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Issued: 26 June 2017

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European Commission

25th Anniversary

JRC MARS Bulletin
Crop monitoring in Europe
June 2017

Hot and dry start to summer

Yield forecast for most crops revised slightly downwards

Yield forecasts for wheat and barley were revised slightly downwards (by around 1% at EU level) compared to the May Bulletin. The forecasts for rapeseed and rye were revised upwards, but remain below the five-year average.

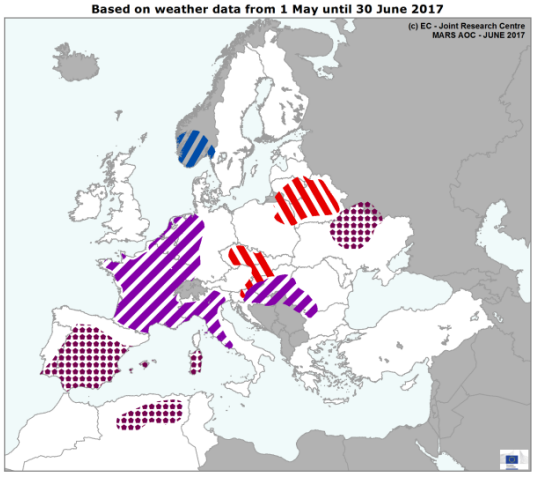
Hot and dry weather conditions hampered crop development in several regions. In central Spain, persistent hot and dry weather conditions have seriously impacted winter crops for several weeks. In France, a dry May and a hot June resulted in unfavourable conditions for both winter and spring crops that are now in the grain-filling stage. In Belgium, Luxembourg and the southern Netherlands, the grain-filling of winter and spring cereals was negatively impacted by high temperatures combined with a cumulated rainfall deficit. Exceptionally warm and/or dry conditions are also affecting some of the main arable land areas of Italy, western Germany, the Czech Republic, Slovakia, Hungary, Romania, Serbia, Croatia, eastern Poland and Lithuania, but, so far, with limited impact on crops.

Contents:

Covers the period from 1 May until 20 June

AREAS OF CONCERN - EXTREME WEATHER EVENTS

Based on weather data from 1 May until 30 June 2017



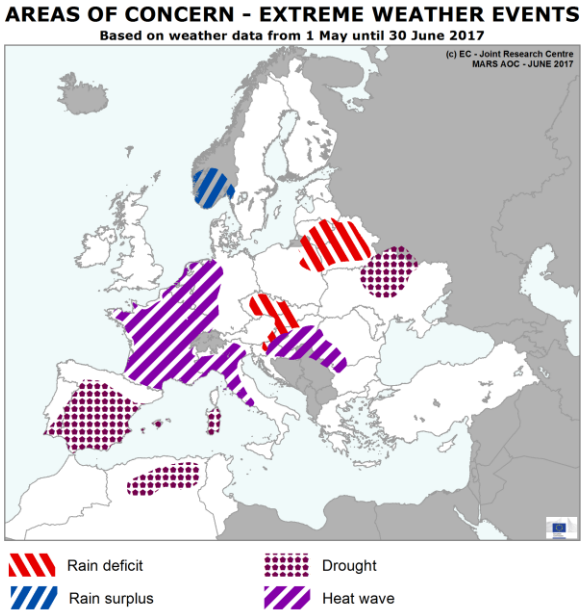
Crop	Yield (t/ha)				
	Avg 5yrs	May Bulletin	MARS 2017 forecasts	% Diff 17/5yrs	% Diff May
TOTAL CEREALS	5.30	5.37	**5.34**	+0.8	-0.6
Total Wheat	5.60	5.66	**5.61**	+0.2	-0.9
soft wheat	5.84	5.91	**5.86**	+0.3	-0.8
durum wheat	3.32	3.34	**3.35**	+0.7	+0.3
Total Barley	4.83	4.76	**4.70**	-2.8	-1.3
spring barley	4.23	4.06	**3.96**	-6.3	-2.5
winter barley	5.68	5.69	**5.68**	+0.0	-0.2
Grain maize	6.88	7.15	**7.14**	+3.8	-0.1
Rye	3.89	3.64	**3.77**	-3.0	+3.6
Triticale	4.20	4.14	**4.14**	-1.6	+0.0
Rape and turnip rape	3.25	3.17	**3.22**	-1.1	+1.6
Potato	32.5	33.6	**33.4**	+2.7	-0.7
Sugar beet	71.6	73.9	**73.9**	+3.1	-0.0
Sunflower	1.94	2.14	**2.18**	+12	+1.9

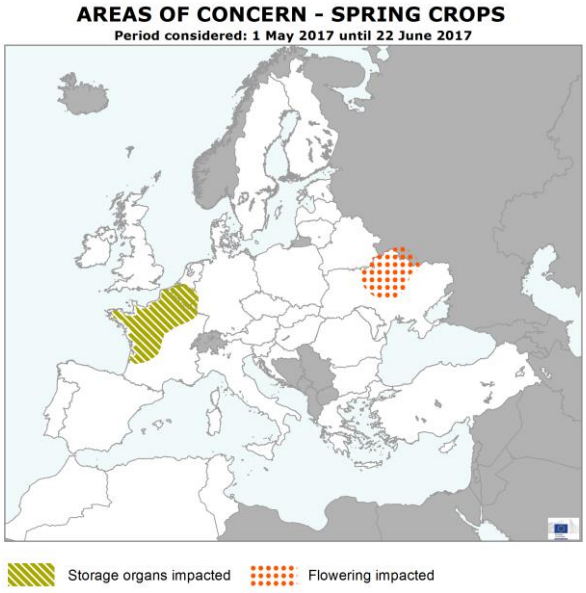
Issued: 23 June 2017

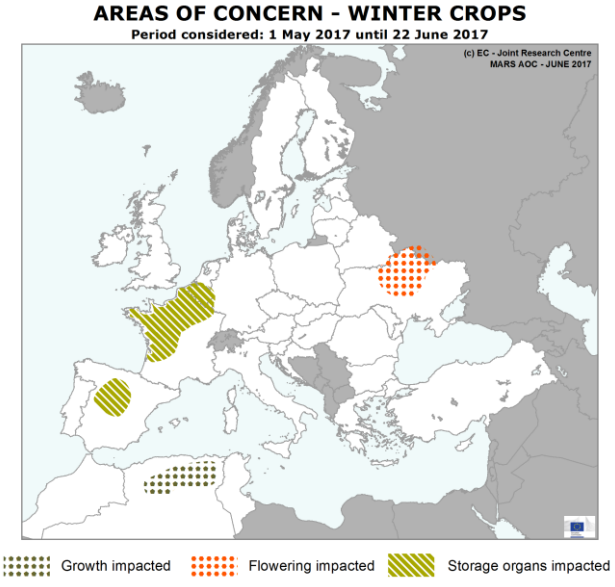
Joint Research Centre

1. Agro-meteorological overview

1.1 Areas of concern







Negative weather conditions hampered winter and spring crop development in several regions, as shown in the above "Areas of Concern" maps. These maps reflect the impacts that have occurred since 1 May. While the first map depicts extreme weather events, the second and third maps show their impacts on spring and winter crops. In central **Spain**, persistent hot and dry weather has seriously impacted winter crops for several weeks. In **Italy**, June has been dry, and a heat wave is affecting the main arable land areas, with temperatures exceeding 33°C for several days. At the moment of analysis, no impact on winter crops is observed, but problems are likely to occur in the coming days. The summer crop season is at risk in northern and central Italy due to water shortage in the main producing regions, but again no impacts have been observed so far. In **France**, a dry May and a hot June has resulted in unfavourable conditions for both winter and spring crops that are now in the grain-filling stage. In the **Netherlands**, **Belgium**, **Luxembourg** and western **Germany**, temperatures have been well above average, and cumulated rainfall presents a significant deficit compared to the long-term average. As a consequence, in Belgium, Luxemburg and the southern Netherlands, winter and spring cereals suffered during grain-filling, and potato crops (which were previously hit by the cold spell) during crop establishment.

A rain deficit is also present in central Europe (**Czech Republic** and **Slovakia**). There is still time to recover in the coming month, but rain is needed to restore soil moisture levels. A heat wave which is currently active in **Hungary, Romania, Serbia** and **Croatia**, is creating unfavourable conditions for crops; the impacts will depend on the magnitude and duration of these conditions.

In **Belarus** and the southern Baltic region (eastern **Poland** and **Lithuania**), precipitation has been below average since May, but soil moisture is still sufficient to maintain adequate crop development. In central **Ukraine**, winter and spring crops were exposed to unfavourable flowering conditions in June due to the persistent hot and dry conditions, which were marked as *drought* in the map of extreme weather events.

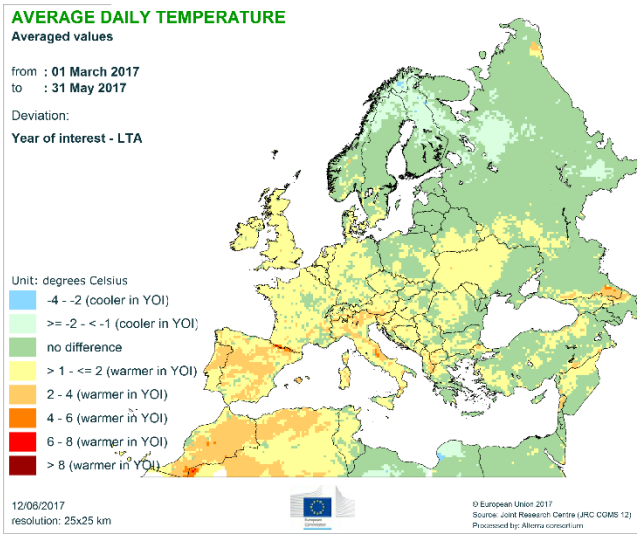
1.2 Agro-meteorological overview – Spring 2017 (March, April and May)

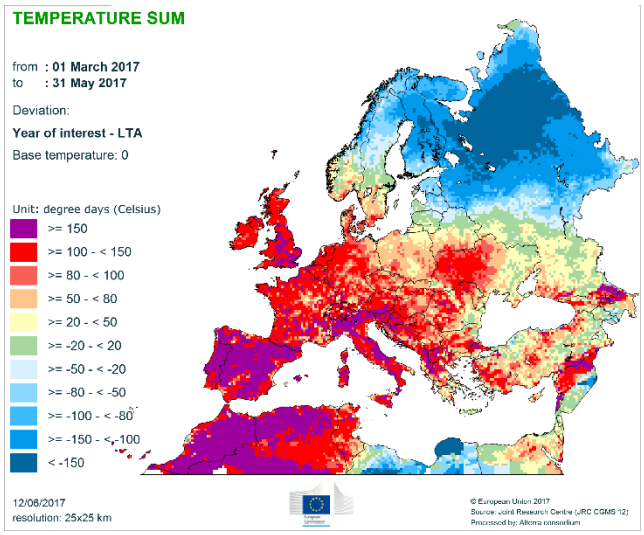
A strong warm weather anomaly characterised March and the beginning of April in major parts of Europe, with air temperatures between 2°C and 5°C above the long-term average. In several regions of central Europe, this period was the warmest or among the warmest on our records. Consequently, phenological development was accelerated, as the temperature sum (Tbase = 0°C) surplus accumulated to more than 100 GDD in a large area extending from England and France to Italy, northern Greece and western Russia, and parts of Spain, Portugal, Morocco and Algeria. Mild weather conditions at the beginning of spring also facilitated the early sowing of spring and summer crops.

A cold spell in the second half of April affected central, eastern and north-eastern Europe and some areas of south-eastern Europe. Minimum temperatures ranged from -2°C to -5°C (locally -10°C). A less severe cold spell occurred at the beginning of May, mainly affecting Poland, the Czech Republic, Slovakia (with minimum temperatures of between -1°C and -4°C) and north-eastern Europe (with minimum temperatures of between -5°C and -10°C). A series of night-frost events after mid-April negatively affected especially the areas, where winter rapeseed was flowering and already emerged summer crops (such as potatoes).

A significant precipitation deficit is recorded for the Maghreb, Italy, major parts of the Iberian Peninsula, the Benelux countries, north-eastern France, regions of northern Germany, central Ukraine, regions of the western Balkans and the westernmost part of the Pannonian basin. For many of these regions, less than six days with significant rainfall (more than 5 mm/day) occurred in spring, resulting in precipitation cumulates of less than 80 mm.

A precipitation surplus was recorded in central European Russia, regionally in south-eastern Europe, Turkey (especially central and eastern parts), Alpine areas, eastern Poland and Norway.





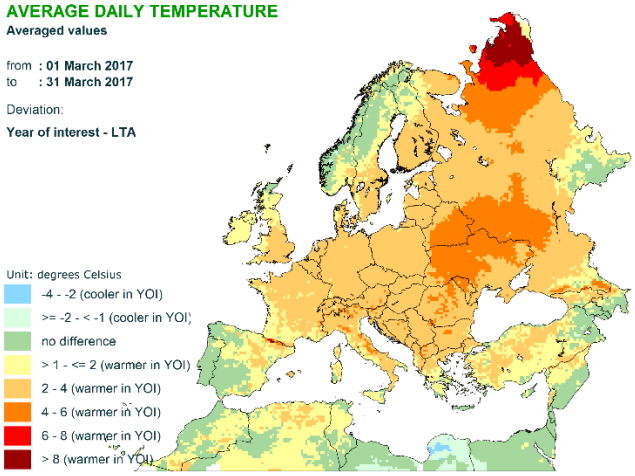
AVERAGE DAILY TEMPERATURE

Averaged values

from : **01 March 2017**
to : **31 March 2017**

Deviation:

Year of interest - LTA



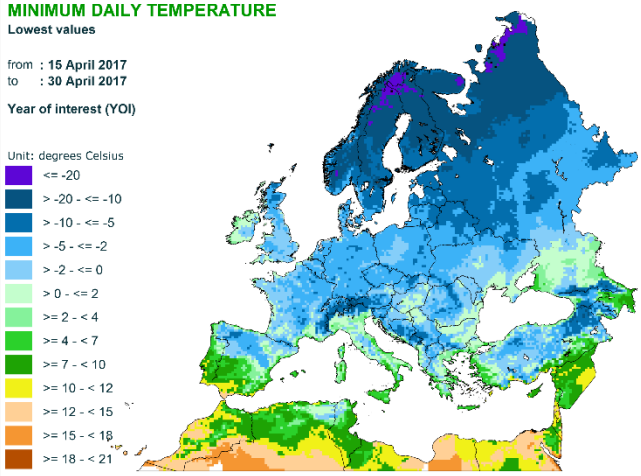
12/06/2017
resolution: 25x25 km

MINIMUM DAILY TEMPERATURE

Lowest values

from : **15 April 2017**
to : **30 April 2017**

Year of interest (YOI)



12/06/2017
resolution: 25x25 km

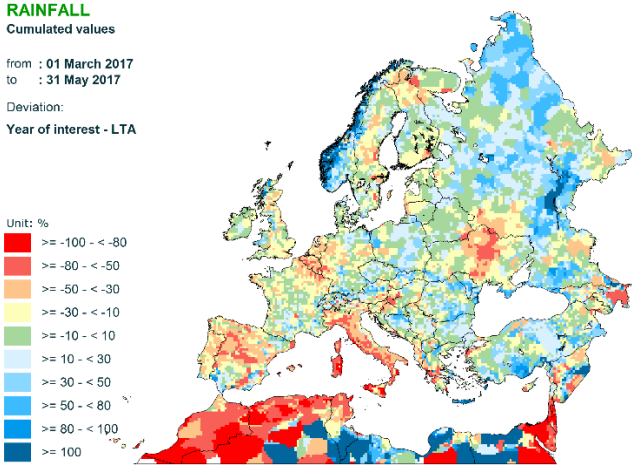
RAINFALL

Cumulated values

from : **01 March 2017**
to : **31 May 2017**

Deviation:

Year of interest - LTA



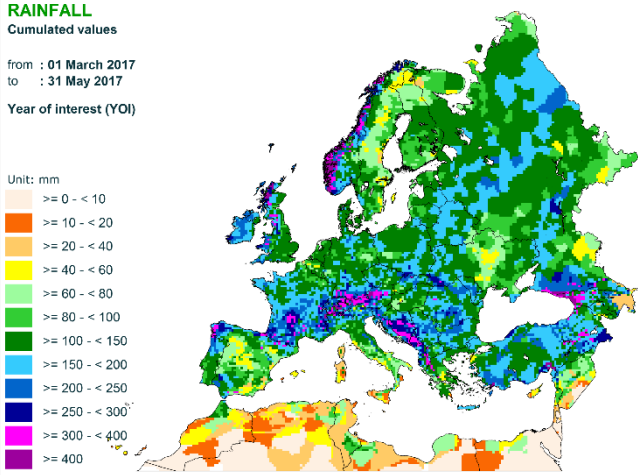
12/06/2017
resolution: 25x25 km

RAINFALL

Cumulated values

from : **01 March 2017**
to : **31 May 2017**

Year of interest (YOI)



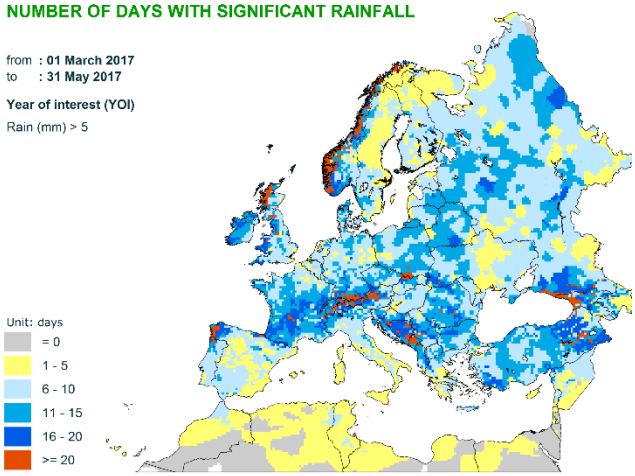
12/06/2017
resolution: 25x25 km

NUMBER OF DAYS WITH SIGNIFICANT RAINFALL

from : **01 March 2017**
to : **31 May 2017**

Year of interest (YOI)

Rain (mm) > 5



12/06/2017
resolution: 25x25 km

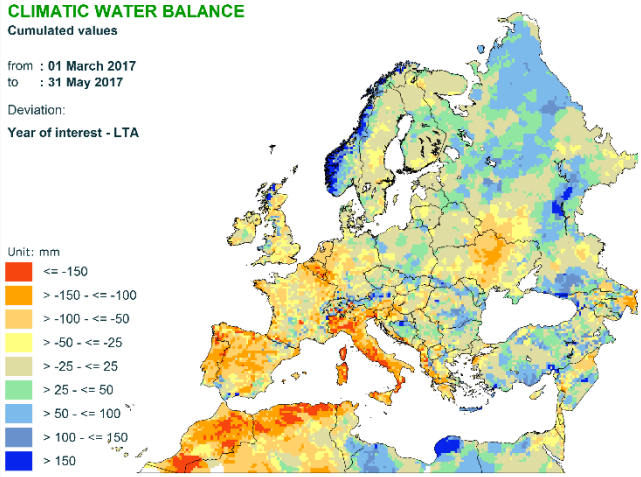
CLIMATIC WATER BALANCE

Cumulated values

from : **01 March 2017**
to : **31 May 2017**

Deviation:

Year of interest - LTA



12/06/2017
resolution: 25x25 km

1.3. Meteorological review (1 June – 20 June)

Warmer-than-usual weather conditions prevailed in western, central and south-eastern Europe, Italy and the Maghreb. The most pronounced positive temperature anomalies, reaching between 4 and 8 °C compared to the long-term-average, were recorded in the Iberian Peninsula. Temperature anomalies between 2 and 4 °C prevailed elsewhere. Anomalies of the active temperature sums (TBase=0°C) between 20 GDD (central Europe) and 150 GDD (the Iberian Peninsula and Maghreb) were recorded.

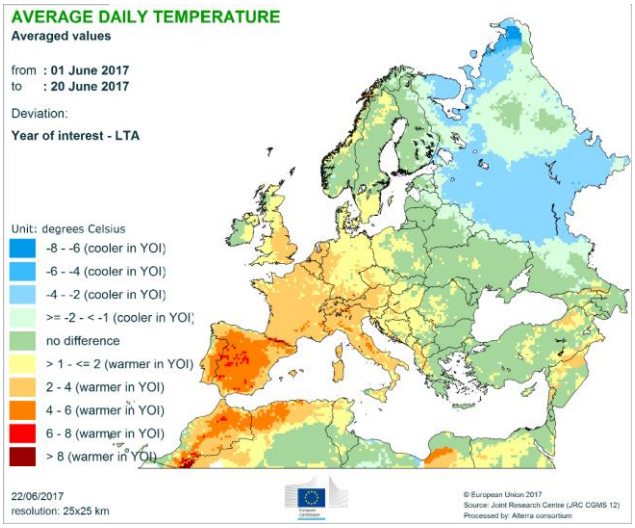
A heat wave is affecting **the Iberian Peninsula.** In the most affected south-western parts of the Peninsula, maximum temperatures exceeded 30 °C during almost throughout the review period, and on some days exceeded 40 °C. Minimum daily temperatures during the second dekad of June did not drop below 22 °C in these areas. **Heat waves** also affected **France, Italy, the Benelux** and parts of **south-eastern Europe**, where maximum temperatures reached well above 33 °C over the most affected areas.

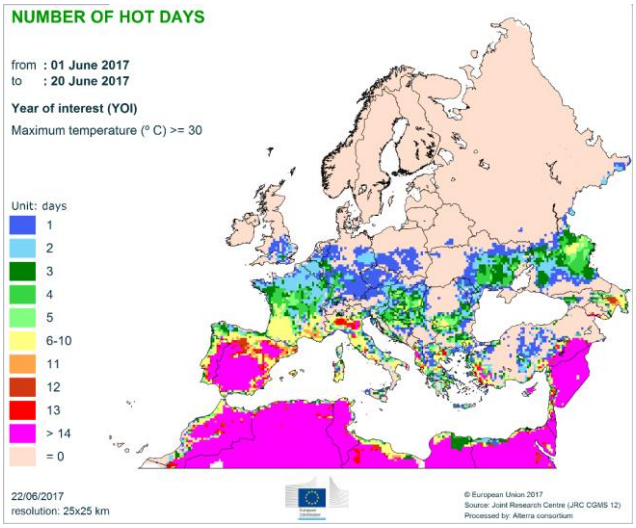
Colder-than-usual weather conditions prevailed in north-eastern Europe, with mean temperature anomalies between -4 and -2°C. As regards the major agricultural areas, minimum temperatures dropped below 0°C regionally over southern Finland.

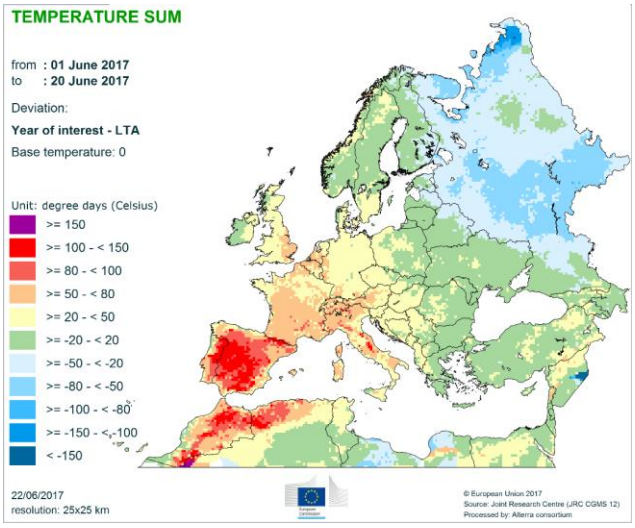
Drier-than-usual weather conditions prevailed in the Iberian Peninsula, Italy, France, the Benelux, major parts of central Europe, the northern Balkans, Ukraine, Belarus, eastern Poland, northern Scandinavia and eastern Turkey.

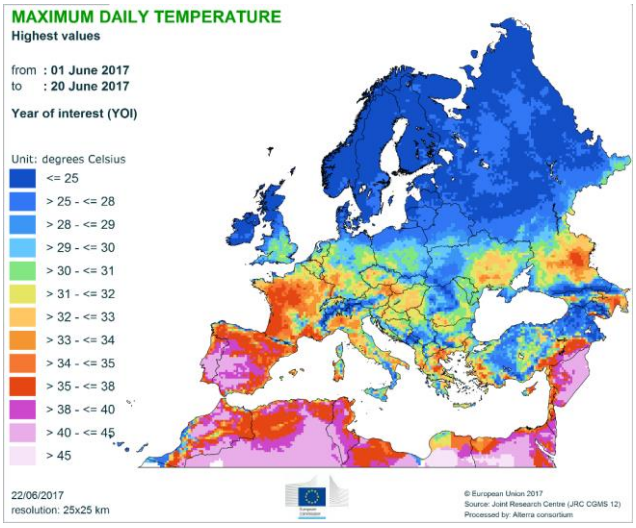
Dry conditions with rainfall cumulates less than 10 mm prevailed in the southern half of the Iberian Peninsula, southern and central parts of Italy, central Hungary, central part of Ukraine, Maghreb and eastern Turkey.

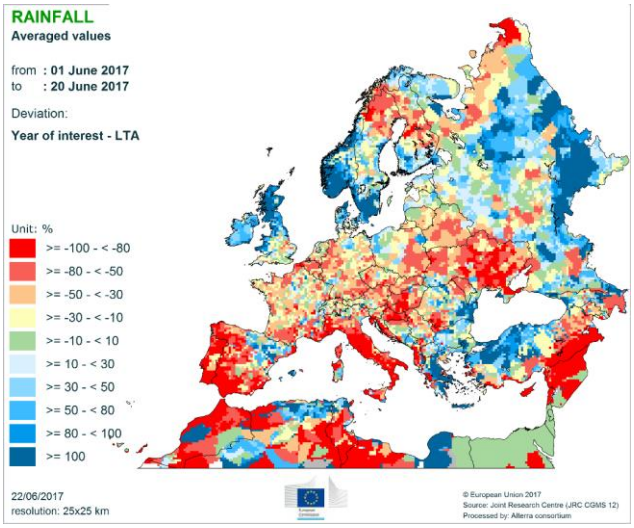
Wetter-than-usual conditions characterised the northern part of the British Isles, southern Scandinavia, European Russia and parts of south-eastern Europe with water surpluses of mainly between 50% and 100% compared to average precipitation cumulate.

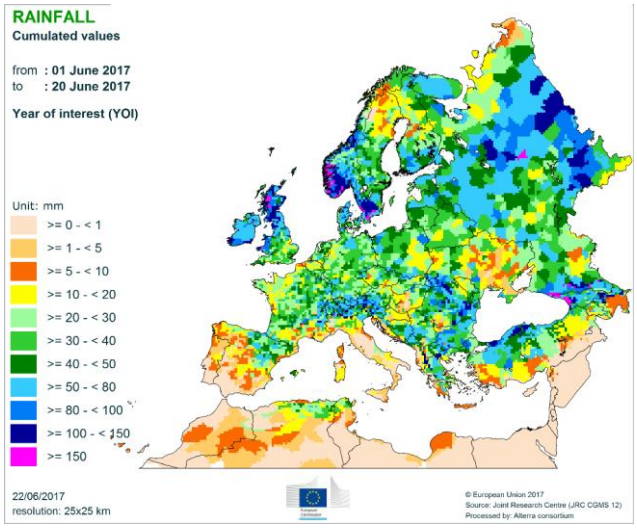


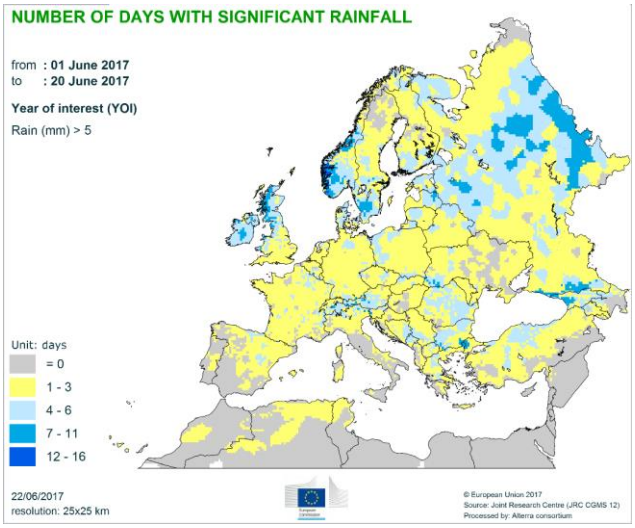


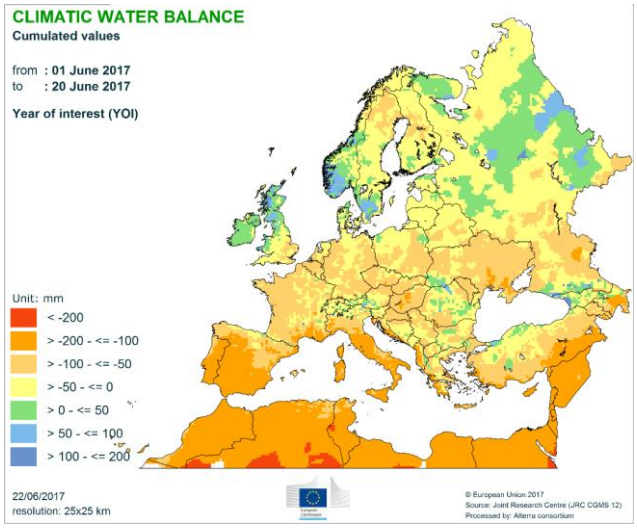












1.4 Weather forecast (23 June – 30 Jun)

The stationary ridge extending from the Mediterranean towards western, central and south-eastern Europe, that caused the heat wave observed during the past days, will become weaker during the first days of the forecast period. A cyclonic disturbance centred over the Norwegian Sea will favour westerly flow towards central Europe at the beginning of the forecast period. From 27 June, a large-scale trough will evolve and deepen over Europe and the central Mediterranean region favouring the intrusion of cooler air flow from the Atlantic. These conditions will favour atmospheric instabilities and could trigger local thunderstorms.

Warmer-than-usual weather conditions in most of Europe, especially in its central, eastern and south-eastern regions as well as in the Mediterranean. Daily mean temperature anomalies (w.r.t. the long-term-average) will be mainly comprised between 2 °C and 6 °C, although higher values will be observed in a large area centred over Hungary.

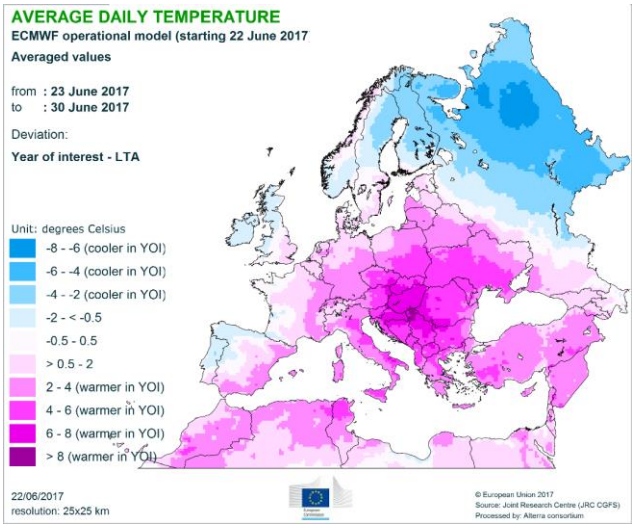
Maximum temperatures will be above 35 °C in large areas of the Iberian Peninsula, southern France, Italy, south-eastern Europe and Turkey. Locally, in regions such as southern Spain, northern Italy, northern Serbia, Greece, Bulgaria and Turkey maximum temperatures will exceed 39 °C. In a large area of eastern Europe, centred over Belarus and Ukraine, maximum temperatures will be mainly between 32 °C and 35 °C (locally reaching 38 °C).

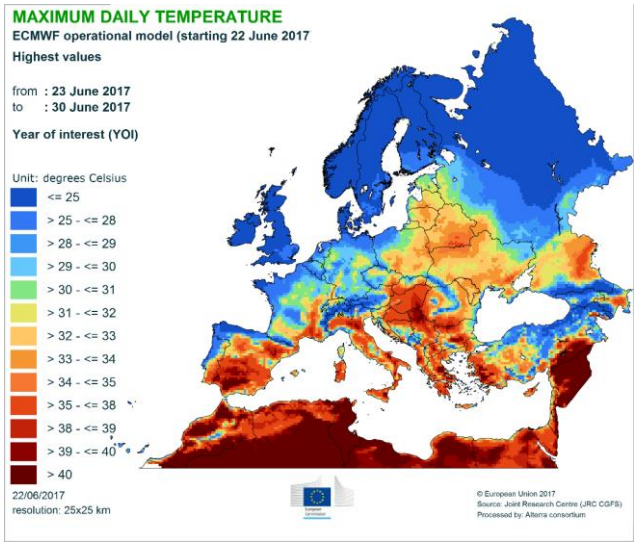
Colder-than-usual weather conditions will prevail in the south-western part of the Iberian Peninsula, Ireland, northern and western UK, the Scandinavian Peninsula and western Russia. Daily mean temperature anomalies will be comprised between -2 °C and -0.5 °C, except for northern Sweden, Finland and Russia, where they will range from -8 °C to -2 °C.

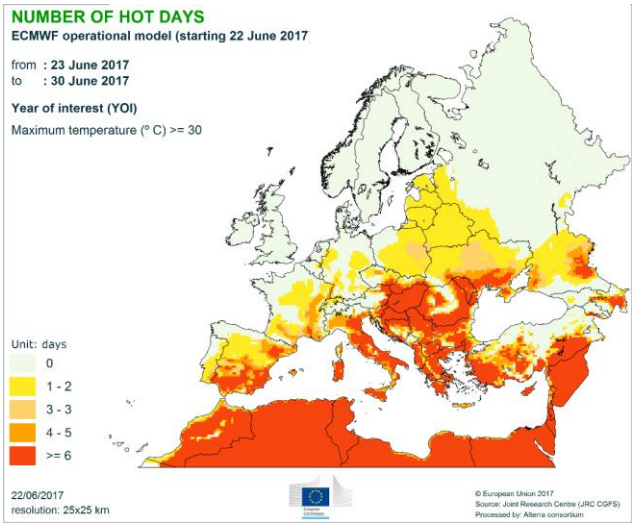
Dry conditions with rainfall cumulates less than 5 mm will prevail in the Iberian Peninsula (except its northern part), southern Italy, large areas in south-eastern and eastern Europe and Turkey.

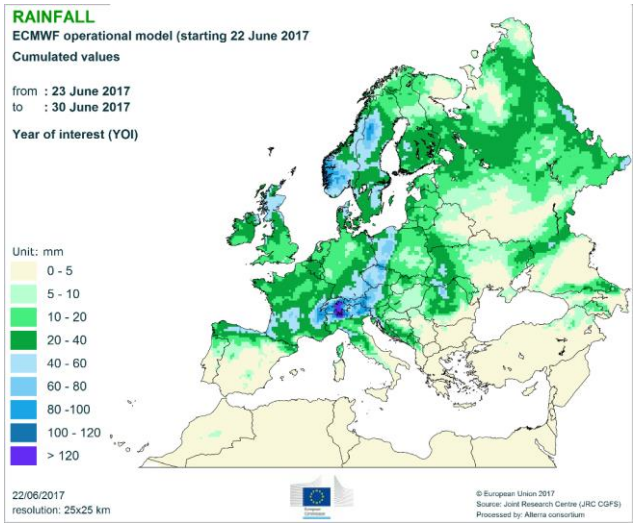
Precipitation above 60 mm (cumulated in the forecast period) will be observed in a large meridional belt extending from the Alps to Poland as well as in areas of Norway and Sweden.

The long-range weather forecast for July-August-September shows very likely warmer-than-usual conditions in the Mediterranean region and western Europe and likely warmer-than-usual conditions in the rest of Europe. In western Europe, precipitation is likely to be below-average.



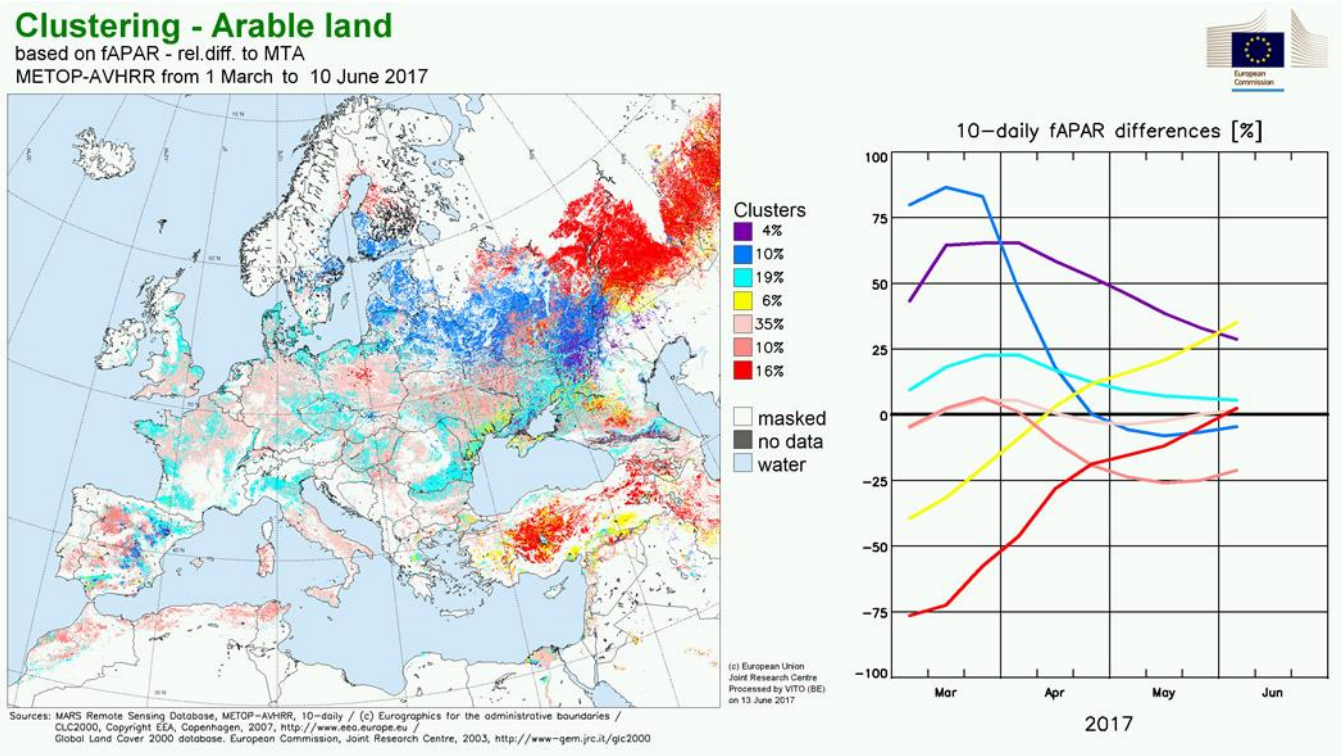






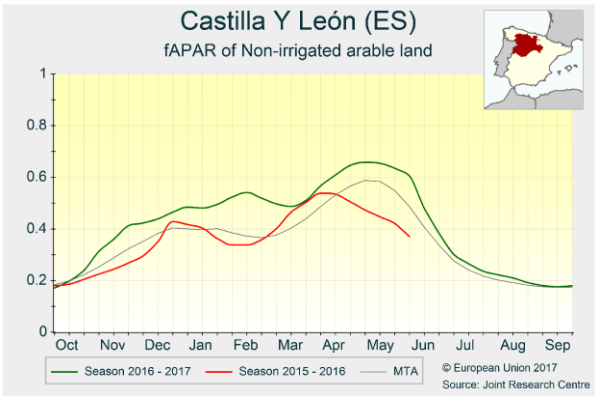
2. Remote Sensing - Observed canopy conditions

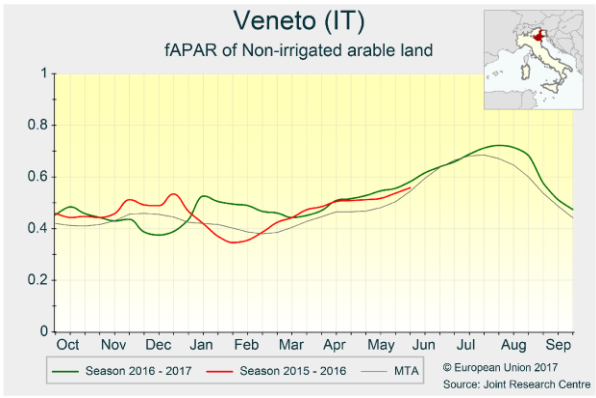
Biomass deficit in Spain and central Ukraine

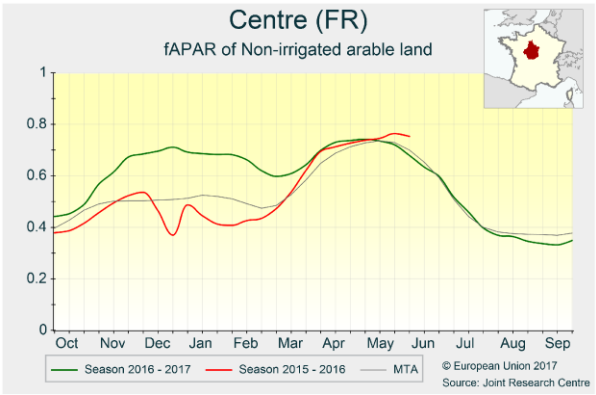


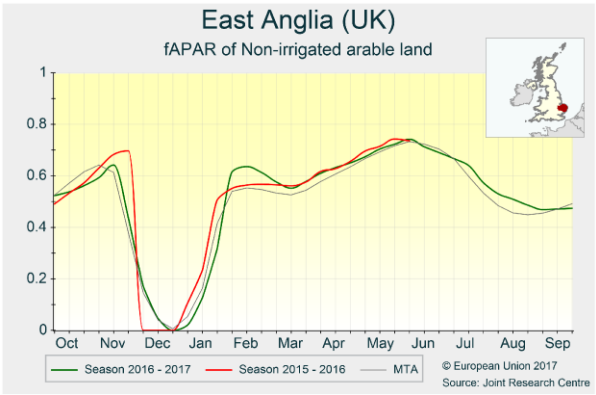
The map displays the differences between the fraction of Absorbed Photosynthetically Active Radiation (fAPAR) from 1 March to 10 June 2017, and the medium-term average (MTA, 2007-2016) for the same period. Such differences are clustered into seven groups with a similar anomalies trend. The cluster trends are visible in the graph above, where the zero-line represents the average fAPAR development, and the other values represent the sign and the intensity of the fAPAR anomalies.

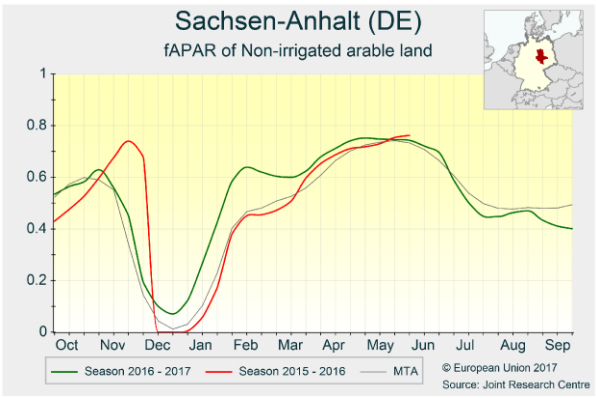
The map summarises the different growing conditions since March throughout Europe, as reflected in the time series of the fAPAR signal. The light red profile (10% of the arable land pixels) describes regions in the south-western Mediterranean basin. In central **Spain** (e.g. *Castilla y León*), regions are highlighted where the lack of spring precipitation, especially during April, is coupled with unusually warm temperatures. This led to a very early senescence with negative effects on the yields of winter cereals; the rains in May arrived late and remained scarce, not substantially improving crop conditions. The same cluster includes regions in the **Maghreb**, where crops suffered from hot and dry conditions mostly during the latest stages of the winter crop cycle, after an optimal early spring development. The light red cluster also includes regions in central Ukraine (e.g. *Poltavs'ka*) and the neighbouring Russian regions: here, reduced precipitation amounts have been recorded since March, and the biomass accumulation of crops has been suboptimal since late May. The light blue profile (19%) represents agricultural areas where, after an early growth in March and April, cold spells repeatedly slowed crop development and biomass accumulation. In those regions, phenological development and biomass accumulation moved towards the average around the flowering stage, which occurred in late May in **France** (e.g. *Centre*) and in June in the **United Kingdom** (e.g. *East Anglia*). The same cluster includes the optimal crop development that occurred in central and eastern Europe (e.g. **Romania** - *Sud-Est*) and northern **Italy**, where early developed crops are now facing a reduced biomass accumulation due to the low soil moisture (e.g. *Veneto*). The pink profile (35%), widespread in central European regions, describes average crop conditions in **Germany** (e.g. *Sachsen-Anhalt*) and slightly delayed winter crop development in Poland (e.g. *Wielkopolskie*). The dark blue colour (10%), present mostly in northern European regions, represents the slightly delayed crop development that occurred in April, due to the low temperatures. The yellow colour (6%) highlights regions with an optimal leaf area expansion – in Ukraine and south-eastern Turkey. Violet regions (4%) represent optimal green biomass accumulation, and red regions (16%) represent late crop development, which characterises most of European Russia's producing regions. The red clusters also include regions with strong delays in winter crop development, such as in Turkey and in central Poland.

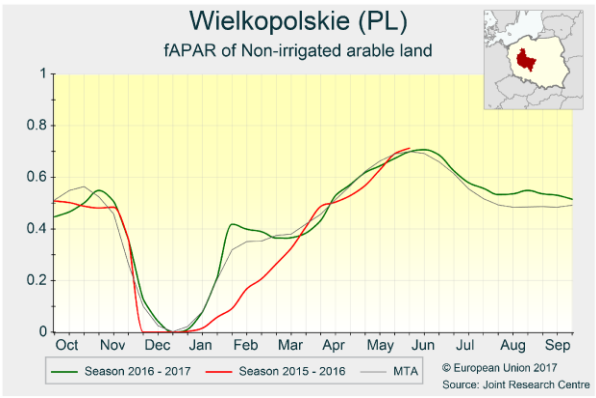

Castilla Y León (ES)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2016 - 2017
Season 2015 - 2016
MTA
© European Union 2017
Source: Joint Research Centre

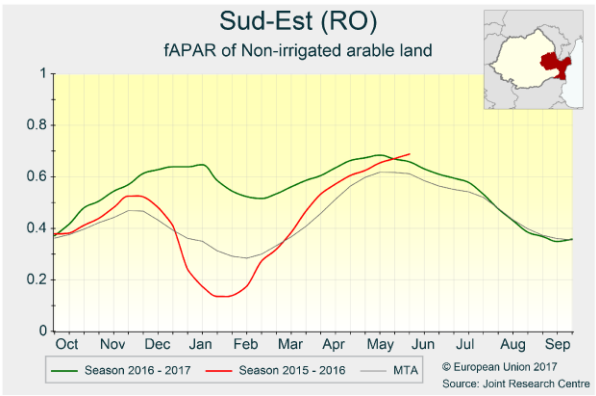

Veneto (IT)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2016 - 2017
Season 2015 - 2016
MTA
© European Union 2017
Source: Joint Research Centre


Centre (FR)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2016 - 2017
Season 2015 - 2016
MTA
© European Union 2017
Source: Joint Research Centre


East Anglia (UK)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2016 - 2017
Season 2015 - 2016
MTA
© European Union 2017
Source: Joint Research Centre


Sachsen-Anhalt (DE)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2016 - 2017
Season 2015 - 2016
MTA
© European Union 2017
Source: Joint Research Centre


Wielkopolskie (PL)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2016 - 2017
Season 2015 - 2016
MTA
© European Union 2017
Source: Joint Research Centre


Sud-Est (RO)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2016 - 2017
Season 2015 - 2016
MTA
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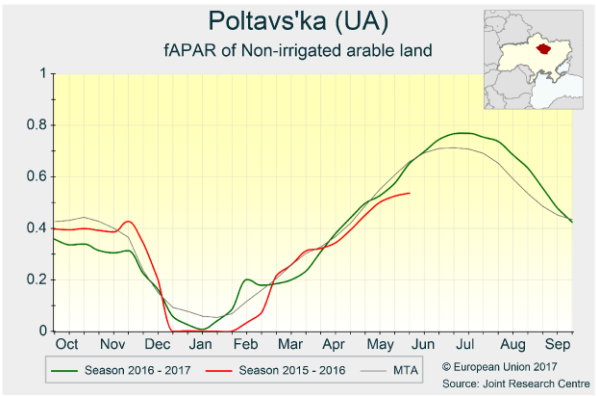
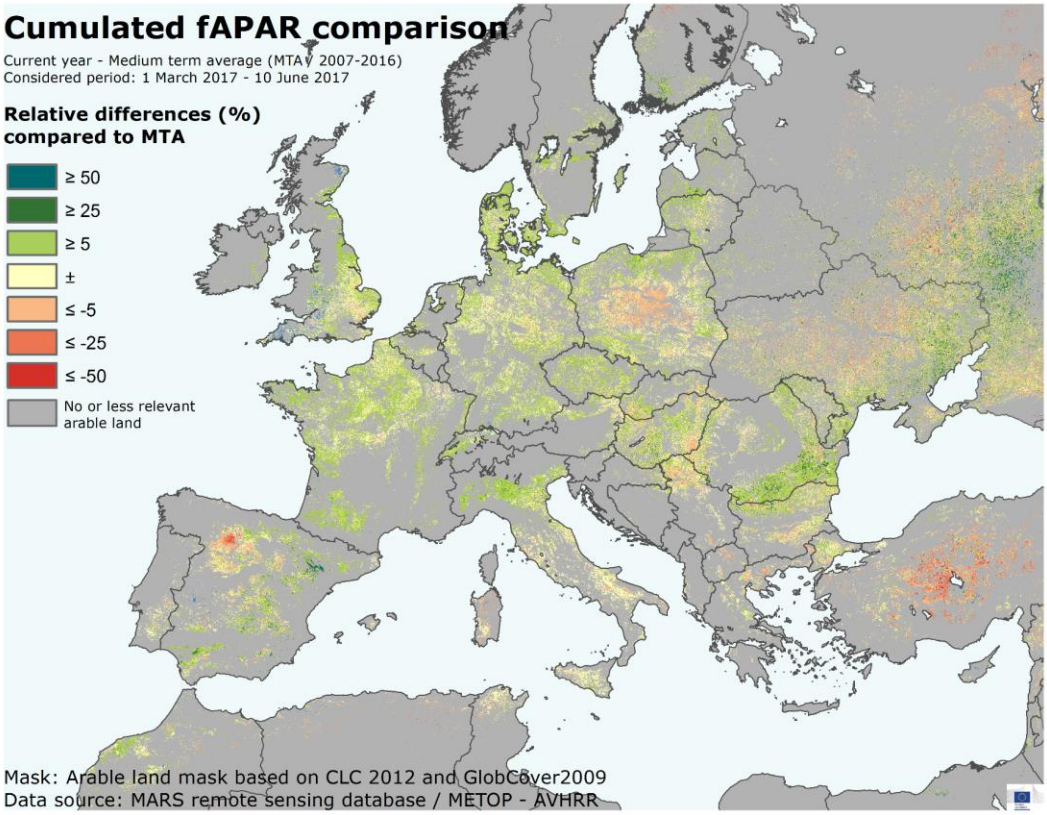
Source: Joint Research Centre


Poltavs'ka (UA)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2016 - 2017
Season 2015 - 2016
MTA
© European Union 2017
Source: Joint Research Centre



The map displays the differences between the fraction of Absorbed Photosynthetically Active Radiation (fAPAR) cumulated from 1 March to 10 June 2017, and the medium-term average (MTA, 2007-2016) for the same period. Positive anomalies (in green) reflect above-average canopy density or advanced crop development, while negative anomalies (in red) reflect below-average biomass accumulation or delayed crop development.

3. Country analysis

3.1 European Union

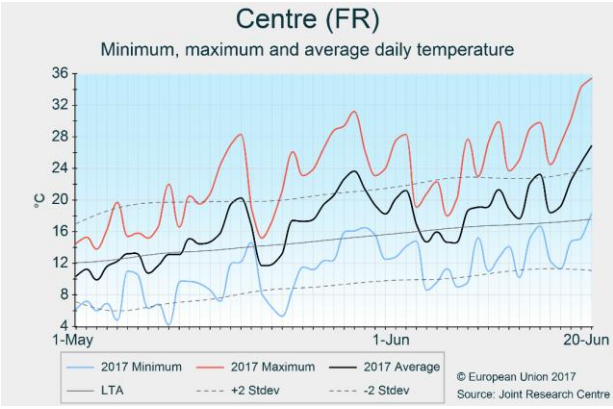
France

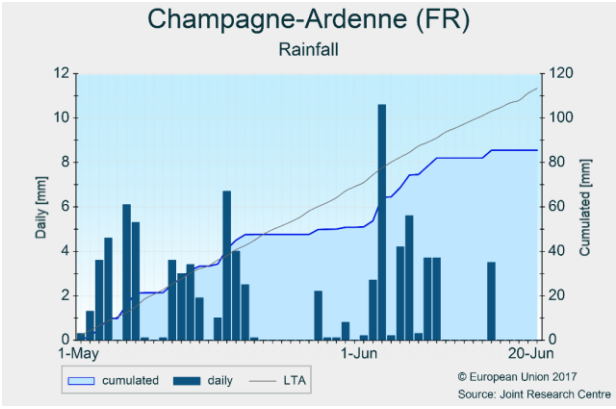
Low expectations maintained for winter cereals due to the hot weather

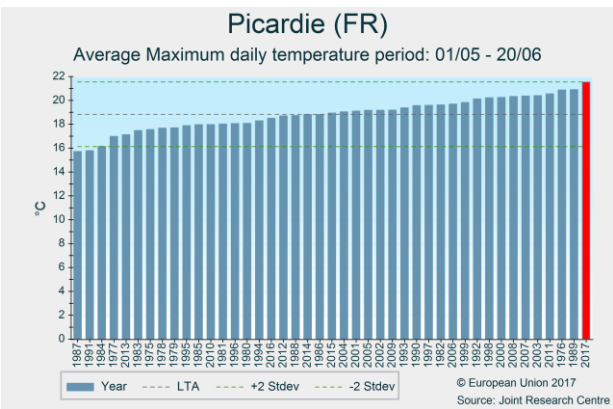
Some rainfall has finally been recorded since the beginning of May, but the water deficit is still continuing, particularly in the north-eastern regions. Hot temperatures recorded since beginning of May (and substantiated by a heat wave mid-June) are posing a new concern, and reinforcing the negative outlook for the yields of winter cereals.

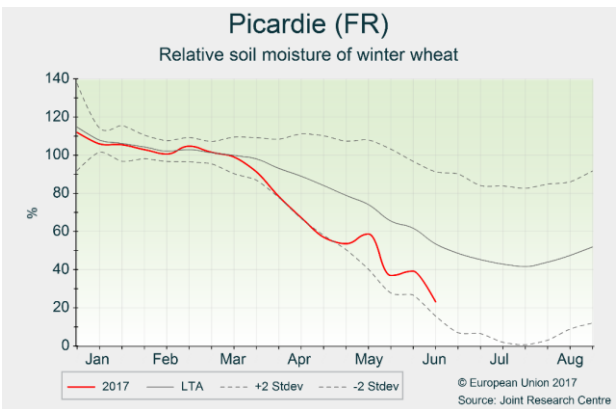
While until last month the main concern was the rain deficit, cumulated rainfall has been average since the beginning of May in all regions. The rain was beneficial for all crops and limited the impact of water stress on winter cereals. However, the soil moisture deficit is still substantial, particularly in Champagne-Ardennes, Lorraine, Picardie, Nord Pas de Calais, Pays de la Loire and Poitou-Charentes. Temperatures remained above average since the beginning of May. The most noticeable anomaly of 2 to 3°C above average was recorded during the last dekad of May, corresponding to the anthesis of soft wheat. While the phenological development of winter cereals (in particular the flowering dates) was in line with an average year, it has accelerated substantially since the flowering stage. Farmers are currently starting to harvest the most advanced winter barley. Temperatures returned to average during the first dekad of June but increased sharply in mid-June. The heat wave is expected to greatly impact cereal yields, as maximum temperatures are greater than 30°C, and minimum temperatures will remain above 20°C for several days in a row. Temperatures will not fall before Friday 23 June. These temperatures are expected to impact the grain filling of winter cereals, more particularly those currently in the milky grain-filling stage (soft wheat, spring barley, late winter barley and durum wheat). Cereals that are already in the ripening stage during the heat wave (such as winter barley in the south and west) will only be slightly impacted by a reduction in the grain weight.

Expectations were previously lowered in the May bulletin due to the water deficit and the cold spell at the end of April. Locally, the cold spell impacted not only winter barley but also wheat. Nevertheless, a high level of uncertainty about the final yields of winter cereals remains as conditions are reported to be highly heterogeneous. At national level, winter cereals are forecast to be below the five-year average, but quality and protein content of the first winter barley harvested are reported to be high. Regarding rapeseed, the forecast is lowered as the regrowth of new flowers after the cold spell did not compensate for the losses. Summer crops are currently in good condition following the rain observed since the beginning of May. The yields are forecast to be close to the trend and will greatly depend on rainfall in the weeks to come, as the soil moisture and groundwater levels are particularly low.









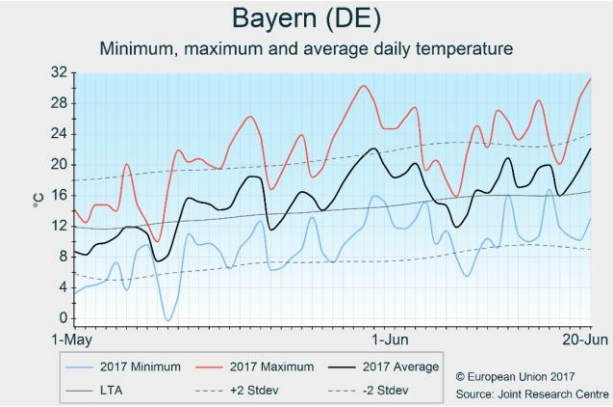
Germany

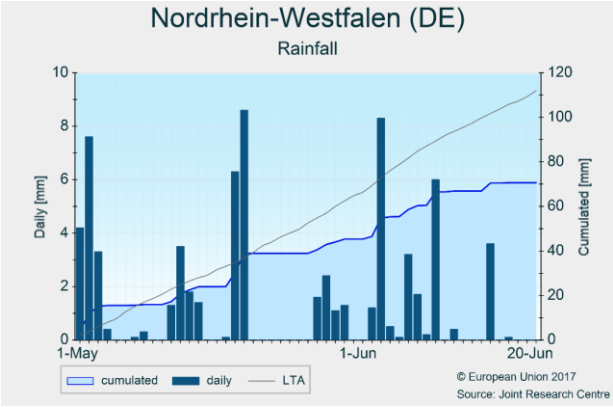
Mostly good yield outlook, regionally dry

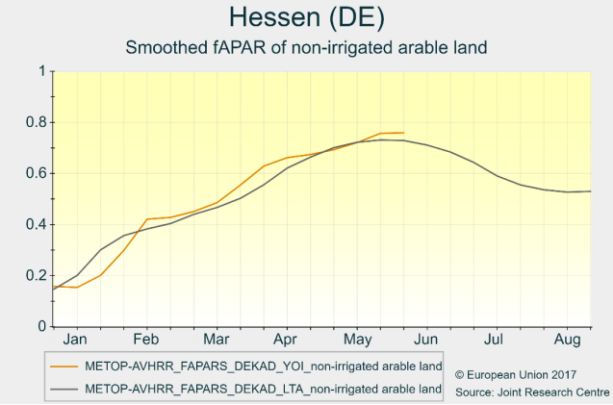
Apart from lower-than-usual temperatures at the beginning of May, favourable conditions prevailed during the period under review. Most winter crops evolved well since May, and decent yields are expected thanks to few but well-distributed rainfall events. More rain is now needed to ensure adequate grain filling, especially in the centre-west. Locally, rapeseed and winter barley suffered due to the dry and cold conditions observed in April.

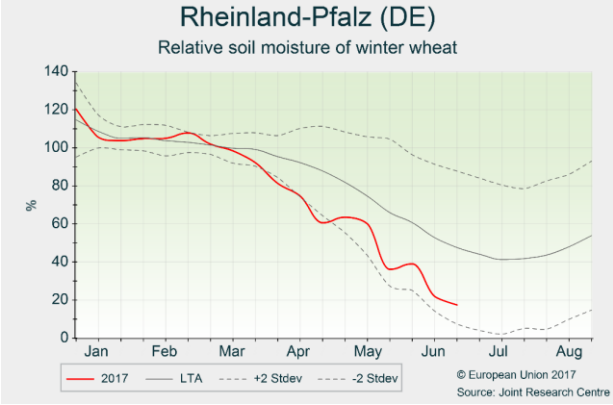
After the first dekad of May (which was dominated by cold temperatures), a warmer-than-usual period set in, which was beneficial for crop development and brought it back on track or to even above-average values. It rained regularly in most regions during the period under review, but less than usual in the centre-west: *Nordrhein-Westfalen, Rheinland-Pfalz, Saarland, Hessen,* and *Thüringen*. The climatic water balance since March indicates a persistent and evident water shortage, in particular for the first three Länder. Generally, most winter and spring cereals are in good shape, and yields should be around the average. However, well-distributed and regular water supply will be required in the coming weeks in western regions and in areas dominated by sandy soils, in order to prevent possible episodes of water stress during the grain-filling stage. Winter barley suffered locally from previous cold temperatures and dry conditions, and yield expectations are lower than average as a result.

Rapeseed yields at national level are expected to be lower than average, and close to last year's results. This is due to low temperatures and insufficient rainfall in the south (*Hessen, Thüringen* and *Niedersachsen*), where local reports also highlight a low number of side shoots per plant as a consequence of the cold and dry conditions. Maize emergence occurred later than usual this year, mainly due to the cold spell around the sowing period, but recovered well in May thanks to warmer-than-average temperatures. The crop development of sugar beets and potatoes is proceeding normally so far.









Poland

Rapeseed recovered from cold spell. Winter cereal yield forecast revised upwards

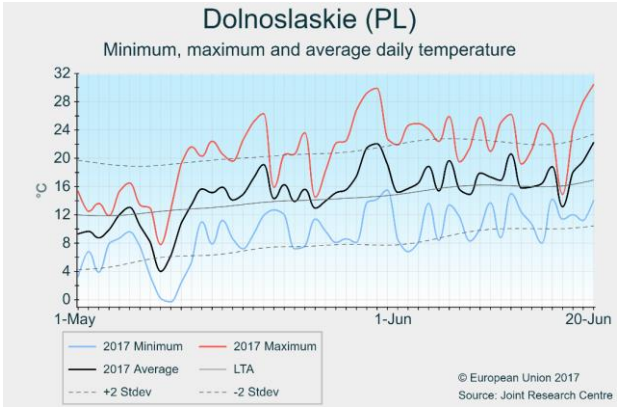
The outlook for winter cereals is positive, despite the warmer-than-usual conditions. The outlook is also positive for rapeseed, which recovered from the cold spell in April. Expectations for spring barley and sugar beet are negative due to unfavourable weather conditions around sowing and/or emergence.

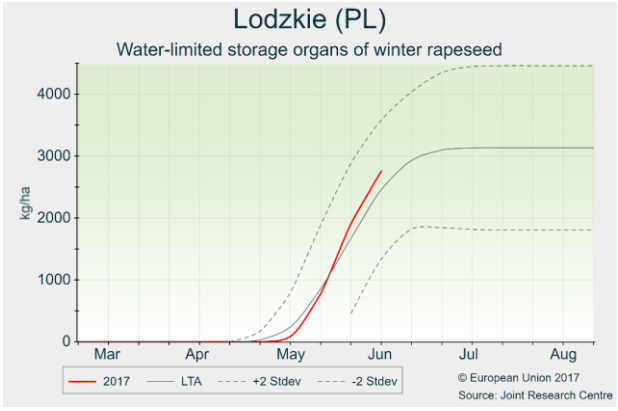
After the cold spell at the end of April and the beginning of May, average temperatures increased and remained slightly above or around the long-term average. Winter cereals quickly made up for the delay in development, which is currently close to the seasonal average. Winter crops are now at the beginning of the grain-filling stage, and are in good shape. However, the warmer-than-usual conditions that started at the end of the review period are expected to shorten the grain-filling stage, which will likely limit the accumulation of dry mass in kernels. Therefore, compared to the previous bulletin, we only slightly increased our yield forecasts for soft wheat, winter barley and rye.

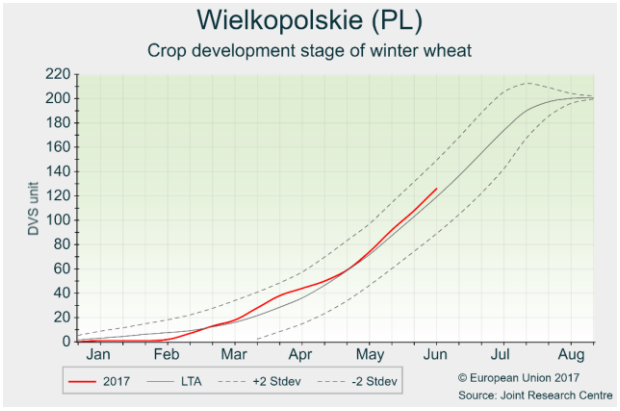
The cold conditions that delayed the sowing of spring barley had negative consequences on crop development and biomass accumulation, which is now lower than the LTA according to our simulations. Future favourable weather conditions could improve the situation, but for the moment we expect yields to be lower than average.

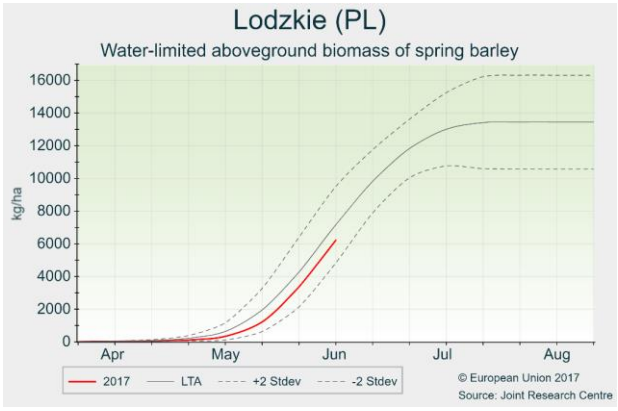
Thanks to the favourable meteorological conditions observed since the second dekad of May, rapeseed recovered very well from the damages incurred at the beginning of flowering stage due to the cold spell. Hence, our forecast was revised upwards, and is now clearly above the five-year average.

Our forecast for sugar beet was substantially reduced. Germination occurred under favourable conditions, but was followed by a cold spell and abundant rainfall. This slowed the development of the newly germinated plants, which are sensitive to excessive water. The early development of grain maize was slowed down by the cold temperatures after sowing; however, the crop recovered quickly when thermal conditions improved. Our model simulations indicate that phenological development is currently near average, and biomass accumulation is slightly above the seasonal average. Since maize is still in the early stage of development, we base our yield forecast on the long-term trend.









United Kingdom and Ireland

Continued positive outlook; still more rain needed in the south-eastern UK

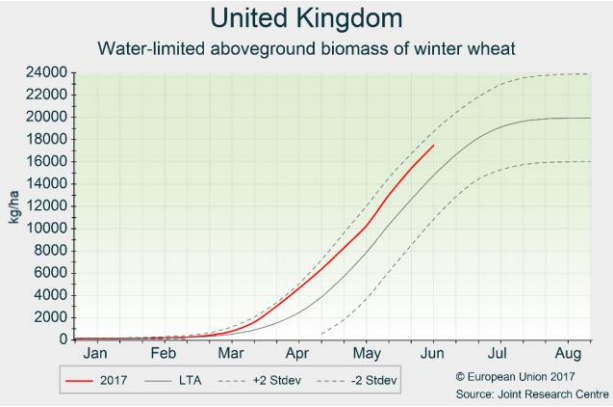
Abundant rainfall during mid-May and early June relieved concerns of imminent water deficiency in the south-eastern UK, but soil moisture levels are still close to critical. Yield forecasts were revised slightly upwards (mainly in Ireland) or maintained (mainly in the UK); more rain is needed in the south-eastern UK to sustain the positive outlook.

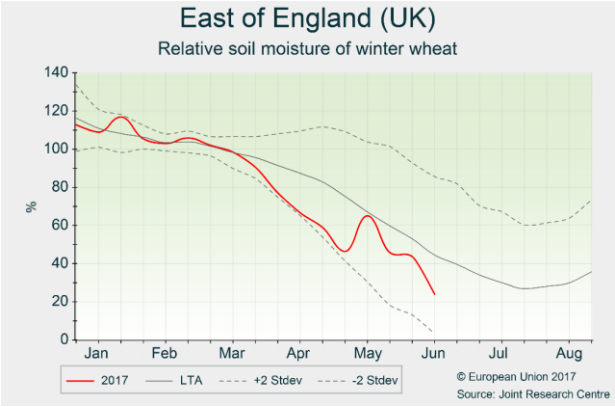
After an average or slightly colder-than-usual first dekad of May, above-average temperatures prevailed throughout the UK and Ireland during the remainder of the review period. Overall, this review period (1 May to 20 June) was the warmest on our records in the UK and among the five warmest in Ireland. Nevertheless, maximum temperatures of more than 30°C only occurred on one or two days, in south-eastern parts of the UK.

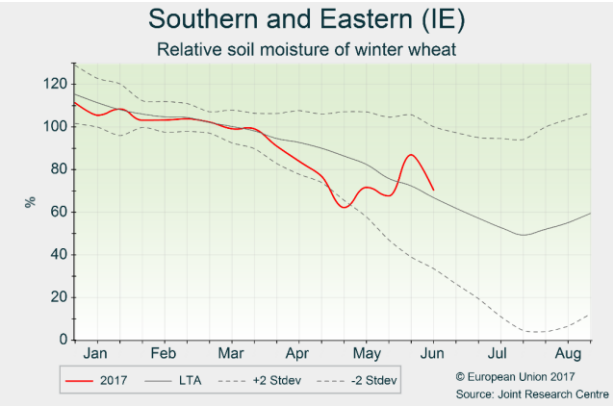
Precipitation was generally above average, mainly due to two distinct rainy periods, around mid-May and during the first dekad of June. The periods in between were practically dry.

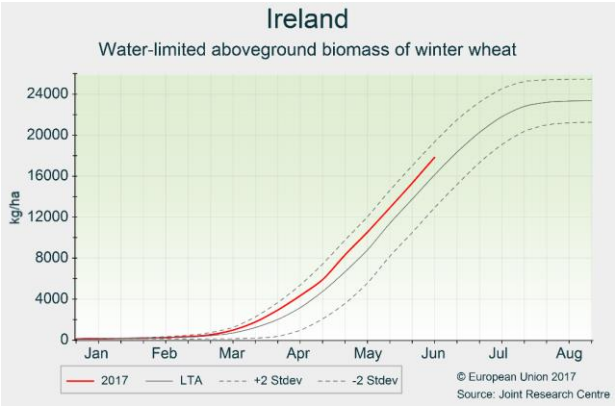
Overall, these conditions have been favourable for crops. The rainfall episodes were particularly welcomed in the south-eastern UK, where soil moisture levels had been close to critical. More rain is still needed there, however, as soil moisture levels were only partly restored and are rapidly decreasing again due to the dry second dekad of June. In Ireland, soil water conditions are generally favourable, thanks to the abundant rain from mid-May to 10 June and dry conditions since then. Winter crop development is advanced by 1-2 weeks due to predominantly above-average temperatures. Sugar beet and potato crops are also generally faring well, after a difficult start, due to the dry conditions until mid May.

The yield forecasts were revised slightly upwards for most crops in Ireland, and are practically maintained for the UK. More rain is needed in the south-eastern UK, however, to sustain the positive outlook.









Spain and Portugal

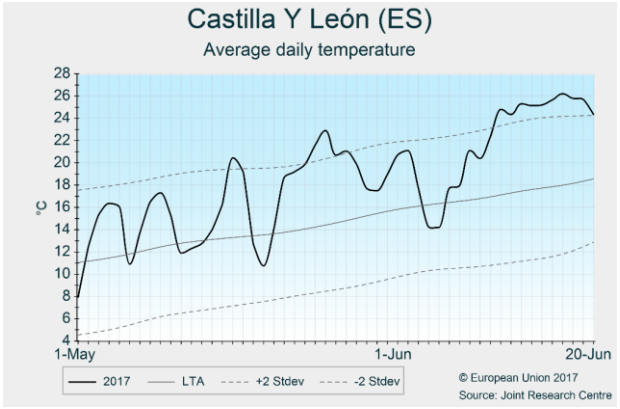
Low yield expectations for winter crops

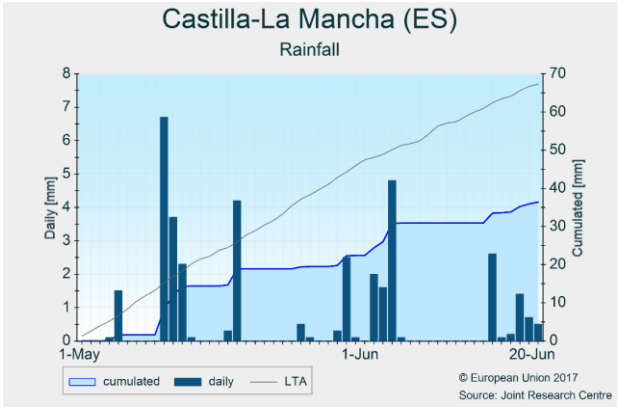
Exceptionally high temperatures were registered during May and June in the Iberian Peninsula. Yield expectations for winter cereals are severely limited by the persistent dry conditions prevailing during the growing season. Summer crops are developing satisfactorily, but the current drought may lead to irrigation restrictions.

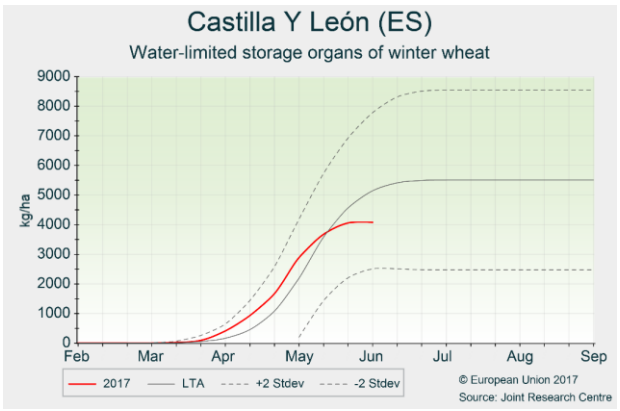
The cumulated temperatures in May and June 2017 across the Iberian Peninsula are amongst the highest of the past four decades. Daily temperatures were particularly high (3-4°C above the seasonal average) in the centre of Spain (*Castilla-La Mancha* and *Castilla y León*) and north-east of Portugal. Precipitation was below average in most of the territory, and mostly concentrated in two periods: mid-May and the first week of June.

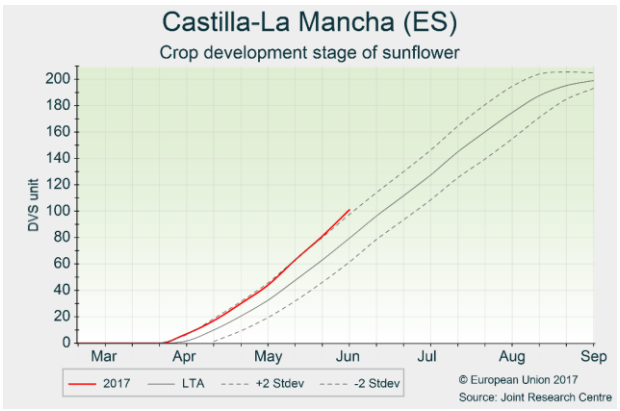
Winter crops are reaching maturity, with harvesting underway in the south (*Alentejo*, *Andalucía*). The hot conditions during May and June were unfavourable for soft wheat and barley, shortening the grain-filling period. Moreover, the recent precipitation arrived too late to improve the status of both crops after the exceptionally dry season suffered in *Castilla y León*, the main producing region. Therefore, yield forecasts for soft wheat and barley in Spain are, respectively, 30% and 40% below last year's results. For durum wheat, yield expectations are average, as the growing season in *Andalucía* was not as dry as in the centre and north. The forecasts for winter cereals in Portugal are below last year's figures.

Sunflowers entered into the grain-filling stage, two weeks earlier than usual. Crop status is currently average in both countries, and yield potential depends on precipitation during the second half of June. Other summer crops are developing satisfactorily so far, but this year's water storage is rather low, especially in the northern half of the Peninsula, which may lead to irrigation restrictions.









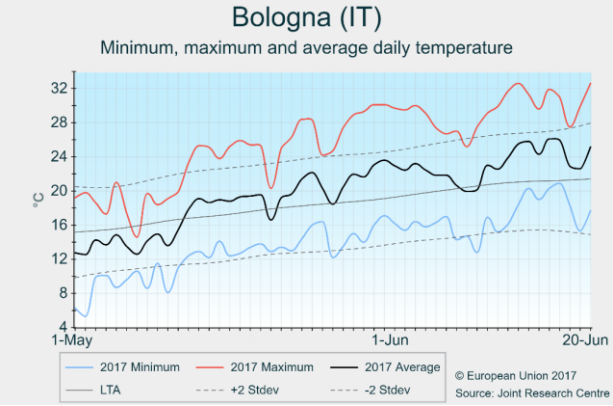
Italy

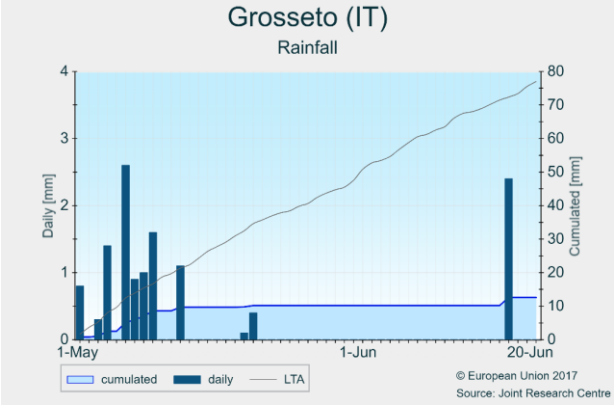
High temperatures accelerating grain filling in cereals

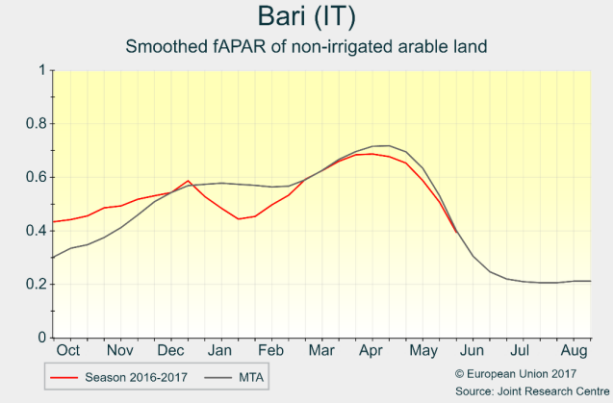
The very dry conditions recorded in Emilia Romagna, one of Italy's most important regions for winter cereals, did not significantly affect crop development. However, the yield forecasts for winter cereals were revised downwards due to the strong positive temperature anomaly since the second dekad of May. Durum wheat expectations are around the long term trend.

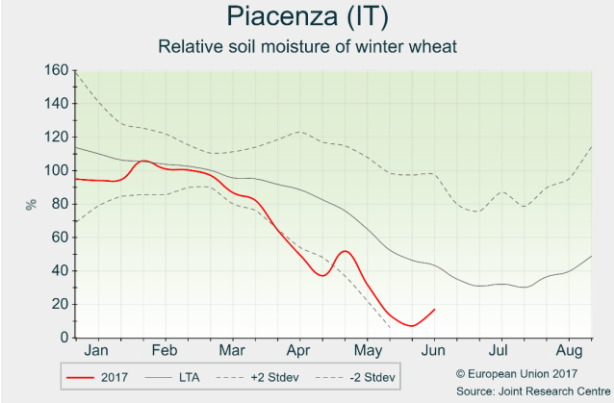
As already pointed out in previous bulletins, several regions of Italy (*Veneto*, *Lombardia*, *Emilia Romagna*, *Toscana*, *Lazio*, *Campania, Sardinia*) experienced very strong rain deficits. The situation improved in almost all the affected areas, especially in northern regions, thanks to beneficial precipitation in April and the beginning of May. Since then, a rain deficit has again accumulated in the western areas of *Emilia Romagna*, *Toscana*, *Lazio*, and northern *Campania*. However, this situation has not significantly affected winter cereals. Data from remote sensing show that crops are in good condition in the most important areas where winter cereals are cultivated. Nevertheless, temperatures have constantly been above the long term average (LTA) since May 11 in almost all the peninsula. Moreover, a heat wave accompanied by dry conditions started on June 18 and is expected to last for around 8 days, pushing maximum temperatures above 35ºC in many areas of *Emilia Romagna*, *Toscana*, *Puglia*, *Calabria*, *Sicilia* and *Sardegna*. These thermal conditions have accelerated grain filling in winter cereals, resulting in lower dry mass accumulation. Consequently, our forecasts for winter wheat and barley were revised downwards compared to the previous bulletin and to the LTA.

Durum wheat harvest operations already started in southern Italy. In general, in the most important regions for this cereal (i.e. *Sicilia*, *Puglia*, and *Le Marche*) remote sensing indicators present development around the LTA, or somewhat lower, such as in *Bari* in *Puglia* and *Trapani* in *Sicilia*. In general, durum wheat crop conditions have been good so far, which is why our forecast was revised upwards compared to the last bulletin. Nevertheless, as in the case of winter cereals in northern regions, grain filling has slowed down due to the constant high temperatures and the expected yield, although satisfactory, is not going to be significantly higher than the long-term trend.









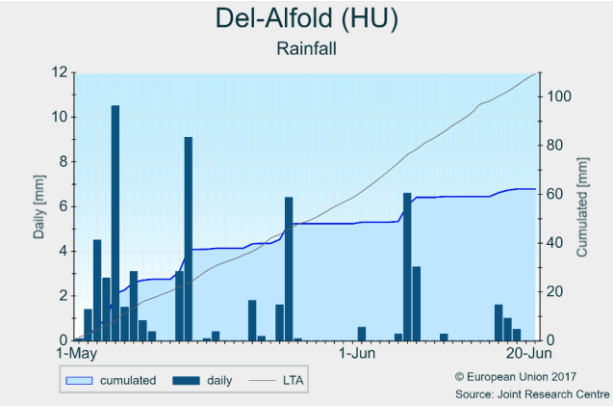
Hungary

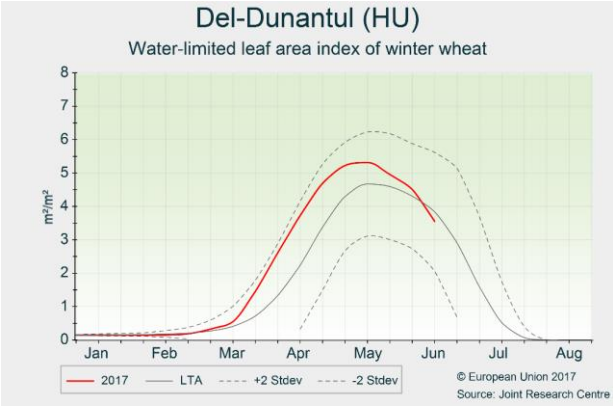
Water deficit deepening

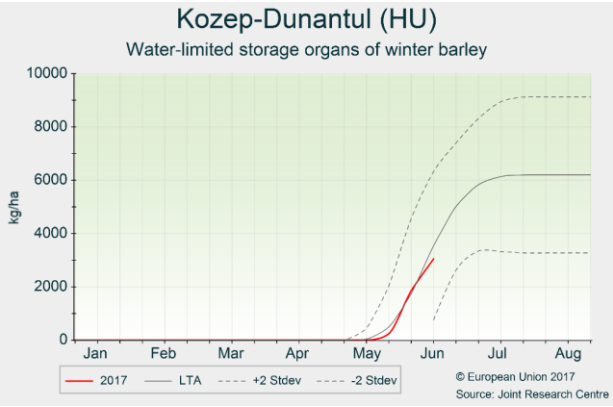
The rainfall recorded in late April and early May was favourable as it occurred before the flowering of winter cereals. From mid–May onwards, only a few rainfall events were recorded and the soil moisture decreased significantly in the central regions of Hungary. Our forecast for winter cereals is revised downwards because of less-than-optimal water supply and the forecasted heat wave.

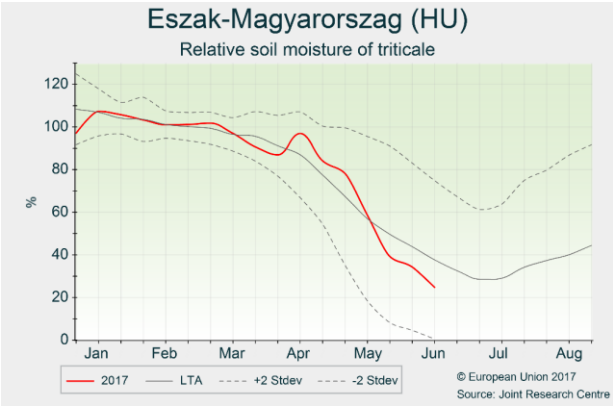
Average thermal conditions were recorded during the first dekad of May even though a short but sharp drop in temperatures occurred around 10 May. From mid-May onwards, daily temperatures fluctuated above the long-term average, but remained in a moderate range, with the maxima exceeding 30°C only slightly and only for a few days. No hot spell occurred until now. Substantial rainfall was recorded in the first half of May, maintaining the soil moisture content of winter cereals and summer crops close to an average level. From mid-May onward, however, there was scarce rainfall (totals around 20 mm) in the central regions of Hungary. The Nyugat-Dunantul, Eszak-Alfold and Eszak-Magyarorszag regions received more rain (40-50 mm), although this was only half of the usual amount.

As the phenological development of winter cereals is advanced by 1-2 weeks, the harvest is expected to occur earlier than usual. Soil moisture levels fell sharply from mid-May and remained below average levels after late May in most regions. The water supply was adequate during the flowering and early grain-filling stages of winter cereals, but later became limited, compromising biomass accumulation in the storage organs and accelerating the senescence of the leaves. The yield forecast for winter cereals and rapeseed is revised downwards. The growth of spring and summer crops is close to that of an average year. The soil water content was below average in the past month, although it is satisfactory for vegetative development. A severe heat wave is forecast for the last dekad of June, which can cause problems in water supply and compromise the flowering of sunflowers. The yield forecast has therefore been lowered.









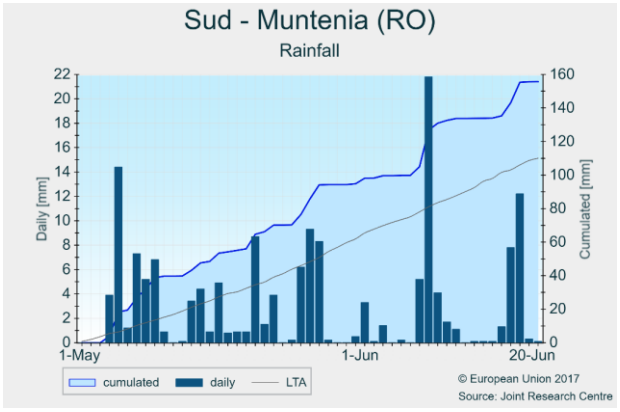
Romania

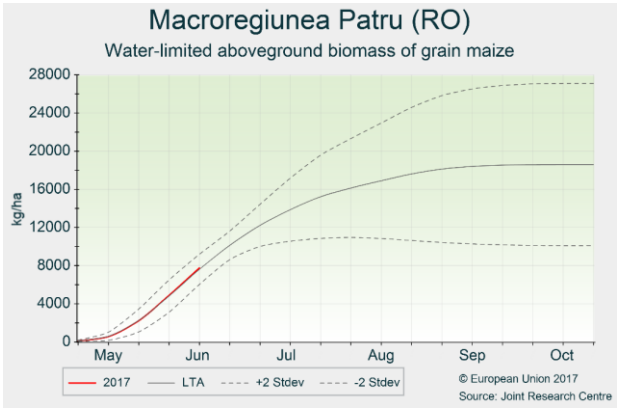
High yield potential, possibly restrained by heat-wave

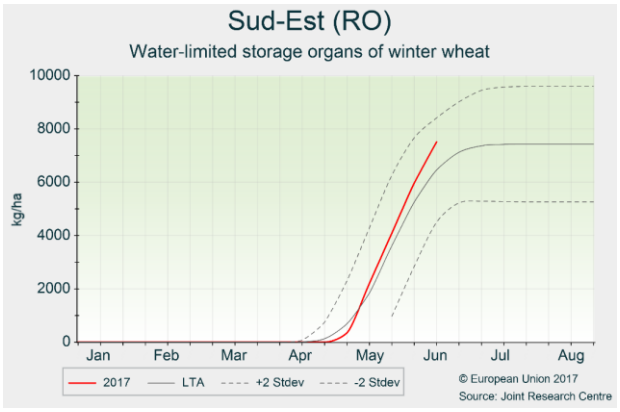
Thermal conditions were favorable in May and during the first half of June. Abundant rainfall kept the soil moisture content above the average in the main production areas, providing a beneficial water supply for the grain filling of cereals and winter rapeseed. Crop model simulations and remote sensing images are both confirming a very positive yield outlook for winter crops.

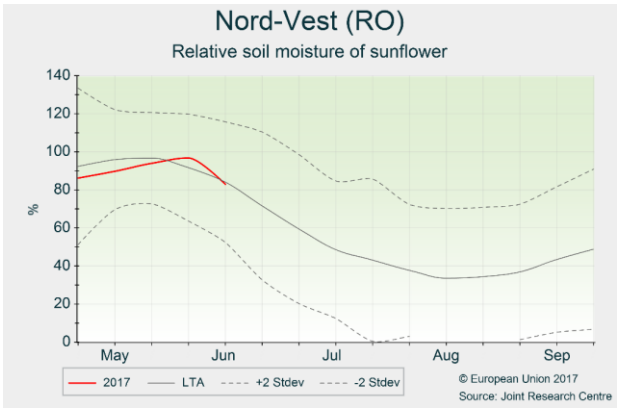
For the current period of analysis (1 May – 20 June), the temperature sum (both for Tbase=0 and 10°C) is showing a neglectable negative anomaly in the south-eastern regions, meanwhile the western regions were exposed to a moderate positive thermal anomaly. Temperatures fluctuated largely around the average but did not exceed frequently +30°C before mid-June. Substantial rainfall was observed, exceeding the average by 20-80 mm and thus sustaining the soil moisture at a favourable level in most regions. However, in some areas of *Macroregiunea Patru*, *Nord-Vest* and *Nord-Est* the rain remained below the average.

Due to the warmer-than-the-average temperatures recorded early spring, winter crops are moderately advanced. The crop reproductive phase, which is crucial for the yield formation, was not shortened. According to our model simulations, the water-limited biomass and storage organs weight of winter crops are exceptionally high in *Sud-Muntenia* and *Sud-Est* regions and also above average along the western and eastern border. The positive biomass anomaly is confirmed by satellite observations. In the central areas (primarily *Centru*) the simulated biomass is slightly below the average consequently to a slight negative thermal anomaly. The current yield forecast of winter cereals is above the trend, but could be revised down depending on the impact of the heat wave forecast for the last dekad of June. The growing season of summer crops is less promising since leaf area and biomass accumulation of maize and sunflower were slightly impacted by the below optimal weather conditions around emergence. Nevertheless, the water supply is currently adequate and promising.









Bulgaria

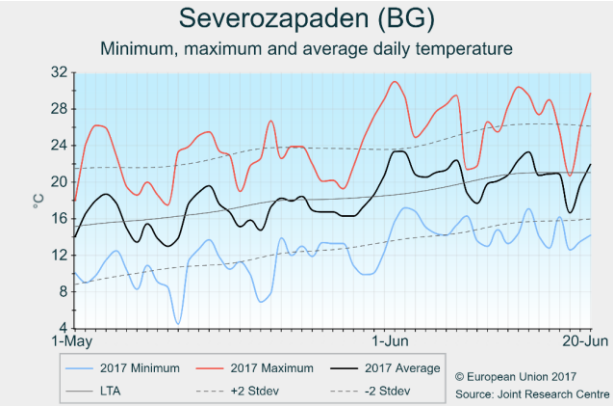
High yield expectations for winter cereals

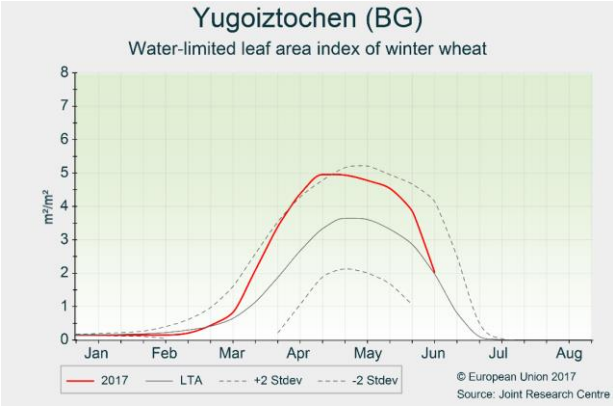
Substantial rainfall maintained the soil moisture above the average in the main agricultural regions. Temperatures were average. Winter crops are moderately advanced compared to a normal year, while the biomass and storage organ weight greatly exceed the average. Summer crops are benefiting from adequate soil moisture for the season.

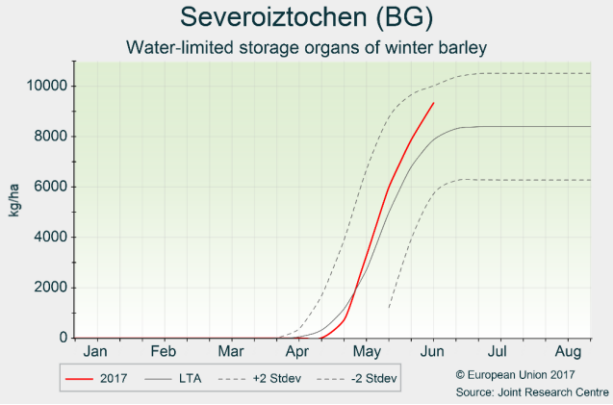
Average thermal conditions prevailed in Bulgaria. Daily temperatures remained in a normal range, since neither frost nor heat waves (only a few hot days with Tmax>30°C) were recorded from beginning of May until 20 June. Precipitation was evenly distributed since 1 May, but the spatial distribution was rather heterogeneous. The cumulated rainfall exceeded the average by 10-60 mm, although a local rainfall deficit persists in the north-west (*Severozapaden*).

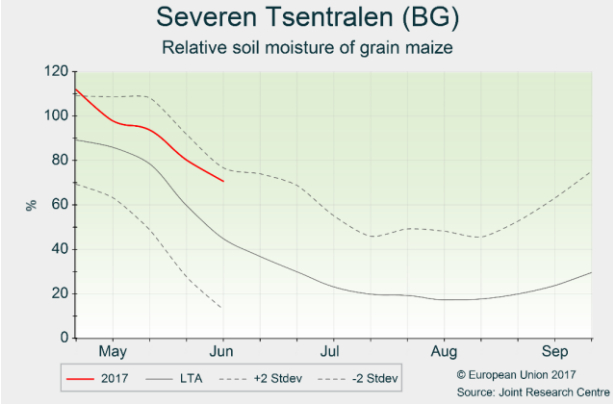
The phenological development of winter crops is following the average in the north-eastern regions and advanced by 5-10 days in the western and south-eastern territories. The beneficial rains kept the soil moisture above the average for both winter and summer crops in the *Severoiztochen and Severen Tsentralen* regions. Locally, in the *Yugoiztochen* and *Severozapeden* regions, the water supply was limited and less than optimal since mid-May due to below-average precipitation in early spring. The canopy expansion of winter crops is exceptionally good this year, increasing the radiation interception. The simulated levels of biomass accumulation and weight of storage organs of winter crops are exceptional for the main agricultural areas.

The summer crops are still in the vegetative phase and their development is close to the average. The growth of maize and sunflowers is close to the long-term average, as reflected by the leaf area index and biomass accumulation. As weather conditions were favourable for winter cereals, the yield expectations are currently positive. Nevertheless, the medium-range weather forecast indicates a high probability of a hot and dry period during the last dekad of June, which can shorten the grain-filling period of winter wheat and negatively affect the yield formation of summer crops.









Austria, Slovakia and the Czech Republic

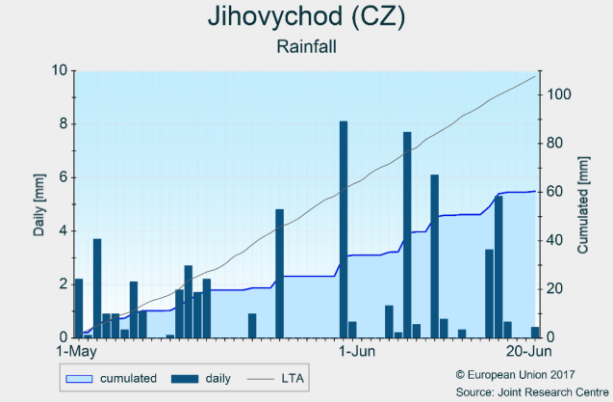
Heat wave and rainfall deficit worsen crop growth conditions

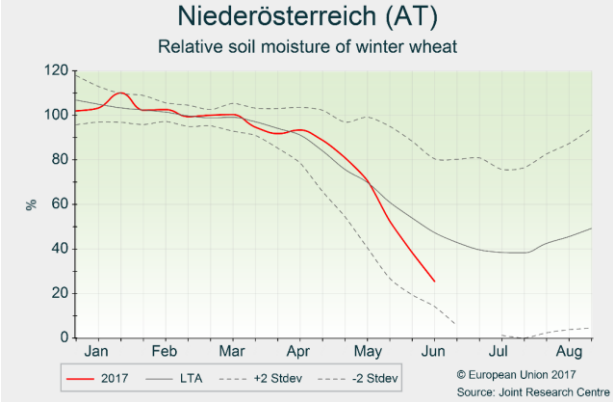
Warmer- and dryer-than-seasonal weather conditions since the second dekad of May are starting to have an impact on crops, especially in southern parts of the Czech Republic and western parts of Slovakia. The yield forecast for winter wheat generally remains below the levels of the last three years.

A warm weather anomaly prevailed since the beginning of the second dekad in May, with air temperatures generally between 1 °C and 4 °C above the long-term-average. Consequently, winter and summer crops are now slightly advanced. Since the beginning of May, a rainfall deficit has accumulated over major agricultural areas.

Winter wheat mainly entered the sensitive flowering stage in the second half of May. During this period, some days occurred with maximum daily air temperature exceeding 30 °C in major agricultural areas. Combined with a soil moisture deficit, this is likely to have negatively affected kernel formation in Jihovychod, Bratislavsky Kray, Zapadne Slovensko and Niederoesterreich. In other regions, preceding rainfall mitigated negative impacts. June, so far, presented a strong rainfall deficit, which further worsened soil moisture conditions, especially in the aforementioned regions, as well as in Jihozapad, Severozapad, Oberöesterreich, Niederöesterreich and Burgenland.

Recent warm weather has accelerated the development of winter wheat, which is now approaching the ripening phase. Current and forecast hot weather conditions could further affect the grain yield potential of winter wheat. Our current yield forecast therefore remains below the levels observed during the past three years. The growth and development of summer crops will highly depend on the weather during the coming month. The grain maize forecast therefore currently remains close to the 5-years average.





Denmark and Sweden

Weather conditions generally favourable for winter and summer crops.

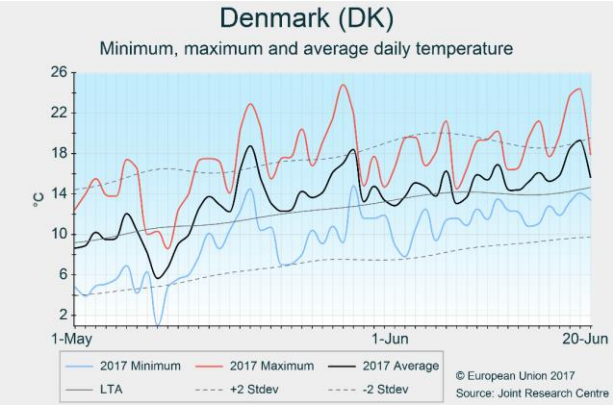
Crop development and accumulated biomass are generally back to average levels thanks to warm temperatures experienced after mid-May and June. Yield forecasts remain close to the five-year average.

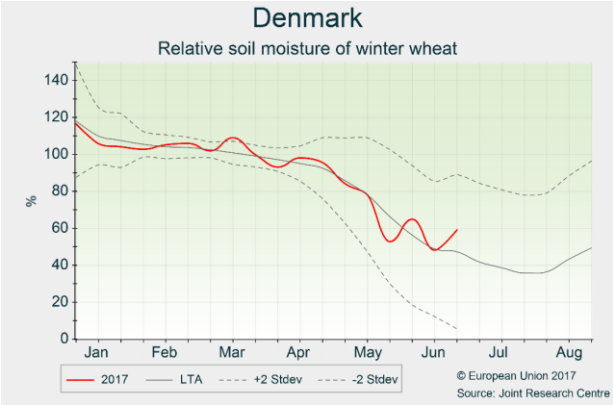
After a period of unusually cold weather during the first half of May, temperatures increased in both countries, becoming warmer than usual during the rest of the month, and close to seasonal values since 1 June. Rainfall was lower than average during May and the beginning of June, and above average later on.

Winter cereals are progressing well in Denmark and Sweden. Despite the delay in sowing, spring barley presents satisfactory development. Generally, winter cereals recovered biomass production levels that were close to the average, except in the *Östra Melansverige* region (south-east of Sweden), where a delay in biomass accumulation still persists. The low levels of precipitation registered in May are not limiting cereal growth. At the current stage, normal rainfall and mild temperatures would be welcome in June and July to extend the duration of the grain-filling stage, and thus increase yield potentials in cereal crops.

In Denmark, the development of rapeseed is slightly advanced and crop models indicate an above-average

biomass accumulation, while development in Sweden is near average. Maize crops in Denmark made a good start, thanks to the warmer-than-usual weather conditions observed in May. Sugar beets, by contrast, present a significant delay in both countries as a consequence of the delay in sowing activities.



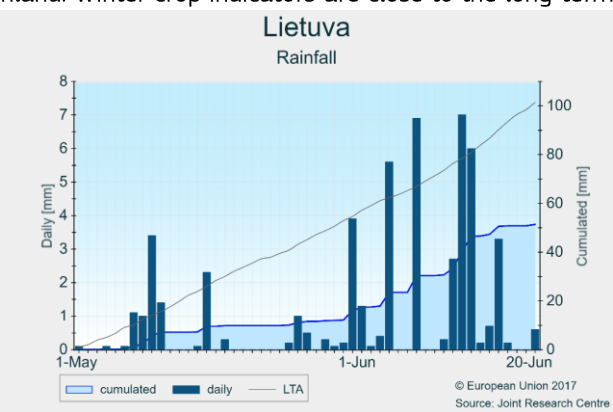


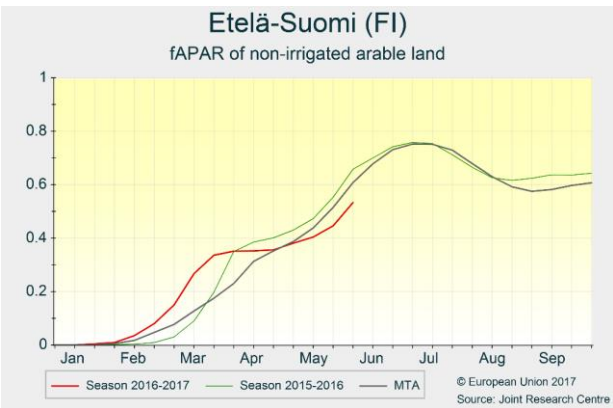
Finland, Lithuania, Latvia and Estonia

Crop development delayed in Finland and Estonia

In Latvia and Lithuania, after the cold spell of May, normal to warm temperatures accelerated the growth and development of winter and spring crops. The delays caused by the preceding cold spell have not yet been compensated in Finland and Estonia, but there is still time to recover.

Colder-than-usual temperatures characterised the first half of May. From the second half of May, temperatures in the Baltics fluctuated around the average (Tmax>20oC and Tmin>5oC) until the end of the period under review (20 June), which allowed for the steady growth of crops. In Finland, some spring frost episodes marked a few nights at the end of May, but no major consequences are expected. The weather conditions after the cold spell created a good environment for maintaining the growth of winter crops, which are already reaching the flowering stage. Apart from some rainy days during the first dekad of June, precipitation in all of the countries has been lower than average, especially in southern Lithuania and in Finland. Winter crop indicators are close to the long-term average, as is the biomass accumulation (fAPAR signal). Spring crops in Latvia and Lithuania are finishing the vegetative phase under average conditions so far, but rainfall, sufficient radiation and above-average temperatures are needed to sustain crop growth during the flowering stage. In Finland and Estonia, where the share of spring crops is predominant (more than 70%), the situation is more delicate. Spring-sowing activities finished around the last week of May (with a delay of around two weeks due to the chilly conditions of mid-May), and the first stages of development were accompanied by a lack of rain. As a result, below-average canopy development has been registered, according to the fAPAR signal. The growing window in these countries, which is already narrow, is therefore becoming shorter. However, positive growing conditions in terms of above-average radiation and temperatures during the coming weeks could help to recover crop development. As a consequence, the yield forecasts for spring and winter crops are around average.





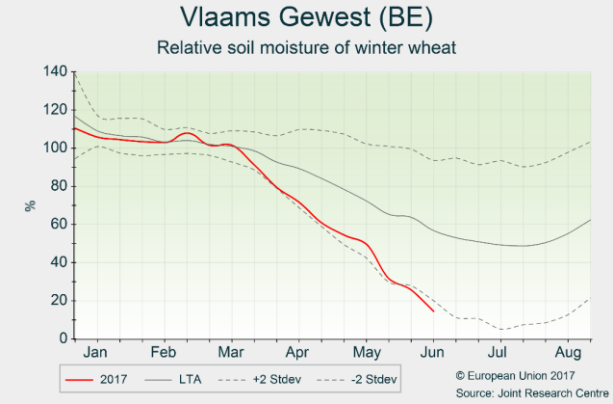
Belgium, the Netherlands and Luxembourg

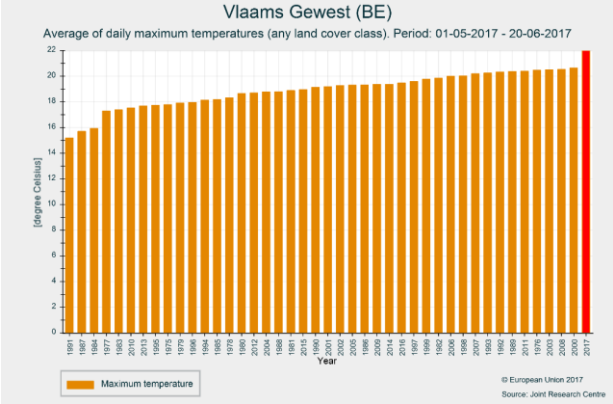
Continued concerns on water deficit in southern areas

Substantially warmer- and drier-than-usual conditions continued to affect crop growth in Belgium, Luxembourg and the southern Netherlands. Yields for most winter and summer crops were revised downwards to below the five-year average for Belgium and Luxembourg but remain above the five-year average in the Netherlands.

After a much colder-than-average first dekad of May, temperatures remained almost constantly above the long-term average for the rest of the review period. Despite these strong contrasts, overall, the review period was the warmest or one of the warmest on our records. Minimum temperatures below 0 °C occurred around 10 May, whereas maximum temperatures exceeding 30 °C were common during one or two days around half May, the end of May and during the last few days of the review period. Despite the scarcity of the precipitation, rainfall was fairly well distributed, yet with a more distinctly wet period in most areas during the first dekad of June and practically dry conditions since then. Overall, precipitation was well below-average, with anomalies ranging from -30 mm to -50 mm, with the largest deficits in Belgium's *Vlaams Gewest*.

The prevailing warmer-than-usual conditions since the first dekad of May, caused an acceleration of crop development. Winter crops are now generally advanced. Their conditions vary considerably, however, mainly depending on water supply. In Luxembourg, Belgium and the southern parts of the Netherlands, where soil moisture levels in most areas have been well below average since mid-March and near critical since the end of April, vegetative growth and early grain filling have been impacted. These areas present a negative yield outlook. In other parts of the Netherlands, where rainfall has been more regular and many areas benefit from relatively high groundwater levels and supplementary irrigation, the outlook is positive. In areas with favourable soil moisture conditions, sugar beet and potato crops recovered well from the cold spell at the end of April and the beginning of May. In drought affected areas, however, these crops have made a difficult start; especially potato crops, which are unlikely to attain good yields in Belgium.



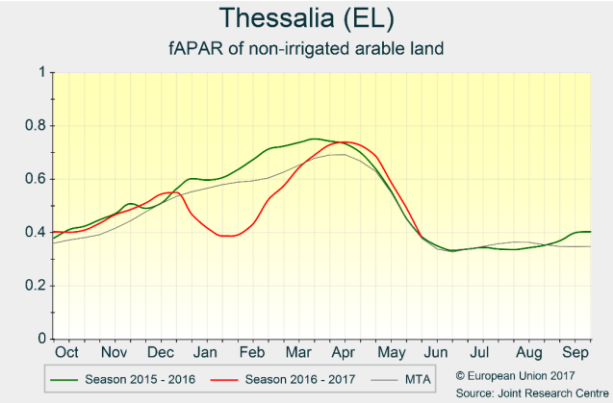


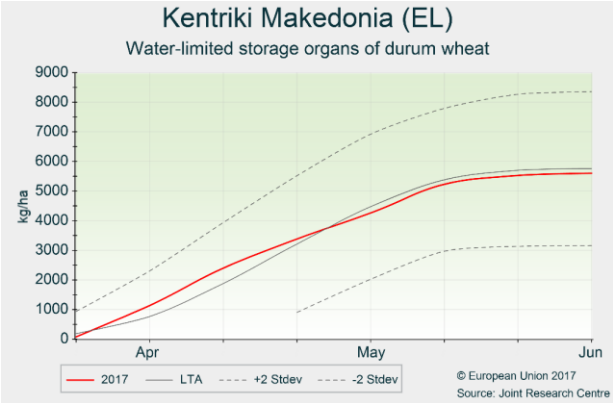
Greece and Cyprus

In Greece, wet conditions were beneficial for the last part of the winter crop season, and yield forecasts increased compared to May and are above the five-year average. The wet conditions led to positive expectations for summer crops, and almost record sunflower yields are forecast. In Cyprus, the season ended under dry conditions, but expectations for both durum wheat and barley remain above the five-year average.

The first half of May was marked by dry and warmer-than-usual weather for Greece. In northern (*Kentriki Makedonia*) and north-eastern regions (*Anatoliki Makedonia*) winter crops were just entering in grain-filling stage and were hampered by the lack of water. In *Thessalia*, low soil moisture levels at the beginning of May occurred during grain filling, with consequences on yield formation. Rainfall in the second half of May replenished soil moisture to above-average levels, while temperatures returned to seasonal values. As a result, the impact of dry conditions on grain filling was recovered in all regions. Crop model outputs for all winter crops confirm this

tendency: water-limited storage organs moved from below-average to average values. This is also reflected in remote sensing data. In central Greece, the winter crop season finished at the end of May or beginning of June, with average to positive yield expectations. In June, temperatures rose to above average, with a few days with maximum temperatures of around 30°C, and precipitation was more abundant than usual, between 40 and 60 mm. Such conditions favoured the latest stages of winter crops in *Kentriki* and *Anatoiliki Makedonia,* where crops have reached maturity. Regarding summer crops, in full vegetative growth, crop model displays the water-limited indicators in line with the potential ones: vegetative growth and yield expectations are optimal for both irrigated and non- irrigated summer crops, but it is still very early in the season. In Cyprus, the crop cycle ended in May, with harvesting activities that were concluded before the end of the month. The cropping season was delayed but favourable, at least until late April when dry and warm weather slightly reduced yield expectations.





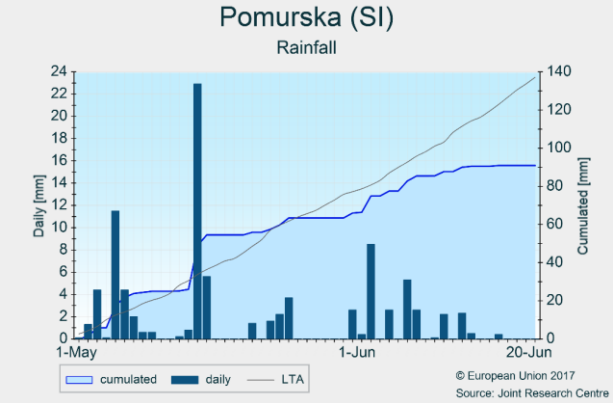
Slovenia and Croatia

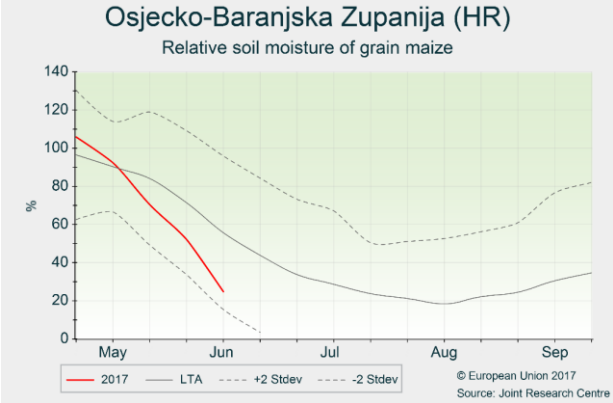
Winter crop yield outlook remains above the 5-year average

The analysis period was characterised by warmer-than-usual conditions. Maximum daily temperatures above 30 °C appeared already during the third dekad of May. A strong rainfall deficit built up since the second half of May. Summer crops are likely to be negatively affected. Winter crops are generally matured or approaching maturity, with a positive yield outlook.

Warmer-than-usual conditions prevailed, with temperature anomalies (compared to the long-term average) of 1-2 °C in May and 1– 4 °C in June. Maximum daily air temperatures exceeded 30 °C as soon as in the third dekad of May. Hot weather continued in June, with up to 5 hot days (with maximum temperature above 30 °C) observed so far in the eastern half of Croatia. A rainfall deficit has accumulated over major agricultural areas (with the exception of several regions in eastern Croatia, which recorded a rainfall surplus). Soil moisture levels were partially replenished during the first half of May, around the flowering stage of soft wheat. Owing to warmer-than-usual weather during the analysis period, soft wheat has already entered the ripening stage and is fast approaching maturity, whereas most winter rapeseed and winter barley crops have already reached maturity.

Due to relatively favourable conditions during the flowering stage, the forecast for winter wheat remains above the 5-year average. The harvesting of winter rapeseed and winter barley is ongoing. Soil moisture levels are depleting rapidly due to the rainfall deficit in June, combined with high atmospheric evaporative demand, especially in shallow soils. These conditions are unlikely to seriously affect winter crops, which have reached or are reaching the final stage of the growth cycle, but they will affect summer crops (maize and sunflower), which are approaching the sensitive stage of flowering.


Pomurska (SI)
Rainfall
Daily [mm]
Cumulated [mm]
1-May
1-Jun
20-Jun
cumulated
daily
LTA
© European Union 2017
Source: Joint Research Centre


Osjecko-Baranjska Zupanija (HR)
Relative soil moisture of grain maize
%
May
Jun
Jul
Aug
Sep
2017
LTA
+2 Stdev
-2 Stdev
© European Union 2017
Source: Joint Research Centre

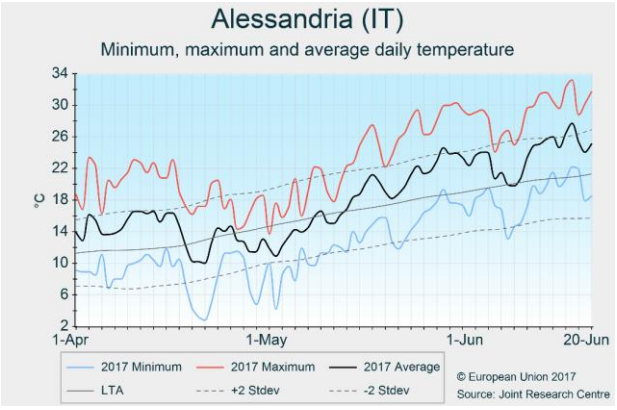
3.2 European Union – rice producing countries

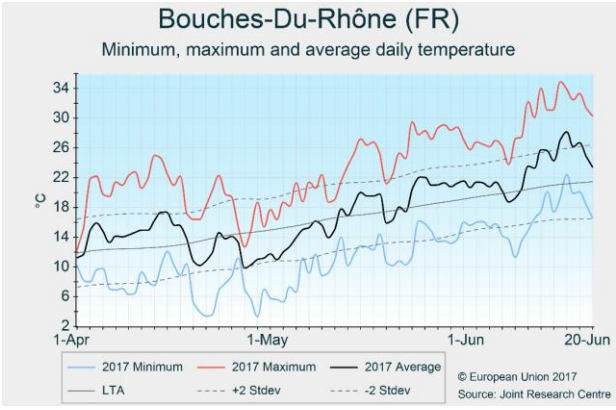
In general, meteorological conditions for rice sowing, emergence, and early development were favourable in all producing countries. The cold spell recorded at the end of April and the beginning of May did not create any damage to the crops. However, it delayed sowing in France, Bulgaria, Hungary, and Romania, and it slowed down emergence and the very early vegetative development in Italy. Nevertheless, crop establishment was adequate and the onset of warmer temperatures accelerated development in these countries. On the Iberian Peninsula, sowings were anticipated thanks to higher than usual temperatures. Here, conditions are generally favourable, but need to be monitored carefully as a drought is hitting the peninsula with consequences for water storage that might limit water supply along the growing season.

Italy and France

Meteorological conditions during the first part of the crop-growing season were generally favourable in the main rice-producing areas of **Italy**. After the cold spell at the beginning of May, which did not affect the emergence of the early-planted plants, temperatures progressively increased, pushing up thermal time accumulation well above the long-term average. Rainfall since 1 May has been below the long-term average in all the rice-producing areas. Rice was sown in time and is still in early vegetative development.

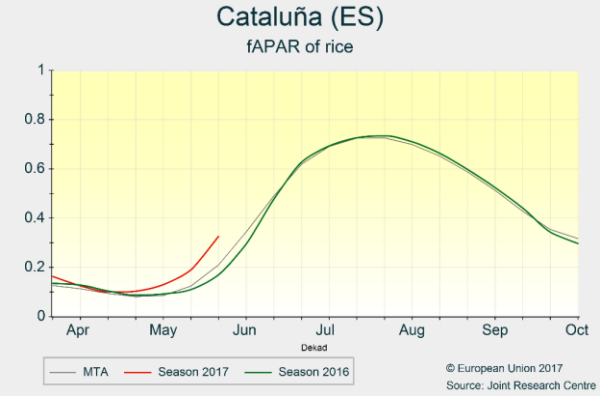
In **France**, temperatures were largely below the average at the beginning of the sowing period (i.e. from 20 April to 15 May). Until 6 May, the minimum temperatures were below 10°C and substantial rainfall was recorded. From 6 May onward, temperatures remained close to the average and increased largely above it during the second dekad of June, while no substantial rainfall has been recorded so far. As a consequence of the initial thermal conditions, some delay in the sowing might have occurred. However, the current temperatures are beneficial and accelerating the development, thus allowing plants to catch up the delay observed at sowing.

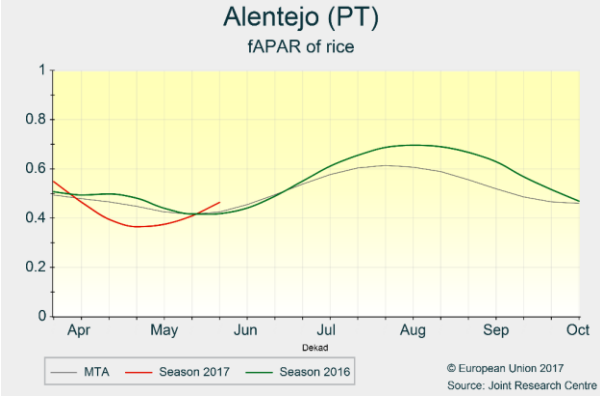




Spain and Portugal

The higher-than-usual temperatures registered in May and June across the Iberian Peninsula have permitted to anticipate sowing in the western regions (Extremadura and Alentejo) and in the area of the Ebro Delta (Cataluña). The analysis of satellite imagery indicates that rice is currently in the initial phase of vegetative growth and thus around 10 days earlier than usual. The current context of above seasonal temperatures are favouring adequate growth. In the Guadalquivir marshes (Sevilla) and Valencia region, sowing took place around the usual date (i.e. end of May) and the crop is now emerging. Weather conditions with higher-than-usual temperatures are beneficial for a good initial development. Therefore, the current thermal growing conditions for rice are favourable. However, the Iberian Peninsula is being hit by a drought, and the water stored in reservoirs and aquifers is substantially below the standard levels. This may produce limitations in irrigation along the growing season, which may potentially affect rice yields.

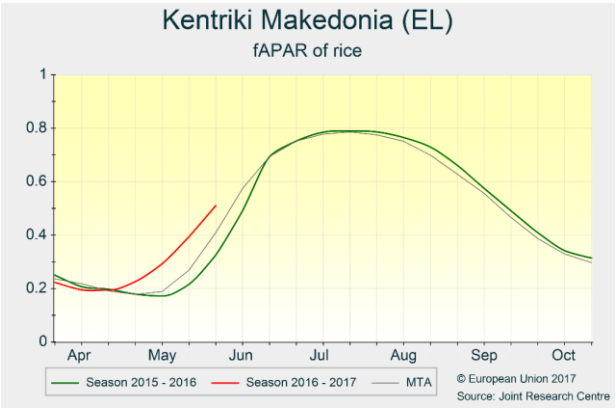


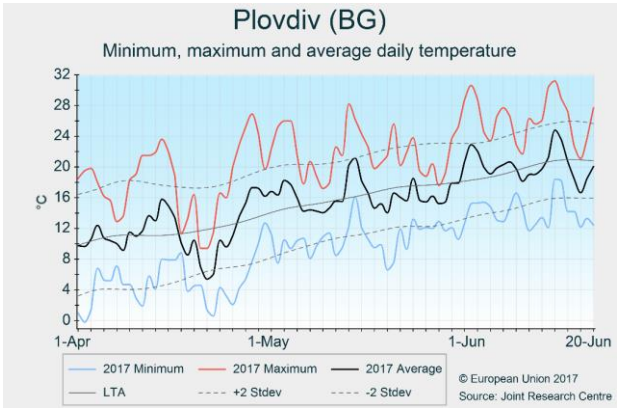


Greece and Bulgaria

In the rice-producing Thessaloniki region of **Greece**, sowing was carried out from end of April to the beginning of May. At sowing time, weather was dry and temperatures just recovered to normal after a cold period. Warmer-than-usual temperatures in the first half of May favoured rice emergence that occurred, according to remote sensing data, slightly earlier than usual. In the second half of May, temperatures were around the long-term average and several rainy days occurred (almost 60 mm in total). Since the beginning of June, maximum temperatures have risen above the LTA with some days above 30°C accelerating crop growth and resulting in a slightly higher-than-average biomass accumulation for this period.

In **Bulgaria**, the cold spell at the end of April did not damage rice crops, but could have delayed sowing operations, and just slightly slowed down development, which however recovered to the long-term average already at the beginning of May with the onset of warmer temperatures. Temperatures have been around the long-term average ever since, determining an average development of the crop that is still in the early phase of vegetative development.



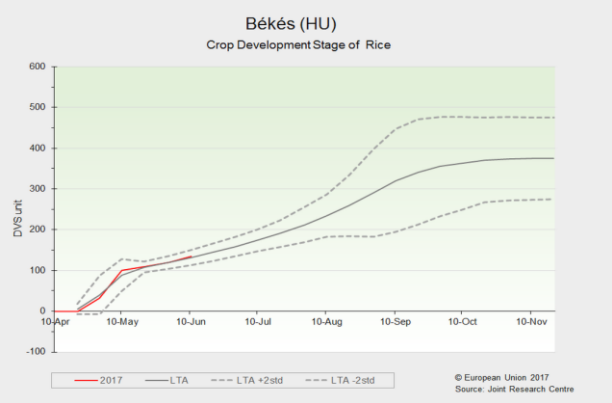


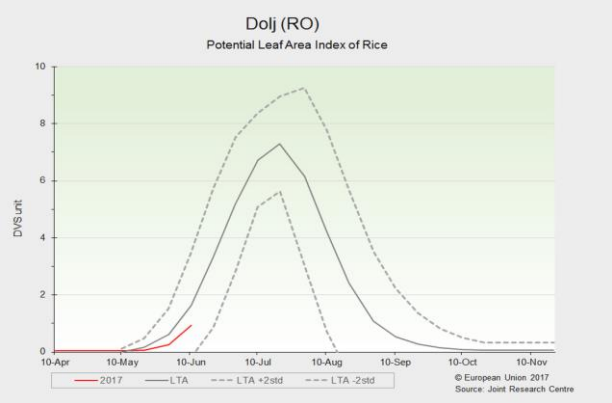
Hungary and Romania

The sowing of rice may have suffered some delay in both countries due to unfavourable cold temperatures occurring during the second half of April. However, the crop establishment was adequate thanks to above-average temperatures recorded after mid-May. The slightly warmer than usual thermal conditions that prevailed since mid-May accelerated crop development, and the crop recovered from the delay accumulated in April and even gained a moderate precocity. At the publication of this bulletin, rice crops are still in the early vegetative phase. In both rice-producing regions of Hungary (Dél-Alföld and Észak-Alföld) and in western Romania, accumulated rainfall since mid-April has remained moderately below the long-term average. In south-eastern Romania where the majority of rice is cultivated, however, precipitation exceeded the long-term average since the second dekad of April.

Our rice model simulations suggest near- or slightly above-average leaf area index values and biomass

accumulation in Hungary and western Romania. In eastern Romania, canopy expansion and biomass accumulation were slower than usual, although the situation is improving. Being in the very early stage of the rice season, the rice yield forecast is therefore kept close to the technological trend in both countries.





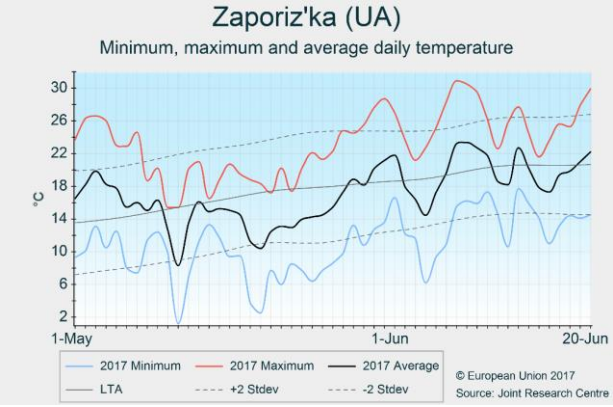
3.3 Black Sea Area

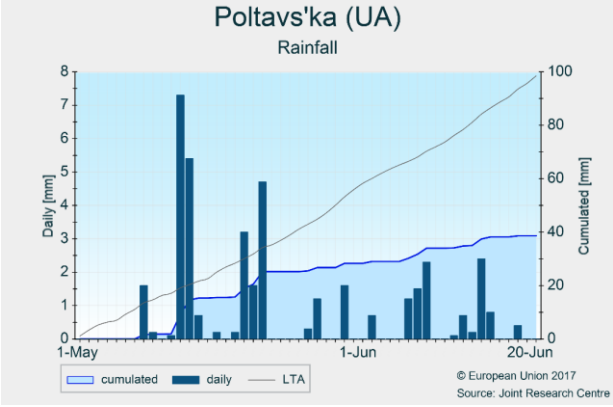
Ukraine

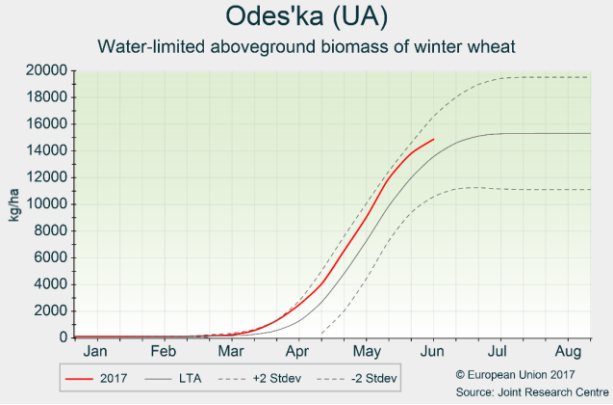
Expectations lowered by dry conditions in central Ukraine

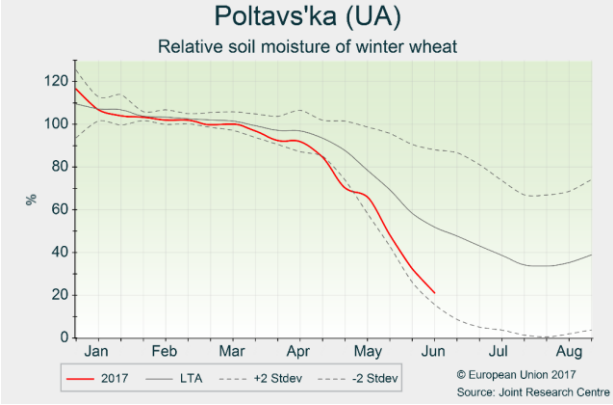
Crop conditions are highly contrasted between central Ukraine (which was affected by a substantial rain deficit) and the rest of the country. Our yield forecast was revised downwards, but is still above the five-year average as conditions are beneficial in the main crop-producing regions.

The first dekad of May was characterised by above-average temperatures before a cold snap interrupted the warm thermal conditions, with minimum temperatures reaching -2°C in central Ukraine. These low temperatures had no major impact on crops. The drop in temperatures was followed by thunderstorms, which brought some rains that were beneficial to central oblasts, but not sufficient to compensate the precipitation deficit, which remains at 50% compared to the long-term-average cumulated rainfall for the period of analysis. Temperatures remained slightly below average in the southern, central and eastern oblasts during the last dekad of May, but returned to average since the first dekad of June. Winter crop conditions are highly contrasted as a result of the dry conditions observed in central Ukraine. The most impacted oblasts are Cherkas'ka, Kyyivs'ka, and Poltavs'ka. By contrast, conditions are beneficial in the main producing oblasts in eastern and southern Ukraine (Zaporis'ka and Odes'ka). Winter wheat and winter barley yields are forecast to be 10% below those of last year because of the drought, but are still above the historical trend considering the good conditions in the main producing regions. The dry conditions in central Ukraine also impacted spring barley growth and delayed the emergence of grain maize and sunflower crops. Spring barley yields are revised downwards. The yield forecast for sunflower and maize is based on the historical trend as it is very early in the season and final yields will strongly depend on rainfall during the coming weeks.









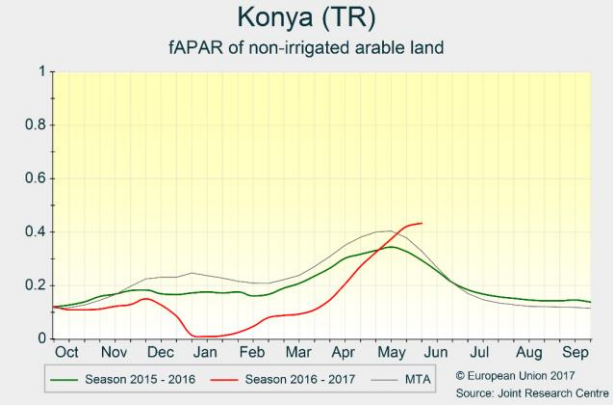
Turkey

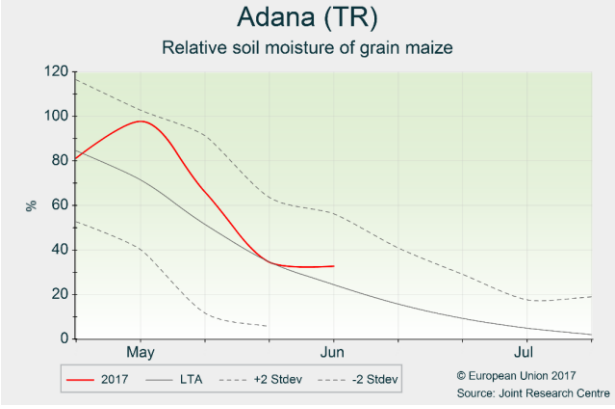
Late flowering but average biomass accumulation

Wet and warm weather in May accelerated winter crop development in Anatolian regions, moving biomass accumulation to average values; dry and hot weather in south-eastern regions, slightly shortened the grain filling phase of winter crops. In June, weather conditions were average and beneficial for both winter and summer crops.

The first half of May resulted in warmer-than-usual temperatures that were 3-4°C above the average, with maximum temperatures reaching 30°C on some days. The warm temperatures accelerated winter crop development and increased biomass production. The increased water demand was satisfied thanks to the abundant and well-distributed rains that occurred in the second half of May. Weather during May was mostly beneficial for winter crops in eastern Anatolian provinces (e.g. *Kayseri*) - relevant for soft and durum wheat production - where winter crops caught up to normal stages with slightly above-average biomass accumulation. In those regions, wheat started flowering during the first ten days of June. In central and western Anatolian regions, winter crops entered the flowering stage towards the middle of the month – ten days later than usual - with average biomass accumulation. In south-eastern regions (*Sanliurfa* and *Mardin*), weather in May was drier and hotter than in the rest of the country, but still in line with average weather conditions; only in southern *Sanliurfa* are wheat and barley likely to have suffered a shortening of the grain-filling period, without significant consequences on a country scale. Towards mid-June, crops reached maturity in all south-eastern regions, and the harvest will start with favourable expectations. In the southern Aegean regions, where most of the grain maize is grown (the *Adana* province accounts for around 30% of the national production), Weather conditions in May were more favourable: temperatures increased and slightly accelerated crop development and biomass accumulation. From the second half of May, significant precipitation occurred and replenished water reservoirs for irrigation. The not-so-warm spring, coupled with sufficient precipitation, determined an overall average development and favourable expectations for growing conditions during the summer. In the rest of the country, the analysis of maize conditions is more complex. Maize is cultivated mostly under irrigation and follows different crop-rotation schemes. However, spring rains provided adequate irrigation water for the summer growing period. Where maize is cultivated as a second crop under a double cropping regime, it will be sown later-than-usual in the coming weeks due to the delay of the first cycle

Yield forecasts for winter crops and summer crops are distinctly above the five-year average and above last year's levels.





3.4 European Russia and Belarus

European Russia

Slow crop development, but good yield expectations

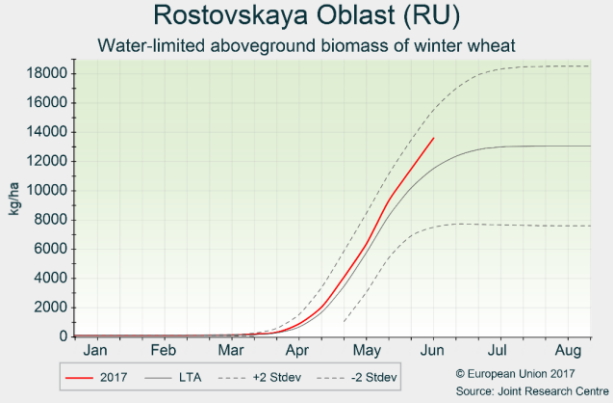
Frequent and plentiful rainfall provided adequate water supply conditions for canopy growth and biomass accumulation. Colder-than-usual weather conditions mostly delayed phenological development, but both winter and spring crops are generally in good shape. The yield expectations are lower than for the previous record year, but still good.

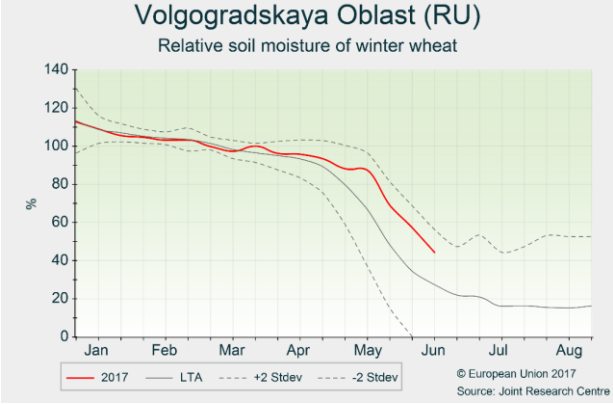
A perceptible warming was experienced in the first days of May, but below-seasonal temperatures returned after 7 May, with frost events occurring in all regions except the southern areas. From mid-May onwards, daily temperatures remained typically below the long-term average by 2-4°C, yetwith strong fluctuations.

In general, the precipitation totals significantly exceeded the average in the main crop-producing areas during the whole review period (1 May – 20 June). Excessive rainfall may have caused local flooding and temporal water-logging problems in southern Russia. In the Krasnodarskiy and Stavropolskiy Krays, the excessive rainfall in May coincided with the flowering stages of winter wheat and may have compromised yield formation. Moderate rainfall deficiency is visible in the western regions of the Central Okrug.

Soil moisture content is above average under winter crops in most of Russia. The biomass accumulation and leaf area expansion of winter wheat is positive in the main crop-producing southern regions, but average elsewhere. The yield potential is high, but moderate temperatures and further precipitation will be needed to sustain it.

In early May, the progress of the spring sowing campaign accelerated considerably, but excessive rainfall during the second and third dekads of May caused some delay. Cold weather conditions during the last two dekads of May were unfavourable for the sprouting, emergence and early development of spring cereals (barley, wheat), while some frost events may have caused injuries and damages to summer crop stands (maize). The development of spring crops is significantly (one- to three weeks) delayed in northern and eastern European Russia. Water supply is adequate in most of European Russia, except along the Ukrainian border. The biomass accumulation and leaf area expansion is typically below average due to belated phenological development, but the situation is improving steadily.



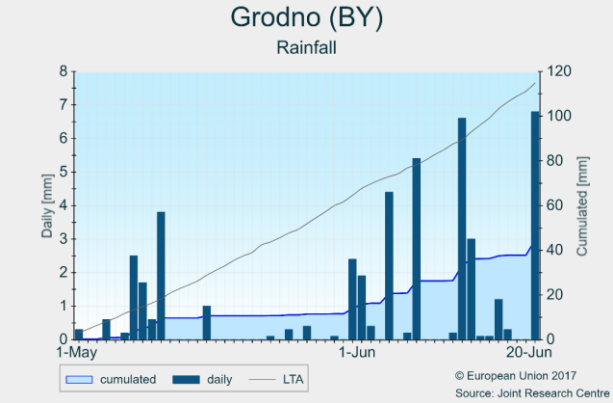


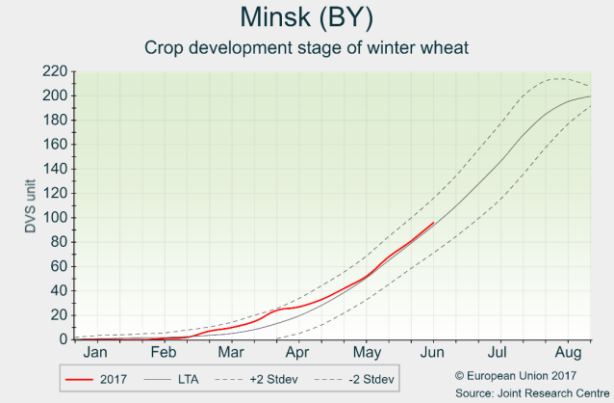
Belarus

Average expectations for winter cereals. Good conditions for grain maize despite late sowing

The ongoing hot weather conditions might have an impact on wheat crops that are at the beginning of grain filling. Grain maize crops made a good start despite the delayed sowing.

After the cold spell at the end of April and the beginning of May, thermal conditions returned to the long-term-average (LTA). A period with significantly warmer-than-usual conditions, started on the 18th June, will likely bring maximum temperatures above 30°C. Precipitation since the beginning of May has been well below the LTA, especially in the Minsk, Brest and Grodno regions. This is not yet a problem as soil moisture levels were replenished during the preceding period. However, this situation could become a concern if continued. Winter cereals have just started the grain filling phase. At the moment their development and biomass accumulation are in line with the LTA. The ongoing warm weather conditions might accelerate grain filling reducing dry matter accumulation. This will depend on the duration and the intensity of the hot weather. Grain maize development is in line with the LTA or slightly delayed despite the bad sowing conditions (see previous bulletin).





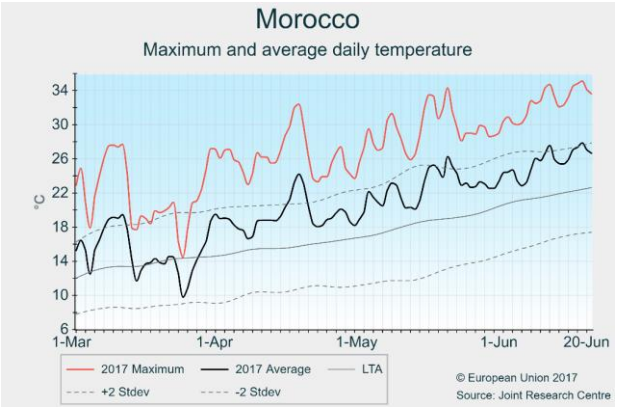
3.5 Maghreb

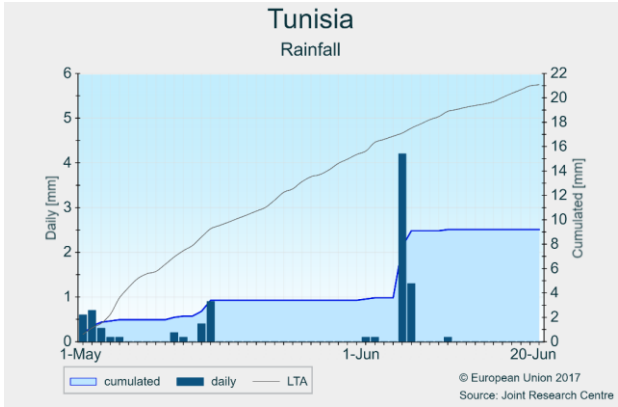
Morocco, Algeria and Tunisia

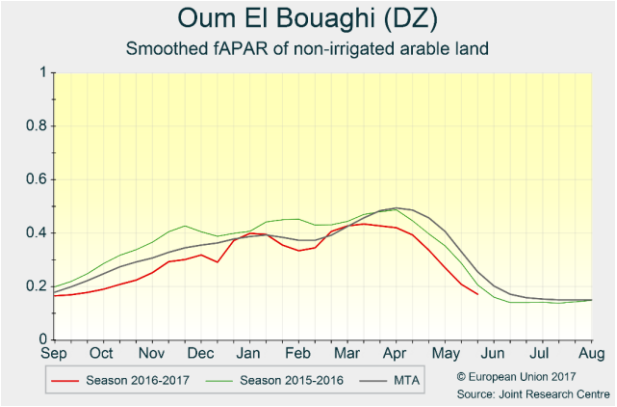
Positive season for Morocco and Tunisia, but negative for Algeria

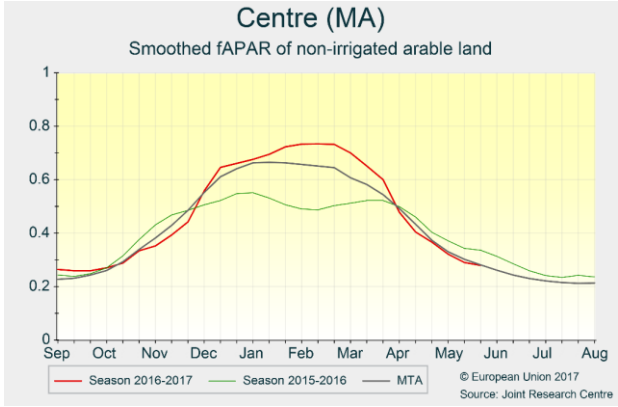
Expectations for all crops in Morocco and Tunisia are above average (slightly above in Tunisia), mainly thanks to the favourable winter season during which vegetative growth was greatly above average. In contrast, yield prospects in Tunisia are below average, aggravated by crop failures in the eastern part of the country as well as in some central and western regions, due to a season marked by scarce rains.

A strong positive thermal anomaly (3-5°C) characterised Morocco and western Algeria, while Tunisia and eastern regions of Algeria were around 2-4°C warmer than usual during the review period (1 May – 20 June). During this period, most of Morocco and the agriculturally important northern regions of Algeria and Tunisia received below-average precipitation. Moreover, hot and dry conditions marked the spring in Maghreb, where record values were recorded in terms of maximum temperatures and rain scarcity. These conditions contrast sharply with the rainy and mild winter that boosted vegetative growth in most regions of Morocco and Tunisia, where the end of the growing cycle was slightly constrained by the dry and hot spring. Resulting yields are above-average in Morocco and slightly above average in Tunisia for soft wheat, durum wheat and barley. Unlike Morocco and Tunisia, large crop-producing regions of Algeria experienced drier conditions in winter that constrained plant growth during the early vegetative phase. Such suboptimal growth made it difficult for cereals to face a hot and dry spring. As a consequence, poor vegetative greenness (fAPAR) was observed when the formation of grains started (April), suggesting compromised production levels in the eastern half of the country (e.g. *Oum El Bouaghi*), some central (*Medea*) and central-western (*Tiaret, Saida*) regions. A more positive outlook is expected in some central regions (e.g. *Ain-Defla*) and western Algeria. However, on a country scale, the yield estimation is substantially below average for all winter cereals.



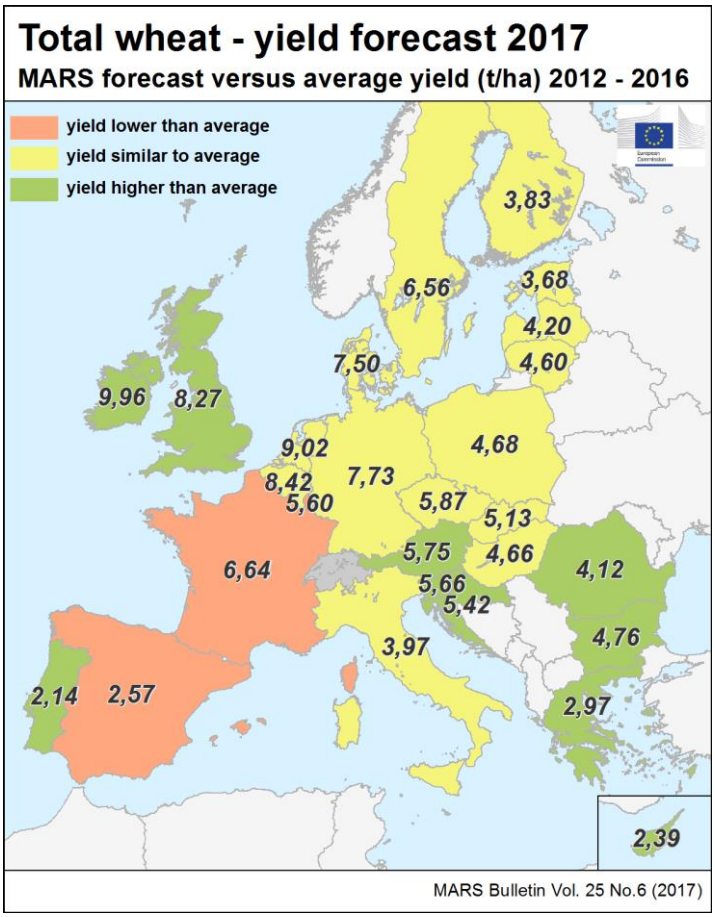




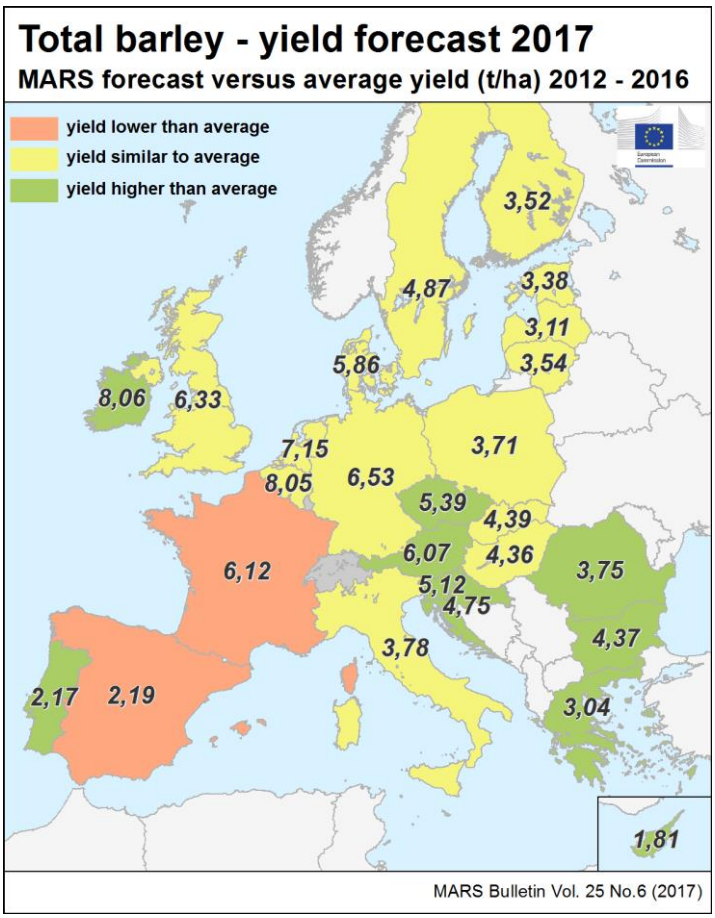


4. Crop yield forecasts

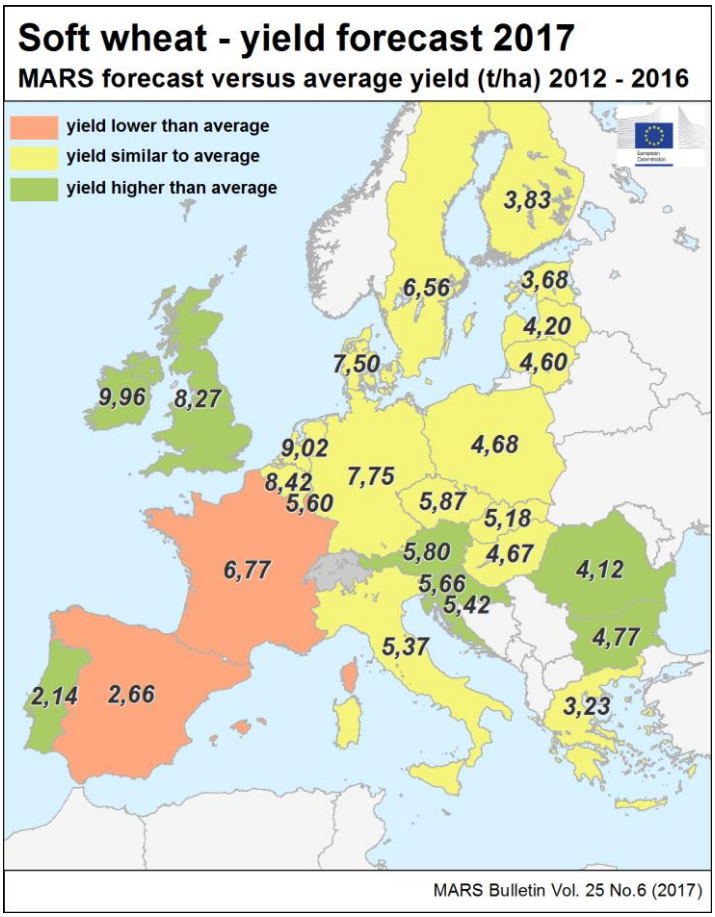
Country	TOTAL WHEAT (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	5,60	5,35	**5,61**	+0,2	+4,9
AT	5,48	6,22	**5,75**	+5,1	-7,5
BE	8,52	6,65	**8,42**	-1,1	+27
BG	4,28	4,75	**4,76**	+11	+0,3
CY	2,16	1,69	**2,39**	+11	+42
CZ	5,88	6,50	**5,87**	-0,2	-9,7
DE	7,95	7,65	**7,73**	-2,7	+1,1
DK	7,54	7,19	**7,50**	-0,5	+4,3
EE	3,77	2,77	**3,68**	-2,4	+33
ES	3,07	3,53	**2,57**	-16	-27
FI	3,89	3,77	**3,83**	-1,5	+1,7
FR	6,94	5,30	**6,64**	-4,4	+25
GR	2,83	2,35	**2,97**	+5,0	+26
HR	5,01	5,50	**5,42**	+8,1	-1,4
HU	4,72	5,38	**4,66**	-1,4	-13
IE	9,11	9,54	**9,96**	+9,3	+4,5
IT	3,96	4,20	**3,97**	+0,1	-5,5
LT	4,66	4,36	**4,60**	-1,2	+5,5
LU	5,95	5,07	**5,60**	-6,0	+10
LV	4,20	4,30	**4,20**	-0,1	-2,5
MT	-	-	**-**	-	-
NL	8,89	8,01	**9,02**	+1,4	+12
PL	4,52	4,54	**4,68**	+3,5	+3,2
PT	1,82	2,31	**2,14**	+18	-7,6
RO	3,50	3,93	**4,12**	+18	+4,6
SE	6,53	6,32	**6,56**	+0,3	+3,7
SI	5,08	5,19	**5,66**	+11	+9,1
SK	4,95	5,93	**5,13**	+3,7	-13
UK	7,87	7,89	**8,27**	+5,1	+4,9



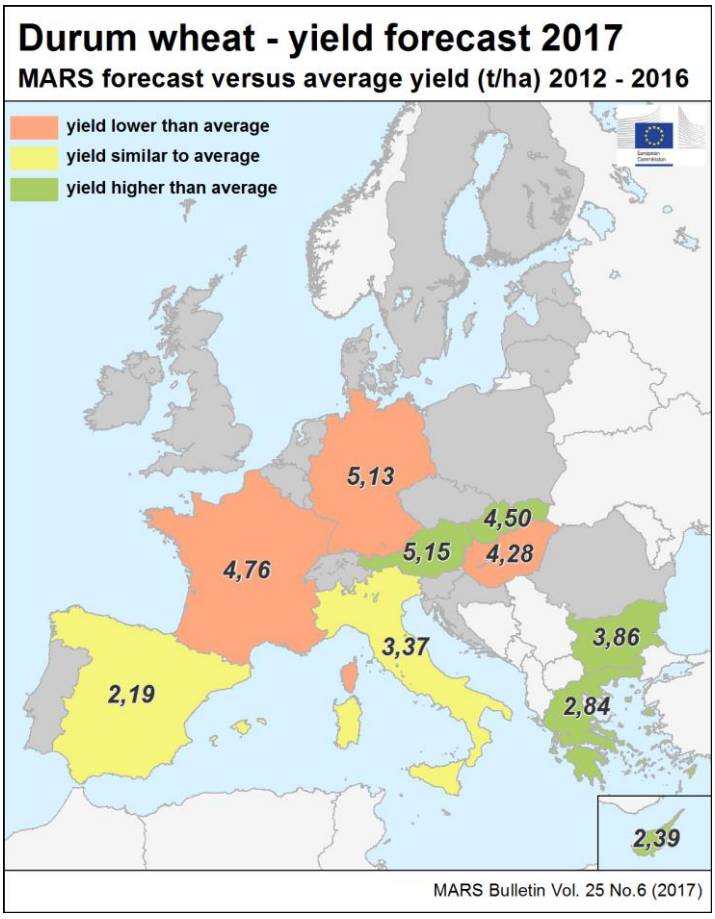
Country	TOTAL BARLEY (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	4,83	4,87	**4,70**	-2,8	-3,5
AT	5,39	6,12	**6,07**	+13	-0,8
BE	8,18	6,21	**8,05**	-1,7	+30
BG	3,90	4,32	**4,37**	+12	+0,9
CY	1,72	0,70	**1,81**	+5,8	+159
CZ	5,08	5,66	**5,39**	+6,2	-4,8
DE	6,79	6,69	**6,53**	-3,8	-2,4
DK	5,78	5,61	**5,86**	+1,4	+4,5
EE	3,39	2,64	**3,38**	-0,5	+28
ES	2,91	3,62	**2,19**	-25	-39
FI	3,57	3,59	**3,52**	-1,4	-1,8
FR	6,45	5,41	**6,12**	-5,1	+13
GR	2,79	2,31	**3,04**	+9,0	+31
HR	4,46	4,72	**4,75**	+6,3	+0,6
HU	4,43	5,14	**4,36**	-1,6	-15
IE	7,71	7,82	**8,06**	+4,5	+3,0
IT	3,81	4,13	**3,78**	-0,7	-8,5
LT	3,55	3,13	**3,54**	-0,1	+13
LU	-	-	**-**	-	-
LV	3,22	2,96	**3,11**	-3,6	+4,9
MT	-	-	**-**	-	-
NL	7,02	6,82	**7,15**	+2,0	+5,0
PL	3,72	3,75	**3,71**	-0,2	-1,0
PT	2,04	2,62	**2,17**	+6,3	-17
RO	3,23	3,80	**3,75**	+16	-1,3
SE	4,89	4,80	**4,87**	-0,3	+1,4
SI	4,61	4,78	**5,12**	+11	+7,2
SK	4,34	5,29	**4,39**	+1,1	-17
UK	6,10	5,93	**6,33**	+3,8	+6,7



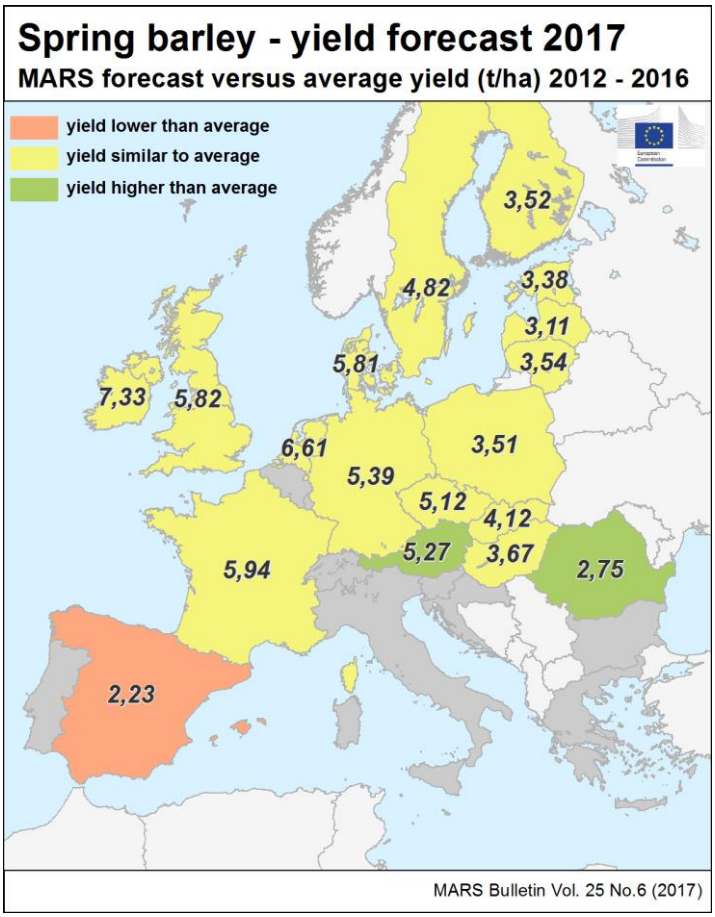
Country	SOFT WHEAT (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	5,84	5,56	**5,86**	+0,3	+5,2
AT	5,52	6,29	**5,80**	+5,1	-7,8
BE	8,52	6,65	**8,42**	-1,1	+27
BG	4,29	4,75	**4,77**	+11	+0,4
CY	-	-	**-**	-	-
CZ	5,88	6,50	**5,87**	-0,2	-9,7
DE	7,96	7,67	**7,75**	-2,7	+1,0
DK	7,54	7,19	**7,50**	-0,5	+4,3
EE	3,77	2,77	**3,68**	-2,4	+33
ES	3,25	3,84	**2,66**	-18	-31
FI	3,89	3,77	**3,83**	-1,5	+1,7
FR	7,07	5,38	**6,77**	-4,2	+26
GR	3,10	2,33	**3,23**	+4,0	+39
HR	5,01	5,50	**5,42**	+8,1	-1,4
HU	4,72	5,39	**4,67**	-1,2	-13
IE	9,11	9,54	**9,96**	+9,3	+4,5
IT	5,51	5,65	**5,37**	-2,6	-5,1
LT	4,66	4,36	**4,60**	-1,2	+5,5
LU	5,95	5,07	**5,60**	-6,0	+10
LV	4,20	4,30	**4,20**	-0,1	-2,5
MT	-	-	**-**	-	-
NL	8,89	8,01	**9,02**	+1,4	+12
PL	4,52	4,54	**4,68**	+3,5	+3,2
PT	1,82	2,31	**2,14**	+18	-7,6
RO	3,50	3,93	**4,12**	+18	+4,6
SE	6,53	6,32	**6,56**	+0,3	+3,7
SI	5,08	5,19	**5,66**	+11	+9,1
SK	4,98	6,10	**5,18**	+4,0	-15
UK	7,87	7,89	**8,27**	+5,1	+4,9



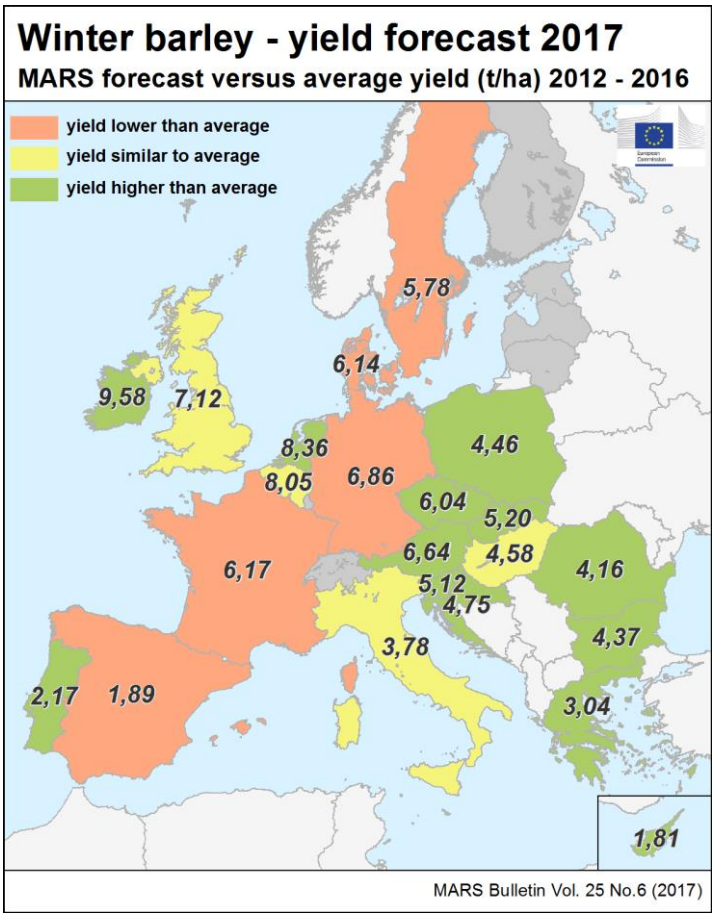
Country	DURUM WHEAT (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	3,32	3,40	**3,35**	+0,7	-1,4
AT	4,65	5,33	**5,15**	+11	-3,5
BE	-	-	**-**	-	-
BG	3,28	4,03	**3,86**	+18	-4,1
CY	2,16	1,69	**2,39**	+11	+42
CZ	-	-	**-**	-	-
DE	5,36	5,31	**5,13**	-4,3	-3,4
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	2,16	2,29	**2,19**	+1,4	-4,6
FI	-	-	**-**	-	-
FR	5,13	4,24	**4,76**	-7,1	+12
GR	2,70	2,36	**2,84**	+5,4	+21
HR	-	-	**-**	-	-
HU	4,64	4,97	**4,28**	-7,7	-14
IE	-	-	**-**	-	-
IT	3,28	3,65	**3,37**	+2,9	-7,5
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	-	-	**-**	-	-
PT	-	-	**-**	-	-
RO	-	-	**-**	-	-
SE	-	-	**-**	-	-
SI	-	-	**-**	-	-
SK	4,28	4,37	**4,50**	+5,1	+3,0
UK	-	-	**-**	-	-



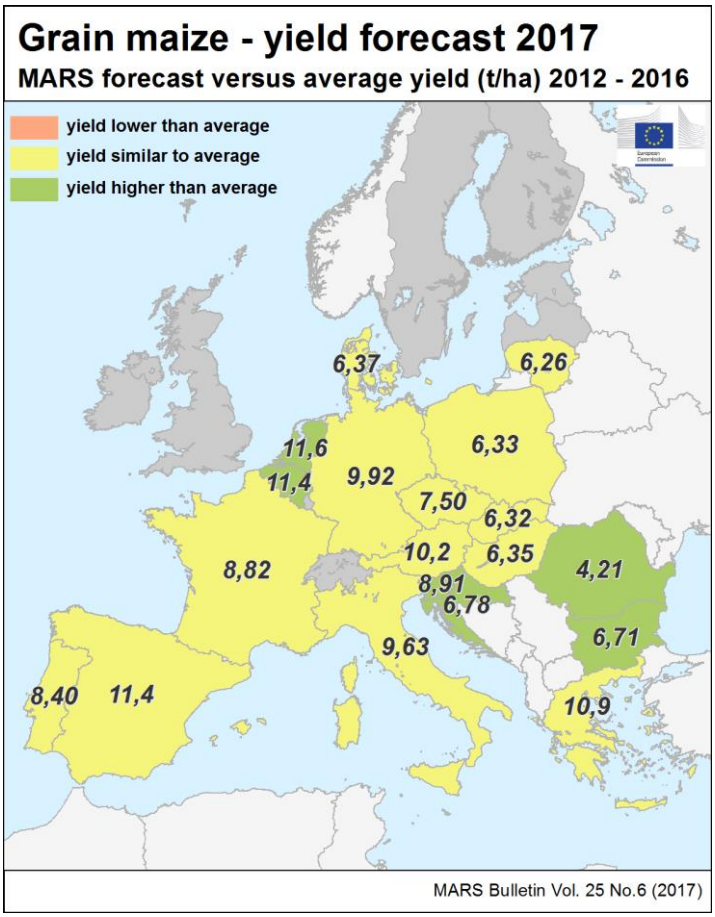
Country	SPRING BARLEY (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	4,23	4,34	**3,96**	-6,3	-8,9
AT	4,49	5,31	**5,27**	+18	-0,8
BE	-	-	**-**	-	-
BG	-	-	**-**	-	-
CY	-	-	**-**	-	-
CZ	5,05	5,45	**5,12**	+1,5	-6,0
DE	5,55	5,26	**5,39**	-3,0	+2,4
DK	5,65	5,51	**5,81**	+2,9	+5,5
EE	3,39	2,64	**3,38**	-0,5	+28
ES	3,00	3,74	**2,23**	-26	-40
FI	3,57	3,59	**3,52**	-1,4	-1,8
FR	6,16	5,00	**5,94**	-3,6	+19
GR	-	-	**-**	-	-
HR	-	-	**-**	-	-
HU	3,55	4,18	**3,67**	+3,4	-12
IE	7,17	7,29	**7,33**	+2,4	+0,6
IT	-	-	**-**	-	-
LT	3,55	3,13	**3,54**	-0,1	+13
LU	-	-	**-**	-	-
LV	3,22	2,96	**3,11**	-3,6	+4,9
MT	-	-	**-**	-	-
NL	6,77	6,53	**6,61**	-2,4	+1,2
PL	3,59	3,62	**3,51**	-2,3	-3,1
PT	-	-	**-**	-	-
RO	2,44	2,80	**2,75**	+13	-1,6
SE	4,83	4,74	**4,82**	-0,3	+1,7
SI	-	-	**-**	-	-
SK	4,21	5,03	**4,12**	-2,1	-18
UK	5,66	5,61	**5,82**	+2,8	+3,7



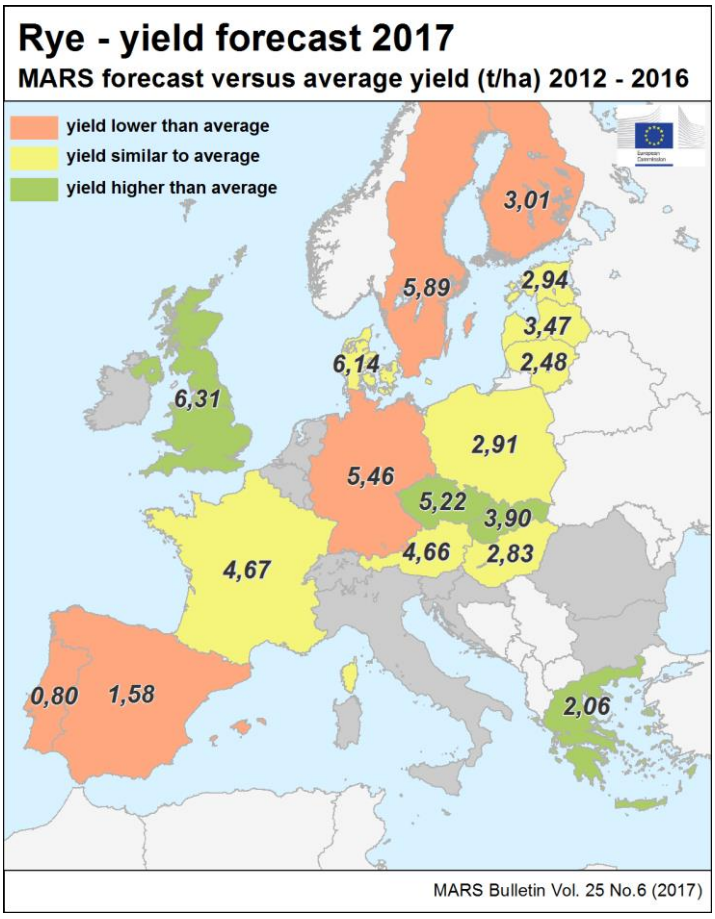
Country	WINTER BARLEY (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	5,68	5,53	**5,68**	+0,0	+2,6
AT	6,08	6,59	**6,64**	+9,3	+0,9
BE	8,18	6,21	**8,05**	-1,7	+30
BG	3,90	4,32	**4,37**	+12	+0,9
CY	1,72	0,70	**1,81**	+5,8	+159
CZ	5,17	6,13	**6,04**	+17	-1,4
DE	7,20	7,08	**6,86**	-4,8	-3,1
DK	6,45	6,16	**6,14**	-4,9	-0,3
EE	-	-	**-**	-	-
ES	2,37	2,66	**1,89**	-20	-29
FI	-	-	**-**	-	-
FR	6,56	5,53	**6,17**	-5,9	+12
GR	2,79	2,31	**3,04**	+9,0	+31
HR	4,46	4,72	**4,75**	+6,3	+0,6
HU	4,74	5,31	**4,58**	-3,4	-14
IE	9,16	8,64	**9,58**	+4,6	+11
IT	3,81	4,13	**3,78**	-0,7	-8,5
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	8,00	7,53	**8,36**	+4,4	+11
PL	4,21	4,28	**4,46**	+5,8	+4,0
PT	2,04	2,62	**2,17**	+6,3	-17
RO	3,52	4,13	**4,16**	+18	+0,6
SE	6,09	5,77	**5,78**	-5,1	+0,1
SI	4,61	4,78	**5,12**	+11	+7,2
SK	4,86	5,90	**5,20**	+6,9	-12
UK	6,88	6,43	**7,12**	+3,5	+11



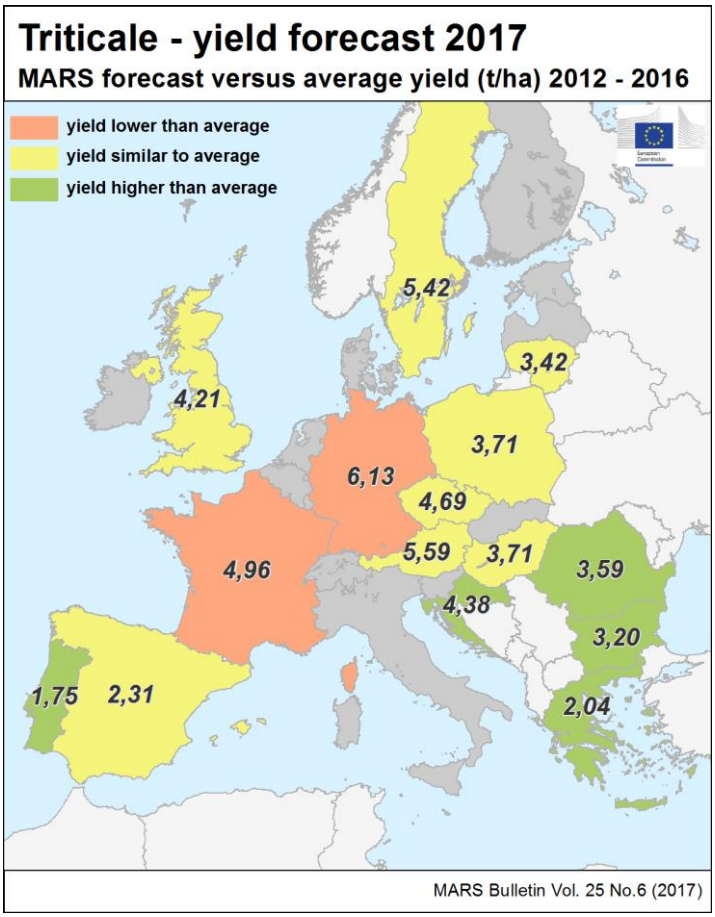
Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	6,88	7,07	**7,14**	+3,8	+1,0
AT	9,92	11,2	**10,2**	+2,6	-8,8
BE	10,4	8,01	**11,4**	+9,0	+42
BG	5,66	5,45	**6,71**	+18	+23
CY	-	-	**-**	-	-
CZ	7,74	9,79	**7,50**	-3,1	-23
DE	9,62	8,79	**9,92**	+3,1	+13
DK	6,23	6,28	**6,37**	+2,3	+1,4
EE	-	-	**-**	-	-
ES	11,1	11,1	**11,4**	+2,6	+2,3
FI	-	-	**-**	-	-
FR	8,82	8,19	**8,82**	-0,0	+7,7
GR	10,8	10,1	**10,9**	+0,4	+7,3
HR	6,46	8,41	**6,78**	+4,9	-19
HU	6,15	8,61	**6,35**	+3,2	-26
IE	-	-	**-**	-	-
IT	9,45	10,4	**9,63**	+1,9	-6,9
LT	6,32	6,91	**6,26**	-1,1	-9,4
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	10,2	7,84	**11,6**	+14	+48
PL	6,33	7,17	**6,33**	-0,0	-12
PT	8,28	8,03	**8,40**	+1,4	+4,6
RO	3,65	3,49	**4,21**	+15	+21
SE	-	-	**-**	-	-
SI	8,00	9,54	**8,91**	+11	-6,6
SK	6,31	7,76	**6,32**	+0,1	-19
UK	-	-	**-**	-	-



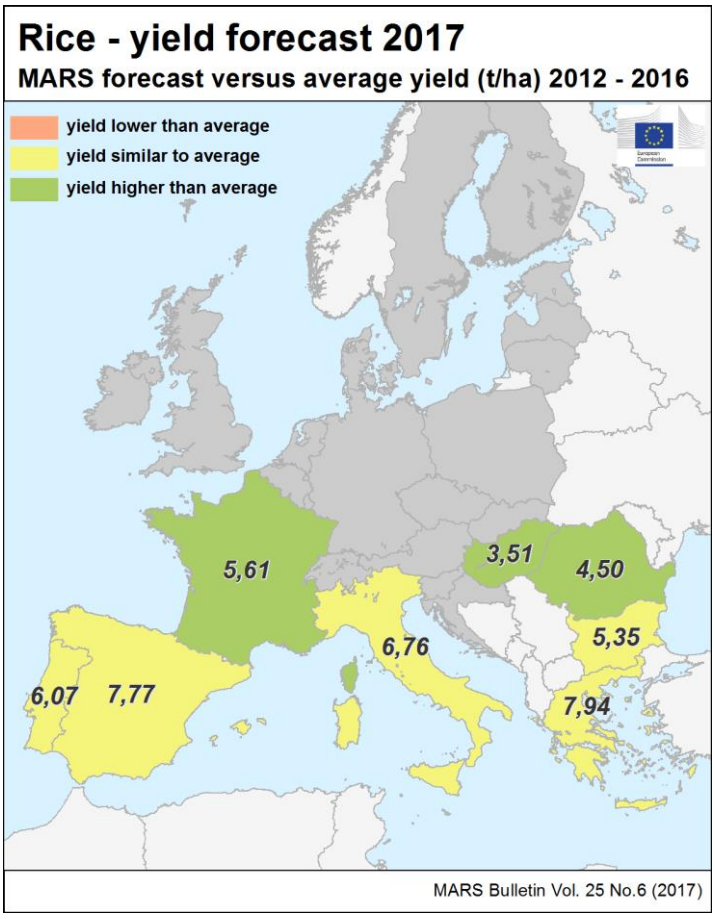
Country	RYE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	3,89	3,89	**3,77**	-3,0	-3,0
AT	4,49	5,05	**4,66**	+3,7	-7,8
BE	-	-	**-**	-	-
BG	-	-	**-**	-	-
CY	-	-	**-**	-	-
CZ	4,88	4,98	**5,22**	+7,0	+4,8
DE	5,71	5,55	**5,46**	-4,3	-1,6
DK	5,96	5,73	**6,14**	+3,0	+7,1
EE	3,06	2,61	**2,94**	-3,7	+13
ES	2,01	2,50	**1,58**	-21	-37
FI	3,19	3,38	**3,01**	-5,7	-11
FR	4,75	3,97	**4,67**	-1,7	+18
GR	1,87	1,48	**2,06**	+9,9	+39
HR	-	-	**-**	-	-
HU	2,77	3,03	**2,83**	+1,9	-6,6
IE	-	-	**-**	-	-
IT	-	-	**-**	-	-
LT	2,44	2,38	**2,48**	+1,8	+4,2
LU	-	-	**-**	-	-
LV	3,48	3,94	**3,47**	-0,1	-12
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	2,91	2,89	**2,91**	-0,1	+0,7
PT	0,85	0,90	**0,80**	-5,5	-11
RO	-	-	**-**	-	-
SE	6,19	6,12	**5,89**	-4,9	-3,7
SI	-	-	**-**	-	-
SK	3,70	3,78	**3,90**	+5,6	+3,4
UK	3,48	1,88	**6,31**	+81	+235



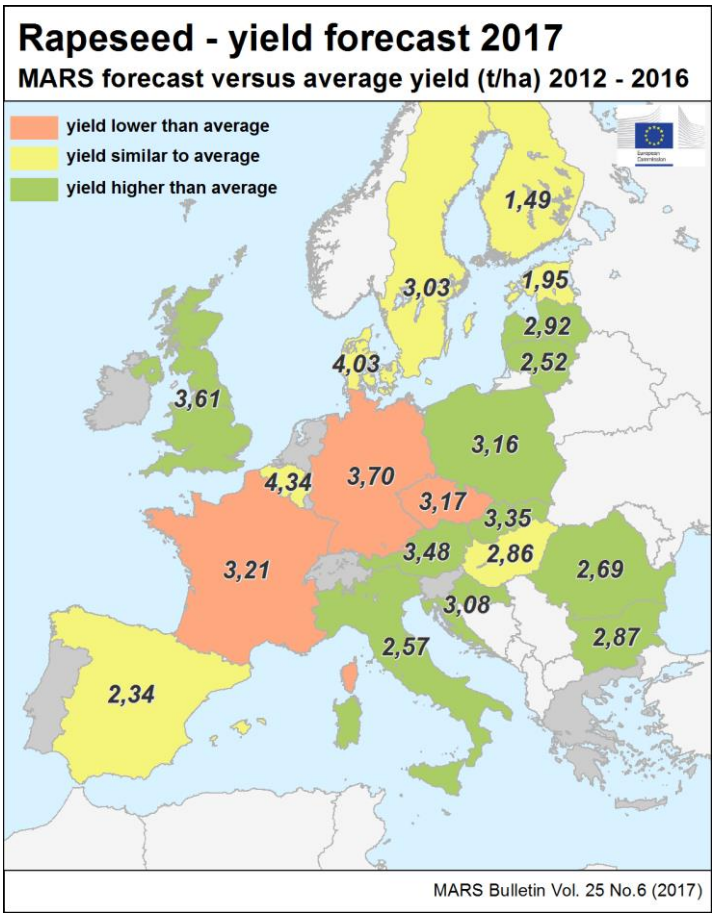
Country	TRITICALE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	4,20	3,98	**4,14**	-1,6	+3,9
AT	5,44	5,88	**5,59**	+2,7	-4,9
BE	-	-	**-**	-	-
BG	2,95	3,06	**3,20**	+8,3	+4,5
CY	-	-	**-**	-	-
CZ	4,70	4,88	**4,69**	-0,3	-3,9
DE	6,49	6,08	**6,13**	-5,7	+0,7
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	2,25	2,41	**2,31**	+2,9	-4,3
FI	-	-	**-**	-	-
FR	5,17	4,33	**4,96**	-4,2	+14
GR	1,75	1,75	**2,04**	+17	+16
HR	4,01	4,10	**4,38**	+9,1	+6,9
HU	3,86	4,14	**3,71**	-3,9	-10
IE	-	-	**-**	-	-
IT	-	-	**-**	-	-
LT	3,43	3,28	**3,42**	-0,4	+4,2
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	3,63	3,60	**3,71**	+2,2	+2,9
PT	1,53	1,95	**1,75**	+14	-10
RO	3,24	2,90	**3,59**	+11	+24
SE	5,61	5,23	**5,42**	-3,3	+3,7
SI	-	-	**-**	-	-
SK	-	-	**-**	-	-
UK	4,08	3,91	**4,21**	+3,3	+7,8



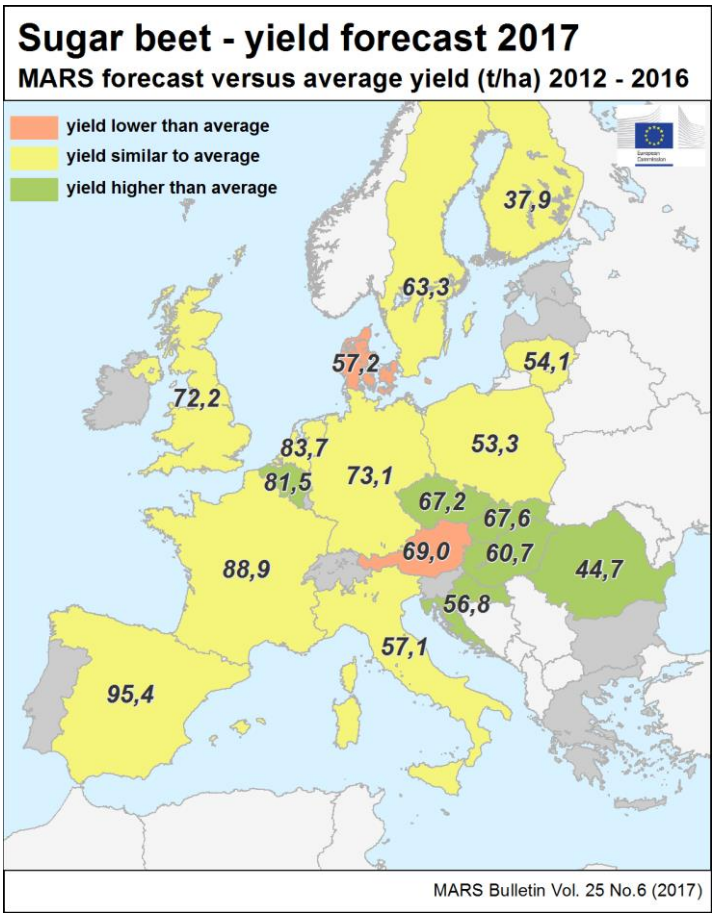
Country	RICE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	6,86	6,74	**6,90**	+0,6	+2,5
AT	-	-	**-**	-	-
BE	-	-	**-**	-	-
BG	5,27	5,00	**5,35**	+1,5	+7,0
CY	-	-	**-**	-	-
CZ	-	-	**-**	-	-
DE	-	-	**-**	-	-
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	7,72	7,51	**7,77**	+0,6	+3,4
FI	-	-	**-**	-	-
FR	5,30	5,33	**5,61**	+5,8	+5,3
GR	7,86	7,57	**7,94**	+1,0	+4,9
HR	-	-	**-**	-	-
HU	3,42	3,40	**3,51**	+2,7	+3,1
IE	-	-	**-**	-	-
IT	6,79	6,68	**6,76**	-0,5	+1,1
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	-	-	**-**	-	-
PT	5,98	5,71	**6,07**	+1,4	+6,2
RO	4,33	4,67	**4,50**	+3,9	-3,7
SE	-	-	**-**	-	-
SI	-	-	**-**	-	-
SK	-	-	**-**	-	-
UK	-	-	**-**	-	-



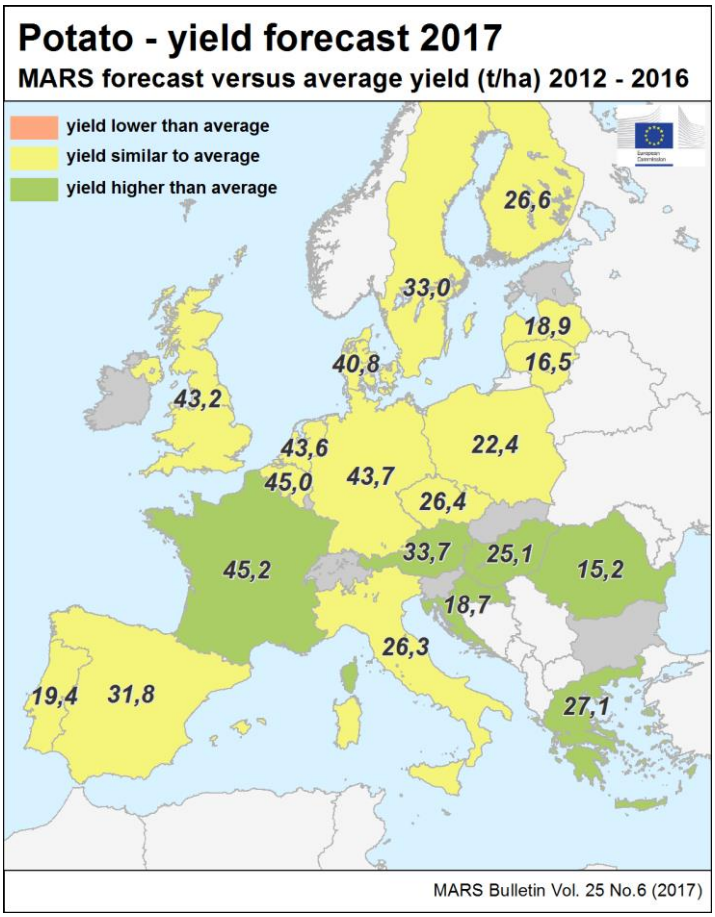
Country	RAPE AND TURNIP RAPE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	3,25	3,07	**3,22**	-1,1	+4,7
AT	3,26	3,58	**3,48**	+6,6	-2,8
BE	4,21	3,77	**4,34**	+3,0	+15
BG	2,58	2,95	**2,87**	+11	-2,9
CY	-	-	**-**	-	-
CZ	3,41	3,46	**3,17**	-6,9	-8,3
DE	3,90	3,46	**3,70**	-5,3	+6,8
DK	3,89	3,13	**4,03**	+3,6	+29
EE	2,02	1,46	**1,95**	-3,6	+33
ES	2,36	2,58	**2,34**	-0,7	-9,1
FI	1,49	1,54	**1,49**	+0,2	-3,3
FR	3,35	3,06	**3,21**	-4,4	+4,9
GR	-	-	**-**	-	-
HR	2,88	3,11	**3,08**	+6,9	-0,9
HU	2,95	3,44	**2,86**	-2,9	-17
IE	-	-	**-**	-	-
IT	2,37	2,57	**2,57**	+8,4	-0,0
LT	2,39	2,60	**2,52**	+5,3	-3,1
LU	-	-	**-**	-	-
LV	2,61	2,83	**2,92**	+12	+3,2
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	2,88	2,69	**3,16**	+9,7	+18
PT	-	-	**-**	-	-
RO	2,54	2,84	**2,69**	+5,6	-5,4
SE	3,10	2,89	**3,03**	-2,2	+4,8
SI	-	-	**-**	-	-
SK	2,88	3,46	**3,35**	+16	-3,2
UK	3,40	3,07	**3,61**	+6,1	+18



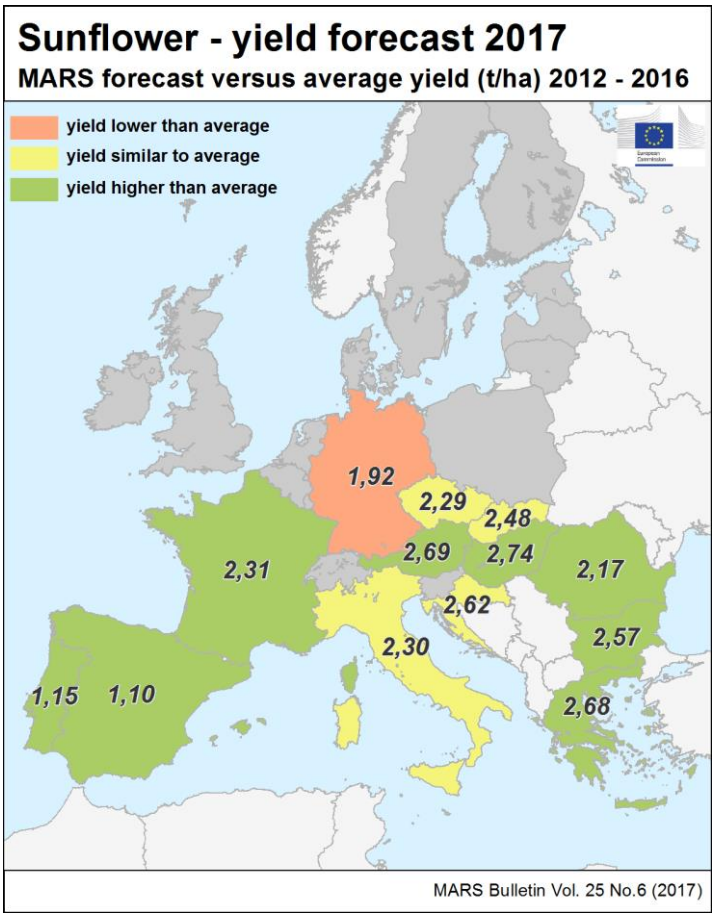
Country	SUGAR BEETS (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	71,6	72,4	**73,9**	+3,1	+2,1
AT	71,8	81,3	**69,0**	-4,0	-15
BE	77,2	72,1	**81,5**	+5,6	+13
BG	-	-	**-**	-	-
CY	-	-	**-**	-	-
CZ	64,2	67,8	**67,2**	+4,6	-0,9
DE	72,1	76,3	**73,1**	+1,3	-4,2
DK	60,9	51,3	**57,2**	-6,1	+12
EE	-	-	**-**	-	-
ES	92,5	95,7	**95,4**	+3,2	-0,3
FI	38,1	37,3	**37,9**	-0,6	+1,5
FR	87,4	83,9	**88,9**	+1,8	+6,0
GR	-	-	**-**	-	-
HR	52,1	NA	**56,8**	+9,0	NA
HU	57,2	67,5	**60,7**	+6,2	-10
IE	-	-	**-**	-	-
IT	55,6	NA	**57,1**	+2,7	NA
LT	54,1	61,3	**54,1**	+0,1	-12
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	80,6	77,8	**83,7**	+3,8	+7,6
PL	53,0	51,7	**53,3**	+0,6	+3,1
PT	-	-	**-**	-	-
RO	37,5	39,9	**44,7**	+19	+12
SE	63,9	65,0	**63,3**	-0,9	-2,6
SI	-	-	**-**	-	-
SK	56,8	70,2	**67,6**	+19	-3,6
UK	71,0	66,0	**72,2**	+1,7	+9,4



Country	POTATO (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	32,5	32,9	**33,4**	+2,7	+1,3
AT	31,4	36,2	**33,7**	+7,3	-6,8
BE	45,8	37,9	**45,0**	-1,8	+19
BG	-	-	**-**	-	-
CY	-	-	**-**	-	-
CZ	26,5	29,9	**26,4**	-0,5	-12
DE	43,8	43,2	**43,7**	-0,2	+1,2
DK	41,8	42,4	**40,8**	-2,4	-3,7
EE	-	-	**-**	-	-
ES	30,9	30,7	**31,8**	+3,2	+3,8
FI	26,6	27,1	**26,6**	-0,0	-2,0
FR	42,7	39,0	**45,2**	+5,7	+16
GR	25,0	27,5	**27,1**	+8,1	-1,4
HR	17,2	NA	**18,7**	+9,0	NA
HU	24,1	24,6	**25,1**	+4,4	+2,1
IE	-	-	**-**	-	-
IT	26,2	NA	**26,3**	+0,4	NA
LT	16,8	16,0	**16,5**	-2,0	+3,0
LU	-	-	**-**	-	-
LV	18,8	19,9	**18,9**	+0,3	-5,0
MT	-	-	**-**	-	-
NL	43,4	42,9	**43,6**	+0,2	+1,6
PL	22,9	23,7	**22,4**	-1,9	-5,4
PT	18,7	18,8	**19,4**	+3,8	+3,0
RO	14,3	14,2	**15,2**	+5,8	+6,5
SE	34,3	35,7	**33,0**	-3,6	-7,5
SI	-	-	**-**	-	-
SK	-	-	**-**	-	-
UK	42,1	45,0	**43,2**	+2,6	-4,1



Country	SUNFLOWER (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
EU	1,94	2,06	**2,18**	+12	+6,0
AT	2,53	3,29	**2,69**	+6,6	-18
BE	-	-	**-**	-	-
BG	2,15	2,20	**2,57**	+20	+17
CY	-	-	**-**	-	-
CZ	2,32	2,85	**2,29**	-1,5	-20
DE	2,19	2,17	**1,92**	-12	-12
DK	-	-	**-**	-	-
EE	-	-	**-**	-	-
ES	1,05	0,99	**1,10**	+4,5	+11
FI	-	-	**-**	-	-
FR	2,17	2,12	**2,31**	+6,2	+8,9
GR	1,95	2,11	**2,68**	+38	+27
HR	2,55	2,81	**2,62**	+2,8	-6,6
HU	2,55	2,95	**2,74**	+7,6	-7,1
IE	-	-	**-**	-	-
IT	2,26	2,42	**2,30**	+1,8	-5,1
LT	-	-	**-**	-	-
LU	-	-	**-**	-	-
LV	-	-	**-**	-	-
MT	-	-	**-**	-	-
NL	-	-	**-**	-	-
PL	-	-	**-**	-	-
PT	0,93	1,30	**1,15**	+24	-12
RO	1,83	1,92	**2,17**	+18	+13
SE	-	-	**-**	-	-
SI	-	-	**-**	-	-
SK	2,47	2,94	**2,48**	+0,4	-16
UK	-	-	**-**	-	-



Country	WHEAT (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
BY	3,66	3,71	**3,69**	+1,0	-0,4
DZ	1,66	1,69	**1,40**	-16	-18
MA	1,71	1,13	**1,92**	+12	+70
TN	1,93	1,85	**2,01**	+4,5	+8,9
TR	2,69	2,71	**2,82**	+4,8	+4,1
UA	3,69	4,21	**3,91**	+5,8	-7,2

Country	BARLEY (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
BY	3,44	3,50	**3,43**	-0,2	-2,0
DZ	1,41	1,30	**1,16**	-18	-11
MA	1,07	0,51	**1,17**	+10	+128
TN	1,36	1,44	**1,40**	+2,6	-2,6
TR	2,63	2,48	**2,80**	+6,6	+13
UA	2,73	3,30	**3,02**	+11	-8,5

Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
BY	5,26	5,33	**5,43**	+3,3	+1,9
DZ	-	-	**-**	-	-
MA	-	-	**-**	-	-
TN	-	-	**-**	-	-
TR	8,83	9,42	**9,60**	+8,6	+1,9
UA	5,84	6,60	**6,00**	+2,6	-9,1

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

Sources: 2017 yields come from MARS CROP YIELD FORECASTING SYSTEM (output up to 20/06/2017)

EU. 2012-2017 data come from DG AGRICULTURE short term Outlook data (dated April 2017, received on 22/05/2017), EUROSTAT Eurobase (last update: 01/06/2017) and EES (last update: 15/05/2017)

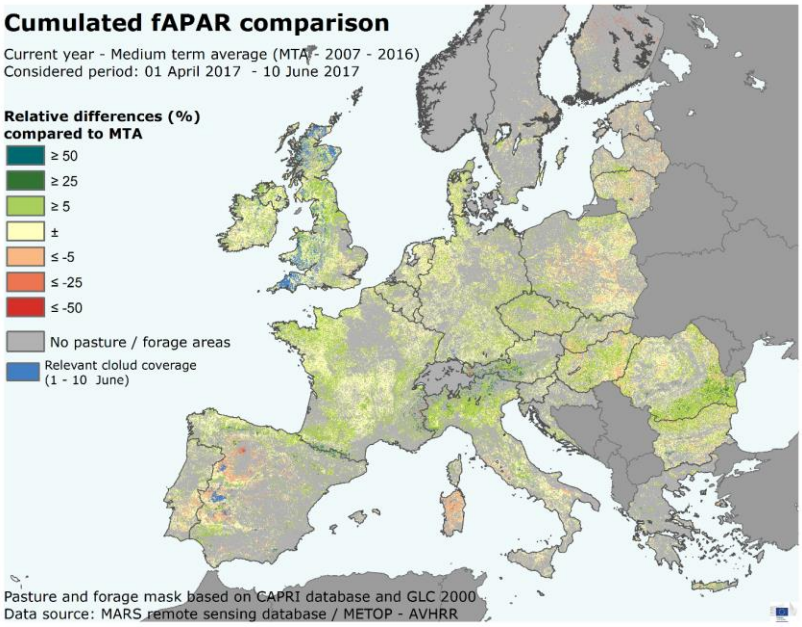
Non-EU. 2012-2016 data come from USDA, DSASI-MADR Algeria , INRA Maroc,CNCT Tunisie,Turkish Statistical Institute (TurkStat), EUROSTAT Eurobase (last update: 01/06/2017),State Statistics Service of Ukraine, FAO and PSD-online

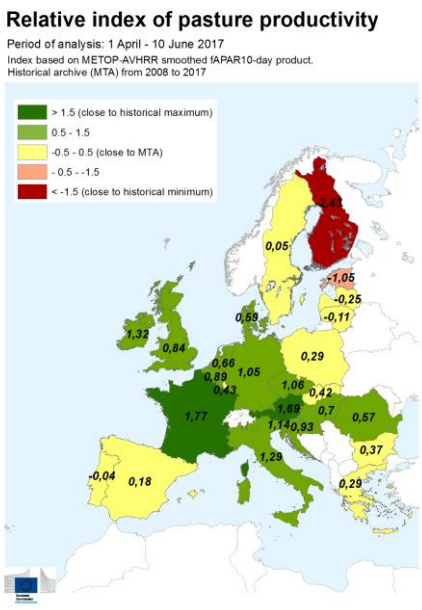
NA = Data not available.

5. Pastures in Europe – Regional monitoring

Dry and hot conditions affect growth in the Mediterranean

Biomass production in the main grassland areas of the Iberian Peninsula and southern Italy has been constrained by exceptionally hot and dry conditions. Conditions in most of the pasture areas in central Europe, Ireland and the UK are favourable. There is a significant grassland development delay in the Baltic Sea area due to low temperatures.





Methodological note

The relative index of pasture productivity is a synthetic indicator of biomass formation based on the integration of the fAPAR (fraction of absorbed photosynthetically active radiation) remote sensing product of pasture areas at country level over a period of interest (in this bulletin, from 1 April to 10 June). The spatial aggregation from remote sensing image pixels to a country-level index was made using a pastures mask from the Common Agricultural Policy Regionalised Impact model (CAPRI, http://www.capri-model.org). The index shows the relative position of the current season within the historical series from 2008 to 2016, and its values range approximately from -3 to 3. A value of 0 indicates that biomass production in the current season is similar to the long-term average. Values higher than 2 and below -2 indicate that biomass production in the current season is close to, respectively, the historical maximum and minimum of the period 2008-2016.

Hot and dry weather reduces grassland production in the Iberian Peninsula; positive outlook for northern Italy

Since May, temperatures were exceptionally high and precipitation was slightly below the long-term average in the *Dehesa* area of **Spain** and **Portugal**. These unfavourable conditions led to a halt in biomass formation and an accelerated senescence in the grasslands of that area. The growing season is now over and, despite the adverse weather during the past two months, the overall pasture productivity for the whole season is only slightly below average, as the grassland status in the first quarter of the year was positive. For the main pastures of northern Spain (*Cantabria*, *Asturias* and *País Vasco*), unusually warm and dry conditions were observed. There, grasslands are in the middle of the growing season and, after a rather favourable spring, biomass formation rates are gradually decreasing. Rainfall is needed in the second half of June and July to prevent substantial damages.

Pasture productivity in the north of **Italy** (*Piemonte*, *Lombardia* and *Veneto*) is higher than usual, thanks to high temperatures and adequate soil moisture levels. The outlook for the end of June is highly favourable. In *Emilia Romagna*, by contrast, weather conditions were unusually dry, with almost no rainfall registered since mid-May. After a favourable start to the season, water constraints are leading to a moderate decrease in photosynthetic activity in the grasslands, and

vegetative growth of fodder maize may also be compromised. Given the high temperatures, precipitation in the coming two weeks will be essential to achieve satisfactory production levels. In the south of Italy and the islands, the growing season of grasslands is ending, and biomass production is well below the medium-term average as consequence of water stress. Especially in *Sicilia* and *Sardegna*, the absence of rainfall since April and the high temperatures registered were particularly harmful to grassland productivity.

Favourable growth conditions in north-western Europe thanks to precipitation in May

Precipitation in the second half of May and the first half of June was abundant across the **UK** and **Ireland**. Thanks to this, soil moisture has increased significantly from the unusually low levels observed in mid-May, preventing any possible episode of water stress in the main grassland areas. Biomass production is above average, and the outlook for the rest of June is positive. Similarly, positive conditions were observed in the north-west of **France** (*Bretagne*, *Normandie* and *Pays de la Loire*), with substantial rainfall registered in May and June favouring high biomass production rates in pastures. In the central (*Limousine*, *Auvergne*) and southern regions (*Midi Pyrénees*, *Rhône-Alpes*), grassland productivity is also higher than the medium-term average, benefiting from slightly above-average temperatures and sufficient rainfall. Only in the north-east (*Lorraine*, *Champagne-Ardenne*) and the **Benelux** region did the scarcity of precipitation observed since mid-March lead to a progressive deceleration of the high production rates observed in early spring. Currently, biomass production in these regions is slightly below average, and the outlook for the rest of June and July is unfavourable if dry conditions persist.

Biomass production improves in central Europe

After the cold spell that affected **Germany**, the **Czech Republic, Slovakia** and **Austria** in the second half of April, temperatures increased sharply, and since mid-May daily averages have persistently been 1-2°C above the long-term average. This has favoured a gradual increment in vegetative photosynthetic activity in the main pasture areas of all four countries. Currently, biomass production levels are above average. Production expectations for the second half of June are rather positive for the Czech Republic, Slovakia and Austria, as soil moisture is high thanks to abundant rainfall from April to May. In Germany, soil moisture is below average, but biomass production is not expected to decrease between now and the end of June.

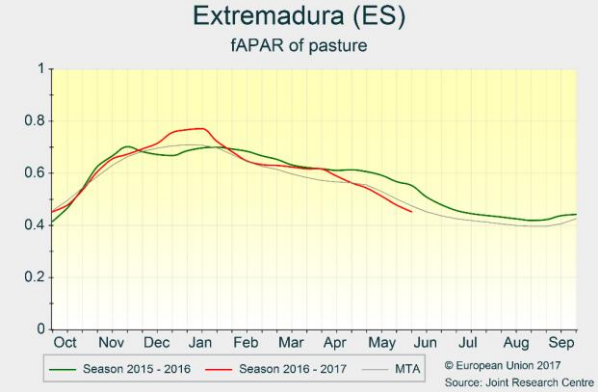
Favourable conditions for Denmark and Poland, but low biomass formation in the rest of the Baltic Sea area

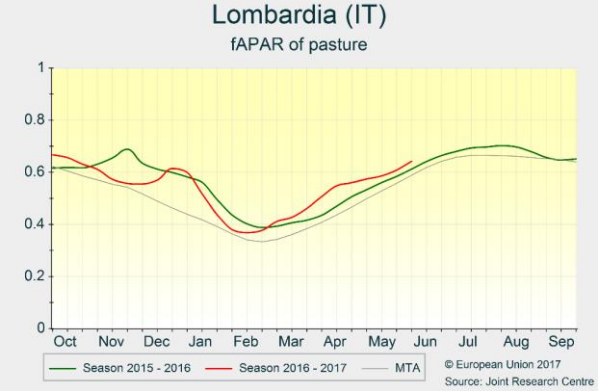
Temperatures remained below average in **Finland**, **Estonia**, **Latvia** and **Lithuania** during most of May and June. A local cold spell persisting from mid-April until mid-May was responsible for a grassland development delay and, therefore, constrained vegetative growth. Daily temperatures rose in the third week of May, reaching 15-20°C, but since then colder-than-usual conditions persist. Consequently, seasonal production is significantly below average, especially in Finland, as the growing season is delayed by cold temperatures. Soil moisture is adequate and, therefore, the evolution of pasture growth in the second half of June will depend primarily on temperatures.

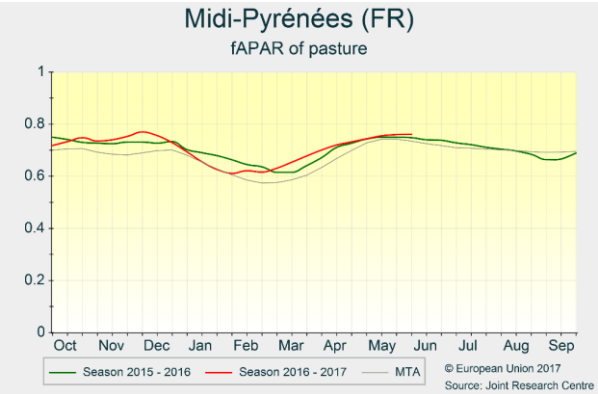
In the east of **Poland** (*Mazowieckie*, *Podlaskie* and *Lubelskie*), which is the area most affected by the cold spell from April to mid-May, grassland growth is progressively recovering as temperatures increased in the second half of May and early June. Similar conditions were observed for **Sweden**. In both countries, biomass production during the last month is below average, but the outlook for June and July is positive, assuming temperatures remain higher than usual. In **Denmark**, weather conditions during the past weeks were favourable, biomass formation of grasslands is higher than a normal year, and production expectations for June and July are high.

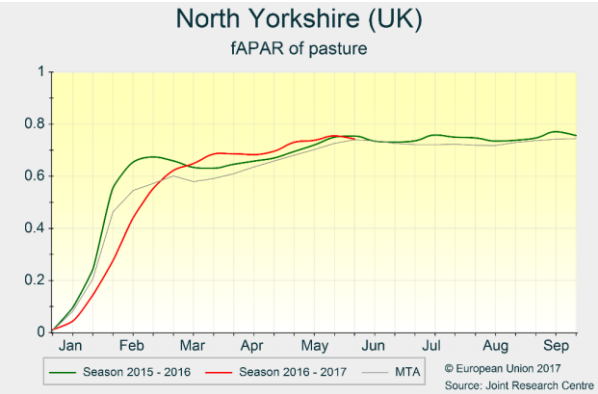
Positive conditions in south-eastern Europe

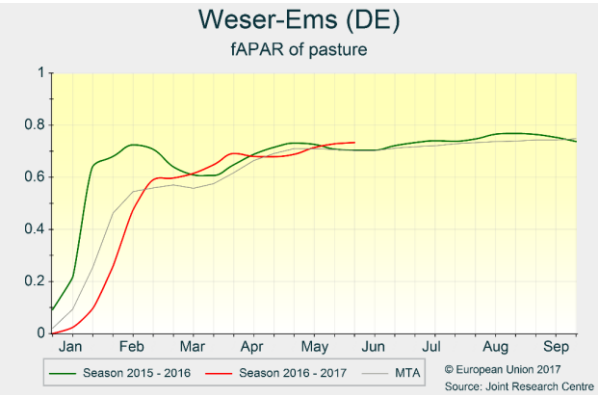
In **Hungary**, biomass production rates in the main grassland areas are currently above the long-term average, favoured by higher-than-usual temperatures and sufficient soil moisture levels. Overall, expectations for the second half of June are positive in most regions, except the south (*Den-Alfold, Den-Dunantul*) where rainfall was scarce since mid-May. Soil water constraints may appear if these dry conditions persist.
In **Romania**, weather conditions since mid-May were favourable in most regions, with abundant rainfall and temperatures that were slightly above the norm . Thanks to this, biomass production levels are higher than average in grasslands and fodder maize areas, particularly in the north-west and centre. The outlook for the end of June is positive, as no significant episode of water stress is expected.
Exceptionally low temperatures at the start of the growing season in **Bulgaria** led to an important delay in pasture development. The abundant rainfall received since mid-April and the above-average temperatures registered in May and June favoured a progressive increase in the biomass formation rates of grasslands. Currently, biomass production is slightly above average, with favourable expectations for the second half of June.

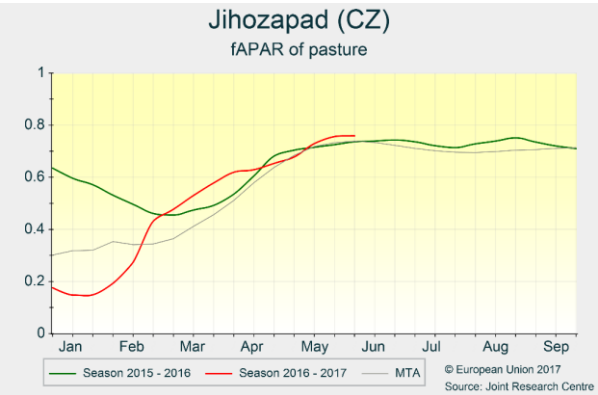


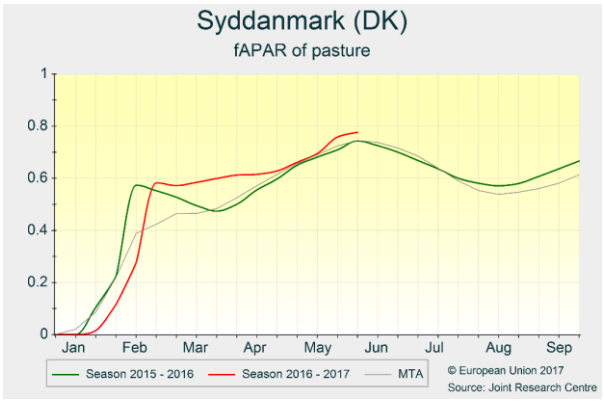








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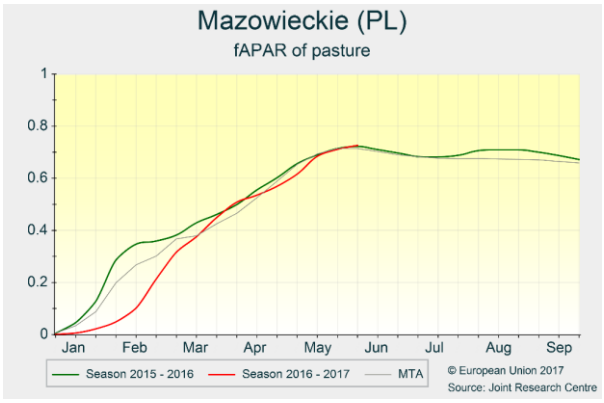
fAPAR of pasture
1
0.8
0.6
0.4
0.2
0
Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre


Mazowieckie (PL)
fAPAR of pasture
1
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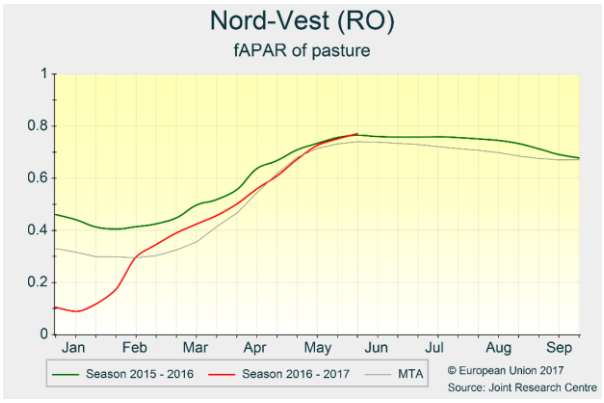
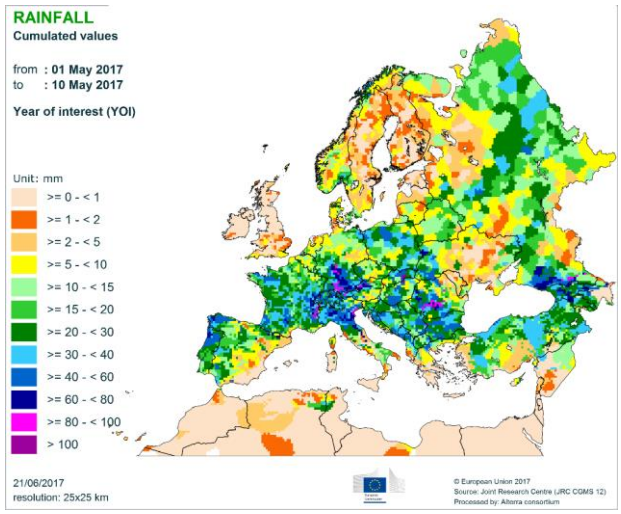
0.6
0.4
0.2
0
Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre

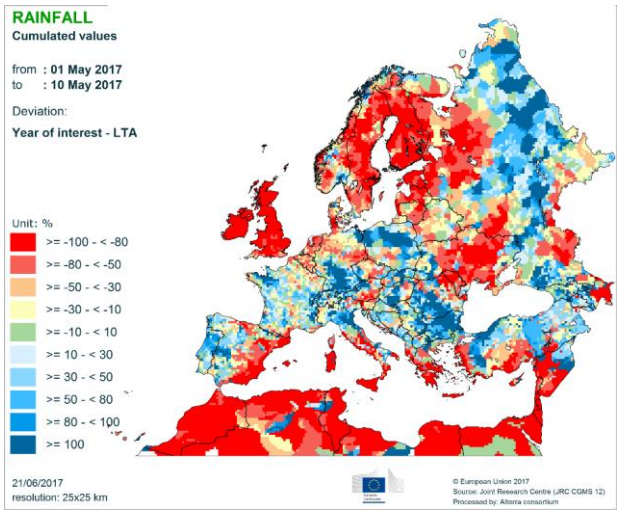

Eesti (EE)
fAPAR of pasture
1
0.8
0.6
0.4
0.2
0
Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre

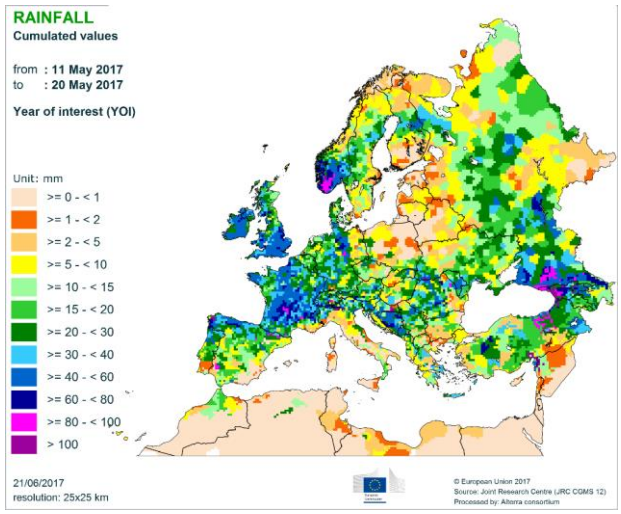

Nord-Vest (RO)
fAPAR of pasture
1
0.8
0.6
0.4
0.2
0
Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2015 - 2016
Season 2016 - 2017
MTA
© European Union 2017
Source: Joint Research Centre

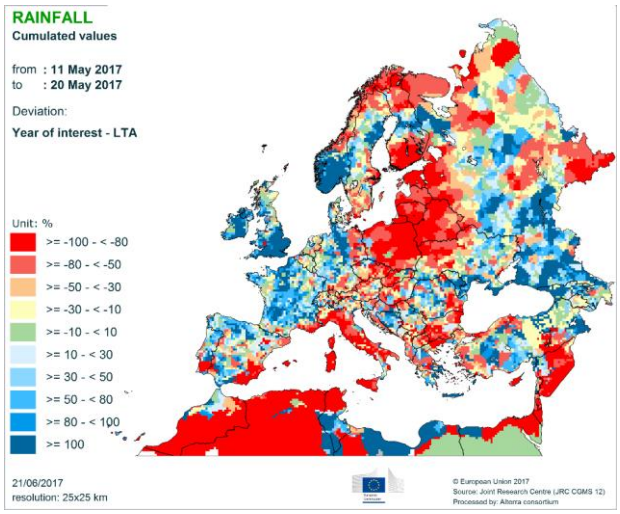
6. Atlas

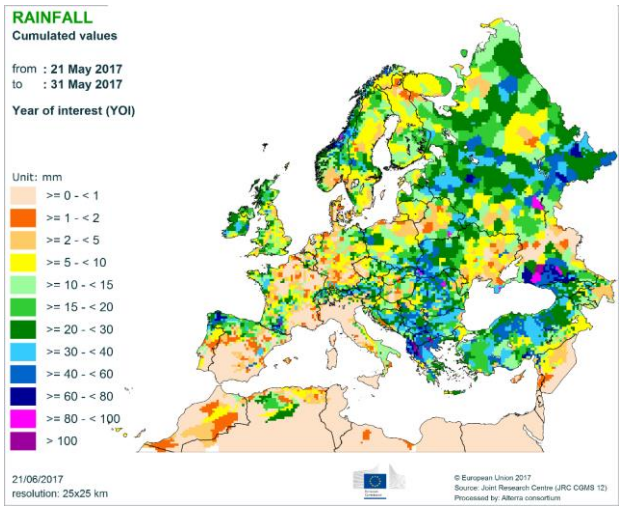
Precipitation

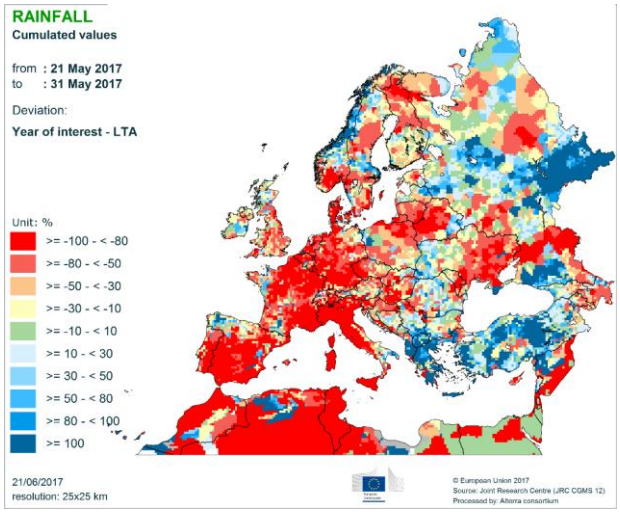


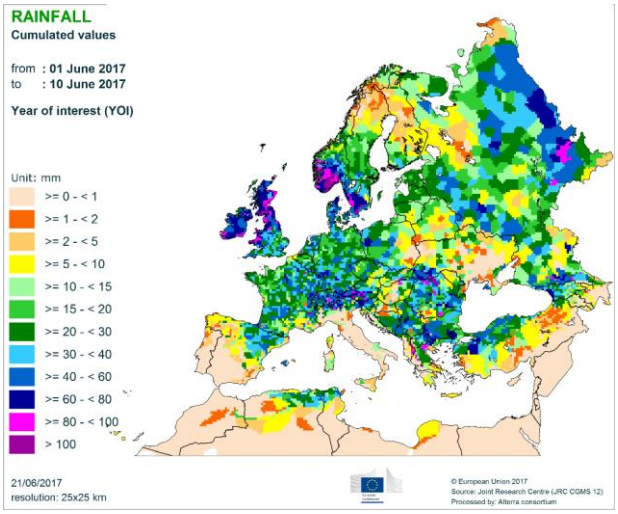








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to : 10 June 2017
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>= 1 - < 2
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>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
> 100
21/06/2017
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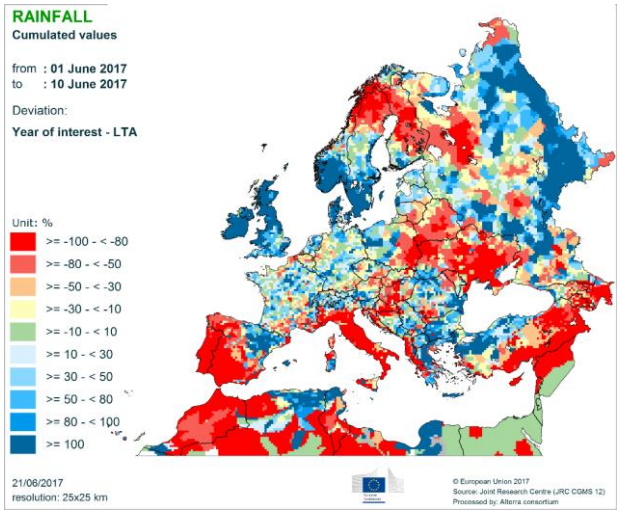
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Altera consortium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>= 30 - < 50
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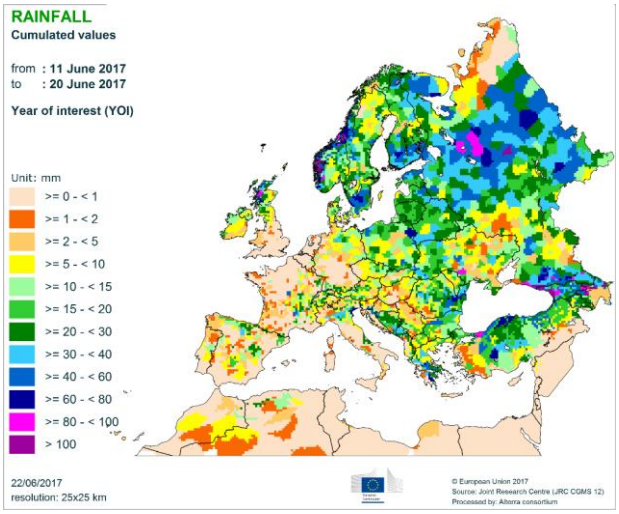
resolution: 25x25 km
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Altera consortium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© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
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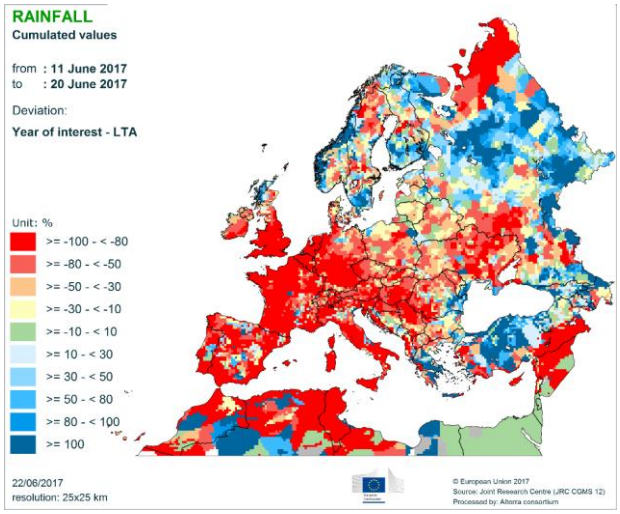
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>= 50 - < 80
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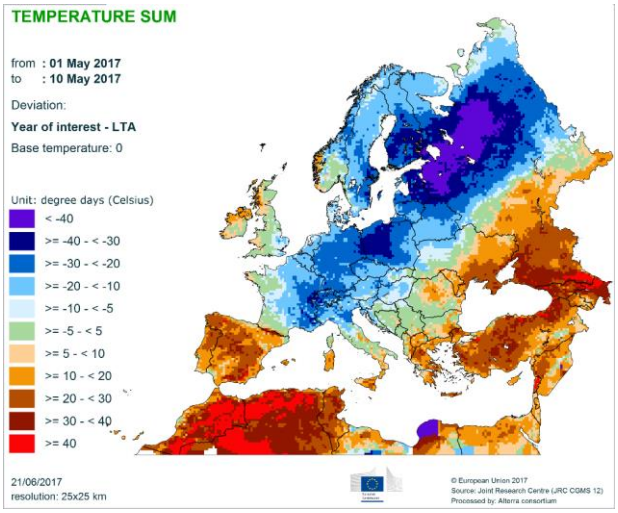
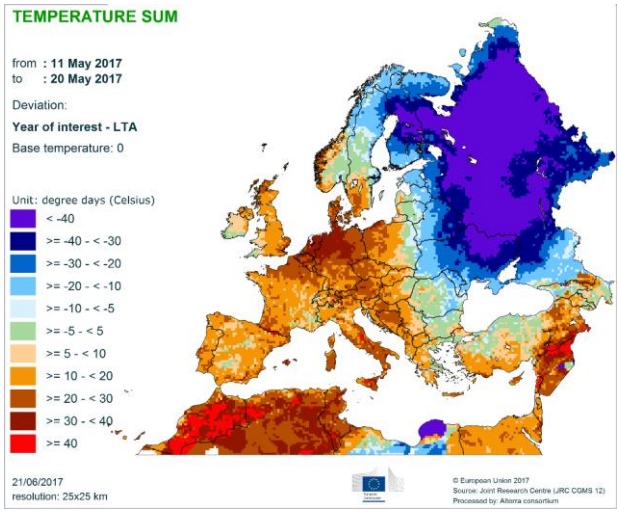
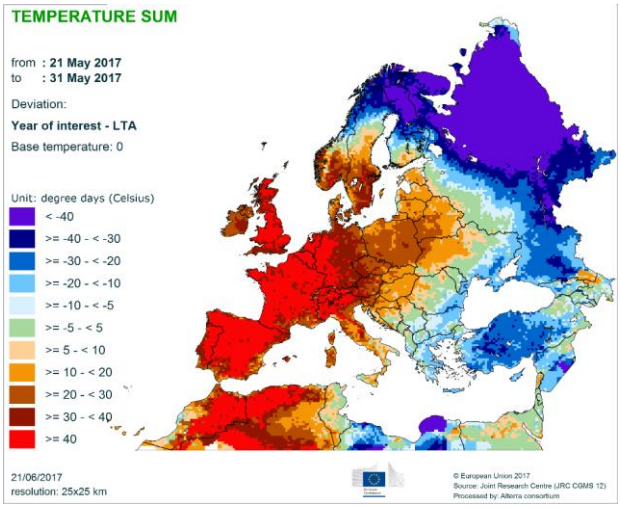
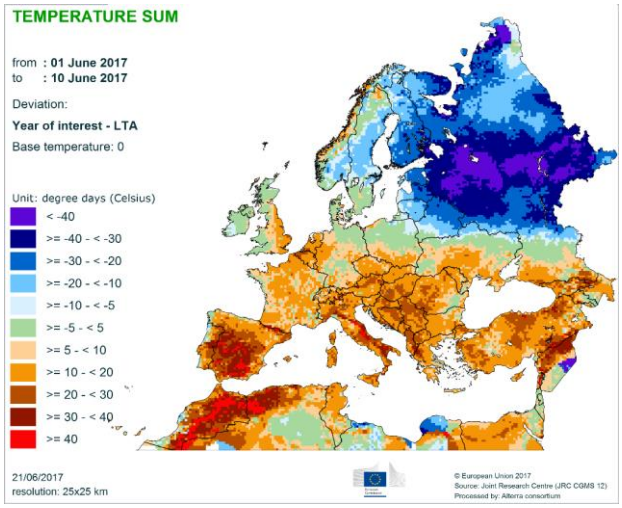
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Altera consortium

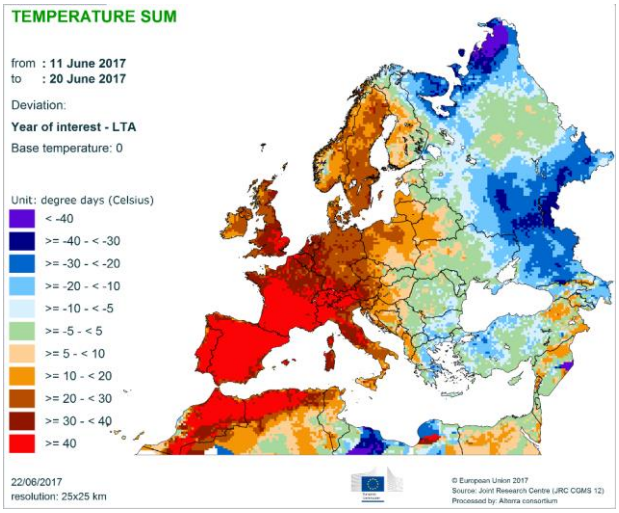
Temperature regime

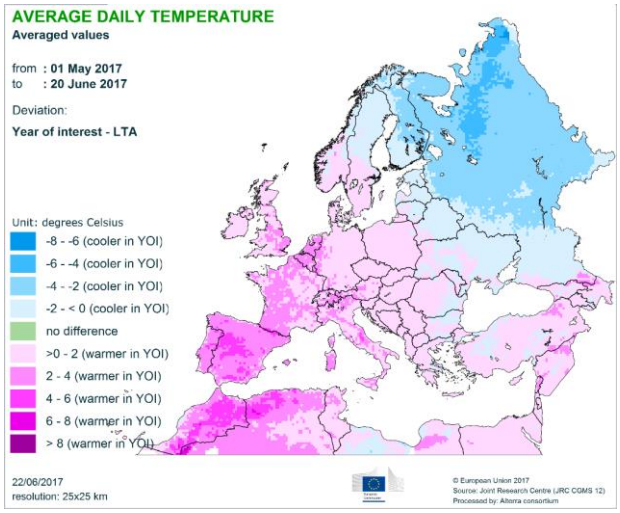












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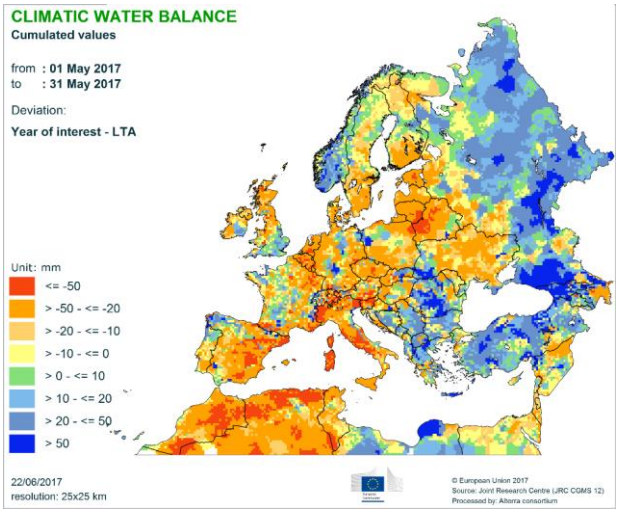

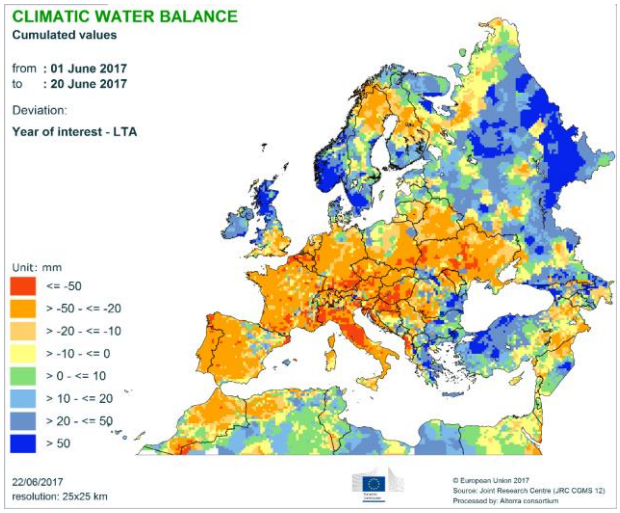

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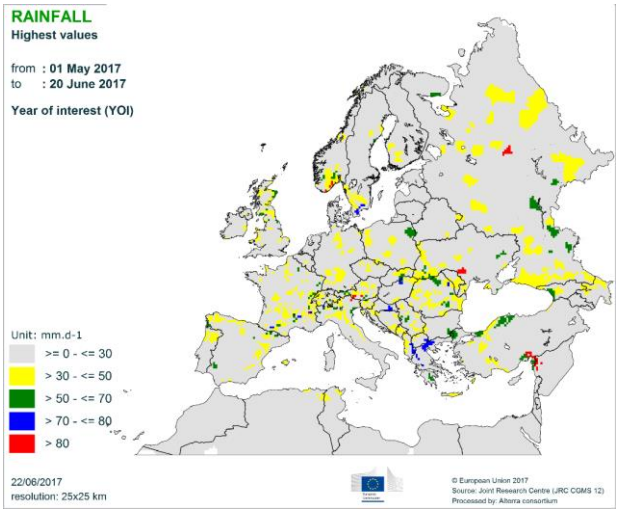
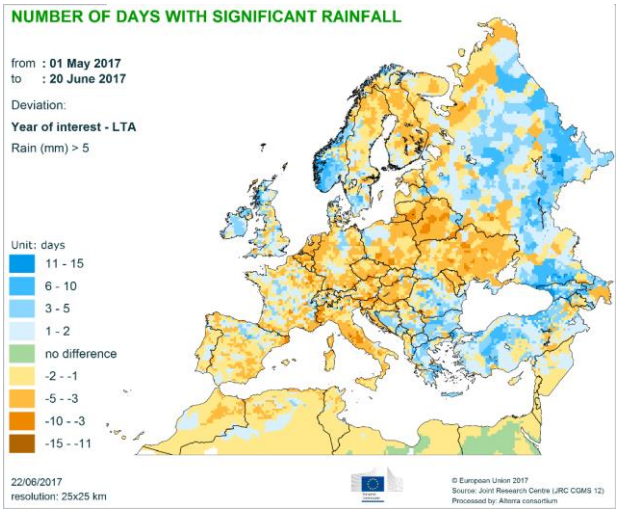
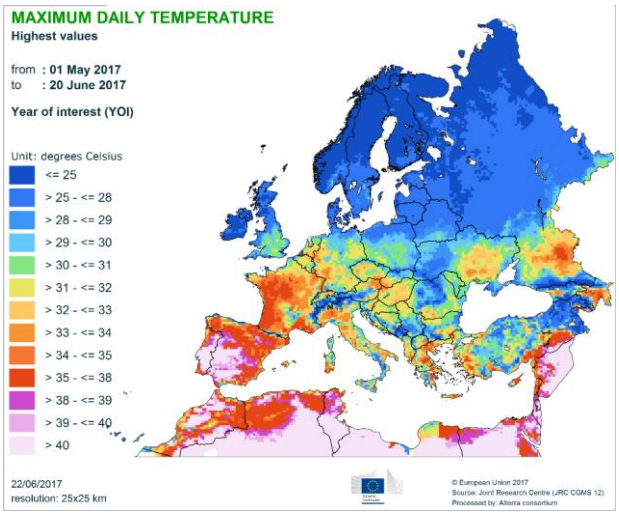
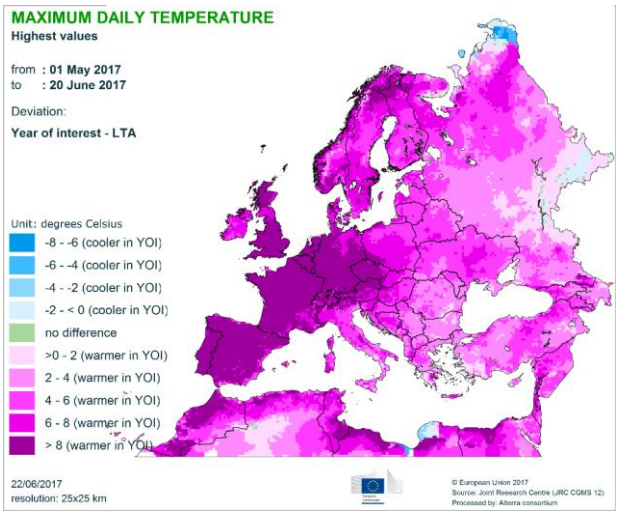
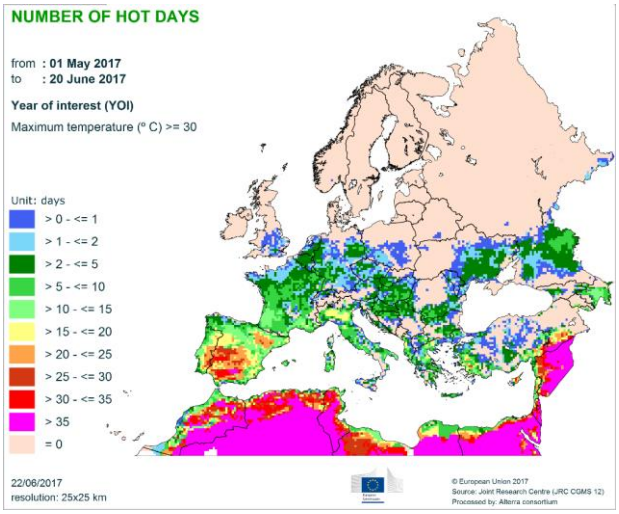
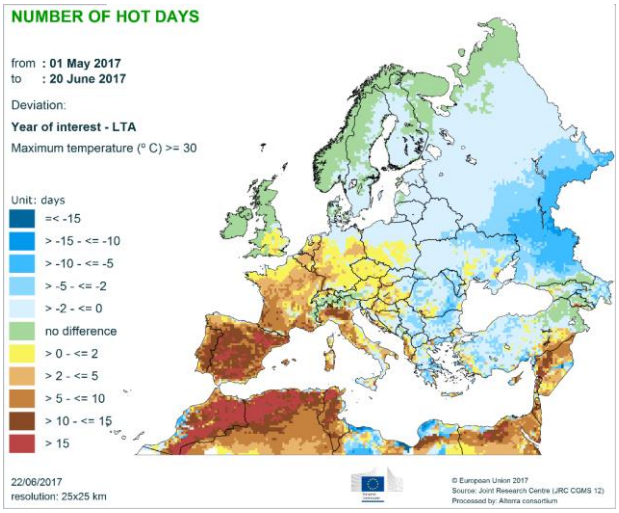




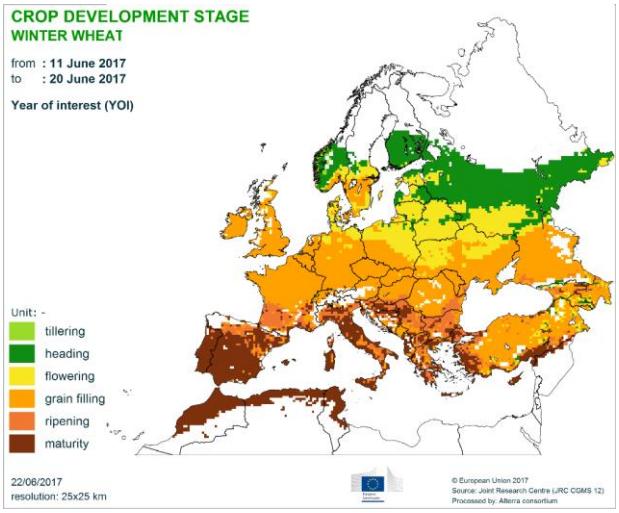


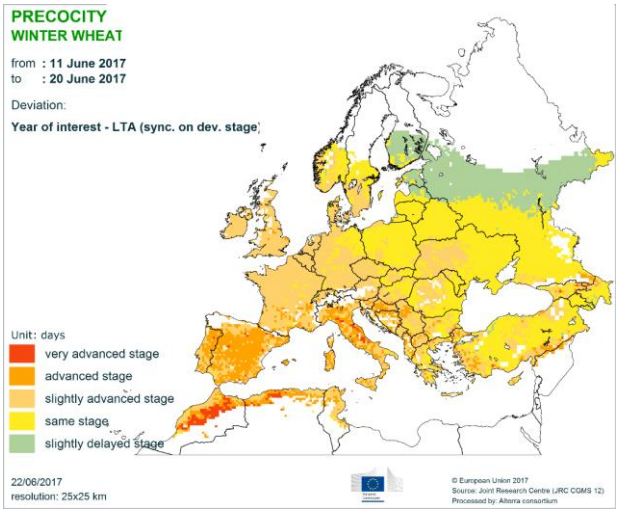


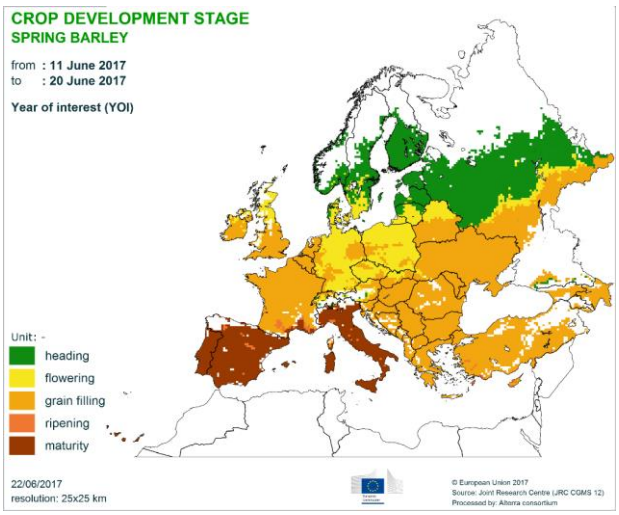


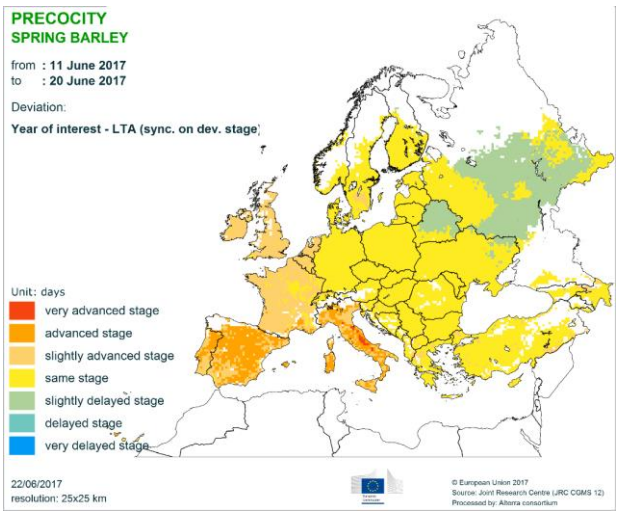


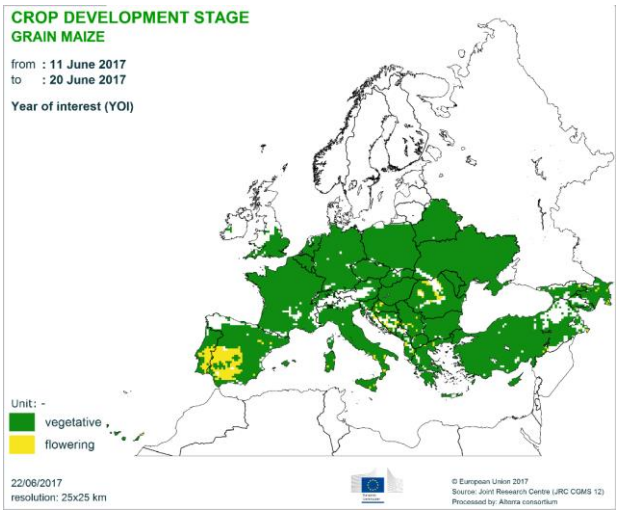
Crop development stages and precocity

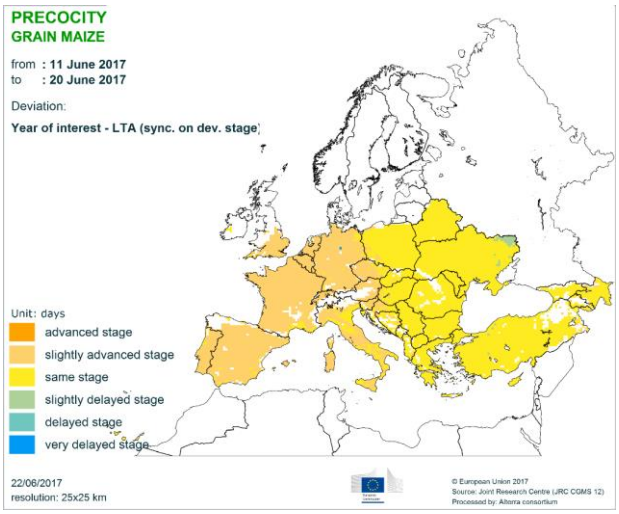


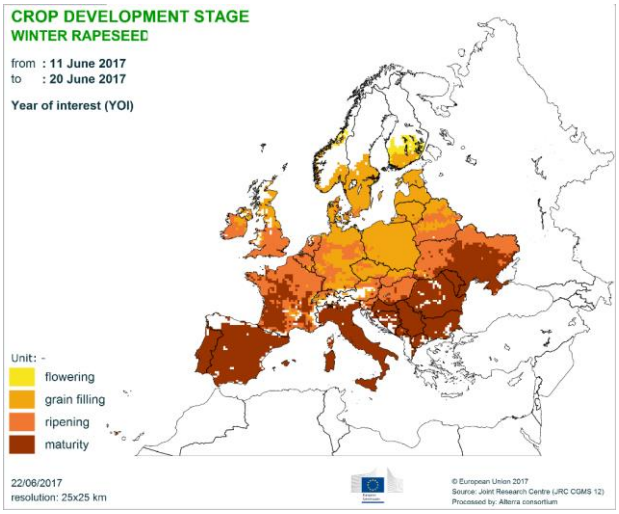


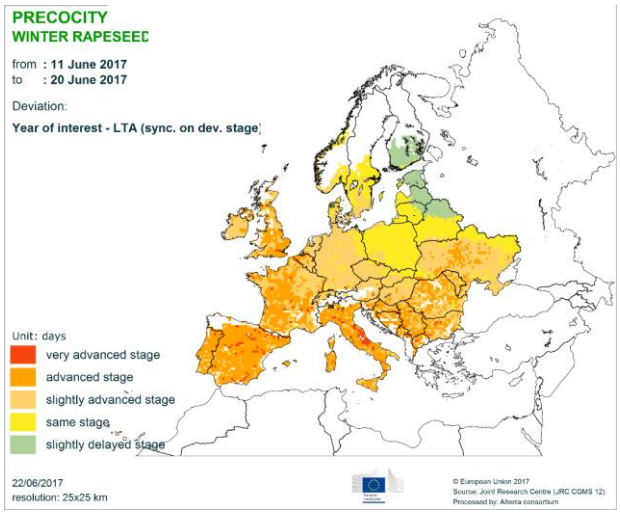


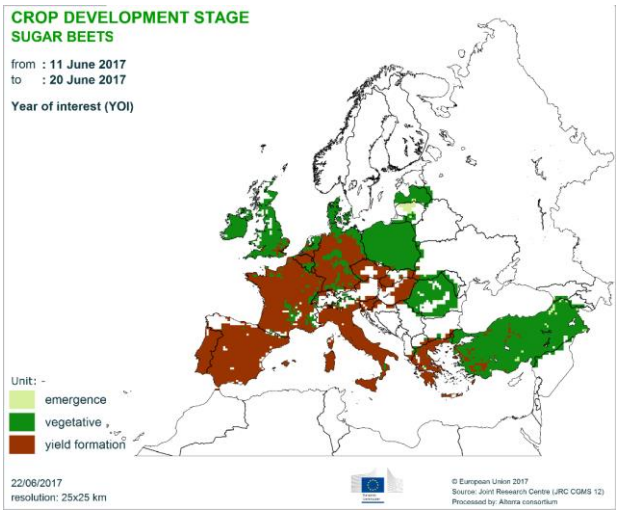


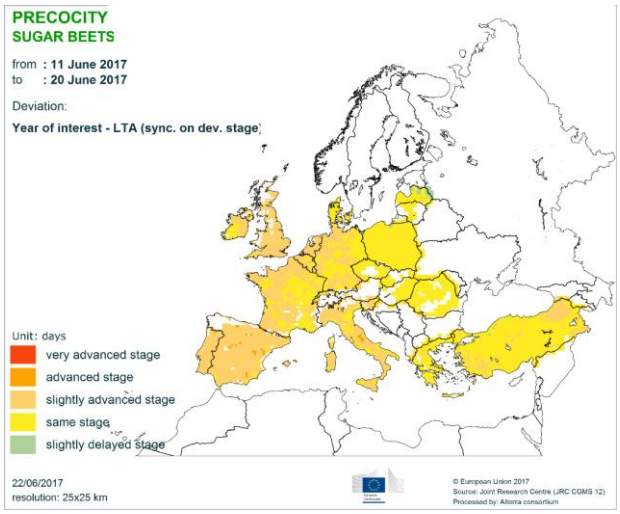




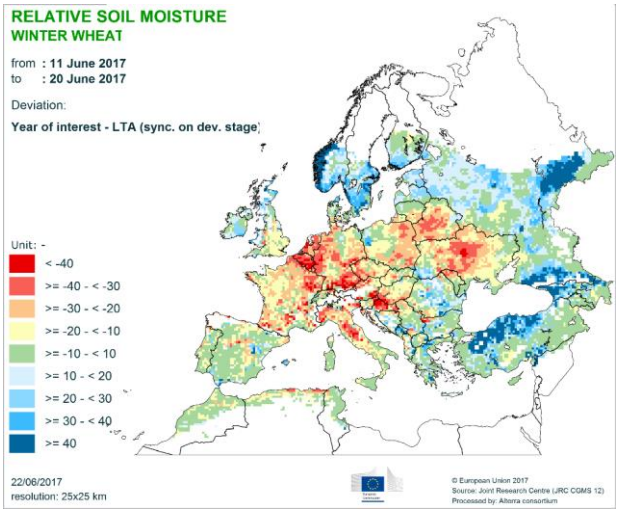

CROP DEVELOPMENT STAGE
WINTER RAPESEED
from : 11 June 2017
to : 20 June 2017
Year of interest (YOI)
Unit: -
flowering
grain filling
ripening
maturity
22/06/2017
resolution: 25x25 km
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

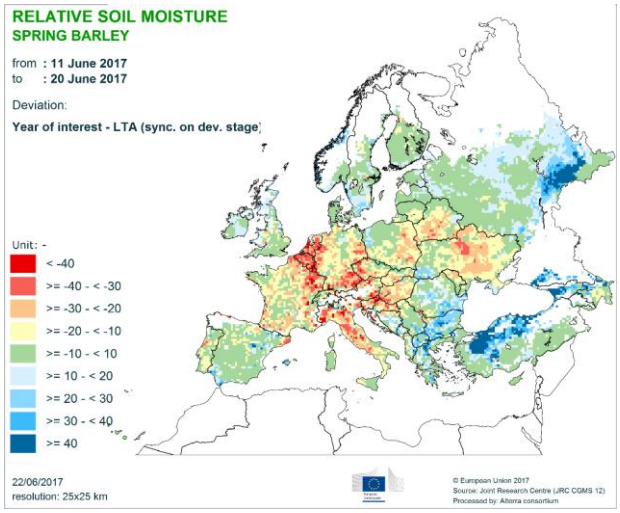

PRECOCITY
WINTER RAPESEED
from : 11 June 2017
to : 20 June 2017
Deviation:
Year of interest - LTA (sync. on dev. stage)
Unit: days
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
22/06/2017
resolution: 25x25 km
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

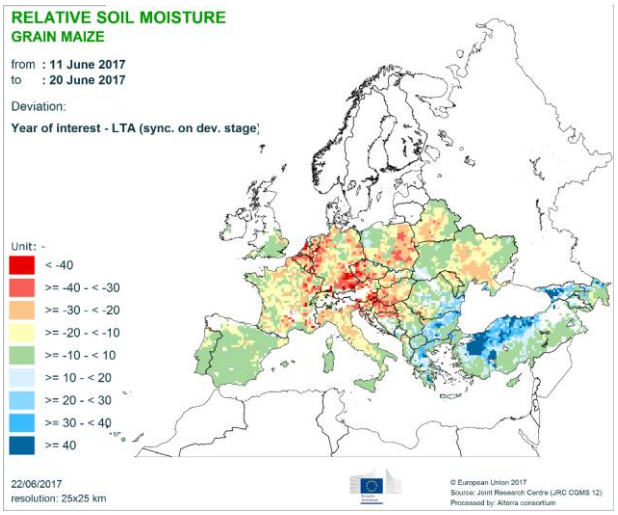

CROP DEVELOPMENT STAGE
SUGAR BEETS
from : 11 June 2017
to : 20 June 2017
Year of interest (YOI)
Unit: -
emergence
vegetative
yield formation
22/06/2017
resolution: 25x25 km
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

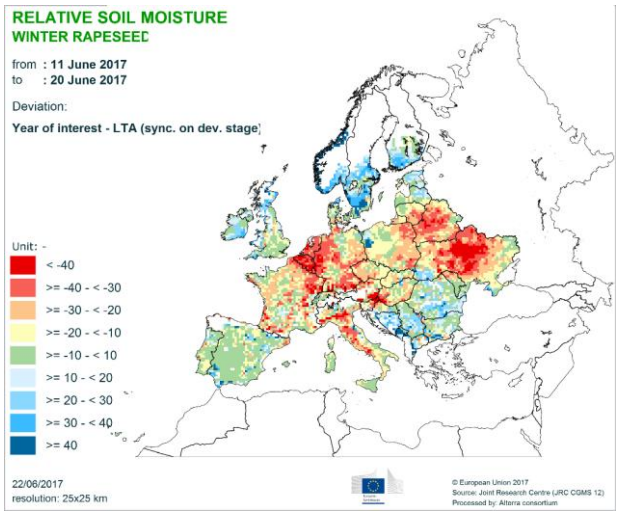

PRECOCITY
SUGAR BEETS
from : 11 June 2017
to : 20 June 2017
Deviation:
Year of interest - LTA (sync. on dev. stage)
Unit: days
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
22/06/2017
resolution: 25x25 km
© European Union 2017
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

Relative soil moisture

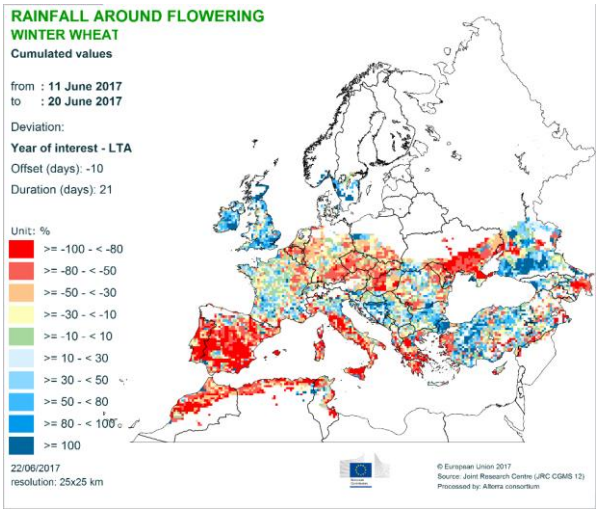


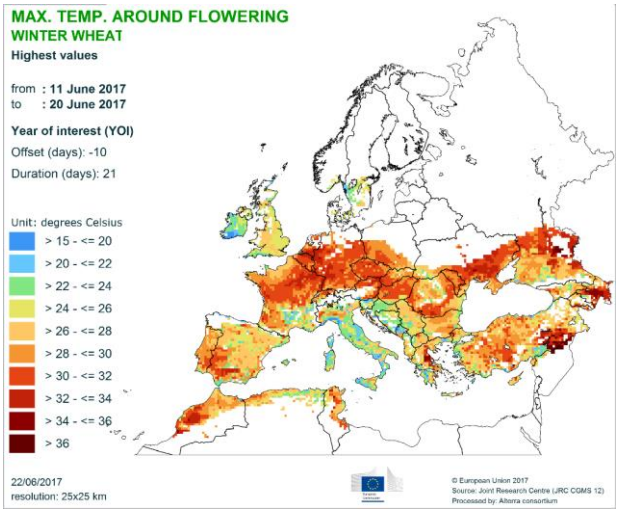


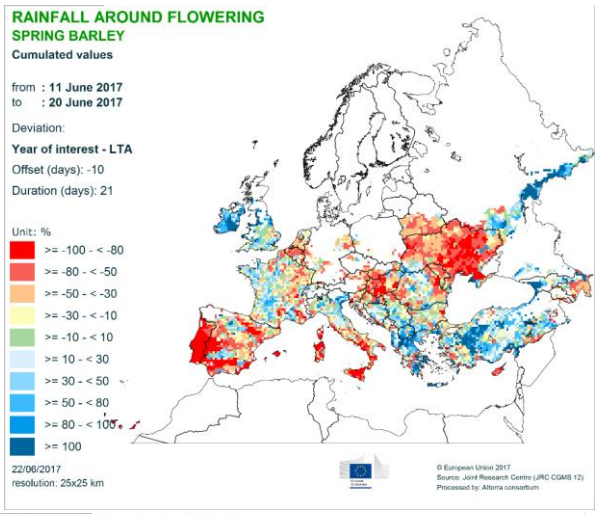


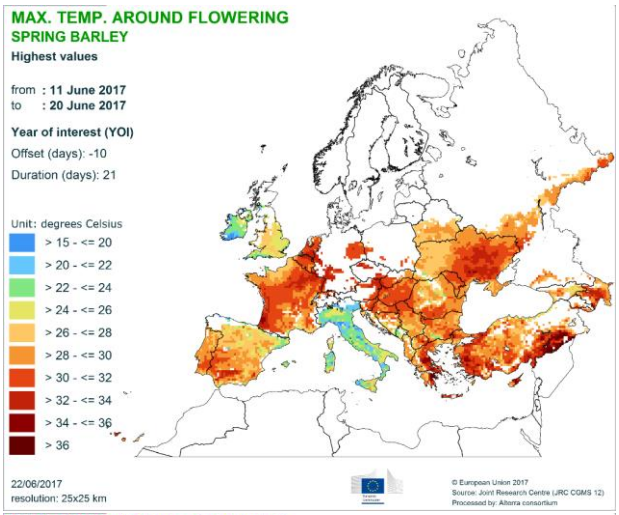


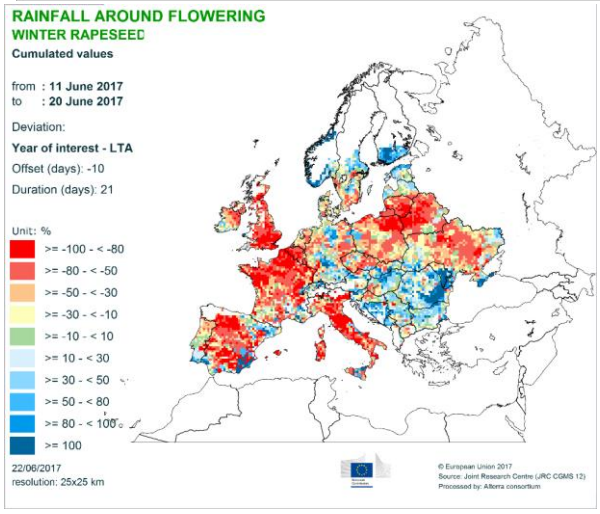
Precipitation and temperatures around flowering

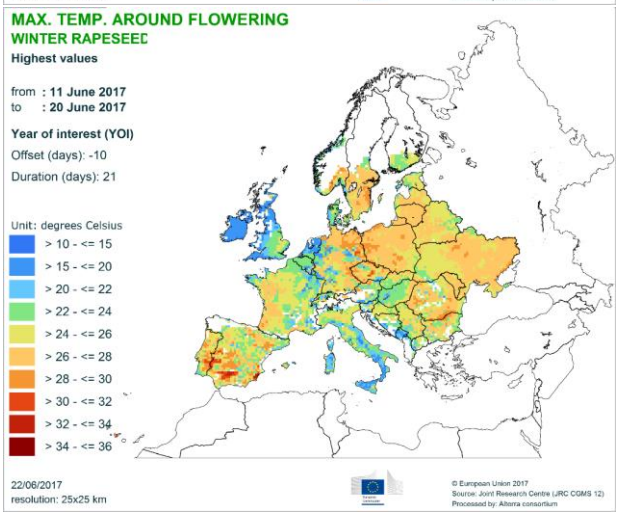




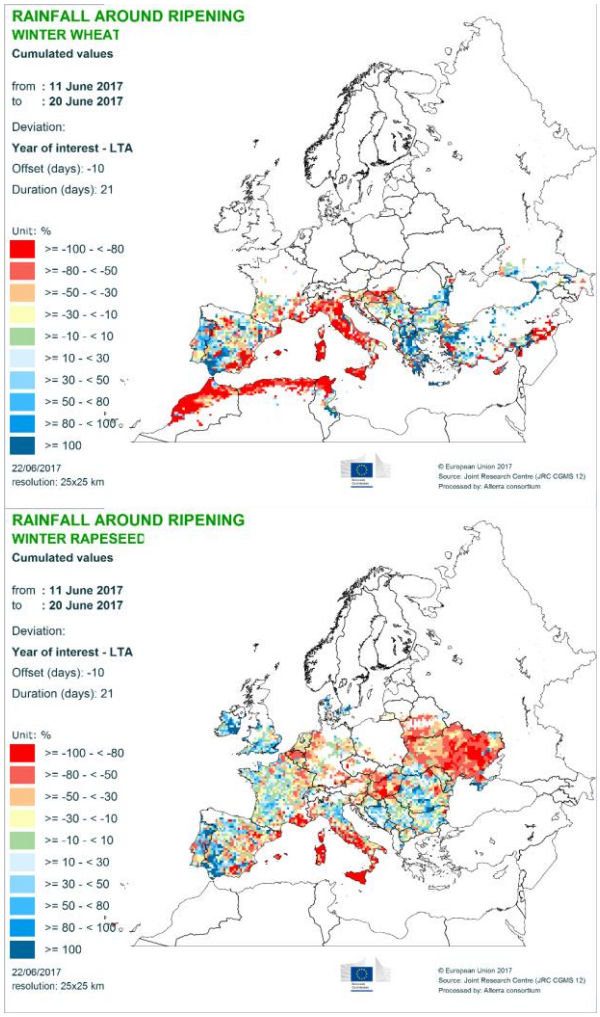


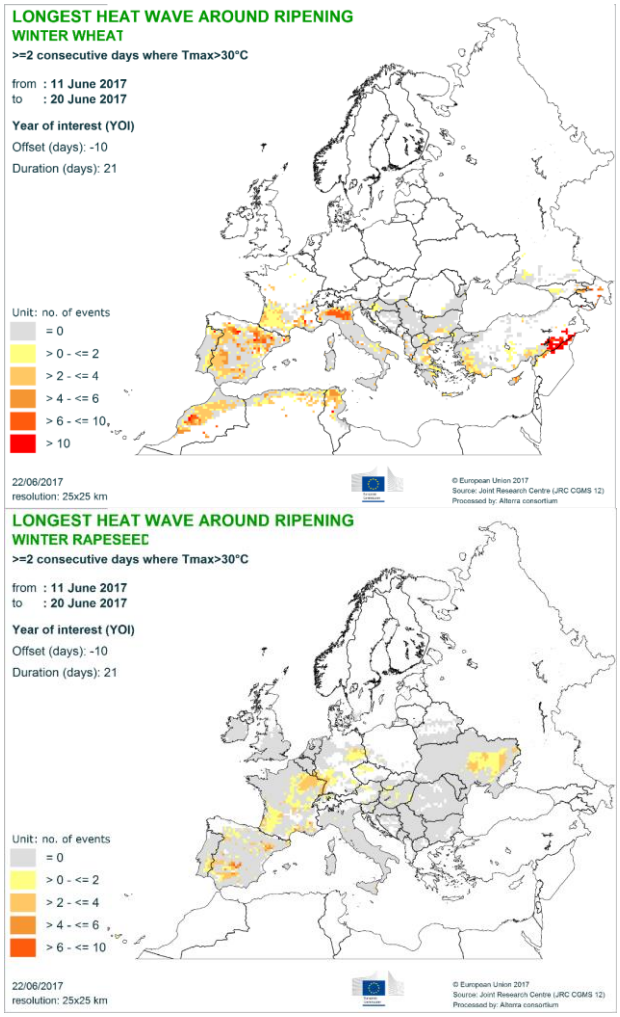




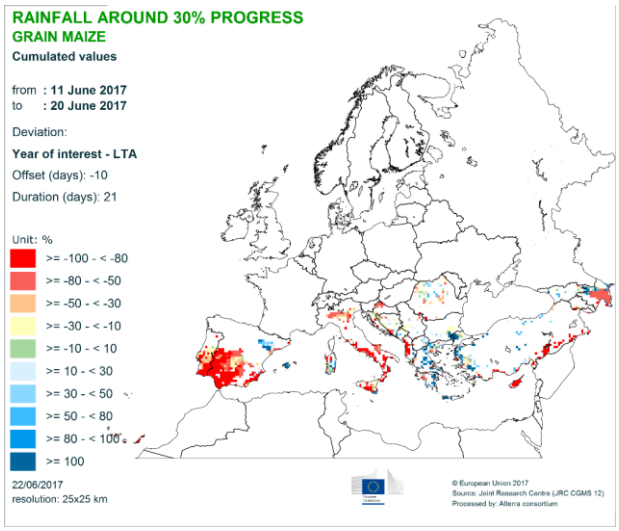


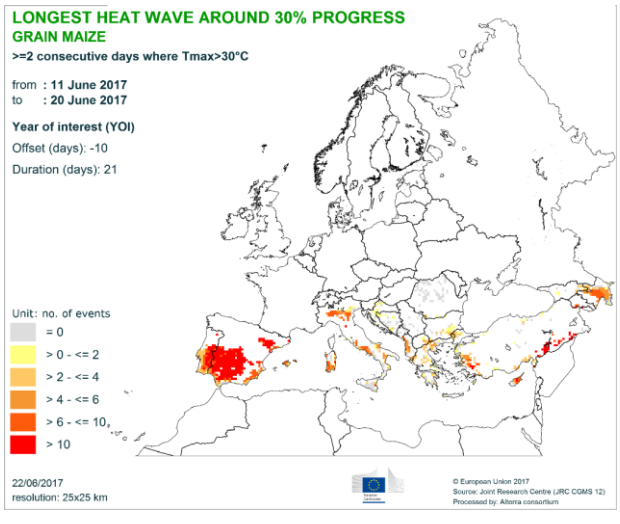
Precipitation and longest heat wave around ripening





Maize: precipitation and temperatures around crop development





JRC MARS Bulletins 2017

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

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

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Analysis and reports
B. Baruth, S. Bassu, I. Biavetti, A. Bussay, A. Ceglar, I. Cerrani, D. Fumagalli, S. Garcia Condado, R. Lecerf, R. Lopez, A. Maiorano, L. Nisini, L. Panarello, L. Seguini, A. Toreti, M. Van den Berg, M. Van der Velde, C. Weissteiner, 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 1975-2016.