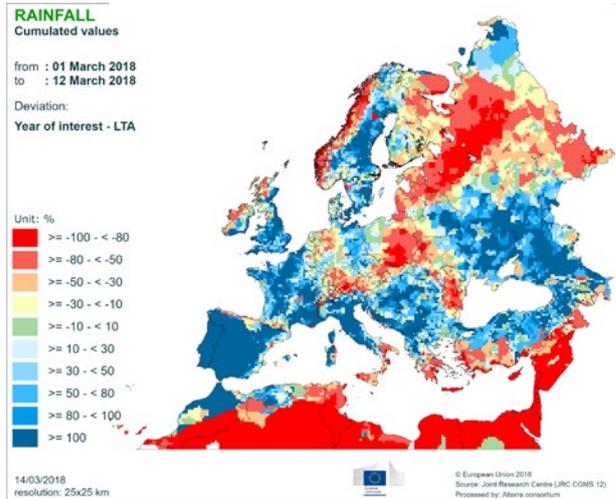
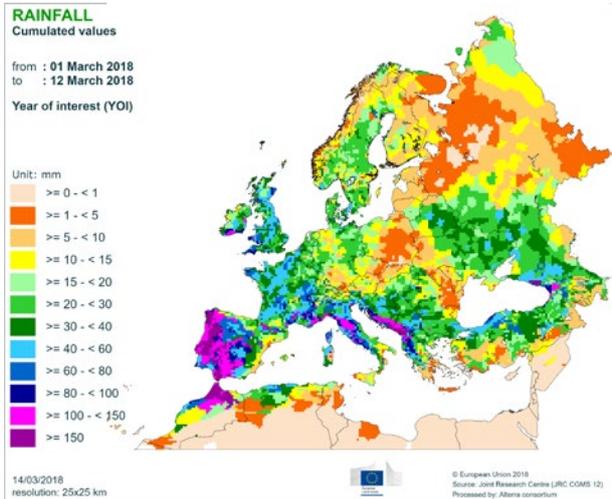
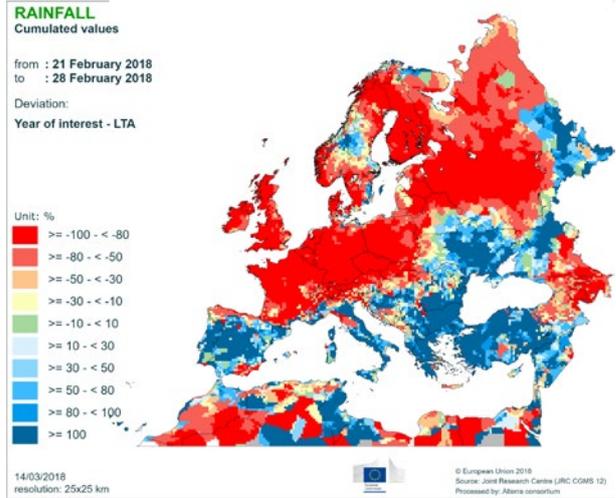
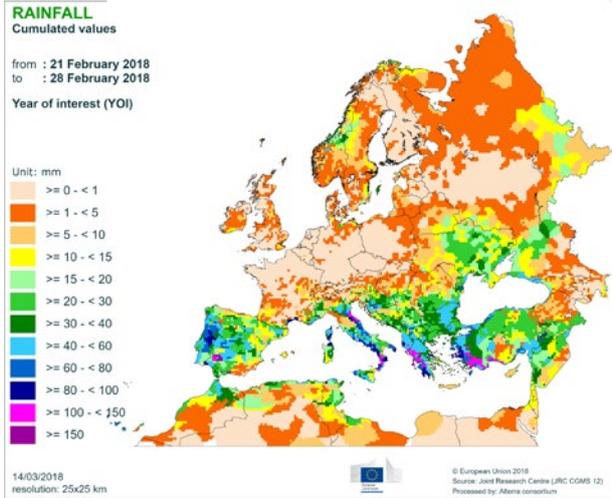
Temperatures





Precipitation regime





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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