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Period covered: 1 April to 14 May 2019
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JRC MARS Bulletin
Crop monitoring in Europe
May 2019

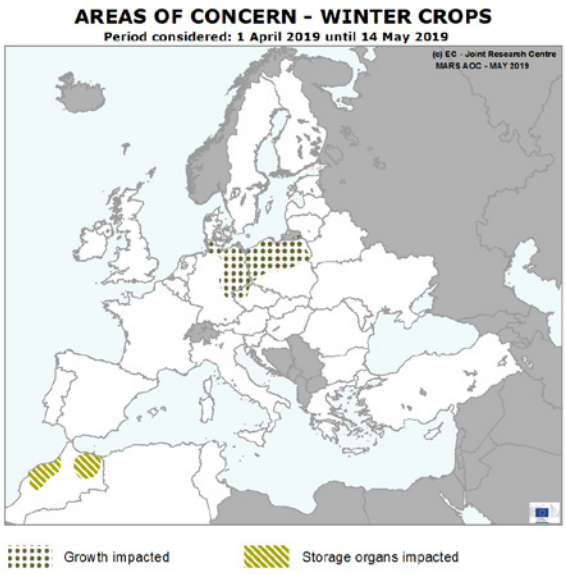
Improved yield outlook in southern Europe

Reduced expectations in northern regions due to persistent rain deficit

Substantial improvements to the yield outlook for winter cereals in southern Europe were largely offset by reduced yield forecasts in northern regions, resulting in a slight upward revision at EU level. Yield expectations for grain maize also improved in most southern EU regions, whereas the yield forecasts for northern maize-producing regions are still mainly based on historical trends.

Rainfall cumulates were well above seasonal values during the analysis period in Italy, south-eastern Europe and south-eastern parts of the Iberian peninsula. The rain surplus instigated the replenishment of soil moisture reserves, which in several regions were critically low, with substantial benefits to winter crops and the early development of spring and summer crops.

Large parts of northern-central Europe experienced a marked rainfall deficit which started mid-March. April was particularly dry in these regions. Winter crops are negatively affected in northern Poland, eastern and north-eastern Germany and north-western Czechia; especially on light sandy soils. Emerging spring and summer crops were also impacted. The current weather forecast foresees some rain in these regions; however, with a large margin of uncertainty.



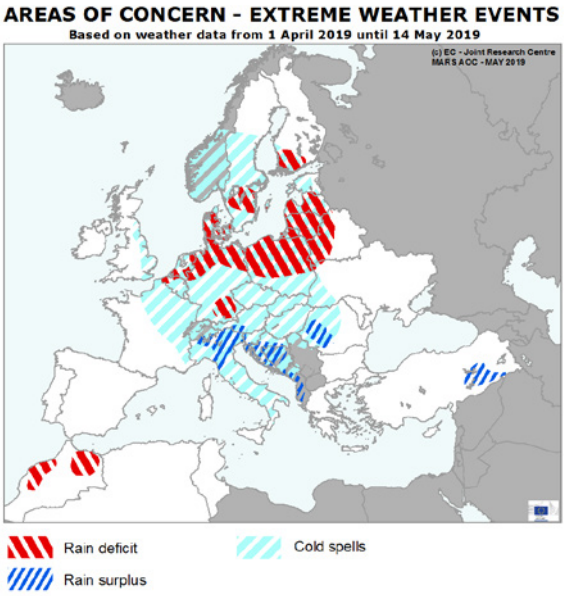
Crop	Yield (t/ha)				
	Avg 5yrs	March Bulletin	MARS 2019 forecasts	% Diff 19/5yrs	% Diff March
TOTAL CEREALS	5.55	5.58	**5.62**	+1.2	+0.7
Total Wheat	5.70	5.77	**5.82**	+2.0	+0.9
soft wheat	5.94	6.01	**6.05**	+1.9	+0.7
durum wheat	3.46	3.42	**3.51**	+1.4	+2.6
Total Barley	4.86	4.95	**4.96**	+2.0	+0.2
spring barley	4.16	4.16	**4.20**	+1.0	+1.0
winter barley	5.78	6.00	**5.97**	+3.2	-0.5
Grain maize	7.62	7.73	**7.92**	+4.0	+2.5
Rye	3.79	3.93	**3.77**	-0.5	-4.1
Triticale	4.13	4.19	**4.17**	+1.1	-0.5
Rape and turnip rape	3.24	3.19	**3.13**	-3.3	-1.9
Potato	33.6	34.4	**34.6**	+2.8	+0.6
Sugar beet	75.2	77.1	**76.5**	+1.7	-0.8
Sunflower	2.20	2.23	**2.41**	+9.5	+8.1

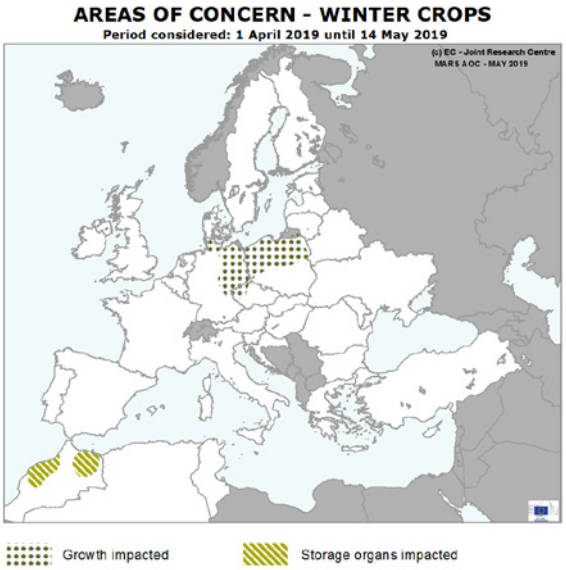
Issued: 17 May 2019

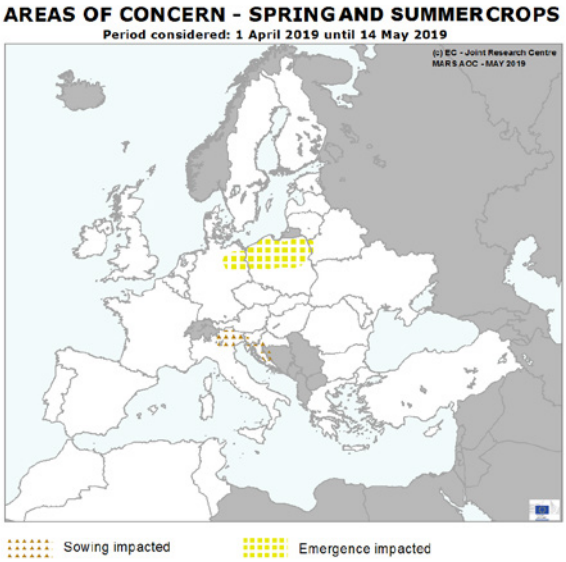
Joint Research Centre

1. Agrometeorological overview

1.1. Areas of concern







The first dekad of May was marked by distinctly colder-than-usual conditions in large parts of Europe. Daily average temperatures in the most affected regions were around 4 °C below the long-term average (LTA). With the exception of the northernmost regions affected, the incidence of frost events was not markedly higher than usual for this period of the year.

The cold-weather anomaly slowed down winter crop development, which, nevertheless, remains slightly advanced due to preceding warm weather conditions. Frost damage to crops, e.g. flowering rapeseed stands, was limited to local occurrences.

Large parts of northern-central Europe experienced a marked rainfall deficit which started mid-March. April was particularly dry in these regions. Winter crops are negatively affected in **northern Poland**, **eastern** and **north-eastern Germany** and **north-western Czechia**; especially on light sandy soils. The current weather forecast foresees some rain in these regions; however, with a large margin of uncertainty. Rainfall deficit in **northern Morocco** regionally hampered grain filling.

The abovementioned warm-and-dry (April) and cold (May) also affected the emergence of spring and summer crops. In most regions these were reflected in manageable delays. In seriously affected areas, seedlings did not develop properly, or were damaged by wind-blown dust from dry sandy soils, or by pests to which weakened stands are more vulnerable. In **northern Poland** and **north-eastern Germany** these effects resulted in poor stands over large areas, in particular of sugar beet.

In contrast, marked rain surplus was observed in several parts of southern Europe. In most of these regions the rain surplus caused some delay to sowing but contributed to the replenishment of soil water levels with benefits to winter crops and emerging spring and summer crops. Extremely wet conditions, with rainfall cumulates regionally exceeding 300 mm since the beginning of April, caused more serious delays to sowing in **north-eastern Italy** and the **western Balkan** region.

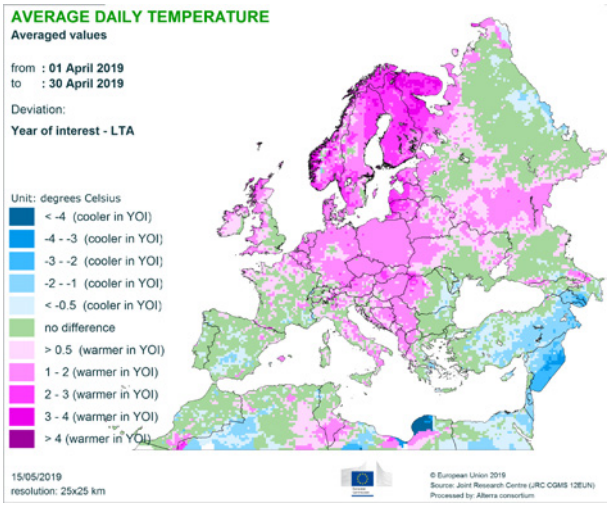
1.2. Meteorological review (1 April-14 May)

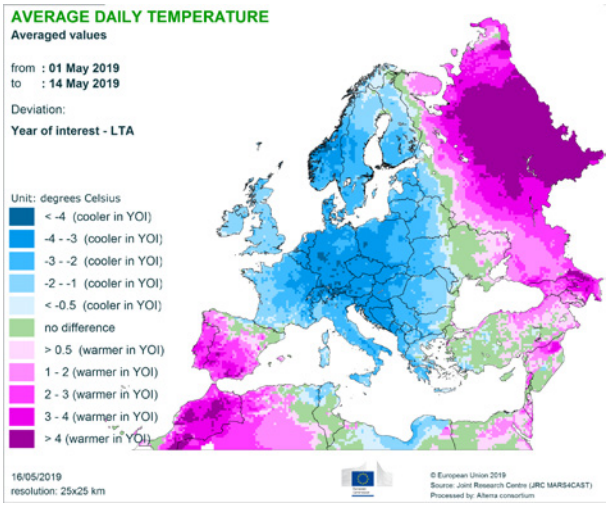
The analysis period was characterised by pronounced temperature anomalies. April was **substantially warmer than usual** in northern, central and eastern Europe, with temperatures up to 3 °C above the LTA, but close to the average in western and southern Europe. Maximum daily temperatures reached over 25 °C in major parts of central, eastern and southern Europe during the third dekad of April; several regions in the southern Iberian peninsula and central Balkans saw maximum temperatures even rising above 30 °C.

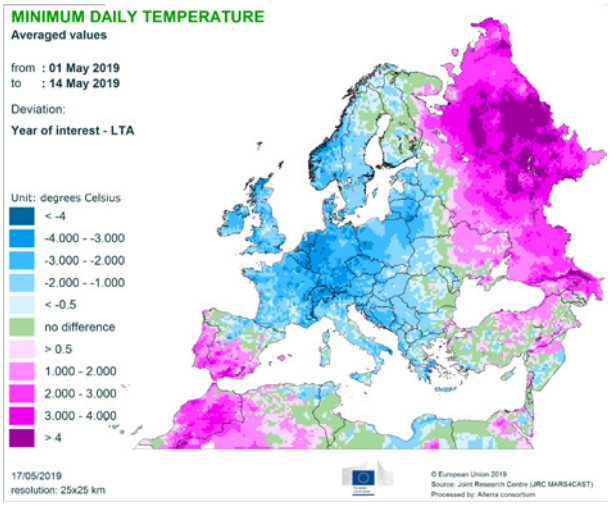
The **beginning of May brought colder-than-usual** weather **in major parts of Europe**, except the Iberian peninsula, north-western Africa and European Russia. A **cold spell in central Europe** brought temperatures down to 4 °C below the LTA. Minimum air temperatures fell below 0 °C in major parts of central and western Europe as well as the western Balkans, where locally minimum temperatures below – 3 °C were recorded. Temperatures well below 0 °C were also recorded in northern Europe.

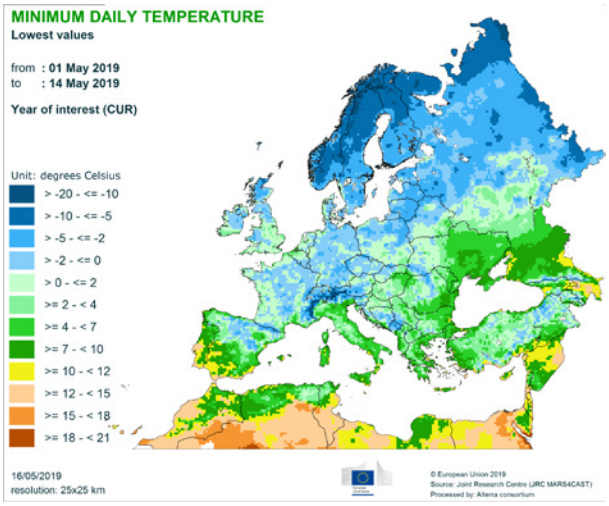
Rainfall cumulates were well **above seasonal values** during the analysis period in Italy, south-eastern Europe and south-eastern parts of the Iberian peninsula. Generally, these regions saw more than 100 mm of rainfall, while areas in northern Italy and the north-western Balkans recorded more than 150 mm (locally even exceeding 300 mm).

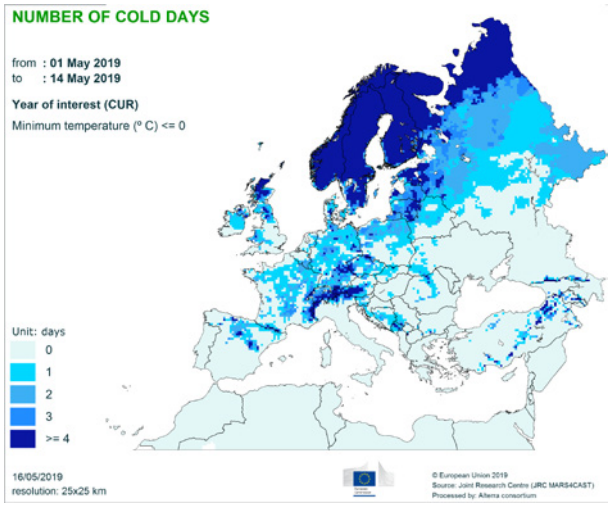
Substantially drier-than-usual weather, with less than 50 % of seasonal rainfall, characterised north-eastern Germany, northern Poland, the Baltic countries, southern Sweden, and northern parts of European Russia. Several regions in northern Poland, Lithuania and Latvia recorded less than 10 mm during the entire analysis period. Drier-than-usual weather also prevailed regionally in southern Germany, Czechia, north-eastern Spain, the United Kingdom, and southern Norway.

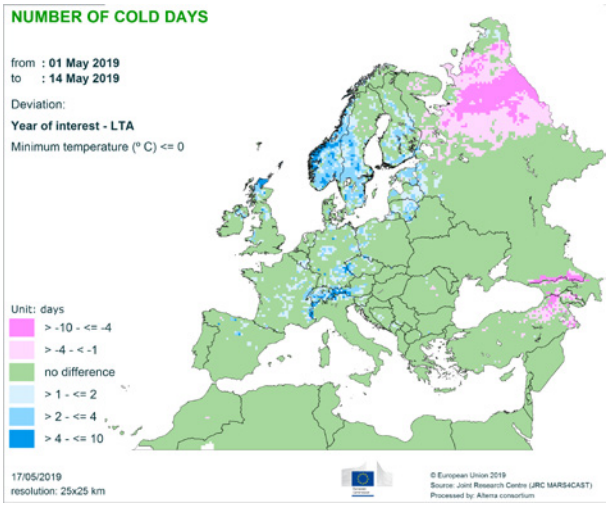


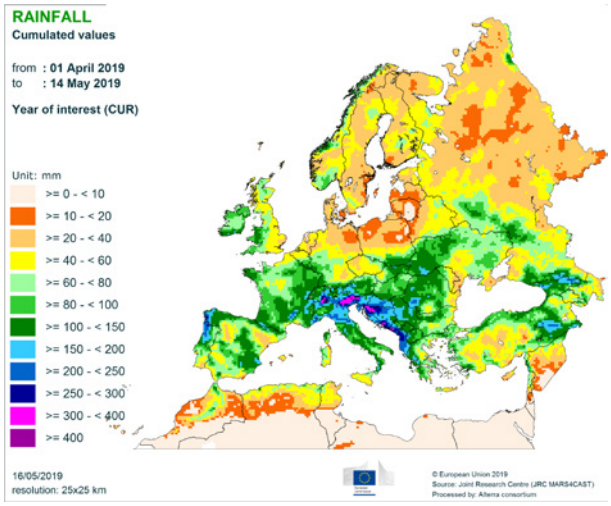


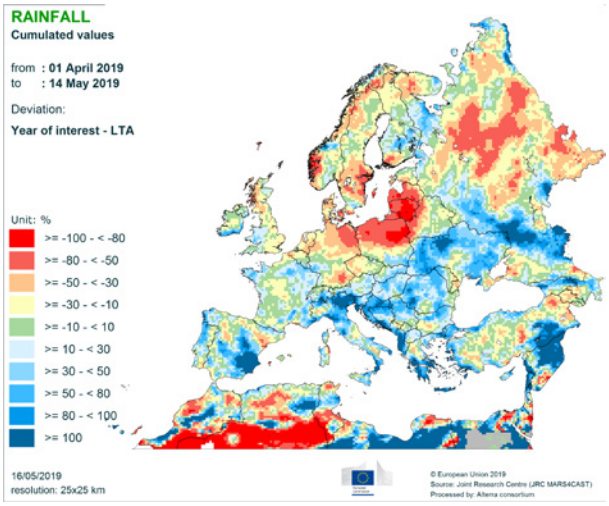


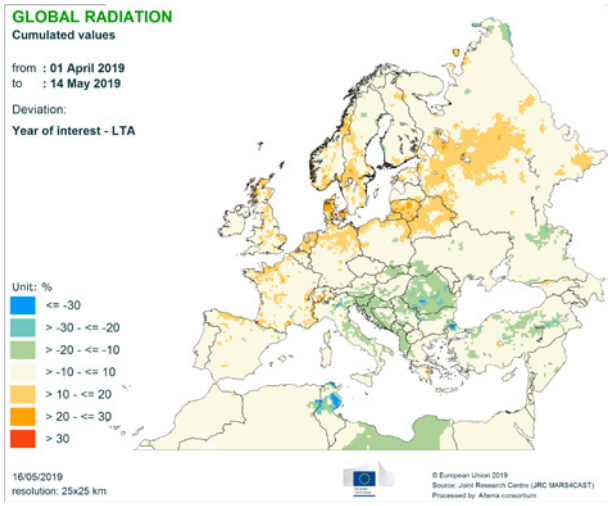


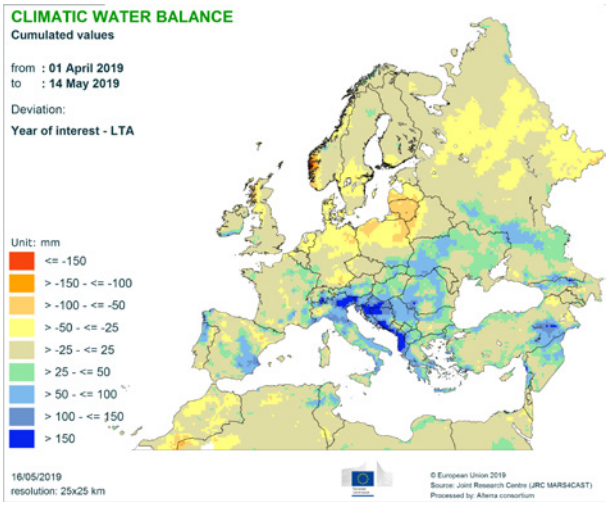

NUMBER OF COLD DAYS
from : 01 May 2019
to : 14 May 2019
Year of interest (CUR)
Minimum temperature (° C) <= 0
Unit: days
0
1
2
3
>= 4
16/05/2019
resolution: 25x25 km
© European Union 2019
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


NUMBER OF COLD DAYS
from : 01 May 2019
to : 14 May 2019
Deviation:
Year of interest - LTA
Minimum temperature (° C) <= 0
Unit: days
> -10 - <= -4
> -4 - < -1
no difference
> 1 - <= 2
> 2 - <= 4
> 4 - <= 10
17/05/2019
resolution: 25x25 km
© European Union 2019
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 April 2019
to : 14 May 2019
Year of interest (CUR)
Unit: mm
>= 0 - < 10
>= 10 - < 20
>= 20 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150 - < 200
>= 200 - < 250
>= 250 - < 300
>= 300 - < 400
>= 400
16/05/2019
resolution: 25x25 km
© European Union 2019
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

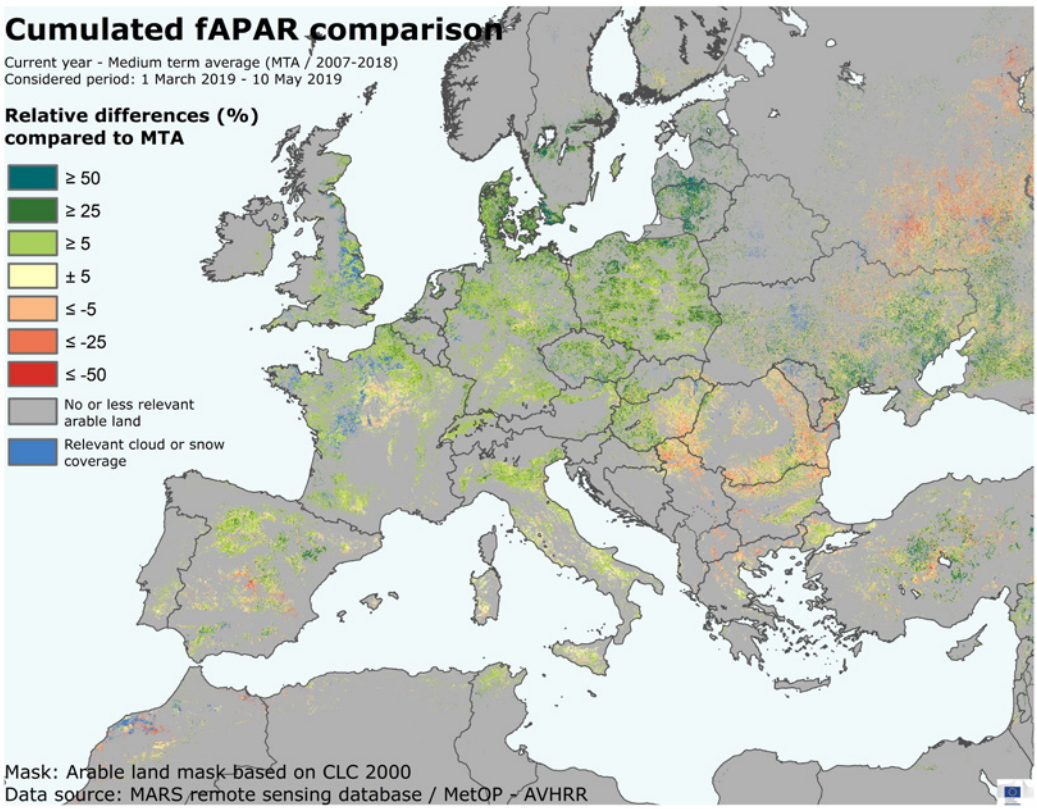

RAINFALL
Cumulated values
from : 01 April 2019
to : 14 May 2019
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
16/05/2019
resolution: 25x25 km
© European Union 2019
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


GLOBAL RADIATION
Cumulated values
from : 01 April 2019
to : 14 May 2019
Deviation:
Year of interest - LTA
Unit: %
<= -30
> -30 - <= -20
> -20 - <= -10
> -10 - <= 10
> 10 - <= 20
> 20 - <= 30
> 30
16/05/2019
resolution: 25x25 km
© European Union 2019
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


CLIMATIC WATER BALANCE
Cumulated values
from : 01 April 2019
to : 14 May 2019
Deviation:
Year of interest - LTA
Unit: mm
<= -150
> -150 - <= -100
> -100 - <= -50
> -50 - <= -25
> -25 - <= 25
> 25 - <= 50
> 50 - <= 100
> 100 - <= 150
> 150
16/05/2019
resolution: 25x25 km
© European Union 2019
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

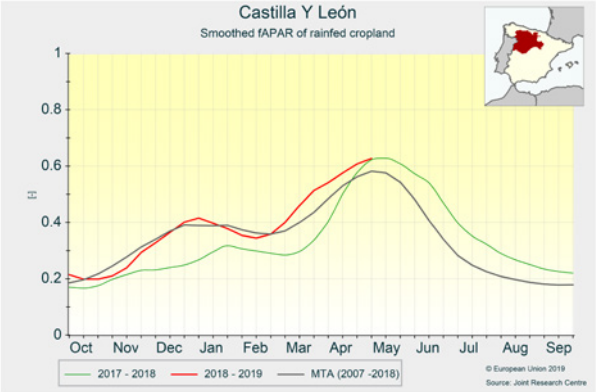
2. Remote sensing — observed crop conditions

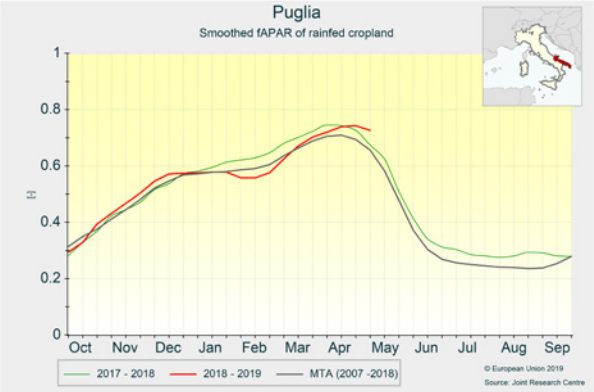
Canopy density improved in south-eastern Europe



The map displays the differences between the fraction of Absorbed Photosynthetically Active Radiation (fAPAR) cumulated from 1 March to 10 May 2019 and the medium-term average (2007-2018) for the same period. Positive anomalies (in green) reflect above-average biomass accumulation or early crop development while negative anomalies (in red) reflect below-average biomass accumulation or late crop development.

In **Spain**, winter crops conditions are now mostly favourable. Well-distributed precipitation during April sustained winter crop growth with favourable biomass accumulation (e.g. *Castilla y León*). Crops are now close to flowering. In central regions only, negative local anomalies are displayed, reflecting persistent dryness and temperature oscillation, which caused strong unfavourable conditions for winter crop growth. In southern **Italy**, winter crops are progressing well thanks to favourable spring precipitation (e.g. *Puglia*). In northern Italy, the abundant rain in April restored soil moisture and favoured biomass accumulation. In **France**, winter crops exhibit generally favourable biomass accumulation and are in advanced stages (e.g. *Champagne-Ardennes*). Nevertheless, in central France, the strong fluctuation of temperatures in April and the suboptimal soil moisture caused a reduction in potential biomass accumulation. In the **United Kingdom** and **Denmark**, reduced precipitation and warm but strongly oscillating temperatures have been observed, hampering the leaf area expansion of crops. The fAPAR signal now reflects average conditions, having previously been advanced and above average (e.g. eastern Scotland). Rain deficit and oscillating temperatures were observed in northern **Germany, Poland** and the **Baltic countries**, but some precipitation in May improved soil moisture and sustained some further crop biomass accumulation. In central and north-eastern Germany and in western Poland, a persistent lack of precipitation negatively affected crop biomass accumulation, now evident in the fAPAR profiles (e.g. *Thüringen*). In **Hungary**, the dry spell in southern regions ended thanks to precipitation in the first 15 days of April and in May. In **Romania**, rain in April and mild-to-warm temperatures moved the development stages of winter crops from delayed to normal (e.g. *Macroregiunea Patru*). In **Bulgaria**, conditions favourable to winter crops are observed in the eastern half of the country, while western regions still present a deficit of biomass accumulation due to a late and unfavourable start to the season. In **Greece**, the unfavourable biomass accumulation in early spring has now recovered thanks to restored soil moisture, but plants remain in weak condition, especially in northern regions. Positive biomass development is observed in **Turkey** and in southern **Ukraine**, while central regions of Ukraine experienced strong drops in temperature and reduced precipitation (e.g. *Cherkas'ka*). The winter crops season in the **Maghreb** region is moving towards harvesting with an average or above-average outlook for most of Tunisia and Algeria, whereas the cereal campaign in Morocco was compromised by dry conditions.


Castilla Y León
Smoothed fAPAR of rainfed cropland
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
© European Union 2019
Source: Joint Research Centre


Puglia
Smoothed fAPAR of rainfed cropland
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
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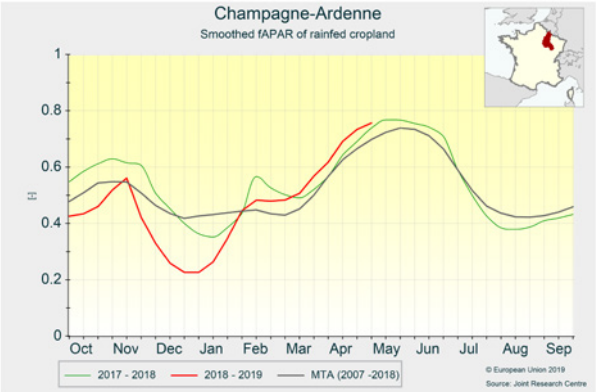
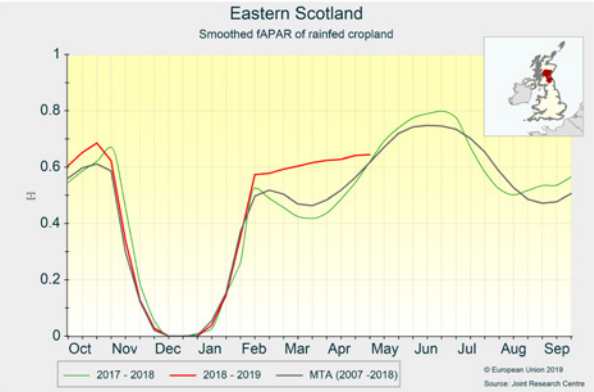
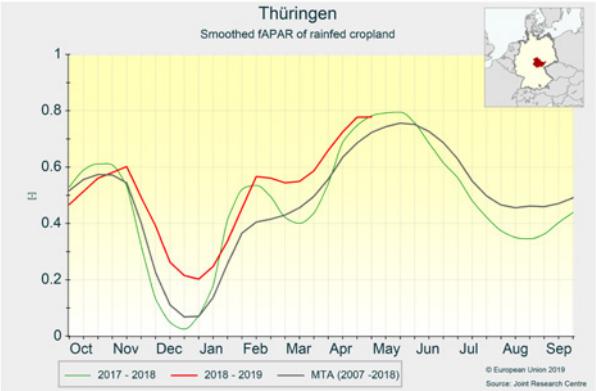
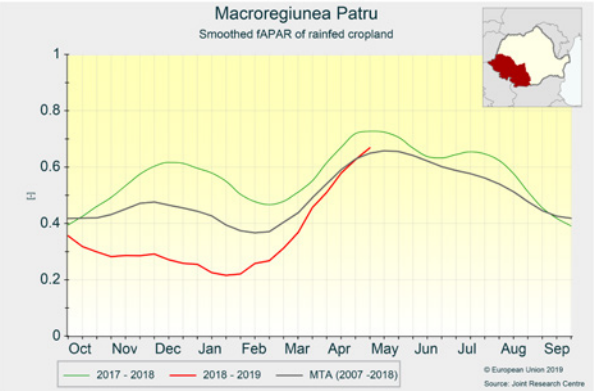
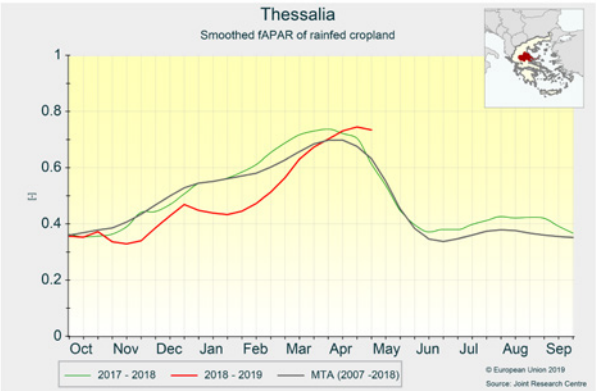
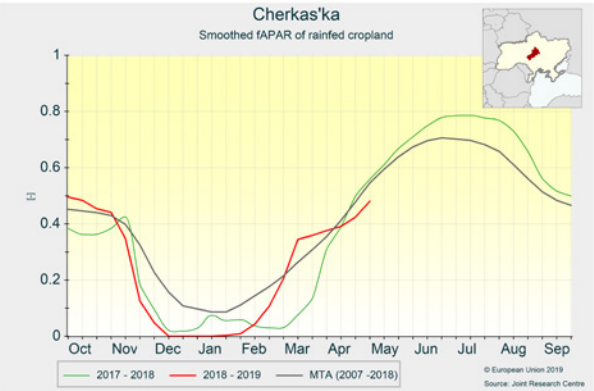

Champagne-Ardenne
Smoothed fAPAR of rainfed cropland
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
© European Union 2019
Source: Joint Research Centre


Eastern Scotland
Smoothed fAPAR of rainfed cropland
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
© European Union 2019
Source: Joint Research Centre


Thüringen
Smoothed fAPAR of rainfed cropland
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
© European Union 2019
Source: Joint Research Centre

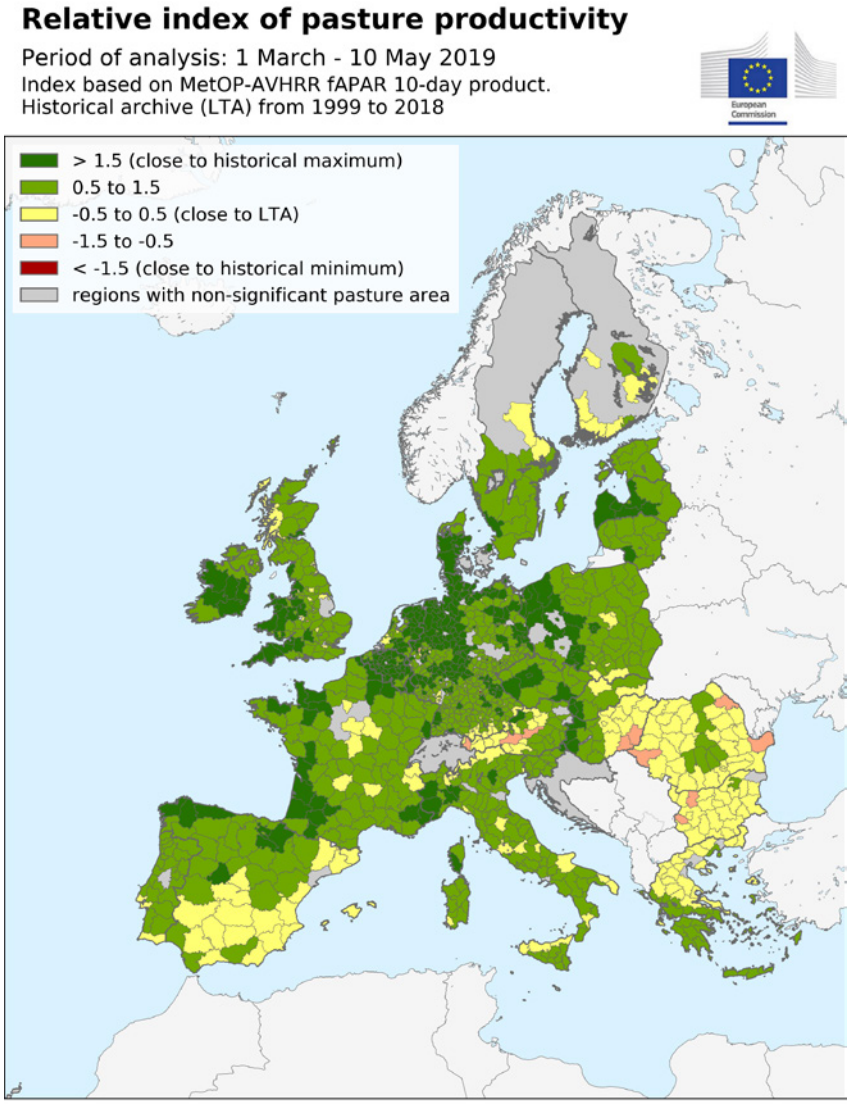

Macroregiunea Patru
Smoothed fAPAR of rainfed cropland
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
© European Union 2019
Source: Joint Research Centre


Thessalia
Smoothed fAPAR of rainfed cropland
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
© European Union 2019
Source: Joint Research Centre


Cherkas'ka
Smoothed fAPAR of rainfed cropland
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
© European Union 2019
Source: Joint Research Centre

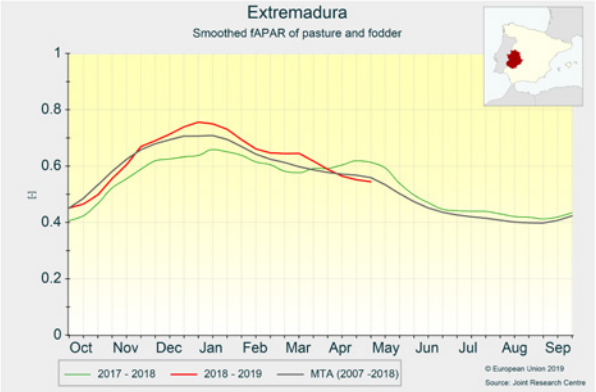
3. Pastures in Europe — Regional monitoring

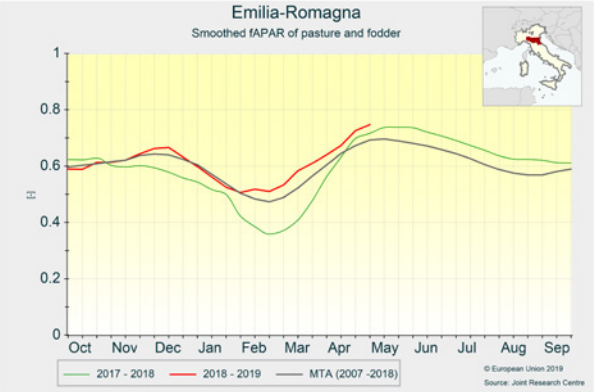
Average to favourable grassland productivity

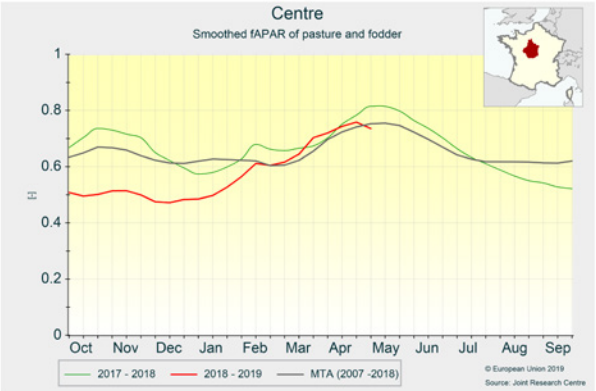


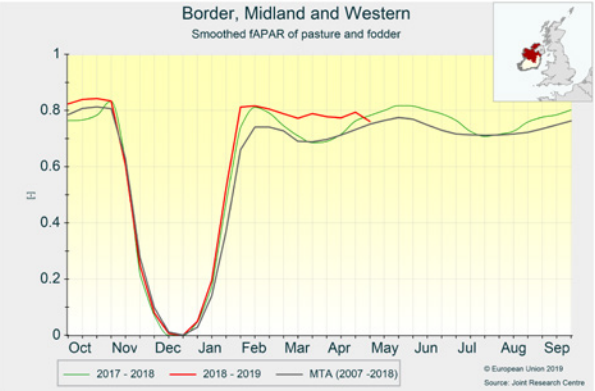
The pasture productivity index (PPI) for the period 1 March to 10 May 2019 is available in the main map. The predominantly positive values indicate favourable to very favourable biomass accumulation in most of the regions. In southern Europe (e.g. southern Italy), pasture growth improved thanks to the favourable rains, whereas dry conditions negatively affected growth in southern Spain. In France, weather conditions favoured positive biomass accumulation in most of the regions but especially in north-eastern regions where PPI increased compared to the April analysis.

In north-eastern Germany and Poland, PPI still displays positive values, despite the ongoing dry conditions: if further rains will not come a significant decrease in the PPI is expected, just when the first cut is underway. In eastern Europe mediocre to average biomass accumulation is observed due to the warm but dry weather that lasted until the middle of April. Since then, favourable precipitation occurred but the expected improvement in biomass accumulation was slowed down due to cold temperatures and low radiation accumulation. If temperatures move back to seasonal values an improvement in PPI can be expected. In the remote sensing graphs of France, Ireland and Germany, below, the most recent values reported are affected by cloud contamination.


Extremadura
Smoothed fAPAR of pasture and fodder
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
© European Union 2019
Source: Joint Research Centre


Emilia-Romagna
Smoothed fAPAR of pasture and fodder
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
© European Union 2019
Source: Joint Research Centre


Centre
Smoothed fAPAR of pasture and fodder
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
© European Union 2019
Source: Joint Research Centre


Border, Midland and Western
Smoothed fAPAR of pasture and fodder
fAPAR
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
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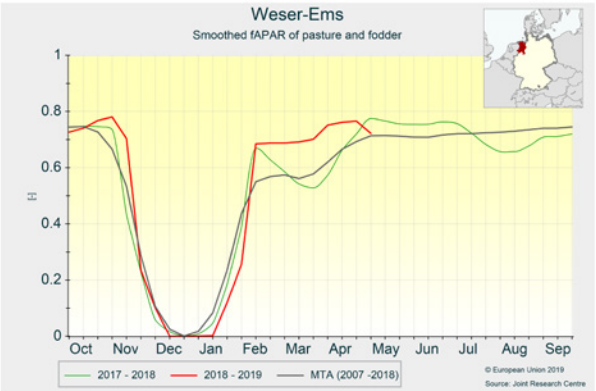
Source: Joint Research Centre


Weser-Ems
Smoothed fAPAR of pasture and fodder
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2017 - 2018
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MTA (2007 -2018)
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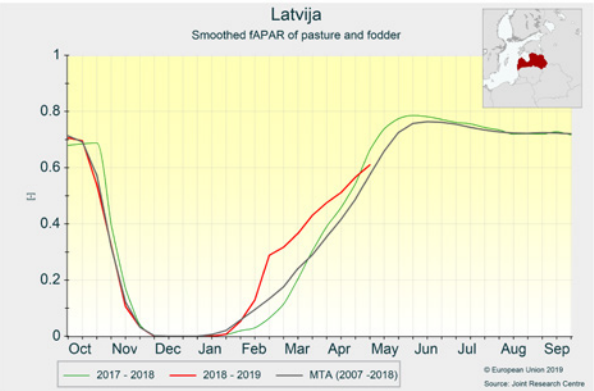
Source: Joint Research Centre


Latvija
Smoothed fAPAR of pasture and fodder
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Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2017 - 2018
2018 - 2019
MTA (2007 -2018)
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4. Country analysis

4.1. Sowing conditions

Spring barley

Good progress of sowing in northern Europe

Sowing progressed well in the Scandinavian and Baltic Sea regions, with good germination despite the dry conditions in April.

In most European countries (e.g. the United Kingdom, France, Germany, Benelux, Poland, Slovakia, Ukraine), sowing was mainly concluded at the end of March, i.e. around 3 weeks earlier than usual, as reported in the April issue of the bulletin. In general, warmer-than-usual seedbed conditions were adequate to ensure optimal emergence.

In Denmark and Sweden, the sowing campaign started after mid-March as usual and was practically concluded in April, in adequate conditions thanks to the beneficial rainfall registered since the end of April.

In Croatia, Hungary and Romania, sowing was concluded in April when weather conditions improved due to the rainfall observed since mid-April, ensuring germination and uniform establishment.

In the Baltic Sea region, spring barley sowing mostly started during the first dekad of April, 1 week earlier than usual, with some sowing occurring as early as late March on the sandy soils of south-eastern Lithuania. Sowing progressed well and germination has been adequate, despite the dry conditions in April.

In southern Finland, warmer-than-usual weather permitted the first sowing to start at the end of April, around 2 weeks earlier than usual. In the northern areas, where temperatures are still cold and fields covered with snow, sowing is expected to start after mid-May, which is a normal time for this country.

Sugar beet

Slow start to growth after trouble-free sowing campaign

Sowing progressed well during March and April, and was conducted within the optimal window. However, emergence and early development were impaired or slowed down by dry and/or cold weather in several of the main production regions, most markedly in Poland and northern Germany.

After a favourable sowing campaign (completed by the second dekad of April), low temperatures during the first dekad of May slowed down development of sugar beet. Similarly in the United Kingdom, early growth has been slow due to the cold weather. The sowing campaign in the Netherlands, Belgium, Denmark and Germany was completed during the third dekad of April, which corresponds to the normal ending period. Early development was slow due to the dry conditions (in April) and cold conditions (since the end of April), rendering plants vulnerable to pests. However, so far pest pressure has been low. The most difficult start to the season occurred in Poland and northern Germany, where very dry soil conditions in April caused delays to the emergence of plants. Additionally, in Poland (central regions), damage was observed due to wind erosion and coverage of seedlings with sand. Cold air inflow, accompanied by night frost events during the first dekad of May, resulted in further damage to emerged stands. Pest pressure is high in Poland (especially in south-eastern regions). In Hungary and Romania, sugar beet sowing was completed during the first dekad of April. Despite very dry conditions during sowing, currently there is no concern for emergence and early development, as soil water conditions improved after the first dekad of April.

Maize

Maize sowing almost concluded, with some delays

Maize sowing is concluded in most parts of Europe. Delays were reported in south-eastern France, Spain and Italy. Maize germination and emergence generally proceeded well thanks to timely rainfall.

Sowing of maize is still proceeding in cooler regions, such as in Poland, as well as in the main grain maize area of France, Aquitaine, where low temperatures and rain have hampered a timely sowing. Sowing in France's northern and eastern maize production regions is almost concluded. The thermal conditions in Germany allowed sowing mostly from mid-April to the end of April. Soil moisture levels were critically low, hampering germination and emergence, but recent rainfall improved the situation in most parts of the country. Eastern Germany, which increased its maize acreage compared to 2018, remains drier than other parts, which adds up to the lower water holding capacity of its sandy soils. Similar soil moisture conditions as for Germany apply for Poland, where many farmers sowed early, encouraged by warm temperatures. In the main maize regions of Italy (Po Valley),

maize sowing was initially delayed due to dry conditions and later due to frequent and abundant rainfall events, but plant emergence and development is now proceeding well. In the Iberian peninsula, rainfall in April caused minor delays to maize sowing but was mainly beneficial, after a long dry period. In Hungary, Romania and Bulgaria maize growth and development are proceeding well, thanks to timely rainfall after the second dekad of April. Maize sowing in the Ukraine is underway under favourable conditions; well more than half of the area has already been sown.

In the first dekad of May, cooler weather (0 to – 6 ºC below the LTA) set in, which has temporarily slowed down maize growth in large parts of Europe, except the Iberian peninsula.

Sunflower

Overall, good progress

The sunflower sowing campaign generally progressed well and has finished in most regions in Europe. Frequent rainfall events caused delay, primarily in southern France, northern Italy and Ukraine. Emergence and early development was hampered in some regions of Spain, Romania, Hungary and Bulgaria due to low moisture content of the topsoils, but recent rains considerably mitigated the situation.

In Bulgaria and southern Romania, sowing started in the last dekad of March and proceeded much faster than in 2018, thanks to dry weather conditions and near-average temperatures. Beneficial rains after 11 April increased soil moisture content and thus provided adequate conditions for sprouting and early crop development. The sowing campaign in Croatia and Hungary progressed well due to dry weather conditions. Some precipitation in early April caused only moderate delay. Abundant rainfall since the last dekad of April favourably replenished the soil moisture of the upper soil layers, thus allowing adequate germination.

In southern and central Italy, weather conditions allowed sowing to be conducted without constraints. In northern Italy, substantial rainfall in April alleviated the previous water deficit. The same rainfall caused some delay, but longer dry periods between precipitation events allowed operations to be concluded within the optimal window.

In southern France, the sowing campaign started in late March; however, abundant rainfall and below-average temperatures in early April slowed its pace. Early sown crops that emerged swiftly became vulnerable to damage during this period. Farmers finished sowing in the last dekad of April or in early May with some delay, but current conditions are favourable. In northern regions, the sowing campaign proceeded normally.

In Spain, sowing was completed in *Andalucía* around mid-April, despite some rain. Sowing in the *Castilla y León* and *Castilla-La Mancha* regions followed later, according to a normal schedule as only moderate rainfall was experienced during the sowing window.

In Ukraine, sowing started in early April but its progress was slower than usual and it is still ongoing, due to frequent rainfall observed since mid-April.

Soybean

Rainfall delays sowing in most of the main producing regions

Sowing is delayed due to the abundant rainfall observed during the usual sowing window (15 April to 15 May). A small share of the soybean was sown during the second half of April, but the cold spell observed during the first half of May slowed down emergence.

In Italy, the main European soybean producer, the sowing campaign has not started yet, due to the abundant and frequent rainfall observed since mid-April. Farmers have to wait for the soils to dry before sowing can start. Similar conditions have been experienced in Croatia. In Austria and Romania, temperatures have been too low to sow at the end of April, and abundant rain hampered sowing since then. In Hungary, the second half of April was beneficial for sowing but the abundant rainfall observed since the beginning of May is delaying the large part of the sowing that still needs to be done. In France, more particularly the main producing area located in the south-western regions, farmers only had a short window at the end of April to sow with a few days without rainfall. Rainfall currently forecast is not favourable for the soils to dry, which could cause further delays to sowing, possibly with negative impacts on yields. Moreover, for the fields already sown, in all the main producing regions, temperatures have not been favourable for emergence, following the cold spell.

4.2. European Union

France

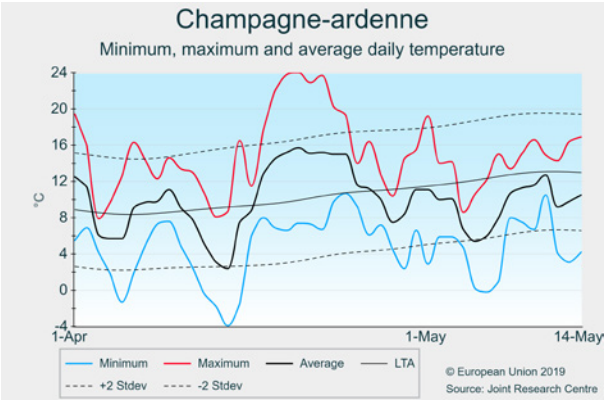
High potential despite limited impact of the exceptional cold spell

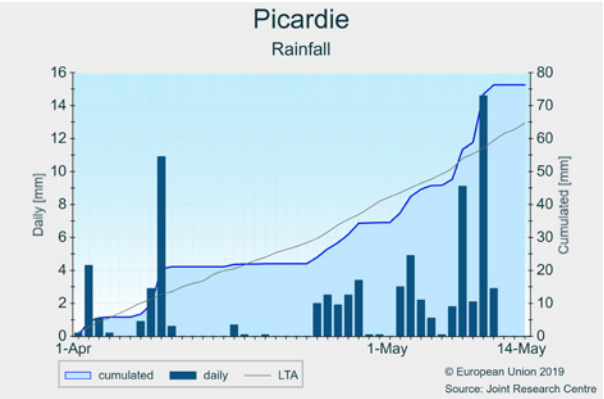
The consequences of cold spells at the beginning of April and beginning of May are expected to be minor and limited to a few winter cereals and summer crop stands. Yield forecasts are around or above average, except for rapeseed due to constant pest pressure, dry conditions in early spring and the cold spell in the north.

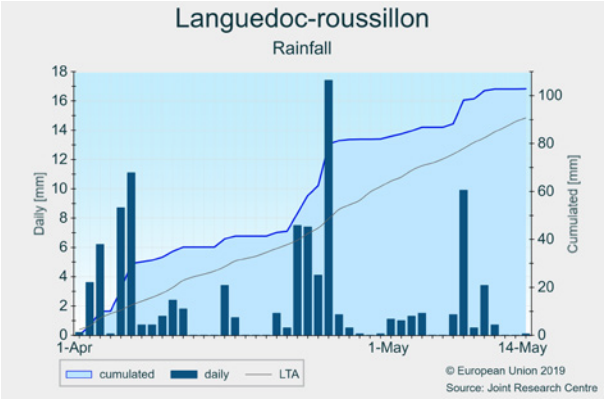
Thermal conditions have been particularly variable during the analysis period. The cold spell at the beginning of May is not expected to have had negative impacts on winter cereals (some of which were at the sensitive meiosis stage), due to radiation compensating for the impact of cold temperatures. With respect to summer crops, most of the grain maize was still at an early stage and protected by the soil, so no major impacts are expected. A small share of the early sown sugar beet was impacted by the cold spell mid-April, with plant density reduced by up to 20 % in some fields ([1]).

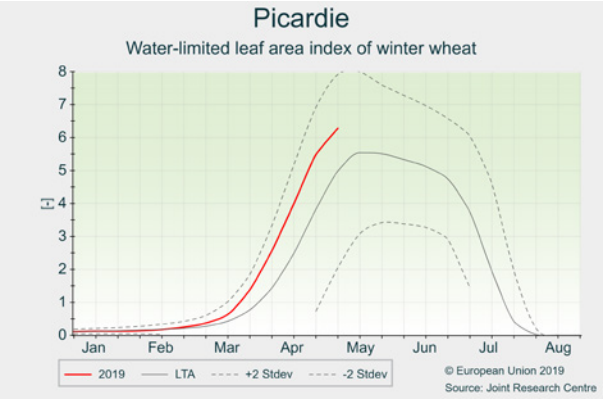
Cumulative rainfall for the analysis period is close to the LTA in all regions; the south-east, which was previously dry, received above-average rainfall. The north had a long period without significant rain in April but abundant rain was recorded in the beginning of May. No major impact from water stress is expected on winter and spring cereals, and disease pressure was relatively low.

However, the recent rainfall is now increasing disease pressure on winter cereals (in particular rust and septoria). Some concerns are rising about more rain forecast in the coming days, which would increase the pressure of fusarium, particularly on durum wheat reaching flowering. Winter barley is entering the flowering stage and conditions are promising; our forecast is now above the historical trend. Soft wheat is also in good condition and the yield forecast is above the trend and the 5-year average; yet still with a high margin of uncertainty as weather conditions during flowering and grain filling may substantially change the outlook. The rapeseed yield forecast is now below the trend and the average.









([1]) http://www.itbfr.org/tous-les-articles/article/news/situation-betteraviere-davril-2019

Germany

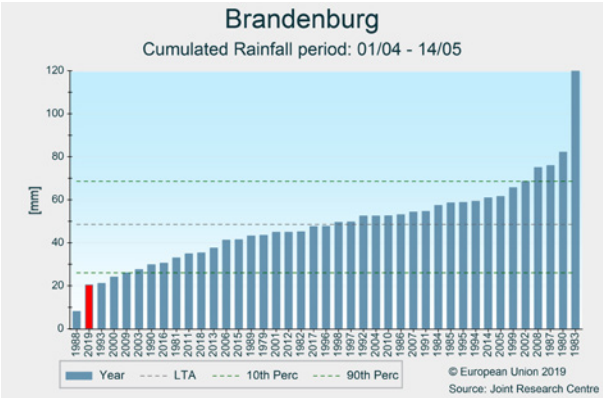
Compromised crop potential in the east and north-east

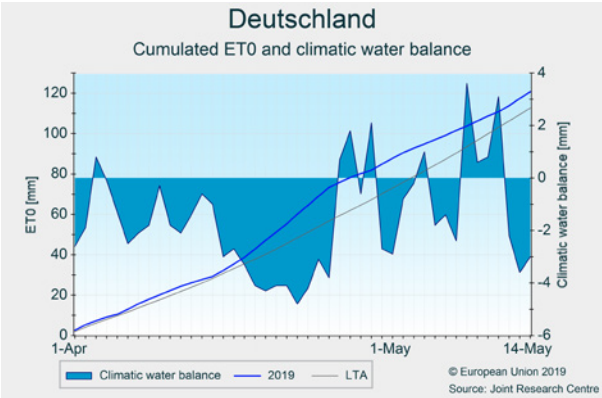
Soil moisture conditions in May have improved after a very dry April, with the exception of the east and north-east. Winter and spring crops are forecast above last year's disappointing yields but below the 5-year average. More precipitation will be necessary to sustain adequate grain filling and ripening.

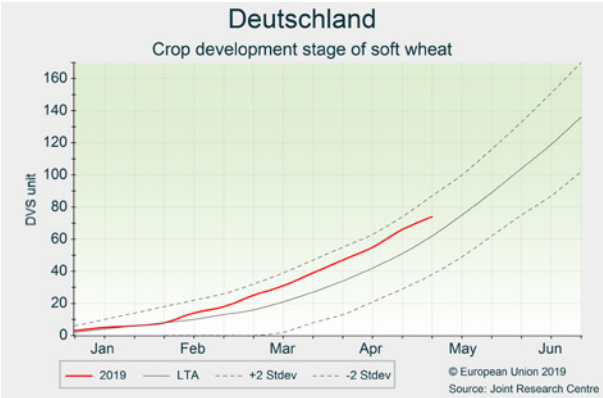
April was exceptionally dry, especially in the north-east. This, in combination with warmer-than-usual conditions accompanied by first summer temperature peaks and above-average radiation, led to a negative climatic water balance for the whole of Germany. May is decidedly cooler so far and has brought beneficial rainfall, although this is not yet sufficient to compensate for the dry April; especially in *Mecklenburg-Vorpommern*, *Brandenburg* and *Sachsen-Anhalt*, where soil moisture values are rapidly declining and approaching critical levels. In these three regional states, and some spots in south-eastern Germany, crops could not benefit from optimal soil moisture at a very demanding vegetative stage and suffered from water stress in the light soils, reducing the crop yield potential. In the remaining parts of Germany, soil moisture levels have at least remained stable or were partially replenished.

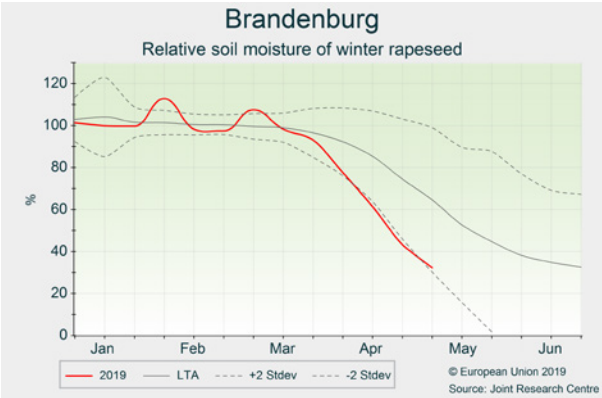
Winter and spring crops continue to be advanced, even though the cooler temperatures in May slowed crop development. Winter wheat has just concluded stem elongation and winter rapeseed is approaching the end of the flowering phase. On two occasions, around 11 April and the beginning of May, minimum temperatures dropped below 0 °C and this may have locally affected crop stands, foremost of rapeseed.

Sowing and emergence of summer crops took place under dry conditions; however, the crop yield potential will probably not be reduced if the rather rainy and cooler conditions of May continue, with the exception of the abovementioned regions.









Poland

Crops on sandy soils affected by dry conditions

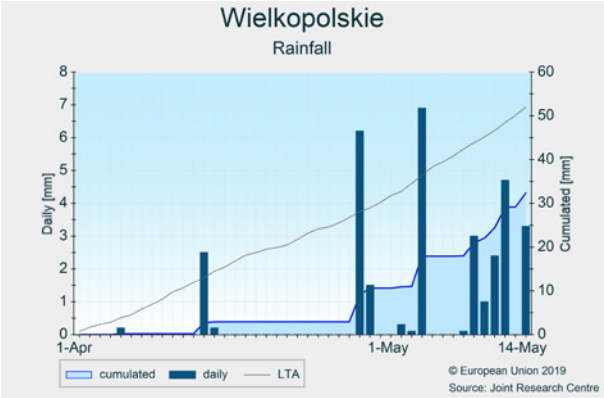
Very dry conditions, frost events and pest pressure during emergence and early development negatively affected the outlook for sugar beet.

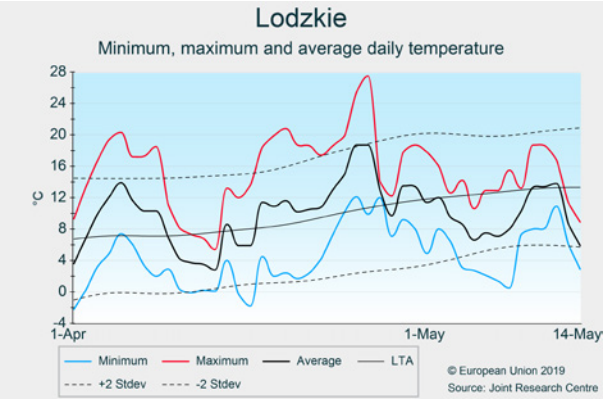
Rainfall in April was well below average, which, in combination with slightly higher-than-usual temperatures and radiation, resulted in depletion of soil moisture reserves. The very end of April brought some rain, but in most parts of the country it was too little to alleviate poor soil water conditions (with the exception of southern regions). Some cold events, with temperatures below – 5 °C, occurred during the second dekad of April and the first dekad of May.

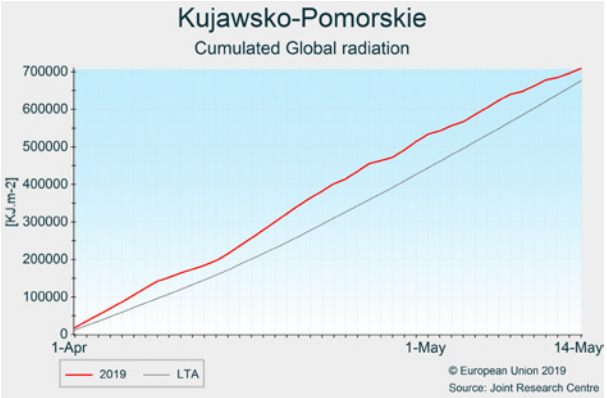
Development of winter crops and spring crops is advanced. Flowering of rapeseed (approximately 10 days ahead of the usual date) and stem elongation of winter wheat coincided with a very dry period, which may have affected yield potentials of crops on light (i.e. sandy) soils. Additionally, pest pressure is high for rapeseed, as well as for winter cereals.

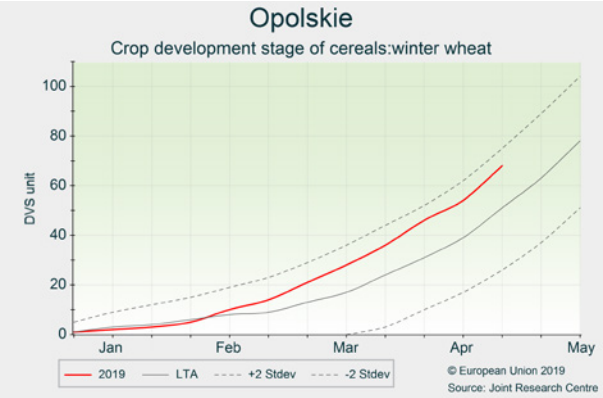
Spring crops sown during the first half of March (i.e. ahead of the usual time) benefited from favourable soil moisture conditions for emergence, while crops sown after this time had a difficult start due to very dry topsoils. Strong wind erosion in central regions damaged sugar beet seedlings or covered them with sand. The situation was further deteriorated by high pest pressure and damage from cold spells.

Crop forecasts are mostly around average (with the exception of sugar beet, for which the forecast was revised downwards). More precipitation and adequate thermal conditions are needed to allow normal crop development, to sustain the average forecasts.









Ireland and United Kingdom

Crops progress well despite dry April in eastern United Kingdom

Winter and spring cereals are generally faring well, even in the eastern United Kingdom, where rain in May — after a dry April — sustained establishment of spring crops and yield potentials for winter cereals. Rapeseed crops have been affected by dry conditions and pest infection. Sugar beet crops have emerged well and potato planting is under way.

Temperatures were mostly above average, with the exception of the beginning of April and after 1 May, when temperatures were lower than usual.

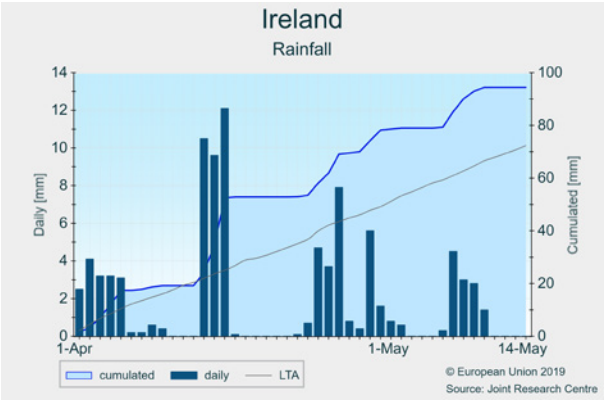
Rainfall was well below average in the eastern United Kingdom (*North-East, Yorkshire and Humber, East Midlands, East of England, South-East*), but close to average or above average in Ireland and the rest of the United Kingdom.

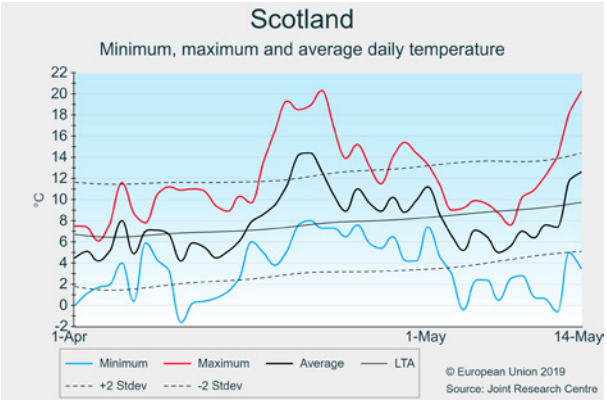
Sowing of spring cereals was mostly completed by the end of April in Scotland and Ireland. In most areas, sugar beet sowing was almost finished in mid-April and the more advanced crops are at leaf stage 2-4. Potato planting has been in full swing since mid-April.

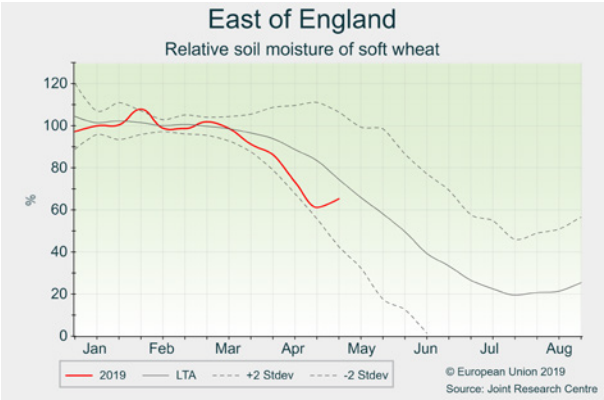
Weather conditions have generally been adequate for emergence and early crop establishment. In the eastern United Kingdom, where the sowing of spring cereals was finished in March, young stands developed an adequate rooting system to withstand the dry conditions in April. Spring crops generally greatly benefited from the rainfall in May.

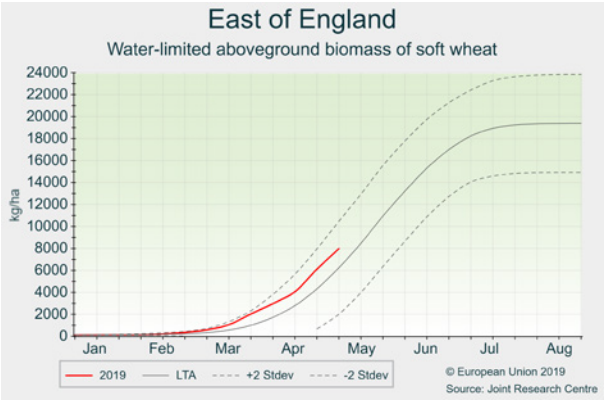
Rapeseed crops were flowering in mid-April, but subject to unfavourable dry conditions. According to field reports ([2]), cabbage stem flea beetle infections have been commonly observed during spring in southern areas, further affecting the intensity of flowering. Rapeseed is looking good in northern areas of the United Kingdom.

Winter cereals are faring well, with the earliest planted crops at flag leaf stage. Our yield forecasts are maintained close to average. For rapeseed, the forecast has been slightly reduced taking into account the rainfall pattern; yield impacts from the spring infection are uncertain and are not yet considered in our forecasts.









([2]) https://www.fwi.co.uk/arable/crop-management/pests/more-than-half-of-osr-plants-infested-with-flea-beetle-larvae

Spain and Portugal

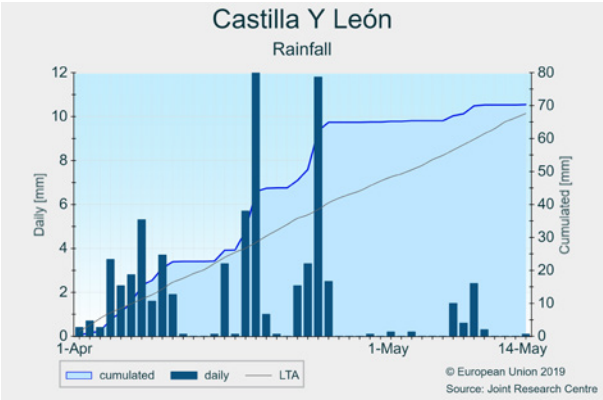
North faring better than south

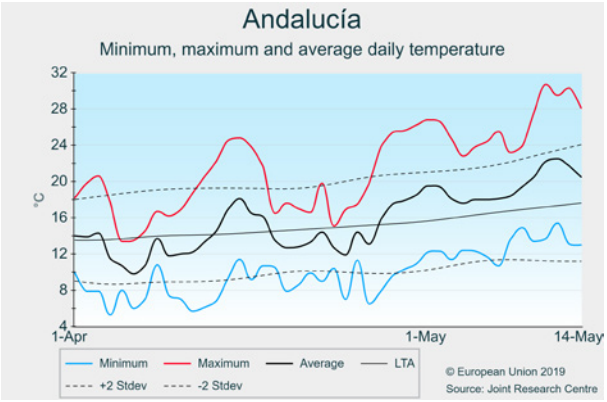
Abundant rainfall has improved the dry situation in the Iberian peninsula, but soil and reservoir water reserves remain in deficit. Crop performance is generally average or above average in the northern half of the peninsula, and below average in the southern half.

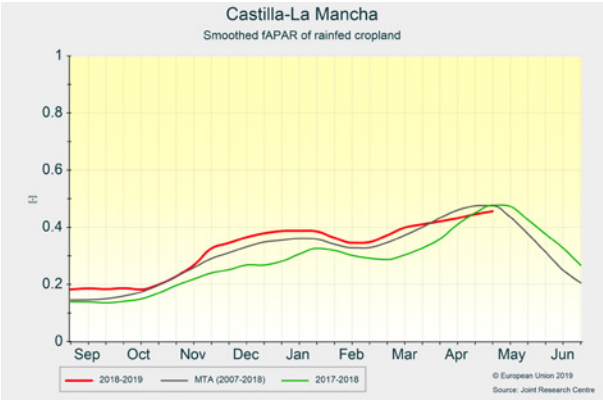
It was a particularly rainy April in Spain and Portugal, alleviating the critical hydrological situation in both countries. Nevertheless, accumulated precipitation since 1 December 2018 remains in deficit (except in north-eastern Spain). This is also reflected in Spanish water reservoirs, which have partially recovered but are still clearly below the LTA (*source:* www.embalses.net). Temperatures remained 0 °C to 2 °C below the LTA in most areas.

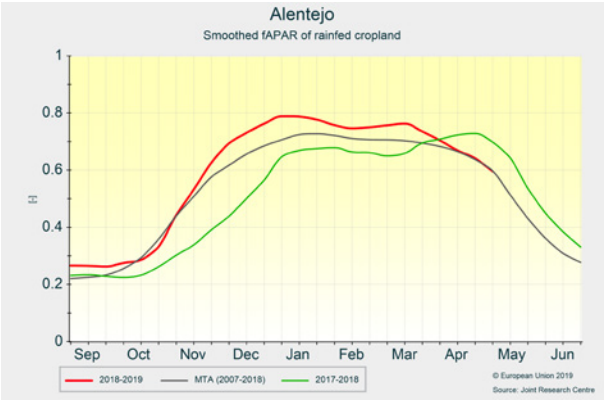
The remote sensing-based fAPAR indicator signals generally better crop development in the northern parts (e.g. *Aragón* and to a lesser degree *Castilla y León*) than in the southern parts of the peninsula. Thanks to the April rainfall, the agriculturally important region *Castilla y León* has recovered from the drought, but soil moisture is not yet fully replenished; therefore it remains dependent on the supply of rain in the coming weeks. Consistently below-average fAPAR values are found in a wide area south of *Madrid,* including large parts of *Castilla-La Mancha* (in particular *Toledo*) and *Extremadura.* The same applies to the Mediterranean coast from *Alicante* up to *Tarragona.* fAPAR values in *Andalucía* are close to the 2007-2018 medium-term average, thanks to some provinces being above-average (e.g. *Sevilla*). Similarly, in Portugal, the central and northern regions are performing well in terms of fAPAR, in contrast to clearly lower values in the south *(Alentejo)*, where a steep drop suggests early senescence.

Winter crop development is following the seasonal average in both countries, with the exception of *Aragón,* where it is slightly advanced. Winter cereals are now in the grain-filling phase in southern regions, while entering the flowering phase in the more northern regions. Summer crops have largely been sown, with some delays due to rainfall. So far, conditions have been favourable for summer crop development but it remains uncertain whether water reserves are sufficient for their irrigation.









Italy

Continued rain mostly favourable to crops

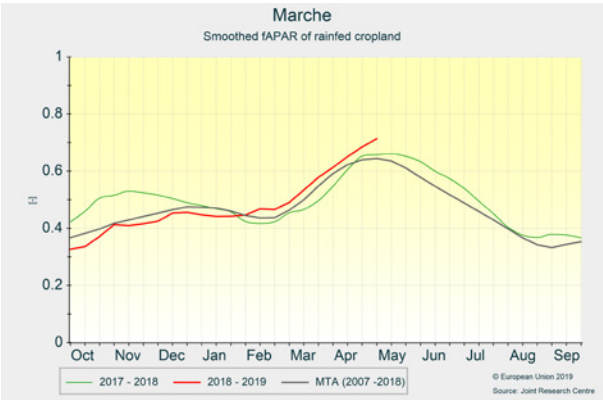
The restoration of soil moisture, combined with average temperatures, improved the condition of crops throughout the country. Winter cereal yield forecasts are well above the 5-year average. Excessive rain in north-eastern regions negatively affected soybean sowing.

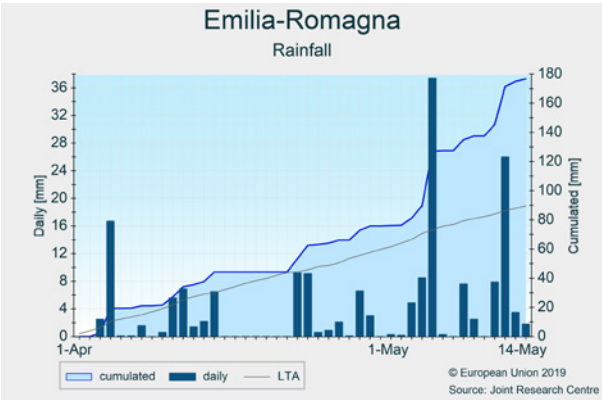
Rainfall during April and May was favourable, with positive anomalies in the main agricultural regions (e.g. 140 mm in *Emilia Romagna* and 70 mm in *Puglia*). North-eastern regions experienced abundant precipitation of 230 mm to 280 mm during the period of analysis (> + 100 % compared to LTA).

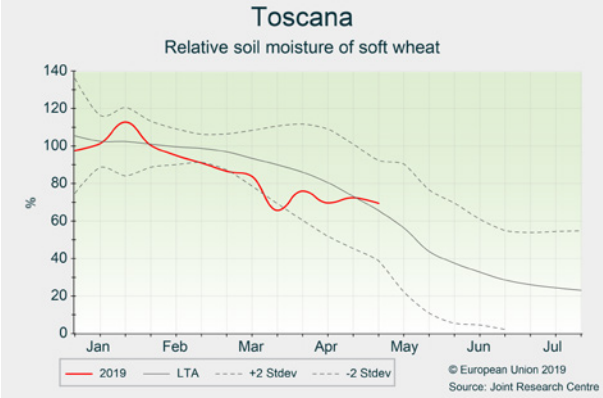
Temperature during April was around average, apart from a few days of warm anomaly (T_{max} 24 °C). Since the beginning of May, in all regions the rainy and cool weather brought temperatures to below-average values (– 2 °C to – 4 °C compared to LTA).

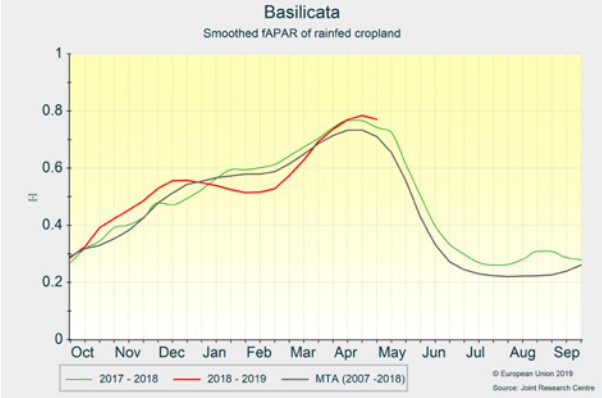
In central and northern Italy, rainfall favoured nitrogen uptake and restored soil moisture (e.g. *Toscana*), and boosted crop growth above the average (e.g. *Marche*). Winter crops are now approaching the flowering stage and the young maize stands present adequate canopy development. In north-eastern regions, excessive rain negatively affected soybean sowing and rapeseed flowering.

In southern regions, winter crops are at the flowering stage (e.g. *Basilicata*) or at the beginning of grain filling (*Sicilia*), with above-average biomass accumulation and very favourable soil moisture. The weather forecast indicates warm temperatures for the coming week, which should further sustain the favourable crop conditions, although more precipitation (as forecast) could favour an increase in pressure from pests and diseases.









Hungary

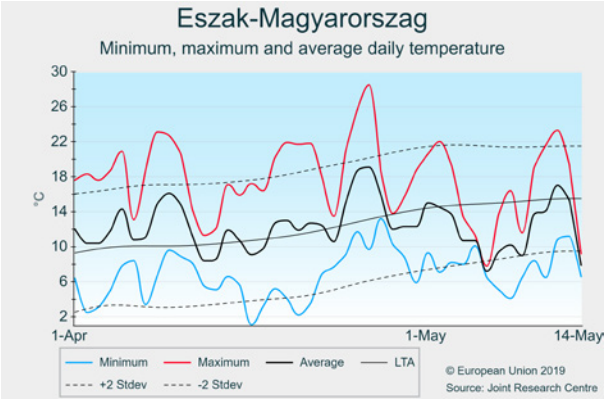
Abundant rain finally arrives

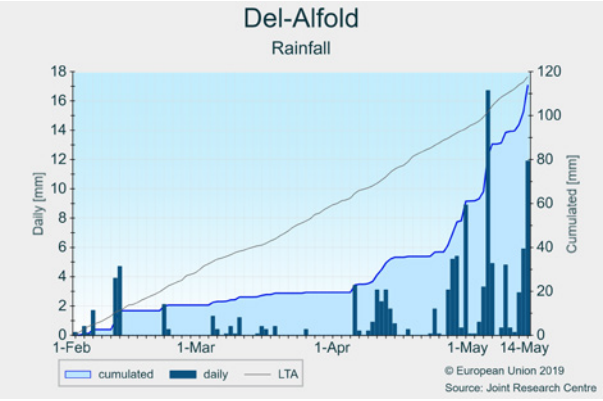
Mild and dry weather until late April was followed by a substantially colder-than-usual period with abundant rain. The precipitation arrived just before the start of flowering of winter crops, saving yields in the eastern half of Hungary. The yield forecast for winter crops was revised upwards and is now close to the historical trend.

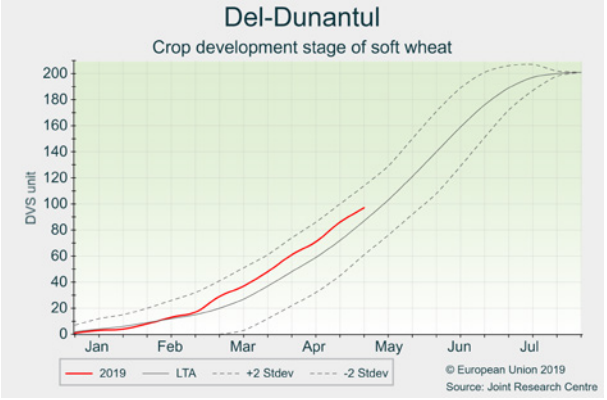
During April, daily temperatures exceeded the LTA by 2 °C on average. In late April, a noticeable cooling started and the first dekad of May was quite cold. After a dry March, rain became more frequent in early April, somewhat alleviating the situation, and extremely wet weather since late April has resulted in 60-100 mm precipitation sums for the period as a whole.

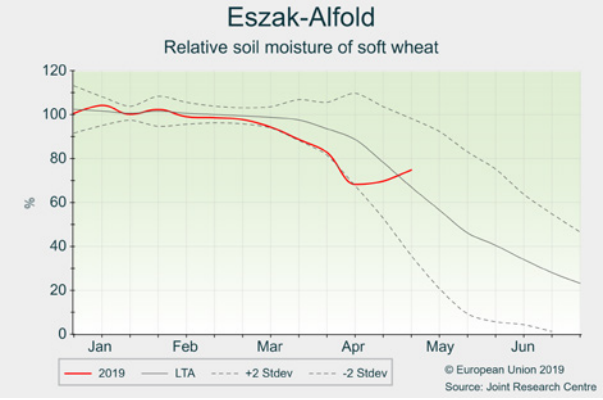
Concerns about critically low soil moisture contents were literally washed away by the recent rains. However, the current wet and cold conditions also brought some problems. Late sowings have been hampered by overly wet topsoils. Unusually low temperatures slowed down the emergence and early growth of summer crops. Moreover, the overly wet conditions may lead to lodging of winter cereals and increased pressure from pests and weeds.

The development of winter crops is still advanced due to the unusually high temperatures in March and April. The flowering of rapeseed started in mid-April. With the end of the spring drought, winter crops have partly recovered in eastern Hungary, but leaf area index and biomass accumulation are still below average. The situation is much more positive in western Hungary. The yield forecast for winter crops was revised upwards and is now close to the historical trend.









Romania

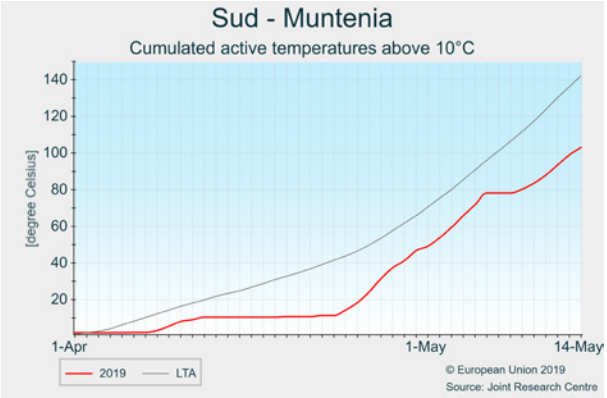
Spring drought has come to an end

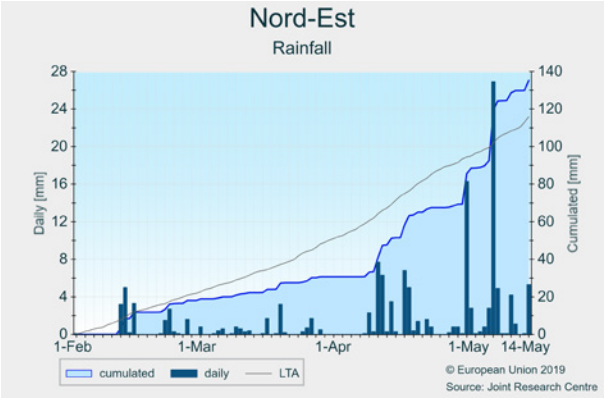
Beneficial precipitation terminated the spring drought in early May. Winter cereals partially recovered and yield expectations improved. The sowing campaign for summer crops was successful.

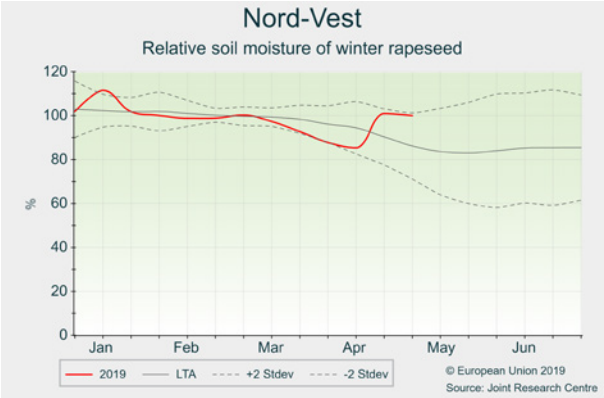
Milder and colder-than-usual periods alternated during the review period (1 April to 13 May), resulting in near-normal average temperatures overall. The first and last dekads of April were predominantly warmer than usual, while cold spells were experienced in mid-April and during the first half of May in Romania.

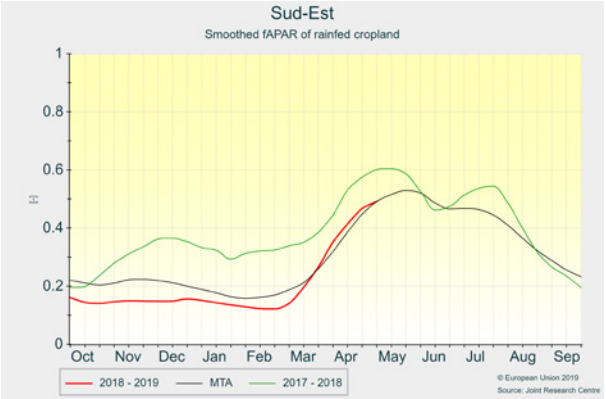
After a long-lasting dry period, considerable rainfall in the southern regions and average precipitation elsewhere mitigated the water deficit during the second dekad of April. During the last days of April, abundant precipitation arrived almost everywhere in the country, ending the spring drought. Precipitation totals for the review period typically reached 80-200 mm, although the eastern part of the *Sud-Est* region received only 25-50 mm.

The dry conditions allowed for good progress of the spring sowing campaign, and the latest rains beneficially increased soil moisture content. However, emergence and early growth of summer crops was unfavourably slow in the first dekad of May, due to low daily temperatures and radiation. Winter cereals present moderately advanced phenological development. Soil moisture levels were below optimal in early April, but the arrival of the recent rains was timely, helping winter cereals to partially recover for the heading phase; water supply was adequate once more for the grain-filling period. Satellite images confirm the improvement of crop status. On balance, the yield outlook for winter cereals was revised upwards, whereas rapeseed is still expected to be below the trend.









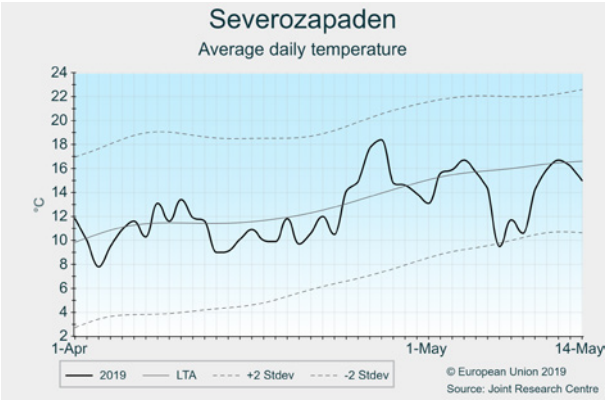
Bulgaria

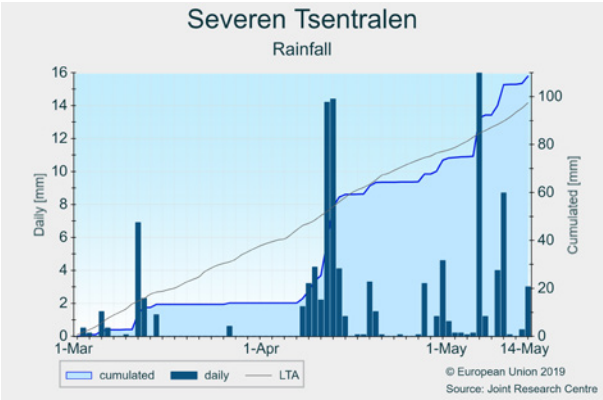
Improved yield outlook

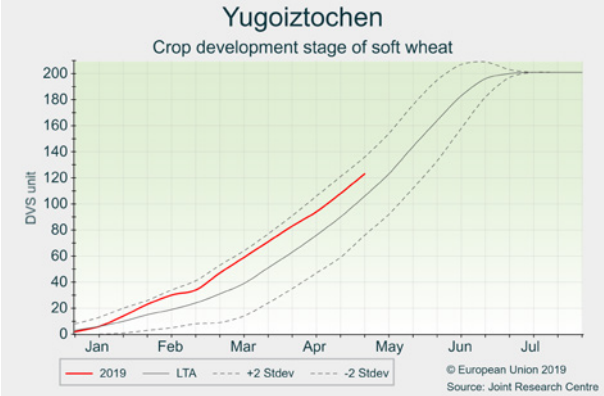
Abundant rainfall favourably increased soil moisture content. Remote sensing indicators suggest near-average or slightly below-average condition of winter crops. Our previously pessimistic yield outlook was revised upwards and is now close to the historical trend.

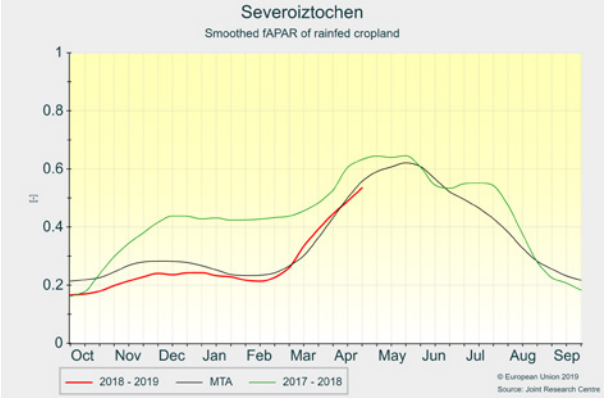
Thermal conditions in the review period (1 April to 13 May) were around average overall, albeit with considerable variability. Rainfall (urgently needed, as reported in the April bulletin) arrived, and the period 7-15 April and the first dekad of May were particularly rainy. Considering the review period as a whole (1 April to 13 May), typically 60-130 mm rain was recorded (exceeding the LTA by 10-120 %), but some areas in south-western Bulgaria received below-average precipitation. Longer dry periods allowed advanced progress in the sowing of summer crops, while the recent rains supported adequate emergence and early plant growth. Soil moisture levels under winter crops are generally near-average or above-average in the northern regions, while some drier areas can be detected in the south-eastern regions.

The development of winter crops is slightly advanced (by 5-10 days). Winter wheat is finishing the flowering stage, while rapeseed has entered the grain-filling phase. Remote sensing indicators suggest near-average or moderately below-average biomass accumulation. Water supply during flowering has so far been adequate in the northern regions and satisfactory in southern Bulgaria. Therefore, our previous yield forecast for winter crops was increased to the trend level.









Czechia, Austria and Slovakia

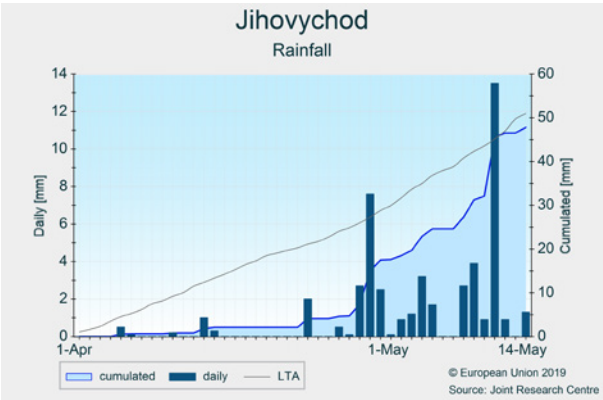
Dry April followed by wet and cold start to May

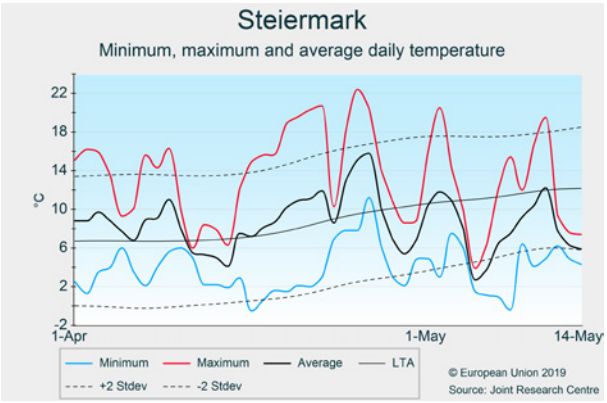
The period under analysis was characterised by a substantial warm weather anomaly. The lack of rainfall in many agricultural regions is rapidly depleting soil water levels. The winter crop yield forecasts were revised downwards slightly for Austria and more markedly for Slovakia and Czechia.

The warmest April weather conditions in our records were recorded, with air temperatures exceeding the LTA by between 4 °C and 6 °C. Locally, maximum air temperatures reached nearly 30 °C. May was also warmer than usual so far. Concerning precipitation, drier-than-usual conditions prevailed north of the Alps. Rainfall cumulates for the period as a whole rarely exceeded 30 mm in important agricultural regions of western Slovakia, northern Austria and Czechia. This contrasted with the situation in southern Austria, where rainfall cumulates exceeded 100 mm during the period under analysis. Heavy precipitation events, partly in the form of hail, were recorded locally in *Kärnten*, *Steiermark*, *Burgenland*, *Niederösterreich*, *Bratislavský Kraj* and *Jihozápad*.

The summer crops sowing campaign is now mainly finished. Warm weather conditions in April were favourable for the spread of pests, affecting especially emerging sugar beet stands. The abovementioned heavy rainfall events caused plant dieback locally. In these cases, summer crops were re-sown.

Regarding winter crops, the unusually warm weather during the period under analysis accelerated development, but also caused sharply decreasing soil water levels in major parts of Czechia, Slovakia and the northern half of Austria. The yield forecast for winter cereals was revised downwards on account of the emerging drought conditions; much will depend on the weather conditions during flowering in the coming weeks. Winter rapeseed crops were negatively affected by unfavourable weather, with dry and exceptionally warm conditions around the flowering stage, most markedly in Slovakia. The yields of summer crops are kept at the historical trend values.





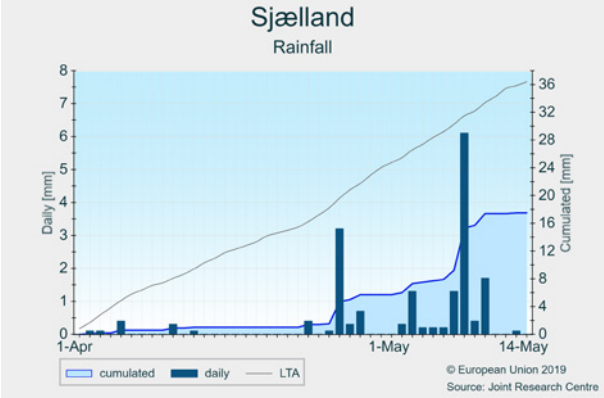
Denmark and Sweden

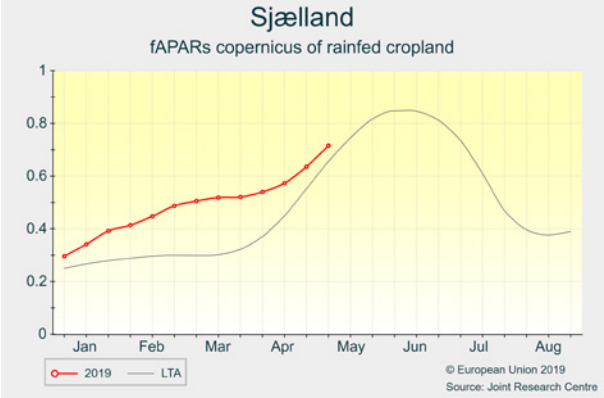
Crops are still in good condition, despite exceptional rainfall deficit

Soils are exceptionally dry for this time of the season, following a severe rain deficit in April. Rain in May brought some relief. Crop growth is not yet impacted and the yield outlook is still positive. However, yields will be severely compromised if no significant rainfall is observed in the coming weeks.

In April, only a few significant rainfall events were observed, while temperatures fluctuated around seasonal values. Substantial rainfall during the first dekad of May limited the water deficit. Our crop model shows well below average soil moisture contents for this time of the season, and drought indices are higher than last year on the same date ([3]). Nevertheless, remote sensing images are still showing a positive fAPAR anomaly. The plant water demand is still relatively low and the rain observed in the first dekad of May came on time to limit the soil water depletion and to allow adequate nitrogen uptake. Up to now, winter crops are not substantially impacted by the dry conditions and our yield forecast remains above the historical trend and the 5-year average. The spring barley forecast is still based on the trend, considering the rooting system is not completely developed and its growth might start to be impacted earlier than winter crops by the rain deficit. While the yield outlook is still positive, the low soil moisture might soon become a real concern in the absence of more substantial rainfall in the coming weeks, particularly considering that water demand will steeply increase as summer approaches.

([3]) https://www.dmi.dk/fileadmin/tkdata/KlGridDK/grid_maps/day/212/interpolated_1/2019/05/20190516.png





Estonia, Lithuania, Latvia and Finland

Fair outlook despite dry April

Higher-than-usual temperatures continued in April, but rainfall was well below average in all regions. Spring sowing activities are progressing well, within a normal window, and germination has been good despite the dry conditions in April. Winter crops are in good condition and advanced in development.

Warmer-than-usual temperatures prevailed in all agricultural regions, but night frost events still occurred, mainly around mid-April and the beginning of May.

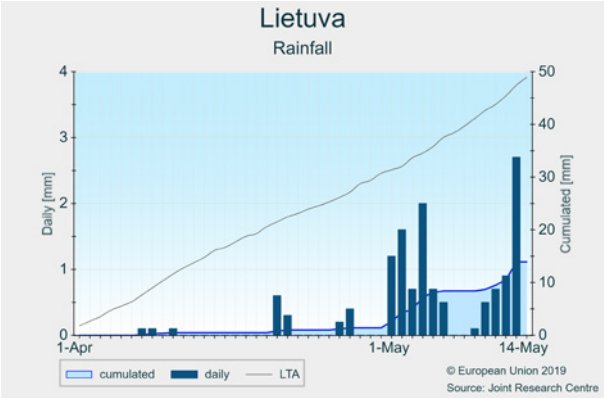
Cumulative rainfall during the review period (1 April to 13 May) is well below average. Only 22 % and 44 % of the precipitation normally expected during this period was registered in Lithuania and Latvia, respectively. Rainfall was mainly concentrated during the first dekad of May.

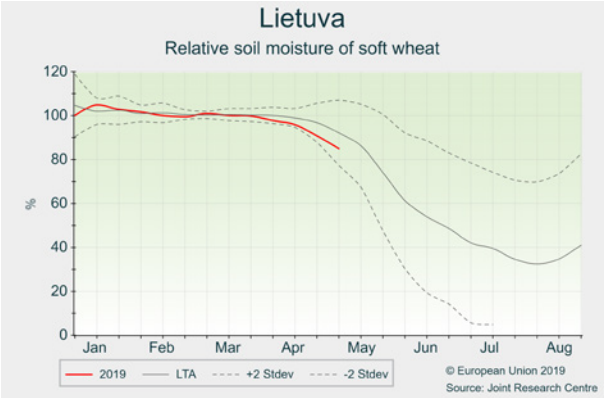
In southern Finland, the warm weather permitted the sowing of spring cereals, sugar beet and potatoes to start at the end of April, around 2 weeks earlier than usual. In northern areas, however, where temperatures are still cold and fields covered with snow, sowing is expected to start after mid-May, which is a normal time for this country. In the Baltic countries, the sowing of spring cereals, sugar beet and potatoes has been progressing well since the beginning of April, with good germination despite the dry and windy conditions in April.

Winter cereals are faring well, reaching flag leaf stage in southern Lithuania; soil moisture in deeper layers has been sufficient to sustain growth. Spring crops benefited from the rainfall at the beginning of May, but more rain is needed to replenish soil moisture levels and enable good development of spring crops.

Winter rapeseed crops are advanced by around 10 days (currently reaching flowering) and in good condition.

The yield forecasts for winter crops remain close to the 5-year average. For other crops, the yield forecast is still based on historical trends.





Belgium, Luxembourg and the Netherlands

Crops do fairly well, despite dry April and cold start to May

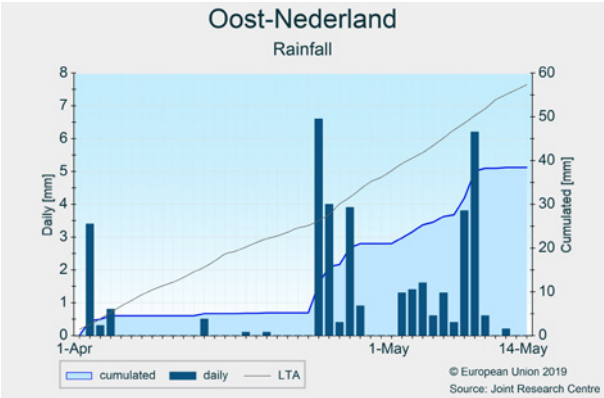
Unusually dry conditions until the end of April were followed by a period of relatively cold temperatures and frequent rain events. Spring sowing could easily be accomplished, but emergence and development of recently sown crops were hampered. Winter crops are faring well. Our yield forecasts remain slightly above the 5-year average.

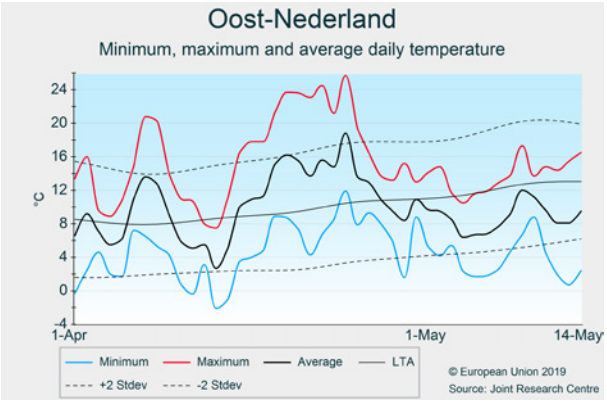
The period of unusually dry and predominantly warmer-than-usual weather conditions that had started in mid-March abruptly ended around 26 April, when it was followed by a period with below-average temperatures and frequent rainfall events. For the review period as a whole, cumulative rainfall ranged from above-average in Luxembourg and southern Belgium, to less than 70 % of the LTA (locally less than 50 %) in eastern parts of the Netherlands and western Belgium, whereas temperatures were simply average. The warmest daily maximum temperatures (up to 26 °C) occurred around 24 April; mild frosts occurred only on a few days, in mid-April.

In general, winter crops successfully withstood the unusually dry conditions, which contributed to root system development. The recent rains arrived just in time to avoid negative impacts, so winter crop development and biomass accumulation remain slightly above average. Soil moisture levels are still relatively low, and more rain is needed to sustain good growth in the coming weeks when temperatures are expected to rise. Ground water levels are also still below average, which could lead to irrigation restrictions later in the season.

The dry April allowed good progress of sowing activities. Many farmers applied irrigation to avoid wind erosion and to facilitate germination and emergence. Sugar beet sowing was completed around 3 weeks into April, whereas potato planting was mostly completed by the end of April. Maize sowing (mostly destined for silage in the Benelux countries) has almost been completed. Emergence and development of the recently sown fields have been slow, due to the first dry and then cold conditions. Locally, some fields were re-sown due to damage from wind erosion, frost, soil crusting or pests. Overall, however, stands are in fair condition.

The yield forecasts for winter crops remain practically unchanged. The yield forecasts for summer crops are still based on historical trends.





Greece and Cyprus

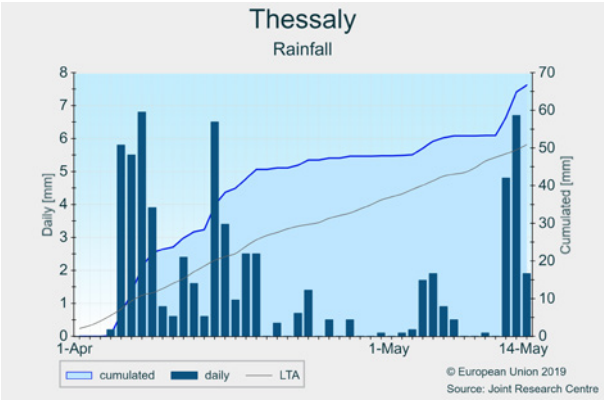
April rains bring partial relief to Greece

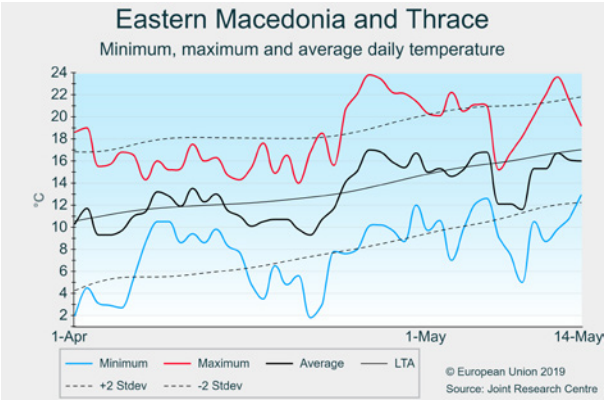
In Greece, rainfall in April was beneficial to crops, but may have come too late for some northern areas. Crop development proceeds well in the centre and east. Very positive outlook for winter crop campaign in Cyprus.

In Greece and Cyprus, the first half of April was characterised by frequent rainfall, restoring soil water reserves and terminating a very dry phase in the centre-north of Greece. Temperatures were 0-2 °C cooler than usual in most parts of Greece (but average in the north-west). The situation for crops in Greece has definitely improved with the rainfall, and crops have recovered well in the previously drought-affected areas (*Dytiki Macedonia* and *Kentriki Makedonia*), as revealed by the remote sensing fAPAR indicator. Additionally, the warmer temperatures which set in in the last week of April contributed to a boost in crop development. Cyprus is at the end of a very good growing season, thanks to a winter and spring with regular and abundant rainfall.

Despite the steep recovery curve of fAPAR in *Kentriki Makedonia*, the rains may have come late for winter crops, the development of which was accelerated due to the drought conditions. Rains were probably more beneficial in *Dytiki Makedonia*, which is naturally behind in crop development with respect to its neighbouring region, and has therefore received rains at an earlier development stage (well before flowering), which suggests a higher recovery potential. *Anatoliki Makedonia kai Thraki* suffered less from the drought and is recovering, while the fAPAR indicator is above average in central and western Greece, including the important agricultural region *Thessalia*, promising good yields there.

The precipitation was in any case highly beneficial for the summer crop campaign. Winter crop development in Greece varies between the flowering and grain-filling phases, while it is at the harvest stage in Cyprus.





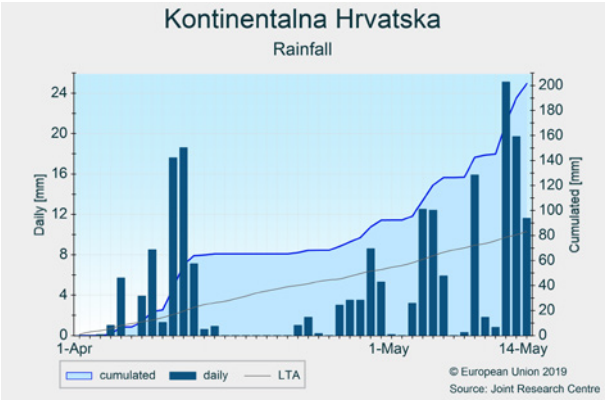
Croatia and Slovenia

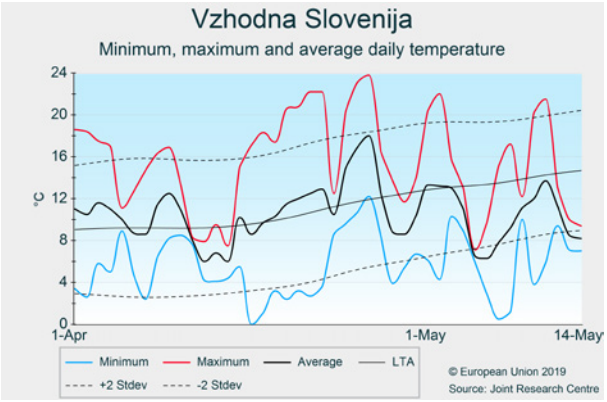
Warm weather interrupted by cold spell at the beginning of May

A warm April was followed by a cold spell and wet conditions at the beginning of May. Emerging drought conditions were mitigated by recent rainfall. Crop yield forecasts for winter cereals were revised upwards, while for summer crops they remain in line with the historical trend.

A warmer-than-usual April (up to 2 °C above the LTA) was followed by a cold first dekad of May, with average temperatures dropping to 4 °C below the LTA. Regionally in Slovenia and western Croatia, the minimum temperatures recorded dropped below 0 °C during this cold spell. Rainfall cumulates during the analysis period were generally well above seasonal levels, diminishing the soil moisture deficit which had accumulated during preceding periods. Rainfall cumulates exceeding 200 mm in western Slovenia, and regionally in Croatia, locally caused waterlogging problems for winter cereals and emerging summer crops.

The recent rains contributed to an improved yield outlook for winter crops. The emerging drought conditions in eastern Croatia, as reported in the April bulletin, have been mitigated and our yield forecasts for winter cereals have been revised upwards. Nevertheless, recent wetness may provide favourable conditions for the spread of diseases, depending mainly on weather conditions in the coming weeks. Cold weather conditions at the beginning of May caused delays to the emergence of summer crops; however, it is still too early to foresee any impact on final yield. The seasonal outlook for summer crops therefore remains in line with historical trends.





4.3. Black Sea area

Ukraine

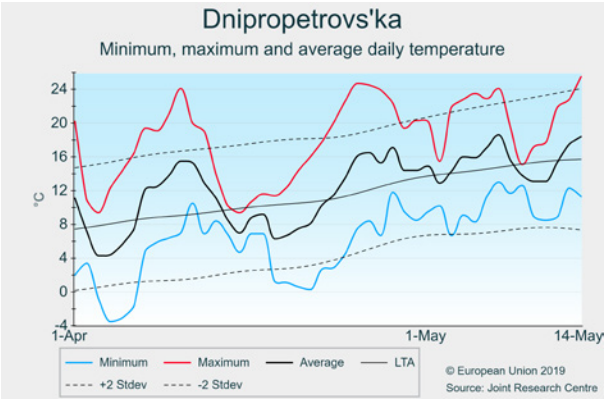
High yield potential for winter cereals

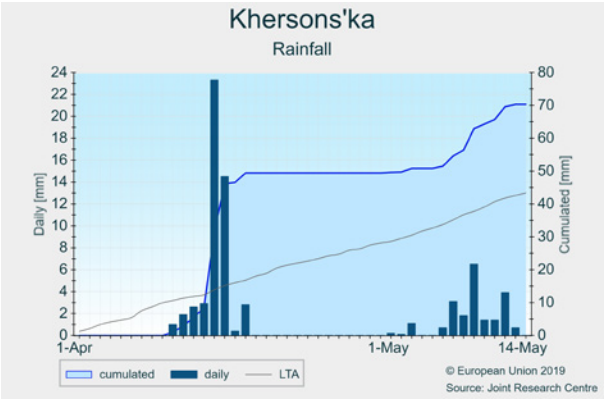
Weather conditions during the analysis period have been favourable for winter cereals and spring barley. Thanks to substantial rain, the concerns about dry conditions in southern oblasts are now over. Our yield forecasts for winter cereals have been revised upwards. Record-high yields could be attained if favourable conditions continue.

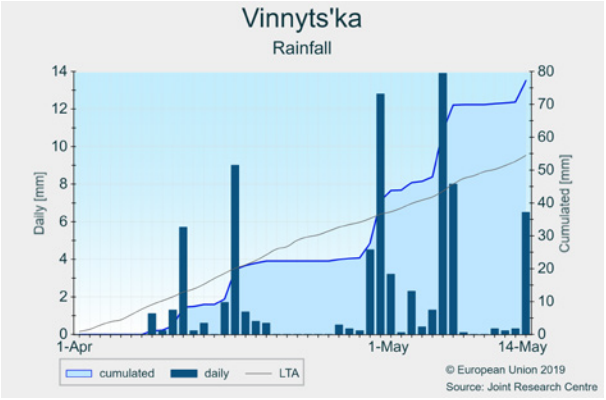
Rainfall during the period of analysis was well above the LTA. In the southern oblasts, which had previously experienced a rain deficit, substantial rainfall was observed in mid-April and during the first dekad of May. Temperatures were mild during the analysis period and without growth-impacting extremes. Crop phenology is ahead of an average year thanks to the above-average temperatures recorded in March. The condition of winter crops is estimated to be good everywhere, and considering the above-average rainfall for the period of analysis, the outlook is very positive. Only the low radiation and rainfall in the western oblasts (*Vinnyts'ka*) at the beginning of May (not at a critical development stage) will increase disease pressure and must be monitored in case it is prolonged.

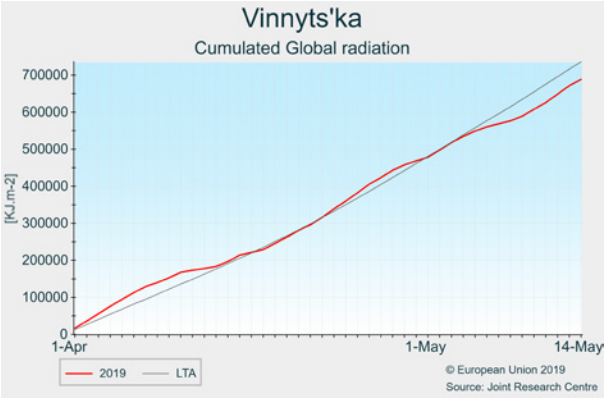
The current yield potential is above the record high for soft wheat, winter barley and spring barley, and thus the yield forecast is revised upwards. In the absence of adverse events during flowering (end of May) and grain filling, our forecast could be further increased.

The sowing of summer crops has been proceeding at a normal pace. Only the most recent rainfall in the west has caused some delay, which could be extended considering the rain forecast in the coming days.









Turkey

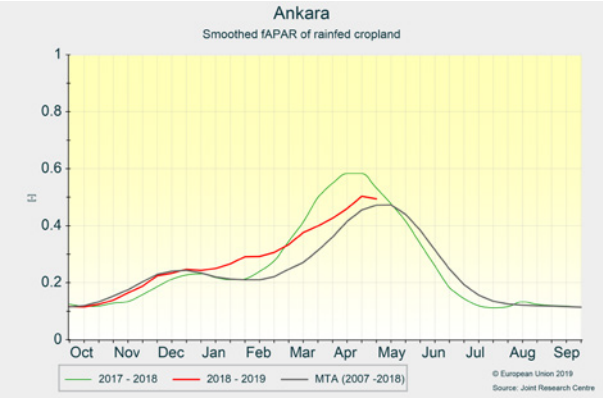
Late but positive season

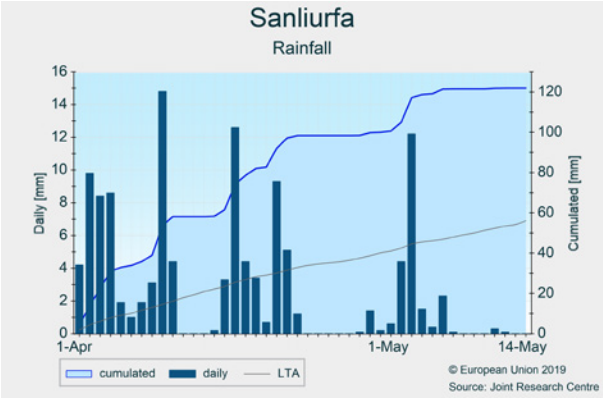
Winter cereals are progressing well and our above-average yield forecasts are maintained. For summer crops, which made a positive start to the season, the forecasts are still based on historical trends.

In western and central Anatolian regions, the strong temperature oscillation — maximum temperature rising from 8 °C to 24 °C within 5 days — resulted in accelerated crop development and winter crop leaf area well above the average (e.g. *Ankara*). In *Konya*, *Manisa*, *Bursa* and *Ankara,* winter crops are close to flowering. Similar weather conditions occurred in the central-eastern Anatolian regions (e.g. *Kirikkale* and *Kaysery*), where winter crops are entering the heading stage. Summer crops emerged in most of these regions under favourable conditions.

In south-eastern regions (e.g. *Dyakarbak* and *Sanliurfa*), the warm and humid weather conditions observed during the winter continued, with mixed effects on crops. In *Gaziantep,* crop development was delayed and biomass accumulation negatively affected by the excess of water, that caused anoxia at root level and even some totally flooded areas. In *Sanliurfa* and in *Mardin,* phenological development is also still delayed but biomass accumulation has been above average. Winter crop yield expectations for the south-eastern region as a whole are positive.

In southern regions (*Adana, Hatay*), where a significant proportion of summer crops are cultivated, remote sensing results show below-average canopy development. This is attributed to wet and cool conditions (with minimum temperatures of 2 °C) during the emergence of maize, which delayed crop development and hampered biomass accumulation.





4.4. European Russia and Belarus

European Russia

Spring sowing campaign progressing well

Mostly mild weather conditions prevailed in Russia, but a severe cold spell occurred in mid-April. Precipitation was above average in south-western regions, while eastern and northern regions remained drier. Winter wheat is in good shape in the main producing south-western regions, but problematic eastward. Overall yield expectations are slightly above average.

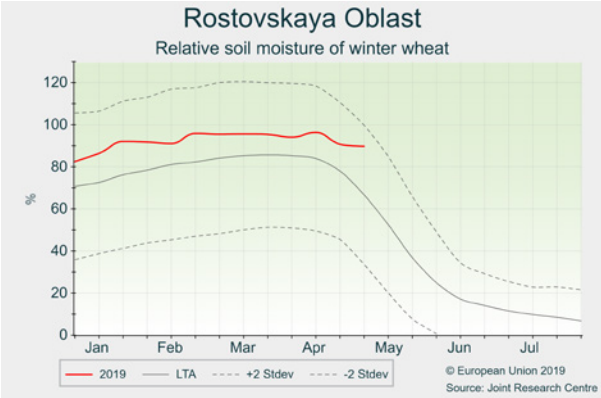
During the review period (1 April to 14 May), daily temperatures mostly fluctuated above the average. Around 14 April, an arctic cold-air intrusion reached the Central and Volga okrugs, resulting in a severe cold spell until 20 April. Minimum temperatures fell to – 3 °C to – 5 °C in the western half of Russia, while in the eastern parts of the Volga okrug, minimum temperatures were in the range of – 5 °C to – 10 °C. Frost damage may have occurred in the de-hardened winter wheat stands there. Above-seasonal temperatures returned in the last dekad of April.

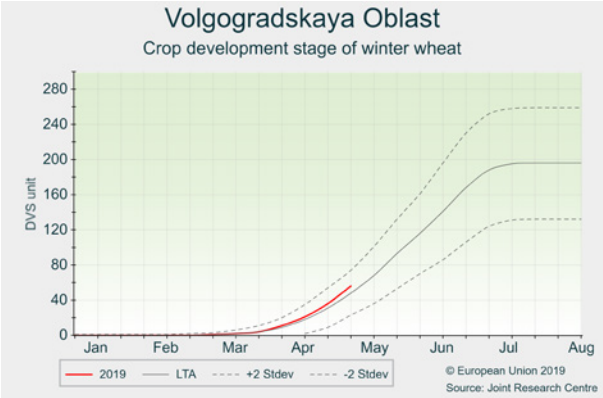
Since 1 April, precipitation has been above-average (50-110 mm) in western and especially south-western regions of European Russia. The eastern parts of the Central Black Earth region, most of the Volga okrug and the agriculturally less important northern part of Russia received below-average precipitation, typically only 15-40 mm.

The sowing campaign of spring crops started early and its pace has been significantly quicker than usual until now.

Winter crop development is advanced in south-western regions, but average or slightly delayed in northern and eastern regions. According to our model simulations, soil moisture levels are mostly average or above average in the main regions for winter cereal cultivation.

Crop model simulations and analysis of remote-sensing images indicate near- or above-average biomass accumulation and canopy expansion in the South and North Caucasian okrugs, as well as in the western half of the Central okrug. In contrast, weak biomass accumulation is signalled in the eastern parts of the Central Black Earth region and in the Volga okrug (even before the recent cold spell), which is attributed to delayed development, growth problems and difficult wintering conditions. Because of these problems, a considerable part of the area sown to winter wheat in the Volga okrug is now considered as lost.





Belarus

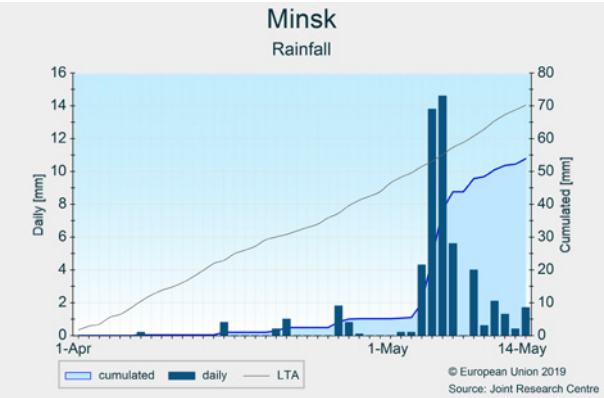
Very dry April

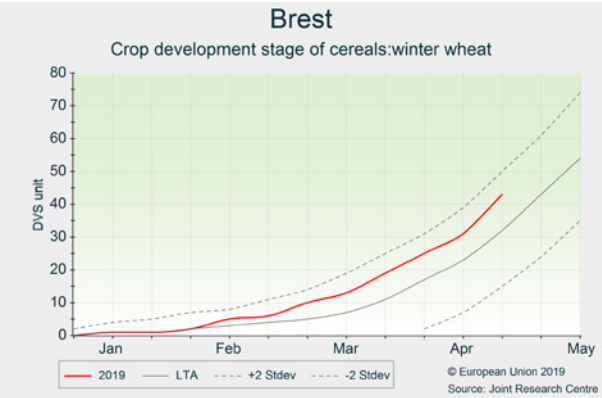
Rainfall at the beginning of May alleviated previous dry soil conditions and allows for a positive yield outlook.

The weather in April was exceptionally dry, with radiation above the LTA; temperatures oscillated around average values. Rains during the first dekad of May alleviated the dry soil conditions in most regions, with the exception of the south-eastern regions of *Mogilev* and *Gomel,* where soil moisture remains low.

Winter crops are advanced, due to warmer-than-usual weather during the previous reporting periods, and winter grains are in the stem elongation stage. Milder-than-usual conditions may have increased pressure from pests and diseases.

The sowing campaign for spring crops and maize is complete. Very dry soils in April may have adversely impacted the emergence and early development of spring crops. However, rains observed at the beginning of May allowed for a continuation of the positive yield outlook. More rain is needed, especially in the south-eastern regions, to ensure normal progress of crops.





4.5. Maghreb

Morocco, Algeria and Tunisia

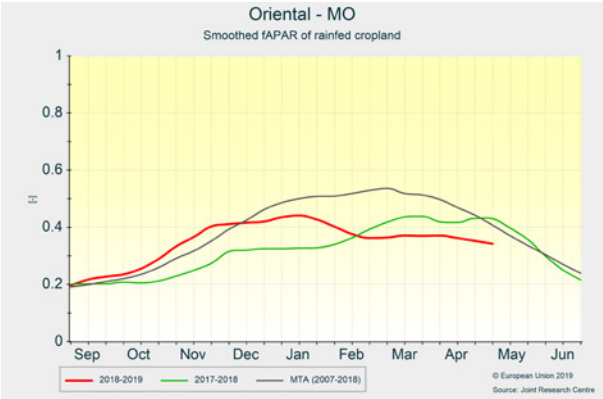
Yield forecast revised downwards in Morocco; positive outlook for Algeria and Tunisia

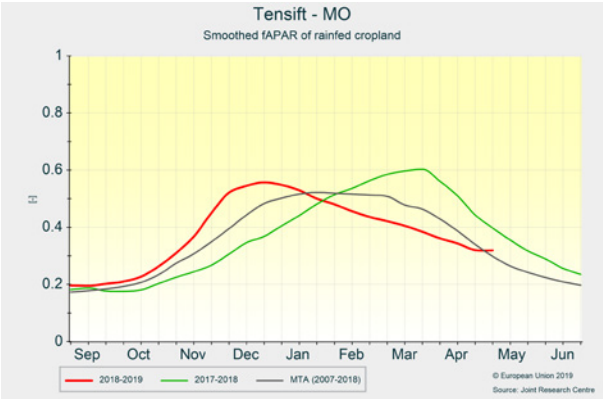
Persistent dry conditions in Morocco compromised the cereal campaign. Crop conditions in Algeria benefited from well-distributed and above-average rainfall, leading to above-average yield forecasts. Average to positive outlook for cereals in Tunisia.

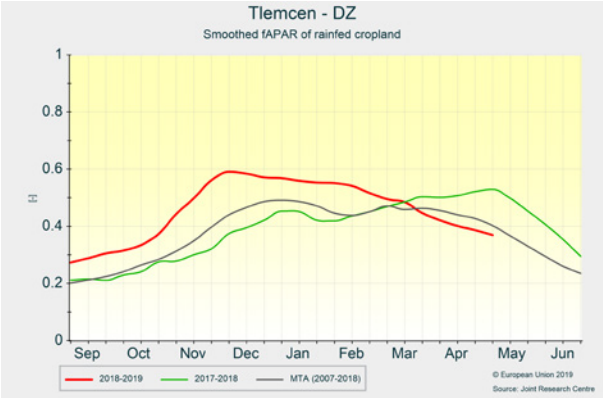
Agricultural areas in **Morocco** experienced above-average temperature profiles and scarce precipitation during the review period. Persistent dry weather in northern districts of the Oriental region worsened the condition of crops, which were already impacted by drought since flowering, thus further compromising cereal production (in particular barley) during grain filling. The dry conditions observed in Tensift and Centre regions were less persistent during the season, but still had a negative impact on both barley and wheat during grain filling. Cereal crops are currently (on average) approaching the initial or advanced senescence stages. The persistent unfavourable climatic conditions (after a positive start with above-average biomass accumulation) led to a downwards revision in the yield forecast for the country.

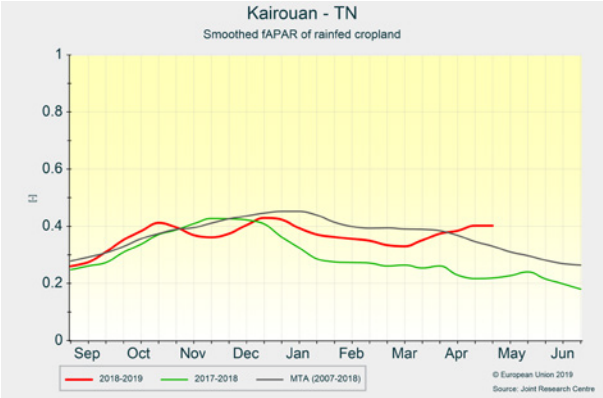
In **Algeria**, cereal crops benefited from fairly well distributed rainfall and above-average temperature profiles throughout the analysis period. Barley crops in the western provinces of Tlemcen and Ain-Temouchent (accounting for almost 20 % of national production) are performing well and advanced by almost 10 days. Remote-sensing indicators show above-average biomass accumulation in all the eastern agricultural regions. Our yield forecasts for the country are above the 5-year average.

In **Tunisia**, heavy (daily) rainfall events registered in northern districts during March did not have a negative impact on crop growth and development. Remote-sensing indicators and crop models signal above-average crop biomass accumulation in the main agricultural regions of the country (e.g. Beja, Kef, Siliana, and Kasserine). The only exception here is the region of Kairouan, where biomass accumulation (mainly of barley) is somewhat below average. Our forecasts for the country are in line with the 5-year average for barley and (somewhat) above the 5-year average for durum wheat and soft wheat.







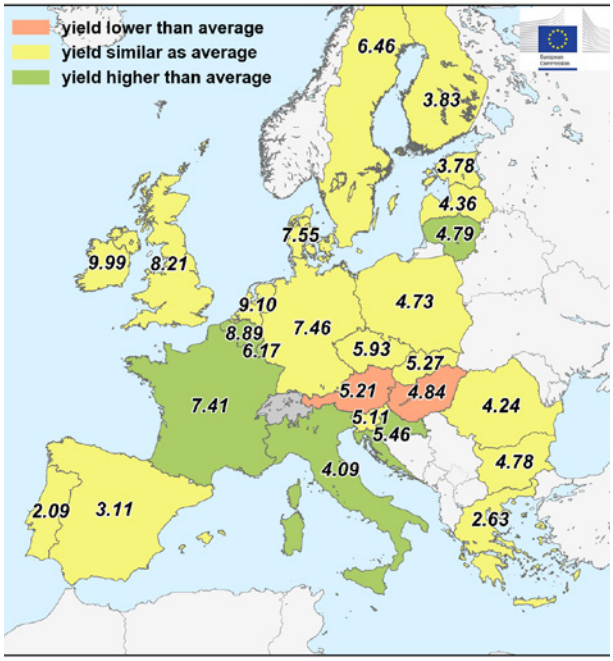


5. Crop yield forecasts

Country	TOTAL WHEAT (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	5.70	5.42	**5.82**	+2.0	+7.3
AT	5.49	4.67	**5.21**	-5.1	+11
BE	8.51	8.44	**8.89**	+4.5	+5.3
BG	4.73	4.81	**4.78**	+1.2	-0.7
CY	-	-	**-**	-	-
CZ	6.09	5.39	**5.93**	-2.5	+10
DE	7.75	6.67	**7.46**	-3.8	+12
DK	7.58	6.23	**7.55**	-0.3	+21
EE	3.75	2.91	**3.78**	+0.7	+30
ES	3.12	3.90	**3.11**	-0.5	-20
FI	3.83	2.78	**3.83**	-0.1	+38
FR	6.90	6.85	**7.41**	+7.4	+8.3
GR	2.69	2.48	**2.63**	-2.2	+5.7
HR	5.23	5.38	**5.46**	+4.3	+1.5
HU	5.15	5.10	**4.84**	-6.1	-5.1
IE	9.86	8.8	**9.99**	+1.4	+14
IT	3.87	3.81	**4.09**	+5.6	+7.4
LT	4.54	3.67	**4.79**	+5.4	+30
LU	5.80	6.05	**6.17**	+6.3	+2.0
LV	4.20	3.43	**4.36**	+3.8	+27
MT	-	-	**-**	-	-
NL	8.88	8.82	**9.10**	+2.4	+3.1
PL	4.59	4.06	**4.73**	+3.0	+16
PT	2.13	2.32	**2.09**	-1.8	-10
RO	4.20	4.80	**4.24**	+1.0	-12
SE	6.42	4.34	**6.46**	+0.6	+49
SI	5.00	4.38	**5.11**	+2.1	+17
SK	5.25	4.77	**5.27**	+0.6	+11
UK	8.28	7.76	**8.21**	-0.9	+5.7

Total wheat - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

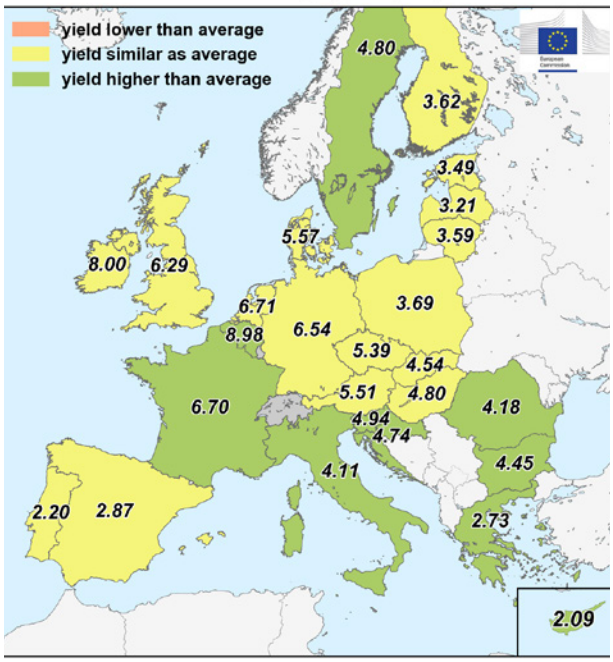


MARS Bulletin Vol. 27 No.5 (2019)

Country	TOTAL BARLEY (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	4.86	4.60	**4.96**	+2.0	+7.8
AT	5.62	4.99	**5.51**	-2.0	+10
BE	8.20	7.78	**8.98**	+9.5	+16
BG	4.22	4.25	**4.45**	+5.5	+4.7
CY	1.43	1.81	**2.09**	+46	+15
CZ	5.38	4.95	**5.39**	+0.1	+9.0
DE	6.77	5.77	**6.54**	-3.4	+13
DK	5.53	4.38	**5.57**	+0.8	+27
EE	3.38	2.49	**3.49**	+3.4	+40
ES	2.87	3.51	**2.87**	-0.2	-18
FI	3.63	3.30	**3.62**	-0.4	+9.6
FR	6.37	6.32	**6.70**	+5.2	+6.1
GR	2.61	2.64	**2.73**	+4.9	+3.4
HR	4.52	4.53	**4.74**	+4.8	+4.4
HU	4.85	4.67	**4.80**	-1.1	+2.7
IE	7.89	6.61	**8.00**	+1.4	+21
IT	3.92	4.05	**4.11**	+5.0	+1.6
LT	3.48	2.74	**3.59**	+3.1	+31
LU	-	-	**-**	-	-
LV	3.24	2.58	**3.21**	-0.7	+24
MT	-	-	**-**	-	-
NL	6.57	6.58	**6.71**	+2.1	+2.1
PL	3.67	3.12	**3.69**	+0.7	+18
PT	2.22	2.48	**2.20**	-0.8	-11
RO	3.84	4.60	**4.18**	+9.0	-9.0
SE	4.59	3.04	**4.80**	+4.6	+58
SI	4.64	4.20	**4.94**	+6.4	+18
SK	4.65	3.90	**4.54**	-2.5	+17
UK	6.18	5.72	**6.29**	+1.8	+9.9

Total barley - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

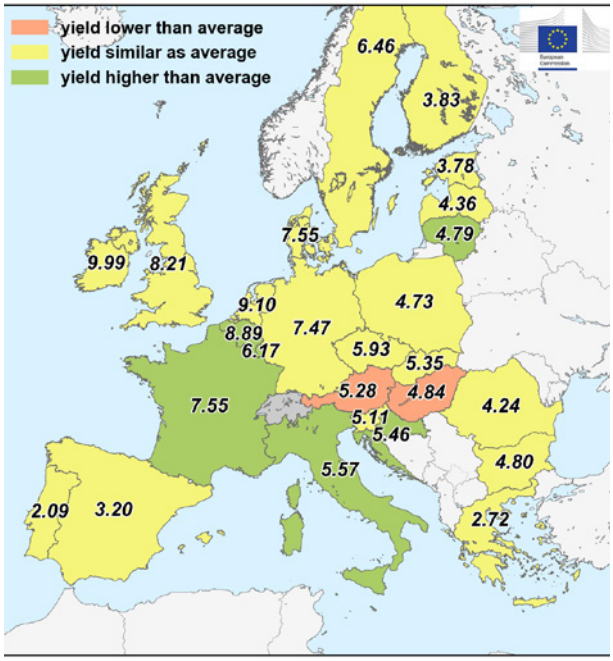


MARS Bulletin Vol. 27 No.5 (2019)

Country	SOFT WHEAT (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	5.94	5.62	**6.05**	+1.9	+7.6
AT	5.55	4.71	**5.28**	-5.0	+12
BE	8.51	8.44	**8.89**	+4.5	+5.3
BG	4.73	4.82	**4.80**	+1.3	-0.6
CY	-	-	**-**	-	-
CZ	6.09	5.39	**5.93**	-2.5	+10
DE	7.77	6.69	**7.47**	-3.8	+12
DK	7.58	6.23	**7.55**	-0.3	+21
EE	3.75	2.91	**3.78**	+0.7	+30
ES	3.22	3.98	**3.20**	-0.5	-20
FI	3.83	2.78	**3.83**	-0.1	+38
FR	7.02	6.98	**7.55**	+7.5	+8.3
GR	2.80	2.51	**2.72**	-2.9	+8.4
HR	5.23	5.38	**5.46**	+4.3	+1.5
HU	5.16	5.11	**4.84**	-6.2	-5.3
IE	9.86	8.77	**9.99**	+1.4	+14
IT	5.16	5.13	**5.57**	+8.0	+8.5
LT	4.54	3.67	**4.79**	+5.4	+30
LU	5.80	6.05	**6.17**	+6.3	+2.0
LV	4.20	3.43	**4.36**	+3.8	+27
MT	-	-	**-**	-	-
NL	8.88	8.82	**9.10**	+2.4	+3.1
PL	4.59	4.06	**4.73**	+3.0	+16
PT	2.13	2.32	**2.09**	-1.8	-10
RO	4.20	4.80	**4.24**	+1.0	-12
SE	6.42	4.34	**6.46**	+0.6	+49
SI	5.00	4.38	**5.11**	+2.1	+17
SK	5.30	4.77	**5.35**	+0.9	+12
UK	8.28	7.76	**8.21**	-0.9	+5.7

Soft wheat - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

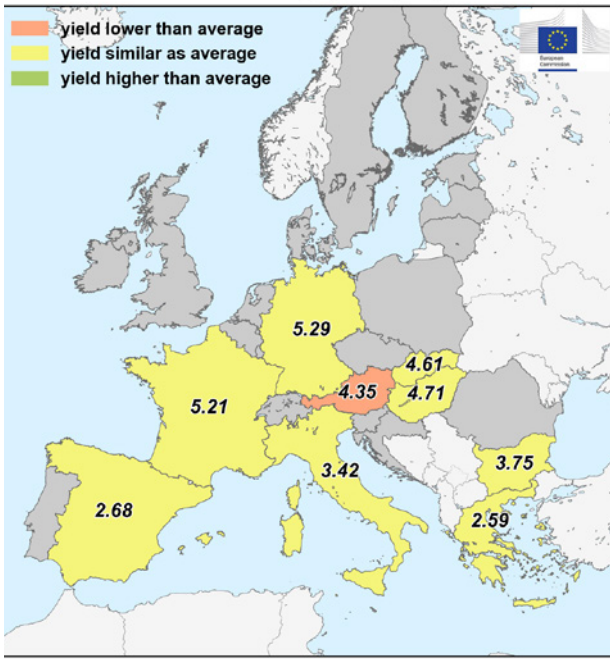


MARS Bulletin Vol. 27 No.5 (2019)

Country	DURUM WHEAT (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	3.46	3.54	**3.51**	+1.4	-1.0
AT	4.57	4.17	**4.35**	-4.8	+4.2
BE	-	-	**-**	-	-
BG	3.88	4.01	**3.75**	-3.4	-6.5
CY	-	-	**-**	-	-
CZ	-	-	**-**	-	-
DE	5.25	4.57	**5.29**	+0.8	+16
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	2.69	3.54	**2.68**	-0.5	-24
FI	-	-	**-**	-	-
FR	5.13	5.04	**5.21**	+1.5	+3.3
GR	2.64	2.47	**2.59**	-1.9	+4.5
HR	-	-	**-**	-	-
HU	4.80	4.70	**4.71**	-1.9	+0.1
IE	-	-	**-**	-	-
IT	3.34	3.24	**3.42**	+2.4	+5.4
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	-	-	**-**	-	-
PT	-	-	**-**	-	-
RO	-	-	**-**	-	-
SE	-	-	**-**	-	-
SI	-	-	**-**	-	-
SK	4.63	4.82	**4.61**	-0.5	-4.3
UK	-	-	**-**	-	-

Durum wheat - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

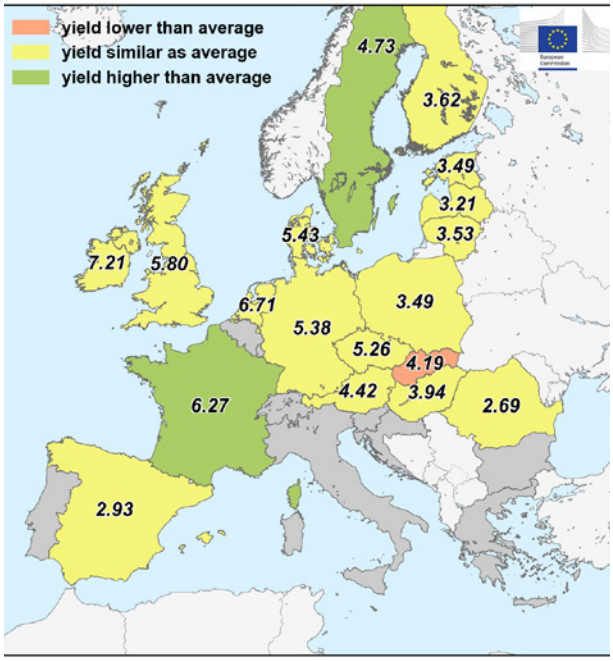


MARS Bulletin Vol. 27 No.5 (2019)

Country	SPRING BARLEY (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	4.16	3.98	**4.20**	+1.0	+5.5
AT	4.53	3.44	**4.42**	-2.3	+29
BE	-	-	**-**	-	-
BG	-	-	**-**	-	-
CY	-	-	**-**	-	-
CZ	5.28	4.93	**5.26**	-0.3	+6.7
DE	5.38	4.95	**5.38**	+0.0	+8.5
DK	5.36	4.28	**5.43**	+1.3	+27
EE	3.38	2.49	**3.49**	+3.4	+40
ES	2.96	3.59	**2.93**	-1.1	-18
FI	3.63	3.30	**3.62**	-0.4	+9.6
FR	6.00	6.21	**6.27**	+4.5	+0.9
GR	-	-	**-**	-	-
HR	-	-	**-**	-	-
HU	3.87	2.69	**3.94**	+1.9	+46
IE	7.22	5.62	**7.21**	-0.1	+28
IT	-	-	**-**	-	-
LT	3.46	2.72	**3.53**	+1.9	+30
LU	-	-	**-**	-	-
LV	3.24	2.58	**3.21**	-0.7	+24
MT	-	-	**-**	-	-
NL	6.57	6.58	**6.71**	+2.1	+2.1
PL	3.48	2.95	**3.49**	+0.1	+18
PT	-	-	**-**	-	-
RO	2.65	2.56	**2.69**	+1.5	+5.0
SE	4.53	3.01	**4.73**	+4.3	+57
SI	-	-	**-**	-	-
SK	4.47	3.63	**4.19**	-6.4	+15
UK	5.66	5.17	**5.80**	+2.4	+12

Spring barley - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

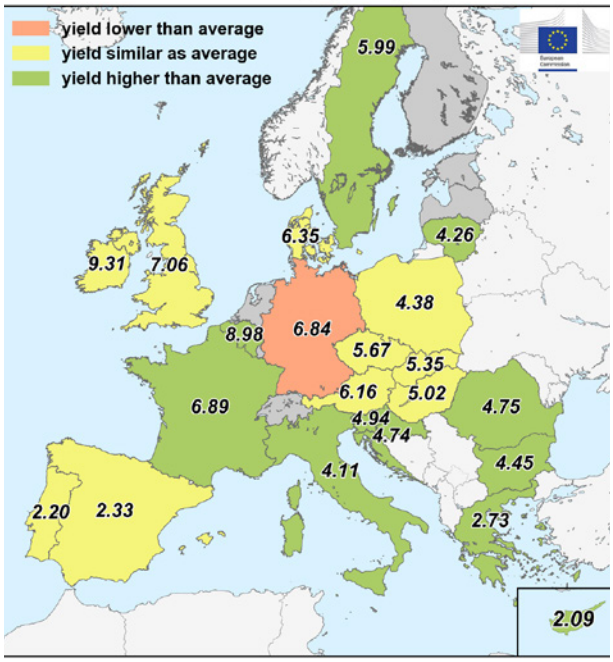


MARS Bulletin Vol. 27 No.5 (2019)

Country	WINTER BARLEY (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	5.78	5.49	**5.97**	+3.2	+8.7
AT	6.31	5.77	**6.16**	-2.4	+6.7
BE	8.20	7.78	**8.98**	+9.5	+16
BG	4.22	4.25	**4.45**	+5.5	+4.7
CY	1.43	1.81	**2.09**	+46	+15
CZ	5.63	4.98	**5.67**	+0.8	+14
DE	7.18	6.06	**6.84**	-4.8	+13
DK	6.40	5.25	**6.35**	-0.7	+21
EE	-	-	**-**	-	-
ES	2.30	2.94	**2.33**	+1.1	-21
FI	-	-	**-**	-	-
FR	6.50	6.36	**6.89**	+6.0	+8.3
GR	2.61	2.64	**2.73**	+4.9	+3.4
HR	4.52	4.53	**4.74**	+4.8	+4.4
HU	5.09	4.92	**5.02**	-1.5	+2.0
IE	9.22	8.80	**9.31**	+1.0	+5.8
IT	3.92	4.05	**4.11**	+5.0	+1.6
LT	3.97	3.43	**4.26**	+7.3	+24
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	4.32	3.78	**4.38**	+1.3	+16
PT	2.22	2.48	**2.20**	-0.8	-11
RO	4.22	5.12	**4.75**	+12.6	-7.1
SE	5.75	3.74	**5.99**	+4.1	+60
SI	4.64	4.20	**4.94**	+6.4	+18
SK	5.17	4.48	**5.35**	+3.4	+20
UK	7.03	6.79	**7.06**	+0.4	+4.1

Winter barley - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

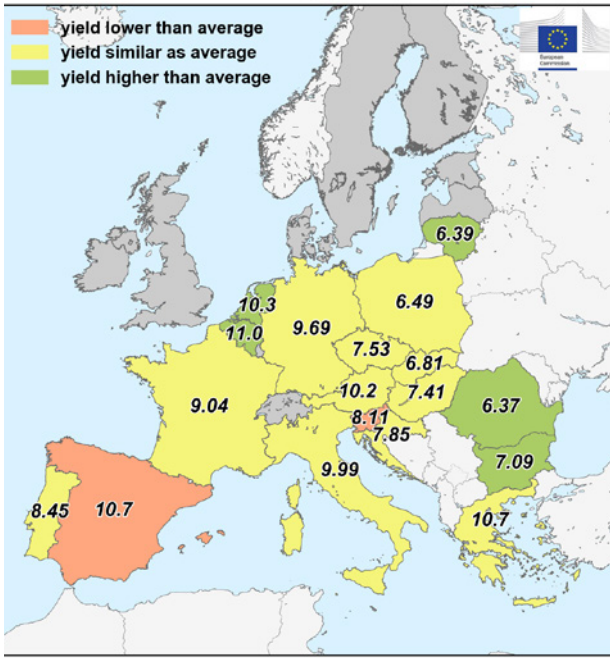


MARS Bulletin Vol. 27 No.5 (2019)

Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	7.62	8.36	**7.92**	+4.0	-5.2
AT	10.2	10.2	**10.2**	+0.7	+0.8
BE	10.5	8.23	**11.0**	+4.8	+33
BG	6.54	7.82	**7.09**	+8.5	-9.3
CY	-	-	**-**	-	-
CZ	7.39	5.98	**7.53**	+2.0	+26
DE	9.62	8.14	**9.69**	+0.7	+19
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	11.2	10.8	**10.7**	-4.6	-1.4
FI	-	-	**-**	-	-
FR	9.18	8.95	**9.04**	-1.6	+1.0
GR	10.4	9.84	**10.7**	+3.6	+9.1
HR	7.68	9.13	**7.85**	+2.2	-14
HU	7.46	8.44	**7.41**	-0.6	-12
IE	-	-	**-**	-	-
IT	10.3	9.87	**9.99**	-2.6	+1.2
LT	6.05	6.54	**6.39**	+5.6	-2.3
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	9.61	6.17	**10.3**	+6.9	+67
PL	6.31	5.99	**6.49**	+2.9	+8.4
PT	8.33	8.24	**8.45**	+1.5	+2.6
RO	5.18	7.79	**6.37**	+23	-18
SE	-	-	**-**	-	-
SI	8.80	9.45	**8.11**	-7.8	-14
SK	6.94	8.51	**6.81**	-1.9	-20
UK	-	-	**-**	-	-

Grain maize - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

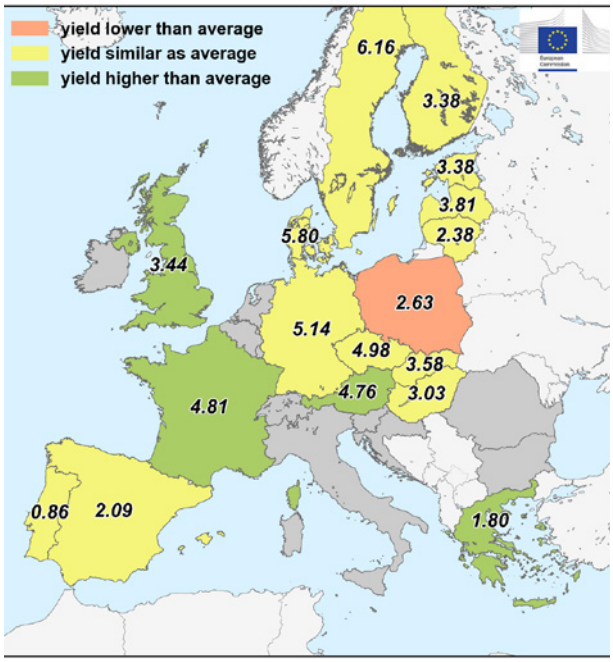


MARS Bulletin Vol. 27 No.5 (2019)

Country	RYE (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	3.79	3.24	**3.77**	-0.5	+16
AT	4.48	4.36	**4.76**	+6.1	+9.2
BE	-	-	**-**	-	-
BG	-	-	**-**	-	-
CY	-	-	**-**	-	-
CZ	4.93	4.74	**4.98**	+0.8	+5.0
DE	5.31	4.30	**5.14**	-3.2	+20
DK	5.92	5.20	**5.80**	-2.1	+12
EE	3.30	2.72	**3.38**	+2.5	+24
ES	2.05	2.85	**2.09**	+1.8	-27
FI	3.36	2.58	**3.38**	+0.5	+31
FR	4.55	4.58	**4.81**	+5.5	+4.8
GR	1.70	1.77	**1.80**	+5.6	+1.7
HR	-	-	**-**	-	-
HU	3.02	3.26	**3.03**	+0.3	-7.2
IE	-	-	**-**	-	-
IT	-	-	**-**	-	-
LT	2.41	2.07	**2.38**	-1.7	+15
LU	-	-	**-**	-	-
LV	3.79	3.76	**3.81**	+0.4	+1.2
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	2.88	2.42	**2.63**	-8.7	+8.5
PT	0.89	0.93	**0.86**	-3.6	-7.7
RO	-	-	**-**	-	-
SE	6.07	4.53	**6.16**	+1.4	+36
SI	-	-	**-**	-	-
SK	3.57	3.39	**3.58**	+0.4	+5.4
UK	2.59	3.05	**3.44**	+33	+13

Rye - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

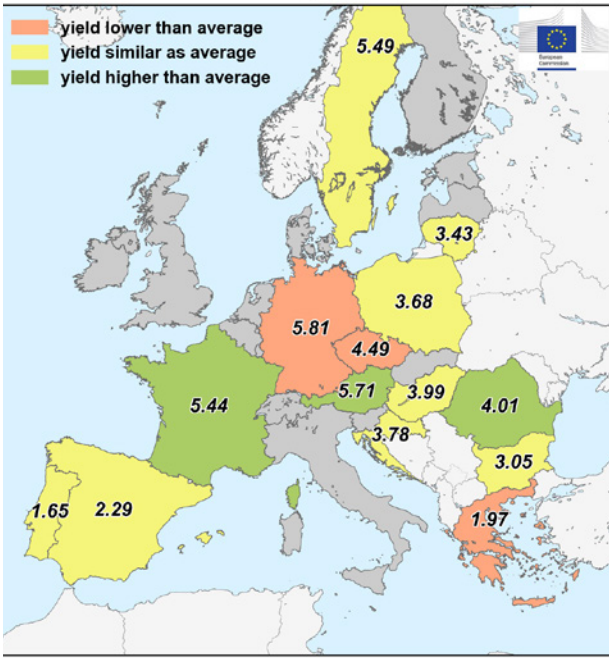


MARS Bulletin Vol. 27 No.5 (2019)

Country	TRITICALE (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	4.13	3.76	**4.17**	+1.1	+11
AT	5.43	4.91	**5.71**	+5.0	+16
BE	-	-	**-**	-	-
BG	3.03	2.66	**3.05**	+0.4	+15
CY	-	-	**-**	-	-
CZ	4.82	4.55	**4.49**	-6.9	-1.3
DE	6.23	5.41	**5.81**	-6.8	+7.3
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	2.35	3.08	**2.29**	-2.6	-26
FI	-	-	**-**	-	-
FR	5.00	4.87	**5.44**	+8.7	+12
GR	2.13	2.11	**1.97**	-7.5	-6.9
HR	3.86	3.66	**3.78**	-2.1	+3.1
HU	3.96	3.76	**3.99**	+0.7	+6.3
IE	-	-	**-**	-	-
IT	-	-	**-**	-	-
LT	3.35	2.69	**3.43**	+2.2	+28
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	3.65	3.17	**3.68**	+0.8	+16
PT	1.68	1.80	**1.65**	-2.2	-8.7
RO	3.85	4.44	**4.01**	+4.4	-10
SE	5.46	3.38	**5.49**	+0.5	+62
SI	-	-	**-**	-	-
SK	-	-	**-**	-	-
UK	-	-	**-**	-	-

Triticale - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

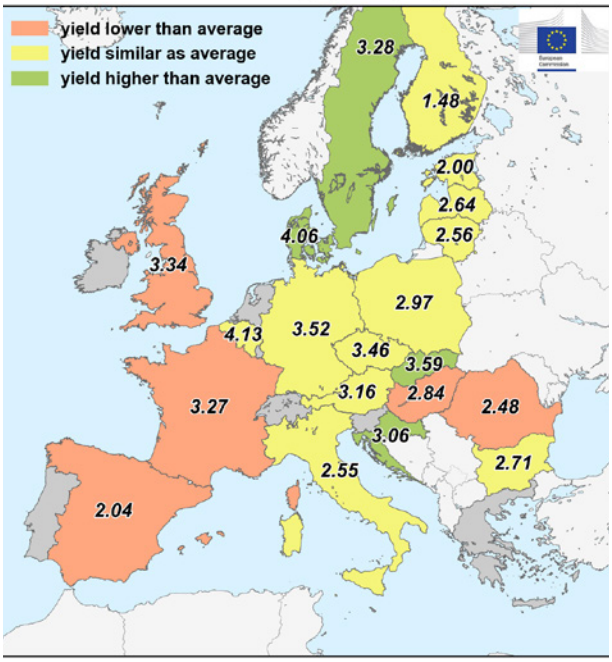


MARS Bulletin Vol. 27 No.5 (2019)

Country	RAPE AND TURNIP RAPE (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	3.24	2.89	**3.13**	-3.3	+8.5
AT	3.27	2.98	**3.16**	-3.4	+5.9
BE	4.12	3.79	**4.13**	+0.3	+9.1
BG	2.75	2.58	**2.71**	-1.7	+4.9
CY	-	-	**-**	-	-
CZ	3.43	3.43	**3.46**	+0.8	+1.1
DE	3.64	2.99	**3.52**	-3.2	+18
DK	3.89	3.43	**4.06**	+4.3	+18
EE	2.02	1.56	**2.00**	-1.3	+28
ES	2.13	2.26	**2.04**	-4.2	-10
FI	1.50	1.33	**1.48**	-1.4	+12
FR	3.43	3.06	**3.27**	-4.5	+6.8
GR	-	-	**-**	-	-
HR	2.88	2.84	**3.06**	+6.0	+7.8
HU	3.13	3.02	**2.84**	-9.2	-5.8
IE	-	-	**-**	-	-
IT	2.55	2.72	**2.55**	-0.1	-6.3
LT	2.52	2.11	**2.56**	+1.3	+21
LU	-	-	**-**	-	-
LV	2.56	1.90	**2.64**	+3.2	+39
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	2.90	2.56	**2.97**	+2.3	+16
PT	-	-	**-**	-	-
RO	2.66	2.55	**2.48**	-7.0	-2.7
SE	3.13	2.24	**3.28**	+5.0	+47
SI	-	-	**-**	-	-
SK	3.12	3.11	**3.59**	+15	+15
UK	3.61	3.45	**3.34**	-7.4	-3.3

Rapeseed - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

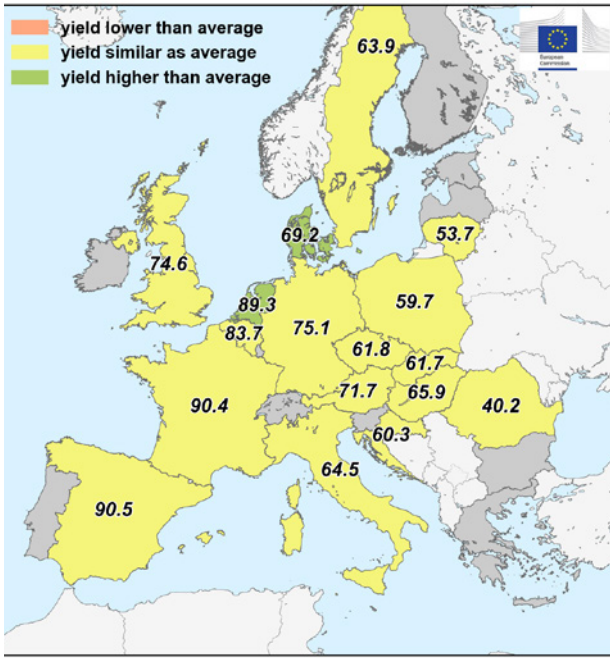


MARS Bulletin Vol. 27 No.5 (2019)

Country	SUGAR BEETS (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	75.2	68.1	**76.5**	+1.7	+12
AT	73.9	68.8	**71.7**	-3.0	+4.2
BE	83.7	82.8	**83.7**	+0.0	+1.0
BG	-	-	**-**	-	-
CY	-	-	**-**	-	-
CZ	64.4	57.5	**61.8**	-3.9	+7.5
DE	75.0	63.3	**75.1**	+0.2	+19
DK	65.9	61.5	**69.2**	+5.0	+13
EE	-	-	**-**	-	-
ES	91.3	86.7	**90.5**	-0.9	+4.4
FI	-	-	**-**	-	-
FR	88.6	81.6	**90.4**	+2.0	+11
GR	-	-	**-**	-	-
HR	62.6	54.8	**60.3**	-3.6	+10
HU	64.0	59.3	**65.9**	+3.0	+11
IE	-	-	**-**	-	-
IT	62.2	64.0	**64.5**	+3.6	+0.8
LT	55.8	57.2	**53.7**	-3.7	-6.1
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	83.8	76.4	**89.3**	+6.6	+17
PL	58.4	50.7	**59.7**	+2.2	+18
PT	-	-	**-**	-	-
RO	41.1	38.5	**40.2**	-2.3	+4.3
SE	64.0	55.3	**63.9**	-0.2	+16
SI	-	-	**-**	-	-
SK	60.4	59.9	**61.7**	+2.3	+3.1
UK	73.5	69.3	**74.6**	+1.5	+7.7

Sugar beet - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

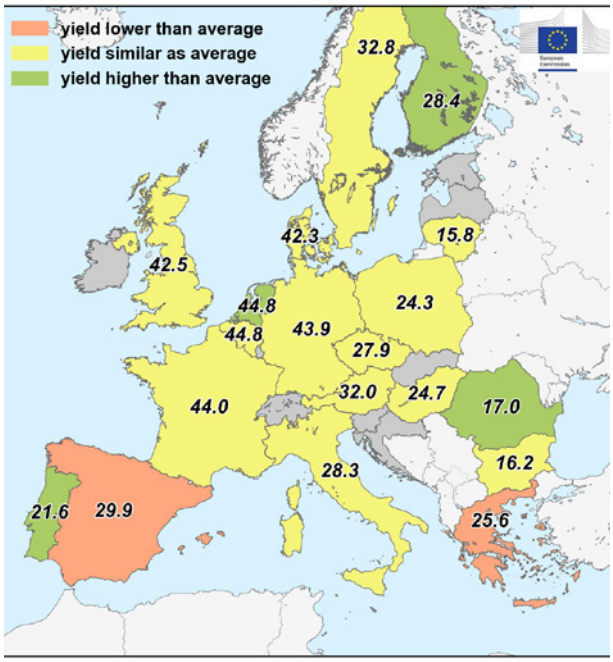


MARS Bulletin Vol. 27 No.5 (2019)

Country	POTATO (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	33.6	30.5	**34.6**	+2.8	+13
AT	31.0	29.4	**32.0**	+3.2	+9.0
BE	43.4	32.6	**44.8**	+3.0	+37
BG	16.2	18.6	**16.2**	+0.3	-13
CY	-	-	**-**	-	-
CZ	27.3	25.5	**27.9**	+2.3	+9.4
DE	43.5	35.4	**43.9**	+0.8	+24
DK	40.8	34.8	**42.3**	+3.5	+22
EE	-	-	**-**	-	-
ES	31.3	29.8	**29.9**	-4.4	+0.4
FI	27.1	28.1	**28.4**	+4.8	+1.3
FR	42.4	39.4	**44.0**	+3.6	+12
GR	27.2	28.8	**25.6**	-5.8	-11
HR	-	-	**-**	-	-
HU	24.6	22.8	**24.7**	+0.6	+8.7
IE	-	-	**-**	-	-
IT	27.9	28.9	**28.3**	+1.7	-2.0
LT	16.0	15.5	**15.8**	-1.2	+1.6
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	42.6	36.6	**44.8**	+5.2	+22
PL	24.8	22.3	**24.3**	-1.8	+9.0
PT	20.3	21.1	**21.6**	+6.6	+2.8
RO	16.2	17.7	**17.0**	+5.0	-3.7
SE	34.0	30.3	**32.8**	-3.4	+8.5
SI	-	-	**-**	-	-
SK	-	-	**-**	-	-
UK	42.8	41.6	**42.5**	-0.8	+2.1

Potato - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

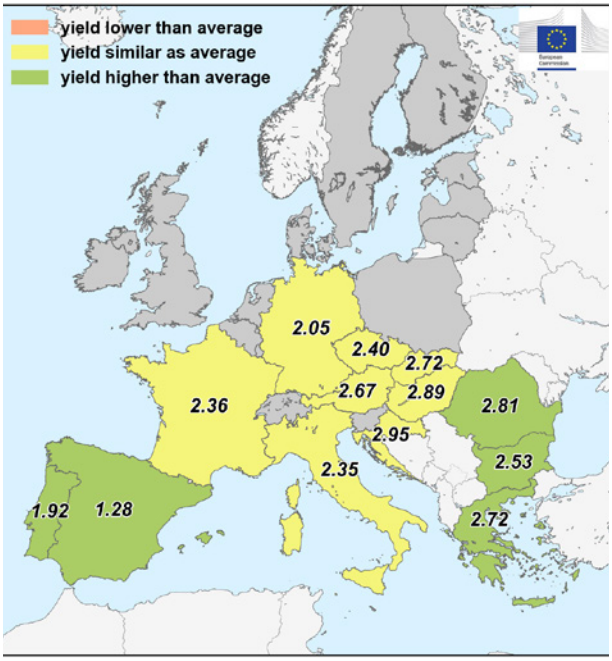


MARS Bulletin Vol. 27 No.5 (2019)

Country	SUNFLOWER (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	2.20	2.41	**2.41**	+9.5	+0.0
AT	2.64	2.80	**2.67**	+1.2	-4.8
BE	-	-	**-**	-	-
BG	2.29	2.44	**2.53**	+11	+3.7
CY	-	-	**-**	-	-
CZ	2.40	2.36	**2.40**	+0.2	+1.9
DE	2.07	1.82	**2.05**	-1.4	+12
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	1.16	1.34	**1.28**	+11	-4.5
FI	-	-	**-**	-	-
FR	2.31	2.25	**2.36**	+2.0	+4.8
GR	2.53	2.43	**2.72**	+7.5	+12
HR	2.88	3.00	**2.95**	+2.3	-1.8
HU	2.82	2.93	**2.89**	+2.5	-1.5
IE	-	-	**-**	-	-
IT	2.32	2.40	**2.35**	+1.2	-2.1
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	-	-	**-**	-	-
PT	1.37	1.79	**1.92**	+40	+7.3
RO	2.33	2.80	**2.81**	+20	+0.2
SE	-	-	**-**	-	-
SI	-	-	**-**	-	-
SK	2.67	2.93	**2.72**	+2.1	-7.1
UK	-	-	**-**	-	-

Sunflower - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018

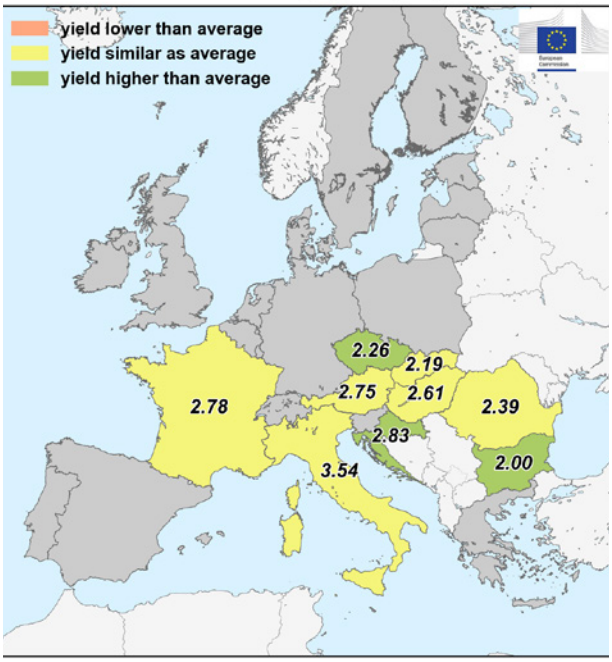


MARS Bulletin Vol. 27 No.5 (2019)

Country	SOYBEAN (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
EU	2.91	2.98	**2.92**	+0.7	-1.7
AT	2.78	2.73	**2.75**	-1.1	+0.5
BE	-	-	**-**	-	-
BG	1.41	1.92	**2.00**	+42	+4.2
CY	-	-	**-**	-	-
CZ	2.09	1.66	**2.26**	+8.2	+36
DE	-	-	**-**	-	-
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	-	-	**-**	-	-
FI	-	-	**-**	-	-
FR	2.70	2.60	**2.78**	+3.2	+7.0
GR	-	-	**-**	-	-
HR	2.71	3.19	**2.83**	+4.5	-11
HU	2.56	2.83	**2.61**	+1.9	-8.0
IE	-	-	**-**	-	-
IT	3.59	3.49	**3.54**	-1.3	+1.4
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	-	-	**-**	-	-
PT	-	-	**-**	-	-
RO	2.37	2.75	**2.39**	+0.8	-13
SE	-	-	**-**	-	-
SI	-	-	**-**	-	-
SK	2.19	2.31	**2.19**	+0.0	-5.3
UK	-	-	**-**	-	-

Soybean - yield forecast 2019

MARS forecast versus average yield (t/ha) 2014 - 2018



MARS Bulletin Vol. 27 No.5 (2019)

Country	WHEAT (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
BY	3.71	3.71	**3.75**	+0.9	+0.9
DZ	1.55	NA	**1.77**	+14	NA
MA	1.94	2.16	**1.52**	-22	-30
TN	1.75	1.75	**1.87**	+6.9	+6.9
TR	2.71	2.74	**3.03**	+12	+11
UA	3.98	3.73	**4.23**	+6.1	+13

Country	BARLEY (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
BY	3.35	3.40	**3.48**	+3.7	+2.2
DZ	1.25	NA	**1.42**	+13	NA
MA	1.23	1.45	**0.87**	-30	-40
TN	0.80	0.60	**0.79**	-0.9	+32
TR	2.63	2.67	**2.89**	+10	+8.3
UA	3.10	2.96	**3.28**	+5.6	+11

Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
BY	5.22	5.00	**5.81**	+11	+16
DZ	-	-	**-**	-	-
MA	-	-	**-**	-	-
TN	-	-	**-**	-	-
TR	9.34	9.64	**9.56**	+2.3	-0.9
UA	6.37	7.84	**7.11**	+12	-9.3

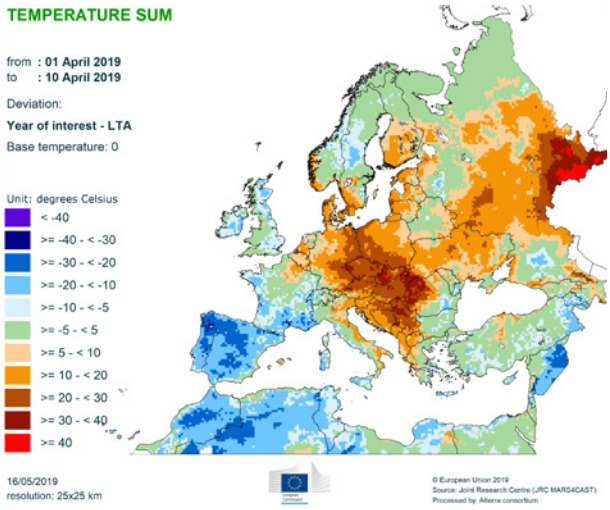
Country	SOYBEAN (t/ha)				
	Avg 5yrs	2018	MARS 2019 forecasts	%19/5yrs	%19/18
BY	-	-	**-**	-	-
DZ	-	-	**-**	-	-
MA	-	-	**-**	-	-
TN	-	-	**-**	-	-
TR	4.35	4.26	**4.57**	+4.9	+7.2
UA	2.17	2.58	**2.09**	-3.8	-19

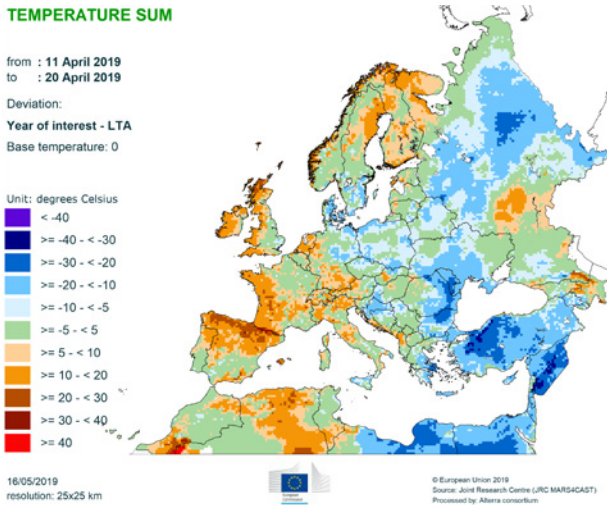
Note: Yields are forecast for crops with more than 10 000 ha per country.

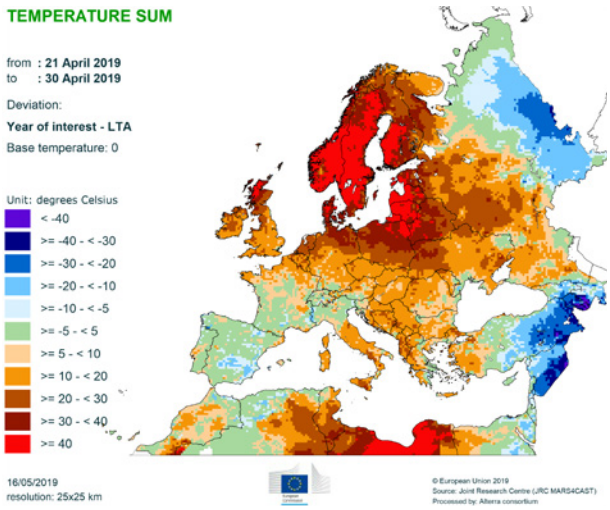
Sources: 2014-2019 data come from DG Agriculture and Rural Development short-term Outlook data (dated April 2019, received on 3.5.2019), Eurostat Eurobase (last update: 2.5.2019) and EES (last update: 15.11.2017).
2014-2018 data come from USDA, DSASI-MADR Algeria , INRA Maroc, CNCT Tunisie, Turkish Statistical Institute (TurkStat), Eurostat Eurobase (last update: 2.5.2019), State Statistics Service of Ukraine, FAO and PSD-online.
2019 yields come from MARS Crop Yield Forecasting System (output up to 10.5.2019).
NA = Data not available.

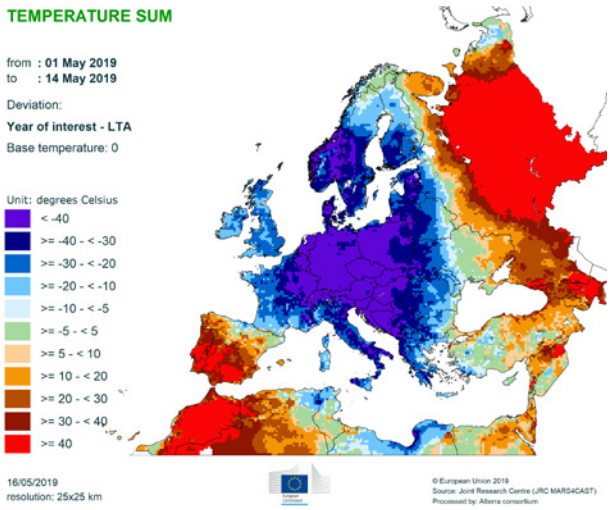
6. Atlas

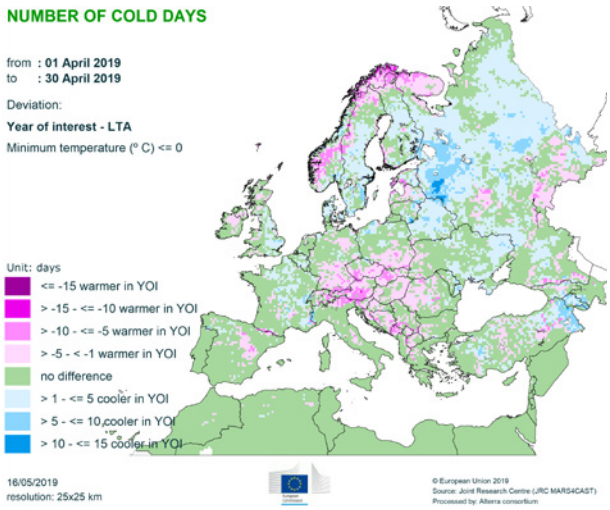
Temperature regime

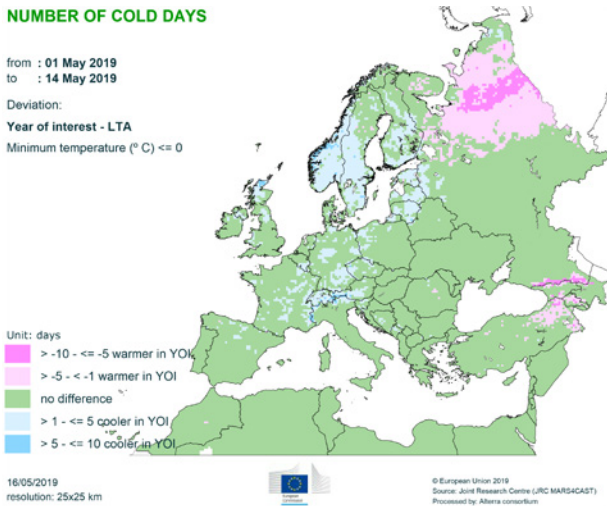


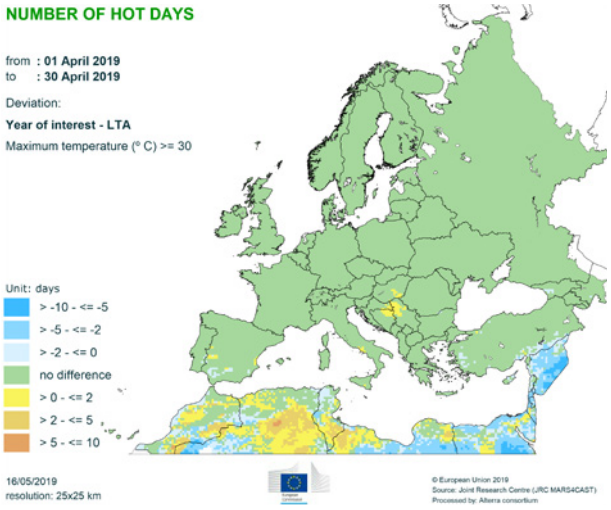


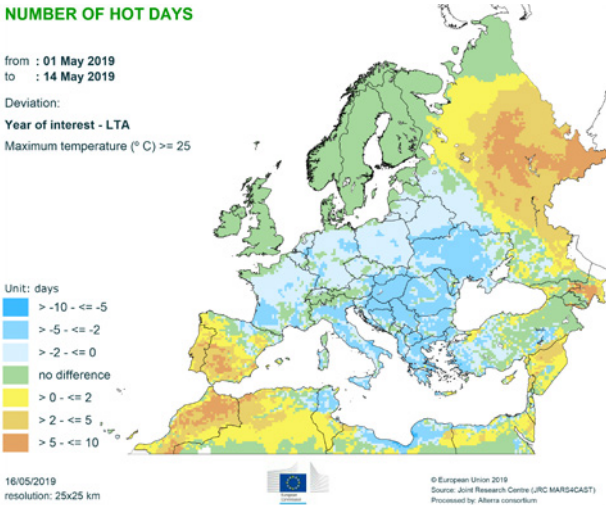




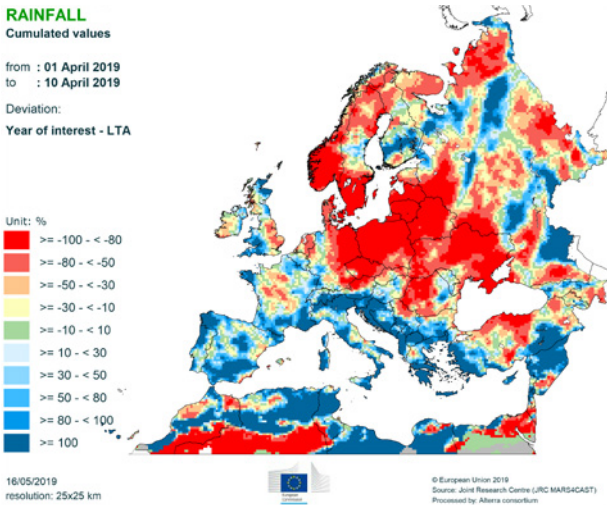


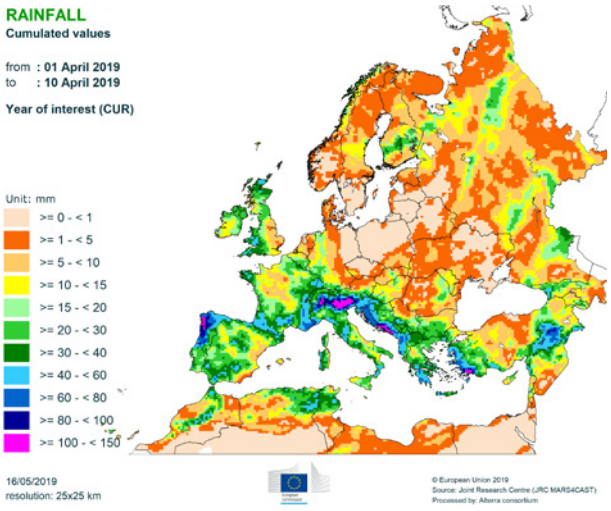


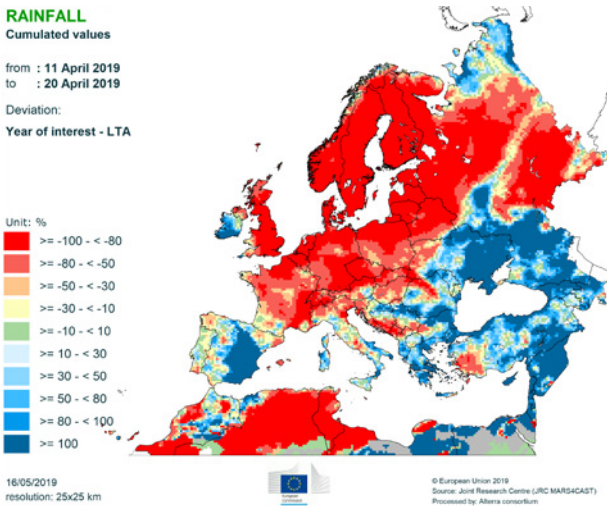


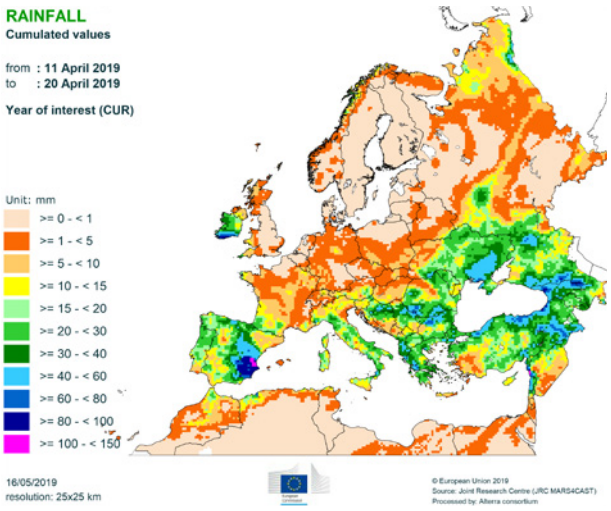


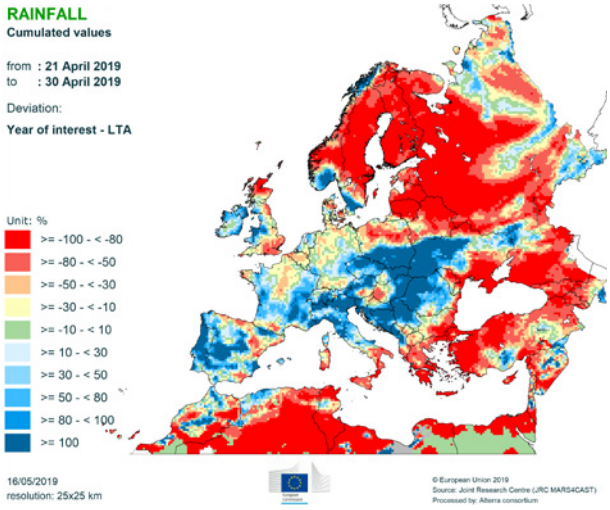
Precipitation

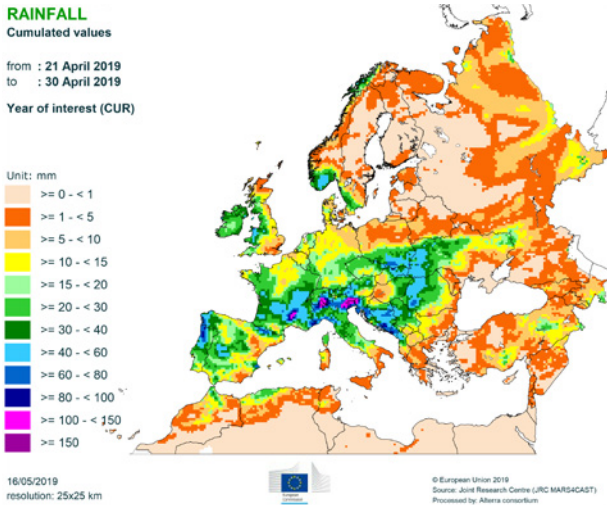


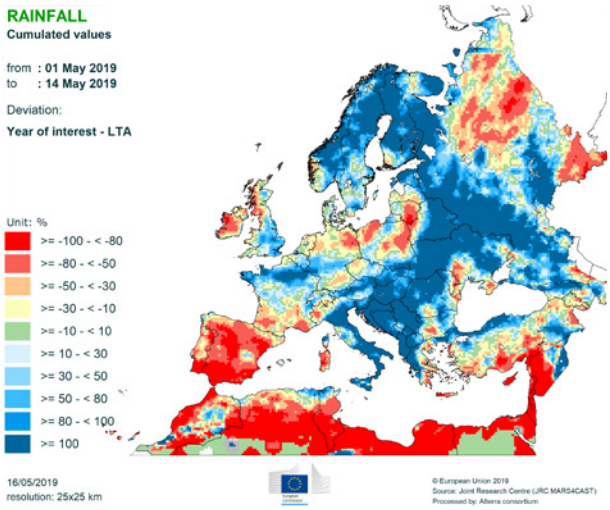







RAINFALL
Cumulated values
from : 21 April 2019
to : 30 April 2019
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
16/05/2019
resolution: 25x25 km
© European Union 2019
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 21 April 2019
to : 30 April 2019
Year of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
16/05/2019
resolution: 25x25 km
© European Union 2019
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 May 2019
to : 14 May 2019
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
16/05/2019
resolution: 25x25 km
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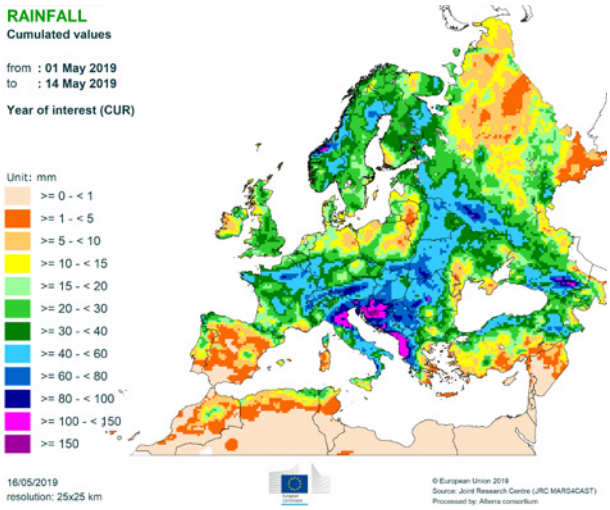
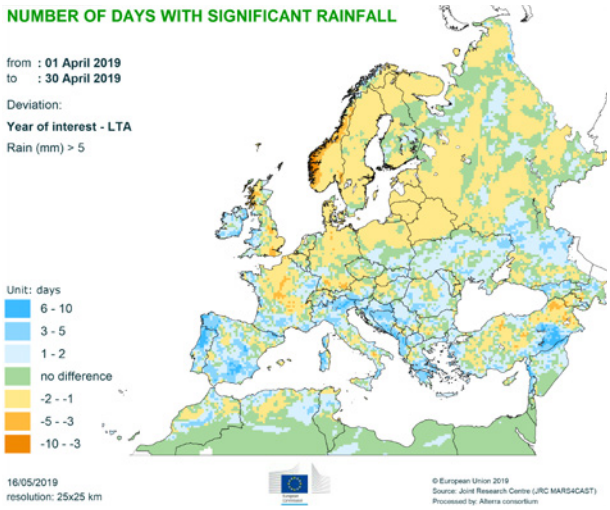
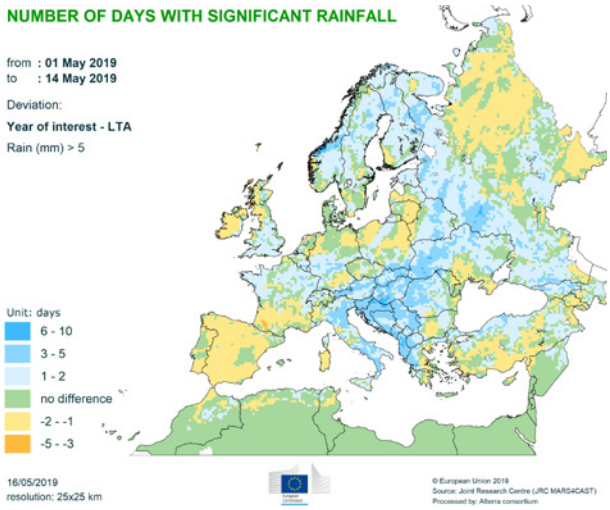

RAINFALL
Cumulated values
from : 01 May 2019
to : 14 May 2019
Year of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
16/05/2019
resolution: 25x25 km
© European Union 2019
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 April 2019
to : 30 April 2019
Deviation:
Year of interest - LTA
Rain (mm) > 5
Unit: days
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
-10 - -3
16/05/2019
resolution: 25x25 km
© European Union 2019
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 May 2019
to : 14 May 2019
Deviation:
Year of interest - LTA
Rain (mm) > 5
Unit: days
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
16/05/2019
resolution: 25x25 km
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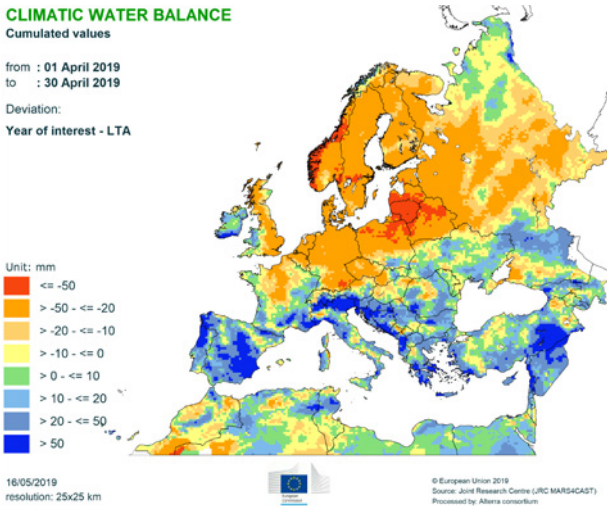
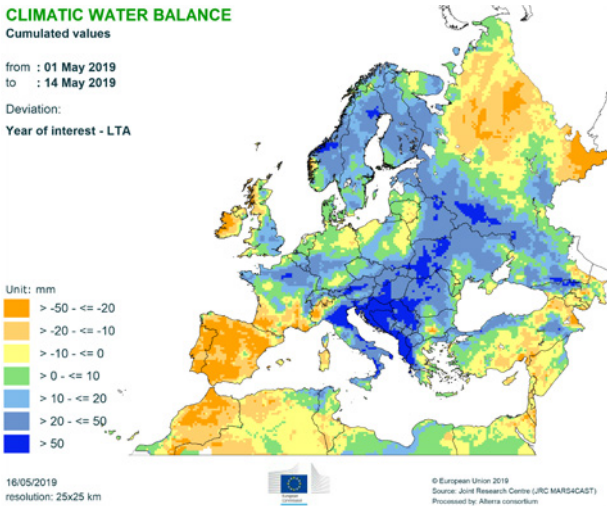
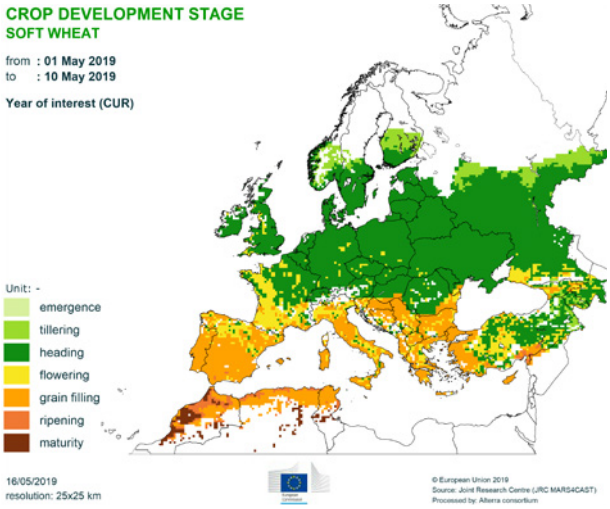
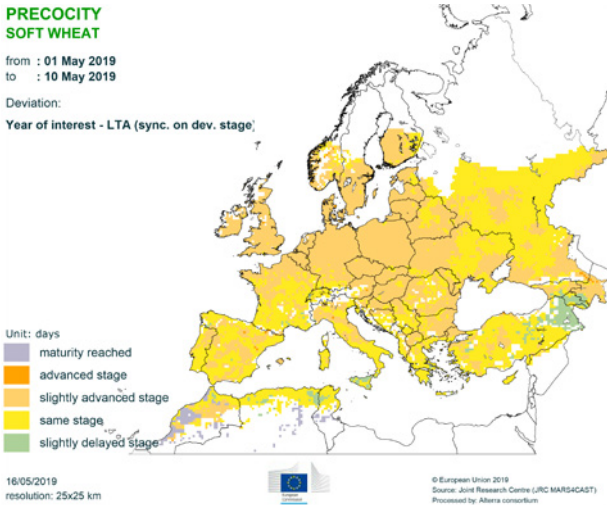
Climatic water balance

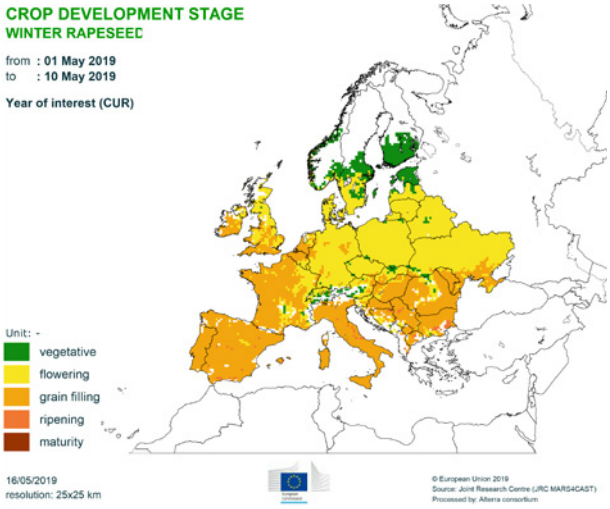


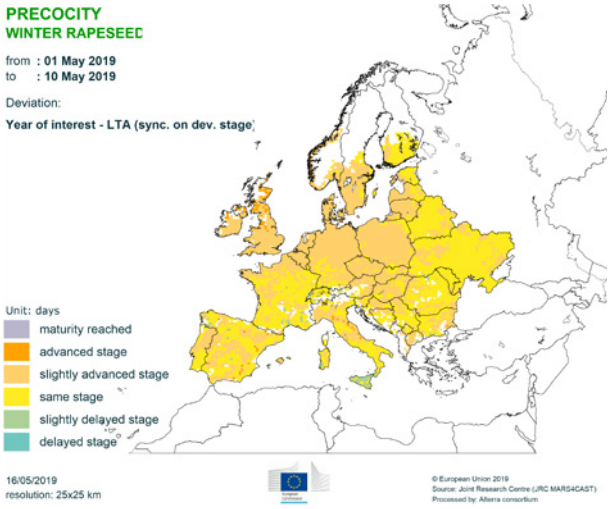


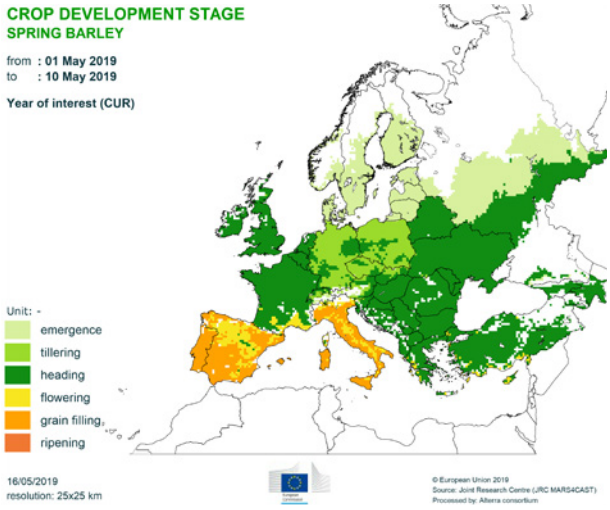
Crop development stages and precocity

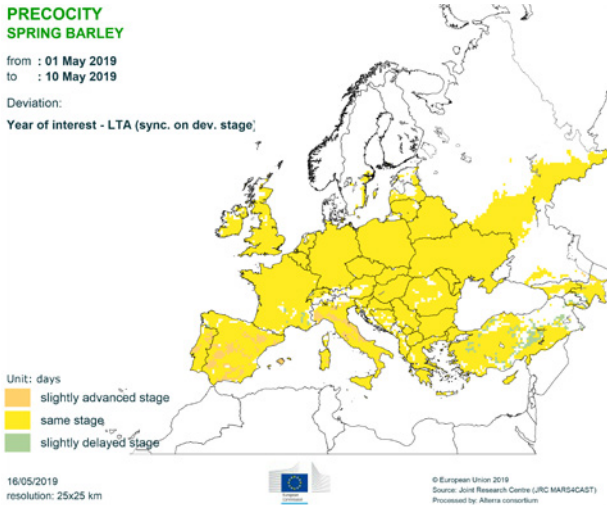




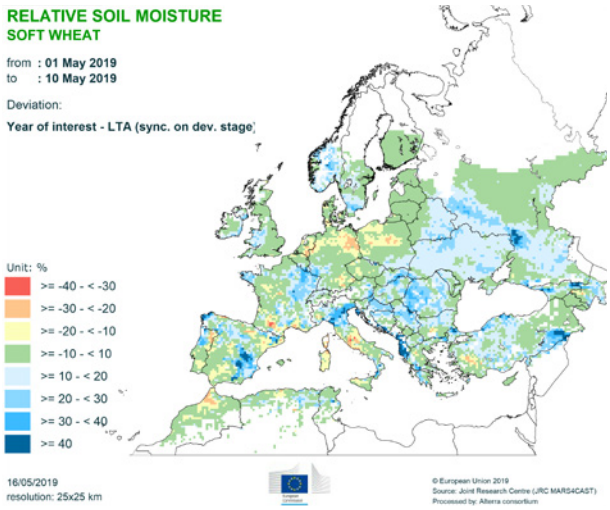


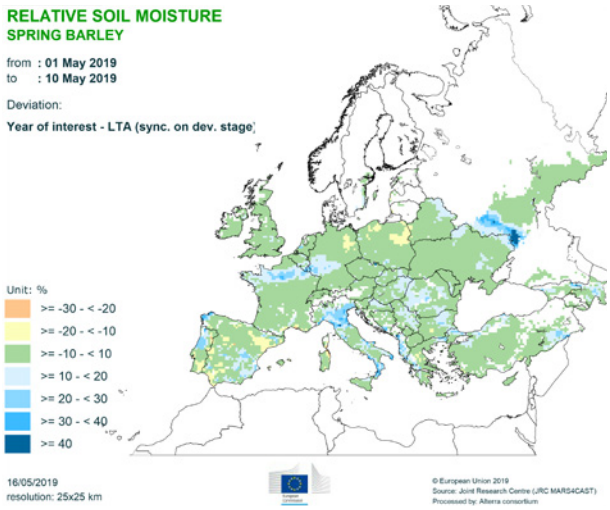




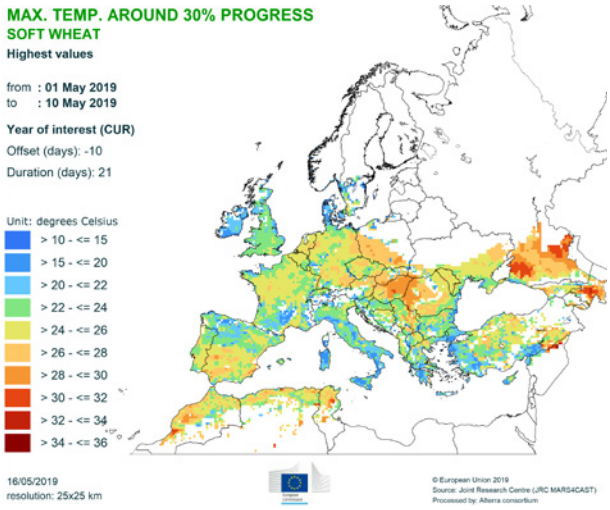


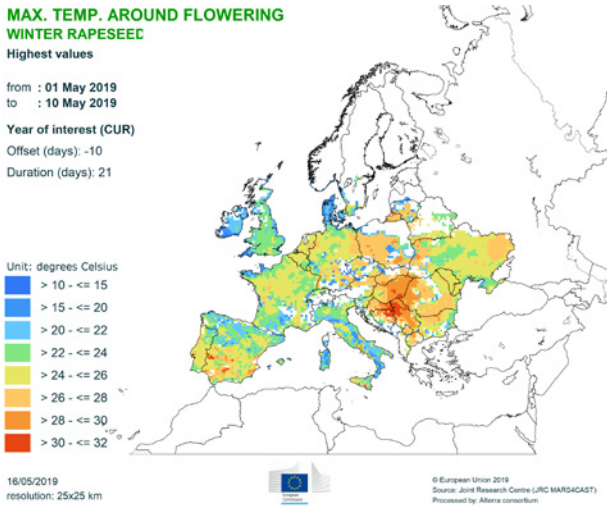
Relative soil moisture



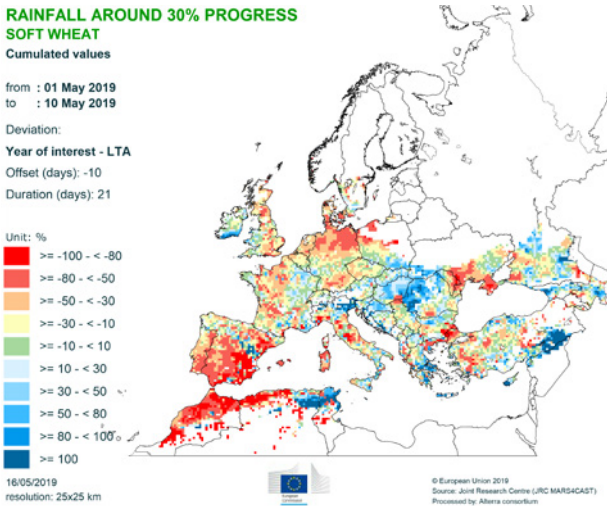


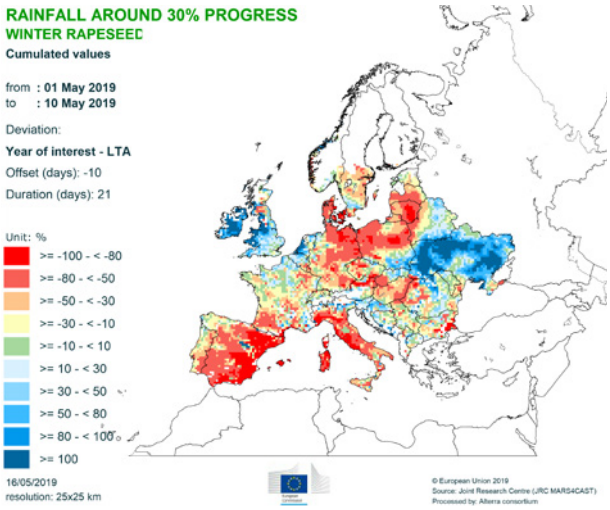
Maximum temperature around crop development





Precipitation around crop development





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JRC MARS Bulletins 2019

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

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

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MARS stands for Monitoring Agricultural Resources

Technical note
The long-term average (LTA) used within this bulletin as a reference is based on an archive of data covering 1979-2018.

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