European Commission

JRC MARS Bulletin Vol. 24 No 6

Period covered: 1 May–15 June
Issued: 20 June 2016

JRC MARS Bulletin

Crop monitoring in Europe

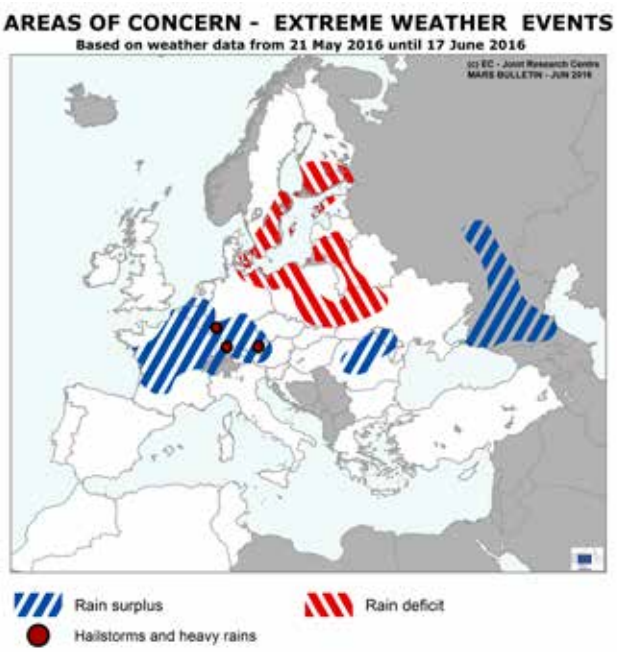
June 2016

Fairly good yield outlook for the EU-28

Excellent conditions in Spain; less positive in western Europe

Good conditions prevailed in Romania, Hungary, and especially in Spain, but unfavourable weather conditions at the end of May and early June constrained crop development in large parts of western Europe. Dry conditions persisted in parts of Poland and Germany. Yield prospects at the EU-28 level remain clearly above the five-year average.

On balance, at the EU-28 level, the forecast for soft wheat yields was revised slightly downwards (but remains clearly above the five-year average), as the downward revision for Germany and France was not completely compensated by the upward revision for Spain, Italy and Portugal. Durum wheat yield expectations are comparable to those of last year at the EU-28 level, and the forecast for Italy remains practically unaltered from the previous bulletin. The forecast for barley at the EU-28 level was revised upwards, mainly due to an increase in forecasted spring barley yields in Spain. Rapeseed yield estimates were revised downwards for the EU-28, and are currently forecast to be below last year's level, mainly due to lowered expectations for France, Germany and Poland.



Crop	Yield t/ha				
	Avg 5yrs	May Bulletin	MARS 2016 forecasts	% Diff 16/5yrs	% Diff May
TOTAL CEREALS	5.27	5.54	**5.53**	+ 4.9	- 0.2
Total Wheat	5.60	5.85	**5.82**	+ 3.9	- 0.5
soft wheat	5.83	6.116	**6.07**	+ 4.1	- 0.7
durum wheat	3.33	3.45	**3.48**	+ 4.4	+ 0.9
Total Barley	4.72	4.99	**5.01**	+ 6.3	+ 0.4
spring barley	4.12	4.24	**4.33**	+ 4.9	+ 2.1
winter barley	5.57	5.98	**5.94**	+ 6.5	- 0.7
Grain maize	6.93	7.31	**7.35**	+ 6.1	+ 0.5
Rye	3.76	3.85	**3.77**	+ 0.3	- 2.1
Triticale	4.20	4.26	**4.20**	- 0.2	- 1.4
Rape and turnip rape	3.20	3.29	**3.24**	+ 1.0	- 1.5
Potato	32.07	33.21	**33.16**	+ 3.4	- 0.2
Sugar beet	71.80	73.29	**73.20**	+ 2.0	- 0.3
Sunflower	1.94	2.01	**2.08**	+ 7.1	+ 3.5

Issued: 17 june 2016

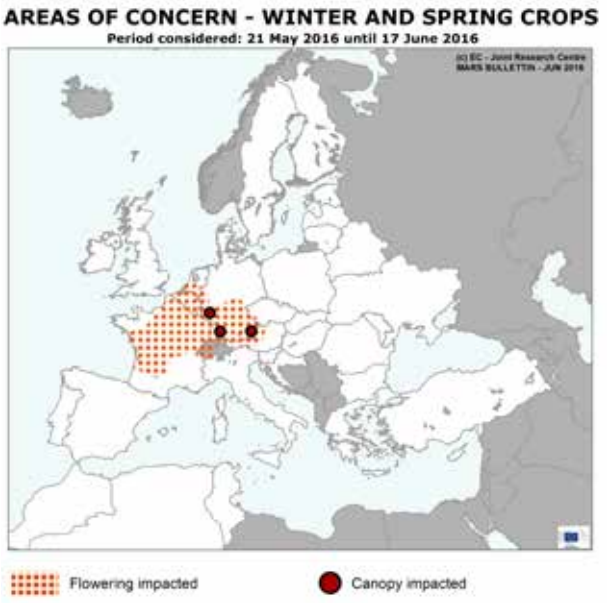
Joint Research Centre

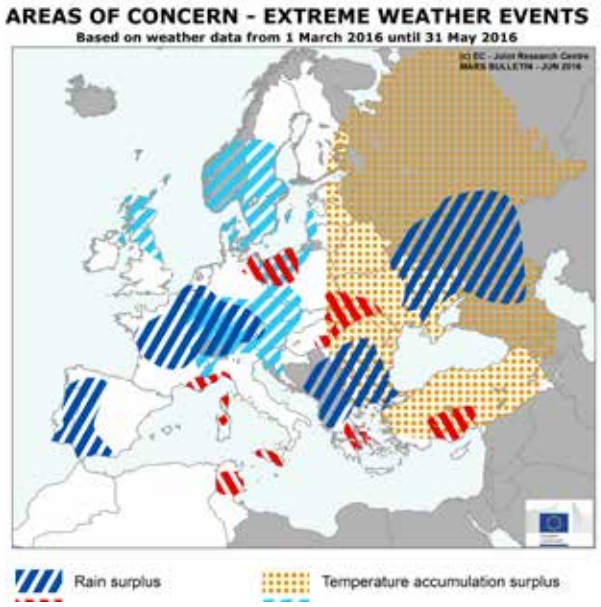
1. Agro-meteorological overview

1.1. Areas of concern

The above maps indicate the main weather events, and their impact, between 21 May and 17 June 2016. For the weather event analysis, the European Centre for Medium-Range Weather Forecasts (ECMWF) weather forecast, up to 26 May, was also considered.

The rain deficit in **north-eastern Germany** and **northern Poland**, indicated for the third time in a row, persists and has expanded to **Sweden**, **Finland** and the **Baltic countries**, as well as to **Ukraine** and **Belarus**. Soil moisture reached critical levels in the aforementioned German and Polish regions. If the currently forecasted rain does not occur, crops are at risk of wilting. By contrast, heavy rains occurred in the northern half of **France**, **Belgium**, the southern **Netherlands,** southern **Germany** and north-western **Austria** in late May and early June. As a consequence, pests and disease pressure increased while winter cereals were flowering, one of the most sensitive stages of the whole development cycle. In Germany, local hailstorms and heavy rains caused waterlogging and damaged the crop canopy. There was a precipitation surplus in central **Romania**, **Moldova** and eastern **Russia**, but this is not included on the AOC map as it had positive consequences for crop development.





1.2. Meteorological review spring 2016 (March, April, May)

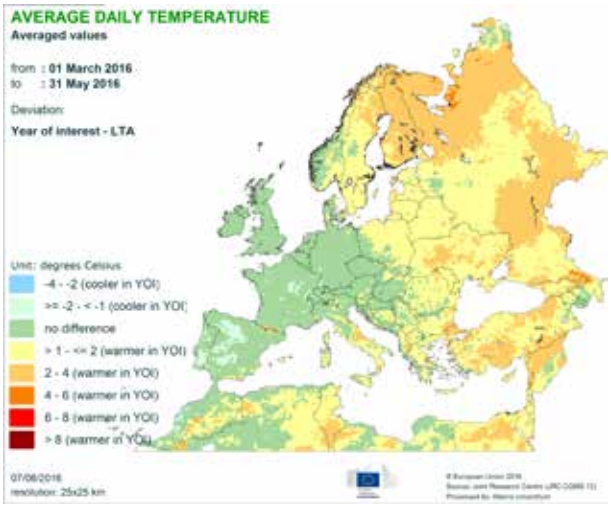
Warmer-than-usual spring weather was experienced in large parts of eastern and northern Europe. Mean spring air temperatures were generally 1 °C to 4 °C above the long-term average for these regions. March and the first half of April were among the warmest in our records in south-eastern Europe, Ukraine and Turkey. The first two dekads of April were particularly warm in south-eastern Europe, with daily temperature maxima locally reaching 25-32 °C. Central and western Europe experienced normal or slightly colder-than-usual temperature conditions. In most of Europe, frost events were sparse and insignificant during March and the first two dekads of April. May was characterised by a warm temperature anomaly in regions surrounding the Baltic Sea and north-eastern Europe.

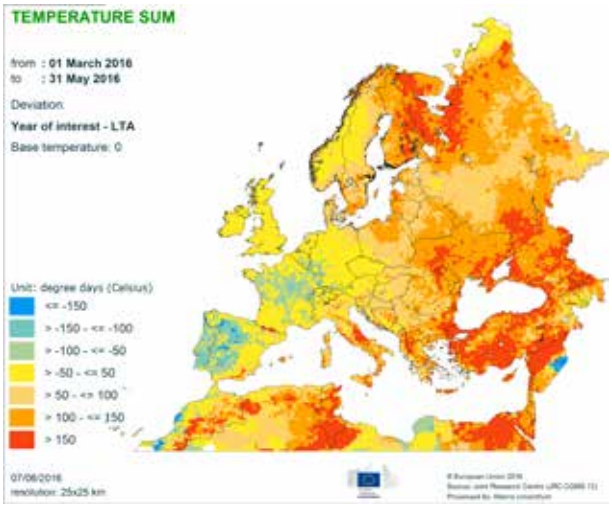
A cold spell at the end of April affected many regions of central Europe, parts of western Europe and the north-western Balkans, with air temperatures dropping by 2 °C to 8 °C below the long-term average. Minimum daily temperatures fell below 0 °C, and a snow layer was recorded in many areas. Temperatures in regions affected by the cold spell returned to normal during the first dekads of May, and remained close to seasonal values throughout the rest of the month.

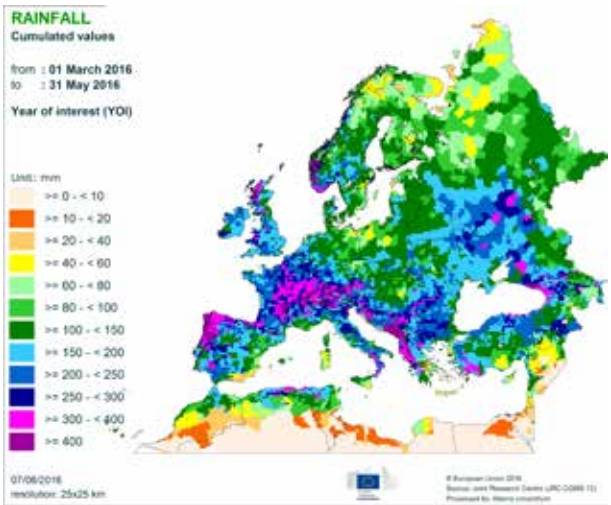
Spring precipitation was substantially above the long-term average in the western half of the Iberian peninsula, central and northern France, south-eastern Europe, the eastern half of Ukraine, the central part of European Russia and central Scandinavian regions. Abundant rainfall with cumulates above 200 mm occurred in many of the abovementioned regions.

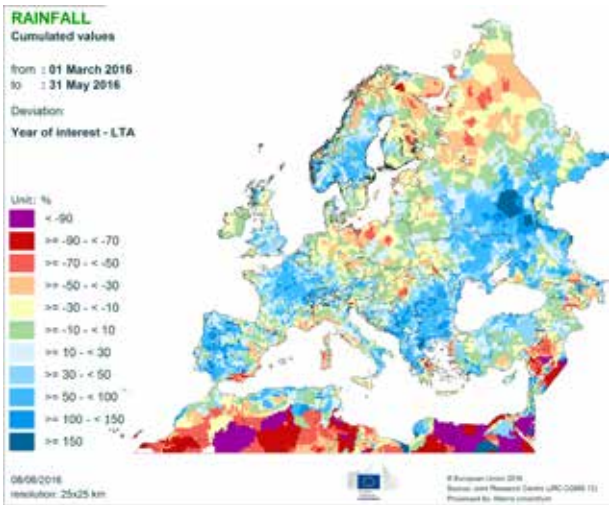
Heavy rainfall events at the end of May and beginning of June caused local flooding and waterlogging in the central-northern part of France and southern Germany. Rainfall cumulates exceeded 100 mm over a week-long period starting on 26 May in the abovementioned regions.

A precipitation deficit was experienced in northern Poland and northern Germany, eastern Hungary, many areas of the western Mediterranean and north-eastern Europe. Recorded rainfall cumulates in the abovementioned regions ranged between 20 and 80 mm, which is well below the spring climatological values.









1.3. Meteorological review (1 June–15 June)

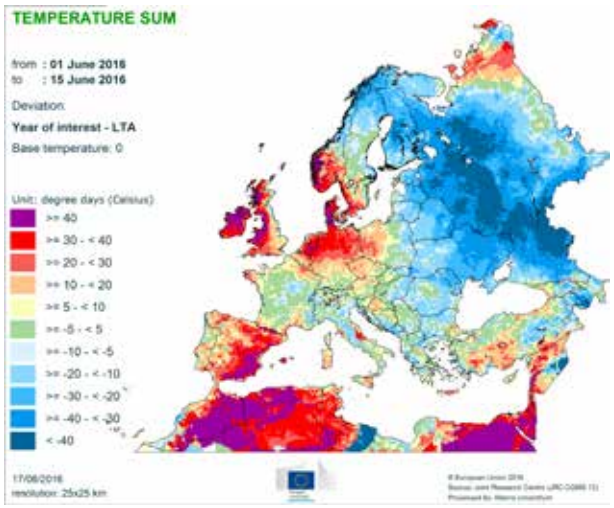
The first half of June was warmer than usual in the Iberian Peninsula, the northern half of Germany, Denmark, the British Isles, the Benelux countries, southern Scandinavia and the Maghreb countries, with temperature anomalies mainly between 2 °C and 4 °C above the long-term average. Maximum daily temperatures above 30 °C were mainly limited to western Mediterranean regions, western Black Sea regions and the Maghreb countries.

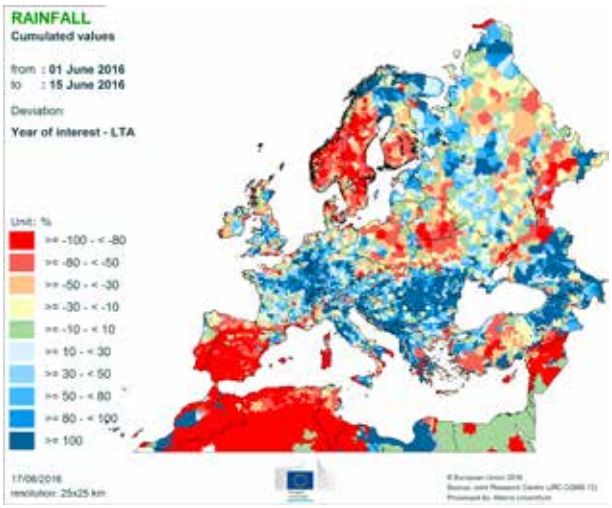
Eastern Europe experienced a cold weather anomaly, with average temperatures mainly between 2 °C and 4 °C below the long-term average.

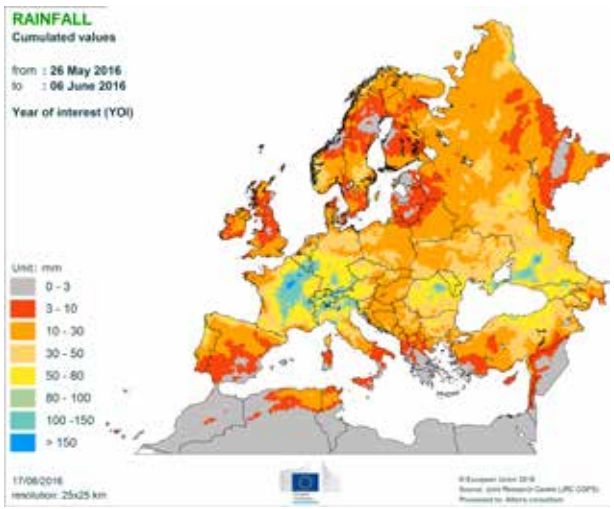
Dry conditions with less than 3 mm of rainfall were recorded in the Iberian Peninsula and regionally in many areas of Scandinavia, Poland, Belarus, western Turkey, the central part of European Russia and the Maghreb countries. A strong rainfall deficit has persisted since the beginning of spring in north-western Poland, north-eastern Germany, southern Finland, south-eastern Spain, regionally in western Ukraine and Sardinia.

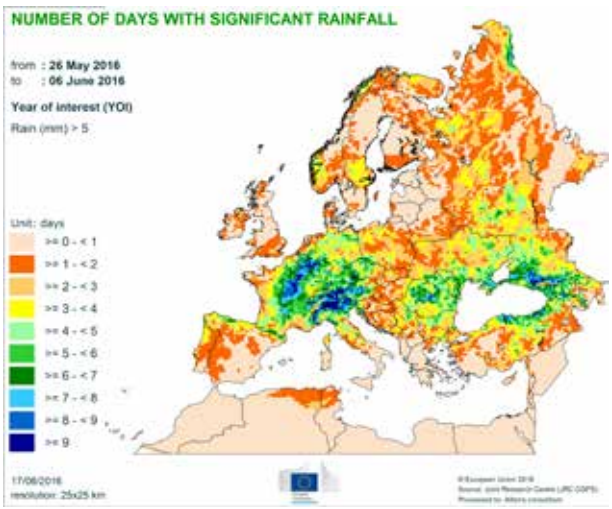
A rainfall surplus was recorded in central and eastern France, western and southern Germany, Austria, a large part of Italy (with the exception of Sardinia), south-eastern Europe, the southern part of European Russia and many areas of north-eastern Europe. Rainfall cumulates in these areas generally exceeded 50 mm.

Heavy rainfall events occurred between 26 May and 6 June in central France, western and southern Germany, western Austria, north-eastern Romania and the north-eastern Black Sea region. Intense rainfall in France and Germany during this period, with cumulates above 100 mm, resulted in local flooding and waterlogging. Many of these events were accompanied locally by hail and/or strong winds, which may have caused substantial damage to the crop canopy.









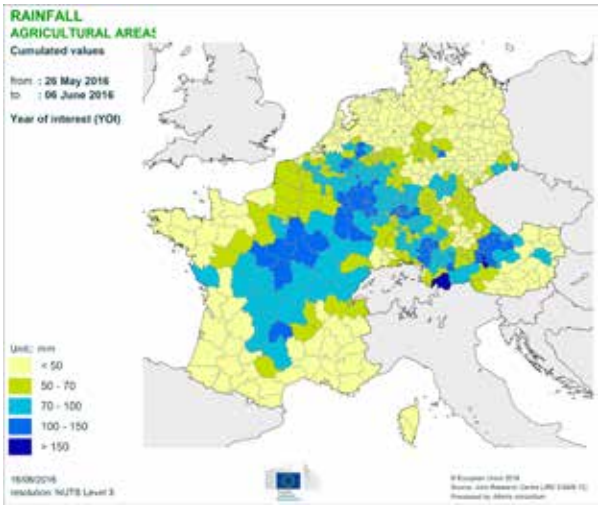
1.4. Heavy rainfall events between 26 May and 6 June

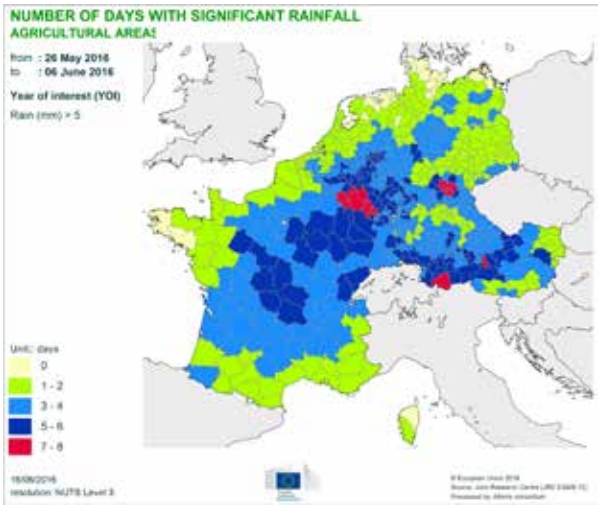
Heavy rainfall events have affected parts of central and north-eastern France, the southern Netherlands, southern Germany and north-western Austria. The synoptic situation that caused this event was characterised by a high-pressure ridge across the eastern North Atlantic, stretching from eastern Greenland to Scandinavia. Troughs of low pressure formed on either side of the ridge, resulting in the 'omega block' pattern. An area of low pressure was trapped below the ridge over western Europe. Low pressure remained almost stationary, with moist and warm air being pulled from the Mediterranean Sea. This synoptic constellation favoured the formation of heavy thunderstorms in Germany and heavy and widespread rainfall in a quasi-stationary convergence zone over France.

In Germany, heavy rains began on 27 May, with severe and fairly stationary thunderstorms. Persistent heavy rainfall between 27 and 29 May occurred in Baden Württemberg, Rheinland Pfalz, Südhessen and Bayern. The period between 30 May and 2 June brought intense rainfall events, especially in Bayern (the most intense events were recorded in the regions of Rottal-Inn and Passau) and in Oberöesterreich in north-western Austria. Rainfall cumulates in these regions locally exceeded 125 mm during this period. However, most of the accumulated rainfall fell during a short period of time, sometimes even within hours. It led locally to the clogging of soil pores, which reduced infiltration capacity. As a result, rainfall water was exposed to soil runoff, in many areas resulting in flash floods and standing water in agricultural areas. Heavy rainfall was often accompanied by strong winds and hail, causing severe canopy damages locally.

Central and northern France and northwards as far as the southern Netherlands were affected by persistent intense rainfall events between 26 May and 2 June. The low pressure system began to weaken on 31 May, when the intensity of rainfall events decreased. Rainfall cumulates exceeded 100 mm in many of the affected areas, with more than 150 mm being recorded locally. The very heavy rainfall events that occurred while soil moisture was already generally high due to the very wet month of May resulted in saturated soils and the local flooding of agricultural fields. Moreover, high levels of humidity led to increased disease pressure. Runoff due to saturated soils contributed to the flooding of many rivers in central and northern France. Rainfall cumulates for May were the highest in our records in many regions of central and northern France.

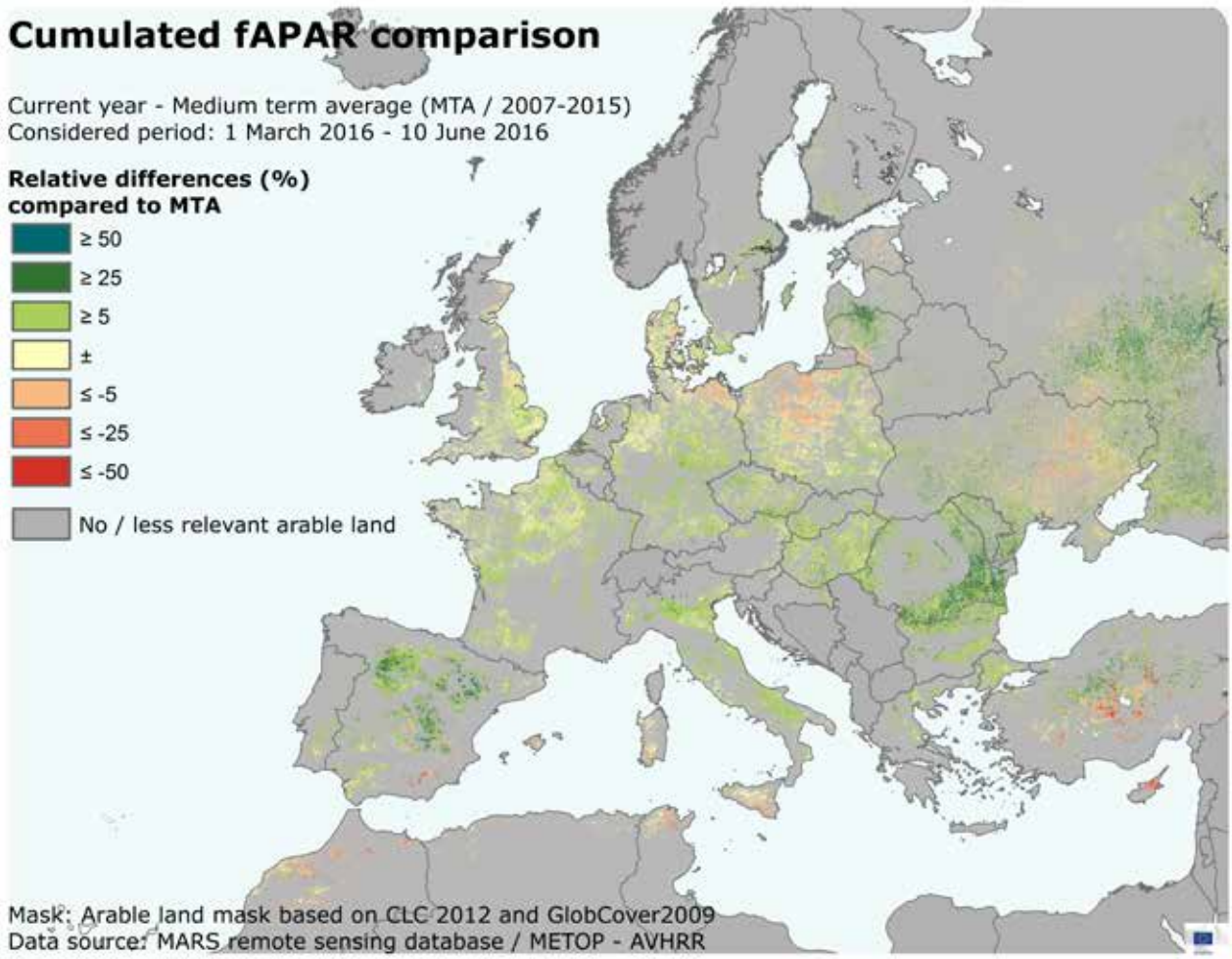
Heavy rainfall events were recorded also in the Nord-Est region of Romania, central Moldova and regionally in north-eastern Black Sea areas, where cumulates generally exceeded 100 mm.





2. Remote sensing — Observed canopy conditions

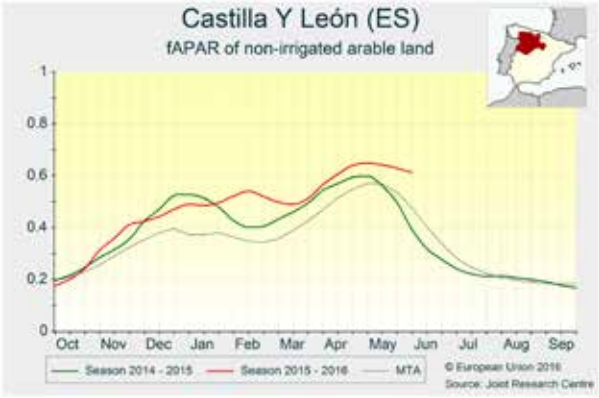
Conditions favourable for winter crops, average for summer crops

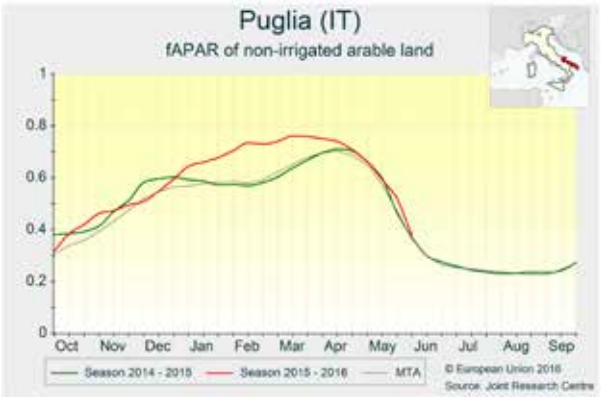


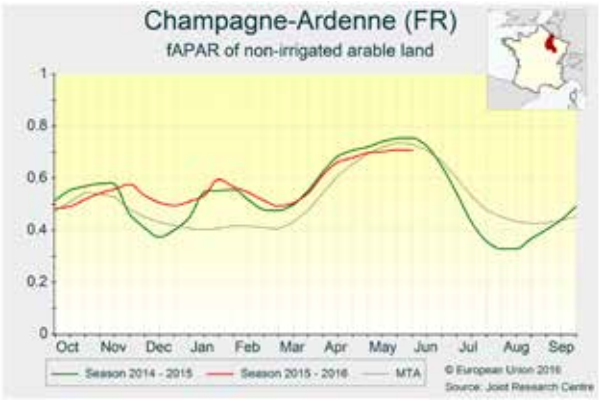
The map displays the differences between the fraction of absorbed photosynthetically active radiation (fAPAR) cumulated during the period from 1 March to 10 June 2016 and the medium-term average (MTA, 2007-2015) for the same period.

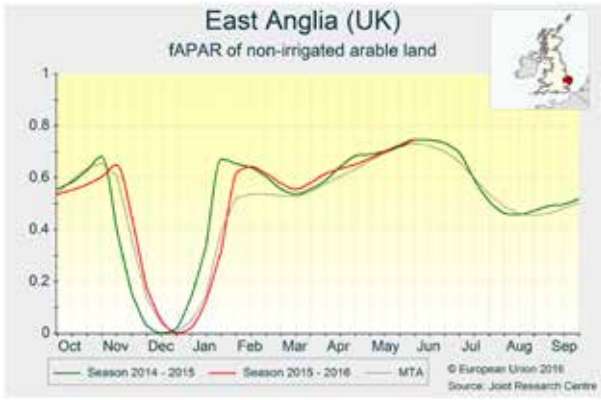
In **Spain**, strong positive anomalies are present in the main central and northern crop-growing regions (e.g. Castilla y León), where crops are now in the grain-filling stage. In southern **Italy**, the winter crop season is almost at its end: in Puglia, where yield expectations are very high, winter crops are at the grain-filling stage, while crops have already reached maturity in Sicily. In central and northern **France**, heavy rains and lower-than-usual temperatures and radiation slowed canopy development and reduced the biomass accumulation of winter and spring crops (e.g. Champagne-Ardenne), which are now entering the grain-filling stage. In the **United Kingdom**, the main agricultural regions of England (e.g. East Anglia) present average to slightly better-than-average biomass accumulation thanks to normal spring weather conditions. In central and southern **Germany**, the rainy period of May did not hamper biomass accumulation. By contrast, it was too dry in northern regions (e.g. Mecklenburg-Vorpommern), and the crops (which are coming to the end of the flowering stage) are in fragile condition. Similar conditions prevail in northern and central **Poland** (e.g. Wielkopolskie), where the leaf-area expansion of crops is still below average, and the sparse rains of the past weeks were insufficient to improve the low soil moisture levels. Crops in this region are in the flowering or grain-filling stages.

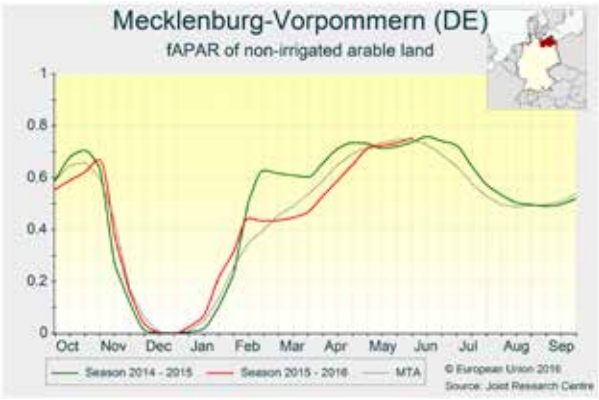
In **central Europe**, the crop canopy anomalies range from slightly positive to positive. Temperatures were particularly favourable for crop canopy development in southern **Hungary** (e.g. Dél-Alföld). Crop development was slowed down in **Romania** and **Bulgaria** due to cooler-than-usual temperatures in May, but still remains advanced by more than 10 days compared to an average year. Crops are in optimal condition in **Ukraine**, and leaf-area expansion is now clearly above average (e.g. Dnipropetrovs'ka). A similar situation is depicted for **Russia**. In **Turkey**, warm temperatures and plentiful precipitation led to optimal crop development, especially in northern regions. A biomass deficit is visible in southern regions, but this is due to a change in the type of crops sown and not to poor crop status.

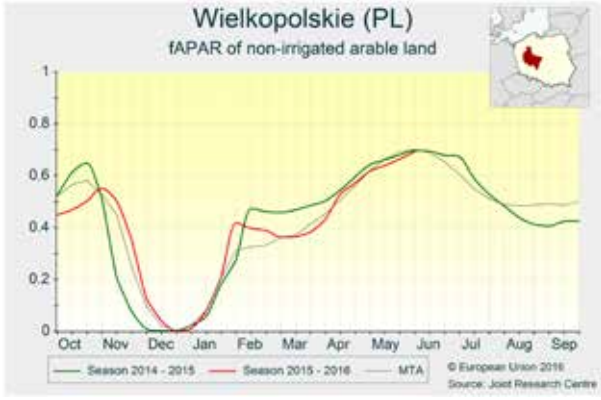

Castilla Y León (ES)
fAPAR of non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre

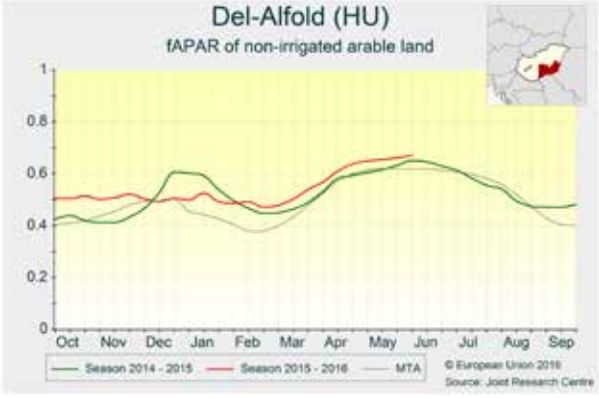

Puglia (IT)
fAPAR of non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre

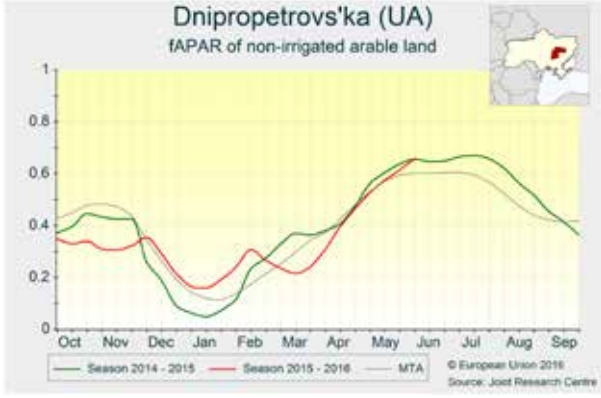

Champagne-Ardenne (FR)
fAPAR of non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre


East Anglia (UK)
fAPAR of non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre


Mecklenburg-Vorpommern (DE)
fAPAR of non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre


Wielkopolskie (PL)
fAPAR of non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre


Del-Alfold (HU)
fAPAR of non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre


Dnipropetrovs'ka (UA)
fAPAR of non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre

3. Country analysis

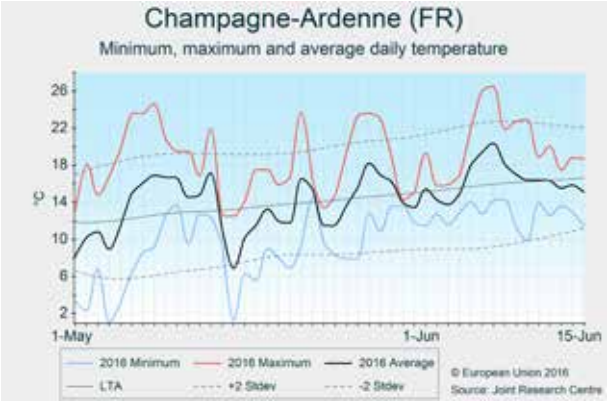
3.1. European Union

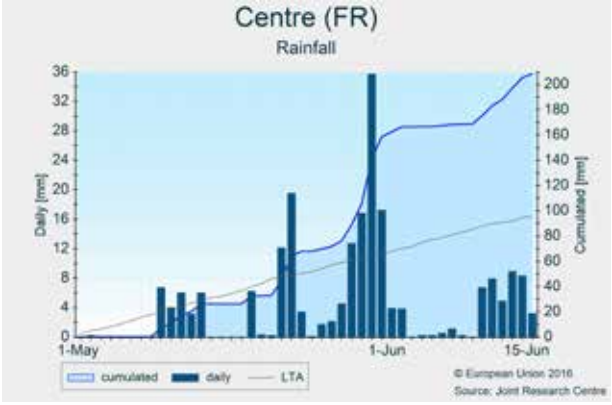
France

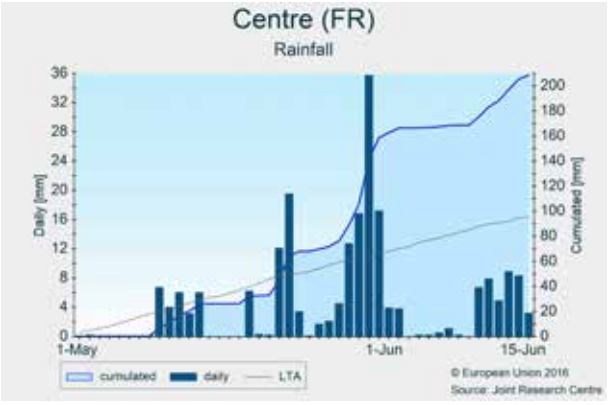
Poorer outlook due to humid conditions

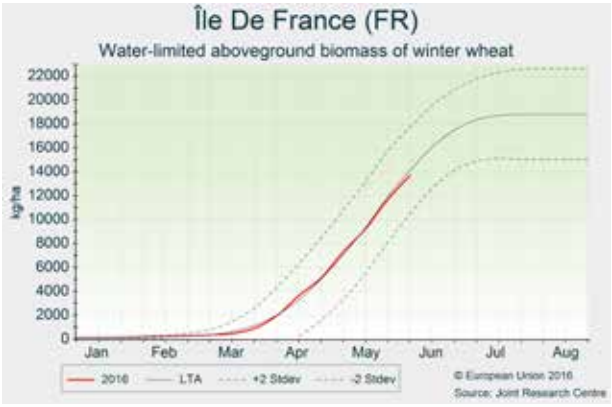
Large areas of northern France received exceptional rainfall at the end of May. As conditions were already humid, this increased the risk of disease and lodging. Fields were locally flooded. Although yields of the main crops are expected to be impacted, the forecasts remain close to the five-year average.

Temperatures fluctuated around the average during the period of analysis. Rainfall was well above average in the northern half of the country, and the situation was exacerbated by an episode of heavy rainfall in the last dekad of May, centred on the Centre region, with 147 mm of rain. Only Bretagne, Aquitaine, Midi-Pyrénées and Provence-Alpes-Côte d'Azur received slightly less rainfall than average. The heavy rainfall event occurred while soil moisture was already high, saturating soils and flooding fields locally. Excessive humidity had various consequences for winter crops: saturated soils increase the risk of lodging and anoxia, and the high humidity levels also increased disease pressure, which was already high this spring. Waterlogging also presented a risk to grain maize and sunflowers in the northern half of France. The heavy rain episode was accompanied by very low radiation during the grain-filling stage of winter cereals, which will reduce the yield potential. Yields of winter cereals could be further reduced if the negative conditions persist. Forecast yields of winter wheat, winter barley and triticale are revised downwards compared to the latest bulletin, and are now very close to the five-year average. Rapeseed yields are forecast to be below the five-year average as a result of the cold spell which occurred at the end of April and current disease pressure. Sunflowers were sown later than usual, diminishing their potential yield. Sugar beet is the only crop that is expected to benefit from the above-average rainfall.









Germany

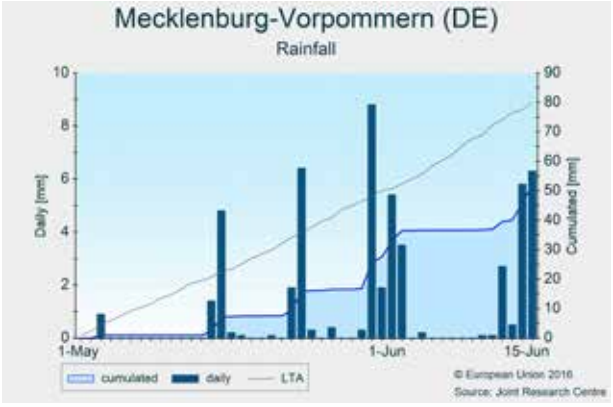
Fairly good yield outlook despite a bad weather period

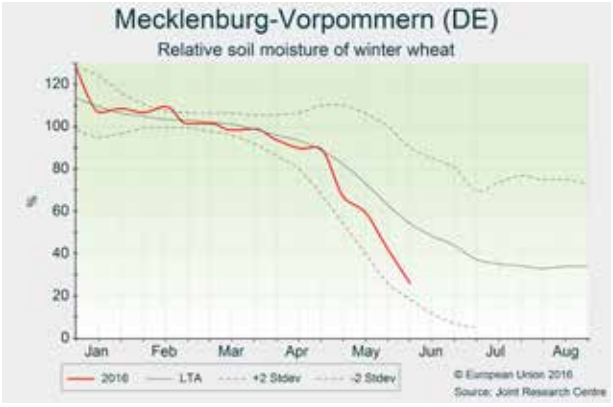
Unfavourable weather conditions at the end of May/early June, with heavy rainfall in the west and south, tempered the previously excellent outlook for most crops. Yield forecasts are still close to or above the five-year average for winter crops. More rain is needed in the north to sustain grain filling.

In central and southern Germany, growing conditions were favourable until the end of May, with average temperature accumulation and drier-than-usual weather conditions allowing for the completion of the sowing campaign. This was followed by a two-week period of unsettled weather with plentiful precipitation, torrential rains and thunderstorms, which locally caused severe damage and flooding. Insurance companies report that more than 40 000 ha of arable land were damaged due to heavy rains and hail. In Bayern and Baden-Württemberg, where conditions had already been humid, soils are partially overly wet. This increases the risk of nutrient deficiency, pest damage and constrained plant development. In central Germany (e.g. Hessen), these rainfall events were beneficial to crop growth after the earlier dry period, and will sustain crop growth in the coming weeks.

Northern Germany mostly experienced warmer-than-usual conditions and good radiation levels. Precipitation was sparse, with fewer rainy days than usual. Particularly Mecklenburg-Vorpommern remained too dry, intensifying the considerable rain deficit, whereas precipitation brought some relief to Sachsen-Anhalt and Niedersachsen. Cooler weather has currently set in.

Winter wheat has started grain filling in the south, but as the flowering stage was affected by heavy rainfall, increasing the risk of infection, yield forecasts were lowered slightly. In contrast to winter barley, the yield forecast for spring barley increased, as conditions are good and the crop was not affected by the bad weather. The forecast for rapeseed was lowered, as conditions are too dry in the north to sustain adequate maturation, and more rain is needed. Forecasts for sugar beet, potatoes and maize remain unchanged, as the extent to which the humid conditions will have a negative impact is yet to be seen. Soil moisture levels in some of the main producing regions are well replenished, and can now sustain good growth rates.



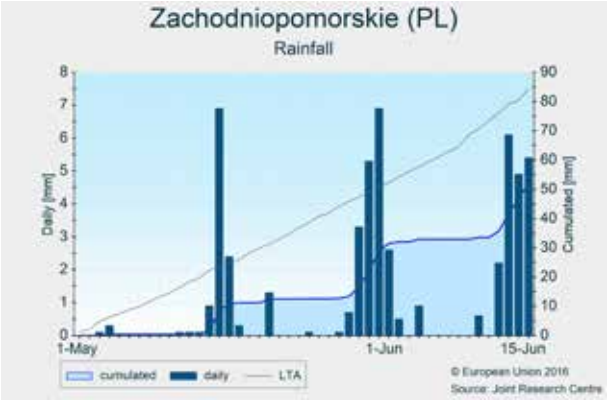


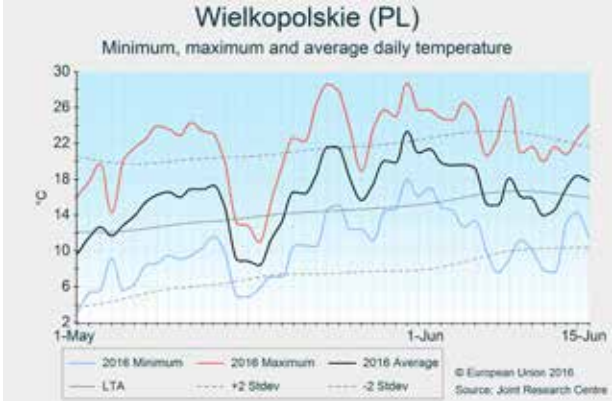
Poland

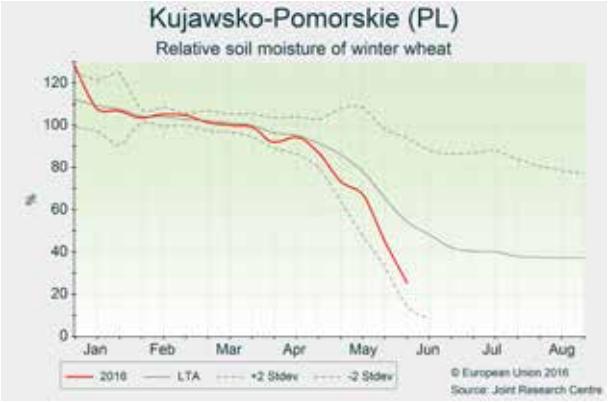
Persistently poor conditions

Crops have been suffering from poor conditions since the start of the season, which manifest as dry sowing conditions, frost kill, and pest and disease pressure. The main concern is currently for north-western regions, which are experiencing a substantial water deficit. A negative yield outlook is becoming more probable for winter cereals, and the season has started badly for summer crops.

Temperatures have been slightly warmer than usual since the beginning of May, and were 4 °C above the average from 21 May to 5 June. Global radiation was substantially higher than usual in all regions. Rainfall remained 30 to 50 % below the average in all regions and the soil moisture levels dropped substantially. Since 1 January, cumulated rainfall has been significantly below the average in Pomorskie, Kujawsko-Pomorskie and Zachodniopomorskie, raising concerns of a possible drought. The crop growth and yield potential will be impacted in these regions, as winter cereals are currently in the grain-filling stage. Rainfall is forecast for the coming week, and will hopefully help replenish the soils. The warm temperatures observed since mid May led to accelerated crop development. In the meantime, the above-average radiation favoured biomass accumulation in regions that were not exposed to water stress. Apart from north-western regions, conditions were mostly beneficial during the period of analysis. Nevertheless, the poor conditions since the start of the season are having an extremely negative impact on the yield outlook. Winter wheat, winter barley, rapeseed, rye and triticale yields are forecast to be below the five-year average. The start of the season was also bad for grain maize, sugar beet and potatoes due to the cold spell, and their yield potential will remain limited.







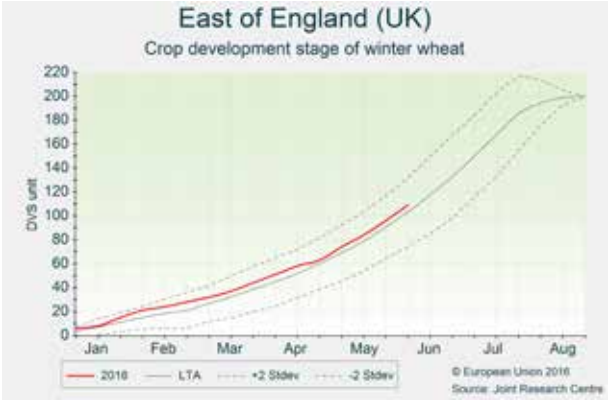
United Kingdom and Ireland

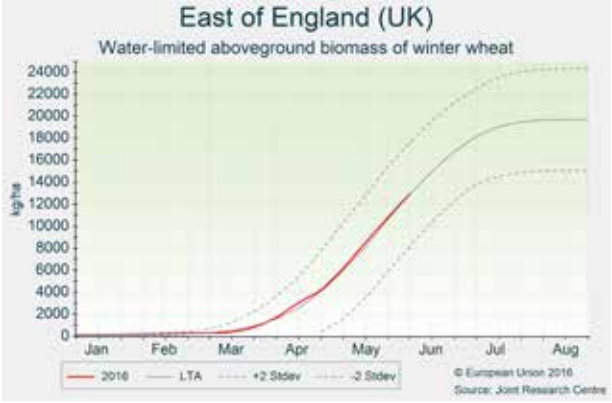
Normal conditions prevail

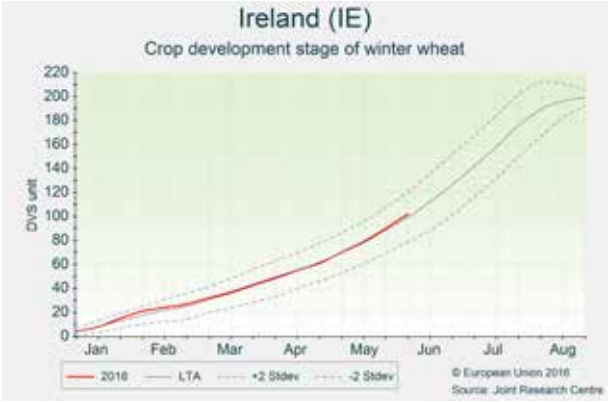
Crop development and biomass accumulation are average thanks to adequate temperature and rainfall conditions. Pest and disease pressure remains high. The yield forecasts remain close to or slightly above the five-year average and close to those of the previous bulletin.

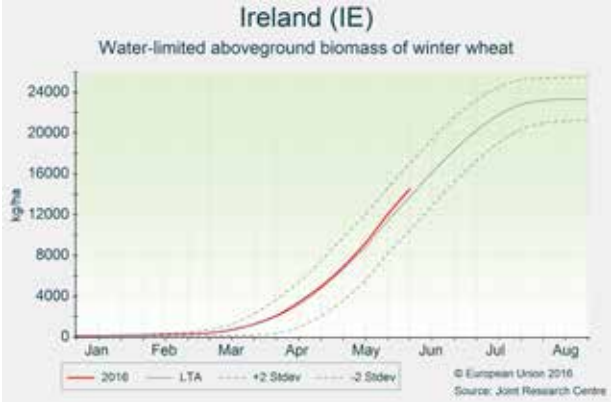
Temperatures predominantly exceeded the average during the first half of May and from 4 June, whereas they were around or below average in the second half of May and early June. For the period as a whole, this resulted in temperature anomalies of up to almost 2 °C in parts of the western United Kingdom and Ireland. Daily maxima exceeding 25 °C were recorded on 8 May and 7 June in parts of the central and south-eastern United Kingdom. Light frosts occurred locally during the first half of May. Rainfall for the period as a whole was close to the average in most regions, but somewhat below average in northern England, southern Scotland and western Ireland. Episodes of dry and rainy days were generally well distributed over the period of review, enabling good access to fields to finalise spring sowing and other field activities. Radiation levels were somewhat above average in the western and northern United Kingdom and Ireland, but lower in the south- and central-eastern United Kingdom, mainly due to densely overcast weather at the end of May.

Model indicators show near- or slightly above-average development and biomass accumulation of winter crops, and adequate water supply. Pest and disease pressure remains high, however. The yield forecasts remain close to or slightly above the five-year average, and close to those of the previous bulletin.







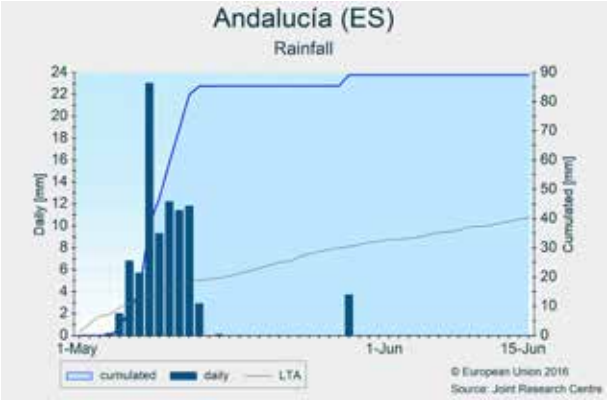


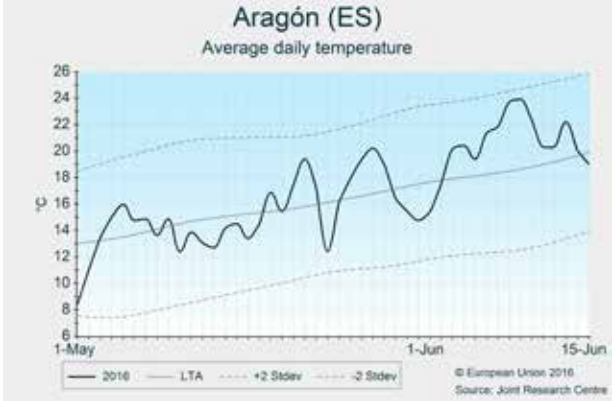
Spain and Portugal

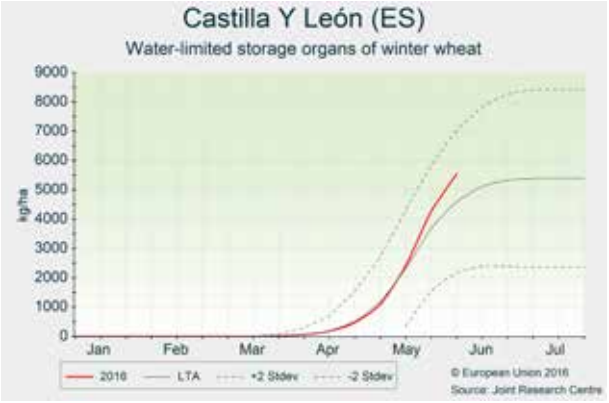
High winter crop yields expected

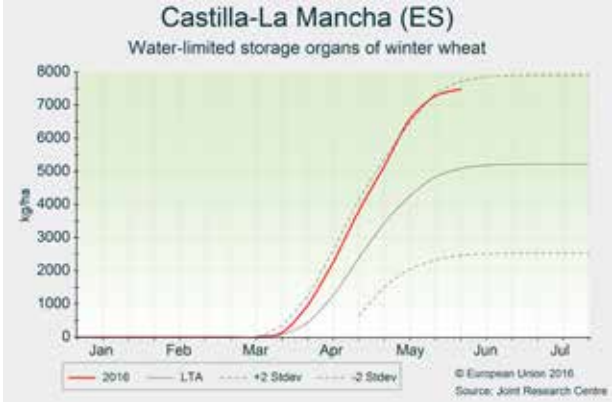
Winter cereals are progressively reaching maturity in the southern and central Iberian Peninsula. Yield expectations are high, thanks to a humid and chilly spring. A rain-free period at the end of May has permitted the completion of the grain maize sowing campaign in Castilla y León, almost one month later than usual.

The first half of May was exceptionally humid in most of the Iberian Peninsula. Precipitation was particularly abundant in the south-west (west of Andalucía, Extremadura, Alentejo), with 80 mm of rain in the second week of May. Temperatures were also slightly cooler than usual, especially in Castilla-La Mancha. From mid May, weather conditions changed drastically: temperatures rose above seasonal values, and rainfall was sparse in the main crop-producing regions. Winter cereals are now reaching physiological maturity in the southern half of the peninsula, with harvests already underway in some parts of Andalucía. Yield expectations for wheat and barley are high, far above last year's yields, thanks to the humid conditions during this season and, particularly, the substantial rainfall in May that sustained the critical grain-filling phase. Rainfall scarcity in the second half of May was crucial to improve summer crop conditions. As access to fields was hampered by overly wet soils in Castilla y León during April and most of May, the sowing of grain maize and sunflowers had to be postponed, finishing only at the end of May. As a result, the development of summer crops in the north-west of Spain presents a delay of almost one month. Temperatures in the second half of June and July will determine if yields, particularly those of grain maize, have been affected.









Italy

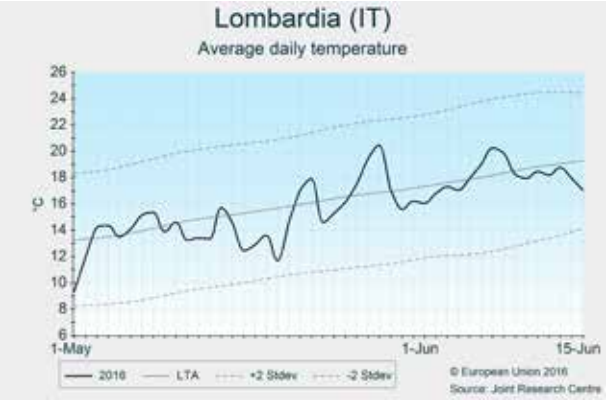
Generally positive end-of-season for winter crops, and good outlook for spring crops

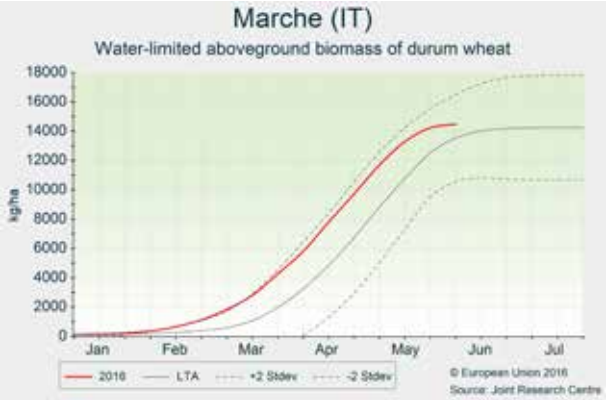
Close-to-average thermal conditions were favourable for the grain filling of winter crops. Excess water is hampering the harvesting of durum wheat in southern Italy, but weather forecasts for the coming days are favourable. The yield outlook for both winter and spring crops is slightly above the average of recent years.

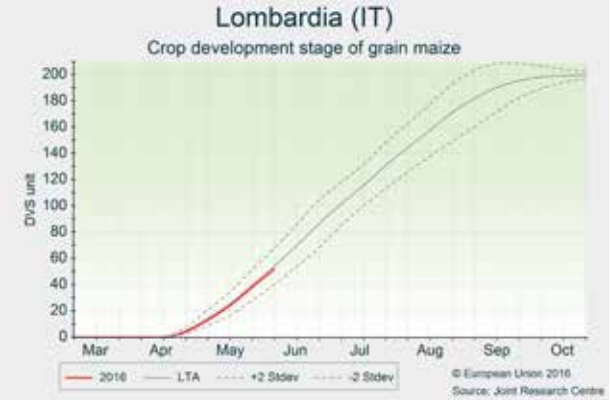
In Italy, temperatures were consistently near the long-term average during the period of review (1 May-15 June 2016). Only a few regions (Calabria, Basilicata, Emilia Romagna and Veneto) experienced slightly lower-than-usual temperatures. Across the country, daily maximum temperatures remained below 35 °C. These mild thermal conditions were favourable for the grain filling of winter crops. Rainfall was generally abundant, exceeding the average by 40 % or more in many important agricultural regions. Positive anomalies reached almost 130 % in Basilicata and about 80 % in Puglia, Veneto and Toscana. This precipitation pattern was favourable for ensuring adequate soil moisture during the grain-filling stage of winter crops, but excess water is hampering the early harvesting of durum wheat in southern Italy, and the pressure of diseases is high. The hot and dry conditions expected for the coming days will probably improve the situation in central-southern Italy.

Crop-model indicators and remote sensing indices suggest slightly above-average yields for winter cereals.

Rapeseed is close to maturity in north-eastern and central Italy, and its yield forecast is above the trend. Grain maize and sunflowers are at the vegetative stage, and are so far in good condition. The yield forecasts for these spring crops are also slightly above the average of recent years, but weather conditions during the coming month will be crucial.





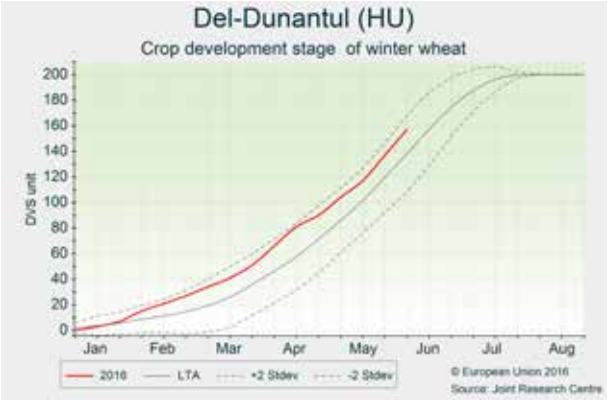


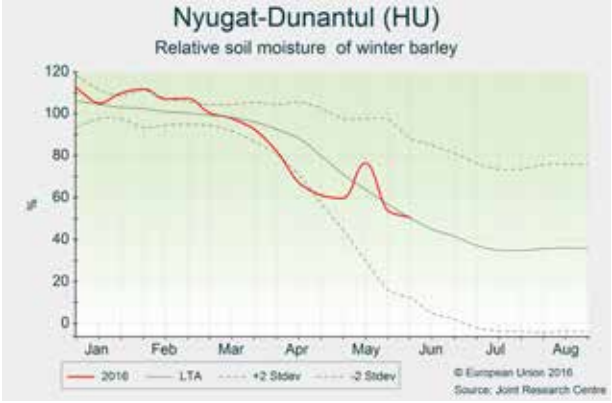
Hungary

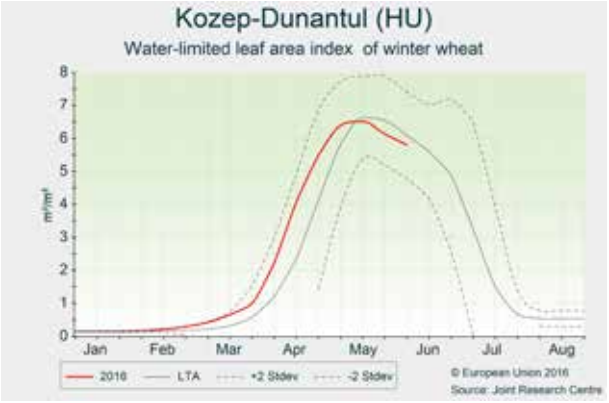
Yield outlook for winter crops is fairly high

Near-average thermal conditions and sufficient rainfall created good conditions for the grain-filling stage of winter cereals. Our crop simulations show the general status of winter cereals and rapeseed to be very good. The current yield forecast for winter crops greatly exceeds the five-year average.

Daily temperatures fluctuated mostly around average, but mid May was significantly colder and the last dekad of May was warmer than usual. No frost events occurred. The precipitation sum moderately exceeded the average by 25-50 mm in the western half of Hungary, while the eastern regions received near-average amounts of rainfall. The precipitation was equally and well distributed over time, providing a continuously favourable water supply to the winter crops. However, the moist weather led to higher rates of fungal infections and increased the cost of pest control. The development of winter crops is still advanced by 1-2 weeks. Winter rapeseed and winter barley are close to ripening, suggesting an early start to this year's harvest. In late May, the soil moisture content started to fall due to intense evapotranspiration, but is still near or above average under most crops. The winter crops developed average crop canopies, and the senescence has begun. As the biomass accumulation of winter cereals is quite high, and the yield formation of barley and wheat occurred under near-optimal conditions, our yield forecast is decidedly positive. Our model simulations show above-average crop development, leaf-area index and biomass accumulation for spring barley and sugar beets, which benefited from the mild spring conditions. Maize, sunflowers and potatoes show near- or slightly below-average development and growth.







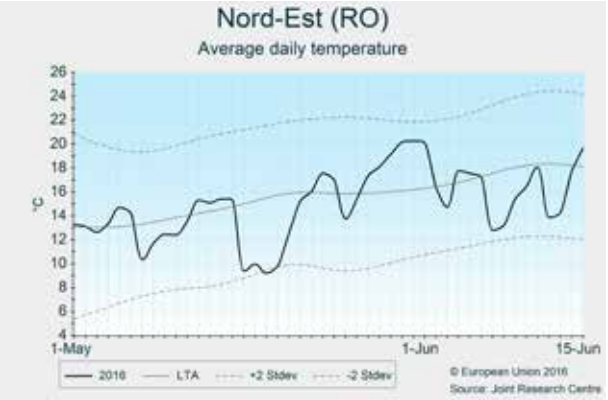
Romania

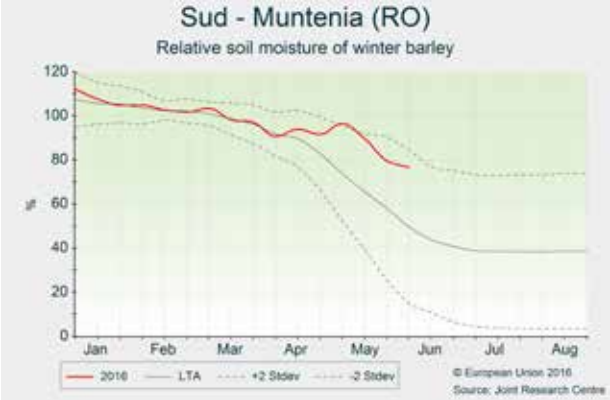
High yield potential for winter crops

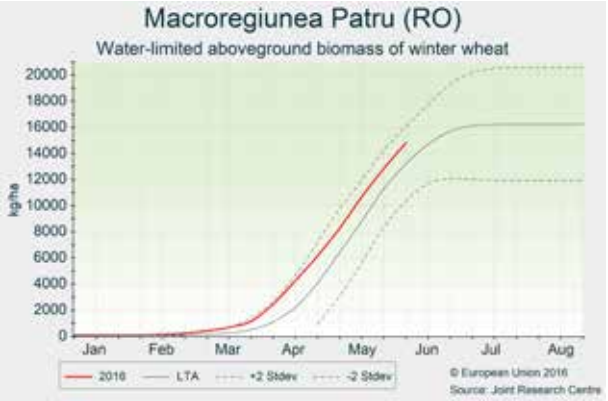
May and the first half of June were characterised by wet conditions. Abundant rainfall led to above-average soil moisture. Beneficial water supply during the grain-filling period of winter cereals resulted in high biomass accumulation. The development of summer crops is delayed and growth is weaker than usual, but the ample soil moisture content is promising.

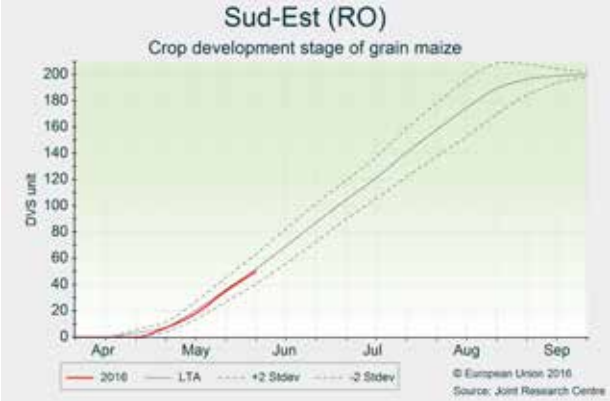
Temperature accumulation was moderately below average during the whole review period, and temperatures indicated a high temporal variability. After 15 May, a short cold spell occurred with minimum temperatures close to 0 °C, but fortunately no frost events occurred in the lowlands. Rainfall was well distributed and plentiful over time. The precipitation sum typically exceeded the average by 30-110 mm, with the exception of areas along the western border of Romania and some smaller parts of the Sud-Est region, where rainfall remained around average. The intense precipitation could have led to hail damage and local flooding. The moist conditions and mild temperatures give rise to concerns about pests, disease and weeds. Persistent wet weather is likely to reduce the grain quality and could cause a difficult harvest.

Winter crop development is still advanced by 10 to 15 days, leading to expectations of an early start to the harvest. Fortunately, the crop reproduction phase was only slightly shortened, allowing enough time for yield formation. As our model simulations indicate quite positive water-limited biomass accumulation and storage organ weight of winter cereals in most of Romania, the previous high yield forecast is maintained. The analysis of METOP satellite images also depicts a positive picture. The sowing of maize and sunflowers was delayed, and colder-than-usual thermal conditions during early development phases led to further delays. Soil moisture under summer crops is favourable, but the leaf-area expansion of maize and sunflowers is below average.







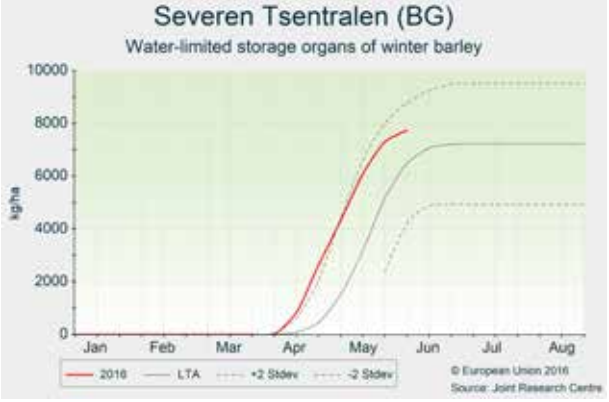


Bulgaria

Very wet

Frequent and abundant rainfall kept soil moisture at very high levels. Winter crops present accelerated phenological development, high biomass accumulation and good yield potential, but there is considerable pest pressure and excessively wet conditions can compromise grain quality. The development of summer crops is weaker than usual, but will benefit from the replenished soil moisture reserves.

Thermal conditions in northern Bulgaria were mostly colder than usual, whereas temperatures in the southern areas fluctuated around the average. The review period did not present any frost or extreme heat events. Precipitation was frequent and abundant throughout the country, especially during the first half of May. Total rainfall for the review period as a whole exceeded the average by 30-60 %, and by more than 100 % in large areas of the Severozapaden and Yugoiztichen regions and the coastal areas of Severoiztochen. For Bulgaria as a whole, this year so far has been the wettest in our records (since 1975), with the greatest extremes occurring in the southern half of the country. Although the earlier huge advance in the phenological development of winter crops was slightly moderated, it remains considerable, and crop-model simulations indicate high biomass accumulation. The previous positive yield forecast for winter cereals is maintained, even though excessively wet soil conditions may have had negative effects on yields, and grain quality may have been affected by fungal infections due to the moist weather. The development of maize and sunflower crops was delayed due to sowing problems and low soil temperatures around emergence. The canopy expansion and biomass accumulation of these crops are still less than optimal. However, soil moisture levels are very well replenished and will last until late June or early July, providing favourable water supply conditions for the crucial flowering and early yield-forming period of summer crops. Our yield forecast therefore remains optimistic.



Austria, Slovakia and the Czech Republic

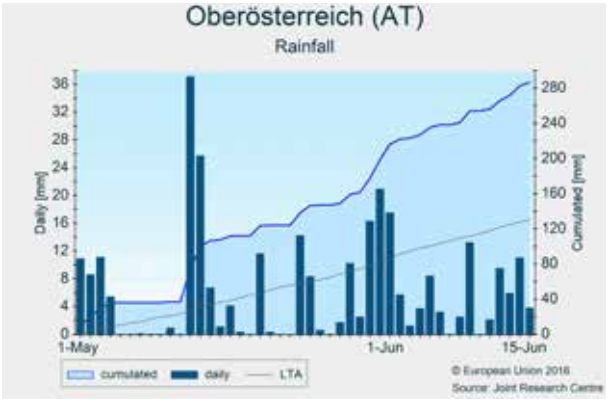
Highly contrasting weather conditions provide uncertain outlook for Austria

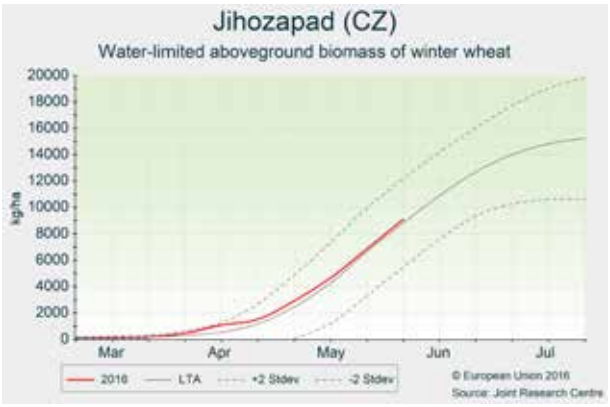
Generally wet and mild conditions in Austria ensured beneficial soil moisture conditions but increased disease pressure. Torrential rains in Oberösterreich caused severe canopy damage locally. Normal or slightly drier-than-usual conditions prevailed in the Czech Republic and Slovakia. Yield forecasts for winter cereals are close to or slightly above the five-year average.

After the cold spell at the end of April, temperatures returned to normal in the first dekad of May, followed by a substantially colder-than-usual second dekad, a warmer-than-usual third dekad and seasonal temperatures prevailing in the first half of June. Rainfall in Austria and western Slovakia was substantially higher than usual. In Oberösterreich, two heavy rainfall episodes (from 12 to 14 May and 30 May to 2 June) occurred during the analysis period, in many cases accompanied by strong winds and hail. Rainfall cumulates during the second episode reached 150-200 mm close to the border with Germany. Heavy rainfall locally resulted in waterlogging and flooding. By contrast, drier-than-usual weather conditions prevailed in northern and western regions of the Czech Republic and in the eastern half of Slovakia.

As reported in May, crop growth and development in many areas were affected by a cold spell at the end of April. Since then, grain maize has partially recovered, while severely damaged fields — especially in Austria — were resown. The performance of these resown areas remains to be seen.

The current situation of winter cereals is close to the average in the Czech Republic and Slovakia. Winter wheat development is slightly advanced, and soil moisture conditions are adequate. Crop-model indicators for Austria show similar results, but there the situation presents additional complexities: disease pressure is increasing due to persistent humid conditions, and the extreme weather conditions during heavy rainfall episodes caused severe canopy damage locally. At the national level, the impacts on seasonal yields are as yet uncertain. The current forecasts for winter cereals are close to or slightly above the five-year average.





Denmark and Sweden

Rain needed to maintain positive outlook

Soil moisture levels are diminishing due to the low levels of precipitation and warm thermal conditions that prevailed in both countries. As winter cereals enter the grain-development phase, rainfall would be welcome in order to maintain the current positive outlook.

Thermal conditions in both Denmark and Sweden were warmer than usual, with maximum temperatures reaching 27 °C at the beginning of June in Denmark and the southern regions of Sweden. The period under review (1 May to 15 June 2016) is among the five warmest in our database (since 1975). The first half of May was almost dry and provided a convenient window to complete the sowing of spring barley (which had been delayed due to interruptions in April because of frequent rainfall) and grain maize (which was completed in the normal window). Several rainfall events have occurred since mid May, but at low levels of precipitation, and cumulated rainfall for the review period is well below the long-term average. Soil moisture levels are below average due to the increased evapotranspiration caused by the warm temperatures, and with the low levels of cumulated rainfall. Winter cereals are completing the flowering stage and are gradually entering the grain-filling stage. Rainfall would be welcome at these crucial development stages to maintain a good yield outlook. Currently, winter cereals are progressing well, and our model suggests advanced development and biomass accumulation. Yield forecasts for winter cereals, turnips and sugar beets are based on scenario analyses and are above the five-year average. Trends and averages have been used to forecast the yields of spring barley, grain maize and potatoes.

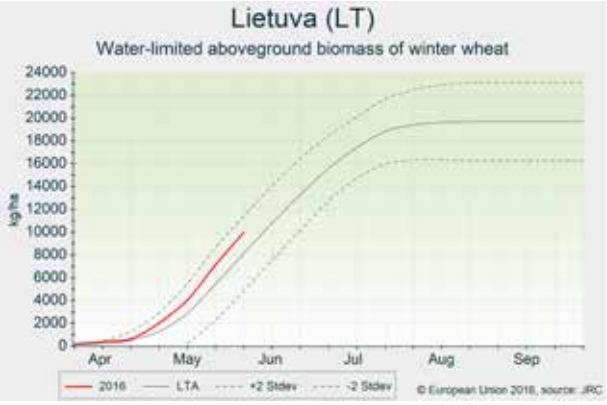
Finland, Lithuania, Latvia and Estonia

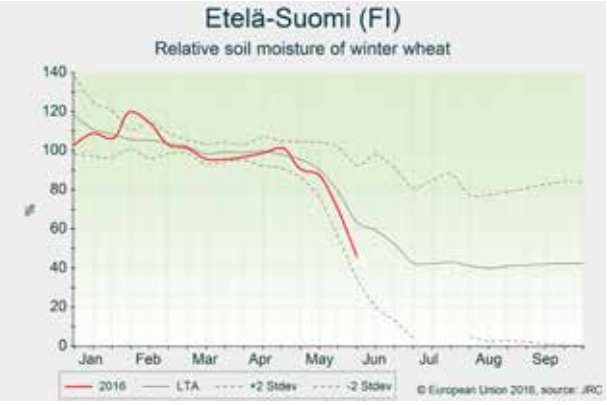
Substantial radiation and mild temperatures stimulated crop growth and development

Spring and winter crop growth is advanced. Spring crops are progressing well to date, and winter crop yield expectations remain above average.

May was substantially warmer than usual in all countries, especially in Estonia and Finland, which registered one of the warmest months in our historical database. In June, temperatures fell to 3-4 °C below seasonal values, leading to a risk of light frosts in the Baltic countries. Drier-than-usual conditions prevailed during most of the period under review in central and southern Finland and the Baltic countries. For the period as a whole, cumulated radiation was well above average in all countries, thanks to the sunny conditions in May.

Higher-than-usual radiation and temperatures boosted the emergence of spring crops (mainly barley, wheat and rapeseed), which present an advanced development of about 7-10 days. Soil humidity was sufficient during the early growth cycle phases, and plants are generally faring well. The development of winter crops was also accelerated, and winter rapeseed, wheat, rye and triticale are currently passing through the flowering stage under optimal conditions. This is in line with our crop-model simulations, since biomass accumulation shows higher-than-usual values. Although soils have become increasingly dry due to the lack of precipitation, the current soil moisture level of 40-50 % doesn't pose a constraint to growing conditions. However, late-sown crops (maize, potatoes and sugar beet) might face difficulties in emergence if persistent dry conditions lead soil moisture to drop to more critical values. Our yield forecasts are close to those of our previous bulletin.





Belgium, the Netherlands and Luxembourg

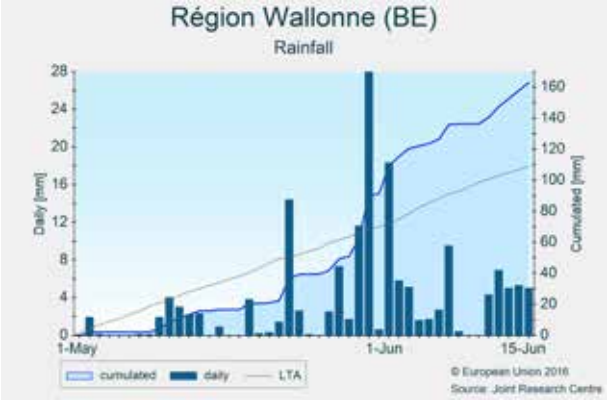
Wet weather tempers positive outlook

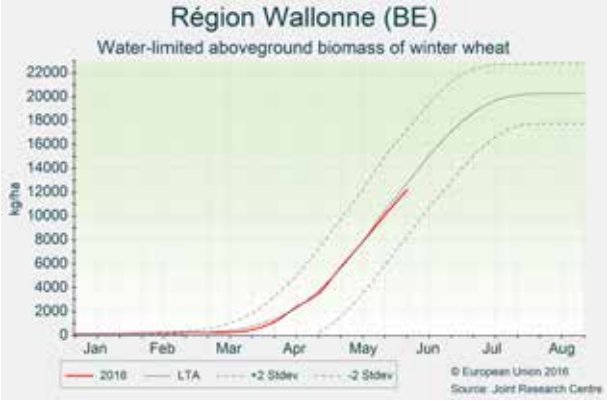
Torrential rains at the end of May/early June caused waterlogging and flooding in poorly drained areas in Belgium, Luxembourg and southern parts of the Netherlands, tempering the outlook, especially for potato and sugar beet crops. The yield forecasts remain close to the five-year average.

In most of the Benelux region, temperatures predominantly exceeded the average during the period of review. The periods from 6 to 13 May and around 7 June were particularly warm, with maximum temperatures exceeding 26 °C in many areas. Light frosts occurred sporadically during the first days of May.

Rainfall was below average until the end of May, followed by a period of abundant precipitation which reached torrential levels in Belgium, Luxembourg and southern parts of the Netherlands, locally causing severe damage and flooding. Rainfall for the period as a whole exceeded the long-term average by more than 100 mm in Luxembourg and north-eastern Belgium, but remained well below average in the northern half of the Netherlands.

The weather conditions until the end of May were generally very favourable for winter crops, as well as for the sowing and establishment of spring and summer crops. This favourable outlook was tempered by the wet period. The impacts on winter cereals are expected to manifest as increased disease pressure and reduced photosynthesis due to the overcast weather conditions. More severe damage is expected in recently established spring crops in flat and concave areas that are subject to prolonged waterlogging and flooding. Potato and sugar beet crops are most affected. Depending on weather conditions during the coming weeks, crops in many affected areas may still recover, and crops on well-drained soils can actually benefit from the currently high soil moisture levels. The current yield forecasts are based on scenario analysis, and remain close to the five-year average





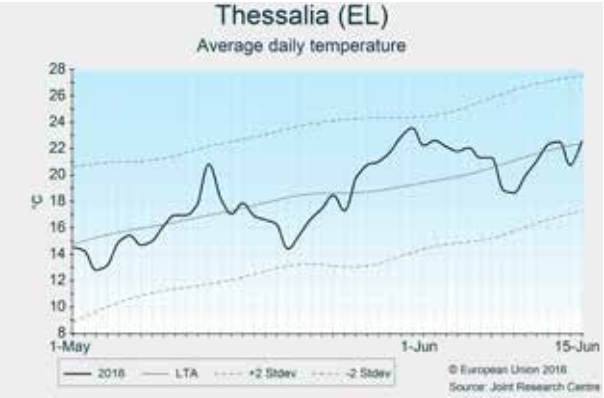
Greece and Cyprus

Harvesting of winter cereals underway

Temperatures in both countries fluctuated mainly around average. Heavy rains occurred on 20 and 21 May, and several agricultural areas were flooded in Greece. Cyprus was almost completely dry. The winter cereal harvest is underway, and the yield outlook is below the five-year average.

In Greece, thermal conditions in the period under consideration were around average. Precipitation was above average, mainly due to heavy rainfall on 20 and 21 May, which led to the flooding of several agricultural areas in central-northern regions. During these two days, the northern areas (e.g. Kilkis, Imathia) received around 50-65 mm and the central regions (e.g. Karditsa, Larissa) 40-50 mm of rain, in some cases accompanied by hail. These conditions negatively impacted the grain yields and quality of winter cereals. In areas where rainfall was less extreme, however, the grain filling of winter cereals improved during its final phase. Grain maize also benefited from the abovementioned conditions, and its development stage is currently around eight leaves. The harvesting of winter barley has almost finished, and that of winter wheat is ongoing. Our yield forecast for winter cereals, based on scenario analyses, is slightly below the five-year average.

In Cyprus, temperatures were slightly above the long-term average for the period under consideration. Some rainfall occurred at the beginning of May, but since then it has been almost completely dry. The harvesting of winter barley has almost finished, and shows low yields because of the previous long dry period. Scenarios have been used to forecast crop yields, which are below the five-year average.



Slovenia and Croatia

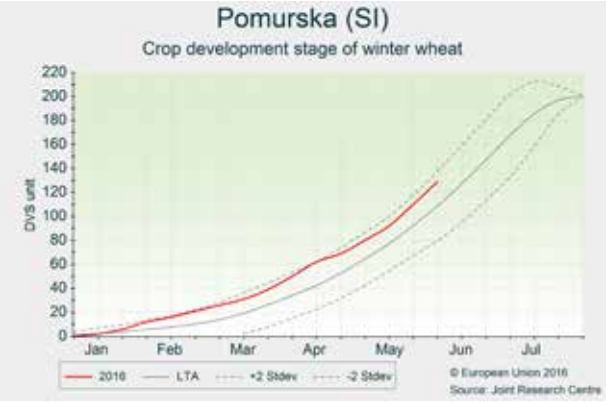
Weather conditions generally favourable for crops

Wetter-than-usual weather conditions prevailed in Slovenia and the western half of Croatia. Highly contrasting temperature conditions were recorded in May, followed by seasonal temperatures during the first half of June. Growing conditions generally favoured crop growth and development.

Temperatures fluctuated strongly. After the cold spell at the end of April, air temperatures returned to normal during the first dekad of May, but the second dekad was colder than usual again, with air temperatures 2 °C to 4 °C below the long-term average. Warmer-than-usual weather prevailed at the end of May, followed by seasonal temperatures during the first half of June.

Abundant rainfall was recorded in central and eastern Slovenia as well as in the western half of Croatia in May, with rainfall cumulates generally exceeding 100 mm (regionally more than 150 mm). By contrast, Vukovarsko-Srijemska and Zupanija in eastern Croatia saw less than 40 mm of rain in May. The first half of June brought between 20 and 60 mm of rain in the eastern half of Slovenia and the eastern half of Croatia, whereas higher cumulates were recorded in orographic regions.

Grain maize recovered in many areas that had been affected by the cold spell at the end of April, and severely damaged fields were replanted. These replanted areas experienced mainly beneficial growing conditions during the second half of May and the first half of June. The yield of grain maize will mainly depend on weather conditions during the coming period, when more sensitive stages will occur. The grain maize yield forecast therefore remains close to the long-term trend, which is slightly above the average of the past five years. Winter wheat development is currently slightly advanced due to the generally good growing conditions during the analysis period. The impacts of the cold spell on winter wheat appear to have been minor in Croatia and more significant in Slovenia, due to lower minimum temperatures. Therefore, the yield forecasts for winter wheat have been slightly increased for Croatia and slightly decreased for Slovenia. The harvesting of winter barley has started in Croatia.



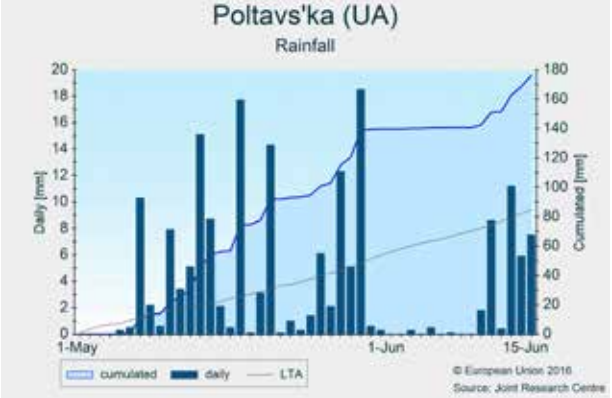
3.2. Black Sea Area

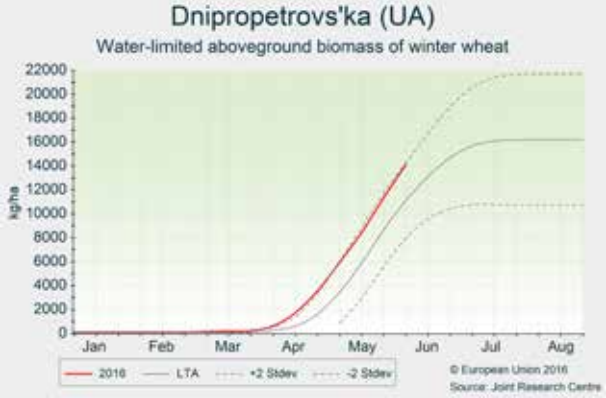
Ukraine

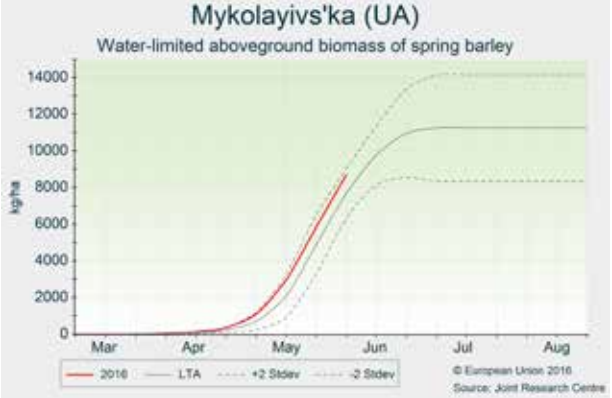
Outlook turning positive

While the season started with concerns over poor sowing conditions and the risk of frost kill to winter cereals, conditions during spring were particularly beneficial. Crops are benefiting from good water supply and mild temperatures. The yield forecasts for wheat and barley were revised upwards, and are now close to record levels.

Contrasting conditions prevailed between the westernmost oblasts and the rest of the country. May was particularly rainy in the main crop regions of central and eastern Ukraine, and cumulated rainfall was well above the long-term average. Poltavs'ka received twice the usual amount of precipitation. Temperatures were slightly below average, and radiation also remained below average. In the westernmost regions, cumulated rainfall was slightly below average while temperatures and radiation were close to the average. The main producing regions will benefit from the above-average rainfall, which has fully replenished soil moisture levels. Crops are currently advanced compared to an average year due to the mild temperatures this spring. Winter cereals have already reached the grain-filling stage and, according to our model, biomass accumulation is well above average. The yield forecasts for all crops were revised further upwards, and are now well above the five-year average and close to record levels. The grain maize yield forecast is close to the average of the past three years, and very close to the record level of 2013.





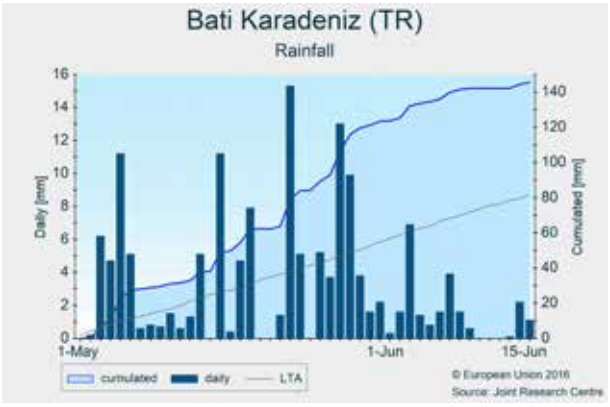


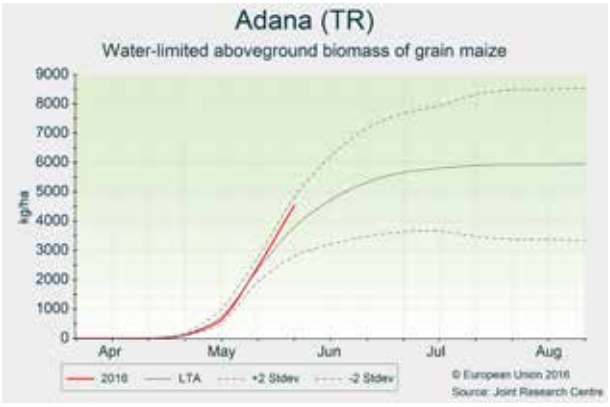
Turkey

Rain benefits maize and the grain filling of winter cereals, but hampers harvesting

Rainy conditions and average temperatures prevailed during the period under review. The replenished soil moisture helped to improve the grain filling of winter cereals, albeit during its final phase. The harvest is underway, and low yields are reported. Grain maize benefited from the wet conditions, and is progressing well.

Cumulated temperatures in Turkey were slightly above the long-term average, except in some central-northern regions where they were recorded as being slightly below average. The period under review (1 May–15 June 2016) was particularly marked by the increased levels of precipitation and frequent rainfall events throughout the country. At country level, the cumulated rainfall was around 50 % (in some regions 90 %) greater than the long-term average. Soil moisture levels, which had fallen dramatically in several areas during March and April, were significantly replenished. This improved conditions for winter cereals that were at the final phase of grain filling after a long dry period and helped to avoid high yield losses. The harvesting of winter cereals started in the second half of May with winter barley in southern areas, and is gradually progressing northwards, including winter wheat. The first harvest reports confirm our below-average forecasts. On the other hand, the abovementioned weather conditions were favourable for grain maize, which has started to present advanced biomass accumulation. Scenario analysis has been used to forecast grain maize yields, which is currently above the five-year average





([3]) http://www.apk-inform.com/en/harvest/1065838#.VxdcKfiNhaQ

3.3. European Russia and Belarus

European Russia

Near-record winter wheat yield expected

The current yield outlook for winter wheat is exceptionally good, and a near-record yield is expected. The well-replenished soils in southern and central Russia ensure adequate water supply, even for the yield formation of maize.

During May, daily temperatures fluctuated close to the long-term average in the southern part of European Russia. Temperatures dropped significantly at the beginning of June, and the first half of the month was colder than usual, by 2-4 °C in the western half of Russia and along the Kazakh border. Abundant and frequent rains occurred in central and southern Russia, including most of the Chernozem belt, the southern regions of the Near Volga Okrug and the whole South and North Caucasus okrugs. The precipitation surplus in this zone reached 50-100 % of the seasonal average. In the eastern and northern areas of Russia, weather conditions in May were near average or drier than usual, which allowed the spring sowing campaign to be completed on time.

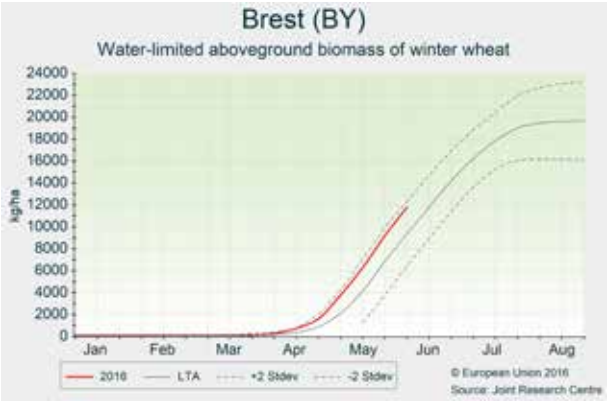
Winter cereals present advanced phenological development of one to two weeks. The soil moisture reached high levels in the main agricultural areas, providing very good water supply, which, alongside mild temperatures, provided near-optimal conditions for the biomass accumulation and yield formation of winter crops. An analysis of satellite data confirms the very good overall crop conditions and indicates considerable improvement along the Ukrainian border, where crop status had been problematic. The current yield outlook for winter wheat is exceptionally good, and a near-record yield is expected. The well-replenished soils in southern and central Russia ensure adequate water supply, even for the yield formation of maize.

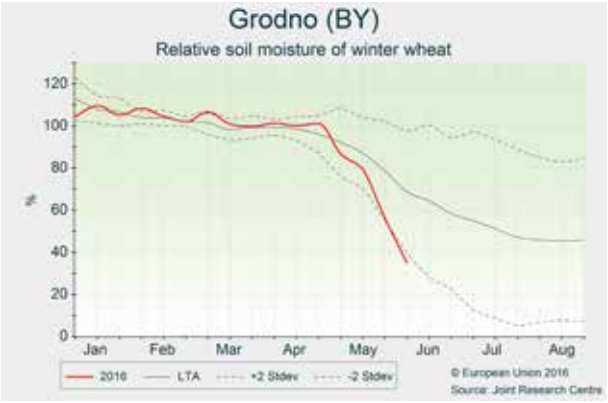
Belarus

Positive yield outlook despite low precipitation

Winter wheat is presenting above-average biomass, and the yield forecast is above the five-year average.

From 1 May to 15 June, average temperatures were close to normal in most of the country, but slightly warmer in north-western regions. As a consequence, winter crops have maintained the advanced level of development gained in previous months. Cumulated precipitation was close to the average in south-eastern regions (Mogilev and Gomel), whereas the rest of the country experienced a lack of rain during the period under review. The province of Grodno is particularly dry, having received only 45 % of the normal precipitation since the beginning of May. Soil moisture levels were decreasing sharply in these areas, however, abundant rains recorded on 15 June were able to replenish soil water content. Winter wheat is presenting above-average biomass, and the yield forecast is above the five-year average. Spring crop indicators are close to the average, and yields are forecast to be in line with the trend.





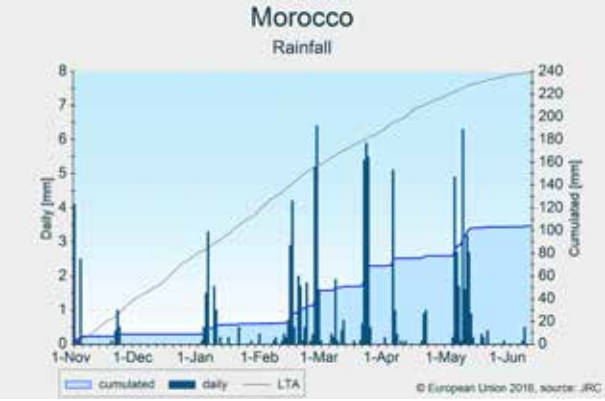
3.4. Magrehb

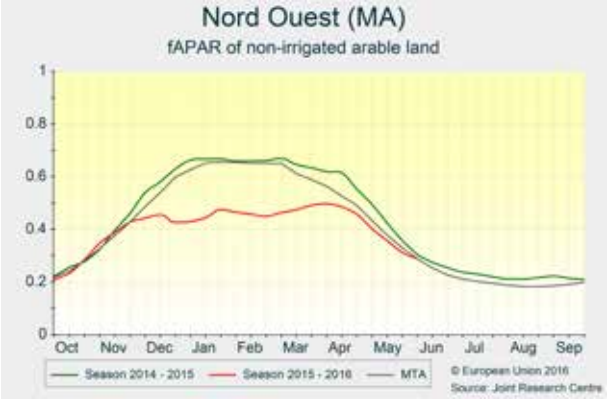
Morocco, Algeria and Tunisia

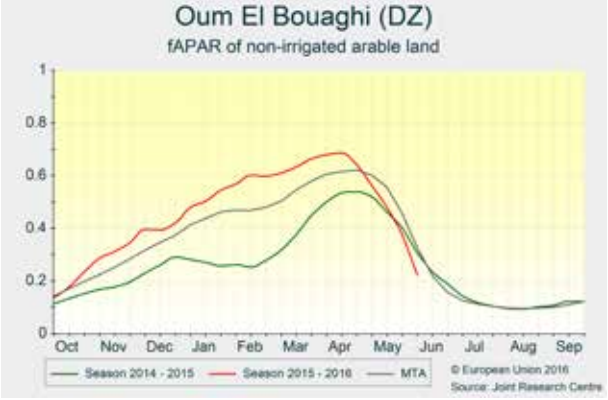
From a historically negative season in Morocco to a positive one in Tunisia

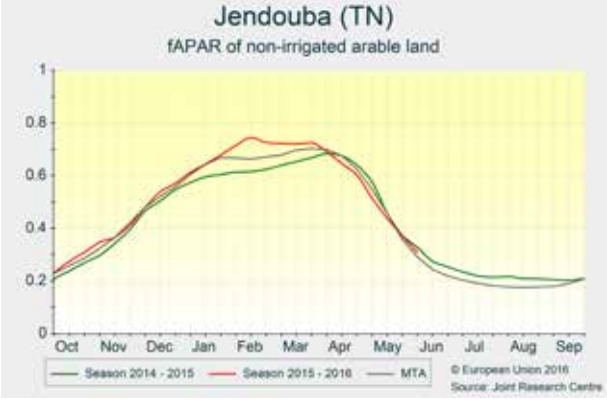
In Morocco, the 2015–2016 winter-cereal campaign has ended with extraordinarily low yield expectations. A similar pessimistic outlook for western Algeria is mitigated by a favourable outlook in eastern regions, resulting in yield forecasts being close to the trend. In Tunisia, the outlook for wheat is above average, whereas barley is forecast to be below average.

The Moroccan winter-cereal season was marked by a historic shortfall in precipitation from November to January, coupled by unusually warm conditions. These adverse conditions resulted in crop failure and a dramatic reduction in the harvested area. The very few winter-cereal areas that succeeded in overcoming the extreme growth-restricting conditions (mainly located in Nord Ouest) were harvested in the normal Moroccan window (May-June); yields are substantially below average. Similar conditions prevailed in the winter-cereal areas of western Algeria. A more positive picture prevails in the regions of eastern Algeria, which were sown during a later window (November-December) and exposed to a shorter dry spell. Spring growing conditions were beneficial, resulting in a positive status at maturity. Current weather conditions are favourable for harvesting, which will be completed in the coming weeks. On balance, our yield forecast for Algeria is close to the average. The Tunisian winter-cereal campaign has practically concluded. Overall, there were no limiting climatic factors in the northern coastal regions (where most of the Tunisian wheat production is concentrated), resulting in an above-average yield forecast. In central Tunisia, where winter barley is more typically grown, the winter-cereal campaign has been marked by persistent dry conditions that have impacted the vegetative and reproductive stages (January-April), resulting in a below-average yield forecast for winter barley.









4. Crop yield forecasts

Country	TOTAL WHEAT t/ha					TOTAL BARLEY t/ha				
	2015	2016	Avg 5yrs	%16/15	%16/5yrs	2015	2016	Avg 5yrs	%16/15	%16/5yrs
EU-28	6.03	**5.82**	5.60	- 3.5	+ 3.9	5.02	**5.01**	4.72	- 0.2	+ 6.3
AT	5.70	**5.83**	5.39	+ 2.3	+ 8.0	5.54	**5.45**	5.38	- 1.5	+ 1.3
BE	9.36	**8.93**	8.83	- 4.6	+ 1.1	9.28	**9.21**	8.62	- 0.8	+ 6.8
BG	4.53	**4.65**	4.10	+ 2.6	+ 13.3	4.04	**4.14**	3.86	+ 2.3	+ 7.1
CY	-	-	-	-	-	2.49	**1.04**	1.82	- 58.3	- 42.9
CZ	6.36	**5.93**	5.71	- 6.7	+ 3.8	5.44	**4.92**	4.93	- 9.5	- 0.2
DE	8.09	**8.02**	7.81	- 0.8	+ 2.7	7.17	**6.85**	6.61	- 4.5	+ 3.6
DK	7.96	**7.80**	7.34	- 2.0	+ 6.2	6.11	**5.87**	5.78	- 4.0	+ 1.5
EE	4.79	**3.78**	3.82	- 21.0	- 1.0	4.23	**3.36**	3.38	- 20.6	- 0.7
ES	2.92	**3.52**	3.07	+ 20.3	+ 14.7	2.46	**3.43**	2.73	+ 39.2	+ 25.3
FI	4.10	**3.85**	3.82	- 6.1	+ 0.7	3.46	**3.52**	3.49	+ 1.7	+ 1.1
FR	7.79	**7.32**	7.20	- 6.0	+ 1.7	7.09	**6.76**	6.49	- 4.7	+ 4.1
GR	2.99	**2.93**	2.99	- 2.2	- 2.2	2.51	**2.70**	2.78	+ 7.6	- 2.9
HR	5.39	**5.23**	4.96	- 3.0	+ 5.4	4.39	**4.61**	4.36	+ 5.1	+ 5.9
HU	5.14	**5.14**	4.49	+ 0.1	+ 14.6	4.82	**5.00**	4.24	+ 3.7	+ 18.1
IE	10.66	**10.06**	9.23	- 5.6	+ 9.0	8.58	**8.10**	7.78	- 5.6	+ 4.1
IT	3.93	**3.99**	3.89	+ 1.5	+ 2.6	3.91	**3.85**	3.72	- 1.7	+ 3.4
LT	5.24	**4.44**	4.53	- 15.2	- 1.9	4.00	**3.48**	3.46	- 13.2	+ 0.3
LU	6.28	**6.41**	6.05	+ 2.0	+ 6.0	-	-	-	-	-
LV	5.03	**3.83**	3.90	- 23.8	- 1.6	3.83	**2.92**	2.93	- 23.8	- 0.3
MT	-	-	-	-	-	-	-	-	-	-
NL	9.04	**9.19**	8.88	+ 1.7	+ 3.5	6.43	**6.58**	6.66	+ 2.4	- 1.2
PL	4.57	**4.24**	4.44	- 7.2	- 4.4	3.53	**3.59**	3.62	+ 1.7	- 0.9
PT	2.16	**2.30**	1.62	+ 6.5	+ 41.7	2.32	**2.32**	1.76	+ 0.0	+ 31.5
RO	3.82	**3.92**	3.44	+ 2.6	+ 13.8	3.45	**3.62**	3.14	+ 4.7	+ 15.1
SE	7.21	**6.83**	6.34	- 5.3	+ 7.7	5.25	**4.89**	4.80	- 6.8	+ 1.8
SI	5.11	**4.62**	5.08	- 9.5	- 8.9	4.63	**4.44**	4.56	- 4.1	- 2.5
SK	5.53	**4.61**	4.68	- 16.6	- 1.4	4.82	**4.21**	4.10	- 12.8	+ 2.6
UK	8.98	**8.09**	7.89	- 9.9	+ 2.5	6.69	**6.18**	6.12	- 7.7	+ 0.9

Country	SOFT WHEAT t/ha					DURUM WHEAT t/ha				
	2015	2016	Avg 5yrs	%16/15	%16/5yrs	2015	2016	Avg 5yrs	%16/15	%16/5yrs
EU-28	6.29	**6.07**	5.83	- 3.4	+ 4.1	3.49	**3.48**	3.33	- 0.5	+ 4.4
AT	5.77	**5.90**	5.44	+ 2.2	+ 8.4	4.64	**4.85**	4.53	+ 4.7	+ 7.1
BE	9.36	**8.93**	8.83	- 4.6	+ 1.1	-	-	-	-	-
BG	4.54	**4.66**	4.12	+ 2.6	+ 13.2	3.29	**3.74**	3.17	+ 13.4	+ 17.9
CY	-	-	-	-	-	-	-	-	-	-
CZ	6.36	**5.93**	5.71	- 6.7	+ 3.8	-	-	-	-	-
DE	8.11	**8.04**	7.83	- 0.9	+ 2.7	4.64	**5.35**	5.23	+ 15.1	+ 2.2
DK	7.96	**7.80**	7.34	- 2.0	+ 6.2	-	-	-	-	-
EE	4.79	**3.78**	3.82	- 21.0	- 1.0	-	-	-	-	-
ES	2.99	**3.69**	3.24	+ 23.6	+ 14.0	2.59	**2.69**	2.18	+ 3.7	+ 23.2
FI	4.10	**3.85**	3.82	- 6.1	+ 0.7	-	-	-	-	-
FR	7.92	**7.45**	7.34	- 5.9	+ 1.6	5.62	**5.35**	5.25	- 4.9	+ 1.8
GR	3.25	**3.07**	3.20	- 5.7	- 4.1	2.86	**2.86**	2.90	- 0.2	- 1.6
HR	5.39	**5.23**	4.96	- 3.0	+ 5.4	-	-	-	-	-
HU	5.14	**5.15**	4.49	+ 0.1	+ 14.6	4.83	**5.03**	4.39	+ 4.0	+ 14.4
IE	10.66	**10.06**	9.23	- 5.6	+ 9.0	-	-	-	-	-
IT	5.41	**5.65**	5.43	+ 4.4	+ 4.0	3.31	**3.30**	3.18	- 0.3	+ 3.7
LT	5.24	**4.44**	4.53	- 15.2	- 1.9	-	-	-	-	-
LU	6.28	**6.41**	6.05	+ 2.0	+ 6.0	-	-	-	-	-
LV	5.03	**3.83**	3.90	- 23.8	- 1.6	-	-	-	-	-
MT	-	-	-	-	-	-	-	-	-	-
NL	9.04	**9.19**	8.88	+ 1.7	+ 3.5	-	-	-	-	-
PL	4.57	**4.24**	4.44	- 7.2	- 4.4	-	-	-	-	-
PT	2.16	**2.30**	1.62	+ 6.5	+ 41.7	-	-	-	-	-
RO	3.82	**3.92**	3.44	+ 2.6	+ 13.8	-	-	-	-	-
SE	7.21	**6.83**	6.34	- 5.3	+ 7.7	-	-	-	-	-
SI	5.11	**4.62**	5.08	- 9.5	- 8.9	-	-	-	-	-
SK	5.56	**4.61**	4.70	- 17.0	- 1.7	5.14	**4.62**	4.25	- 10.1	+ 8.6
UK	8.98	**8.09**	7.89	- 9.9	+ 2.5	-	-	-	-	-

Country	SPRING BARLEY t/ha					WINTER BARLEY t/ha				
	2015	2016	Avg 5yrs	%16/15	%16/5yrs	2015	2016	Avg 5yrs	%16/15	%16/5yrs
EU-28	4.18	**4.33**	4.12	+ 3.6	+ 4.9	6.13	**5.94**	5.57	-3.1	+ 6.5
AT	4.92	**4.48**	4.66	- 9.0	- 3.8	5.99	**6.21**	5.99	+ 3.7	+ 3.6
BE	-	-	-	-	-	9.28	**9.21**	8.62	-0.8	+ 6.8
BG	-	-	-	-	-	4.04	**4.14**	3.86	+ 2.3	+ 7.1
CY	-	-	-	-	-	2.49	**1.04**	1.82	- 58.3	- 42.9
CZ	5.43	**4.72**	4.96	-1 3.2	- 4.9	5.46	**5.40**	4.87	- 1.2	+ 10.9
DE	5.42	**5.56**	5.70	+ 2.5	-2.5	7.69	**7.23**	6.92	- 5.9	+ 4.4
DK	5.96	**5.67**	5.67	- 4.9	- 0.0	6.76	**6.75**	6.31	- 0.2	+ 7.1
EE	4.23	**3.36**	3.38	- 20.6	- 0.7	-	-	-	-	-
ES	2.51	**3.47**	2.79	+ 37.9	+ 24.2	2.11	**3.15**	2.40	+ 48.9	+ 30.9
FI	3.46	**3.52**	3.49	+ 1.7	+ 1.1	-	-	-	-	-
FR	6.50	**6.32**	5.97	- 2.9	+ 5.8	7.30	**6.90**	6.69	- 5.4	+ 3.2
GR	-	-	-	-	-	2.51	**2.70**	2.78	+ 7.6	- 2.9
HR	-	-	-	-	-	4.39	**4.61**	4.36	+ 5.1	+ 5.9
HU	3.89	**4.31**	3.68	+ 10.8	+ 16.9	5.14	**5.26**	4.49	+ 2.3	+ 17.3
IE	7.72	**7.46**	7.29	- 3.4	+ 2.3	10.21	**9.40**	9.31	- 7.9	+ 0.9
IT	-	-	-	-	-	3.91	**3.85**	3.72	- 1.7	+ 3.4
LT	4.00	**3.48**	3.46	- 13.2	+ 0.3	-	-	-	-	-
LU	-	-	-	-	-	-	-	-	-	-
LV	3.83	**2.92**	2.93	- 23.8	- 0.3	-	-	-	-	-
MT	-	-	-	-	-	-	-	-	-	-
NL	6.43	**6.58**	6.66	+ 2.4	- 1.2	-	-	-	-	-
PL	3.30	**3.48**	3.49	+ 5.3	- 0.5	4.13	**3.98**	4.10	-3.6	-3.0
PT	-	-	-	-	-	2.32	**2.32**	1.76	+ 0.0	+ 31.5
RO	2.38	**2.78**	2.50	+ 16.7	+ 11.0	3.90	**3.96**	3.40	+ 1.4	+ 16.3
SE	5.20	**4.83**	4.76	- 7.1	+ 1.4	6.21	**6.01**	5.86	- 3.3	+ 2.5
SI	-	-	-	-	-	4.63	**4.44**	4.56	- 4.1	- 2.5
SK	4.74	**4.09**	4.04	- 13.7	+ 1.2	5.08	**4.58**	4.41	- 9.8	+ 3.8
UK	6.05	**5.71**	5.71	- 5.6	+ 0.1	7.65	**6.88**	6.86	- 10.1	+ 0.3

Country	GRAIN MAIZE t/ha					RYE t/ha				
	2015	2016	Avg 5yrs	%16/15	%16/5yrs	2015	2016	Avg 5yrs	%16/15	%16/5yrs
EU-28	6.30	**7.35**	6.93	+ 16.6	+ 6.1	4.00	**3.77**	3.76	- 5.9	+ 0.3
AT	8.68	**10.15**	9.98	+ 17.0	+ 1.7	4.32	**4.43**	4.40	+ 2.5	+ 0.8
BE	11.87	**11.23**	10.96	- 5.4	+ 2.4	-	-	-	-	-
BG	5.41	**7.18**	5.62	+ 32.7	+ 27.8	-	-	-	-	-
CY	-	-	-	-	-	-	-	-	-	-
CZ	5.54	**7.72**	7.64	+ 39.4	+ 1.0	4.91	**5.07**	4.84	+ 3.2	+ 4.7
DE	8.72	**10.06**	9.95	+ 15.3	+ 1.1	5.66	**5.54**	5.50	- 2.1	+ 0.8
DK	5.89	**6.00**	5.98	+ 1.9	+ 0.4	6.33	**6.24**	6.08	- 1.4	+ 2.6
EE	-	-	-	-	-	3.83	**3.18**	3.00	- 16.9	+ 6.0
ES	11.30	**11.27**	11.08	- 0.3	+ 1.6	1.91	**2.31**	1.99	+ 21.2	+ 16.0
FI	-	-	-	-	-	3.44	**3.22**	3.03	- 6.5	+ 6.2
FR	8.36	**9.27**	9.11	+ 10.9	+ 1.7	4.71	**4.94**	4.84	+ 4.8	+ 2.0
GR	11.22	**11.44**	11.37	+ 1.9	+ 0.6	2.07	**1.91**	2.03	- 7.6	- 6.1
HR	6.49	**6.59**	6.01	+ 1.5	+ 9.6	-	-	-	-	-
HU	5.69	**6.64**	5.77	+ 16.7	+ 15.0	2.79	**2.77**	2.66	- 0.6	+ 4.3
IE	-	-	-	-	-	-	-	-	-	-
IT	9.72	**9.63**	9.28	- 1.0	+ 3.8	-	-	-	-	-
LT	4.81	**6.37**	6.38	+ 32.4	- 0.2	2.78	**2.42**	2.37	- 12.9	+ 2.3
LU	-	-	-	-	-	-	-	-	-	-
LV	-	-	-	-	-	4.28	**3.33**	3.22	- 22.1	+ 3.6
MT	-	-	-	-	-	-	-	-	-	-
NL	10.82	**11.60**	10.79	+ 7.2	+ 7.5	-	-	-	-	-
PL	4.71	**6.30**	6.15	+ 33.8	+ 2.4	2.78	**2.69**	2.82	- 3.0	- 4.6
PT	8.39	**8.42**	8.29	+ 0.4	+ 1.6	0.84	**0.95**	0.86	+ 12.8	+ 10.9
RO	3.19	**4.46**	3.80	+ 39.9	+ 17.4	-	-	-	-	-
SE	-	-	-	-	-	6.35	**6.17**	6.02	- 2.9	+ 2.4
SI	8.96	**8.20**	7.85	- 8.4	+ 4.4	-	-	-	-	-
SK	4.84	**6.08**	6.04	+ 25.6	+ 0.6	3.63	**3.06**	3.60	- 15.7	- 14.9
UK	-	-	-	-	-	-	-	-	-	-

Country	TRITICALE t/ha					RAPE AND TURNIP RAPE t/ha				
	2015	2016	Avg 5yrs	%16/15	%16/5yrs	2015	2016	Avg 5yrs	%16/15	%16/5yrs
EU-28	4.15	**4.20**	4.20	+ 1.1	- 0.2	3.36	**3.24**	3.20	- 3.8	+ 1.0
AT	5.29	**5.40**	5.26	+ 2.1	+ 2.7	2.98	**3.03**	3.23	+ 1.7	- 6.2
BE	-	-	-	-	-	4.28	**4.44**	4.37	+ 3.5	+ 1.4
BG	3.02	**3.36**	2.94	+ 11.1	+ 14.0	2.48	**2.91**	2.45	+ 17.6	+ 19.1
CY	-	-	-	-	-	-	-	-	-	-
CZ	4.72	**4.68**	4.64	- 1.0	+ 0.9	3.43	**3.41**	3.28	- 0.5	+ 4.0
DE	6.47	**6.42**	6.33	- 0.8	+ 1.4	3.90	**4.05**	3.80	+ 3.8	+ 6.7
DK	5.13	**5.54**	5.41	+ 8.1	+ 2.4	4.28	**4.09**	3.94	- 4.6	+ 3.7
EE	-	-	-	-	-	2.77	**1.93**	2.03	- 30.4	- 4.9
ES	2.08	**2.65**	2.22	+ 27.3	+ 19.3	2.10	**2.71**	2.22	+ 28.7	+ 22.0
FI	-	-	-	-	-	1.54	**1.48**	1.46	- 3 .9	+ 1.3
FR	5.41	**5.34**	5.30	- 1.4	+ 0.7	3.56	**3.26**	3.43	- 8.6	- 5.1
GR	-	-	-	-	-	-	-	-	-	-
HR	3.82	**3.84**	3.93	+ 0.6	- 2.2	2.58	**2.78**	2.78	+ 7.6	+ 0.0
HU	3.99	**4.31**	3.75	+ 8.1	+ 15.1	2.63	**3.17**	2.66	+ 20.5	+ 19.4
IE	-	-	-	-	-	-	-	-	-	-
IT	-	-	-	-	-	2.29	**2.51**	2.32	+ 9.5	+ 8.2
LT	3.84	**3.39**	3.31	- 11.8	+ 2.3	3.13	**2.30**	2.25	- 26.4	+ 2.3
LU	-	-	-	-	-	-	-	-	-	-
LV	-	-	-	-	-	3.33	**2.29**	2.31	- 31.2	- 0.7
MT	-	-	-	-	-	-	-	-	-	-
NL	-	-	-	-	-	-	-	-	-	-
PL	3.52	**3.38**	3.58	- 4.1	- 5.6	3.00	**2.62**	2.83	- 12.6	- 7.4
PT	1.72	**1.94**	1.39	+ 13.1	+ 39.5	-	-	-	-	-
RO	3.48	**3.71**	3.37	+ 6.6	+ 10.0	2.51	**2.73**	2.29	+ 9.0	+ 19.3
SE	5.81	**5.68**	5.50	- 2.2	+ 3.4	3.80	**3.49**	3.06	- 8.1	+ 14.2
SI	-	-	-	-	-	-	-	-	-	-
SK	3.60	**3.46**	3.47	- 4.1	- 0.4	2.69	**2.99**	2.64	+ 11.4	+ 13.4
UK	4.78	**4.15**	4.11	- 13.1	+ 1.0	3.56	**3.54**	3.49	- 0.5	+ 1.4

Country	SUGAR BEETS t/ha					POTATO t/ha				
	2015	2016	Avg 5yrs	%16/15	%16/5yrs	2015	2016	Avg 5yrs	%16/15	%16/5yrs
EU-28	71.72	**73.20**	71.80	+ 2.1	+ 2.0	32.05	**33.16**	32.07	+ 3.5	+ 3.4
AT	62.80	**69.60**	70.59	+ 10.8	- 1.4	26.34	**31.68**	31.37	+ 20.3	+ 1.0
BE	85.08	**79.35**	77.81	- 6.7	+ 2.0	46.58	**46.45**	47.82	- 0.3	- 2.9
BG	-	-	-	-	-	14.95	**15.23**	13.51	+ 1.9	+ 12.7
CY	-	-	-	-	-	-	-	-	-	-
CZ	59.38	**64.63**	64.00	+ 8.8	+ 1.0	22.26	**25.92**	26.72	+ 16.4	- 3.0
DE	72.17	**71.77**	71.85	- 0.6	- 0.1	43.81	**44.60**	44.29	+ 1.8	+ 0.7
DK	66.90	**64.35**	63.97	- 3.8	+ 0.6	42.10	**41.24**	41.02	- 2.0	+ 0.5
EE	-	-	-	-	-	-	-	-	-	-
ES	95.30	**95.64**	89.32	+ 0.4	+ 7.1	31.14	**32.00**	30.59	+ 2.8	+ 4.6
FI	32.74	**36.56**	36.65	+ 11.7	- 0.2	24.31	**26.32**	26.30	+ 8.3	+ 0.1
FR	87.50	**89.75**	89.15	+ 2.6	+ 0.7	42.50	**44.03**	44.23	+ 3.6	-0.5
GR	-	-	-	-	-	24.25	**25.88**	25.31	+ 6.7	+ 2.3
HR	54.49	**59.52**	52.45	+ 9.2	+ 13.5	17.06	**16.57**	16.81	- 2.9	- 1.5
HU	57.66	**61.08**	53.96	+ 5.9	+ 13.2	22.65	**26.19**	24.19	+ 15.6	+ 8.3
IE	-	-	-	-	-	-	-	-	-	-
IT	57.01	**57.84**	55.93	+ 1.4	+ 3.4	27.55	**26.83**	26.09	- 2.6	+ 2.8
LT	50.61	**51.65**	51.70	+ 2.1	-0.1	17.00	**16.38**	16.23	- 3.7	+ 0.9
LU	-	-	-	-	-	-	-	-	-	-
LV	-	-	-	-	-	18.00	**18.00**	17.97	+ 0.0	+ 0.2
MT	-	-	-	-	-	-	-	-	-	-
NL	83.30	**82.83**	81.21	- 0.6	+ 2.0	42.69	**44.62**	44.08	+ 4.5	+ 1.2
PL	52.00	**53.87**	52.79	+ 3.6	+ 2.0	21.70	**22.11**	22.26	+ 1.9	- 0.7
PT	-	-	-	-	-	18.62	**19.15**	17.85	+ 2.9	+ 7.3
RO	39.40	**43.01**	36.73	+ 9.2	+ 17.1	14.37	**15.46**	14.92	+ 7.6	+ 3.6
SE	60.80	**63.44**	63.46	+ 4.3	- 0.0	34.73	**34.43**	33.42	- 0.9	+ 3.0
SI	-	-	-	-	-	-	-	-	-	-
SK	56.01	**54.80**	55.28	- 2.2	- 0.9	-	-	-	-	-
UK	66.50	**70.92**	70.19	+ 6.6	+ 1.0	40.20	**41.69**	39.91	+ 3.7	+ 4.5

Country	SUNFLOWER t/ha				
	2015	2016	Avg 5yrs	%16/15	%16/5yrs
EU-28	1.88	**2.08**	1.94	+ 10.1	+ 7.1
AT	2.00	**2.61**	2.47	+ 30.5	+ 5.6
BE	-	-	-	-	-
BG	2.11	**2.36**	2.12	+ 12.1	+ 11.5
CY	-	-	-	-	-
CZ	2.05	**2.33**	2.29	+ 13.8	+ 1.8
DE	1.92	**2.14**	2.14	+ 11.5	- 0.2
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	0.94	**1.12**	1.07	+ 20.2	+ 4.7
FI	-	-	-	-	-
FR	1.96	**2.31**	2.25	+ 17.4	+ 2.2
GR	2.71	**2.52**	2.53	- 6.8	- 0.4
HR	2.73	**2.46**	2.54	- 9.9	- 3.2
HU	2.60	**2.55**	2.44	-1.7	+ 4.5
IE	-	-	-	-	-
IT	2.17	**2.28**	2.23	+ 5.0	+ 2.1
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	1.10	**0.90**	0.76	-1 8.7	+ 17.4
RO	1.76	**2.09**	1.81	+ 19.2	+ 16.0
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	2.31	**2.39**	2.33	+ 3.5	+ 2.6
UK	-	-	-	-	-

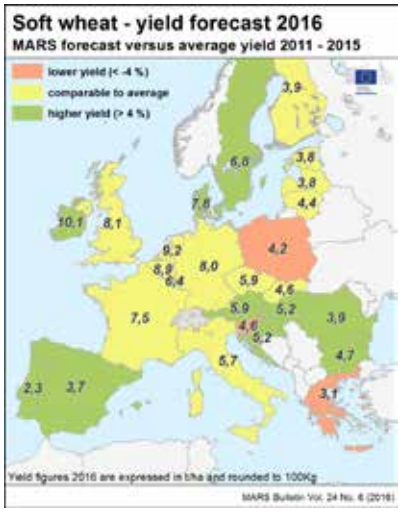
Note: Yields are forecast for crops with more than 10 000 ha per country.
Sources: 2011–2016 data come from DG Agriculture and Rural Development short-term-outlook data (dated May 2016, received on 1.6.2016), Eurostat Eurobase (last update: 1.6.2016) and EES (last update: 31.5.2016).
2016 yields come from MARS Crop Yield Forecasting System (output up to 10.6.2016).

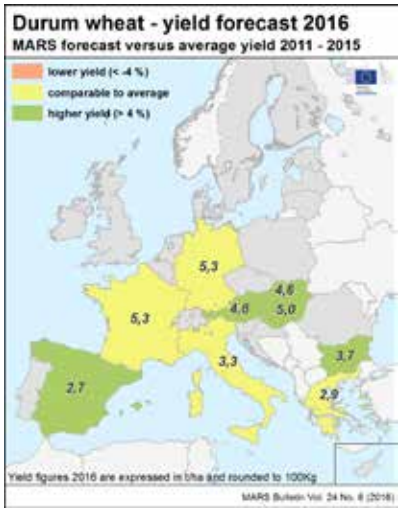
Country	WHEAT (t/ha)				
	2015	2016	Avg 5yrs	%16/15	%16/5yrs
BY	3.43	**3.72**	3.47	+ 8.5	+ 7.2
DZ	1.28	**1.45**	1.46	+ 13.3	- 1.0
MA	2.36	**0.61**	1.86	- 74.2	-67.2
TN	2.15	**2.01**	2.05	- 6.5	- 1.8
TR	2.90	**2.69**	2.69	- 7.4	- 0.1
UA	3.88	**3.98**	3.52	+ 2.7	+ 13.2

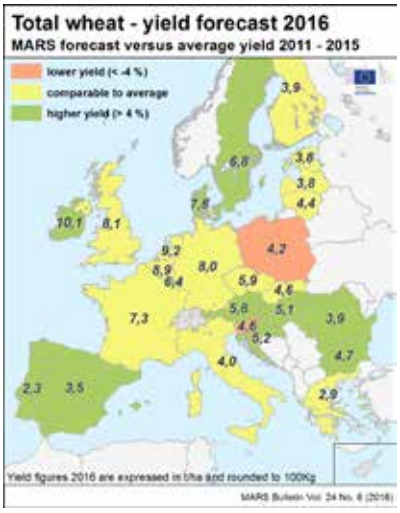
Country	BARLEY (t/ha)				
	2015	2016	Avg 5yrs	%16/15	%16/5yrs
BY	3.33	**3.49**	3.24	+ 4.9	+ 7.7
DZ	0.84	**1.20**	1.09	+ 42.7	+ 9.7
MA	1.62	**0.44**	1.16	- 72.8	- 62.2
TN	1.44	**1.19**	1.30	- 17.1	- 8.4
TR	2.9	**2.59**	2.65	- 10.8	- 2.4
UA	2.95	**2.85**	2.57	- 3.5	+ 10.9

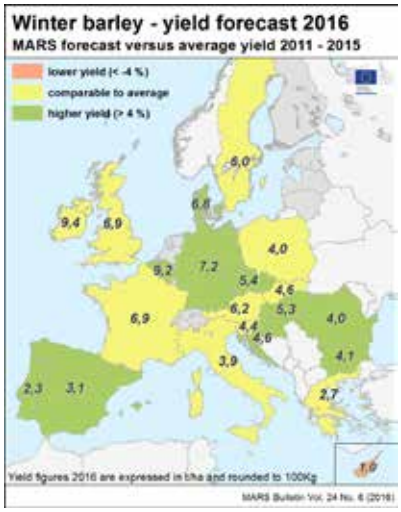
Country	GRAIN MAIZE (t/ha)				
	2015	2016	Avg 5yrs	%16/15	%16/5yrs
BY	5.33	**5.46**	5.60	+ 2.4	- 2.6
DZ	-	-	-	-	-
MA	-	-	-	-	-
TN	-	-	-	-	-
TR	9.30	**9.13**	8.39	- 1.8	+ 8.8
UA	5.71	**6.03**	5.77	+ 5.7	+ 4.5

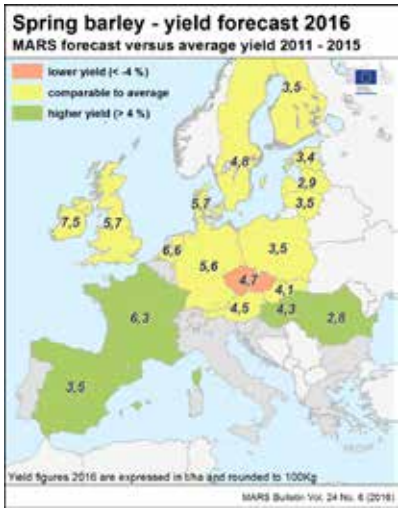
Note: Yields are forecast for crops with more than 10 000 ha per country.
Sources: 2011–2015 data come from USDA, State Statistics Service of Ukraine, FAO, Turkish Statistical Office, PSD-online, INRA Maroc, MinAGRI Tunisia and DSASI Algeria.
2016 yields come from MARS Crop Yield Forecasting System (output up to 10.6.2016).

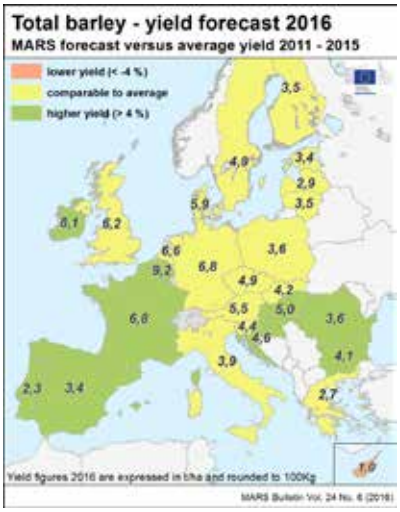

Soft wheat - yield forecast 2016
MARS forecast versus average yield 2011 - 2015
lower yield (< -4 %)
comparable to average
higher yield (> 4 %)
Yield figures 2016 are expressed in t/ha and rounded to 100Kg

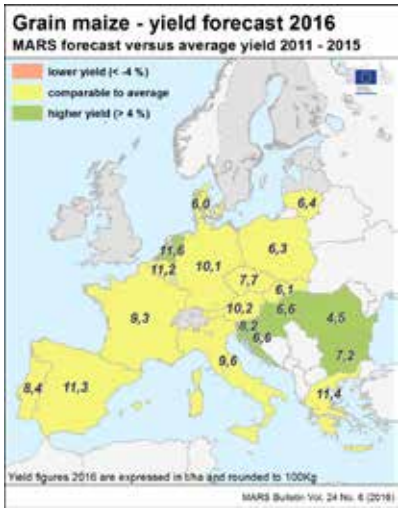

Durum wheat - yield forecast 2016
MARS forecast versus average yield 2011 - 2015
lower yield (< -4 %)
comparable to average
higher yield (> 4 %)
Yield figures 2016 are expressed in t/ha and rounded to 100Kg

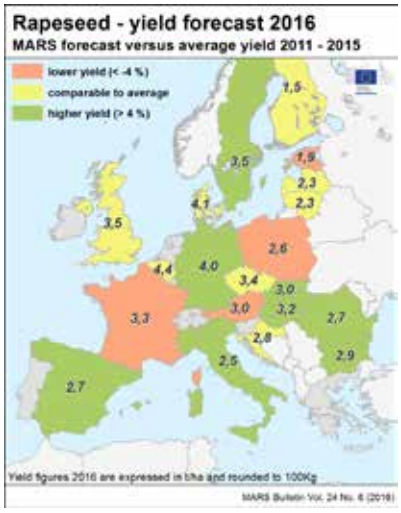

Total wheat - yield forecast 2016
MARS forecast versus average yield 2011 - 2015
lower yield (< -4 %)
comparable to average
higher yield (> 4 %)
Yield figures 2016 are expressed in t/ha and rounded to 100Kg

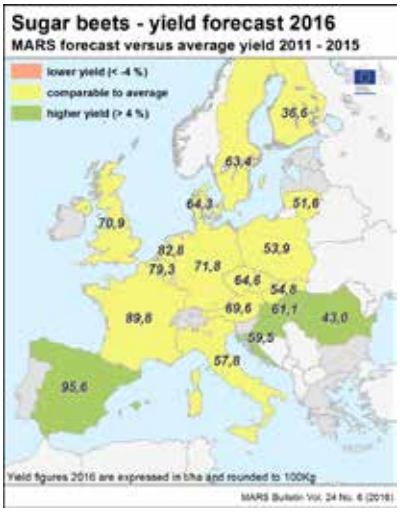

Winter barley - yield forecast 2016
MARS forecast versus average yield 2011 - 2015
lower yield (< -4 %)
comparable to average
higher yield (> 4 %)
Yield figures 2016 are expressed in t/ha and rounded to 100Kg


Spring barley - yield forecast 2016
MARS forecast versus average yield 2011 - 2015
lower yield (< -4 %)
comparable to average
higher yield (> 4 %)
Yield figures 2016 are expressed in t/ha and rounded to 100Kg


Total barley - yield forecast 2016
MARS forecast versus average yield 2011 - 2015
lower yield (< -4 %)
comparable to average
higher yield (> 4 %)
Yield figures 2016 are expressed in t/ha and rounded to 100Kg


Grain maize - yield forecast 2016
MARS forecast versus average yield 2011 - 2015
lower yield (< -4 %)
comparable to average
higher yield (> 4 %)
Yield figures 2016 are expressed in t/ha and rounded to 100Kg

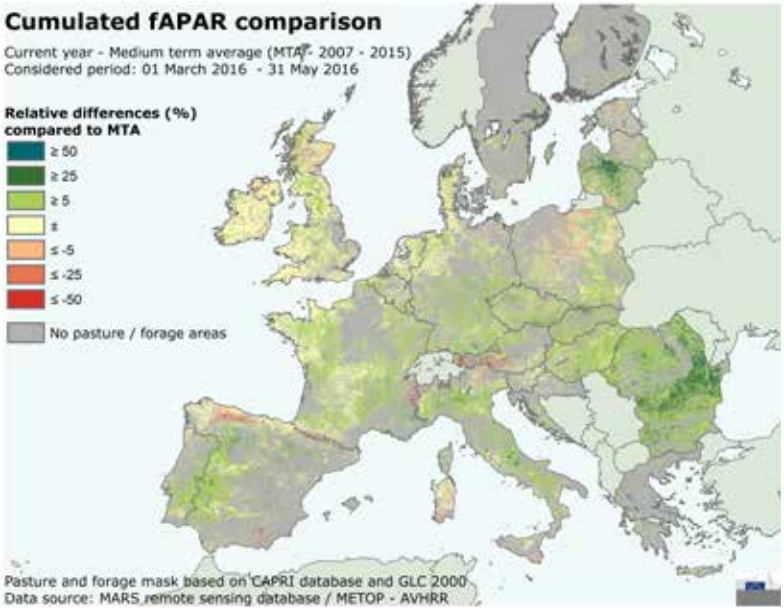

Rapeseed - yield forecast 2016
MARS forecast versus average yield 2011 - 2015
lower yield (< -4 %)
comparable to average
higher yield (> 4 %)
Yield figures 2016 are expressed in t/ha and rounded to 100Kg

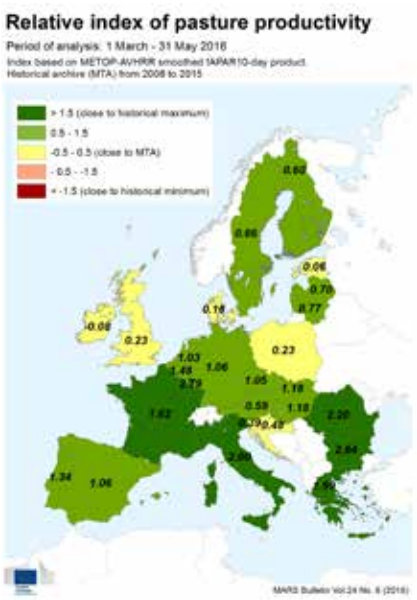

Sugar beets - yield forecast 2016
MARS forecast versus average yield 2011 - 2015
lower yield (< -4 %)
comparable to average
higher yield (> 4 %)
Yield figures 2016 are expressed in t/ha and rounded to 100Kg

5. Pastures in Europe — regional monitoring

Highly favourable conditions in southern Europe

Biomass production in the main grassland areas of Romania, Italy, Hungary, France and Spain will be substantially higher than average in June due to continuing humid conditions in southern Europe. Above-average temperatures in Ireland and the United Kingdom also led to an increase in biomass production rates.





Methodological note

The relative index of pasture productivity is a synthetic indicator of biomass formation based on the integration of the fAPAR (fraction of absorbed photosynthetically active radiation) remote sensing product of pasture areas at country level over a period of interest (in this bulletin, from 1 March to 31 May 2016). The spatial aggregation from remotely sensed image pixels to a country-level index was made using a pastures mask from the common agricultural policy regionalised impact model (CAPRI, http://www.capri-model.org). The index shows the relative position of the current season compared to the historical series from 2008 to 2015, and its values range approximately from – 3 to 3. A value of 0 indicates that biomass production in the current season is similar to the long-term average. Values greater than 2 and less than – 2 indicate that biomass production in the current season is close to, respectively, the historical maximum and minimum of the period 2008–2015.

Above-average production in the Iberian Peninsula and Italy

May was more humid than usual in the Dehesa area between **Spain** and **Portugal**, which will help to maintain the above-average production levels observed to date. In the Cantabrian basin (Asturias, Cantabria), grasslands growth is close to the average, except for the mountainous areas, where low incoming radiation levels and colder-than-usual temperatures are substantially constraining pasture production.

Weather conditions in May were also favourable for grassland areas in central and southern **Italy**. Sufficient rainfall in most regions sustained the high biomass formation levels observed since early spring. In the north, a temperature increase since the second half of May and sufficient precipitation guarantees the rapid development of fodder maize, recently sown in Lombardia, Veneto and Emilia-Romagna.

Weather remains favourable in north-eastern Europe

Thanks to the abundant rainfall registered (mainly in the second half of May), biomass-production rates in southern-central **France** (Limousin, Auvergne, Midi-Pyrénées) continue to be significantly above the long-term average. No water stress is expected in the coming weeks. Weather conditions were also favourable in north-eastern France (Champagne-Ardenne, Lorraine) and the **Benelux** region, where sufficient precipitation and slightly higher-than-usual temperatures depict a favourable outlook for pasture productivity in June.

In **Ireland** and the **United Kingdom**, temperatures in May were higher than usual, especially in the second week. This was crucial to increase biomass-production rates in all of the main grassland areas after a rather cold start to the growing season. Overall, the biomass production in spring is close to the long-term average. The outlook for June will mainly depend on temperatures, as soil moisture is currently high in most regions and could support high biomass-production levels.

Positive conditions in central European grasslands

The above-average biomass-production rates observed since early spring in the grassland areas of central and southern **Germany** (Hessen, Bayern, Baden-Württemberg) continued in May thanks to the rainfall registered, which was especially concentrated in the second half of the month. Soil moisture is above seasonal values, guaranteeing high biomass-formation rates in the coming weeks. The same positive conditions are observed in the main pasture areas of the **Czech Republic**, **Slovakia** and **Austria**, with the exception of the Tirol region where colder-than-usual conditions are delaying grassland development.

In northern Germany, pasture productivity is close to the average. Temperatures in May were substantially higher than usual, and this may favour biomass-formation rates in the coming weeks. Only in Mecklenburg-Vorpommern is grassland growth below the average, constrained by the unusually dry conditions experienced throughout spring.

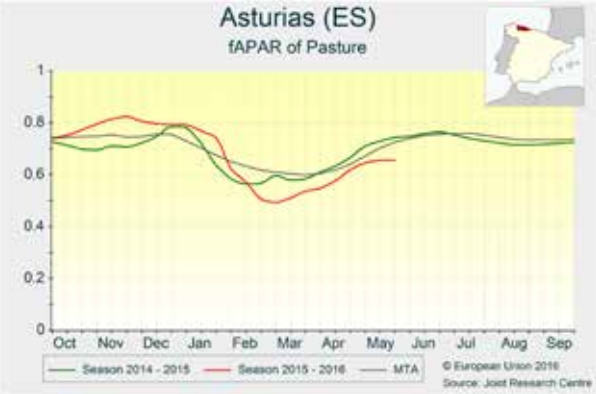
Mild temperatures benefit pasture growth in the Baltic Sea area

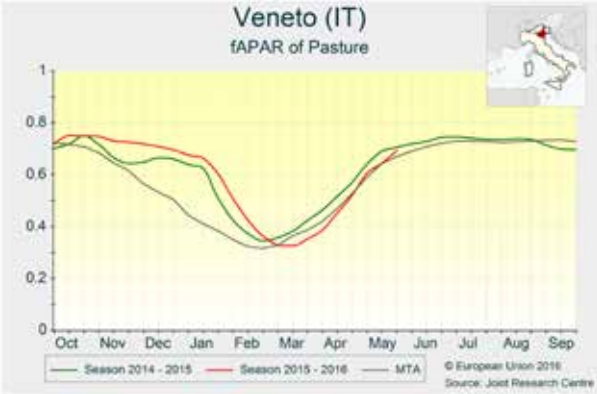
Weather conditions in May have been positive for pasture growth in **Denmark**, **Latvia**, **Lithuania**, **Finland** and **Sweden**. Average temperatures were unusually high the second and last weeks of May (about 3-4 °C above seasonal values), facilitating a progressive increase in biomass-production rates. Total pasture productivity from March to May is slightly above the average, and the outlook for the coming weeks remains positive.

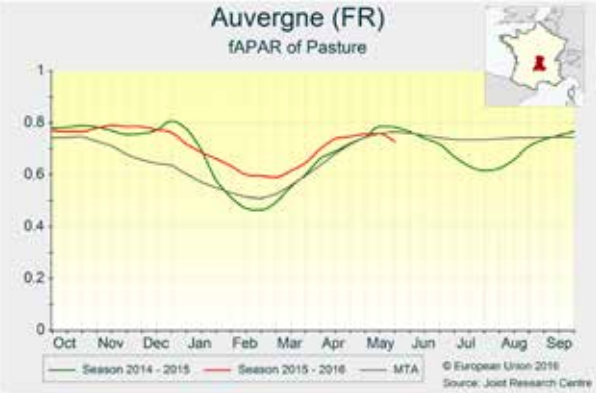
In eastern **Poland** (Mazowieckie, Lubelskie), the vegetative status of pastures is satisfactory. Precipitation registered during spring was sufficient to support above-average biomass production. By contrast, grasslands in the North (Pomorskie, Kujwawsko-Pomorskie) present growth levels that are below seasonal values, as the growing season is quite dry and temperatures in May were warmer than usual. Rainfall in June is essential to progressively recover average production levels.

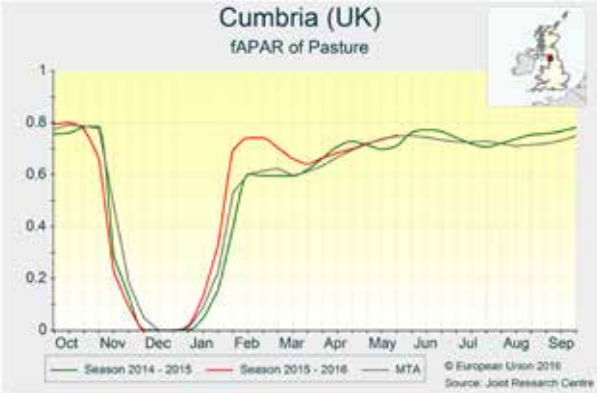
Excellent season in south-eastern Europe

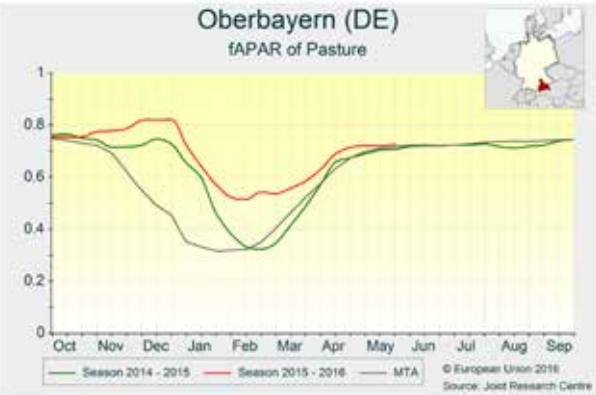
To date, the growing season in **Romania** and **Bulgaria** has been exceptionally positive. The unusually humid conditions (which are highly favourable for pasture growth) observed since the end of winter continued in May. As a result, photosynthetic activity levels in grasslands are the highest of the period 2008-2016, especially in the Danube basin. These favourable conditions also led to the rapid vegetative growth of fodder maize, which is currently in the initial phases of development.
Grassland productivity in **Hungary** is also well above average. After a drier-than-usual April, the abundant precipitation registered in the second week of May was crucial to maintaining the high biomass-formation levels observed during most of the growing season. Rainfall in June will be essential to extend the currently positive pasture conditions, particularly in eastern regions.

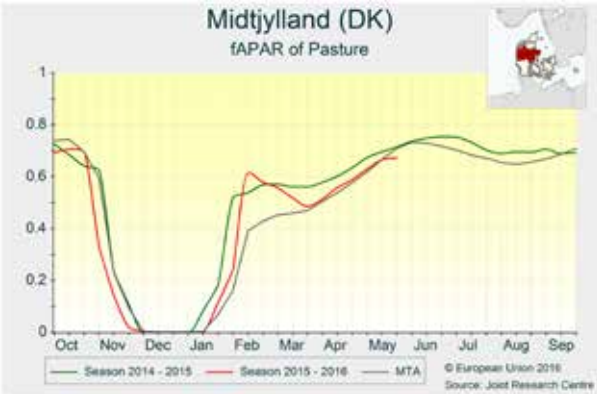

Asturias (ES)
fAPAR of Pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre


Veneto (IT)
fAPAR of Pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre

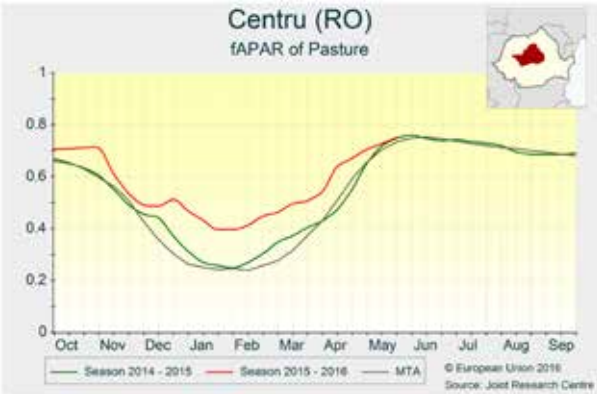

Auvergne (FR)
fAPAR of Pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre


Cumbria (UK)
fAPAR of Pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre


Oberbayern (DE)
fAPAR of Pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre

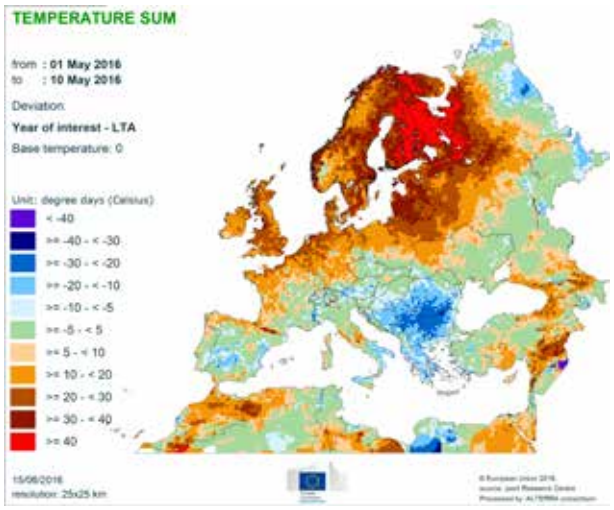

Midtjylland (DK)
fAPAR of Pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre

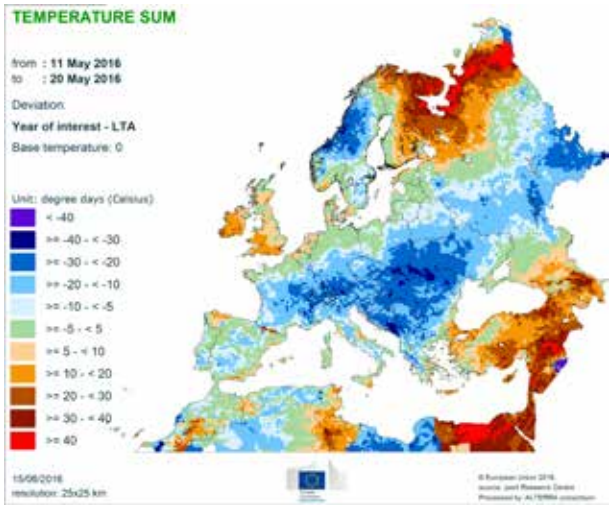

Lubelskie (PL)
fAPAR of Pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre

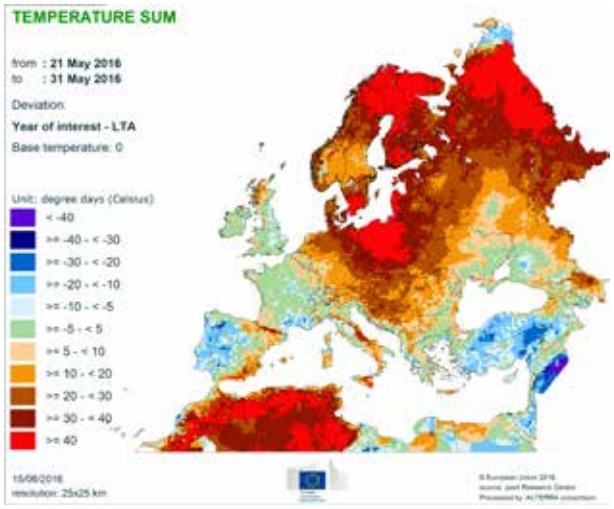

Centru (RO)
fAPAR of Pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2014 - 2015
Season 2015 - 2016
MTA
© European Union 2016
Source: Joint Research Centre

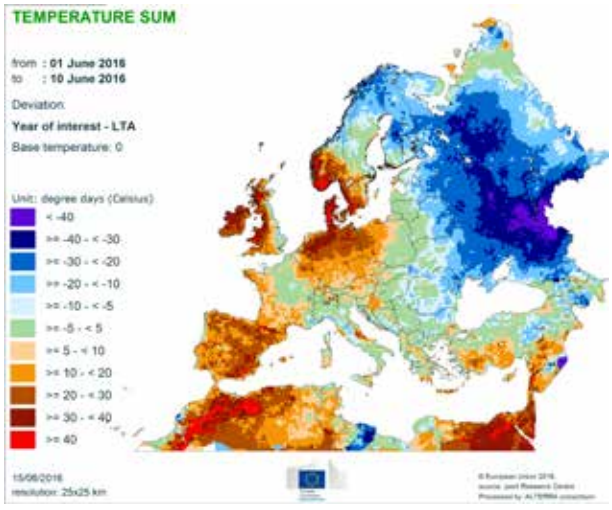
6. Atlas

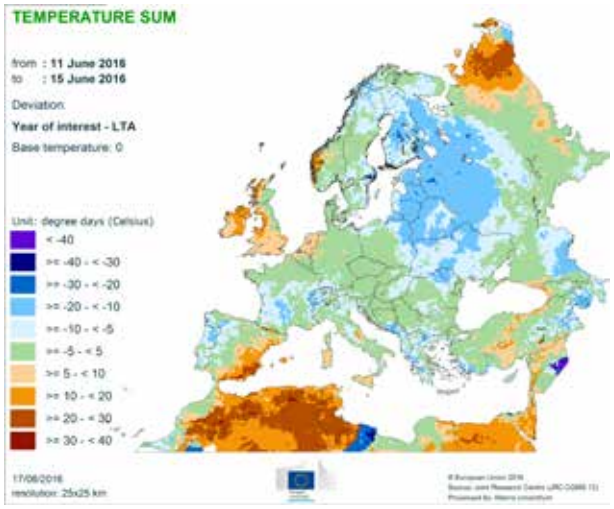
Temperatures

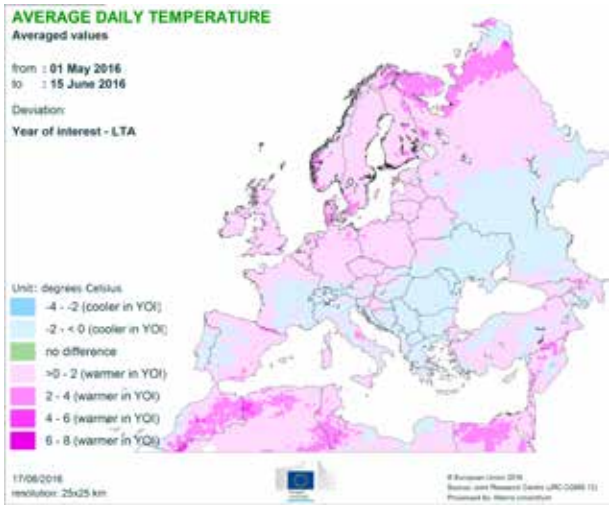




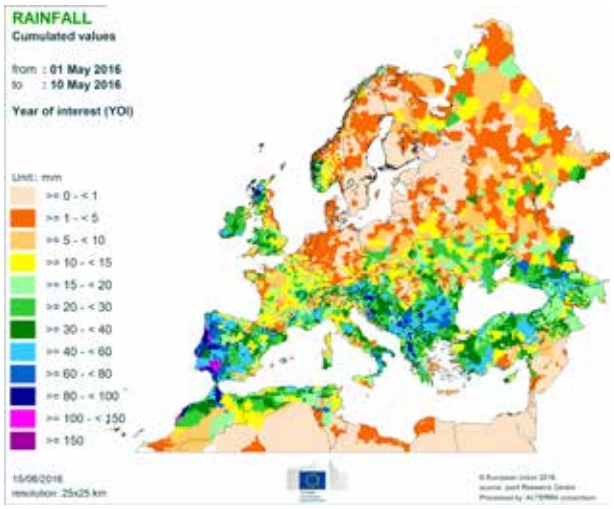


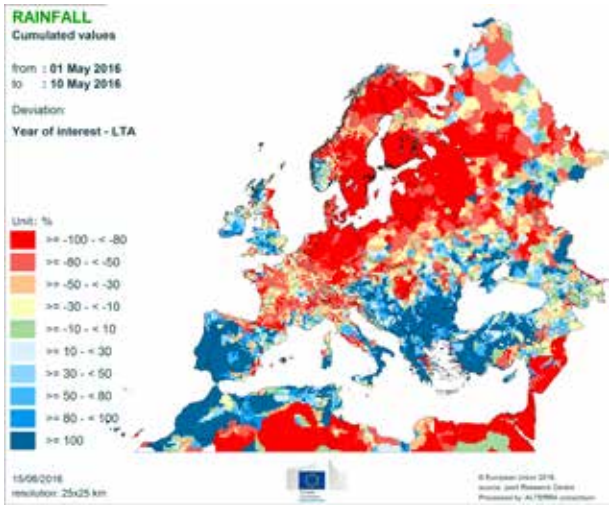


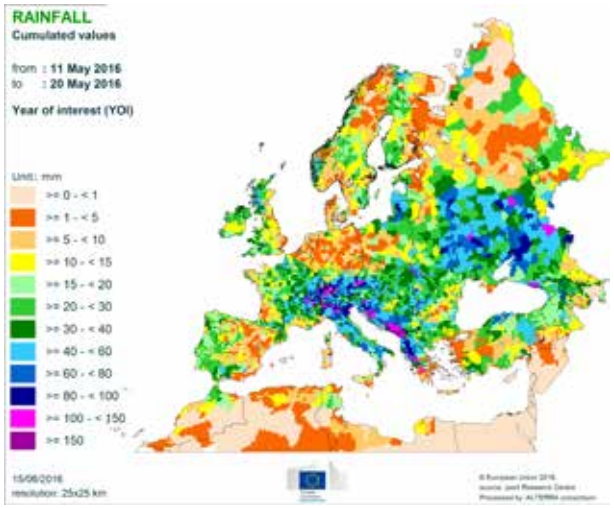


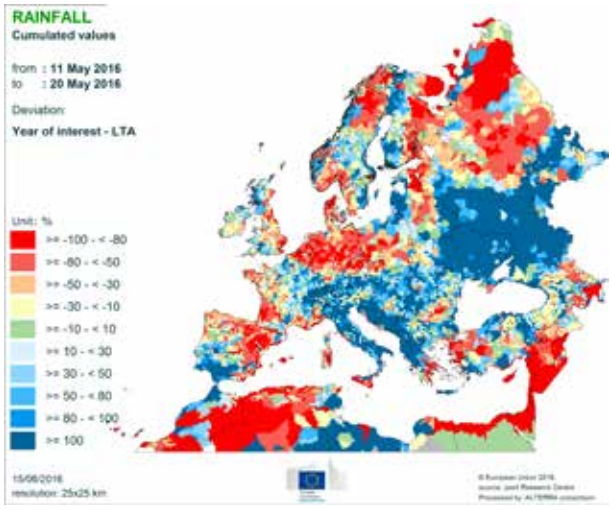


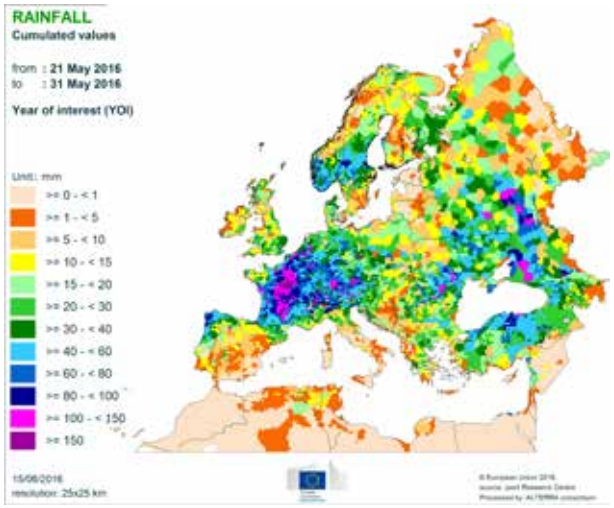
Precipitation

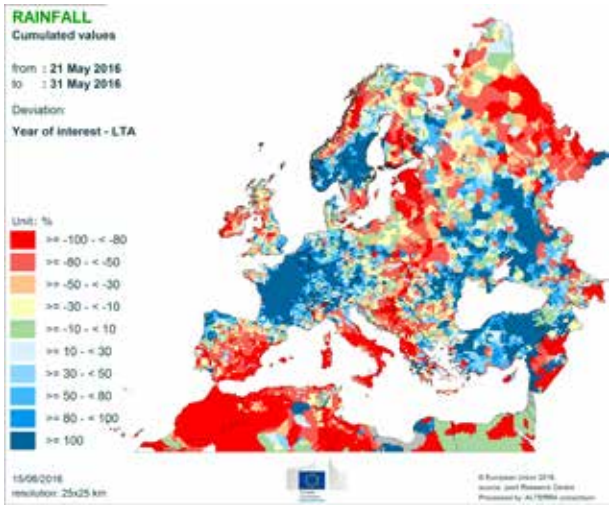


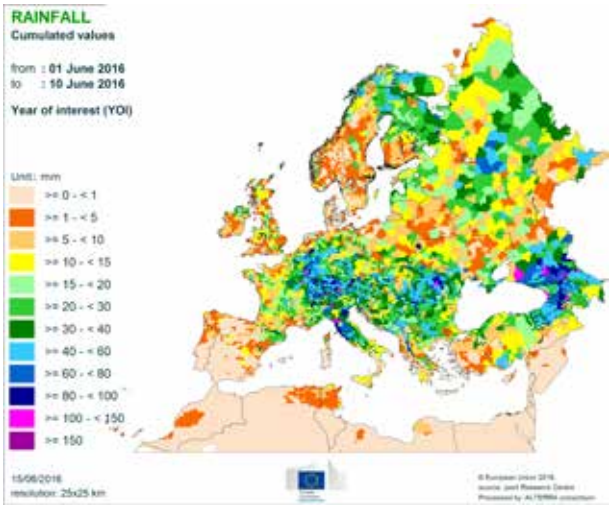


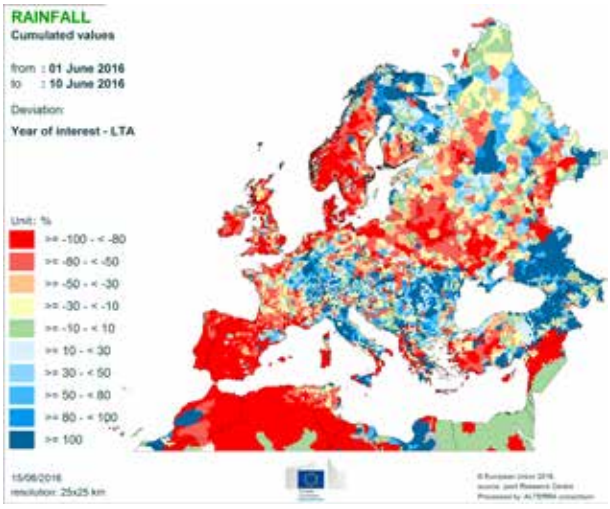


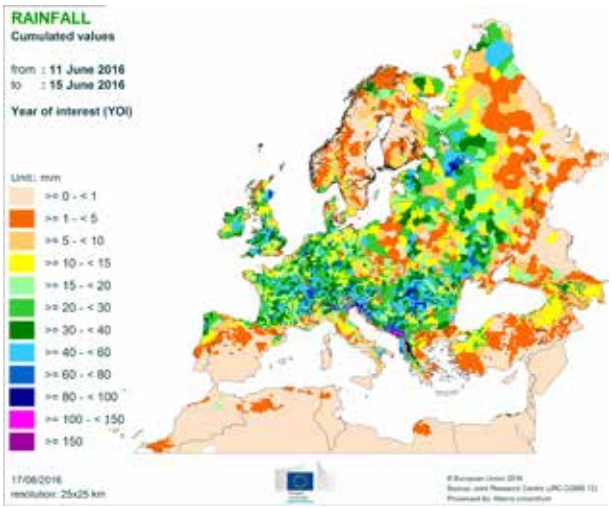


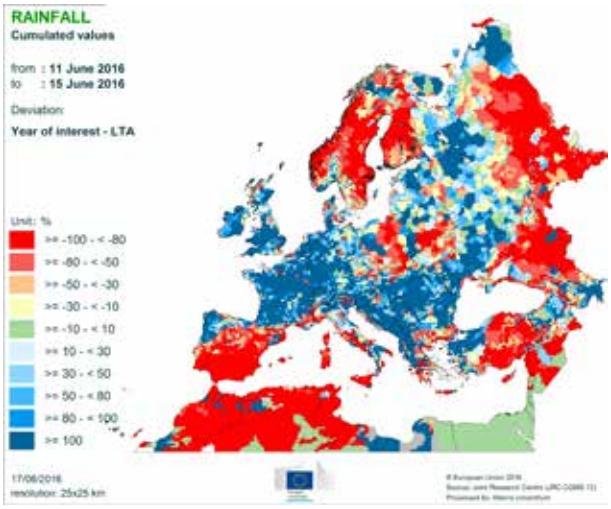




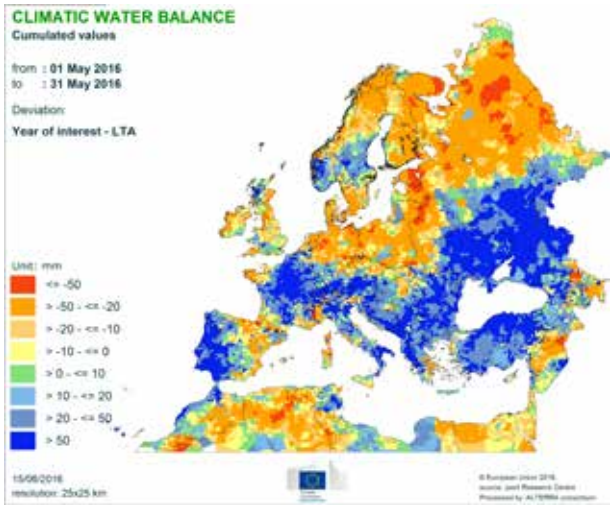


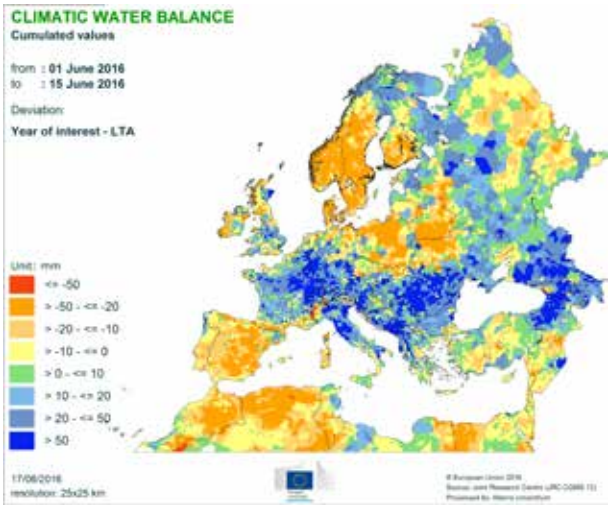




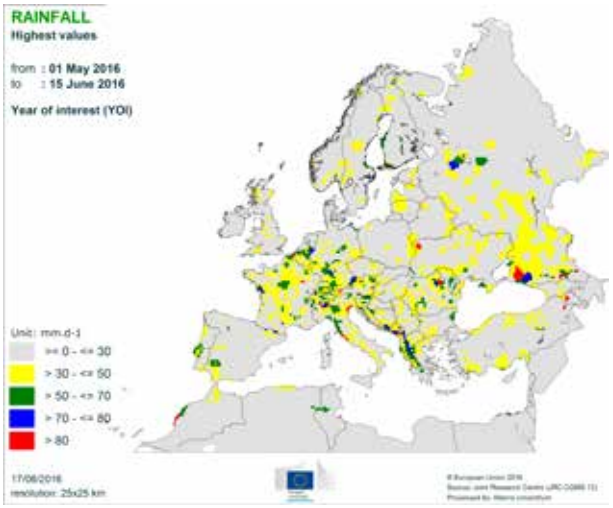


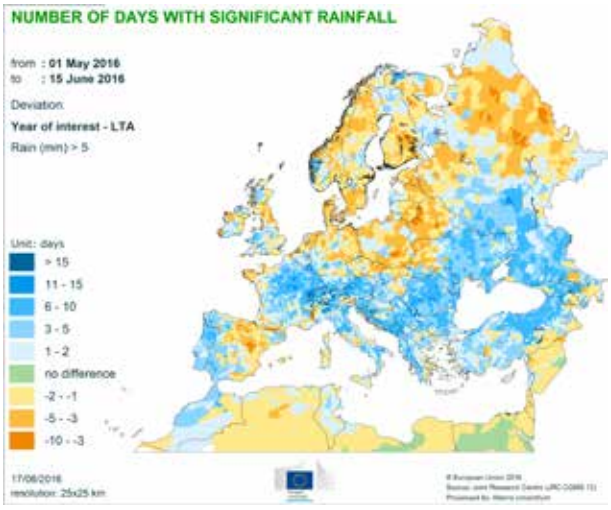
Climatic water balance

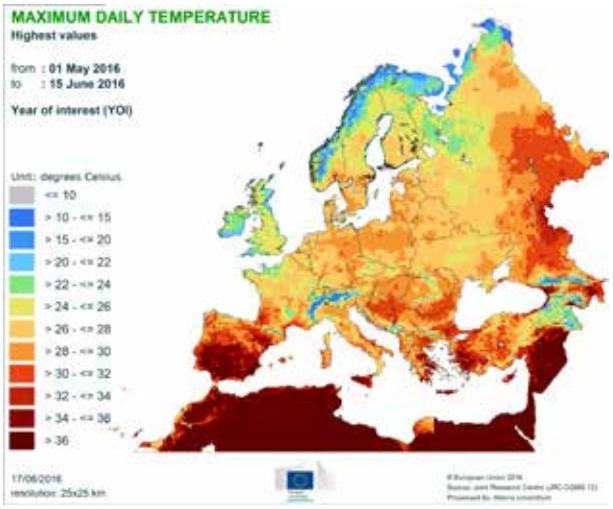


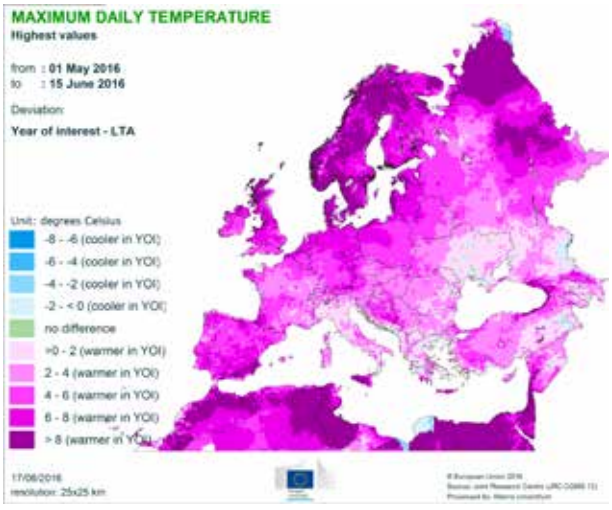


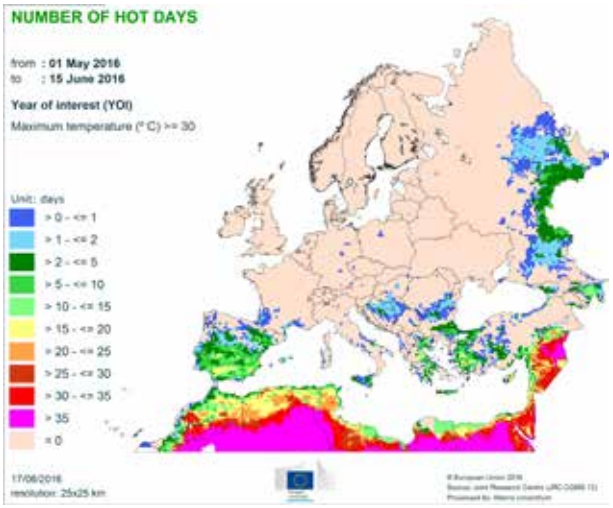
Weather events

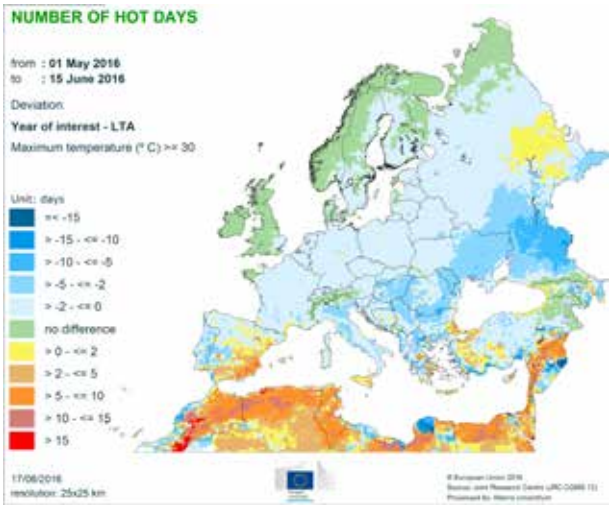




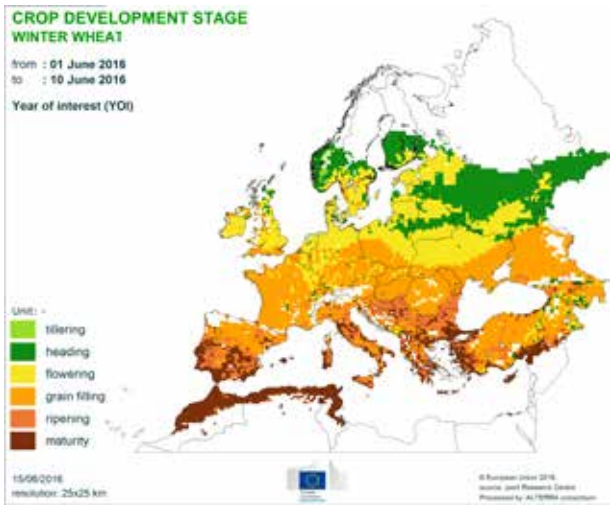


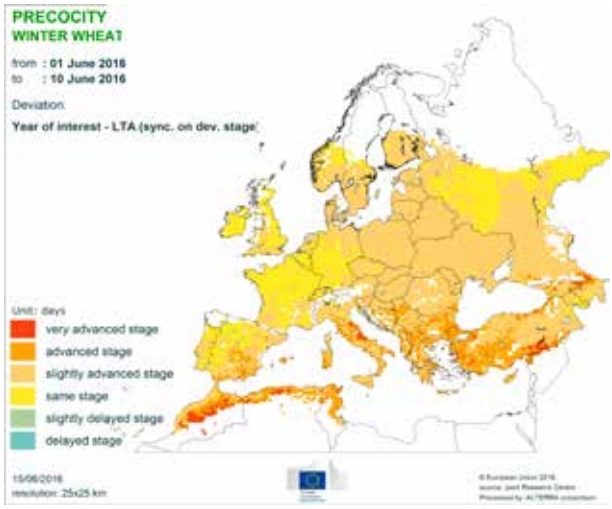


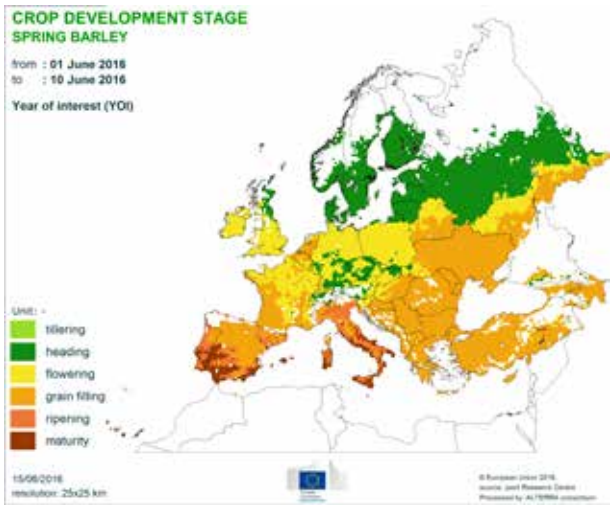


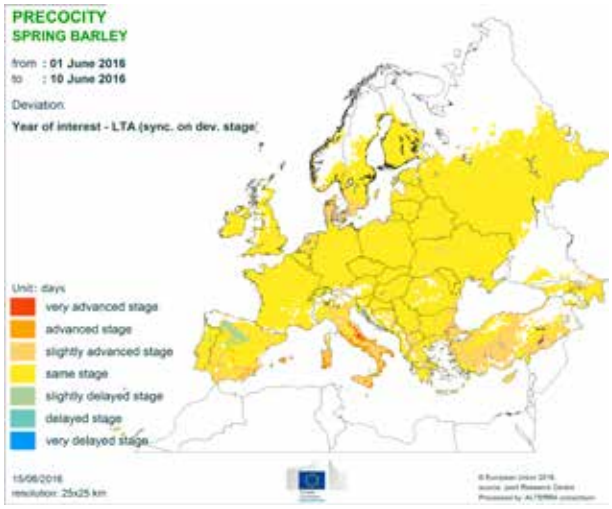


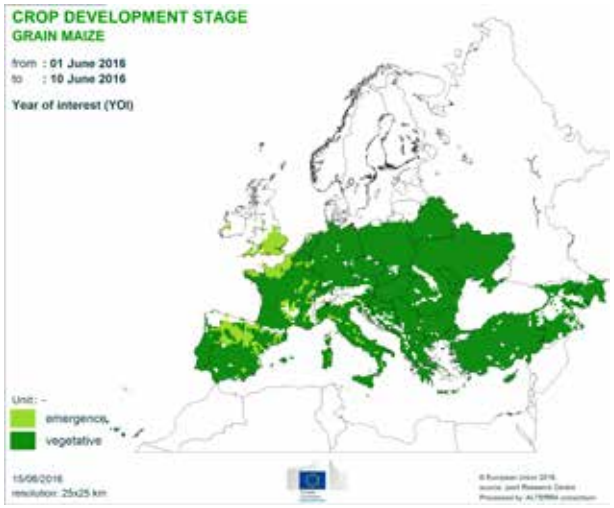
Crop development stages and precocity

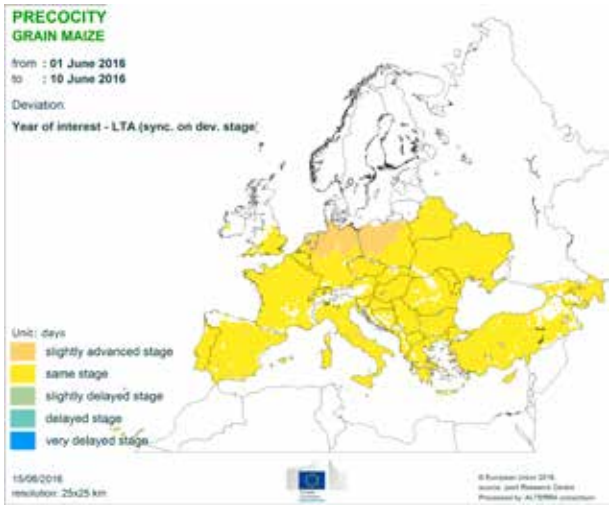


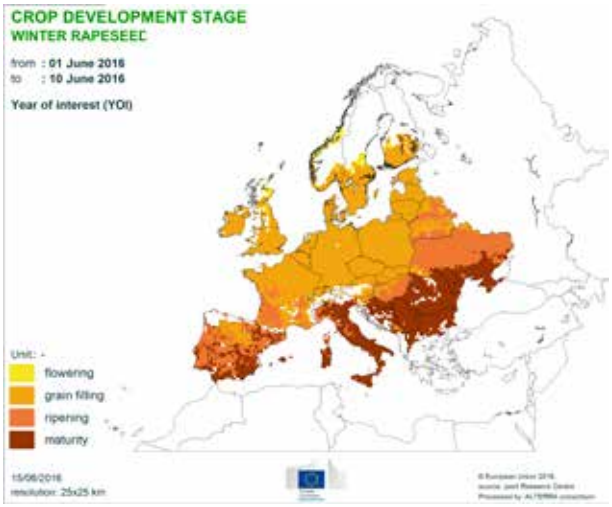


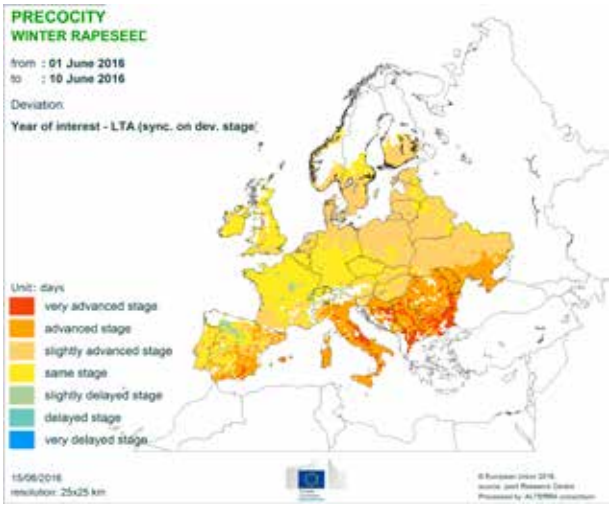


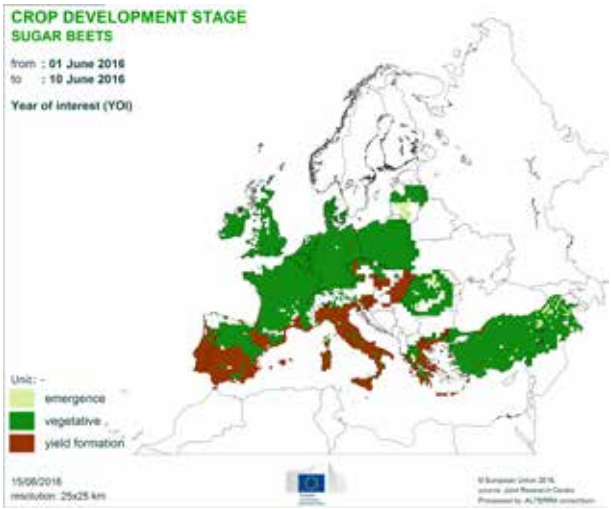


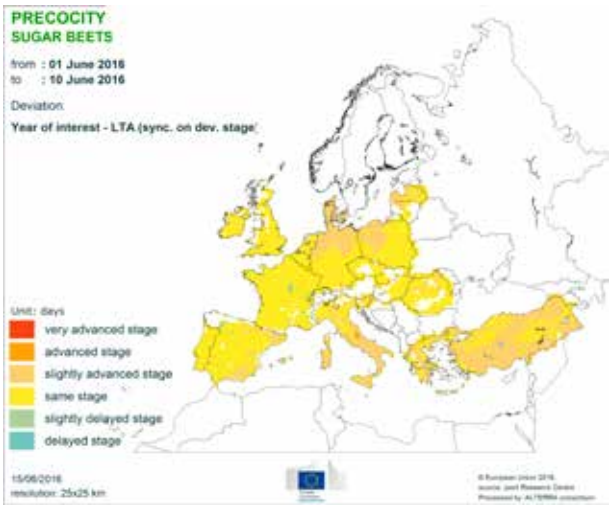




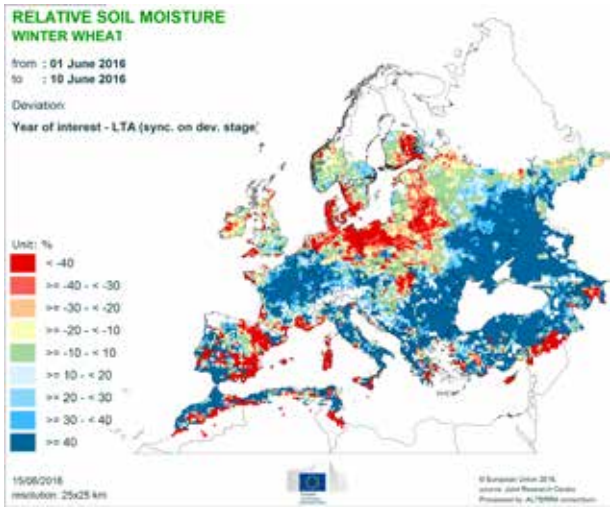

CROP DEVELOPMENT STAGE
WINTER RAPESEED
from : 01 June 2016
to : 10 June 2016
Year of interest (YOI)
Unit: -
flowering
grain filling
ripening
maturity
15/06/2016
resolution: 25x25 km

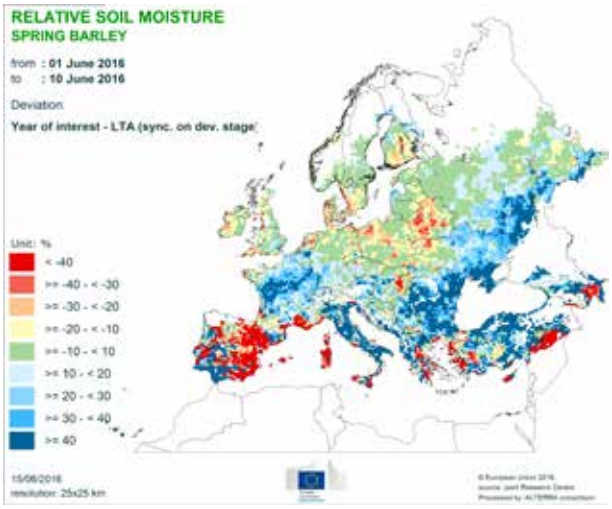

PRECOCITY
WINTER RAPESEED
from : 01 June 2016
to : 10 June 2016
Deviation
Year of interest - LTA (sync. on dev. stage)
Unit: days
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
delayed stage
very delayed stage
15/06/2016
resolution: 25x25 km

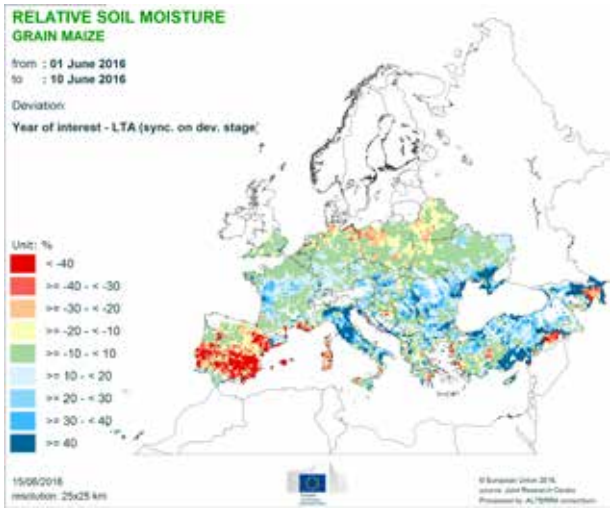

CROP DEVELOPMENT STAGE
SUGAR BEETS
from : 01 June 2016
to : 10 June 2016
Year of interest (YOI)
Unit: -
emergence
vegetative
yield formation
15/06/2016
resolution: 25x25 km

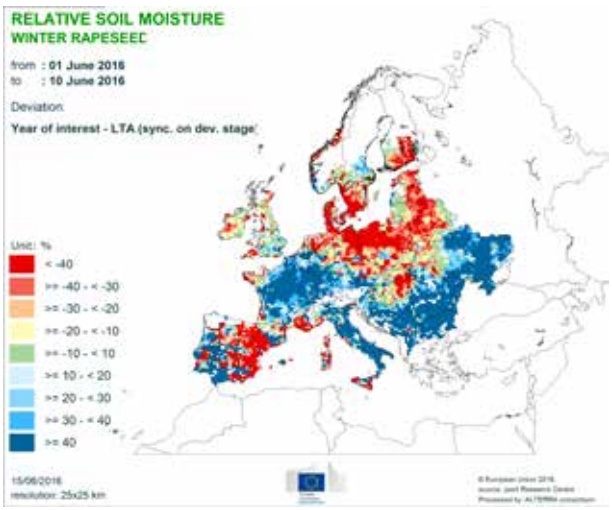

PRECOCITY
SUGAR BEETS
from : 01 June 2016
to : 10 June 2016
Deviation
Year of interest - LTA (sync. on dev. stage)
Unit: days
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
delayed stage
15/06/2016
resolution: 25x25 km

Relative soil moisture

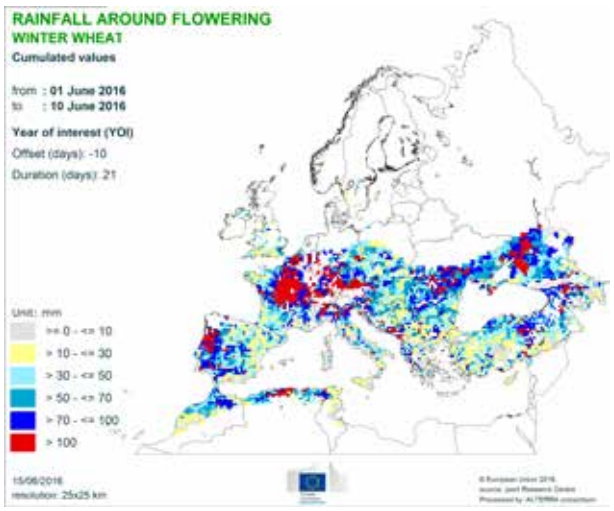


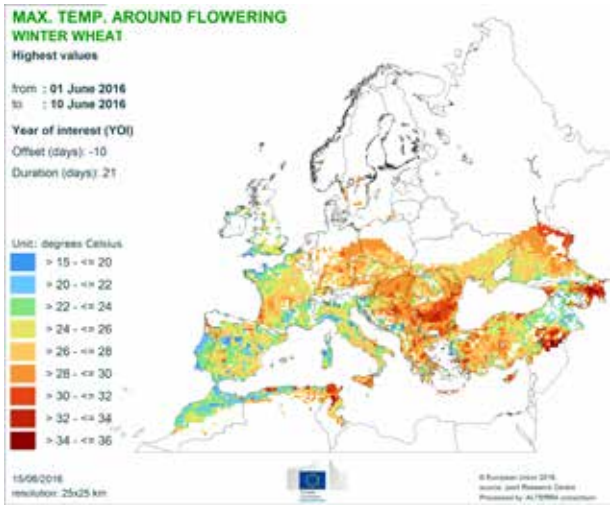


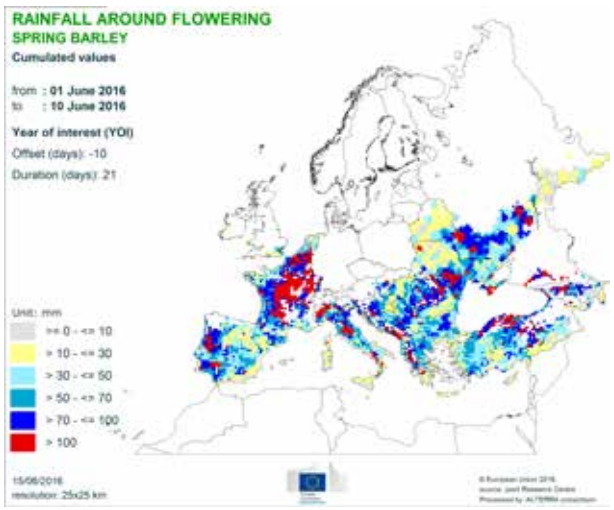


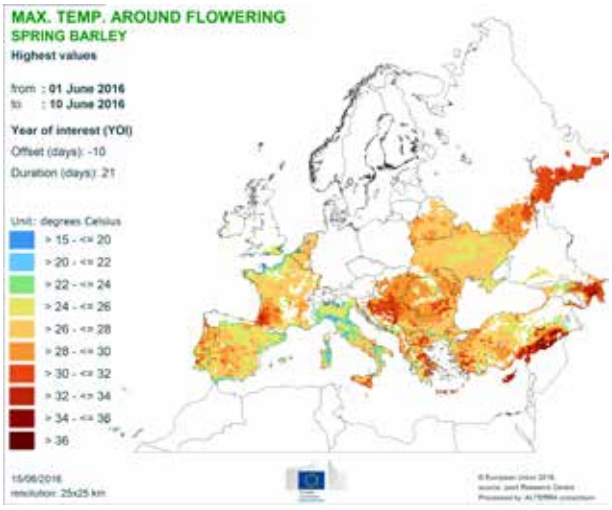


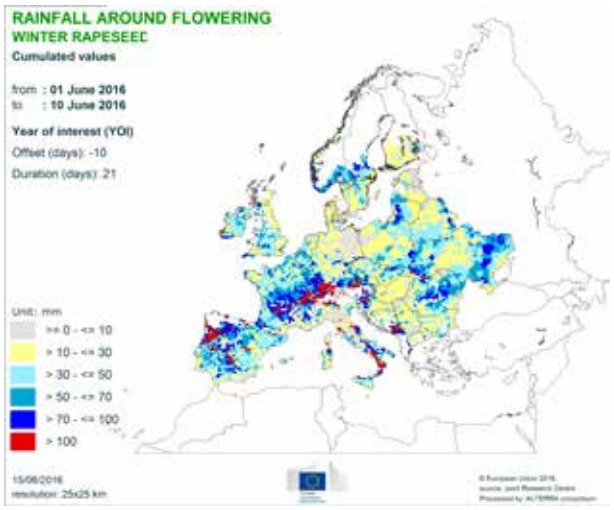
Rainfall and temperatures around flowering

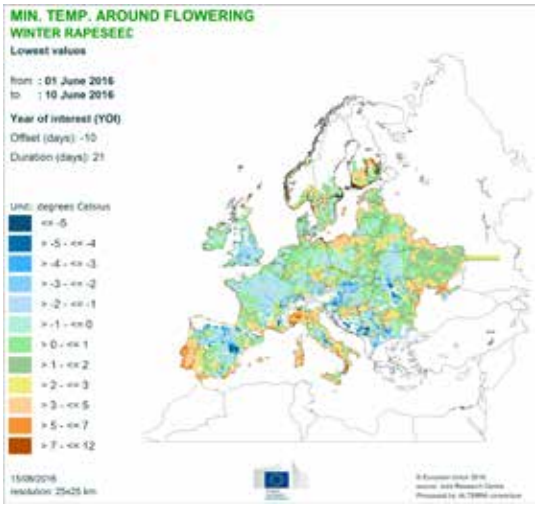












LB-AW-16-006-EN-N

JRC MARS Bulletins 2016

Date	Publication	Reference
25 Jan	Agromet analysis	Vol. 24 No 1
22 Feb	Agromet analysis	Vol. 24 No 2
21 Mar	Agromet analysis and yield forecast	Vol. 24 No 3
26 Apr	Agromet analysis, remote sensing, yield forecast and sowing conditions	Vol. 24 No 4
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*MARS stands for Monitoring Agricultural Resources

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