European Commission

Period covered: 1 May–15 June
Issued: 22 June 2015

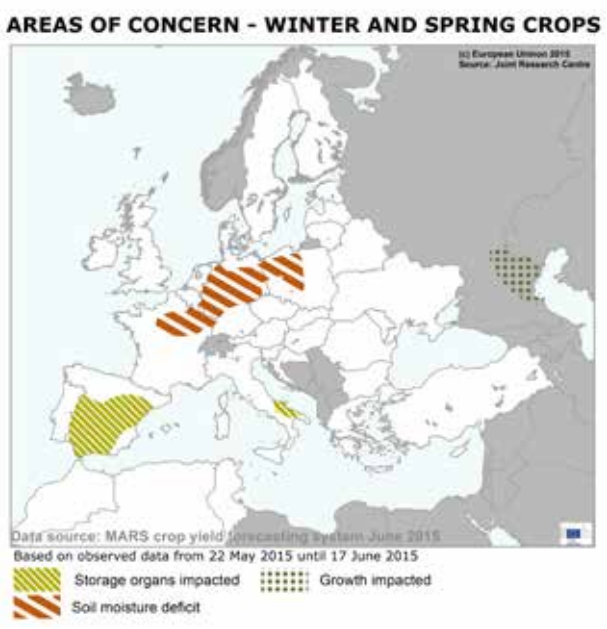
Crop monitoring in Europe

MARS Bulletin Vol. 23 No 6 (2015)

Continued positive outlook at EU-28 level despite drought concern

Crop yield forecasts for most winter cereals at EU-28 level have been lowered compared to last month's forecast due to suboptimal weather conditions. Still, the yield forecast for total cereals at EU-28 level remains above the 5-year average. Summer crops have had a fairly good start to the season.

In Spain, hot and dry conditions are negatively affecting central and southern regions. In Italy, durum wheat in Puglia continues to suffer from a lack of rain, and yields are expected to be low. In western and central Europe a large belt of cropland is currently experiencing low soil moisture conditions which are limiting crop growth, and which, if prolonged, will further negatively affect winter crop grain filling. However, plentiful precipitation is forecast in the coming days for these affected regions. Eastern Europe presents no major concerns apart from high temperatures, coupled with low precipitation in eastern Hungary. In Russia, near the border with Kazakhstan, a prolonged lack of rain has severely impacted cereal canopy growth. By contrast, favourable weather conditions have persisted over grassland in most of Europe, with above-average temperatures in the southern half of Europe. Rainfall has been sufficient, except in some areas of central Europe. Grassland biomass production is substantially higher than average in all countries considered.



Crop	Yield t/ha				
	2014	MARS 2015 forecasts	Avg 5yrs	% 15/14	% 15/5yrs
TOTAL CEREALS	5.71	**5.32**	5.21	-6.8	+2.1
Total Wheat	5.90	**5.62**	5.43	-4.8	+3.3
soft wheat	6.14	**5.85**	5.67	-4.7	+3.3
durum wheat	3.34	**3.22**	3.26	-3.6	-1.1
Total Barley	4.90	**4.65**	4.51	-5.1	+3.0
spring barley	4.16	**3.95**	3.90	-4.9	+1.2
winter barley	5.92	**5.60**	5.39	-5.4	+3.8
Grain maize	8.08	**7.22**	7.02	-10.6	+2.8
Rye	4.24	**3.81**	3.58	-10.1	+6.4
Triticale	4.53	**4.26**	4.16	-5.8	+2.6
Other cereals	3.15	**2.95**	3.48	-6.2	-15.0
Rape and turnip rape	3.62	**3.31**	3.13	-8.4	+5.8
Potato	33.62	**33.34**	31.31	-0.8	+6.5
Sugar beet	76.52	**73.52**	70.35	-3.9	+4.5
Sunflower	2.15	**2.08**	1.91	-2.9	+9.1

Issued: 19 June 2015

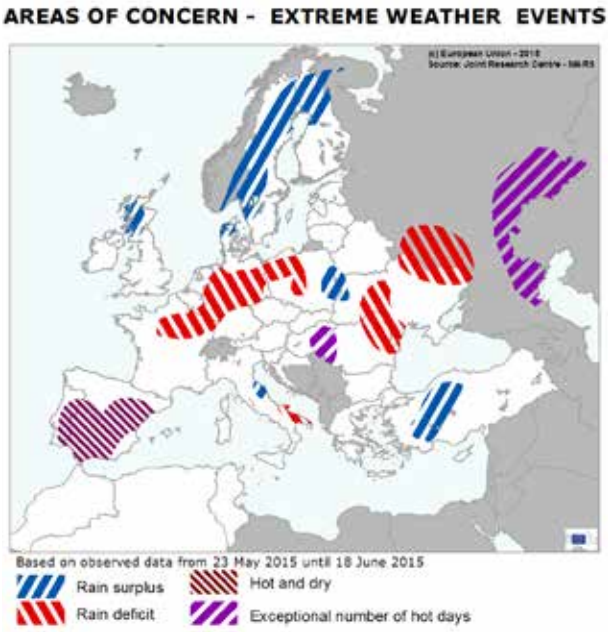
Joint Research Centre

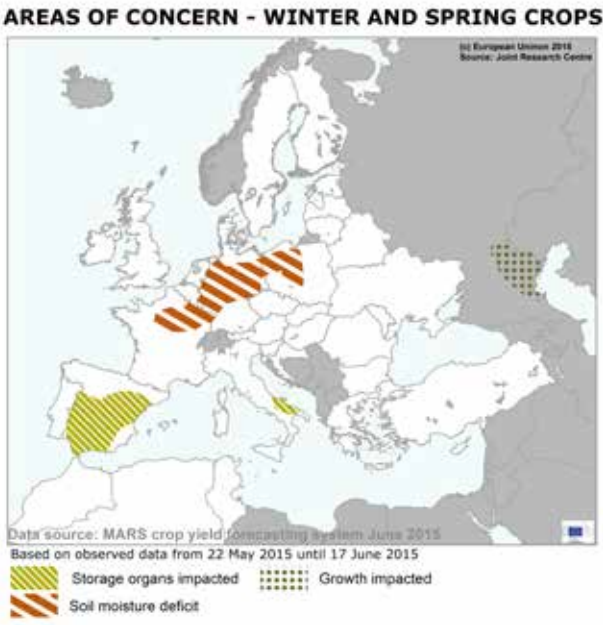
1. Agro-meteorological overview

1.1 Areas of concern

Dry conditions affect crop development in southern and central Europe

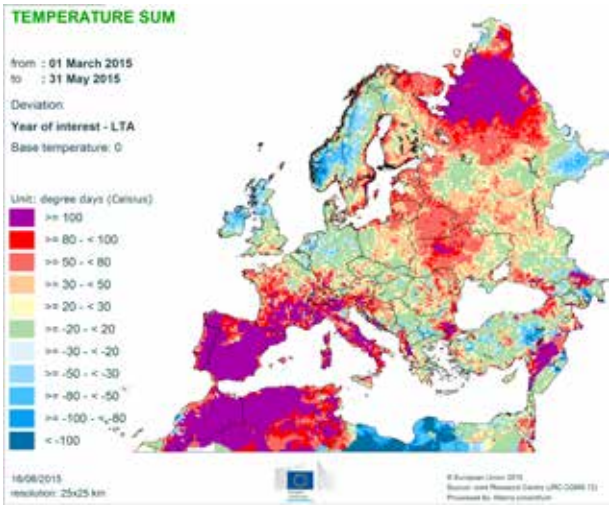
The extreme weather event map presents several areas of concern but an impact on crops has only already manifested itself for some of the zones. In Spain hot and dry conditions have lasted for more than a month and are affecting the central and southern regions, while spring crops in northern areas are still experiencing optimal conditions. In Italy, the durum wheat in Puglia continues to suffer from a lack of rain and yields are expected to be low. In another important durum wheat-producing region, **Marche**, the storms of late May and the beginning of June may have locally damaged the ears of crops. In western and central Europe a large belt of cropland is currently experiencing low soil moisture conditions which are limiting canopy growth and which, if prolonged, will negatively affect winter crop grain filling. The belt extends from **Champagne-Ardenne** (France) to **Wielkopolskie** (Poland), passing through Luxembourg and central Germany. A rain surplus was recorded in the northern European regions (**Scotland**, northern **Sweden** and northern **Finland**) until the beginning of June, but precipitation became normal afterwards. Eastern Europe does not present concerns apart from a slightly surplus of precipitation in eastern **Poland** and high temperatures coupled with low precipitation in eastern **Hungary**. In western and northern regions of Ukraine, where mainly winter crops are growing, rain has been lacking for several weeks but no impact on crops canopy is expected thanks to sufficient soil moisture. In **Russia**, near to the border with **Kazakhstan**, a prolonged lack of rain severely affected the canopy growth of cereals. In **Turkey**, a surplus of precipitation has been registered for several weeks, with positive effects on grain formation and grain filling of winter crops.

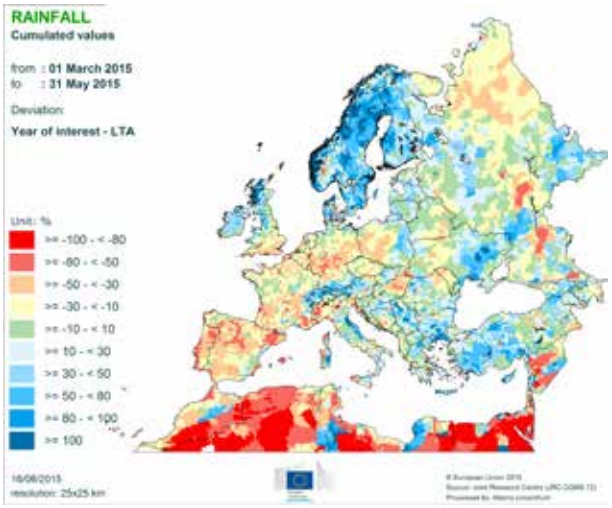




1.2 Spring review (March-May)

Spring (1 March-31 May) was significantly warmer than usual in the Iberian Peninsula, the Maghreb countries and northern and north-eastern Europe. Near normal thermal conditions were experienced in a wide belt between the United Kingdom and Turkey. A considerable precipitation surplus occurred over Ireland, Scotland, Scandinavia, in the Alpine region, Emilia-Romagna (Italy), western Turkey and eastern Ukraine. Low rates of precipitation were observed in the Iberian Peninsula, south-eastern France, central Germany, Puglia (Italy) and the Maghreb countries. The wintering of crops was very good, but in some regions yield expectation decreased due to the below optimal spring weather conditions.





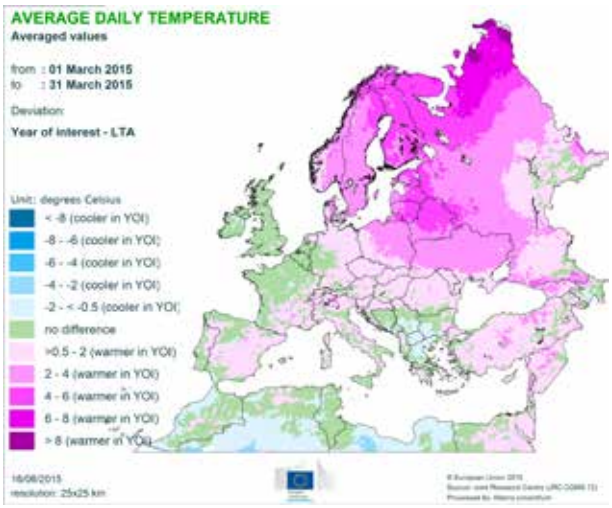
Observed temperatures:

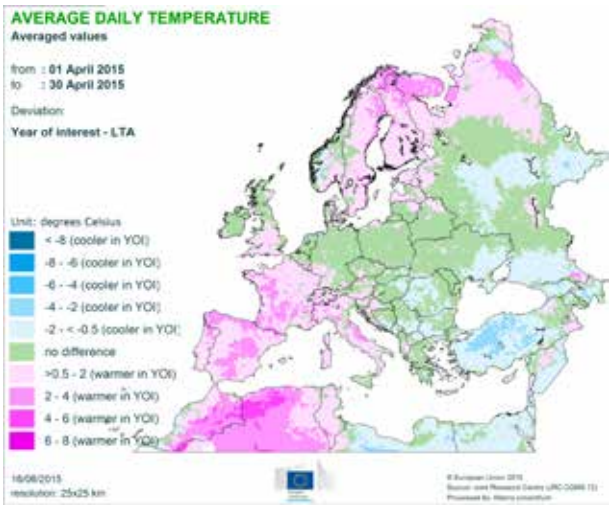
In March, a positive thermal anomaly ruled most of Europe. Extremely mild conditions were experienced over the Baltic states, Scandinavia, Belarus, northern Ukraine as well as in the central and northern territories of Russia, with mean temperatures exceeding the long-term average by 3-8 °C. Only the Balkan Peninsula and northern Africa proved to be somewhat colder than usual.

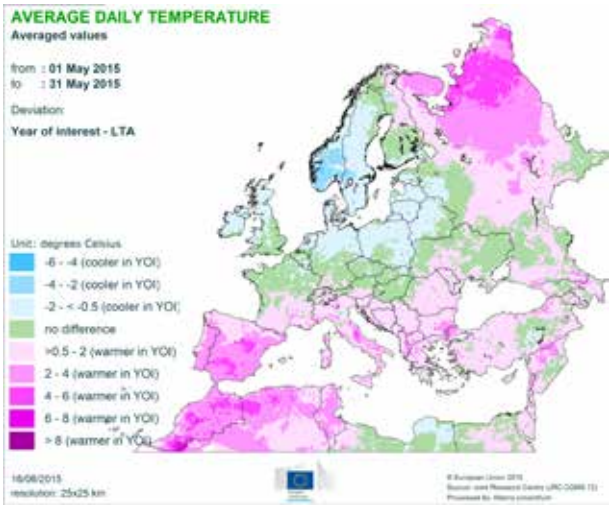
During April, temperatures indicated a high temporal variation over most of Europe, but eventually resulted in near-normal thermal conditions in a wide zone from Ireland to central Ukraine. A positive thermal anomaly prevailed over France, the Iberian and Apennine Peninsula just as in northern Europe and the Maghreb countries. Some smaller areas of the Balkan Peninsula, eastern Ukraine, southern and central Russia, and especially Turkey were affected by weather conditions that were moderately colder than usual.

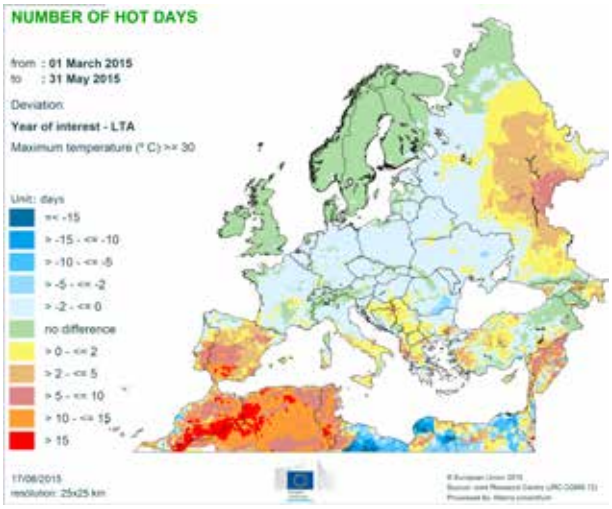
The first and second dekads of May were characterised by a strong positive thermal anomaly (2-7 °C) in southern Europe and north-western Africa. The Iberian Peninsula and the Maghreb countries, in particular, suffered from extreme heat, since daily maximum temperatures were higher than 30 °C, and on the hottest days reached + 35-40 °C. By contrast, a wide belt from the United Kingdom and Norway to the Caspian Sea experienced near normal or moderately colder-than-average temperatures during this period. In the last dekad of May lower-than-average temperatures were recorded over the western half of Europe, while the eastern half experienced positive thermal anomalies of up to 4-6 °C. Southern Russia was hit by a heat wave, probably compromising the winter wheat yield formation.

The cumulated active temperatures (Tbase = 0 °C) since March are well above average (surplus > 50 growing degree days) in Portugal, Spain, southern France, Italy, areas between the Black and Baltic Seas, Finland and northern Russia, where the development of winter crops was considerably accelerated.





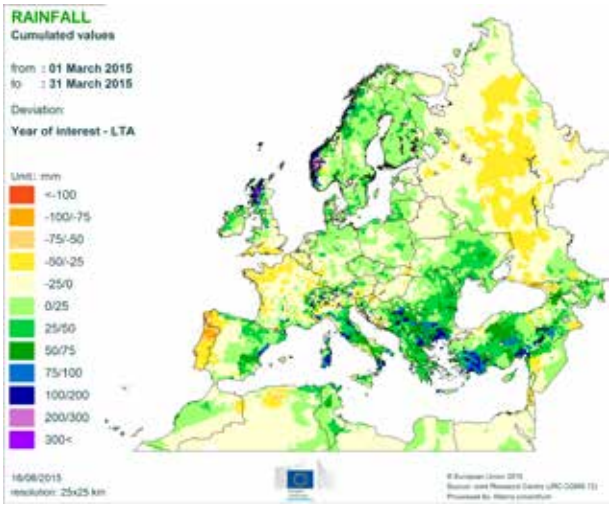


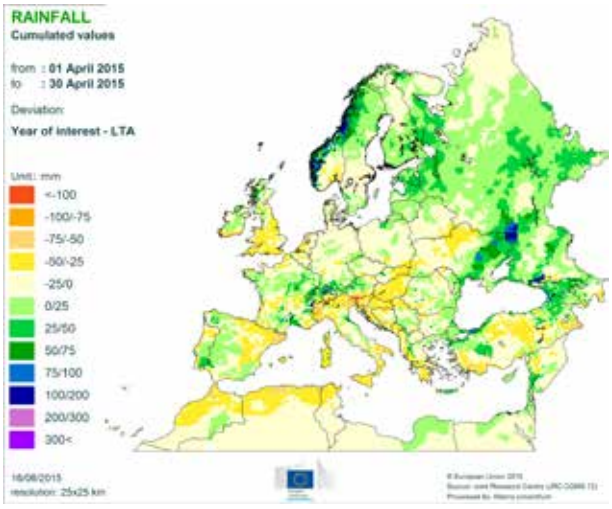


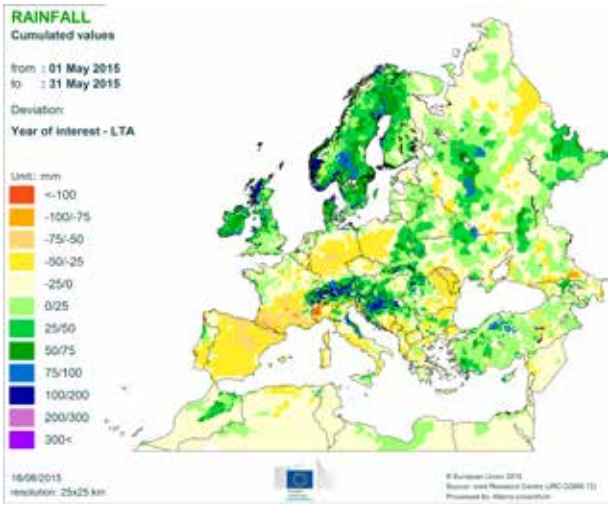
Observed precipitation

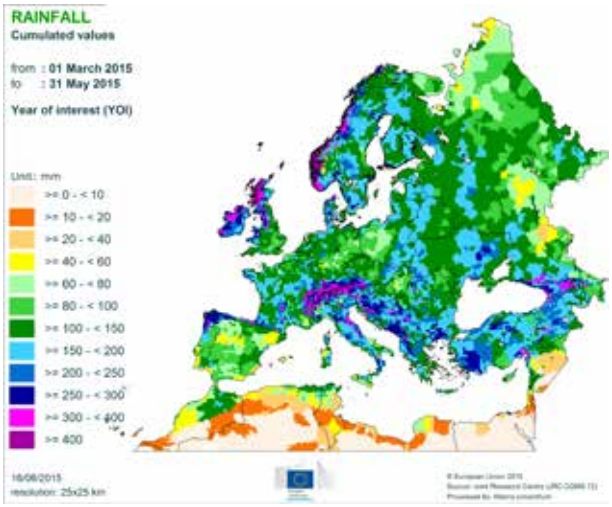
During March, abundant precipitation occurred over eastern Spain, central and southern Italy, most of the Balkans, Turkey, central Ukraine and some northern coastal areas of Europe providing monthly rainfall totals of 50-150 mm. Drier-than-usual conditions were experienced in Portugal, northern France, northern Italy and extended areas of European Russia. The first and second dekads of April were characterised by drier-than-usual weather conditions in western Europe, Italy, the western Balkans and the western part of Turkey. By contrast, abundant rainfall was recorded in eastern Ukraine, southern Russia and the Baltic countries. Rainfall during the third dekad of April was more abundant in western Europe, as opposed to the first two dekads. Rainfall was especially plentiful in western and central France, the north-western Iberian peninsula, the Alps and northern Europe.

During May, wetter than usual conditions with at least 50-100 mm of extra rainfall were typical in Ireland, the northern half of the United Kingdom, Scandinavia, the Alpine region, Slovenia, Croatia, southern Hungary, eastern Poland, northern Ukraine, western Turkey and areas in Russia close to its western and southern border. Dry conditions prevailed in north-eastern Spain, southern France, northern Italy, central Germany, eastern Romania, Moldova and eastern Bulgaria. The strong negative climatic water balance indicates a drought situation for Portugal, Spain, southern France, central Germany and western Poland.







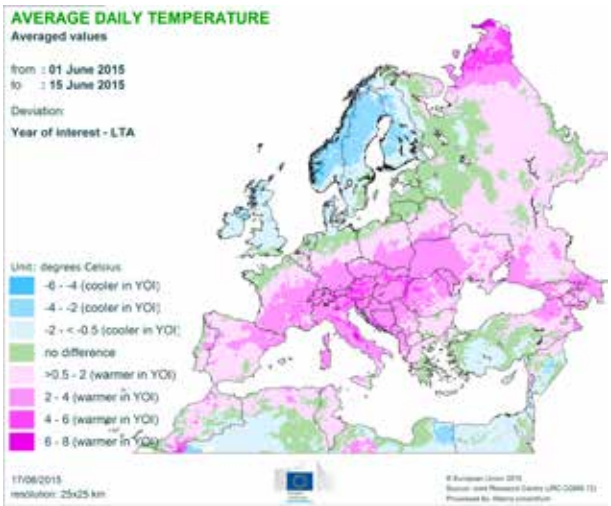


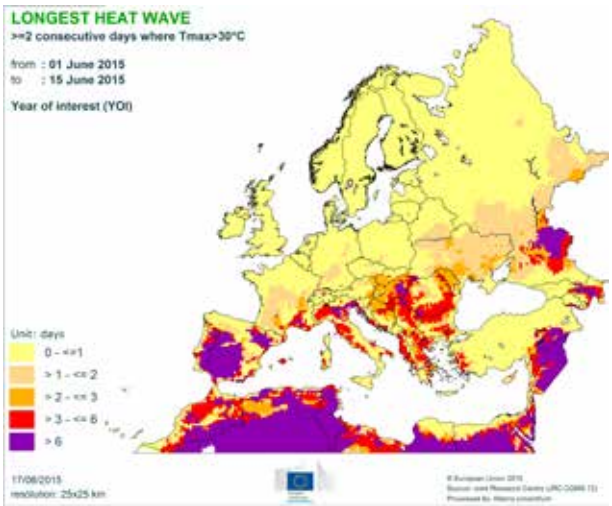
1.3 Meteorological review (1 June–15 June)

Southern Europe and major parts of central Europe registered higher-than-seasonal temperatures, leading to the occurrence of heat waves. Higher-than-usual temperature accumulation accelerated the development of winter crops in Spain, Italy and southern France in particular, which may reduce yields over the regions affected. Drier-than-usual weather conditions were observed over many areas of central and eastern Europe and the northern Balkans. Drought stress is starting to affect crop growth in many regions where dry weather with high temperatures has occurred.

Observed temperatures

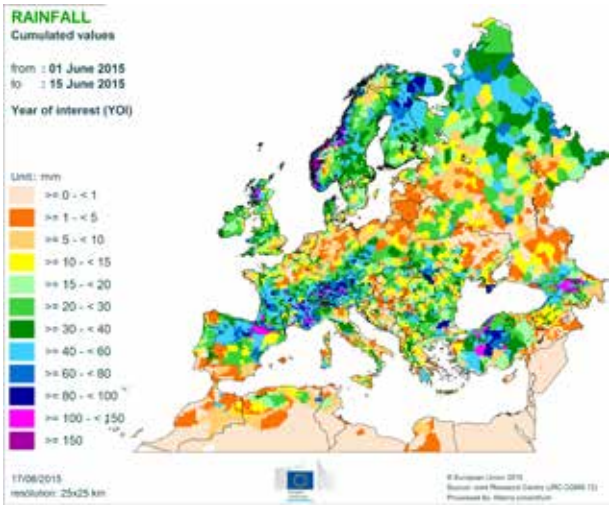
The first half of June was characterised by warmer-than-usual weather in southern and eastern Europe, France, the southern parts of Germany and Poland, the Czech Republic, Slovakia, Austria, Hungary and the Balkans, with air temperatures mainly between 2 and 4 °C above the long-term average. These regions were affected by heat waves, which were most intensive over the south-eastern part of the Iberian peninsula, southern France, central and southern Balkans and south-eastern European Russia. Maximum daily air temperatures exceeded 32 °C in these regions; maximum daily air temperatures exceeded 35 °C locally. Hot weather conditions accelerated crop development. The resulting shortened reproductive cycle of winter crops implies reduced assimilate accumulation, lowering crop yield potential. In contrast, colder-than-usual weather was observed over the British Isles and Scandinavia, with air temperature anomalies down to 4 °C below the long-term average.

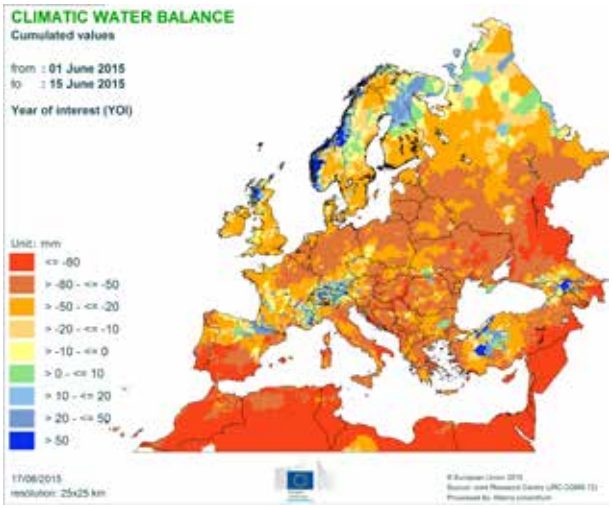




Observed precipitation

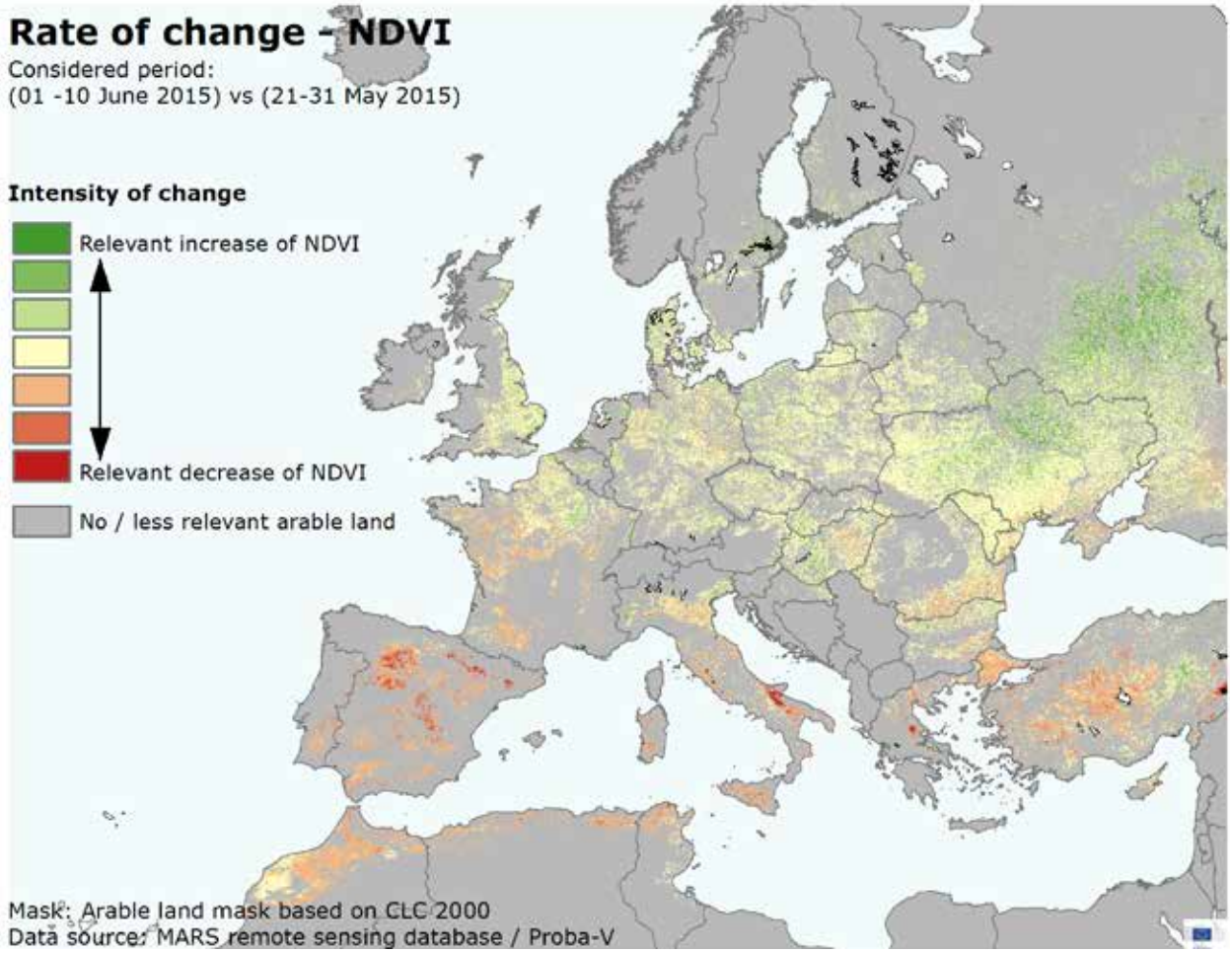
Dry weather was observed during the first half of June over the southern part of the Iberian peninsula, northern France, central and northern Germany, northern Poland, the northern Balkans, the Baltic countries, eastern Ukraine and Russia. Dry conditions and high atmospheric evaporative demand over these regions have been depleting soil moisture reserves. Soil moisture deficit is limiting crop growth in many regions over the southern part of the Iberian peninsula, southern France and central Germany, and is starting to affect crop growth in western Poland, the eastern Czech Republic, northern Romania, Moldova and south-eastern European Russia. Winter crops' yield potential may have been reduced most significantly in areas where drought and heat stress occurred around the flowering stage. Above-average rainfall was recorded over northern Spain, southern France, Scandinavia, the Alpine region and the western half of Turkey.





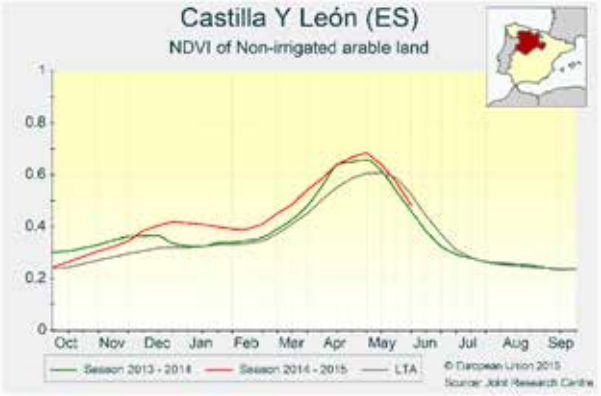
2. Remote sensing — Observed canopy conditions

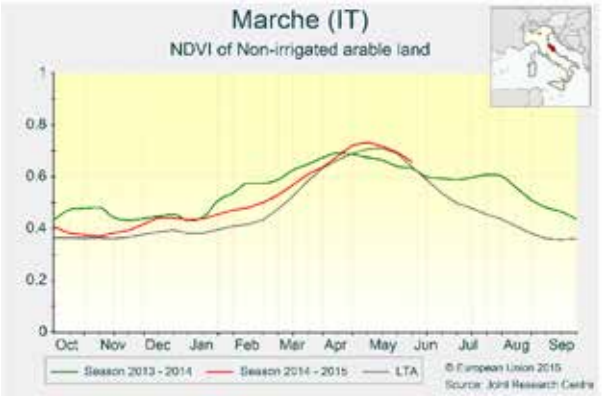
Dry conditions reduced optimal canopy development in the main wintercrop regions. There was optimal crop development in Ukraine.

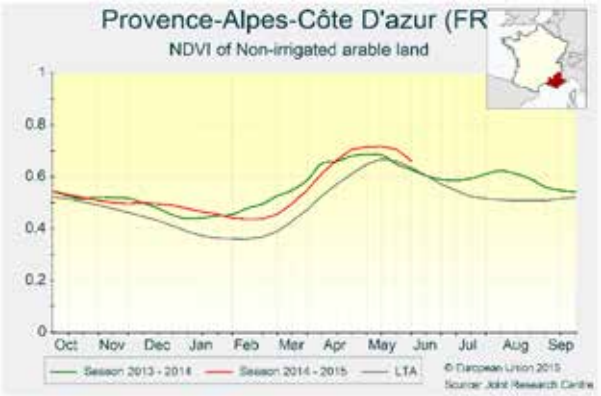


The map displays the rate of change of NDVI (Normalised Difference Vegetation Index) values between two consecutive images: one from the beginning of June and one from the end of May. The red colours indicate areas with a negative difference, due either to normal canopy senescence towards the end of the cycle (light red colours) or to an unexpected impact on biomass (dark red values) because of unfavourable conditions. The yellowish areas indicate regions where the relative change is not relevant as they are mostly around the flowering stage of crop development. During this period, changes in green biomass density are low, and NDVI profiles often plateau. The green colours indicate areas with increasing canopy vigour or canopy density during vegetative development.

In large areas of Spain, crops entered the senescence phase earlier than usual; a lack of rain combined with high temperatures determined an acceleration of the phenological development (indicated by a high negative change rate), reducing, especially for winter crops, the grain-filling period (e.g. in Castilla y Leon). In Italy, durum wheat almost reached the end of the cycle in the main producing regions. Conditions were quite varied: Le Marche received too much rain during the grain-filling stages, whereas Puglia experienced severe dry conditions. In central and southern France, winter crops finished flowering (e.g. Provence-Alpes-Cote D'Azur). Ongoing dry conditions partially affect the grain-filling stages, reducing yield expectations. In the United Kingdom, crop development almost reached the flowering stage with optimal vegetative growth (e.g. East Anglia). In Germany (e.g. Braunschweig) and Poland (e.g. Wielkopolskie), large winter crop areas were affected by the overly dry spring that locally determined a reduction in the vegetative vigour of the canopy. From Hungary to Romania, winter crop are developing normally, with no relevant concerns. In Bulgaria, the growth of winter and summer crops is delayed (e.g. Yuzhen Tsentralen). In Ukraine, the wet and warm conditions of late May led to a boost in canopy growth, and winter crops are entering the flowering stages with optimal canopy development (e.g. Dnipropetrovs'ka). In Turkey, the winter crops in the main producing regions have just completed the flowering stages, and grain filling is supported by optimal soil moisture conditions. In the Maghreb countries, the main crop season has finished.


Castilla Y León (ES)
NDVI of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
LTA


Marche (IT)
NDVI of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
LTA


Provence-Alpes-Côte D'azur (FR
NDVI of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
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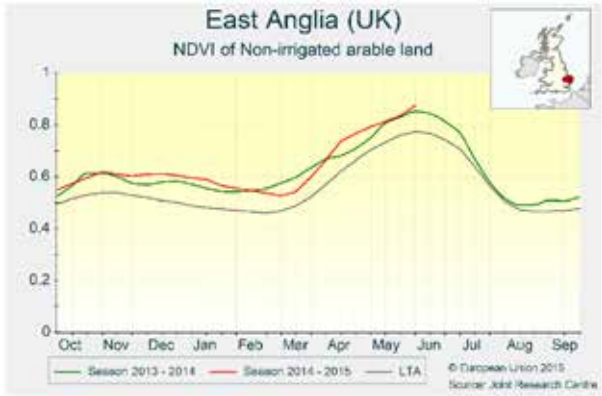
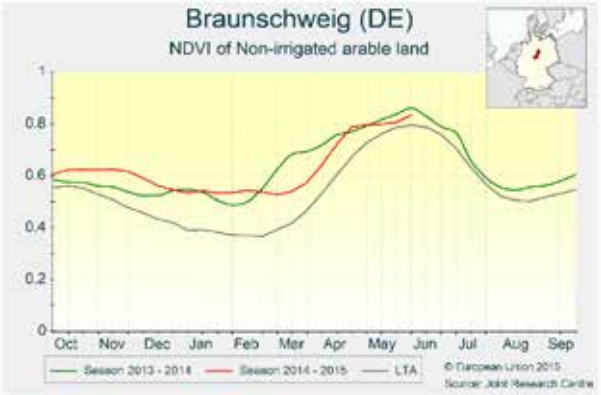
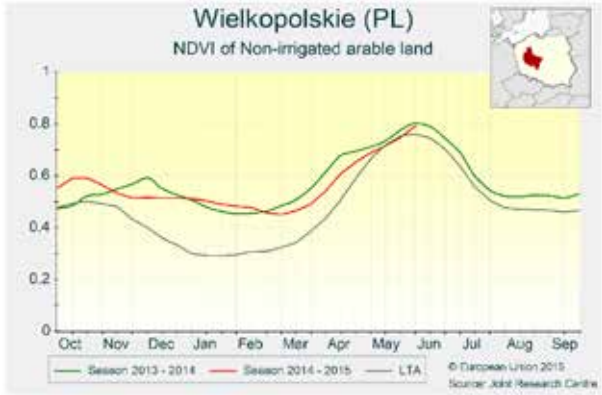

East Anglia (UK)
NDVI of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
LTA


Braunschweig (DE)
NDVI of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
LTA


Wielkopolskie (PL)
NDVI of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
LTA

3. Country analysis

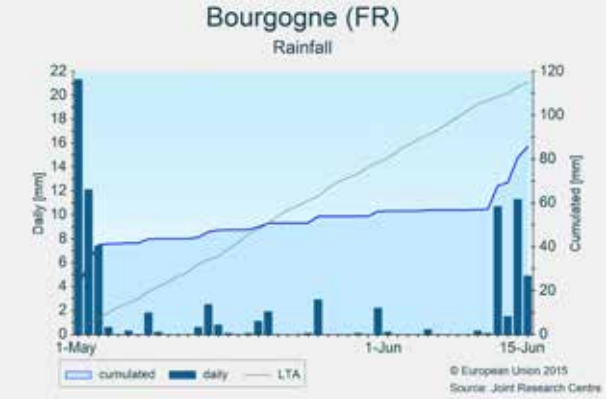
3.1 European Union

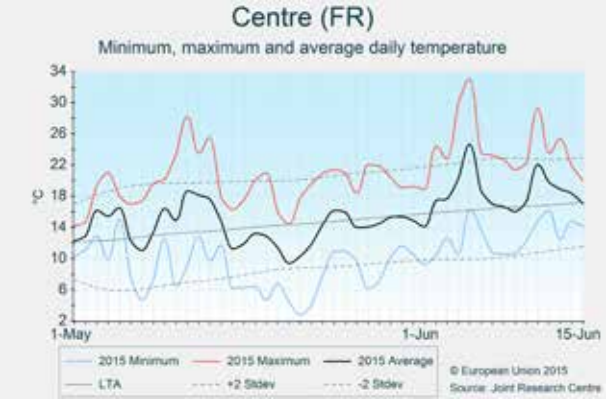
France

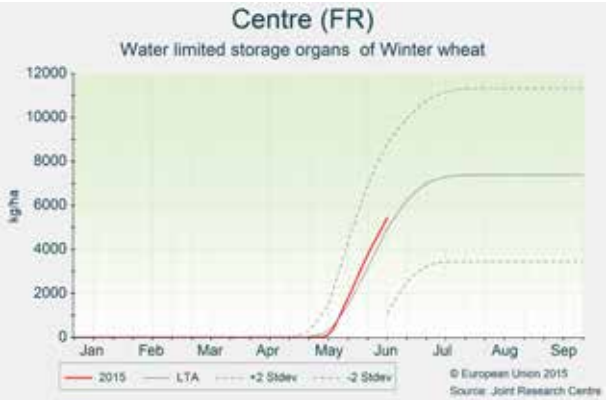
Expectations slightly lowered by dry and hot weather

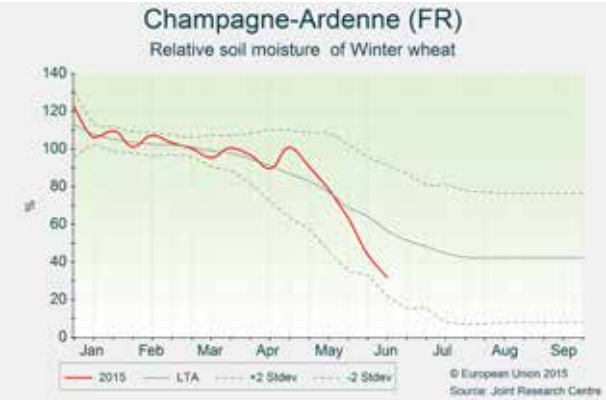
Overall conditions are still good and the yield outlook remains higher than average. Warm temperatures and moderately dry conditions contributed to a slight decrease in winter and spring cereals yield expectations. The yield outlook may drop further during the coming weeks if dry conditions persist.

The first half of May was warmer than average, particularly in the south where maximum temperatures reached 28 °C in Aquitaine and Midi-Pyrénées. While the second half of May was milder and temperatures were close to average, the first half of June was again notably warmer than average throughout the country, with maximum temperatures reaching 31 to 33 °C on 5 June. Since 1 May, except for Pays de la Loire, Poitou-Charentes, Rhône-Alpes and Provence-Alpes-Côte d'Azur, rainfall has been greatly below average. Cumulated rainfall since the beginning of the year is still in an acceptable range and, according to our model and remote sensing images, crops have generally not been impacted by water stress. However winter and spring cereals are being exposed locally to water stress and reached grain filling while temperatures were higher than 25 °C. This will have a negative impact on crops. While yield expectations have fallen slightly, conditions remain generally good and yields are still forecast to be above average. The weather for the coming days will be a determining factor, as soils are becoming increasingly dry, particularly in the north-east where crops are now at the grain-filling stage and will need more water to reach an acceptable yield.







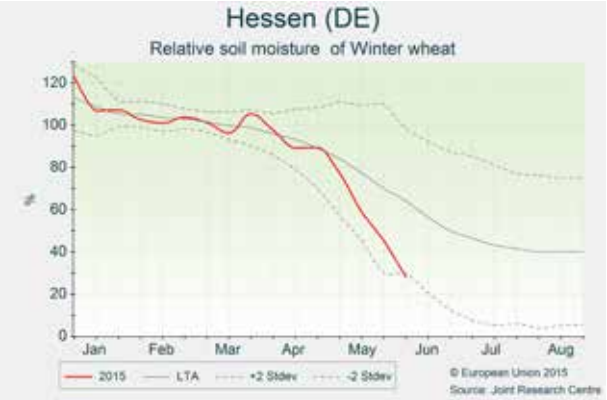


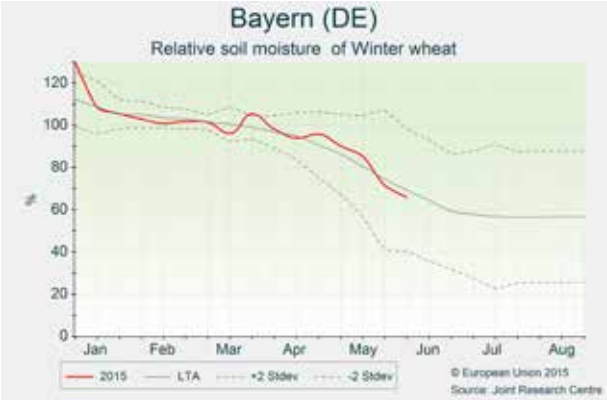
Germany

Dry conditions over large cropland areas

Scarce rainfall over large parts of Germany is giving cause for concern. Soil moisture levels are very low and, unless rainfall occurs in the coming days, a clear yield reduction in winter crop yields will be unavoidable. Although the forecasts for most crops have been lowered compared to the last bulletin, they are still close to the average.

Accumulated temperatures exhibit a clear zonation from colder-than-usual conditions in the north to warmer-than-usual in the south. The cold weather in the north slightly delayed the crop development of winter rapeseed and maize, whereas other crops are at normal development stages throughout the country. A clear cause for concern is the lack of rainfall in large parts of Germany, especially in Rheinland Pfalz, Hessen, Nordrhein-Westfalen, Niedersachsen (apart from coastal regions), Thüringen and Brandenburg, where only a few rainy days were observed. In some areas of Hessen and Thüringen, the entire period under review was dry. As a consequence, soil moisture levels have dropped rapidly and are approaching critical values of around 25 %. Unless rainfall occurs in the near future (which is currently not forecast), yield decreases are inevitable. Currently, model simulations already show a clear decrease in the accumulation of biomass by winter cereals, and lower-than-usual values of the storage organ weight of rapeseed in the driest regions (which fortunately do not coincide with the major producing regions). Early-sown maize is currently not affected as the water demand of the plants is still low and soil moisture was sufficient at the time of emergence. Late-sown maize, however, may have had difficulties in emerging, resulting in uneven stands. By contrast, southern Bayern and southern Baden–Württemberg received above-average rainfall levels. The forecast yields for winter and spring crops have been lowered compared to our last bulletin, but are still at a good level and above the 5-year average.



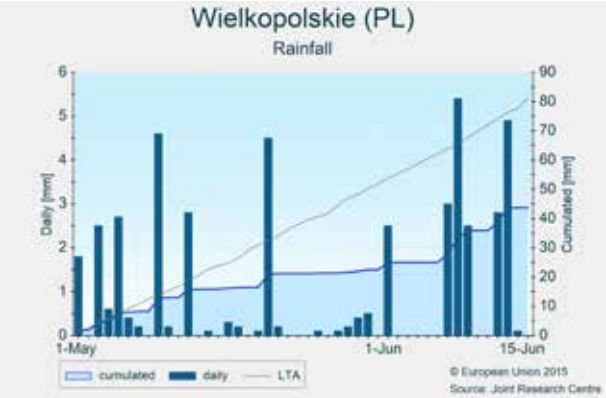


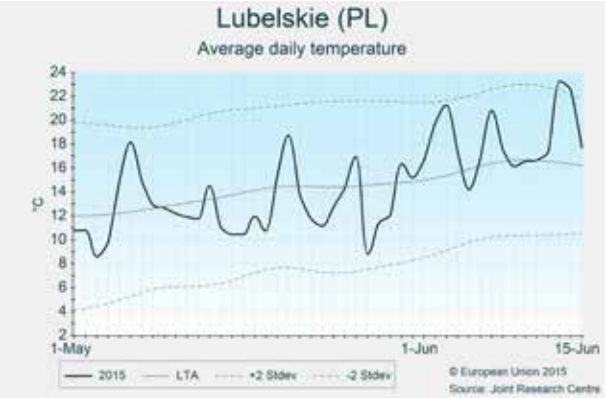
Poland

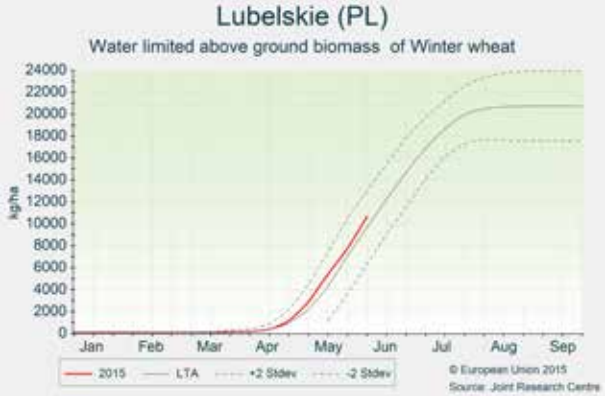
Outlook remains positive but emerging concerns

Contrasting precipitation patterns have been recorded between the rainy east and the drier west of the country. Conditions are generally good and the yield outlook is positive, but will be slightly affected by the dry conditions observed in the central and western regions.

Since 1 May, temperatures have remained near average in most parts of the country. The first dekad of June was clearly warmer than usual, with maximum temperatures reaching 31 °C in the south and west of the country. Differing levels of cumulated rainfall have been observed since 1 May — above average in eastern regions (Lubelskie, Podlaskie) and largely below average in western and central regions, where a rain deficit had already been observed (Lubuskie, Wielkopolskie, Lodskie). These regions have now a significant rain deficit, with only Dolnoslaskie experiencing significant rainfall during the first dekad of June. According to our model, winter cereals have reached, and spring cereals are entering, the flowering stage. At the national level, it is reported that 5 % of winter and spring cereals are affected by drought, mostly located on shallow soils in Lubuskie, Wielkopolskie, Kujawsko-Pomorskie and Lodskie (http://www.susza.iung.pulawy.pl/mapy/). The yield outlook is still positive as the dry conditions observed locally have been offset by some very good conditions at national level. Yields forecast are below those of last year, which was a record year, but are still largely above average. The area impacted by drought may expand in the coming weeks if no substantial rainfall is observed.







United Kingdom and Ireland

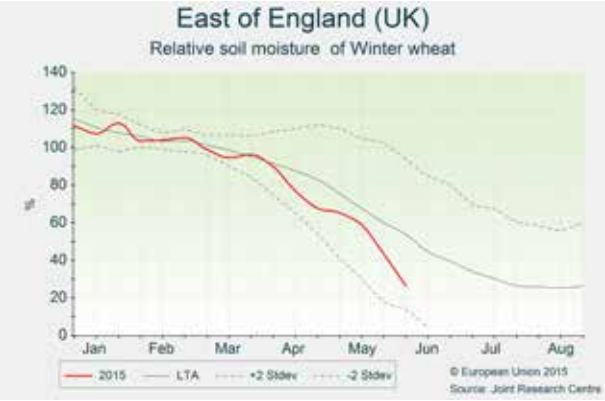
Continued favourable conditions

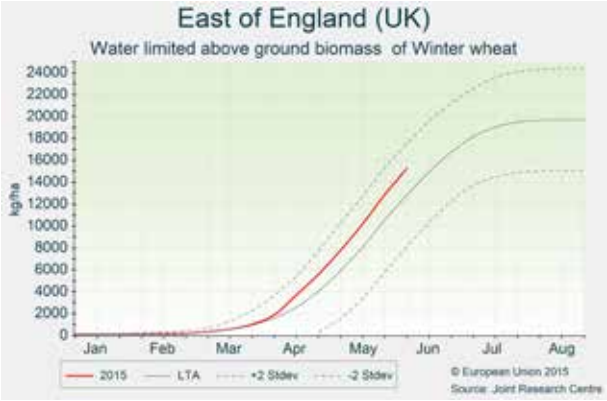
Relatively cool weather slowed down crop development somewhat, but indicators remain positive. More rain is needed in south-eastern England to sustain good growth over the coming weeks. The yield forecasts remain close to those of the last bulletin.

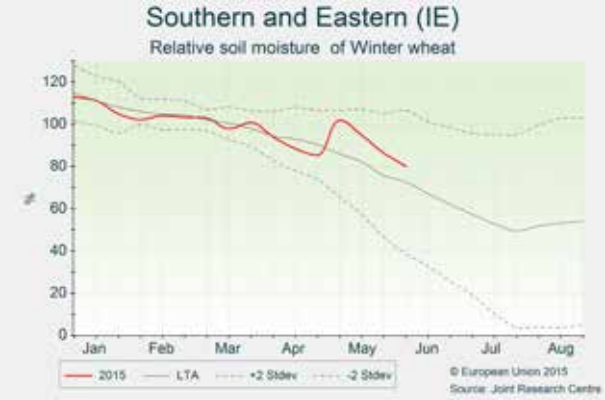
The period of review (1 May-15 June) was characterised by a predominance of below-average temperatures across the British Isles, except for the period 3-12 May, when daily averages exceeded the long-term average. For the period as a whole, temperature sums were around 30 growing degree days (GDDs) below the long-term average in most areas. Daily maxima remained below 25 °C. Frosts occurred locally around 1 May.

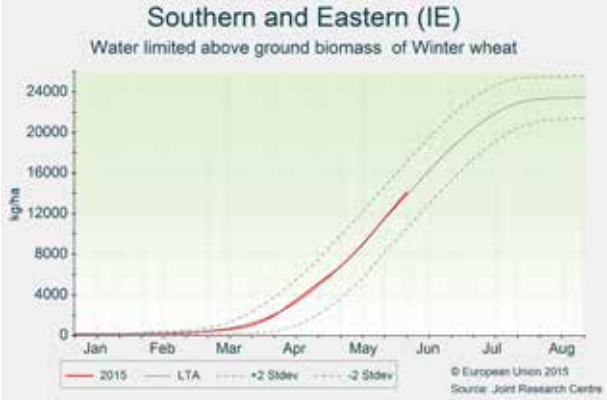
The period until 20 May was wetter than usual. Drier-than-usual conditions prevailed from that date until the end of the review period. For the period as a whole, rainfall was above average in most of the region but below average over south-eastern England. Radiation was average in Ireland and above average in Britain.

As a consequence of the relatively cool weather conditions, crop development has slowed down somewhat and is now at a normal development stage in Britain and somewhat behind in Ireland. However, the modelled leaf area index and biomass accumulation continue to be higher than average. Spring crops are generally also faring well. Soil water levels are low in south-eastern England, where they are approaching critical levels for winter cereals. So far, our models show little or no evidence of water stress, thanks to the relatively cool temperatures. More rain is needed, however, to sustain continued good growth in these important cropland areas, especially if temperatures go up. The yield forecasts remain close to those of the last bulletin.









Spain and Portugal

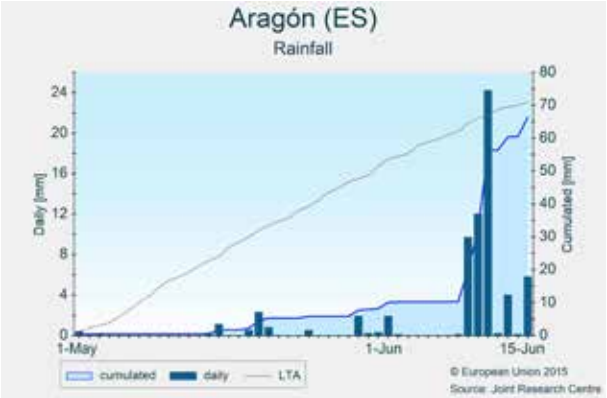
Unfavourable weather during grain filling, yields revised downwards

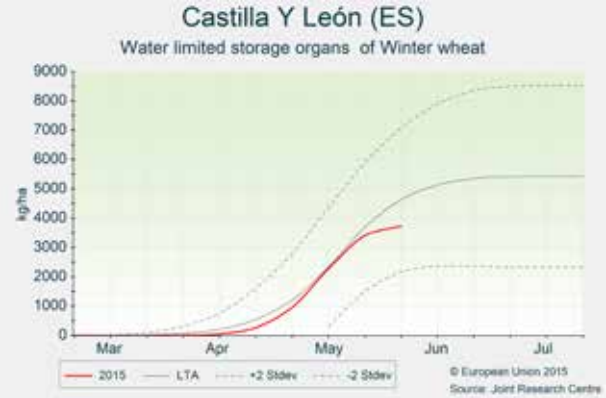
Dry and warm conditions persisted in most of the Iberian peninsula during May and June. Grain filling of winter cereals has been affected by the low soil moisture levels, constraining yield potentials. Conditions for summer crops were average.

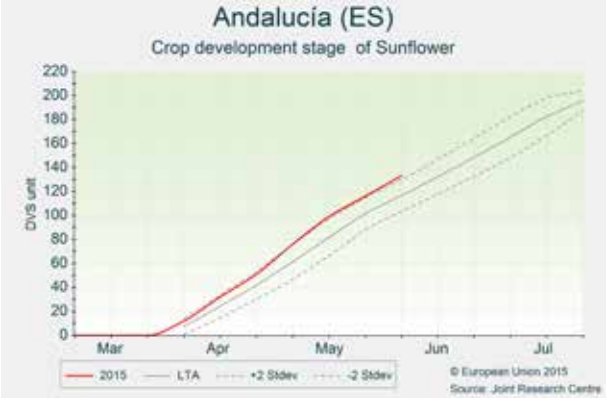
May and June were substantially warmer and drier than usual in the Iberian peninsula. Precipitation was scarce, except in the northern half of the peninsula, where heavy showers were registered in the second week of June. Temperatures were systematically above the long-term average, especially in mid-May and the first week of June, when exceptionally high values were recorded for this period of the year.

Winter cereals are currently being harvested in the south of Spain and Portugal, whereas in the north they are completing the grain-filling phase. Dry conditions in May (during the critical phase of grain filling) substantially constrained yield potentials in most of the peninsula. Precipitation received in June in the north will only partially mitigate the adverse effects of dry conditions on yields. Therefore, yield expectations for soft wheat and barley in Spain have been revised substantially downwards from our last bulletin, and are now close to the results of 2014, an unfavourable year for winter cereals. In Portugal the situation is slightly better, thanks to rainfall registered at the end of April. Nevertheless, the results for winter cereals are expected to be below the exceptionally high yields of 2014.

The high temperatures in May and June accelerated the development of summer crops. Sunflower growth, however, may experience water constraints if dry conditions persist in June. Grain maize yields are expected to be average, as water reservoirs seem sufficiently stocked to support irrigation during the summer months.





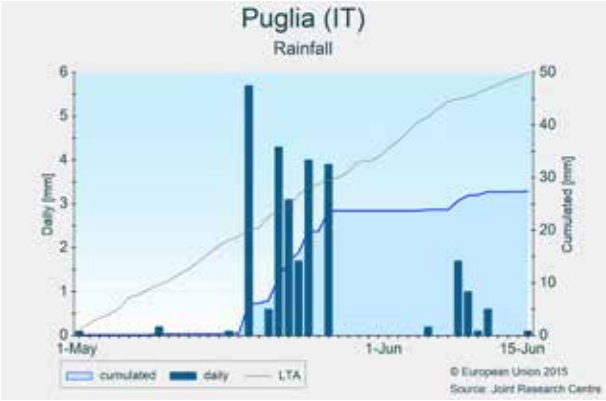


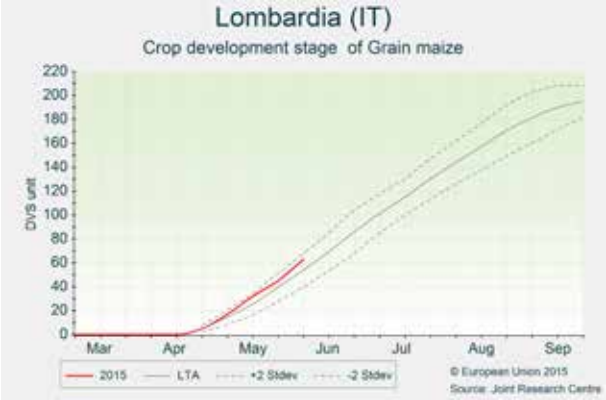
Italy

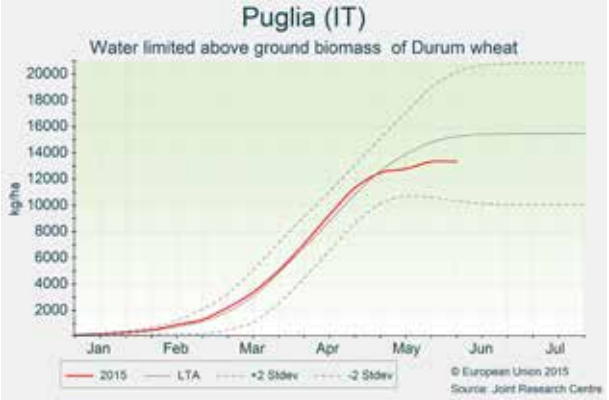
Unfavourable conditions for durum wheat

Warm conditions allowed for the good development of spring crops. Unfavourable weather conditions prevailed in some of the main durum wheat-producing areas, negatively affecting the durum wheat yield outlook. Harvesting of durum wheat has already started in southern regions. The outlook for spring crops is close to the average of recent years.

Across the country, temperatures were above the long-term average during the entire period of review (1 May-15 June), with the only exception being the last dekad of May; on average, the period under review was about 2 °C warmer than usual, and maximum temperatures above 35 °C were recorded in Puglia, Campania and Sicily. These conditions boosted the development of spring crops, but also led to a shorter grain-filling period for winter crops, which could negatively affect the final yields. Rainfall was not well distributed in space and time. The central-eastern regions were hit by heavy thunderstorms and local hail during the end of May and mid June, while other regions such as Puglia, Calabria, Lazio and Piemonte received about 30 % less rain than usual throughout the period of review. These conditions constrained durum wheat yields, particularly in Puglia and Le Marche, due respectively to excess and scarcity of water. Those two regions are among the most important production areas of durum wheat. The yield forecast has therefore been revised downwards compared to the last bulletin. In southern regions, the harvesting of durum wheat has already started. Rapeseed is at the ripening stage in north-eastern and central Italy, while grain maize and sunflowers are at the vegetative stage. According to our model, the yield forecasts for spring crops are currently close to the average of recent years. However, weather conditions during the coming month will be crucial.







Hungary

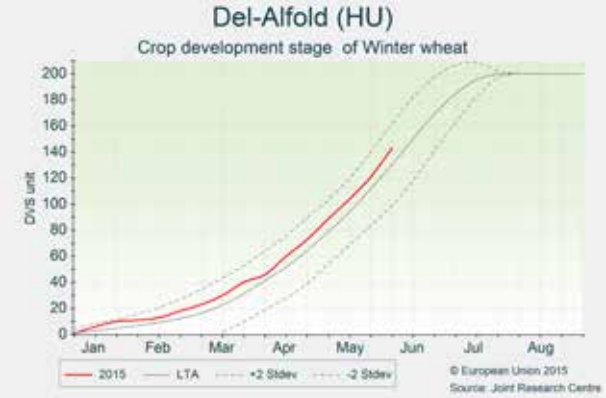
Near average outlook for winter crops

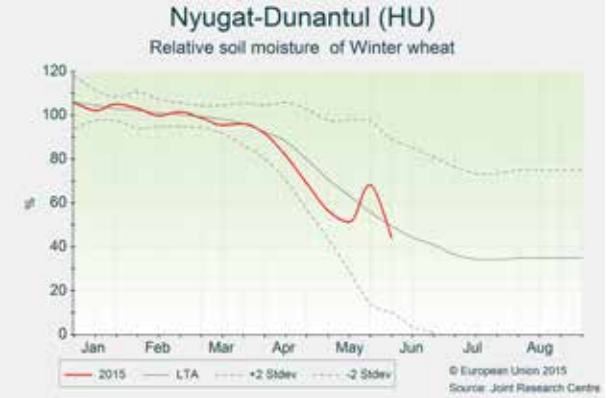
After a long dry period from March to April, precipitation increased from the beginning of May. The last dekad of May was especially rainy. Winter crop conditions are generally average, and the status of summer crops is good. Early yield expectations are positive.

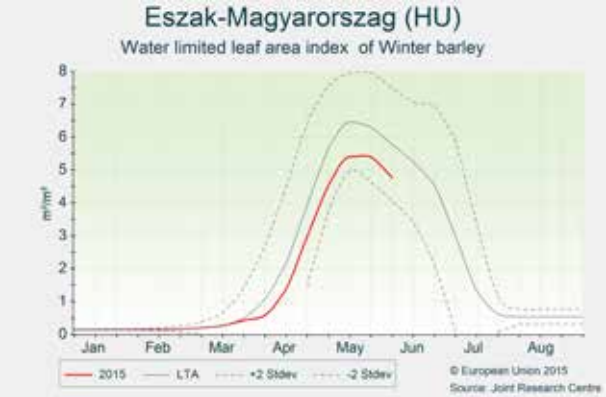
Temperatures fluctuated considerably around the average during May. A pronounced warming period started in early June, with daily maximum temperatures reaching 30 °C and above after 10 June. Maximum temperatures of 34 to 36 °C were recorded. The hot spell lasted only 3 to 5 days and is likely to have only moderately constrained the yield formation of spring and winter cereals.

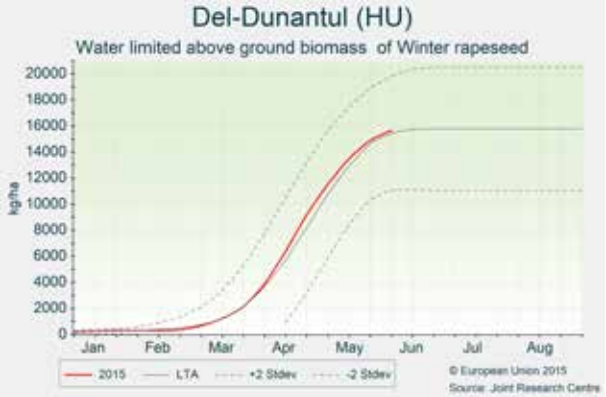
During the past 45 days, the western half of Hungary has received 60 to 90 mm of rainfall, but the Del-Dunantul region experienced 90 to 150 mm of precipitation. The eastern part of Hungary remained less rainy (30 to 70 mm).

Crop development of winter cereals is 1 to 2 weeks early due to the warm weather. This will lead to an early start to the harvest. The soil moisture content decreased sharply during April and remained below average during the first half of May, with the exception of some western territories. The mostly dry weather of this spring compromised the canopy expansion of winter crops. The ample rainfall in the second half of May was beneficial for flowering and the start of the grain filling of winter cereals, but it arrived late for oilseed-rape. The biomass accumulation and yield expectations of winter cereals are close to average. The development and growth of summer crops is slightly better than usual thanks to the beneficial rains of May.









Romania

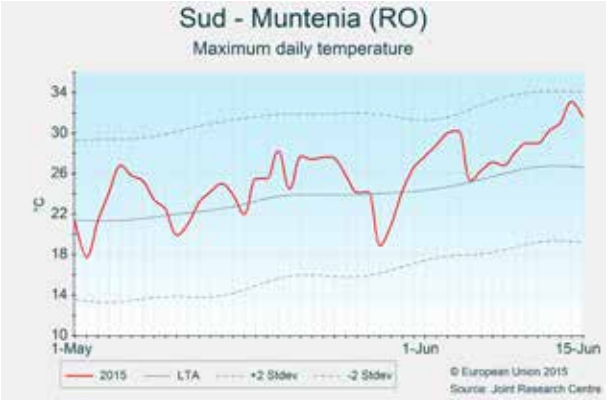
Delicate situation

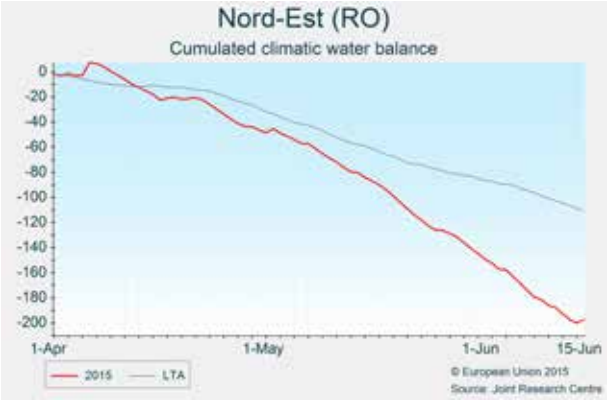
Crop conditions are generally normal and our yield forecasts are close to the average of recent years. Increasing water deficiency is worrying, however, and significant rainfall will be needed soon to sustain current yield expectations.

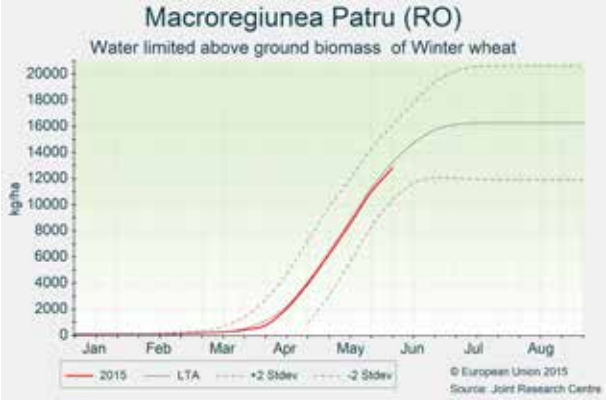
During the period of review (1 May-15 June) Romania experienced warmer-than-usual temperature conditions. The active temperature sum (Tbase = 0 °C) indicates a surplus of 50-100 GDDs compared to the long-term average. The first half of June, in particular, was continuously warmer than usual, with 5 to 8 hot days (Tmax > 30 °C) in the lowlands.

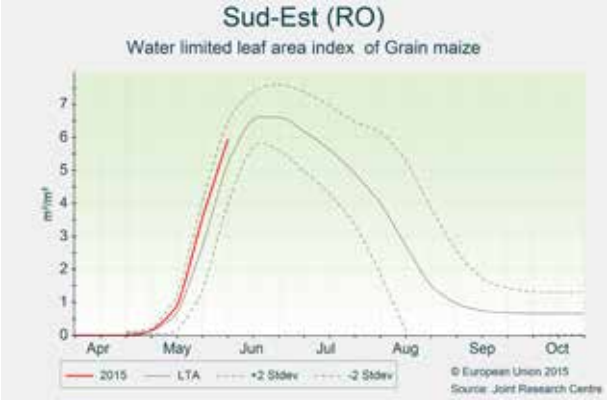
During May, rainfall exceeded the climatological average by 20 to 70 mm in north-western and central Romania. However, rainfall remained scarce in the regions to the east and south of the Carpathian mountains, where only 5 to 25 mm was recorded. Fortunately, some beneficial rainfall (20 to 50 mm) in the first half of June eased the situation to a moderate extent in Sud-Est and Sud-Muntenia, but dryness intensified in the Nord-Est region.

The development of winter wheat and barley is advanced by 5 to 15 days. Rapeseed is even more advanced and has reached the maturity stage in some areas. This season, winter wheat canopies were more weakly developed than usual, and therefore the light interception was less than optimal. The crop model simulation indicates near-average biomass accumulation for winter wheat and winter barley. The yield forecast is close to the trend, but well below last year's record levels. The early biomass accumulation and canopy expansion of maize and sunflowers has been satisfactory until now, but the situation is fragile due to high temperatures and low levels of rainfall. For the same reason, the establishment of potato and sugar beet crops was weaker than usual in the northern and north-eastern regions.









Bulgaria

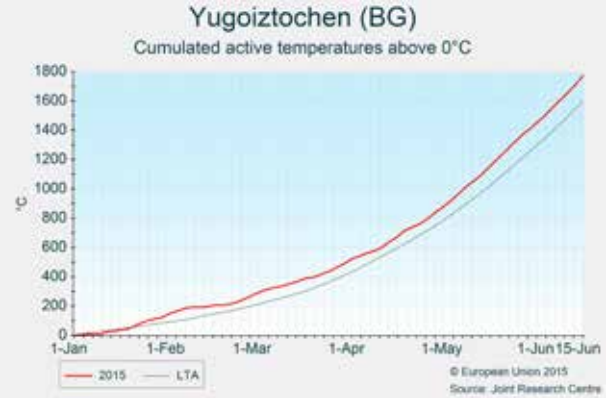
Average yield outlook for winter crops

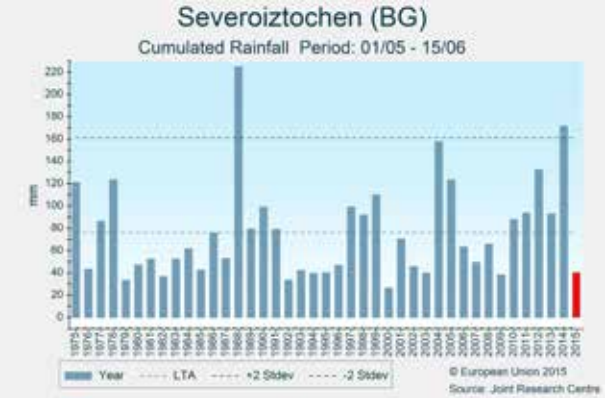
The phenological development of winter crops is advanced due to persistently above-average temperatures since the beginning of May. North-eastern Bulgaria experienced scarce rainfall, decreasing the soil moisture content to below-average levels under winter cereals, but this has so far had little effect on yield formation. Summer crops are generally in good shape.

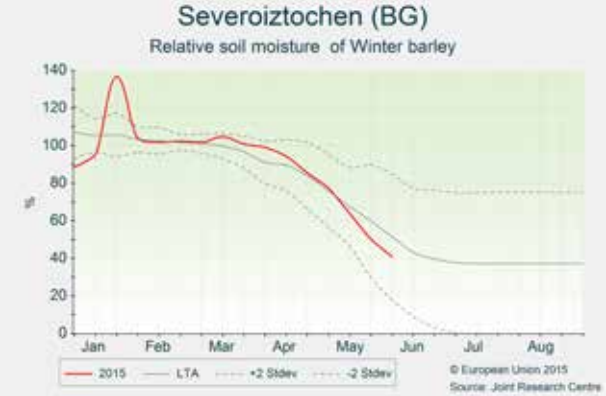
Daily temperatures between early May and mid June mostly exceeded the average, resulting in an average positive thermal anomaly of 1 to 2 °C for the period as a whole. The daily maximum temperatures remained in the normal range and no heat wave occurred. Precipitation presented large spatial variability. Rainfall has been scarce since mid April in Severoiztochen, Severen Tsentralen and eastern Yugoiztochen, resulting in a 50-70 mm rainfall deficit compared to the long-term average.

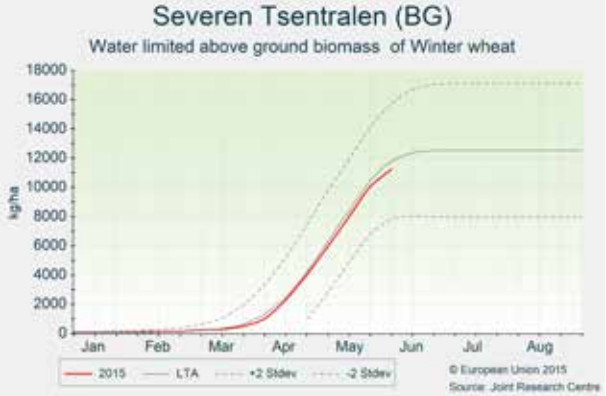
By contrast, abundant rainfall was recorded in north-western and south-eastern Bulgaria. So far, the warm and relatively dry conditions in the north-eastern regions appear to have had little effect on the yield formation of winter crops.

The development of winter crops was further accelerated due to the warm weather conditions, and they currently are in an advanced stage, reaching 7 to 15 days of precocity. An earlier-than-usual start of the harvest is foreseen this year, especially in southern Bulgaria. Good grain quality (high protein content) is expected due to dry weather conditions. The above-average thermal conditions and adequate water supply also facilitated the early growth of sunflowers and grain maize. Our crop simulation results still indicate average levels of biomass accumulation for winter cereals; our previous yield forecast is therefore maintained.









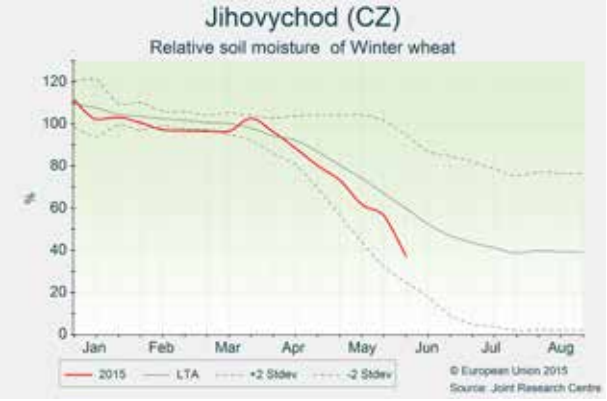
Austria, Slovakia and the Czech Republic

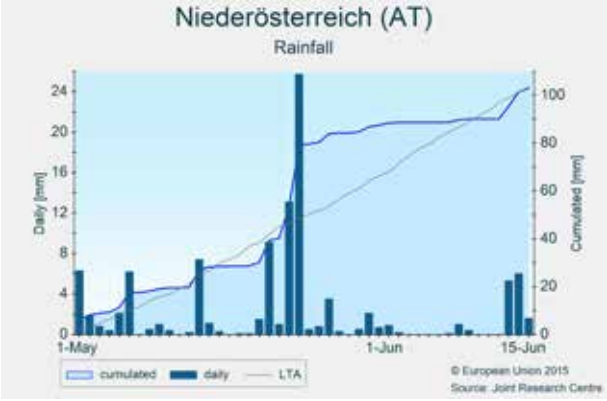
Yield outlook for winter wheat close to the 5-year average

May was slightly warmer than usual, and rainfall varied strongly across the region. The first half of June was characterised by a heat wave and sparse rainfall, exacerbating the soil moisture deficit in northern Austria, the southern Czech Republic and western Slovakia. The outlook for winter wheat yields remains close to the 5-year average.

May started with warmer-than-seasonal weather conditions. During the second dekad of May, temperatures dropped to near- or below-average levels in Slovakia and the Czech Republic. Warmer-than-usual conditions continued in Austria until the third dekad of May, when a cool air mass entered the region. By contrast, June started with a heat wave, with temperatures up to 6 °C above average. Maximum daily air temperatures reached over 30 °C in major agricultural areas. The heat wave and rainfall deficit were most pronounced in north-eastern Austria, south-western Slovakia and the southern Czech Republic. In general, rainfall has been below average since the beginning of May in the Czech Republic, north-western Austria and western Slovakia. Thunderstorms with damaging hail occurred locally, especially in central and eastern Austria.

Winter crops are slightly advanced due to warmer-than-usual conditions. In most areas, winter wheat has reached the grain-filling stage. Rainfall episodes at the end of May partially compensated for a soil moisture deficit, which worsened again during the first half of June. Reduced soil moisture is limiting the growth of winter and summer crops in Niederösterreich, Jichovychod and Zapadne Slovensko. The heat wave that occurred at the beginning of June in these areas put additional stress on winter wheat, which had entered the sensitive flowering stage. Crop yield forecasts for winter wheat remain close to the 5-year average, but more rain will be needed soon to sustain this outlook. Grain maize yields will be determined mainly by meteorological conditions in the coming months, when the crop will enter the flowering and grain-filling stages.



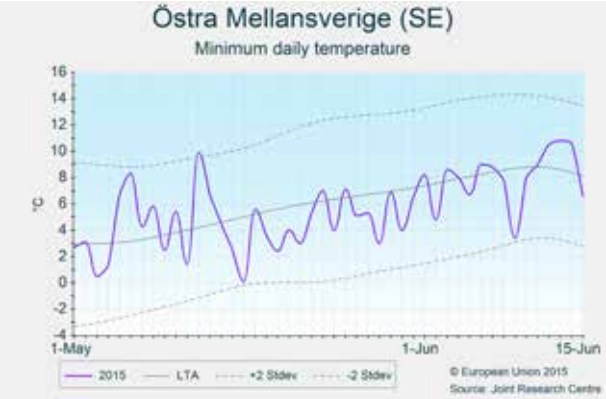


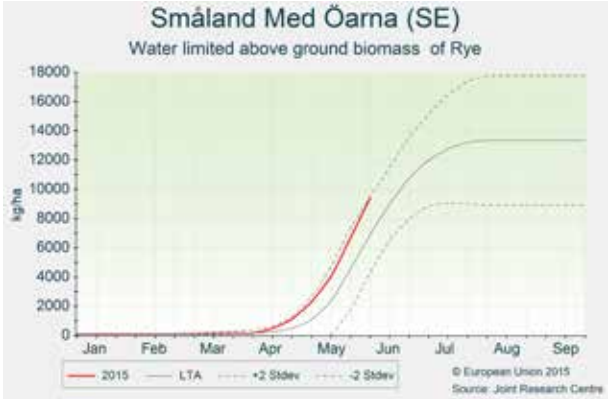
Denmark and Sweden

Slightly cooler temperatures and rainy conditions; positive yield forecast

In May, both countries experienced slightly lower-than-usual temperatures, and higher-than-usual accumulated rainfall. The plentiful rainfall received by all regions in early May greatly improved the soil moisture levels. Winter crops are forecast to be slightly above average, as they have experienced mostly favourable conditions and are expected to continue benefiting from good soil moisture.

During this period, both countries experienced temperatures that were slightly lower than the long-term average (LTA). Temperatures remained close to the LTA for most of May, but by the end of May and beginning of June temperature fell slightly below the average in all regions. This drop in temperatures was greatest in two Swedish regions, Småland Med Öarna and Östra Mallansverige. In May, both countries experienced well above-average rainfall accumulation. Rainfall ceased by the end of May and early June, avoiding prolonged excessive soil moisture levels. While the temperature conditions in both countries led to a slow-down in the development of winter crops, they remain advanced due to previous good conditions. While winter wheat reached the flowering stage in Sweden and the heading stage in Denmark, winter barley reached the flowering stage in both countries. Overall, winter crop growth conditions were good and biomass accumulation remains above average in all regions. According to model results, accumulation in the storage organs of winter rapeseed is well above average, particularly in Denmark. Rye and triticale biomass accumulation also remains well above the LTA in both countries. However, the lower temperatures were less favourable for spring crops, affecting their initial development and growth. In both Denmark and Sweden, potatoes and sugar beet present average growth and development. The spring crop forecast therefore remains near average, and the winter crop forecast remains very positive for both countries.



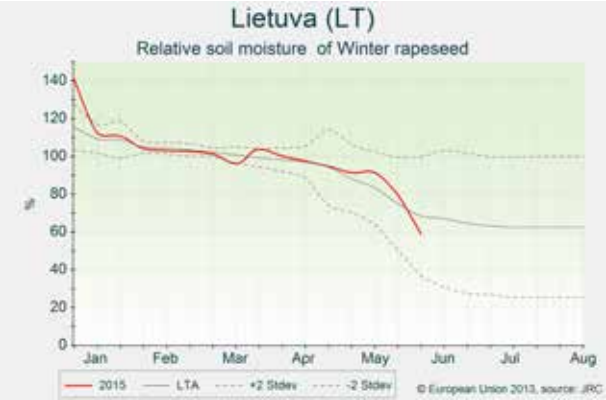


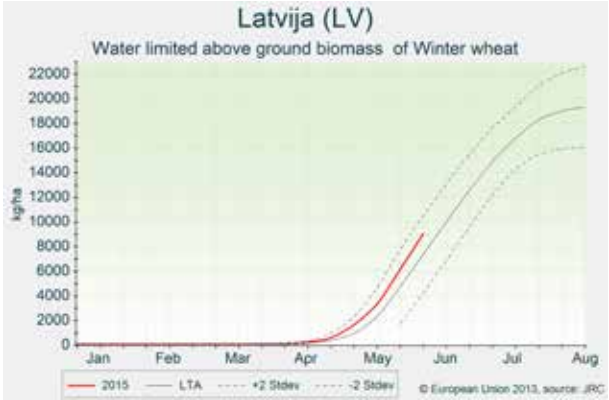
Finland, Lithuania, Latvia and Estonia

Dry start to June in the Baltics

Despite dry weather conditions, soil moisture levels are still optimal for crop growth. Overall, the yield outlook remains positive.

Cumulated temperatures in May were slightly (5-10 %) below average in the Baltic countries, whereas above-average temperatures were recorded in Finland, with the exception of Etelä, where cumulated temperatures were 7 % below average. May was unusually wet in Finland (to a lesser extent in the Etelä and Itä regions), whereas precipitation in the Baltics was slightly below the seasonal average. June started with colder-than-seasonal temperatures in Finland and dry conditions throughout the Baltics, especially in Lithuania and Latvia, where the first half of June was the driest so far in our historical database. As a consequence, soil moisture levels dropped in the past two dekads, but are still around optimal levels. Simulated crop growth indicators for winter crops also remain positive. With this scenario, the weather forecast takes on particular significance at the current point of the season for spring crops (vegetative growth) and winter crops (starting the grain-filling stage). According to our system, the weather conditions for crop growth will improve in the coming 10 days: temperatures will increase above average in the whole area and beneficial rainfall is expected across most of Lithuania and western Latvia. Scarcer precipitation is forecast in Estonia and southern Finland, but simulated soil moisture levels suggest no constraint to the development of spring crops. The yield forecasts were revised slightly upward for winter crops and slightly revised downward for spring crops compared to the previous forecast.



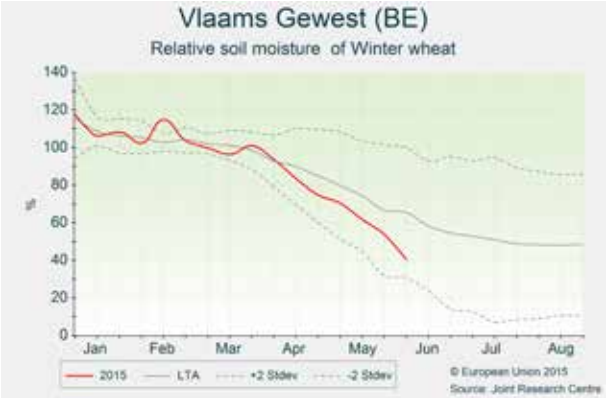


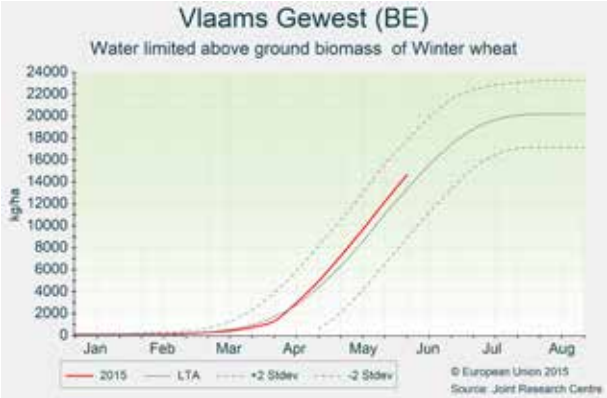
Belgium, the Netherlands and Luxembourg

Continued fairly positive outlook despite dry weather

Temperature conditions in the Benelux countries varied from relatively cool in the northern Netherlands to around average in Belgium and Luxembourg. Rainfall was below average, leading to well below-average soil water levels. Yield forecasts remain close to the trend but more rain is needed to sustain this outlook.

The period of review (1 May-15 June) was characterised by a predominance of below-average temperatures in most of the Benelux countries, except from the periods from 3 to 12 May and around 5 and 12 June, when daily averages clearly exceeded the long-term average. Daily maxima exceeding 30 °C were registered almost everywhere on 5 June, whereas light frost was common in the beginning of May. For the period as a whole, temperature sums were close to average in Belgium, Luxembourg and the southern Netherlands, and below average in the rest of the Netherlands. Rainfall was below-average throughout the region. In most areas, the rainfall deficit (compared to the long-term average) was around 30 to 40 mm for the review period, but it was much more pronounced (around 70 mm) in Luxembourg, and much less





(around 20 mm) in the northern Netherlands. Radiation levels were mostly above average, especially in June.

As a consequence, soil water levels dropped further below average and are now reaching critical values in some areas, especially Luxembourg and the southern Netherlands, where the cumulated water deficit is most pronounced. So far, however, most areas as yet present little or no evidence of water stress, thanks to the predominantly mild temperatures. Winter crops continue to follow the normal development path described in last month's bulletin. Modelled leaf area index and biomass accumulation continue to be somewhat higher than average. Sugar beet crops and maize are generally also still faring well. The yield forecasts remain very close to last month's figures. Significant precipitation, as expected for the coming days, will be needed however to sustain this outlook.

Greece and Cyprus

Warm and dry conditions limit yields of winter cereals in Greece; good yields in Cyprus

In Greece, the grain filling of winter cereals during May was unsatisfactory due to dry conditions and a lack of precipitation. The harvest is ongoing for barley and has just started for wheat. Good yields are reported for the harvesting of winter barley in Cyprus, which has almost been completed.

In May and the first half of June, temperatures in Greece fluctuated mainly above average. More specifically, May 2015 is ranked as one of the second to third warmest in our database for central-northern areas, whereas temperatures were nearer to average in the rest of the country. As precipitation was scarce for the whole country, May is also ranked as one of the driest in our database. Unfortunately, as highlighted in the last bulletin, the dry period came during the grain-filling stage — the most important development stage for winter cereals. The consequent low levels of soil moisture and unsatisfactory grain filling had negative impacts on yields. First reports from the harvesting of winter barley, which started in early June, confirm the concerns regarding lower yields. Figures have therefore been revised downwards compared to our last bulletin. The rye and soft and durum wheat harvest has just started or is about to start. Despite being delayed due to its late sowing, grain maize is progressing well.

In Cyprus, temperatures in May and the first half of June fluctuated around average values. A few rainfall events occurred around mid-May and at the end of the month. The harvesting of barley is almost complete, and that of durum wheat is still ongoing. This year's reported yields are good, mainly because rain fell at crucial development stages.

Slovenia and Croatia

Hot and dry weather conditions at the beginning of June

Warmer-than-usual conditions prevailed. Mild drought stress occurred during the first half of May but was relieved by rainfall at the end of the month. The first half of June was characterised by a heat wave and dry weather, but soil moisture levels remain favourable. The winter wheat yield forecast remains close to the 5-year average.

The first two dekads of May were characterised by substantially warmer-than-usual conditions, with average daily temperatures up to 4 °C above the long-term average. Rainfall cumulates during this period were near average in many parts of Slovenia and Croatia, except in the Mediterranean areas, where a rainfall deficit was observed. The third dekad of May was substantially colder and wetter than usual, with rainfall cumulates exceeding 100 mm in many areas of eastern Slovenia and Croatia. This situation changed after 26 May, with substantially warmer-than-seasonal weather leading to the first heat wave of the season. This heat wave was most intense in the eastern parts of both countries, as well as along the Adriatic coast. Dry conditions prevailed during the first dekad of June, followed by some beneficial rainfall in the middle of the month.

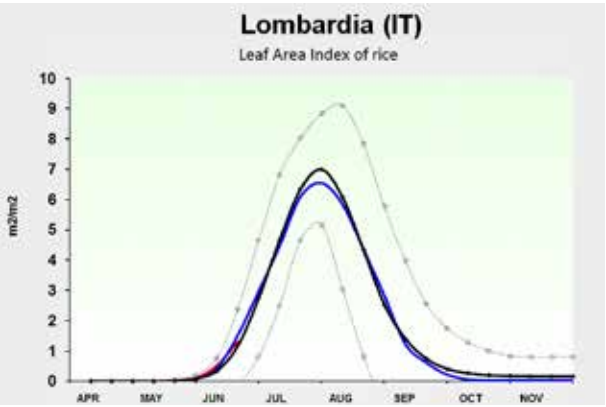
Winter crops are advanced due to predominantly warmer-than-usual conditions since the beginning of April. In most areas, winter wheat entered the grain-filling period at the beginning of June. Mild drought stress during the first two dekads of May was alleviated by beneficial rainfall in the third dekad. Since 26 May, soil moisture levels have decreased steadily but they remain above critical levels, except on shallow soils where early signs of drought stress have been observed. The crop yield outlook for winter wheat remains close to the 5-year average. While the outlook for grain maize is positive, it is still too early in the season to provide a reliable forecast. Trend values are therefore maintained for summer crops.

3.2 EU rice-producing countries

Italy

Favourable yield outlook

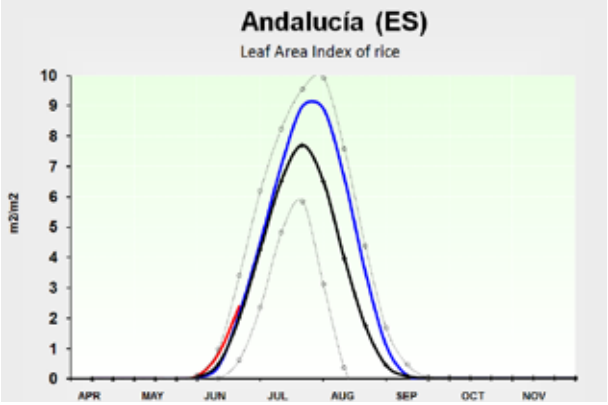
Meteorological conditions have been favourable in the most important rice-producing areas in Italy, Piemonte and Lombardia. Cumulated active temperatures and global radiation during the growing season are above the long-term average. Remote sensing analysis indicates above-average biomass accumulation, and model simulations show near-average leaf area development. The integration of the two indicators suggests a generally favourable outlook. Rainfall since May has been slightly lower than normal, ensuring a low risk of fungal infection. Therefore, the yield forecast is set above the 5-year average.



Spain

Average yield outlook overall

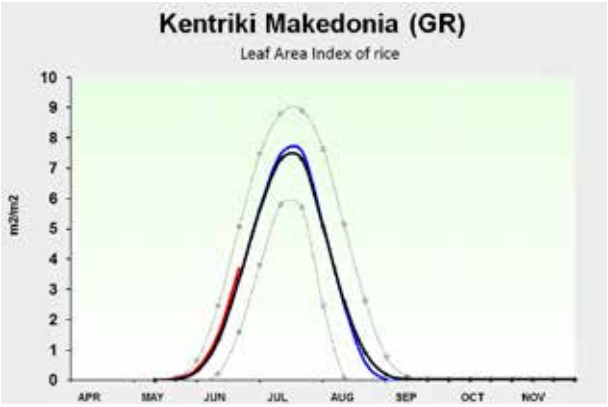
Spain has recently experienced high temperature anomalies and a significant and unusual lack of rainfall for this period. Cumulated active temperature and global radiation are high in Andalucía, Extremadura and Cataluña. The simulated leaf area index indicates good canopy development, particularly in Cataluña. The leaf area index in the southern rice-producing areas remains around average compared to the LTA. According to the model simulations, the risk of fungal infection is low due to the scarce precipitation cumulated during May and June. Therefore, the forecast is close to the 5-year average for the current season.



Greece

Good scenario for rice yields

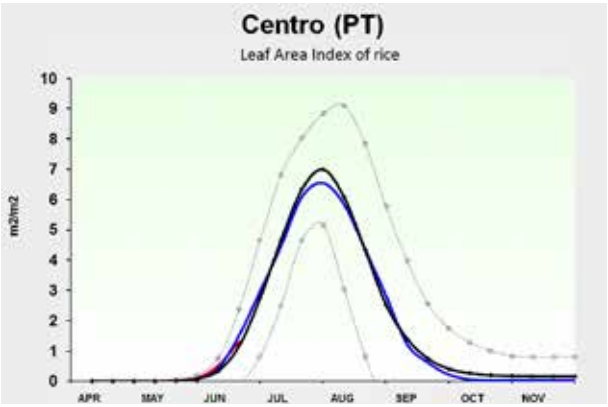
Overall, meteorological conditions in Greece have been favourable, with temperatures above the long-term average and precipitation below average since the beginning of May. Thus, the model simulations suggest near-average leaf area development and a low risk of fungal infection. Yields in line with the long-term trend are expected for the current season.



Portugal

Good crop-growth conditions

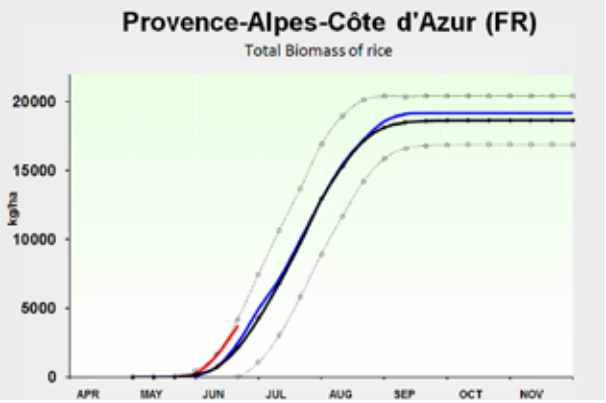
Portugal has experienced unusually warm temperatures from April to June and unusually low levels of accumulated rainfall since April. Cumulated global radiation has been around average, while cumulative active temperature (Tbase = 10) has been above average since April. The simulated growth indicators are above average, with leaf area indicating above-average growth. The fungal infection risk has been low due to the dry conditions. The yield forecast is positive and set close to the average of the past 5 years.



France

Above-average yield forecast

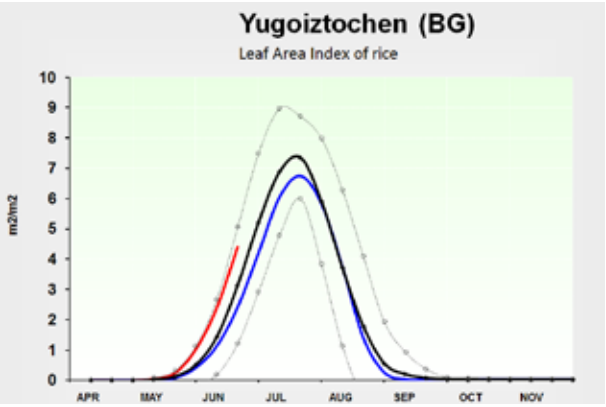
Meteorological conditions during the growing season were favourable in the main rice-producing areas in France (Languedoc-Roussillon and Provence-Alpes-Côte d'Azur). The cumulated temperature is well above average, and global radiation is the highest recorded in our database. Rainfall has been near average, implying a limited risk of fungal infection. Model simulations reflect the overall good conditions, suggesting a good yield outlook. Hence, the yield forecast is set above the 5-year average.



Bulgaria

Positive outlook for rice yields

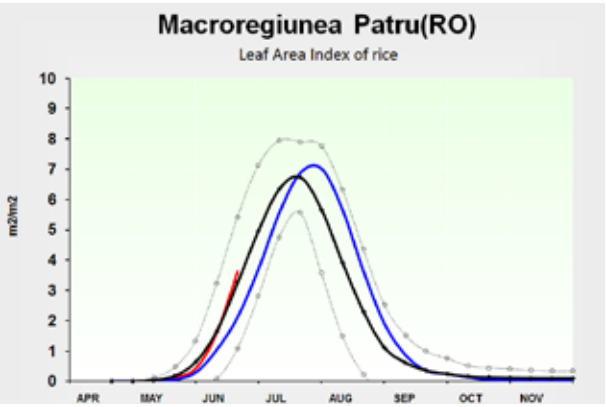
Bulgaria has experienced warmer-than-usual conditions and good accumulation of rainfall, particularly during April. These favourable temperatures and abundant rainfall at the start of the rice season are promising for optimal crop growth and development. Model simulations show above-average leaf area development and biomass accumulation. Fungal infection risk has been low. As it is early in the season, the forecast is based on the statistical trend, and is set above the 5-year average.



Romania

Crop growth conditions near average

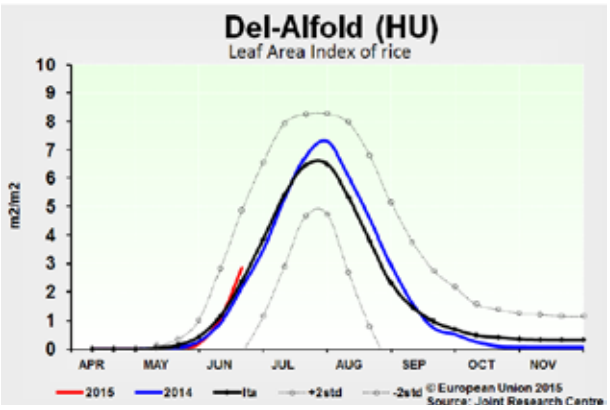
Sufficient water supply has been ensured by above-average rainfall until May, and well-distributed precipitation since then. Since the middle of May, thermal conditions have been slightly warmer than average, whereas cumulated global radiation remained close to average. The simulated growth indicators are near average. Thus, the yield forecast is close to the trend.



Hungary

Average conditions

Overall, meteorological conditions have been favourable for rice in Hungary, with temperatures above average particularly during the end of May and June. The accumulated rainfall was below average from mid-April until June in both rice-producing regions, Del-Alfold and Essay-Alfold. Model simulations suggest above-average crop development, presenting leaf area development levels that indicate a good start to the season. Fungal infection risk has been low due to the scarcity of rainfall. Due to the early stage of the crop season, the yield forecast is only based on the yield statistics trends, and is set close to average yield levels for this year.



3.3 Black Sea area

Ukraine

Good yield outlook

All crops benefited from favourable thermal conditions and high soil water contents. The yield outlook for winter crops is above the 5-year average and may be raised further if good conditions continue. Grain maize is also faring well but spring barley was affected by the rainy conditions during sowing.

Temperatures during the first two dekads of May stayed close to the average throughout the country and increased after the third dekad of May, to 2-3 °C above the average in the western oblasts, and 1.5-2 °C above the average in the eastern oblasts. Rainfall since 1 May has been slightly below the long-term average in the whole country. Since the beginning of the year, cumulated rainfall has been near or slightly above the average in the central and eastern oblasts, and slightly below average in the western parts of the country. These agro-meteorological conditions were favourable to crops, with temperatures close to the average and adequate water supply. Winter wheat yields are forecast to be above average but below last year's record. If the good conditions continue, the forecast may be reviewed upwards, closer to last year's yield. Winter barley conditions are favourable but spring barley may have been negatively affected by the delays to sowing caused by substantial rainfall. Grain maize is benefiting from a good start to the season, with optimal temperatures and a good water supply, particularly in central Ukraine where most of the maize is produced.

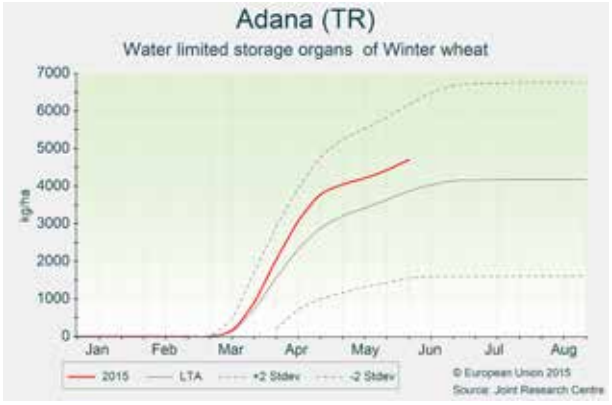
Turkey

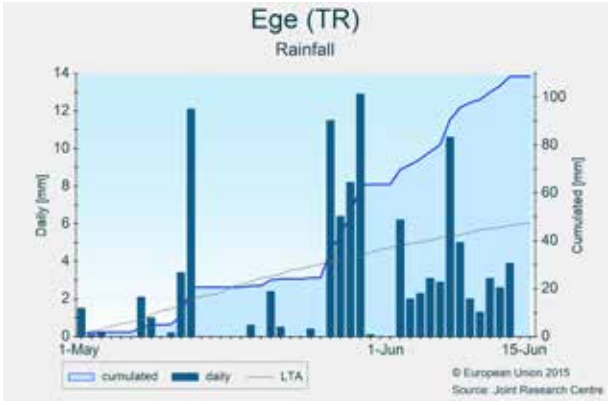
Warm period for the whole country; harvesting of winter cereals is ongoing

The period since the beginning of May has been characterised by above-average temperatures, especially in eastern Turkey. Abundant rainfall occurred during the first dekad of June in western areas. The harvesting of winter cereals is ongoing, and good yields are being reported.

Cumulated active temperatures were above average throughout the country for the period of review (1 May-15 June). The warmest conditions were observed in eastern areas (e.g. Dogu Karadeniz, Kuzeydogu Anadolu, Ortadogu Anadolu), with temperature sums 12-15 % above average. Since the beginning of June, temperatures have been gradually decreasing to average values or even slightly below in western regions (e.g. Ege). Around 20 May the regions of Samsun, Kirikkale and Adana experienced unusually high maximum temperatures, exceeding 32 °C. Regarding precipitation, eastern areas experienced several rainy days during the first two dekads of May, followed by an almost dry period until 15 June. In these areas, the cumulated levels of rainfall since the beginning of June have been below average. The picture is reversed in the western parts of the country, where May was almost dry until 25 May, and since then several rainfall events occurred, especially in the first dekad of June. In these parts of the country, the cumulated levels of rainfall are above average.

Our model simulations present a high storage organ biomass of winter cereals as a result of adequate water availability in the important agricultural regions. Harvesting started in late May for winter wheat (e.g. Cukurova) and somewhat earlier for winter barley. However, frequent rains hampered the progress of harvesting in southern regions. Good yields and good grain quality are reported. Our forecasts for winter cereals are revised upwards compared to the last bulletin. Grain maize, which is mainly irrigated, is progressing well.





3.4. European Russia and Belarus

European Russia

Hot and dry conditions starting to affect crop growth

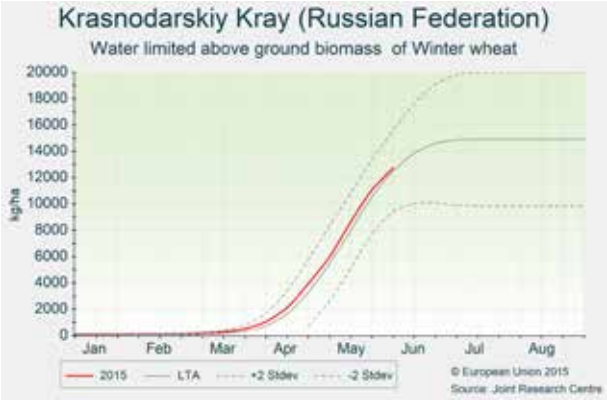
High temperatures and scarce precipitation led to a quick decrease in soil moisture levels in southern Russia. The unfavourable weather conditions negatively affected the biomass accumulation and yield formation of winter cereals. If the drought continues, yield expectations will decrease considerably.

The first two dekads of May were characterised by near-normal or slightly colder-than-usual thermal conditions in the southern half of Russia. Since the last dekad of May, temperatures generally exceeded the average, resulting in 1-4 °C positive thermal anomalies for the period as a whole. Maximum temperatures reached 32-36 °C, and there were 4 to 10 more hot days (Tmax > 30 °C) than usual in the regions close

to the Caspian Sea and further along the Kazakh border. This heat wave adversely affected winter wheat crops, which were in the flowering or the early grain-filling stages.

While precipitation was frequent and abundant in April and during the first dekad of May in the southern and central territories of Russia, rainfall levels decreased significantly from mid-May. The precipitation sum over the past 30 days indicates a deficit of 30-60 mm (compared to the long-term average) in the Black Earth region and southern Russia. Only the eastern half of the Near Volga Okrug and northern Russia experienced near- or above-average precipitation levels.

The warm weather led to the advanced crop development of winter cereals. During May, the soil moisture content under winter wheat crops decreased sharply in the regions characterised by scarce precipitation and high daytime temperatures. The winter wheat model simulations indicate near-average biomass in the regions north of the Caucasus, but reduced biomass assimilation in the eastern part of the Southern Federal District and in the south-western part of the Near Volga Okrug. Remote sensing observations confirm this picture. The growth and development of spring crops is adequate so far.



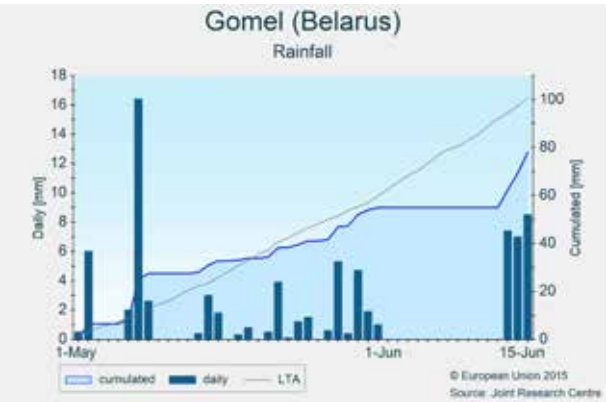
Belarus

Positive yield outlook

Temperatures were close to average, allowing winter crops to maintain the advanced development stages that they attained in early spring. While a lack of rain in south-eastern regions led to a decrease in soil moisture, this does not yet give rise to concern. Average conditions for spring crops.

Average daily temperatures characterised the period 1 May-15 June across the country. However, as cumulated active temperatures (base temperature 0 °C) from January have remained above the long-term average, winter crops have maintained the advanced level of development gained at the beginning of the current season.

Although cumulated precipitation was close to average in most of the country, south-eastern regions experienced a lack of rain from the end of May. In particular, about 80 mm of rain was cumulated from the beginning of May in the province of Gomel, which is 20 mm less than usual. Soil moisture was decreasing quite sharply in these areas, but some rainy days during mid-June were beneficial for replenishing soil water content. However, as confirmed by our model simulations and remote sensing indicators, neither winter nor spring crops were affected by the decrease in soil moisture. In particular, winter wheat presents above-average biomass and leaf area indices, while spring crop indicators are close to average. Consequently, the yield forecasts for winter wheat are still above the historical trend, but lower than the last record year. At this early stage close-to-average yields are forecast for spring crops.



3.5 Maghreb

Morocco, Algeria and Tunisia

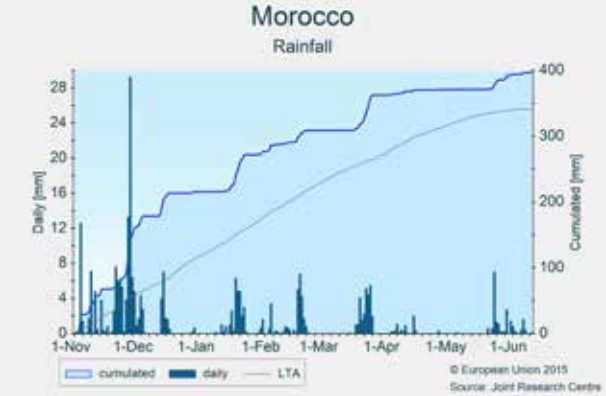
Some rain in the last few weeks, but still warm

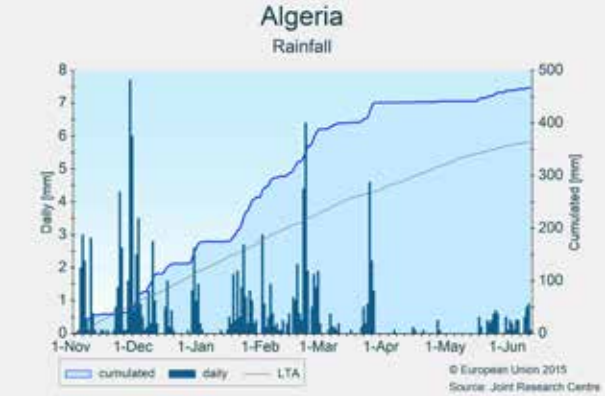
Recent rain in Morocco, Algeria and Tunisia will have alleviated the hot and dry conditions experienced over the past couple of months, although temperatures are still relatively high. Yields are not expected to have been seriously affected.

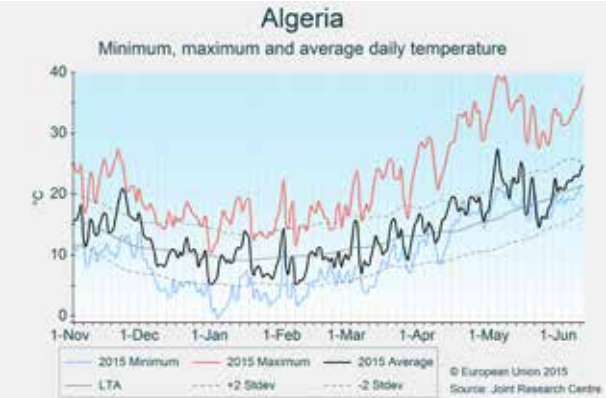
Morocco has received good amounts of rain over the course of the season, but there have been a number of shorter periods with no rain (January, March and April-May). Despite this, the seasonal total for rainfall is above average, which can be expected to indicate good yield prospects. NDVI indicators suggest that cereals have not been adversely affected by these conditions, and more recent rain at the end of May should have helped. Yield forecasts are quite positive.

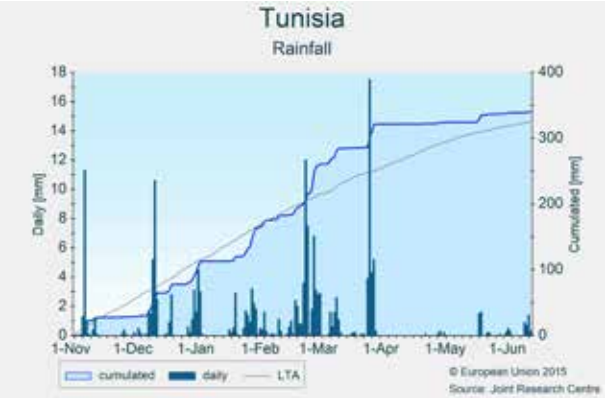
Total seasonal rainfall in Algeria has also been well above average, although there was very little rain in April and May. Temperatures were also well above average over this period. However, as in Morocco, rain since the end of May will have alleviated the situation. Simulated soil moisture has remained above the long-term average for much of the season, and there are no noticeable effects in Algeria's NDVI profile. Yield and production levels are expected to be positive.

Rainfall has been close to the long-term average for much of the season in Tunisia, with a good amount at the very start and then regular rainfall until the beginning of April. The seasonal total is close to the long-term average. Again, very little rain fell during April and May, when it was also very warm. However, simulated soil moisture remained at an adequate level over this period, and NDVI continued to increase through April. It would appear that yield and production levels have not been substantially affected, and forecasts (although lower than 2014) are still above the 5-year average.









4. Crop yield forecasts

Country	TOTAL WHEAT t/ha					TOTAL BARLEY t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	5.90	**5.62**	5.43	-4.8	+3.3	4.90	**4.65**	4.51	-5.1	+3.0
AT	5.92	**5.42**	5.26	-8.4	+3.1	5.80	**5.21**	5.03	-10.2	+3.6
BE	9.41	**8.78**	8.75	-6.7	+0.3	9.30	**8.78**	8.65	-5.6	+1.5
BG	4.22	**4.04**	3.93	-4.2	+2.8	4.00	**3.86**	3.72	-3.5	+3.7
CY	-	**-**	-	-	-	2.44	**2.57**	1.96	+5.3	+31.3
CZ	6.51	**5.63**	5.48	-13.5	+2.7	5.61	**4.43**	4.57	-21.0	-3.0
DE	8.63	**7.77**	7.63	-9.9	+1.8	7.35	**6.56**	6.36	-10.7	+3.1
DK	7.78	**7.30**	7.07	-6.2	+3.3	5.87	**5.69**	5.52	-3.1	+3.0
EE	3.99	**3.54**	3.37	-11.3	+5.2	3.64	**2.92**	2.94	-19.7	-0.4
ES	2.99	**2.95**	3.09	-1.4	-4.5	2.49	**2.51**	2.66	+0.8	-5.6
FI	4.05	**3.74**	3.69	-7.7	+1.1	3.73	**3.45**	3.44	-7.3	+0.4
FR	7.36	**7.41**	7.01	+0.6	+5.7	6.65	**6.77**	6.38	+1.7	+6.1
GR	3.08	**2.77**	2.85	-10.0	-2.9	3.05	**2.70**	2.96	-11.5	-8.7
HR	4.14	**5.26**	4.70	+27.3	+12.0	3.82	**4.68**	4.14	+22.5	+13.1
HU	4.71	**4.19**	4.21	-10.9	-0.4	4.45	**3.94**	3.88	-11.4	+1.7
IE	9.99	**9.16**	8.84	-8.3	+3.7	8.00	**7.84**	7.37	-2.1	+6.3
IT	3.81	**3.77**	3.84	-1.2	-2.0	3.64	**3.62**	3.66	-0.5	-1.0
LT	4.56	**4.11**	4.13	-9.8	-0.3	3.80	**3.15**	3.21	-17.2	-1.8
LU	6.13	**6.39**	5.98	+4.2	+6.9	-	**-**	-	-	-
LV	3.75	**3.69**	3.60	-1.6	+2.3	3.56	**2.65**	2.94	-25.5	-9.7
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	9.11	**8.91**	8.80	-2.2	+1.3	6.75	**6.33**	6.19	-6.2	+2.3
PL	4.97	**4.54**	4.32	-8.8	+5.0	4.05	**3.81**	3.49	-5.9	+9.2
PT	2.06	**1.65**	1.49	-19.9	+10.3	2.18	**1.63**	1.57	-25.2	+4.1
RO	3.65	**3.17**	3.23	-13.2	-1.8	3.36	**2.86**	2.91	-14.8	-1.6
SE	6.80	**6.27**	5.95	-7.8	+5.5	4.78	**4.69**	4.45	-1.8	+5.6
SI	5.23	**5.11**	5.02	-2.4	+1.9	4.85	**4.35**	4.48	-10.4	-3.0
SK	5.47	**4.42**	4.34	-19.3	+1.7	4.87	**3.56**	3.66	-27.0	-2.9
UK	8.58	**8.14**	7.63	-5.1	+6.7	6.40	**6.12**	5.83	-4.4	+5.0

Country	SOFT WHEAT t/ha					DURUM WHEAT t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	6.14	**5.85**	5.67	-4.7	+3.3	3.34	**3.22**	3.26	-3.6	-1.1
AT	5.98	**5.46**	5.30	-8.6	+3.2	4.78	**4.58**	4.50	-4.2	+1.7
BE	9.41	**8.78**	8.75	-6.7	+0.3	-	**-**	-	-	-
BG	4.22	**4.05**	3.94	-4.1	+2.7	3.66	**3.40**	3.18	-7.0	+6.8
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	6.51	**5.63**	5.48	-13.5	+2.7	-	**-**	-	-	-
DE	8.64	**7.78**	7.64	-9.9	+1.8	-	**-**	-	-	-
DK	7.78	**7.30**	7.07	-6.2	+3.3	-	**-**	-	-	-
EE	3.99	**3.54**	3.37	-11.3	+5.2	-	**-**	-	-	-
ES	3.04	**3.06**	3.31	+0.4	-7.5	2.67	**2.31**	2.09	-13.6	+10.6
FI	4.05	**3.74**	3.69	-7.7	+1.1	-	**-**	-	-	-
FR	7.48	**7.54**	7.16	+0.7	+5.4	5.20	**5.27**	5.14	+1.4	+2.5
GR	3.31	**2.91**	3.04	-12.3	-4.3	2.96	**2.70**	2.78	-8.8	-2.8
HR	4.14	**5.26**	4.70	+27.3	+12.0	-	**-**	-	-	-
HU	4.71	**4.20**	4.21	-10.9	-0.4	4.55	**4.17**	4.03	-8.3	+3.5
IE	9.99	**9.16**	8.84	-8.3	+3.7	-	**-**	-	-	-
IT	5.29	**5.45**	5.38	+2.9	+1.2	3.13	**3.03**	3.13	-3.5	-3.2
LT	4.56	**4.11**	4.13	-9.8	-0.3	-	**-**	-	-	-
LU	6.13	**6.39**	5.98	+4.2	+6.9	-	**-**	-	-	-
LV	3.75	**3.69**	3.60	-1.6	+2.3	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	9.11	**8.91**	8.80	-2.2	+1.3	-	**-**	-	-	-
PL	4.97	**4.54**	4.32	-8.8	+5.0	-	**-**	-	-	-
PT	2.06	**1.65**	1.49	-19.9	+10.3	-	**-**	-	-	-
RO	3.65	**3.17**	3.23	-13.2	-1.8	-	**-**	-	-	-
SE	6.80	**6.27**	5.95	-7.8	+5.5	-	**-**	-	-	-
SI	5.23	**5.11**	5.02	-2.4	+1.9	-	**-**	-	-	-
SK	5.47	**4.42**	4.34	-19.3	+1.7	-	**-**	-	-	-
UK	8.58	**8.14**	7.63	-5.1	+6.7	-	**-**	-	-	-

Country	SPRING BARLEY t/ha					WINTER BARLEY t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	4.16	**3.95**	3.90	-4.9	+1.2	5.92	**5.60**	5.39	-5.4	+3.8
AT	4.68	**4.36**	4.13	-6.9	+5.4	6.67	**5.93**	5.87	-11.2	+1.1
BE	-	**-**	-	-	-	9.30	**8.78**	8.65	-5.6	+1.5
BG	-	**-**	-	-	-	4.00	**3.86**	3.72	-3.5	+3.7
CY	-	**-**	-	-	-	2.44	**2.57**	1.96	+5.3	+31.3
CZ	5.56	**4.25**	4.52	-23.5	-6.0	5.74	**4.87**	4.69	-15.2	+3.8
DE	5.98	**5.49**	5.38	-8.1	+2.1	7.73	**6.88**	6.71	-11.1	+2.5
DK	5.68	**5.48**	5.41	-3.5	+1.4	6.63	**6.64**	6.01	+0.1	+10.5
EE	3.64	**2.92**	2.94	-19.7	-0.4	-	**-**	-	-	-
ES	2.58	**2.56**	2.70	-0.5	-4.9	1.91	**2.19**	2.44	+14.7	-10.0
FI	3.73	**3.45**	3.44	-7.3	+0.4	-	**-**	-	-	-
FR	6.12	**6.47**	6.03	+5.7	+7.4	6.88	**6.87**	6.52	-0.1	+5.4
GR	-	**-**	-	-	-	3.05	**2.70**	2.96	-11.5	-8.7
HR	-	**-**	-	-	-	3.82	**4.68**	4.14	+22.5	+13.1
HU	3.89	**3.47**	3.36	-10.8	+3.1	4.67	**4.15**	4.15	-11.2	+0.0
IE	7.50	**7.21**	6.97	-3.8	+3.5	9.30	**9.09**	8.85	-2.4	+2.7
IT	-	**-**	-	-	-	3.64	**3.62**	3.66	-0.5	-1.0
LT	3.80	**3.15**	3.21	-17.2	-1.8	-	**-**	-	-	-
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	3.56	**2.65**	2.94	-25.5	-9.7	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	6.75	**6.33**	6.19	-6.2	+2.3	-	**-**	-	-	-
PL	3.82	**3.69**	3.34	-3.4	+10.3	4.67	**4.30**	4.07	-8.0	+5.7
PT	-	**-**	-	-	-	2.18	**1.63**	1.57	-25.2	+4.1
RO	2.44	**2.33**	2.09	-4.8	+11.0	3.69	**3.11**	3.28	-15.7	-5.2
SE	4.71	**4.60**	4.40	-2.4	+4.5	6.41	**6.66**	5.46	+3.8	+21.8
SI	-	**-**	-	-	-	4.85	**4.35**	4.48	-10.4	-3.0
SK	4.78	**3.46**	3.61	-27.6	-4.1	5.24	**3.91**	3.99	-25.3	-2.0
UK	5.86	**5.68**	5.37	-3.1	+5.7	7.22	**6.72**	6.57	-6.8	+2.3

Country	GRAIN MAIZE t/ha					RYE t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	8.08	**7.22**	7.02	-10.6	+2.8	4.24	**3.81**	3.58	-10.1	+6.4
AT	10.79	**10.49**	10.16	-2.8	+3.2	4.87	**4.18**	4.25	-14.0	-1.6
BE	10.50	**11.24**	10.98	+7.0	+2.3	-	**-**	-	-	-
BG	7.68	**5.58**	5.77	-27.3	-3.2	-	**-**	-	-	-
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	8.43	**7.53**	7.74	-10.7	-2.7	4.99	**4.78**	4.61	-4.3	+3.7
DE	10.69	**10.20**	10.00	-4.5	+2.0	6.12	**5.45**	5.31	-10.9	+2.7
DK	-	**-**	-	-	-	6.36	**6.08**	5.83	-4.5	+4.2
EE	-	**-**	-	-	-	3.22	**2.94**	2.67	-8.6	+10.3
ES	11.24	**11.17**	10.90	-0.6	+2.5	1.72	**1.87**	2.05	+8.7	-8.8
FI	-	**-**	-	-	-	3.17	**2.87**	2.87	-9.7	-0.2
FR	10.03	**9.39**	9.19	-6.5	+2.1	4.90	**5.13**	4.91	+4.6	+4.4
GR	11.96	**11.08**	11.53	-7.3	-3.9	2.11	**1.85**	2.11	-12.2	-12.2
HR	8.11	**6.74**	6.06	-16.9	+11.1	-	**-**	-	-	-
HU	7.74	**6.60**	5.92	-14.8	+11.4	2.91	**2.57**	2.52	-11.8	+2.0
IE	-	**-**	-	-	-	-	**-**	-	-	-
IT	10.62	**9.63**	9.21	-9.3	+4.6	-	**-**	-	-	-
LT	-	**-**	-	-	-	2.25	**2.37**	2.17	+5.1	+8.8
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	3.57	**3.14**	2.90	-12.0	+8.4
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	13.06	**11.41**	11.35	-12.6	+0.5	-	**-**	-	-	-
PL	6.59	**6.56**	6.47	-0.5	+1.3	3.19	**2.97**	2.72	-7.0	+9.1
PT	8.44	**8.48**	8.05	+0.5	+5.3	0.94	**0.98**	0.87	+4.2	+12.5
RO	4.72	**3.64**	3.75	-22.9	-3.0	-	**-**	-	-	-
SE	-	**-**	-	-	-	6.51	**6.15**	5.75	-5.4	+7.0
SI	9.16	**7.91**	7.78	-13.7	+1.6	-	**-**	-	-	-
SK	8.39	**6.77**	6.47	-19.4	+4.6	3.66	**3.38**	3.29	-7.7	+2.9
UK	-	**-**	-	-	-	-	**-**	-	-	-

Country	TRITICALE t/ha					RAPE AND TURNIP RAPE t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	4.53	**4.26**	4.16	-5.8	+2.6	3.62	**3.28**	3.13	-9.4	+4.7
AT	5.90	**5.12**	5.16	-13.2	-0.9	3.76	**3.32**	3.26	-11.5	+2.1
BE	-	**-**	-	-	-	4.81	**4.43**	4.33	-7.9	+2.4
BG	3.18	**3.00**	2.87	-5.6	+4.3	2.78	**2.60**	2.47	-6.2	+5.4
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	5.03	**4.53**	4.51	-9.9	+0.5	3.95	**3.43**	3.19	-13.2	+7.4
DE	7.11	**6.19**	6.12	-13.0	+1.1	4.48	**3.96**	3.80	-11.6	+4.2
DK	6.19	**5.69**	5.27	-8.0	+8.0	4.27	**4.00**	3.76	-6.3	+6.5
EE	-	**-**	-	-	-	2.08	**1.82**	1.76	-12.4	+3.4
ES	2.33	**2.17**	2.28	-6.8	-4.9	2.46	**2.30**	2.22	-6.5	+3.3
FI	-	**-**	-	-	-	1.44	**1.40**	1.37	-2.8	+2.2
FR	5.22	**5.33**	5.30	+2.1	+0.5	3.67	**3.50**	3.37	-4.7	+3.6
GR	-	**-**	-	-	-	-	**-**	-	-	-
HR	3.63	**3.65**	3.76	+0.7	-2.8	3.10	**2.94**	2.68	-5.0	+9.9
HU	3.96	**3.59**	3.56	-9.3	+0.9	3.19	**2.58**	2.52	-19.3	+2.1
IE	-	**-**	-	-	-	-	**-**	-	-	-
IT	-	**-**	-	-	-	2.40	**2.40**	2.36	+0.0	+1.8
LT	3.29	**3.12**	3.03	-5.2	+2.9	2.33	**2.11**	2.09	-9.5	+1.0
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	1.97	**2.26**	2.11	+14.4	+7.0
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	-	**-**	-	-	-	-	**-**	-	-	-
PL	4.02	**3.79**	3.53	-5.5	+7.5	3.43	**3.22**	2.78	-6.1	+16.1
PT	1.48	**1.51**	1.25	+1.8	+20.7	-	**-**	-	-	-
RO	3.68	**3.41**	3.36	-7.3	+1.6	2.62	**2.21**	2.15	-15.6	+2.9
SE	5.92	**5.69**	5.14	-4.0	+10.7	3.38	**3.43**	2.82	+1.4	+21.6
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	3.57	**3.29**	3.24	-7.8	+1.5	3.57	**2.66**	2.53	-25.7	+5.1
UK	4.45	**4.04**	3.98	-9.3	+1.5	3.70	**3.53**	3.49	-4.9	+0.9

Country	SUGAR BEETS t/ha					POTATO t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	76.52	**73.52**	70.35	-3.9	+4.5	33.62	**33.34**	31.31	-0.8	+6.5
AT	83.87	**68.55**	71.96	-18.3	-4.7	35.10	**33.17**	32.15	-5.5	+3.2
BE	81.75	**77.92**	76.05	-4.7	+2.5	54.00	**45.67**	46.89	-15.4	-2.6
BG	-	**-**	-	-	-	-	**-**	-	-	-
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	70.28	**67.09**	62.19	-4.5	+7.9	29.07	**29.91**	27.25	+2.9	+9.7
DE	79.86	**72.11**	70.36	-9.7	+2.5	47.42	**45.63**	43.54	-3.8	+4.8
DK	59.70	**60.13**	62.65	+0.7	-4.0	43.12	**37.02**	39.91	-14.2	-7.3
EE	-	**-**	-	-	-	-	**-**	-	-	-
ES	92.21	**94.22**	85.06	+2.2	+10.8	31.89	**31.90**	30.14	+0.0	+5.8
FI	38.21	**36.32**	36.25	-5.0	+0.2	27.93	**25.92**	25.80	-7.2	+0.5
FR	93.26	**93.81**	88.11	+0.6	+6.5	44.16	**46.04**	43.23	+4.2	+6.5
GR	-	**-**	-	-	-	24.51	**25.43**	25.59	+3.7	-0.7
HR	63.60	**55.19**	51.03	-13.2	+8.1	-	**-**	-	-	-
HU	66.37	**57.54**	53.47	-13.3	+7.6	26.27	**26.50**	23.82	+0.9	+11.2
IE	-	**-**	-	-	-	39.00	**35.77**	33.72	-8.3	+6.1
IT	57.01	**58.28**	57.44	+2.2	+1.5	26.20	**25.72**	25.07	-1.8	+2.6
LT	53.00	**50.78**	50.90	-4.2	-0.2	18.00	**16.18**	16.07	-10.1	+0.7
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	18.00	**17.61**	17.45	-2.1	+0.9
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	87.40	**81.41**	79.19	-6.9	+2.8	45.00	**44.69**	43.88	-0.7	+1.9
PL	54.80	**54.82**	52.16	+0.0	+5.1	23.60	**21.32**	21.40	-9.6	-0.3
PT	-	**-**	-	-	-	19.63	**18.89**	17.10	-3.8	+10.4
RO	40.99	**33.22**	34.61	-19.0	-4.0	16.73	**15.70**	14.60	-6.1	+7.5
SE	59.77	**58.84**	58.91	-1.6	-0.1	32.51	**30.50**	32.08	-6.2	-4.9
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	-	**-**	-	-	-	-	**-**	-	-	-
UK	72.49	**68.73**	67.71	-5.2	+1.5	30.01	**41.06**	38.22	+36.8	+7.4

Country	SUNFLOWER t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	2.15	**2.08**	1.91	-2.9	+9.1
AT	2.83	**2.75**	2.58	-2.9	+6.3
BE	-	**-**	-	-	-
BG	2.38	**2.31**	2.12	-3.0	+9.1
CY	-	**-**	-	-	-
CZ	2.27	**2.38**	2.36	+4.7	+0.8
DE	2.30	**1.97**	2.12	-14.4	-7.3
DK	-	**-**	-	-	-
EE	-	**-**	-	-	-
ES	1.25	**1.12**	1.14	-10.8	-2.0
FI	-	**-**	-	-	-
FR	2.37	**2.42**	2.32	+2.0	+4.4
GR	3.43	**2.68**	2.27	-21.7	+18.3
HR	2.83	**2.67**	2.51	-5.9	+6.4
HU	2.60	**2.70**	2.31	+3.8	+16.8
IE	-	**-**	-	-	-
IT	2.20	**2.25**	2.22	+2.1	+1.1
LT	-	**-**	-	-	-
LU	-	**-**	-	-	-
LV	-	**-**	-	-	-
MT	-	**-**	-	-	-
NL	-	**-**	-	-	-
PL	-	**+ + -**	-	-	-
PT	1.05	**0.63**	0.65	-40.4	-4.1
RO	2.15	**2.01**	1.72	-6.6	+16.9
SE	-	**-**	-	-	-
SI	-	**-**	-	-	-
SK	2.62	**2.29**	2.28	-12.7	+0.3
UK	-	**-**	-	-	-

Country	RICE (t/ha)				
	2014	MARS 2015 forecasts	Avg 5yrs	%15/14	%15/5yrs
EU-28	6.53	**6.86**	6.65	+5.0	+3.1
BG	4.90	**5.59**	5.28	+14.1	+6.0
ES	7.64	**7.54**	7.57	-1.3	-0.4
FR	5.00	**5.89**	5.22	+17.8	+12.8
GR	6.87	**7.44**	7.27	+8.3	+2.3
HU	3.51	**3.75**	3.67	+6.8	+2.2
IT	6.31	**6.81**	6.51	+8.0	+4.6
PT	5.71	**5.93**	5.88	+3.8	+0.8
RO	5.58	**5.30**	5.14	-5.0	+3.1

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

Sources: 2009-2015 data come from DG Agriculture and Rural Development short-term outlook data (dated May 2015, received on 2.6.2015), Eurostat Eurobase (last update: 18.5.2015) and EES (last update: 13.5.2015).
2015 yields come from MARS Crop Yield Forecasting System (output up to 20.6.2015).

Country	WHEAT (t/ha)				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs
BY	4.00	**3.54**	3.39	-11.6	+4.4
DZ	1.48	**1.72**	1.59	+15.9	+7.6
MA	1.71	**2.04**	1.65	+19.5	+23.8
TN	2.09*	**2.14**	1.91	+2.3	+12.0
TR	2.40	**2.76**	2.59	+14.9	+6.4
UA	4.03	**3.65**	3.27	-8.9	+11.8

Country	BARLEY (t/ha)				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs
BY	3.60	**3.38**	3.15	-6.2	+7.1
DZ	1.18	**1.65**	1.39	+39.9	+18.4
MA	0.97	**1.24**	1.10	+27.7	+12.6
TN	1.41	**1.51**	1.19	+6.7	+26.8
TR	2.31	**2.72**	2.56	+17.5	+6.2
UA	3.1	**2.67**	2.36	-11.4	+13.2

Country	GRAIN MAIZE (t/ha)				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs
BY	5.43	**5.69**	5.57	+4.8	+2.0
DZ	-	**-**	-	-	-
MA	-	**-**	-	-	-
TN	-	**-**	-	-	-
TR	9.07	**8.95**	7.98	-1.3	+12.1
UA	6.02	**6.13**	5.61	+0.9	+9.2

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

Sources: 2010-2014 data come from FAO, Turkish Statistical Office, PSD-online, INRA Maroc, MinAGRI Tunisia and DSASI Algeria
*2014 yields come from MARS Crop Yield Forecasting System as reported values were not available.
2015 yields come from MARS Crop Yield Forecasting System (output up to 20.4.2015).


Total wheat - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Durum wheat - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Soft wheat - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Total barley - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Winter barley - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Spring barley - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Rice - yield forecast 2015
Actual yield versus average yield 2010- 2014
lower yield (< -2 %)
comparable to average
better yield (> 2 %)


Triticale - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Rye - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Rape and turnip - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

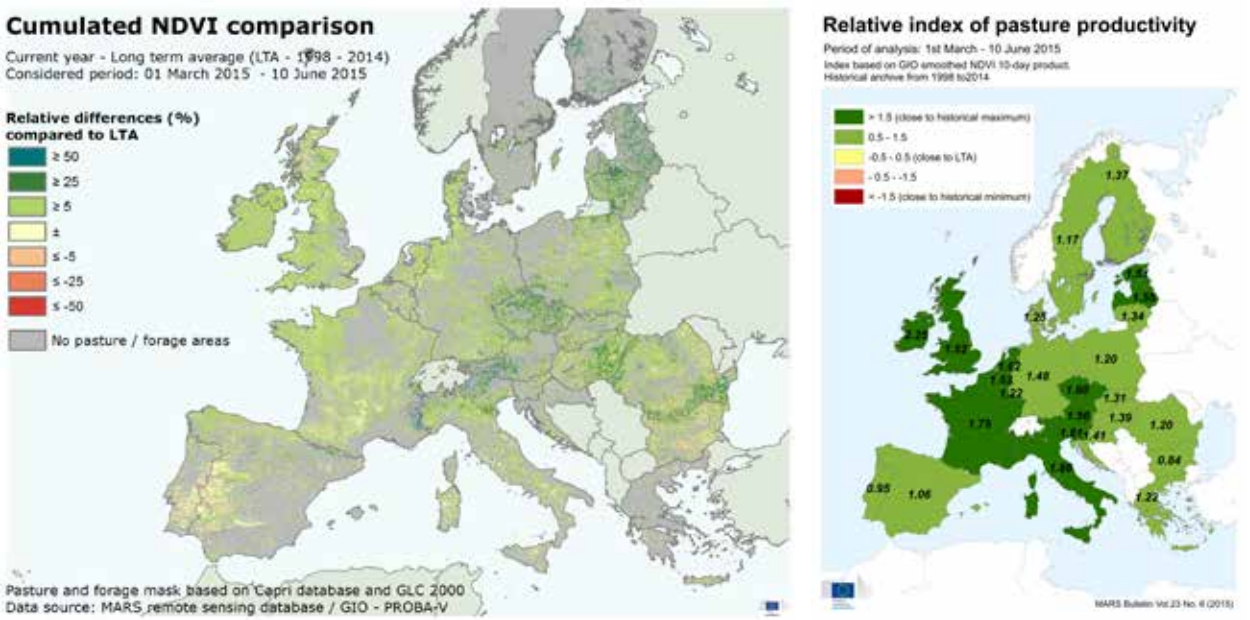

Sugar beets - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Sunflower - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

5. Pastures in Europe — Regional monitoring

High biomass production levels in most of Europe

Favourable weather conditions for grassland persisted in most of Europe, with above-average temperatures in the southern half of Europe. Rainfall was sufficient in most of the main pasture regions, except in some areas of central Europe. Biomass production in grasslands is substantially higher than average in all countries considered.



Methodological note

The relative index of pasture productivity is an indicator of biomass formation based on the integration of the NDVI remote sensing product over pasture areas at country level over a period of interest (in this bulletin from 1 March to 10 June). The spatial aggregation from remote sensing image pixels to a country-level index has been made using a pastures mask result of 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 time series from 1999 to 2014. Its values range approximately from – 3 to 3. A value of 0 indicates that biomass production in the current season is similar to the long-term average. Values higher than 2 and below – 2 indicate that biomass production in the current season is close to, respectively, the historical maximum and minimum of the period 1999-2014.

Positive outlook in northern Iberian peninsula, warm conditions benefit fodder maize growth in Italy

Grasslands in the Dehesa area between Spain and Portugal are reaching maturity, and the growing season is about to finish. Overall, the year has been slightly below average, as water scarcity and high temperatures during the past 2 months have constrained biomass production. For the country as a whole, these unfavourable conditions in the south are more than compensated for in northern Spain, where this season is characterised by abundant precipitation which, in addition to unusually high temperatures in May and June, has boosted grassland growth.

Higher-than-usual temperatures and sufficient precipitation are benefiting fodder maize development in Italy. Temperatures since May have been exceptionally high in all of the northern regions, and fodder maize development is advanced. Leaf area formation is far above that of an average year, and the rainfall registered in the first 2 weeks of June will permit maize to maintain high biomass production levels up to mid July.

Unusually high biomass production in north-western Europe

Warmer-than-usual weather conditions in central and southern France during May and June have increased biomass production from grasslands, which is currently substantially above the long-term average. Heavy rainfall at the end of April was crucial to supporting high growth rates in Limousin, Auvergne and Midi-Pyrénées. The outlook is also quite positive in the north-west of the country. Grassland growth is also above average in eastern France and most of the Benelux region, although the weather since mid-May has been slightly drier than usual, especially in Champagne-Ardenne and Lorraine.

Precipitation was abundant during May-June in most of the main pasture regions of the United Kingdom and Ireland, resulting in unusually high biomass formation. Expectations for the end of June and July are very positive, as soil moisture conditions are optimal. In central England, cumulated rainfall was below average in April, but no constraints are expected for grassland growth in the coming weeks.

Favourable progression of pasture growth in central Europe

In Germany, the positive weather conditions for pasture growth observed in spring continued during May and June. Overall, grassland biomass production is significantly above the long-term average. Southern Bayern has registered abundant rainfall since the end of April, and warmer-than-usual temperatures during the first half of May and June, which facilitated the maintenance of high biomass production rates. Similar conditions were observed in Austria. In central Germany, by contrast, precipitation has been scarce since early May, and temperatures have been close to the average. Nevertheless, the vegetative status of pastures, as indicated by remote sensing images, is extremely positive.

Weather conditions were rather chilly in the north-west, especially in the second half of May, when daily temperatures were 2 °C below the long-term average. Biomass production, however, remains substantially higher than usual, and expectations for the coming month are positive. In the Czech Republic and Slovakia, warm conditions were experienced in May and June. Heavy rainfall registered during the third week of May will support continued high production levels of grasslands for the rest of June.

The season remains positive in northern Europe

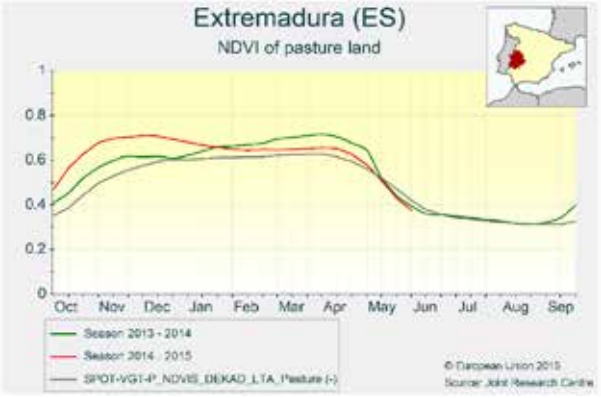
May and the first half of June were colder than usual in Denmark, in contrast to the relatively warm conditions observed in early spring. Temperatures in the second half of May were 1-2 °C below average. Precipitation was close to normal and, overall, biomass production remains high. Expectations for the rest of June and July are positive.

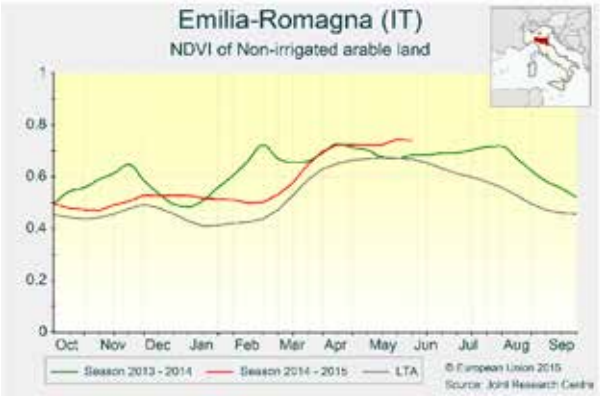
A chilly period in the second half of May was also observed in Latvia, Lithuania and Estonia. However, this did not have an appreciable effect on grassland production, which is now reaching the period of maximum leaf expansion, and total biomass formation is substantially higher than usual. In Finland and Sweden, May and June were exceptionally humid; cumulated precipitation was three times that of an average year, which will benefit biomass production rates in the coming month.

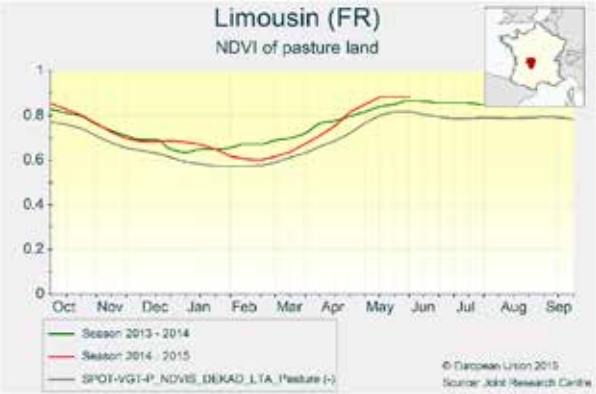
Warm conditions and rainfall boost biomass production in south-eastern Europe

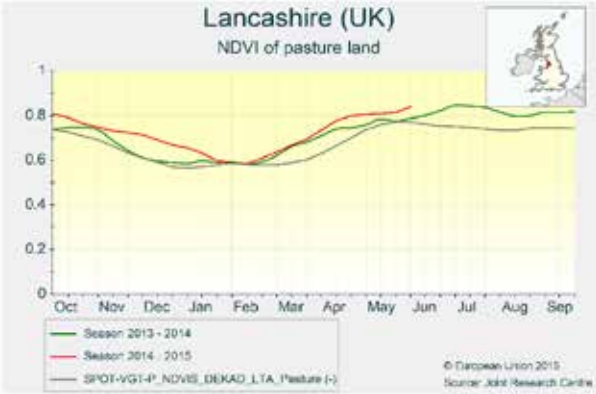
The high biomass production levels observed in Romania at the start of the season continued, favoured by higher-than-usual temperatures and adequate precipitation in May and June. Precipitation was abundant in the north-west of the country, where heavy storms at the end of May recharged soil moisture levels, thus depicting a favourable scenario for grassland growth in June and July. Fodder maize in the east and south of the country is also expected to grow without major water constraints.

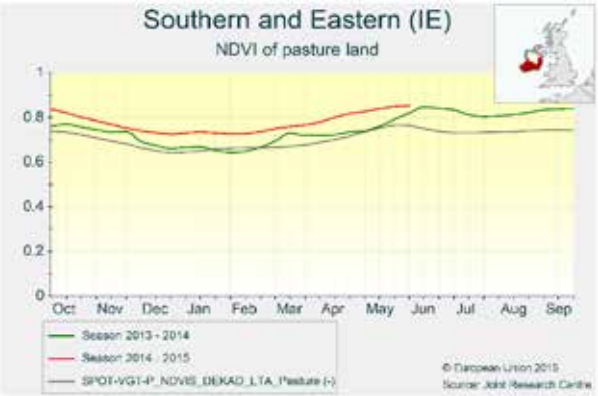
Rainfall registered in Hungary in the second half of May was crucial to avoiding severe water constraints on biomass growth after the rather dry period that had been experienced since March. The rainfall was especially plentiful in the south-west of the country, where almost 100 mm were registered in 10 days at the end of May. This gave a boost to biomass production, and leaf area formation is currently substantially above that of an average year. The outlook is also favourable for the rest of June.

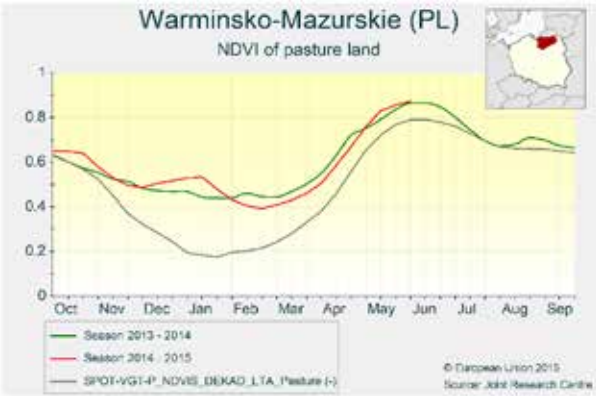


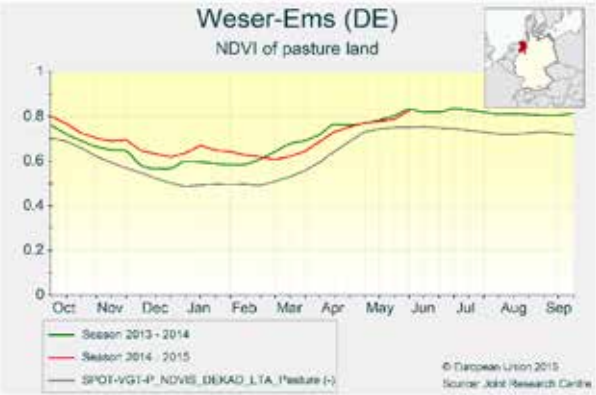


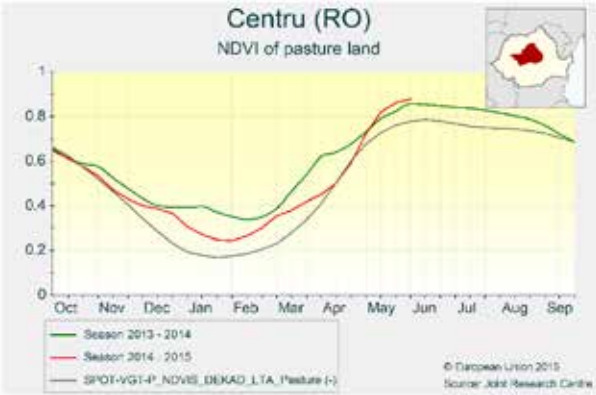

Limousin (FR)
NDVI of pasture land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
SPOT-VGT-P_NDVI8_DEKAD_LTA_Pasture (-)
© European Union 2015
Source: Joint Research Centre


Lancashire (UK)
NDVI of pasture land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
SPOT-VGT-P_NDVI8_DEKAD_LTA_Pasture (-)
© European Union 2015
Source: Joint Research Centre


Southern and Eastern (IE)
NDVI of pasture land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
SPOT-VGT-P_NDVI8_DEKAD_LTA_Pasture (-)
© European Union 2015
Source: Joint Research Centre

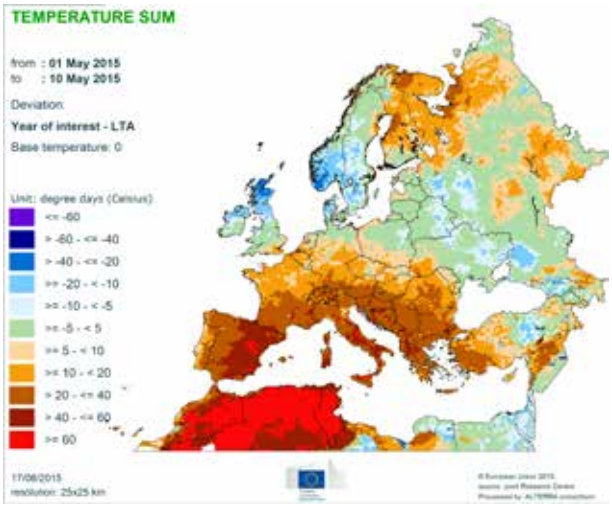

Warminsko-Mazurskie (PL)
NDVI of pasture land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
SPOT-VGT-P_NDVI8_DEKAD_LTA_Pasture (-)
© European Union 2015
Source: Joint Research Centre

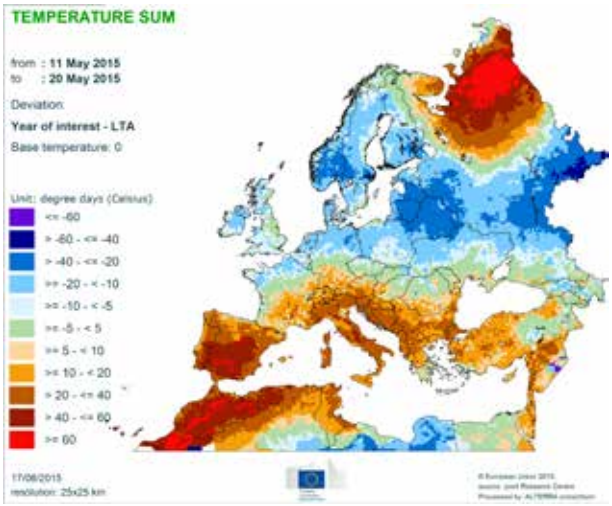

Weser-Ems (DE)
NDVI of pasture land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
SPOT-VGT-P_NDVI8_DEKAD_LTA_Pasture (-)
© European Union 2015
Source: Joint Research Centre

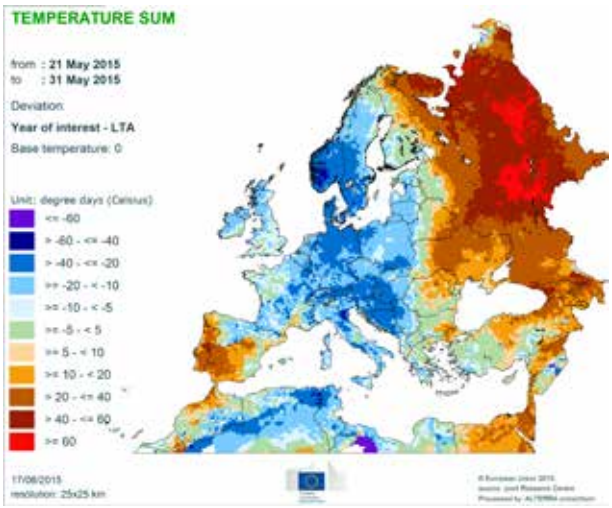

Centru (RO)
NDVI of pasture land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
SPOT-VGT-P_NDVI8_DEKAD_LTA_Pasture (-)
© European Union 2015
Source: Joint Research Centre

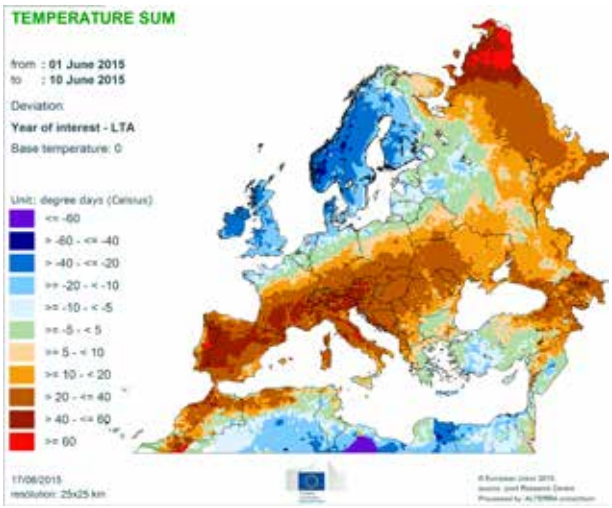
6. Atlas

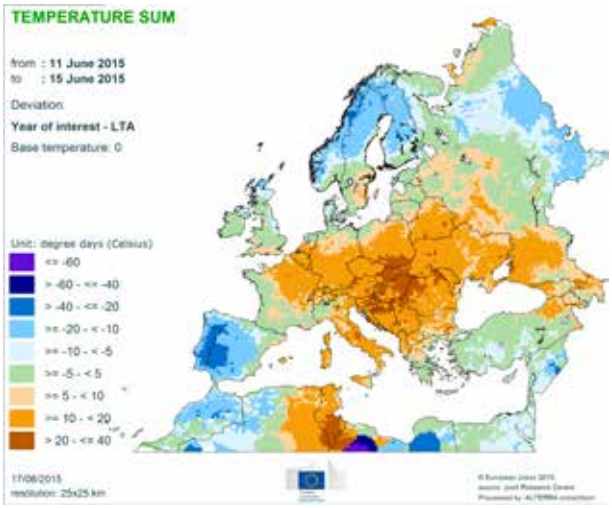
Temperatures

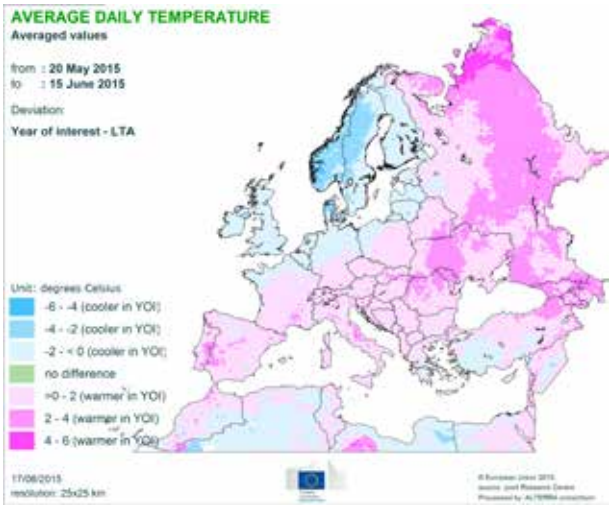




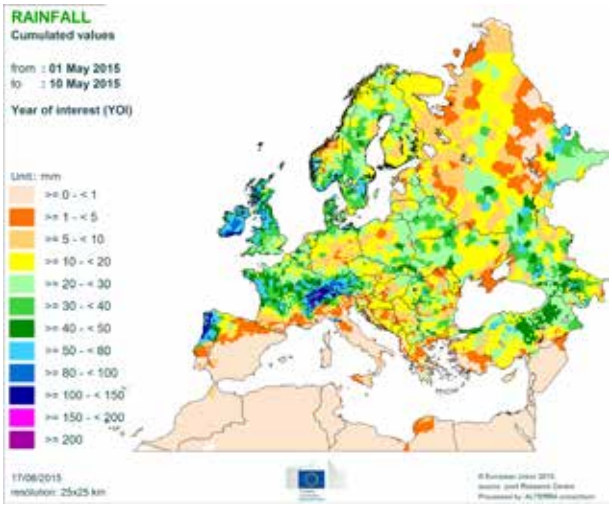


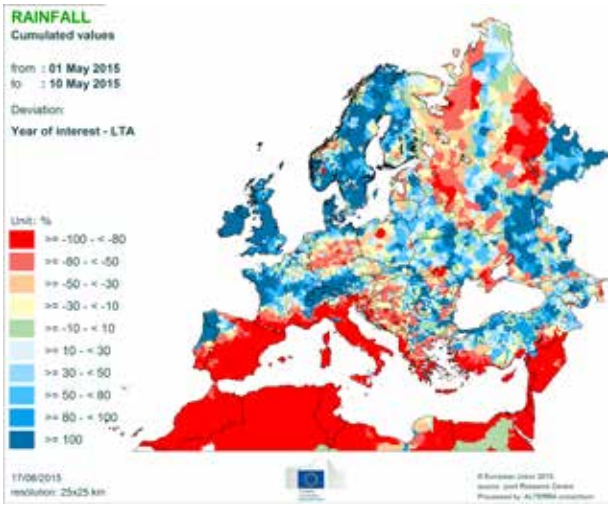


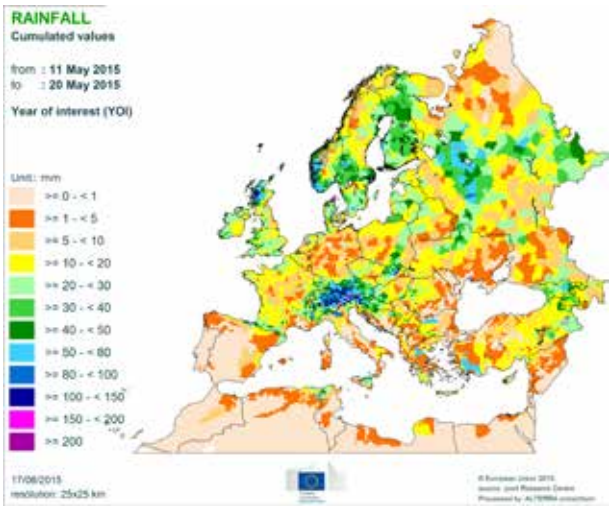


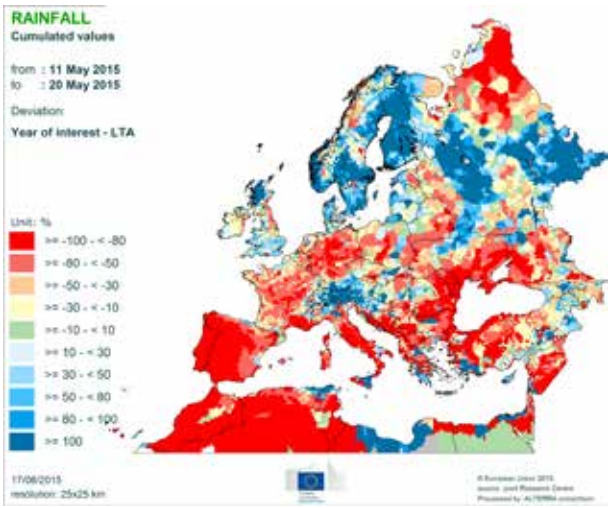


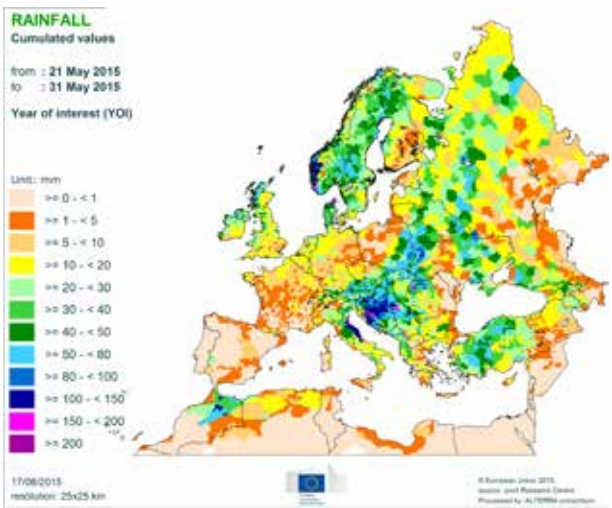
Precipitation

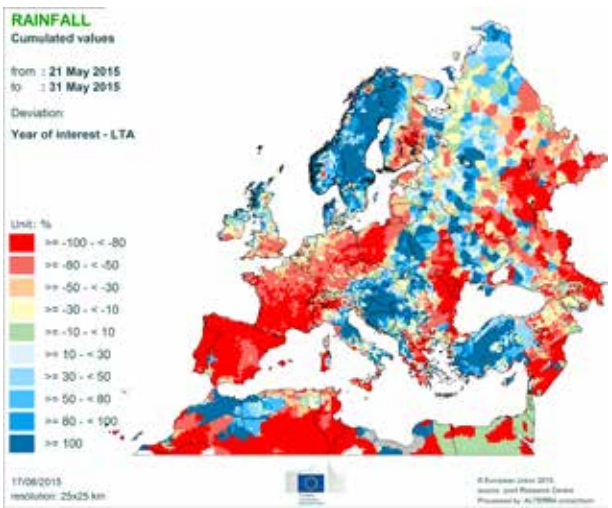


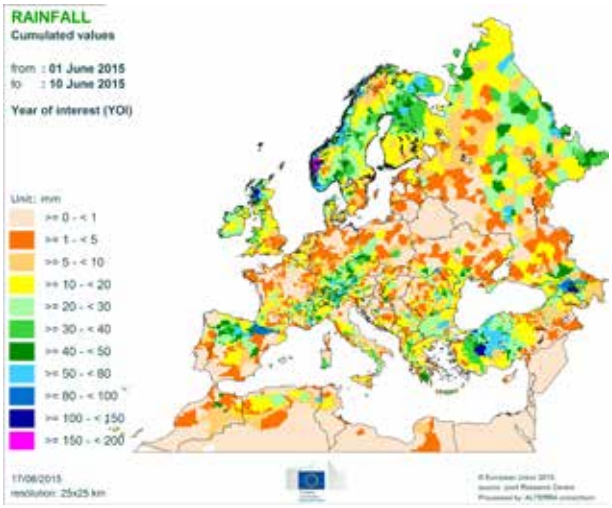


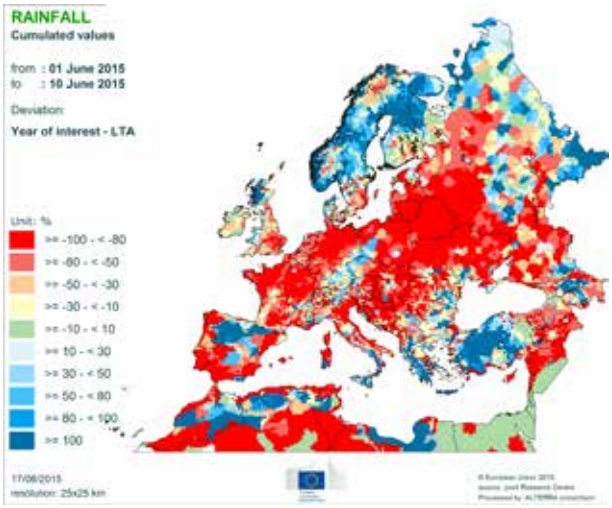


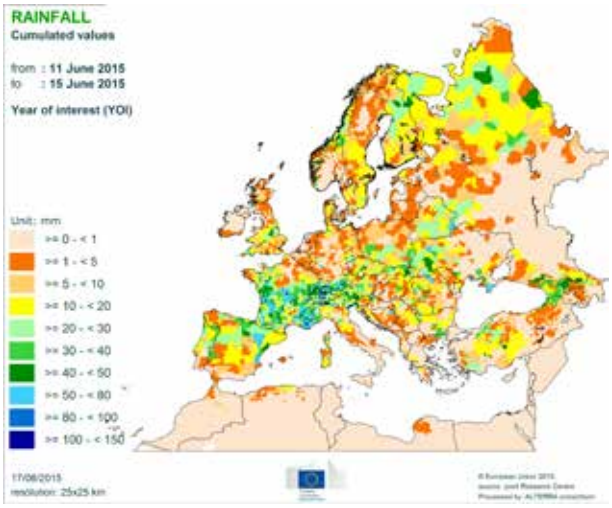


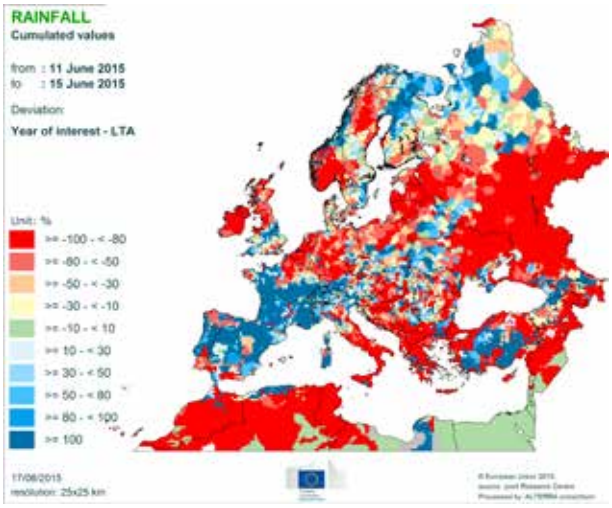




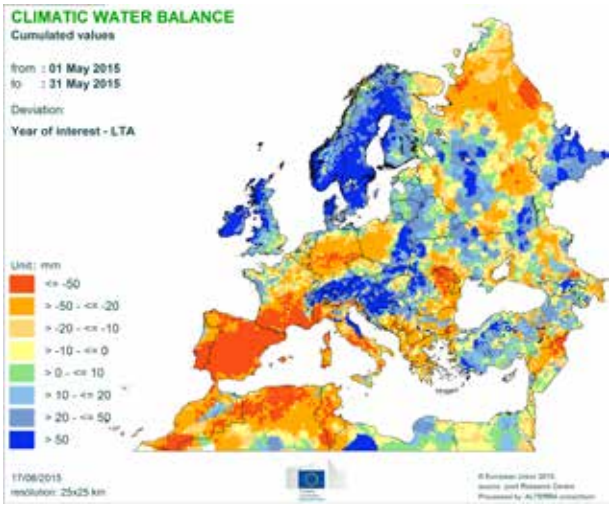


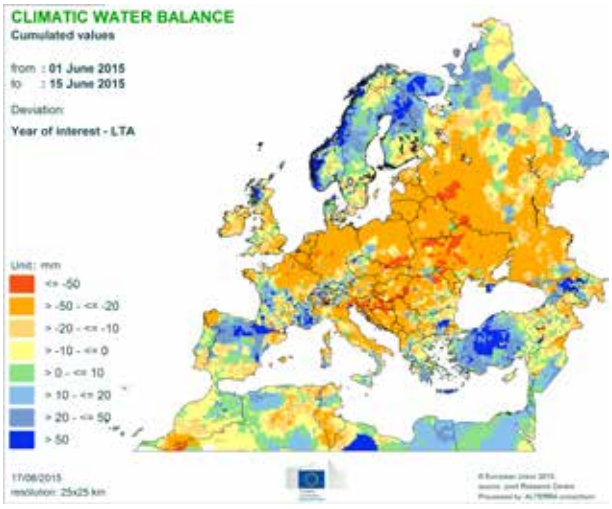




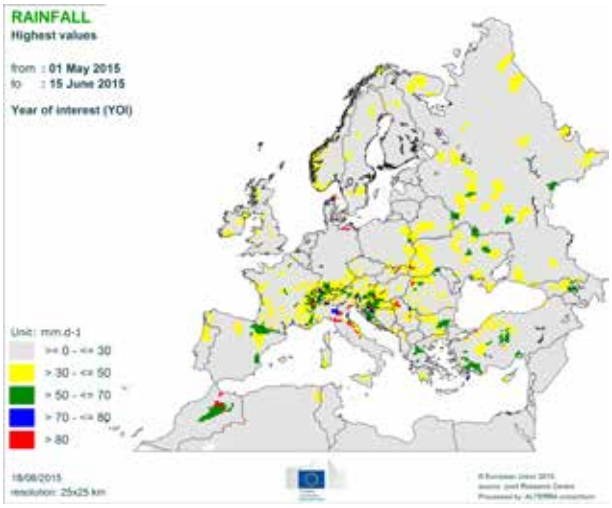


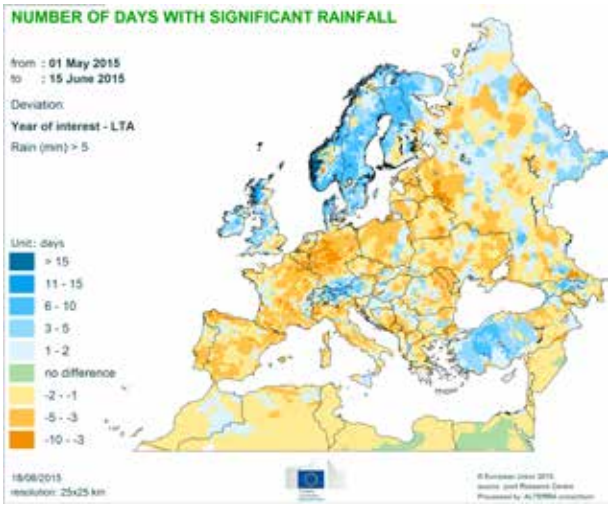
Climatic water balance

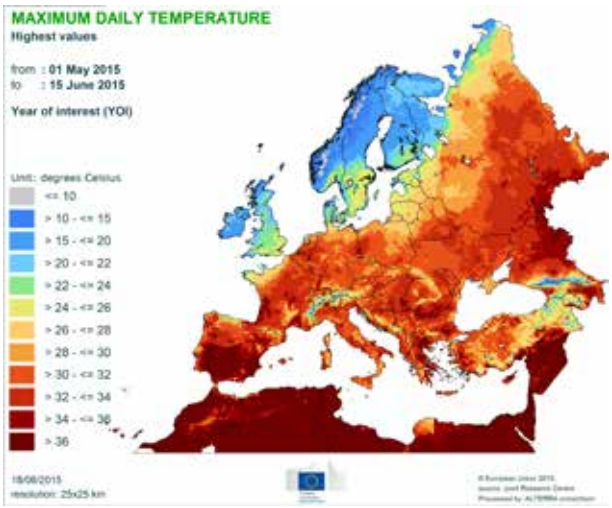


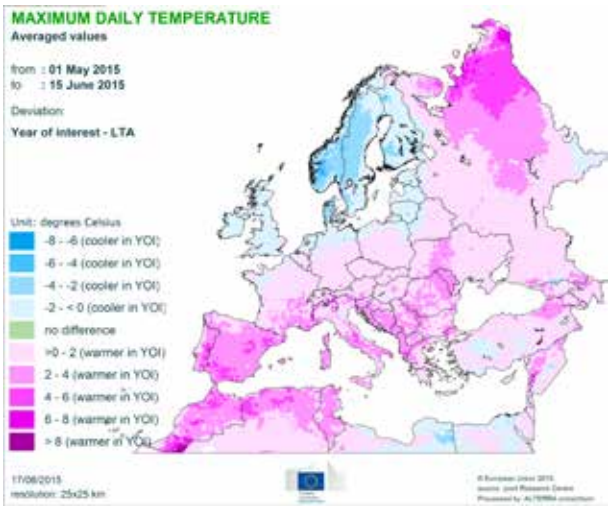


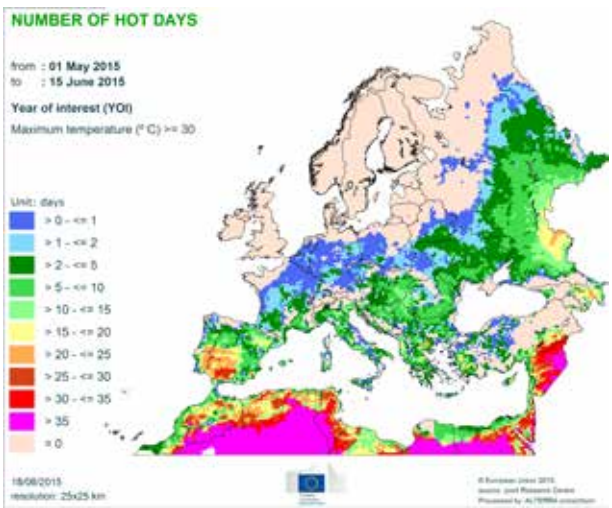
Weather events

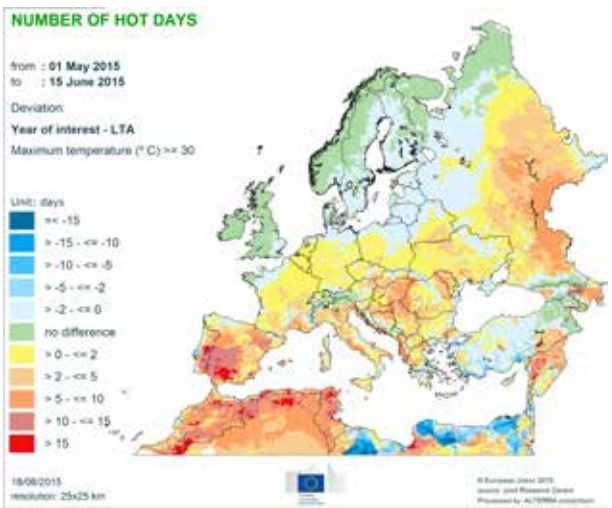




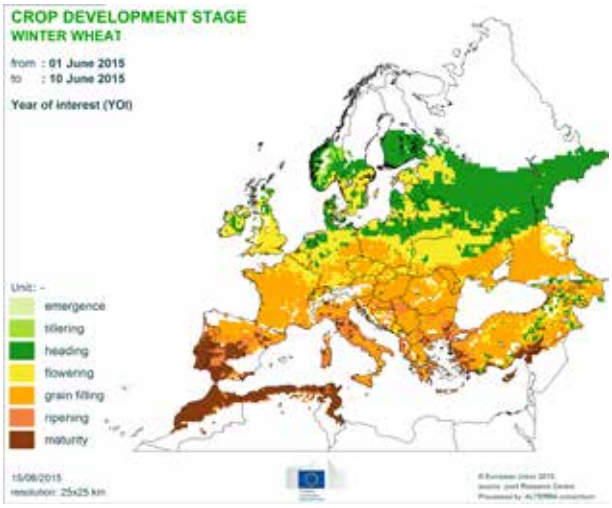


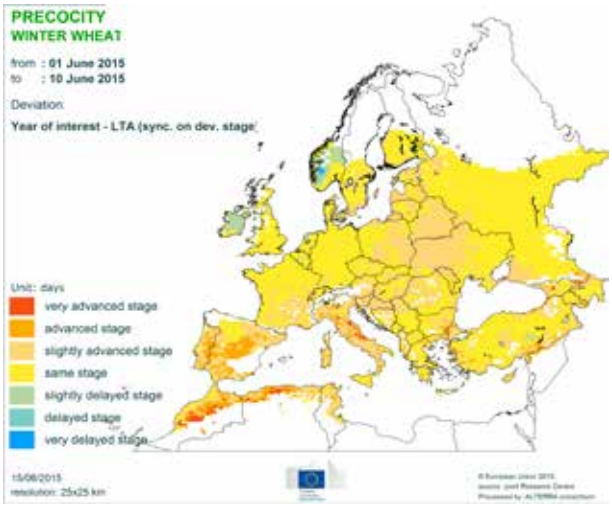


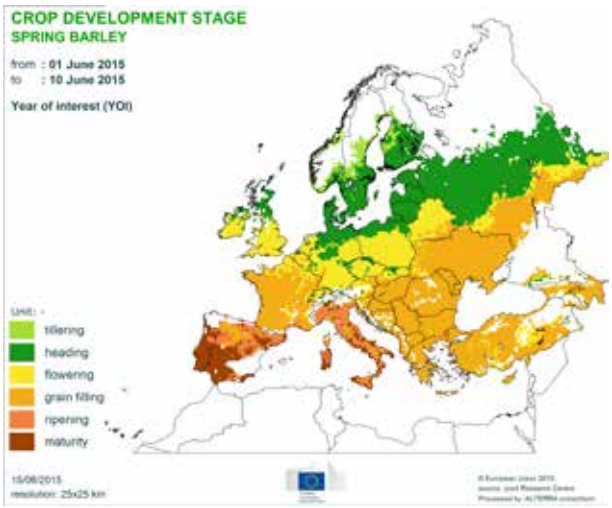


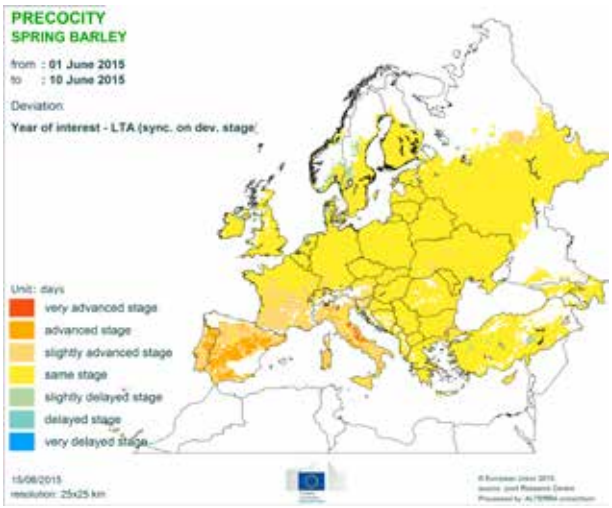


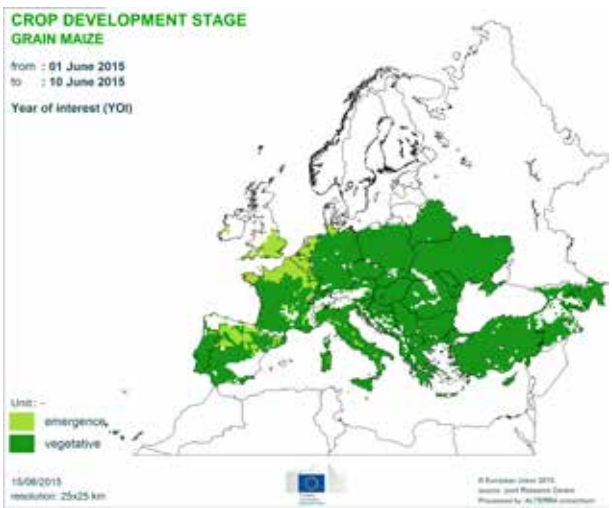
Crop development stages and precocity

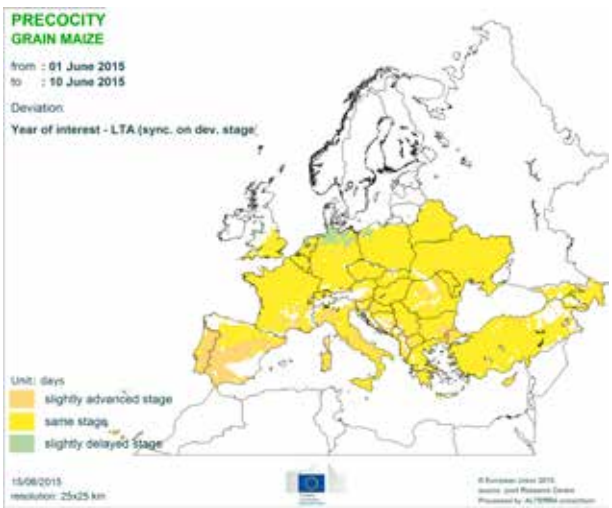


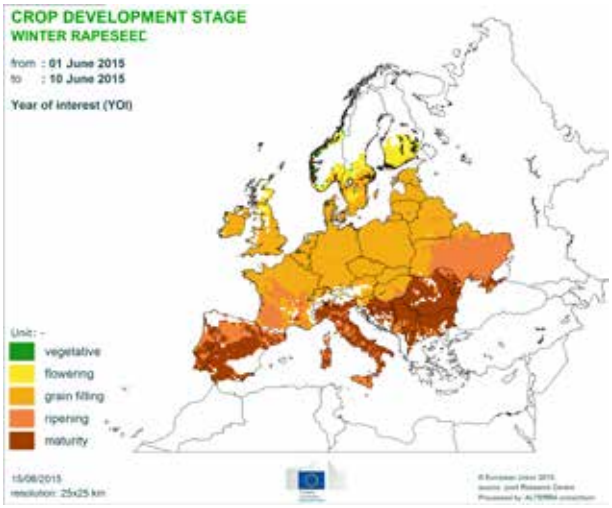


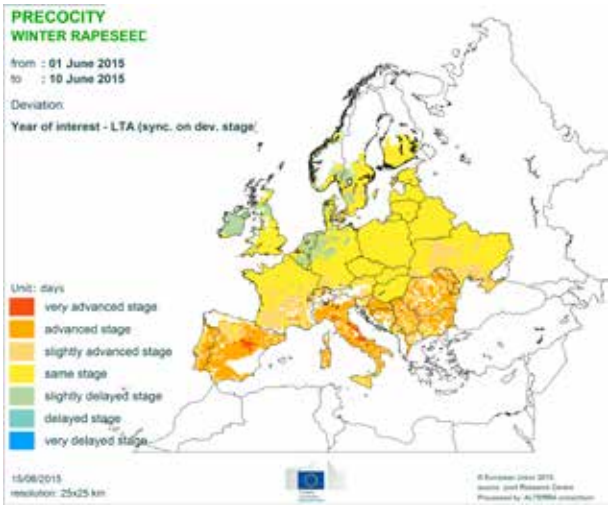




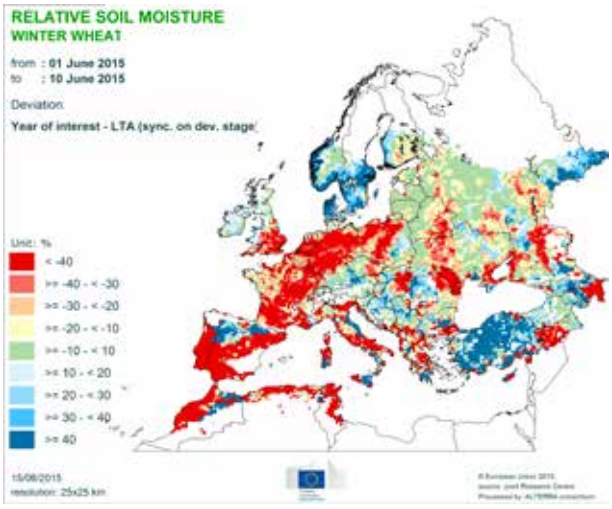


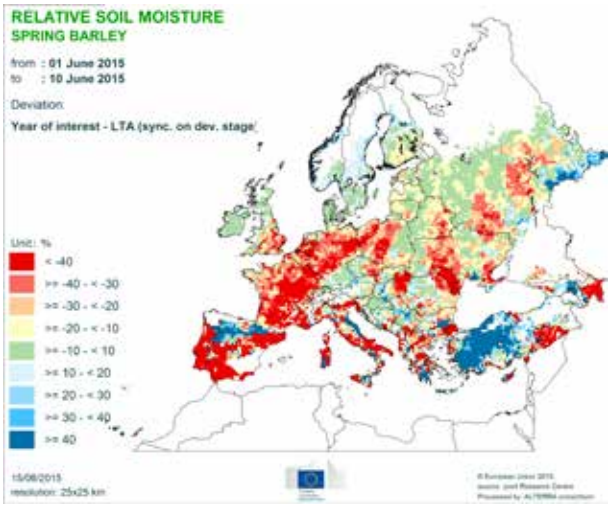


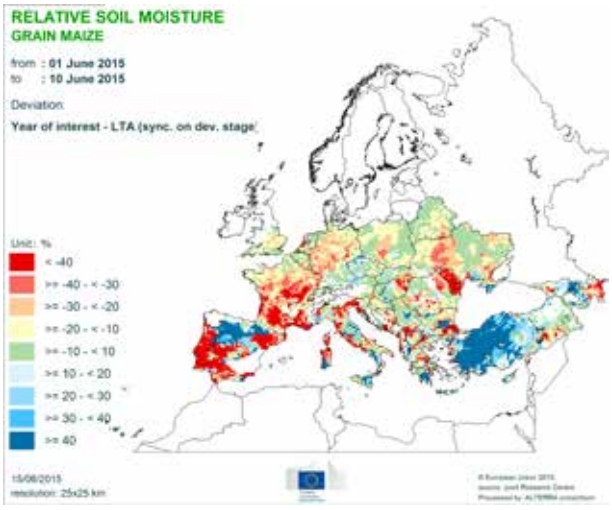


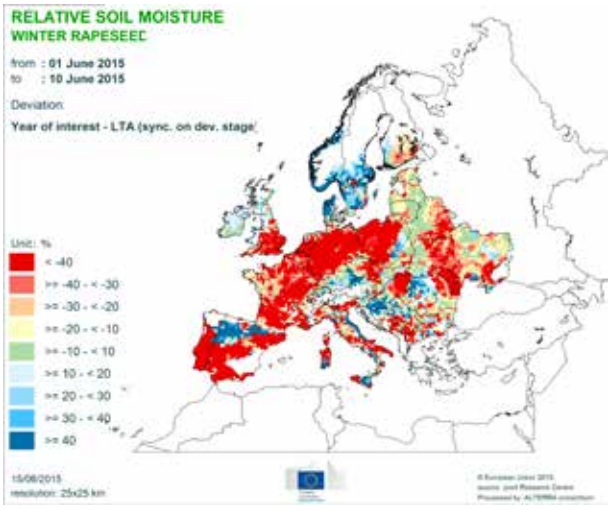


Relative soil moisture

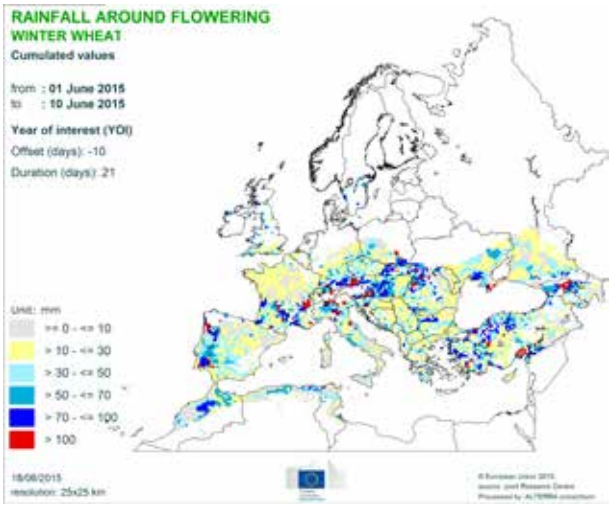


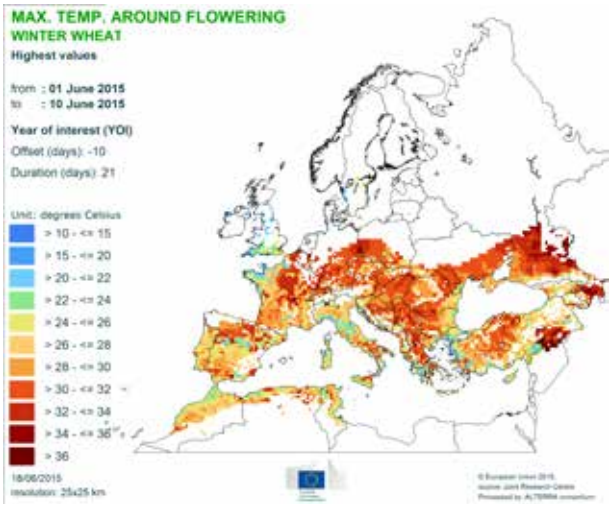


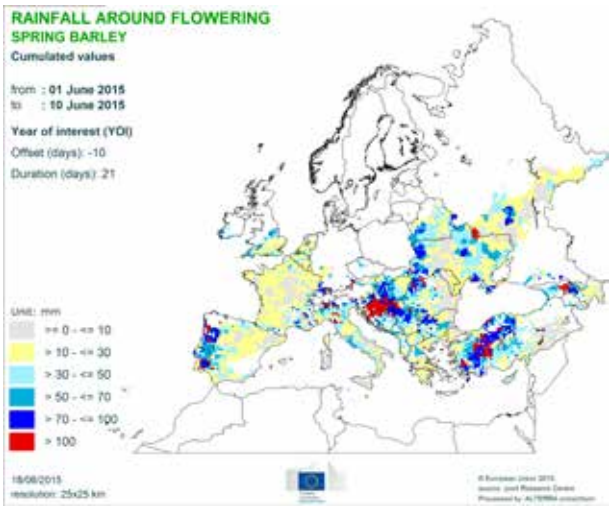


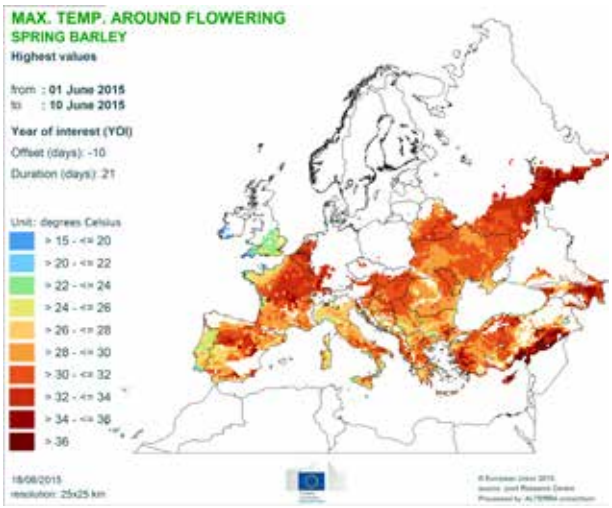


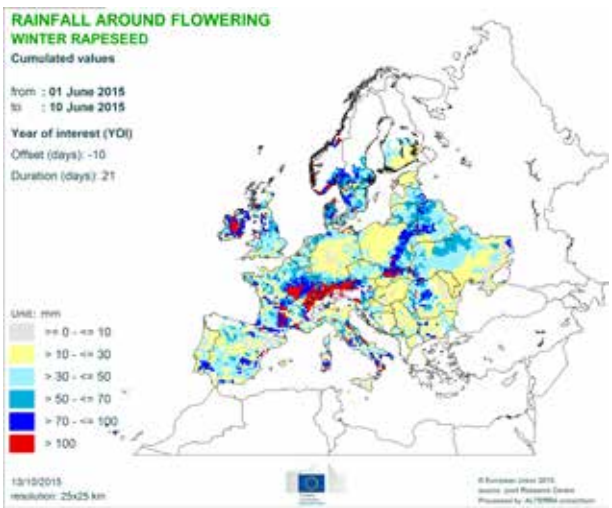
Rainfall and maximum temperatures around flowering

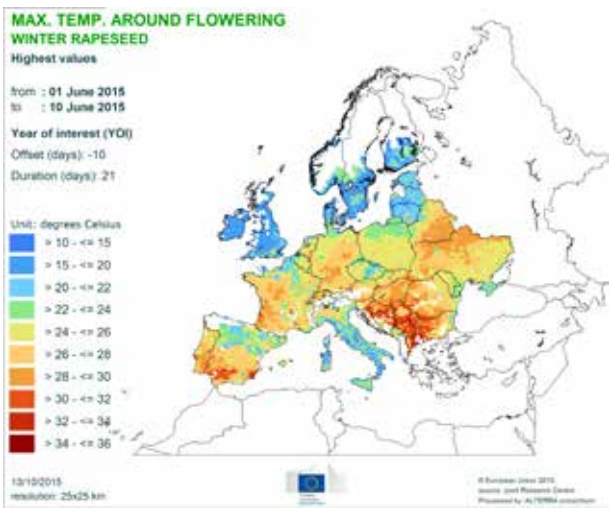




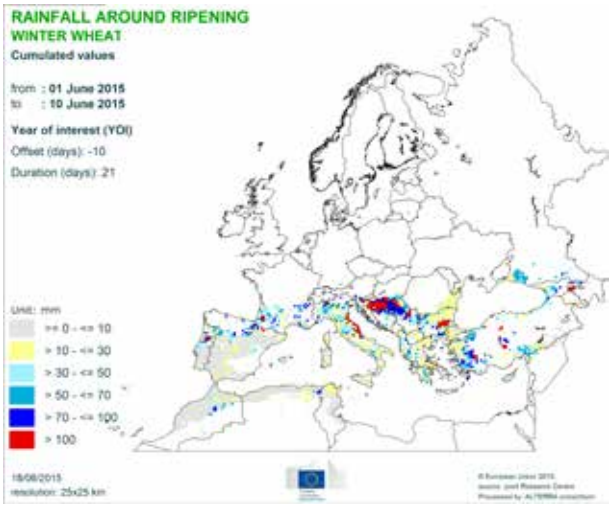


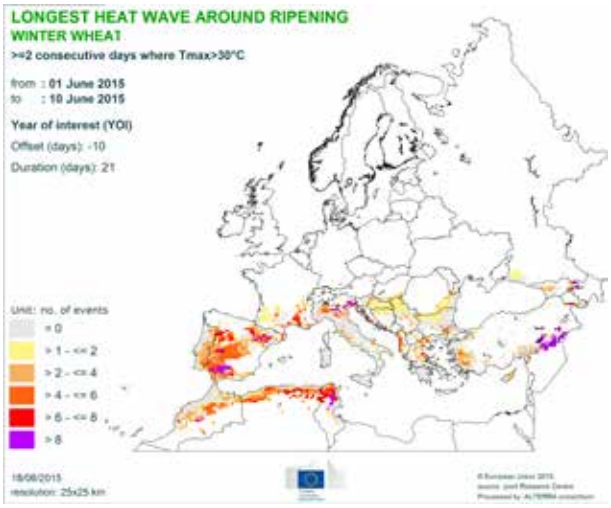


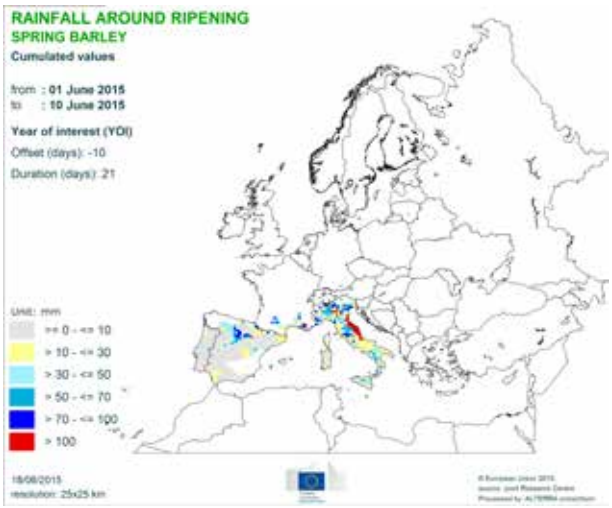


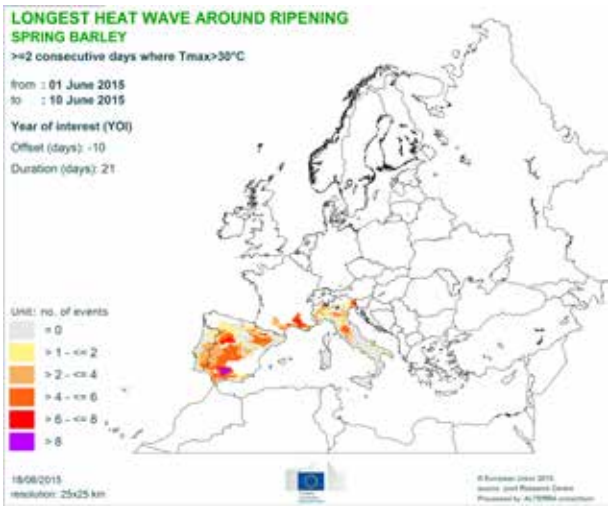


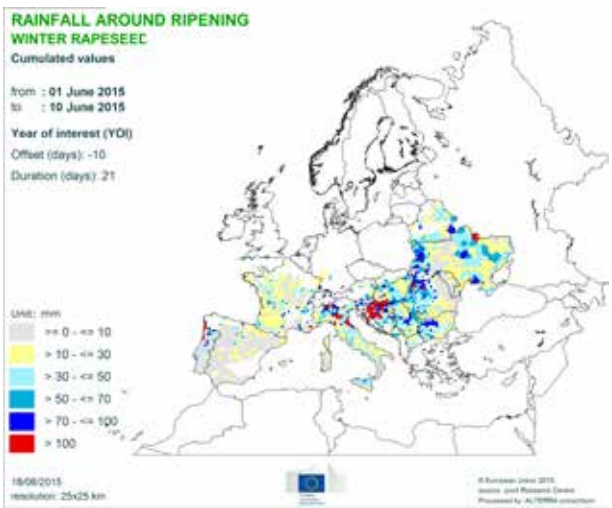
Rainfall and longest heat wave around ripening

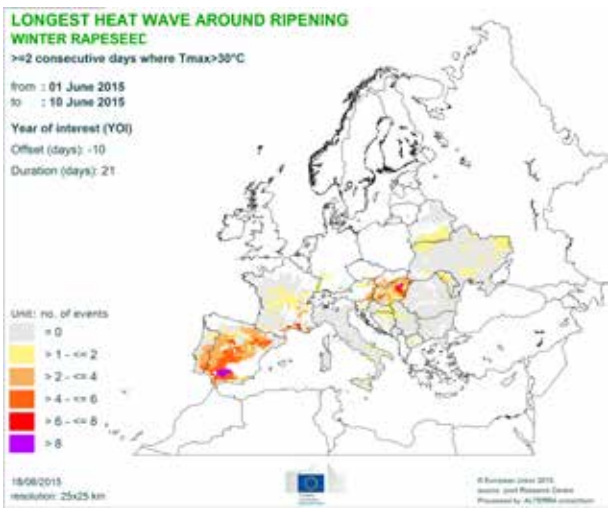












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MARS Bulletins 2015

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

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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 1975-2014.

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