European Commission

Period covered: 1 June–20 July
Issued: 27 July 2015

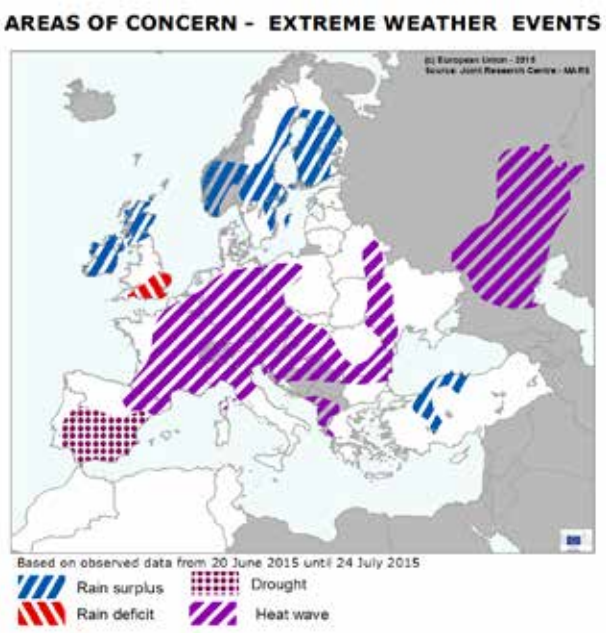
Crop monitoring in Europe

MARS Bulletin Vol. 23 No 7 (2015)

Grain maize outlook worsened due to heat waves and drought

Yield forecasts for all crops at EU-28 level have been lowered compared to last month's forecast due to suboptimal weather conditions. The forecast for winter cereals remains above the 5-year average but the forecast for total cereals dropped just below the 5-year average, due to the significant downward revision for grain maize.

Prolonged and intense heatwaves in July affected important cropland areas in the Czech Republic, Germany, France, northern Italy, Hungary, Austria and Poland. Maximum temperatures often exceeded 35 °C and reached 40 °C locally, hitting spring and winter crops during grain filling and maize while flowering. In Spain, drought conditions worsened in the central and southern regions, causing severe damage to non-irrigated crops during grain-formation and grain-filling stages. Dry and hot conditions also prevailed over Ukraine and Belarus, reducing the yield expectations for winter crops. In the United Kingdom, the southern regions are experiencing a persistent rainfall deficit. A surplus of rain is still persistent in northern Europe, affecting spring crops during the flowering stages in Finland. A surplus of precipitation is also recorded in northern Turkey, with beneficial effects for summer crops.



Crop	Yield t/ha				
	2014	MARS 2015 forecasts	Avg 5yrs	% 15/14	% 15/5yrs
TOTAL CEREALS	5.71	**5.19**	5.21	-9.0	-0.4
Total Wheat	5.90	**5.57**	5.43	-5.6	+2.5
soft wheat	6.14	**5.80**	5.67	-5.4	+2.4
durum wheat	3.34	**3.20**	3.26	-4.3	-1.8
Total Barley	4.90	**4.61**	4.49	-5.9	+2.6
spring barley	4.16	**3.87**	3.91	-6.9	-1.0
winter barley	5.92	**5.58**	5.36	-5.6	+4.3
Grain maize	8.07	**6.71**	7.02	-16.9	-4.4
Rye	4.24	**3.71**	3.58	-12.4	+3.7
Triticale	4.53	**4.18**	4.16	-7.7	+0.6
Other cereals	3.15	**2.89**	3.57	-8.0	-19.0
Rape and turnip rape	3.62	**3.23**	3.13	-10.8	+3.0
Potato	35.10	**33.05**	31.59	-5.9	+4.6
Sugar beet	76.53	**71.91**	70.35	-6.0	+2.2
Sunflower	2.15	**1.95**	1.91	-9.2	+2.0

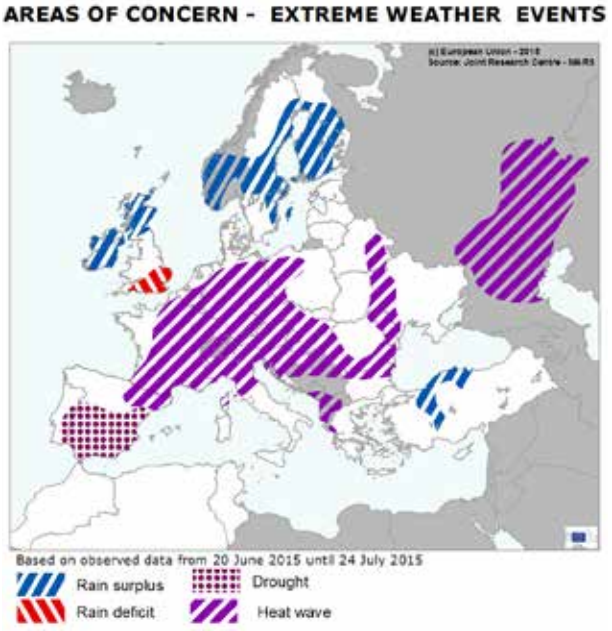
Issued: 24 July 2015

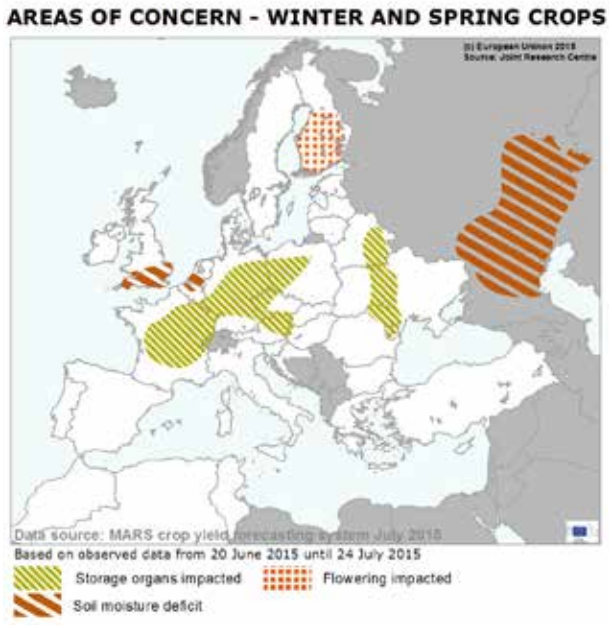
Joint Research Centre

1. Agro-meteorological overview

1.1 Areas of concern

Heatwave impact on winter, spring and summer crops in the main agricultural regions.

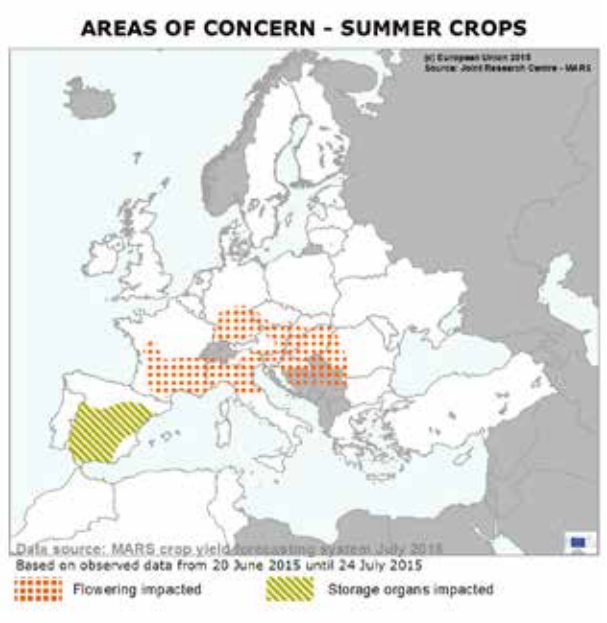




The extreme weather map displays large areas where high temperatures and soil water deficit are causing problems for crops.

In **Spain**, the situation worsened and drought conditions during July in the central and southern regions caused severe damage to non-irrigated crops during grain-formation and grain-filling stages. In northern **Italy** the prolonged and intense heatwaves of July substantially reduced the soil moisture and high temperatures impacted maize during flowering. The heatwaves also covered **the Czech Republic, Germany, France, Hungary, Austria and Poland**. Maximum temperatures often exceeded 35 °C and reached 40 °C locally, hitting spring and winter crops during grain filling and maize while flowering. Among the countries mentioned, **France** is facing the most severe situation, as the others benefited from some rain around the end of June. In the **United Kingdom** the situation is contrasting.

In the northern regions there is a persistent surplus of precipitation whereas the south is facing a persistent deficit with soil moisture running very low but crops still in satisfactory conditions. Dry and hot conditions also prevailed over **Ukraine** and **Belarus**, reducing the yields expectations for winter crops. A surplus of rain is still persistent in northern Europe, and in **Finland** such conditions affected the spring crops during the flowering stages. A surplus of precipitation is also recorded in northern **Turkey** with beneficial effects for summer crop canopy growth.



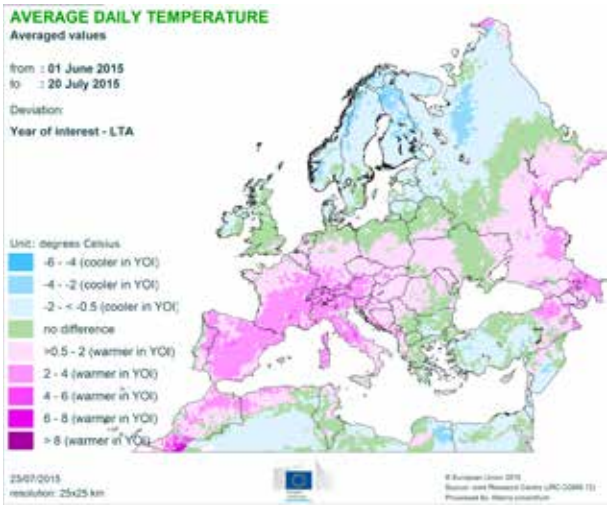
1.2 Meteorological review (1 June-20 July)

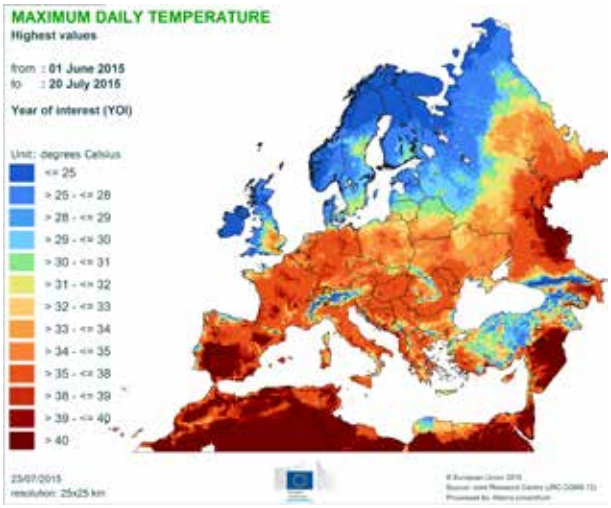
The period since the beginning of June has been characterised by warmer-than-seasonal weather in southern, central and eastern Europe as well as in France. Exceptionally hot weather has been recorded in July in many areas of southern and central Europe. A rainfall deficit has been recorded in major parts of western and central Europe, Italy, the northern Balkans, the western part of Ukraine and Belarus. A rainfall surplus in June has been observed in Scandinavia, the southern Balkans and the western half of Turkey. A dry period has been recorded since the beginning of July in southern Europe, southern France and Turkey.

Observed temperatures

The first half of June was characterised by warmer-than-usual weather in southern, central and eastern Europe, with air temperatures mainly between 2 and 4 °C above the long-term average. A heatwave occurred in the south-east of the Iberian peninsula, southern France, the central and southern parts of the Balkan peninsula and south-eastern European Russia. Warmer-than-usual weather continued during the second half of June in the Iberian peninsula, Italy, Russia and the Black Sea regions. The number of hot days with maximum daily temperatures of in excess of 30 °C significantly exceeded the expected value in the Iberian peninsula, southern France, northern Italy, the eastern part of Hungary and Russia. A severe heatwave affected large parts of southern, central and eastern Europe at the beginning of July. Maximum daily temperatures were close to (or even exceeded) 40 °C in the Iberian peninsula, locally in France and the southern part of European Russia. Maximum daily temperatures were close to 38 °C in other regions affected by the heatwave. A short weather perturbation towards the end of the first dekad of July, moving from western Europe towards the east, decreased the temperatures in major parts of the heat-affected regions, except the Iberian peninsula, where high temperatures persisted. In general, a second heatwave struck southern Europe, France and a large part of central Europe during the second dekad of July, with maximum temperatures rising to 38 °C in most of the affected regions. Temperatures in northern Europe remained below the long-term-average during the first two dekads of July.

The exceptional heat has accelerated crop development in France, southern, central and eastern Europe. Heat stress reduced the yield potential in regions where summer crops were in the most sensitive growing stages, such as flowering or the beginning of the grain-filling period. On the other hand, a delay in crop development can be observed in the northern part of the British Isles, Denmark, the Baltic countries and Scandinavia.

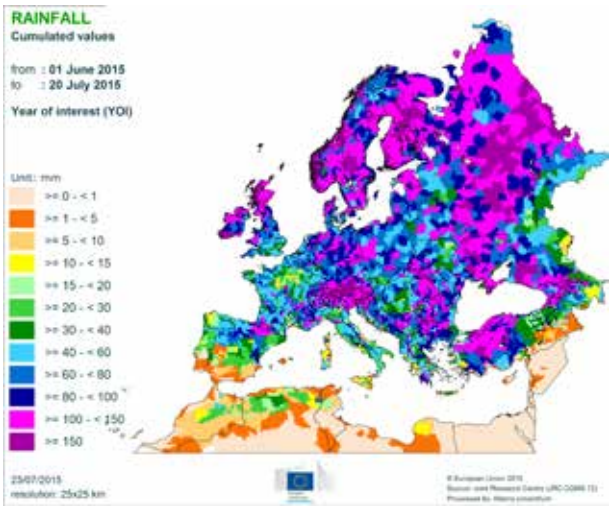


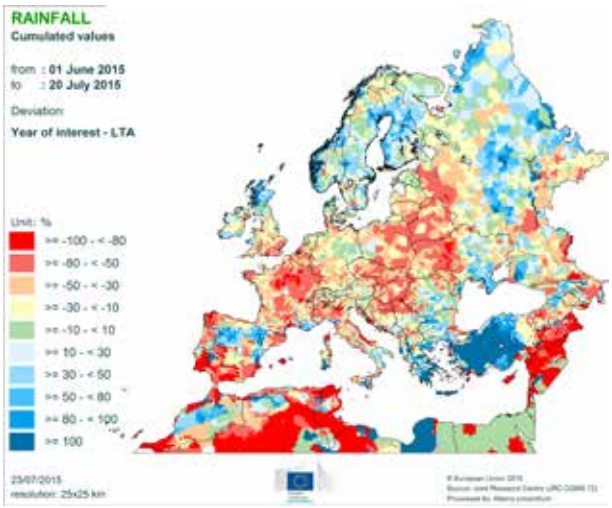


Observed precipitation

A pronounced rainfall deficit has been recorded in June in the British Isles, northern France, the Benelux countries, northern and central Germany, northern Italy, Croatia, Hungary, Slovakia, Poland, Belarus, the Baltic countries and western Ukraine. Northern Spain, the southern Balkans, western Turkey and Finland received a rainfall surplus. Dry conditions were observed during the first two dekads of July in the Iberian peninsula, France, southern Germany, Italy (except the north-eastern areas), a major part of the Balkan peninsula and Turkey. Normal or above-average rainfall was observed in northern Germany, the northern British Isles, southern Scandinavia and the central part of European Russia.

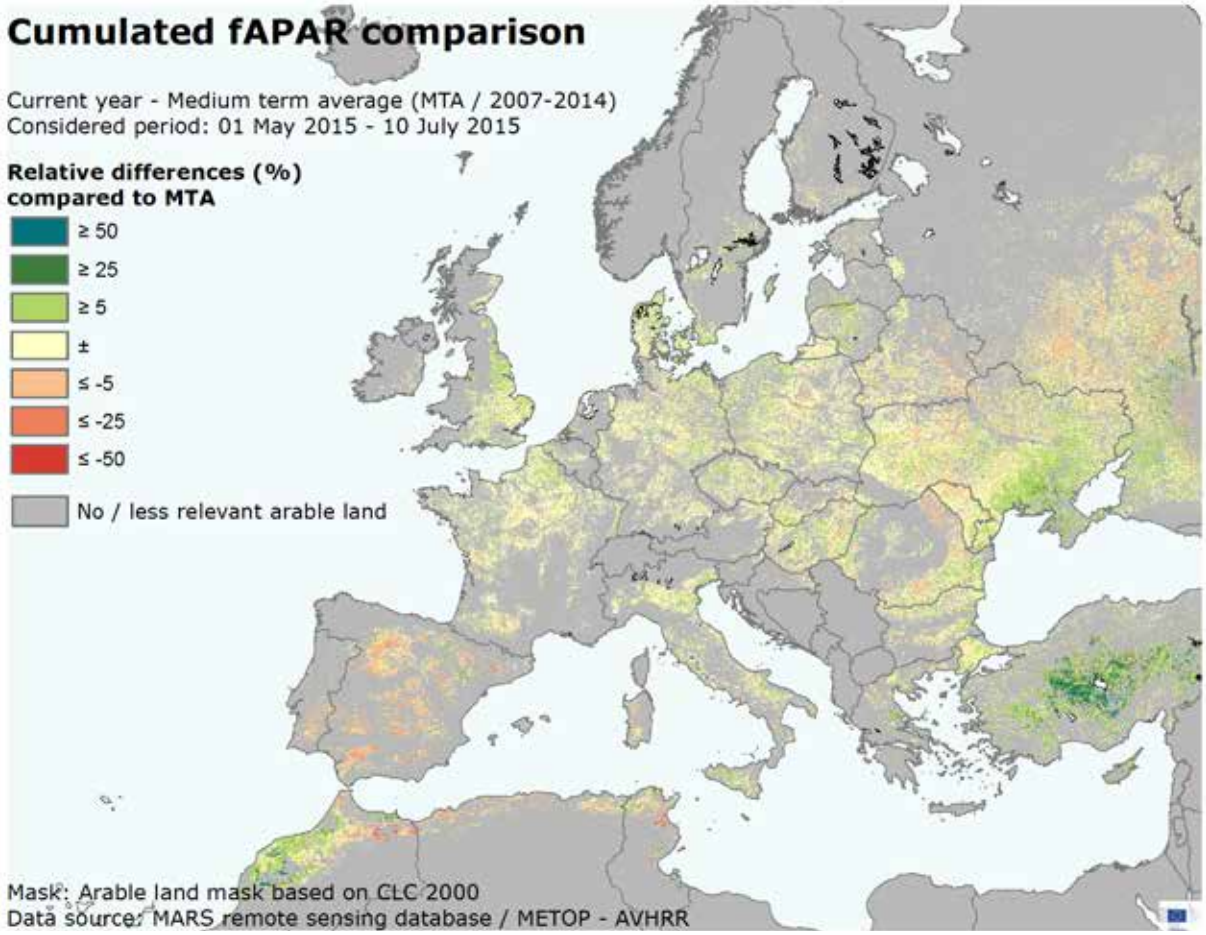
The rainfall deficit has depleted the soil moisture content in many areas of southern, western and eastern Europe, especially where crops are grown on light soils and no irrigation is applied. This soil moisture deficit is limiting crop growth and reducing the yield potential of summer crops that are reaching the sensitive stages of flowering or the beginning of the grain-filling period.



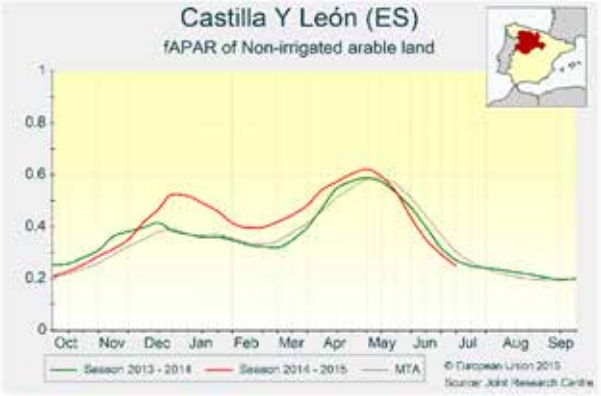


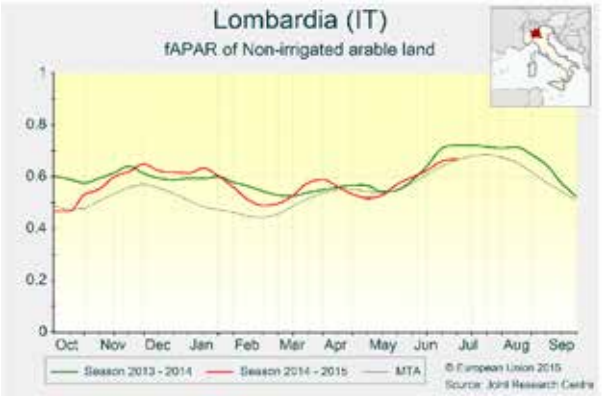
2. Remote sensing — observed canopy conditions

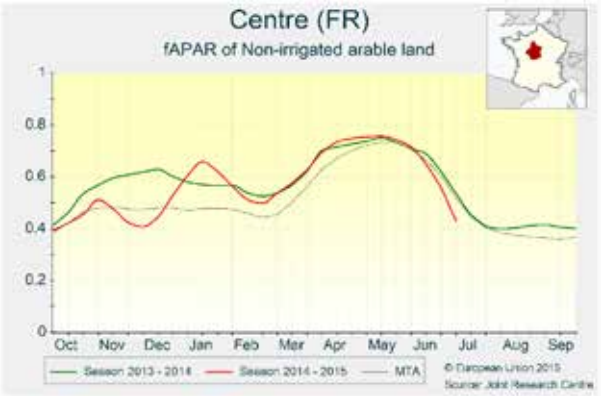
Heatwaves affected winter crops in western Europe and generally led to reduce growth in the canopy of summer crops.

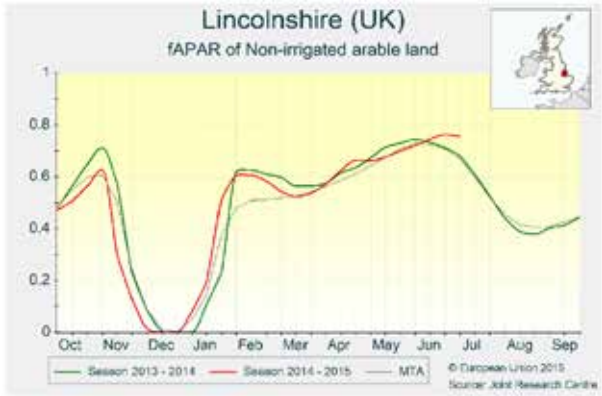


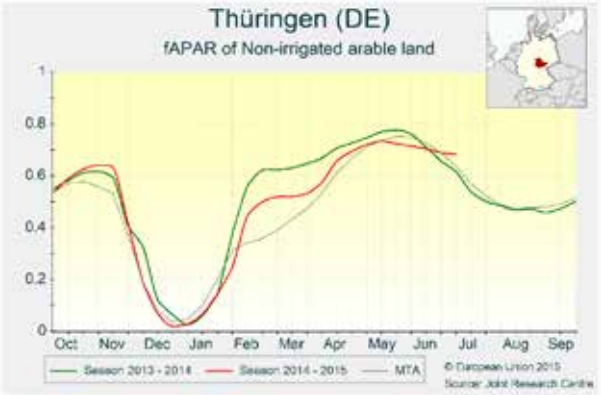
The map above displays the relative differences of the fraction of absorbed photosynthetically active radiation (fAPAR) indicator cumulated over the period 1 May-10 July of the current season, against the cumulated fAPAR values of the same period medium-term average (2007-2014). Significant negative anomalies are highlighted in **Spain**. The heatwaves of June and July determined a shortening of the grain-filling phases of winter and spring crops and led to an early ripening in all regions (e.g. Castilla y Léon). The drought in southern regions is affecting the canopy development of the non-irrigated summer crops. In **Italy**, the summer crop status presents two situations: (1) early-planted areas are benefiting from the high temperatures and crops moved to the flowering stages slightly in advance (compared to normal stages); (2) crops on late-sown fields (e.g. Lombardy (Lombardia)) presented a slowdown of biomass accumulation in June and flowering began under suboptimal conditions in July. In **France**, the heatwaves of July worsened winter- and spring-crop conditions, which were already fragile due to the persistent lack of significant rain. The fAPAR profile shows a sharp decrease in the signal, which reflects the shortening of the grain-filling phase and the consecutive early senescence (e.g. Centre). In southern France, the impact of the dry and hot conditions reduced the canopy growth of the non-irrigated summer crops. In the **United Kingdom**, cumulated fAPAR displays positive anomalies thanks to the optimal crop growth during spring and a slightly longer-than-usual grain-filling period. In the central agricultural regions of **Germany** (e.g. Thuringia, (*Thüringen*)), winter crops benefited from the light rains of recent weeks and suffered a moderate impact from the heatwaves of July and an acceleration of the ripening phase. Locally, the heatwaves of July affected crops that were still in the grain-formation stage. The maize canopy benefits from the high temperatures; the soil moisture is low but still sufficient to maintain canopy vigour. In **Poland**, winter crops are in the grain-filling stage and the recent rains in the western regions allow for good yield expectations. In central Europe, the very hot temperatures of July determined a shortening of the winter crop-yield formation in **Austria** and reduced the summer crop canopy growth in Austria and **Hungary** (e.g. South Transdanubia (*Dél-Dunántúl*)). In **Bulgaria** and **Romania**, the high temperatures had no significant effect on the summer crops that are not yet in the flowering stage. In western **Ukraine** (e.g. *Zhytomirs'ka*), the prolonged dry conditions and the hot temperatures impacted winter crops during the flowering and grain-filling phases, while summer crop development is proceeding under optimal conditions. In **Turkey** (e.g. *Kastamonu*), the summer crop season continues under optimal conditions thanks to rains that were well-distributed during the whole season.

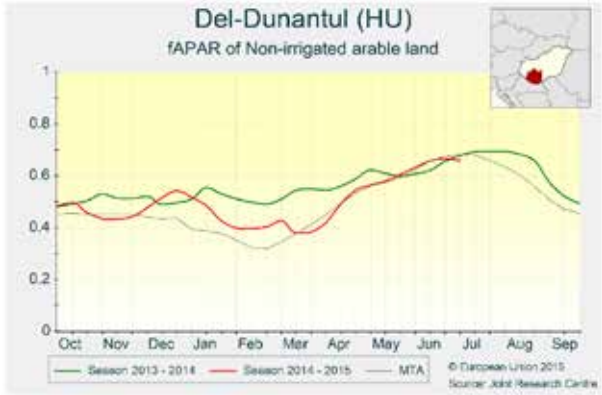

Castilla Y León (ES)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA

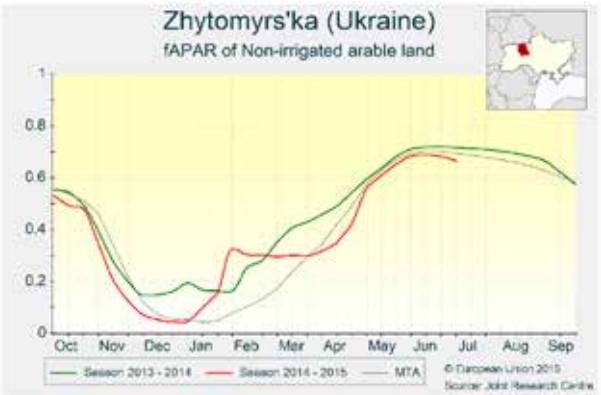

Lombardia (IT)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA

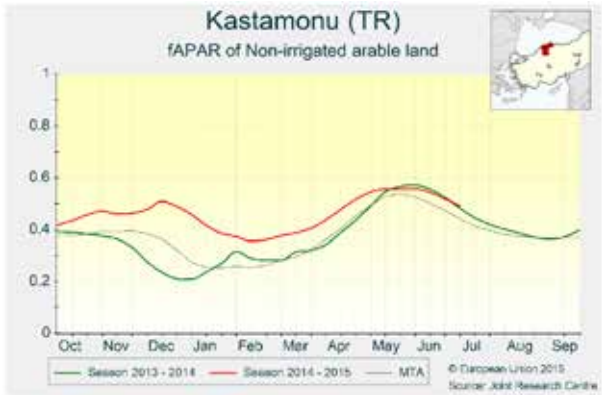

Centre (FR)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA


Lincolnshire (UK)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA


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


Del-Dunantul (HU)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA


Zhytomyrs'ka (Ukraine)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA


Kastamonu (TR)
fAPAR of Non-irrigated arable land
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA

3. Country analysis

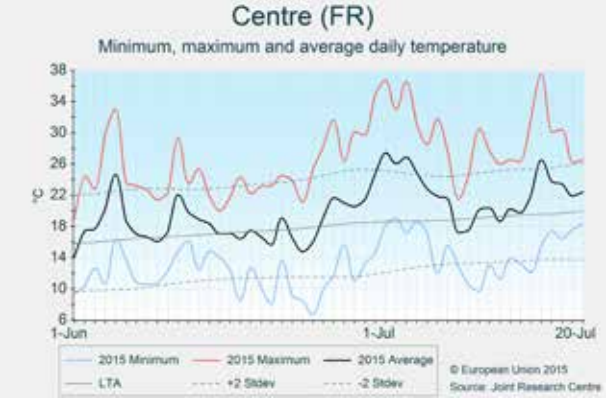
3.1 European Union

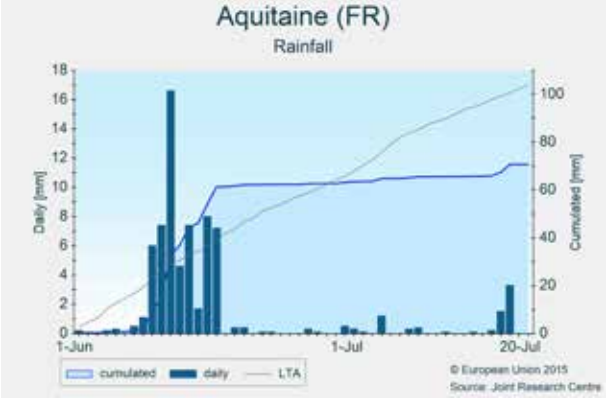
France

Yield forecasts revised downwards following drought conditions

Rainfall levels since the beginning of June have been well below average. The dry conditions were accompanied by a heatwave in July. Winter and spring crop yields are still forecast to be above the 5-year average. The yield forecasts for summer crops, particularly grain maize, have been revised significantly downwards.

Since 1 June, cumulated rainfall has been well below average throughout the country, reaching only 22 % of the long-term average in Île-de-France and 30 % in Champagne-Ardenne. While rainfall in south-western regions has been closer to normal, reaching 70 % of the long-term average in Aquitaine, this was concentrated during the first half of June and no significant rainfall has been observed since then. Dry conditions were accompanied by a heatwave in July. The average maximum temperature since 1 June is close to the record levels of 1975, with the highest temperatures being recorded during early and mid-July. Maximum temperatures reached 38 °C throughout the country, except for Brittany (*Bretagne*) and Lower Normandy (*Basse-Normandie*). These meteorological conditions are exceptional and are similar to those of extreme years such as 2003 and 1976. Regarding crop yields, the scenario could be similar to 2003. The yield forecasts for crops harvested in late June/early July, such as winter barley and durum wheat, are maintained above last year's yields as ripening and harvesting conditions were good. While soft wheat yields were forecast to be at record levels in last month's bulletin, they have been revised back to last year's levels as the end of the grain-filling period and the ripening phase were accelerated due to the hot and dry conditions. Root crops are also facing dry conditions that reduce yield potentials, but the risk of pests and disease is currently very low. Grain maize is most strongly impacted as it is now at the flowering stage. The grain maize yield forecast has been revised substantially downwards and may be revised further downwards if water shortages continue during the coming weeks. Irrigation is currently forbidden in some of the main producing *départements* such as *Tarn-et-Garonne*. Sunflowers are impacted to a lesser extent as they are less sensitive to dry conditions.





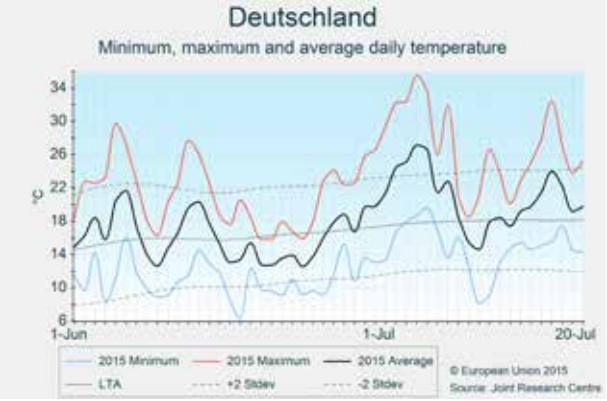
Germany

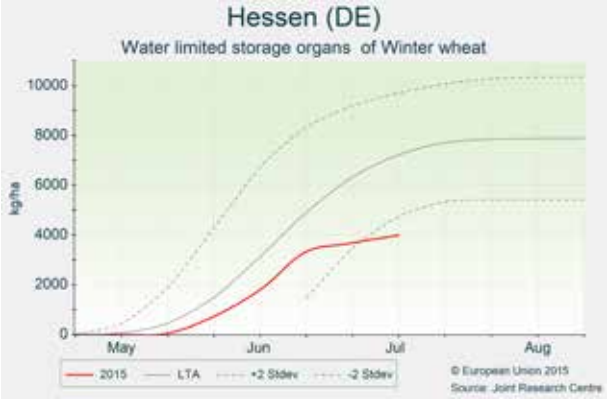
Exceptional heatwave

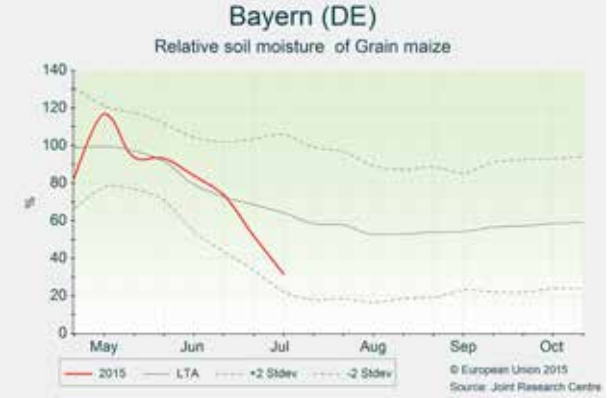
An exceptional heatwave occurred at the beginning of July. Soil moisture was partially replenished in northern and eastern Germany, but not in central Germany. Dry conditions also persist in southern Germany. Although the forecasts for most crops have been lowered compared to the previous bulletin, they are still close to the average.

In June, thermal conditions exhibited a clear zonation, from colder than usual in the north to warmer than usual in the south. In general, this overall pattern continued in July, albeit with overall higher temperatures and large positive anomalies. The beginning of July was marked by a pronounced and very intense heatwave, with daily maximum temperatures reaching above 38 °C in most of the country, which negatively affected cereals that were in the grain-filling stage and grain maize crops that were in the flowering stage, in the south of the country. This heatwave was followed by a second less intensive hot spell, centred around 17 July. While the number of hot days (> 30 °C) in June was seasonal, there was a clear surplus in July compared to the long-term average, namely 5-10 more in southern Germany. After an extremely dry June in central and northern Germany, July brought rain which almost compensated for the rainfall deficit accumulated in June in northern and eastern Germany and helped sustain maize and other summer crops. In central regions, however (e.g. Hessen, Thuringia, and Rhineland-Palatinate (Rheinland Pfalz)), soil moisture levels are still critically low and crops on light soils have been severely impacted, resulting in clearly diminished yield expectations. Bavaria (Bayern) and Baden-Württemberg received adequate rainfall in June but little precipitation during July.

Winter barley has matured and the harvest is underway. The same is true for soft wheat in some parts of the country. Due to the adverse weather conditions, yield forecasts have been lowered compared to our previous bulletin, but are close to the 5-year average with the exception of sunflowers and grain maize (for which conditions have been too dry and hot). However, weather conditions in the coming weeks will determine the final yields of grain maize.





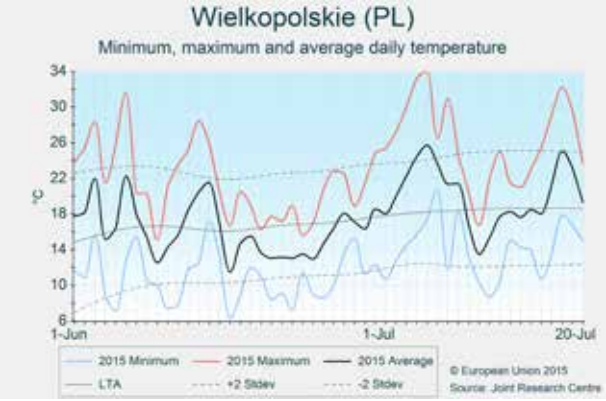


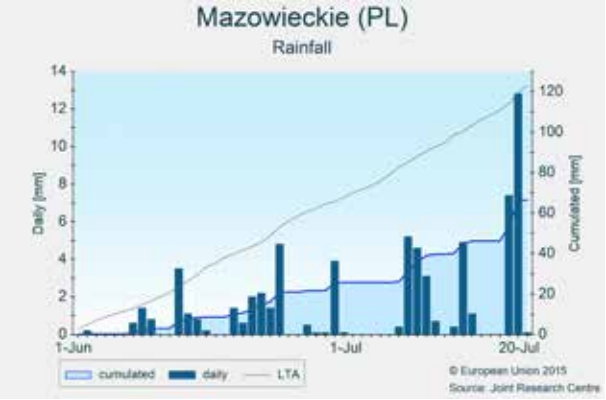
Poland

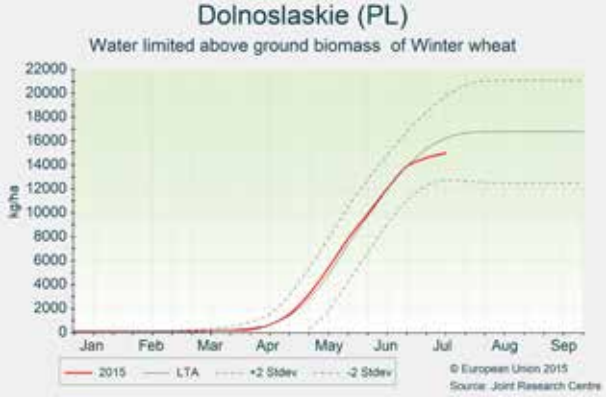
Dry conditions negatively affect yield outlook

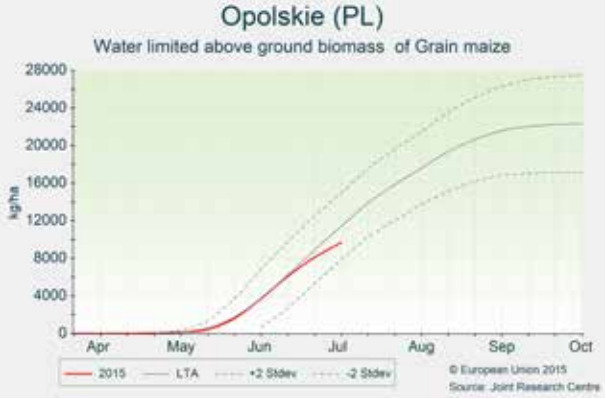
Spring and winter cereals in all regions have been impacted by low levels of soil moisture during periods of the grain-filling stage. Yields for all crops are forecast to be well below last year's record levels and close to the 5-year average.

Temperatures oscillated around the average in June. This was followed by a heatwave during the first dekad of July, with maximum temperatures reaching 35 °C. Rainfall since 1 June has been close to the average in the westernmost regions (Lubuskie, Wielkopolskie, Dolnoslaskie), but was insufficient to compensate for the water deficit developed since the beginning of the year. By contrast, central and eastern regions, which experienced around average rainfall in May, received only 50 to 60 % of the average in June and July so far. As a consequence, most winter and spring cereals were exposed to water stress during the grain-filling stage. In western regions, the driest conditions occurred during the flowering and early grain-filling stages. In eastern regions, soil moisture depleted more markedly towards the end of the grain-filling period, when the heatwave occurred. In accordance with these observations, yield forecasts for spring and winter cereals have been revised downwards to levels below the trend and close to the average. Grain maize is entering the flowering stage and dry conditions are expected to impact the yields significantly.









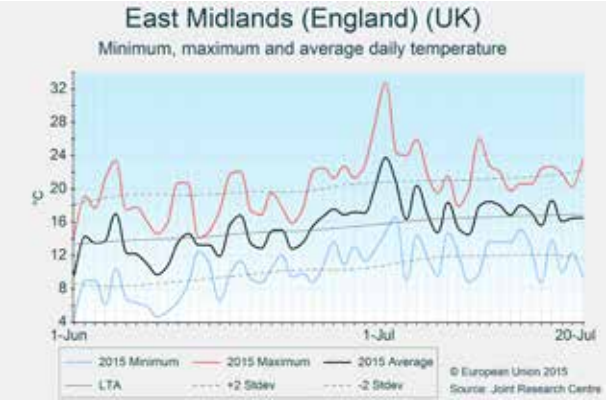
The United Kingdom and Ireland

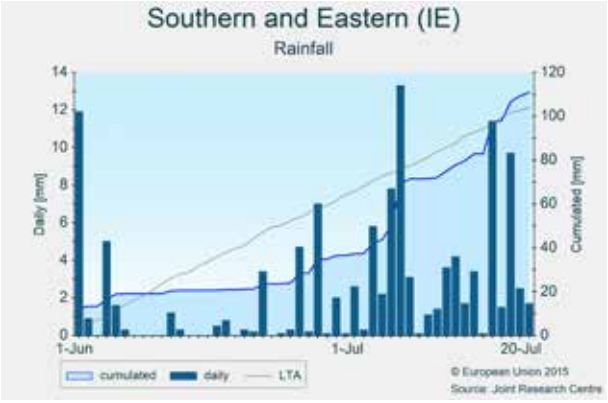
Dry conditions affect yield potentials in south-east; favourable conditions elsewhere

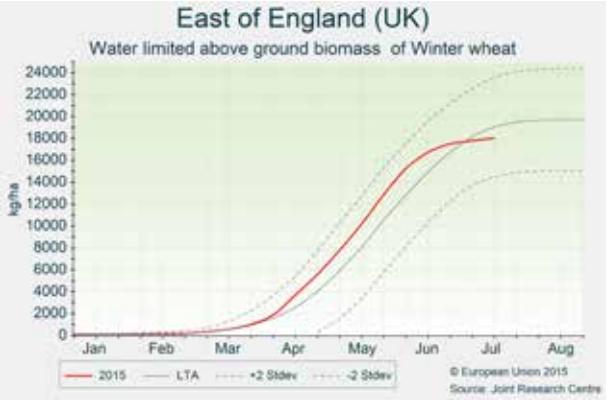
Persistent drier-than-usual conditions in the south-eastern UK negatively affected yield potential. Conditions were favourable elsewhere in the UK and in Ireland. The yield forecasts remain above the 5-year average.

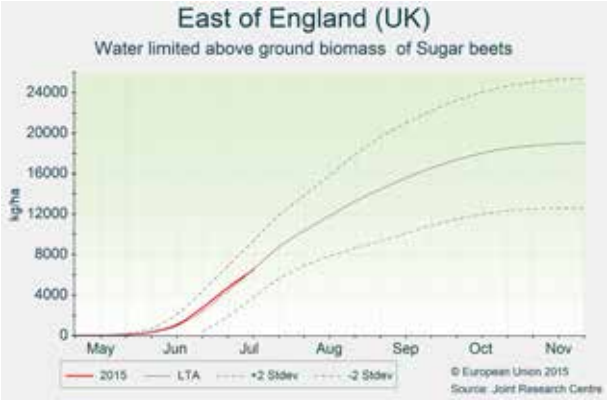
The most salient common weather feature across the British Isles during the period of review was the warmer-than-usual period from about 24 June to 5 July. Maximum temperatures exceeding 30 °C (up to 33 °C) only occurred on 1 July, however, and only in areas south and east of the West Midlands of the UK. Below-average temperatures prevailed before and after this period, resulting in temperature sums that were very close to the long-term average. Rainfall in June was below average across the British Isles, except for north-western Scotland. South-eastern England and the Irish Midlands received less than half the normal amount of rainfall. In July, relatively dry conditions continued in south-eastern England, but the rest of the UK and Ireland were wetter than usual. Even the drier areas experienced frequent events of light rainfall in July.

Crop development is following a seasonal pattern. Oilseed rape and winter barley are now being harvested. Winter wheat is nearing the end of the grain-filling stage or has started ripening. In south-eastern England, the continued water deficit combined with the above-average temperatures affected crop growth in non-irrigated fields, especially on light soils, with negative effects on the yield potential of winter cereals during the grain-filling stage, including sugar beet and potato crops. However, irrigated lands and rain-fed areas in other parts of the UK and Ireland benefited from the relatively cool and sunny weather conditions during most of the period. By itself, the warm spell did not cause significant damage and resulted in only a moderate revision of yield forecasts. For the UK, the forecasts for most crops (except barley and oilseed rape) were revised slightly downwards, but are still above the 5-year average. The yield forecasts for Ireland were revised somewhat upwards and remain above the average, but below last year's levels.









Spain and Portugal

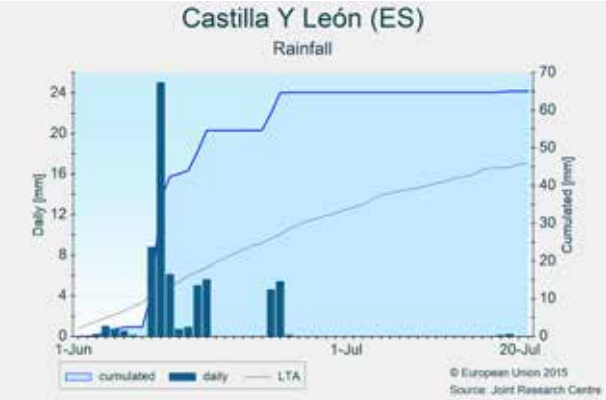
High temperatures accelerate summer crop development

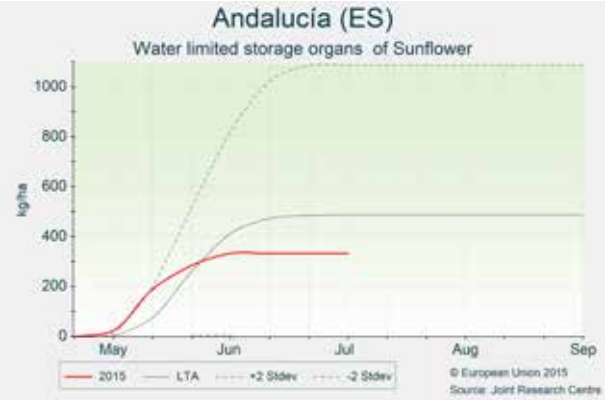
Weather conditions have been unusually warm since June, but precipitation has been close to the norm. Yield expectations for sunflowers are substantially below those of 2014. Average grain maize yields are forecast, as irrigation is progressing with no major constraints.

The warm weather conditions experienced in May persisted in June and July throughout the Iberian peninsula, with daily temperatures 2 °C to 3 °C above the long-term average. The first half of July was particularly hot, with maximum daily temperatures frequently higher than 35 °C, especially in the southern half of Spain. Cumulated precipitation from 1 June has been close to seasonal values and mainly concentrated in the form of heavy showers registered in the second week of June.

The winter cereals harvest is practically finished in all the regions thanks to the absence of rainfall since the second half of June. Due to the dry conditions that prevailed during most of spring, the final yields are expected to be close to those of 2014, which was a rather unfavourable season.

High temperatures accelerated the development of spring and summer crops. Sunflowers are currently reaching maturity in southern regions, where the harvest will start shortly, whereas they are still in the grain-filling stage in northern areas. Dry conditions in May have constrained crop growth and yield expectations are below average, despite the fact that rainfall in June led to a partial recovery of growth rates in Castile-Leon (*Castilla y Leon*). Grain maize in the south of the peninsula has just started grain filling (about 10 days earlier than usual) and is reaching the flowering stage in northern regions. The yield outlook is currently average as irrigation is progressing with no major constraints.



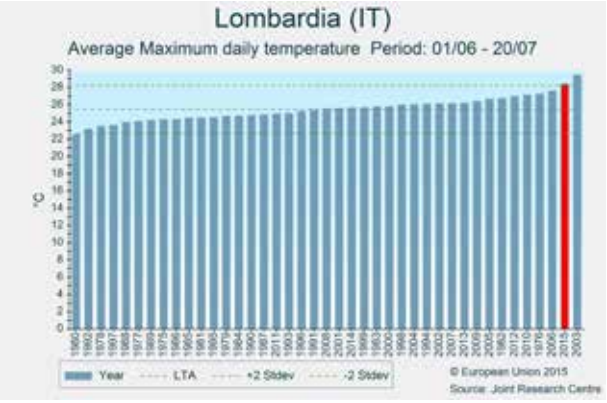


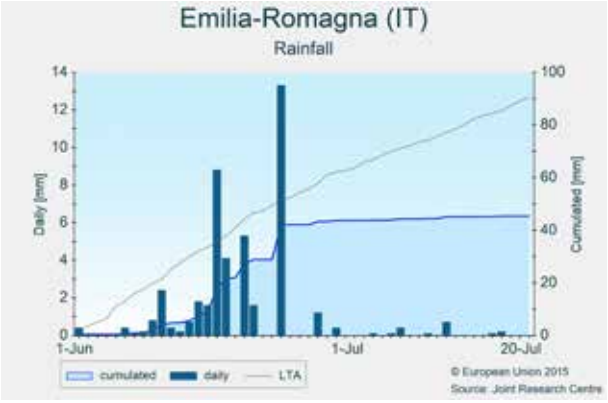
Italy

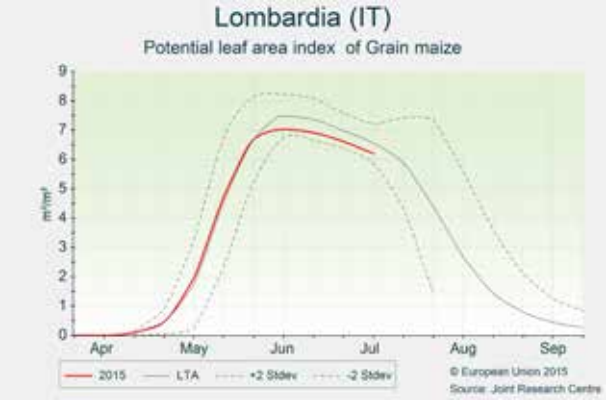
Concerns about maize yields because of heat stress during flowering

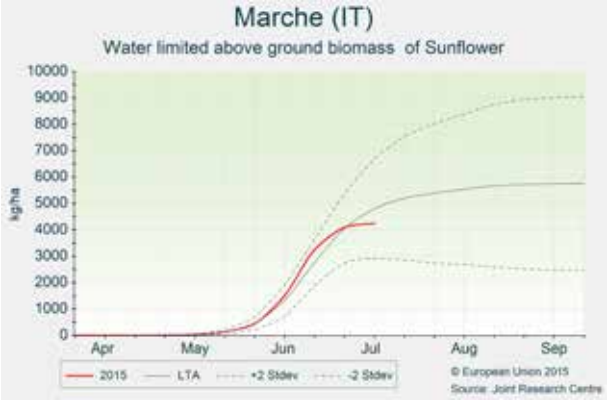
The harvesting of winter cereals has been completed. The yield estimate for durum wheat remains below the 5-year average mainly due to heat stress and drought in south-eastern Italy. The flowering of maize is under threat because of the persistent hot conditions in the north of Italy.

During the period under review (from 1 June to 20 July), temperatures were above the long-term average in northern and central Italy by about 3 °C. So far, this summer is the second warmest experienced in many regions of the north, only behind that of 2003. Maximum temperatures were high and remained above 35 °C for several days in Lombardy, *Emilia Romagna, Tuscany, Lazio* and Apulia (*Puglia*). Rainfall was scarce in northern and central Italy, particularly in Lombardy, Piedmont (*Piemonte*) and *Emilia Romagna*, which received only 50 % of the average precipitation during the review period. As a result of the dry and hot conditions, evaporative demands exceeded water supply, with negative impacts on summer crop growth. In particular, the flowering of maize was affected by the prolonged high temperatures in the most important agricultural areas of Italy; irrigation should partially limit the damage, keeping the crop canopy cooler, but some areas of northern and central Italy could suffer from irrigation restrictions. Thus, the yield forecast for maize was revised downwards and is now well below last year's record level, but only slightly below the 5-year average. The yield forecasts for potatoes and sunflowers were also revised downwards due to the dry conditions. The harvesting of durum wheat was completed at the beginning of July, whereas the harvesting of soft wheat in central and northern regions was completed about 1 week later. Yields are expected to be below average for durum wheat and close to average for soft wheat.









Hungary

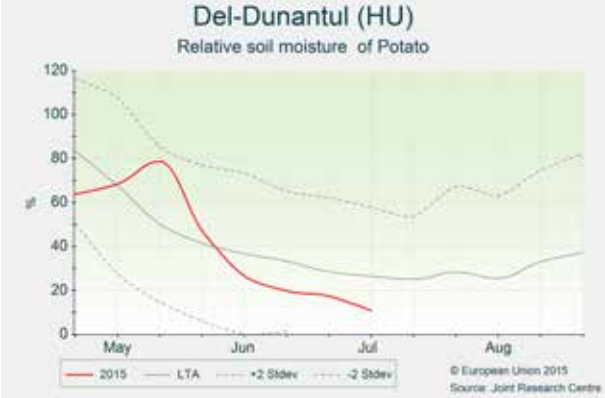
Lowered yield expectations of summer crops

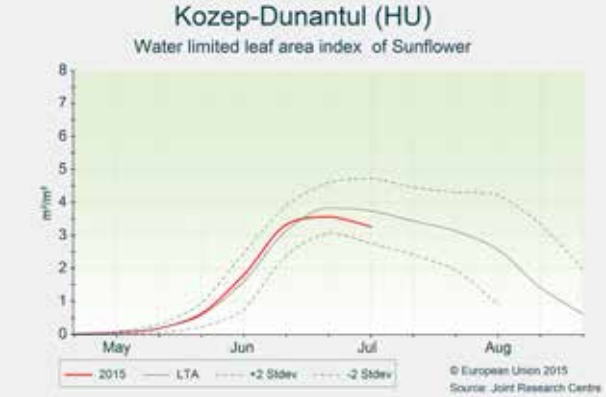
Since the beginning of June, Hungary has experienced drier-than-usual weather conditions. Temperatures greatly exceeded the average in the first half of June and particularly in July. Extreme hot weather negatively affected the yield formation of summer crops. Conditions for the harvesting of cereals were favourable.

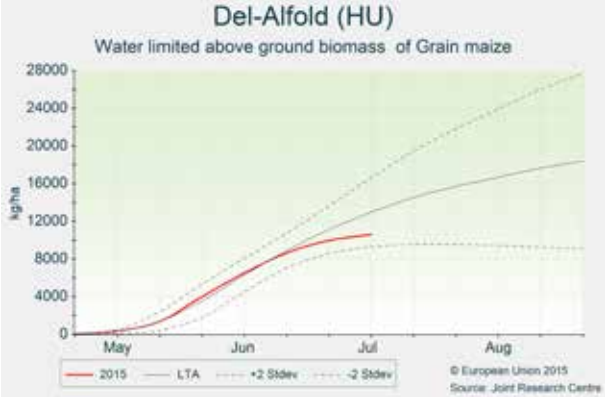
In the first half of June, temperatures were higher than average, but turned cooler during the second half of the month. Two heatwaves negatively affected crops between 3-8 July and 15-20 July, and the weather forecast indicates that extreme hot spells will continue until the end of the month. During 10-15 July hot days (Tmax > 30 °C) were experienced with maximum temperatures of between 36 and 38 °C. Summer crop development is now advanced by 1-2 weeks.

After the beneficial rains of late May, precipitation levels decreased significantly. A rainfall deficit of between 40 and 80 mm has been recorded since the beginning of June. In late June, the mild thermal conditions facilitated the late grain filling and ripening of cereals, leading to a slight upwards revision of the yield forecast. The dry weather allowed for the harvesting of cereals to be completed in good time.

During the reviewed period, soil moisture fell to below-average levels. The extreme high temperatures of July badly affected the pollination of maize crops. As the hot spell and the intensifying water stress led to a decrease of the leaf area index and below-average biomass accumulation of all summer crops, the yield forecast was revised downwards and is likely to be revised even further downwards in the event of drought.







Romania

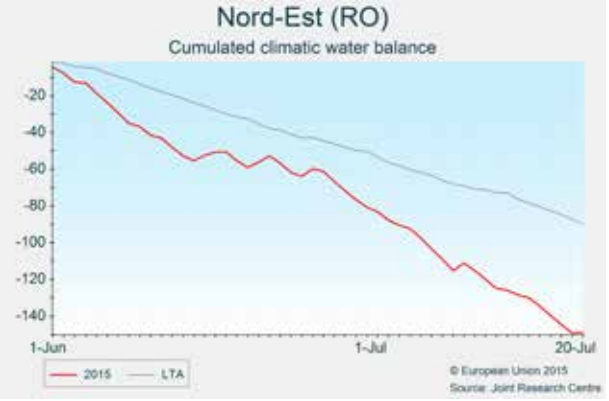
Summer crops face intensifying water deficit

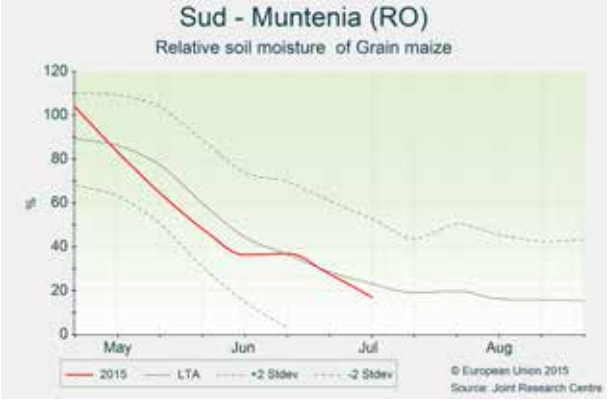
The harvest of winter cereals suffered some delay during the second half of June, but progressed well in July. The yield outlook for winter cereals is good, but remains below last year's exceptionally high levels. Summer crop conditions are good in southern areas, but north-eastern, eastern and north-western regions are experiencing drought.

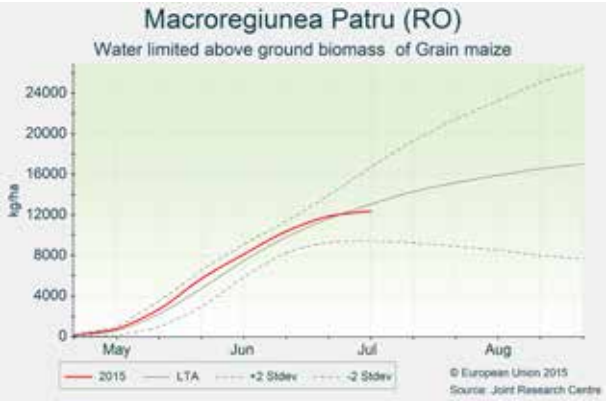
The first half of June was warmer than usual and experienced below-average rainfall, with the exception of south-eastern Romania. From mid-June, temperatures decreased below the long-term average. Precipitation during the second half of June was abundant (50-150 mm) in central and southern Romania, but the areas along the eastern and western border received only 10-20 mm rain. After 5 July, hot and dry weather prevailed throughout the country.

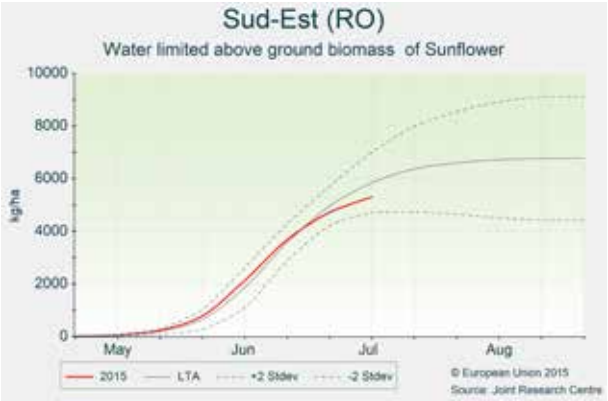
The cumulated climatic water balance (calculated from 1 April to 20 July) shows a considerable water deficiency (100-200 mm) in the North-East (*Nord-Est*) region, but there is also significant water scarcity in the South-East (*Sud-Est*) region and territories along the Hungarian border.

The rainfall of June interrupted the harvest of winter cereals in southern regions. Since early July, the drier weather has caused no significant constraints. The phenological development of summer crops is slightly advanced. The water supply conditions are adequate and seasonal in the Danube valley, but the soil moisture contents in the north-western and north-eastern regions have decreased sharply and are now well below average levels. Our model calculations show above-average biomass of summer crops in the Centre (*Centru*) and South-Muntenia (*Sud–Muntenia*) regions and in the eastern half of Macroregion four (*Macroregiunea Patru*), but biomass accumulation slowed down to below-average levels in eastern and western Romania due to a less-than-optimal water supply. The situation is delicate in these regions because the intensifying water scarcity can cause significant yield losses, primarily in maize, but also in potato and sugar beet stands. The yield forecast for the summer crops was revised downwards, given the developing drought.









Bulgaria

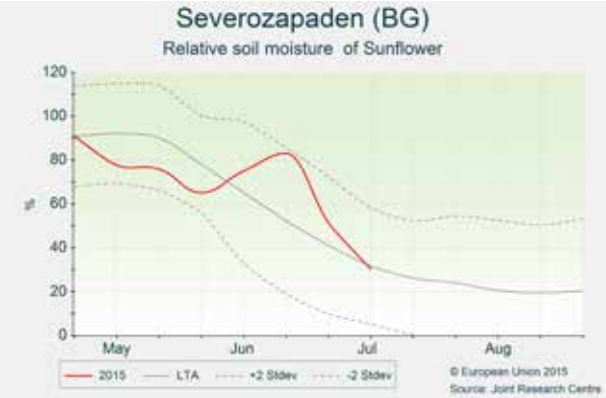
Hampered harvest

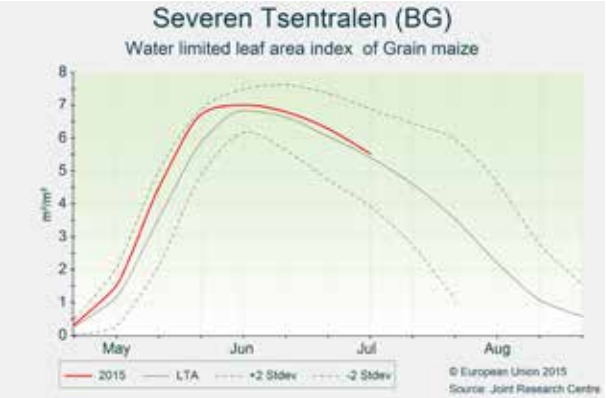
Considerable rainfall hampered the harvesting of winter cereals. The same rains improved the soil moisture conditions for maize and sunflower crops, which present advanced development and above-average biomass accumulation. Consequently, the yield forecast for maize and sunflowers was revised upwards.

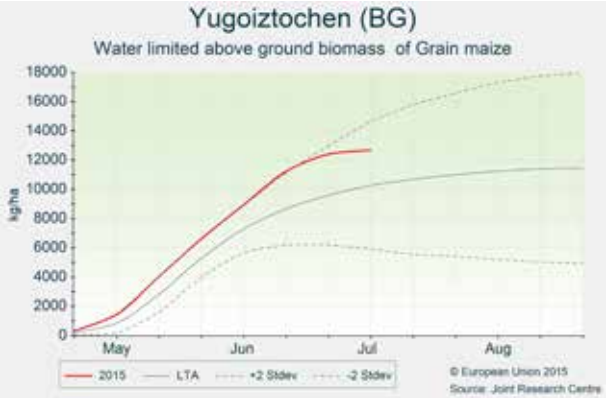
Overall thermal conditions during June were close to average. The first half of the month was warmer than usual, whereas below-average temperatures were typical during the second half. Between 6 and 10 July, a short heatwave occurred with daily maximum temperatures of up to 35 °C. This extreme period of warmth coincided with the tasselling of maize, and is likely to have had a negative effect on the fertilisation of maize flowers.

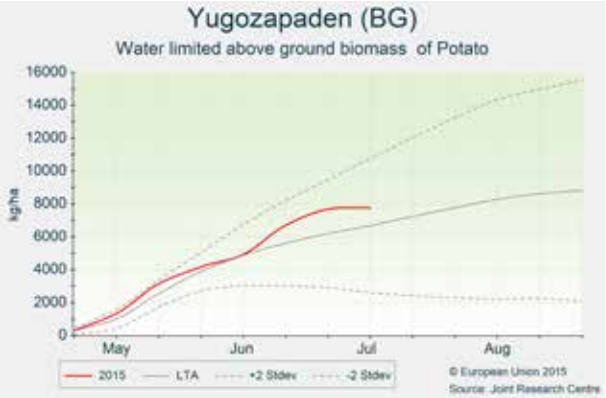
During the first dekad of June, precipitation was below average everywhere in the country except for the South-East (*Yugoiztochen*) region. After mid-June, rainfall became plentiful in the western and southern areas, exceeding the average by 30 to 120 mm. The North-West (*Severozapaden*) region in particular experienced excess precipitation. The first two dekads of July were again characterised by scarce precipitation throughout the country.

The harvesting of winter cereals started earlier than usual, since their development was advanced, but the frequent and abundant rains during the second half of June seriously hampered the progress and may have affected the grain quality to some extent. The situation improved considerably in July. The development of maize and sunflower crops is advanced by about 1 week. Summer crops benefited from the rainfall in June, which favourably increased soil moisture contents during the flowering stage, which is crucial for yield formation. Soil moisture levels are close to average levels. As sunflowers and (especially) maize present above-average biomass accumulation, the yield expectations are above average, but more rain will be needed to maintain the current yield potential.









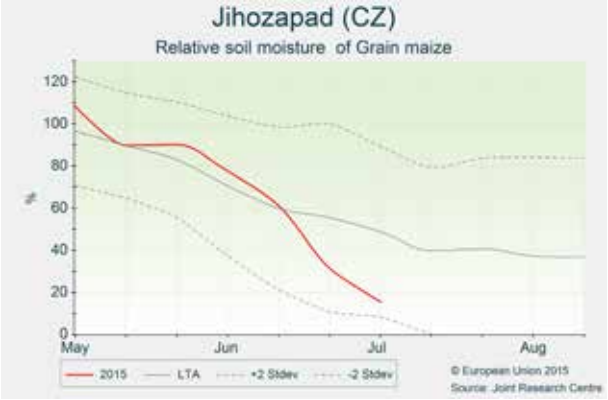
Austria, Slovakia and the Czech Republic

Summer crops affected by a series of heatwaves

The first halves of June and July were characterised by substantially warmer-than-usual weather conditions. The first two dekads of July were the warmest on our records, with recorded maximum daily temperatures of between 35 and 37 °C. The rainfall deficit since the beginning of the summer is especially pronounced in the eastern part of the Czech Republic, eastern Austria and Slovakia. Summer crop yields were revised downwards.

June started with warmer-than-usual weather, with temperature anomalies up to 6 °C above the long-term average. The eastern part of Austria and the western part of Slovakia were struck by the first heatwave of the season, with maximum daily temperatures reaching up to 33 °C. Rainfall in these areas was very scarce. Colder-than-usual weather prevailed during the second half of June, with spatially heterogeneous rainfall conditions; rainfall cumulates were close to normal in western Czech Republic and in Austria, whereas a rainfall deficit was recorded elsewhere. Maximum daily temperatures remained below 30 °C. The first two dekads of July were the warmest on our records. Two heatwaves, which occurred since the beginning of July, have been characterised locally by maximum daily temperatures of between 35 and 37 °C. The most severely affected regions were the western part of the Czech Republic, eastern Austria and western Slovakia. The highest rainfall deficit since the beginning of summer occurred in the eastern part of the Czech Republic, eastern Austria and Slovakia, with rainfall cumulates more than 50 % below the long-term average.

Harvesting is ongoing for winter crops. Summer crops are in advanced development stages due to warmer-than-usual conditions. Grain maize is mainly entering the flowering stages or is at the beginning of the grain-filling period. Hot and dry weather during these sensitive growth stages, with maximum daily temperatures well above 30 °C, has led to heat stress and is downgrading the yield potential of summer crops. Moreover, the lack of rainfall, which has been especially pronounced since the beginning of July, is intensifying drought stress. Summer crop-yield forecasts have therefore been revised downwards.

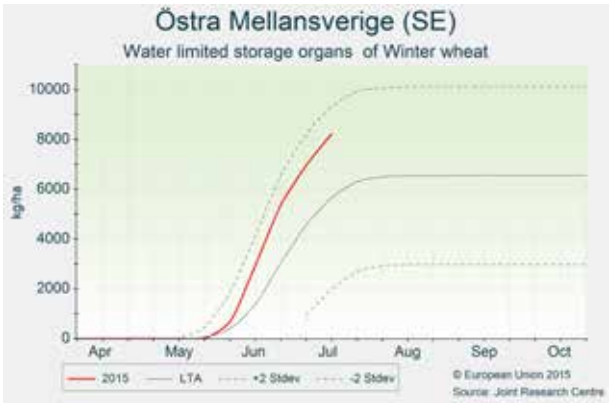


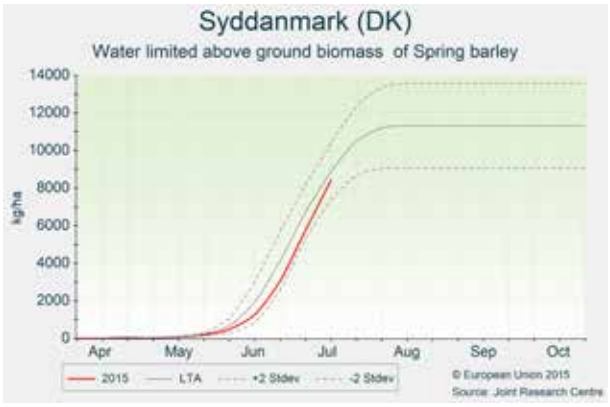
Denmark and Sweden

Overall a wet and cool period, now affecting spring crops

Slightly wetter conditions for this period in both countries, together with the lower-than-normal temperature, have further slowed down spring crop development and growth. While winter crops still show signs of satisfactory growth, dryer and warmer conditions are necessary to avoid some delay of harvest and diminished grain quality.

Weather conditions in both countries have been variable. For all the regions, average temperatures were below the long-term average during June. A short period with temperatures above normal occurred during early July, after which temperatures returned to below long-term average. Both countries had different periods with significant rainfall. In northern Denmark, above-normal cumulative precipitation occurred during all the period, while the centre received it only in the second dekad of June and the south lacked precipitation. North-Central Sweden (*Norra Mellansverige*) and East-Central Sweden (*Östra Mellansverige*) presented above-normal cumulative precipitation in first and second dekads of July and Småland and islands (*Småland Med Öarna*) in the last week of June. Cumulative active temperature (Tbase = 10 °C) decreased in both countries, more so at the end of June. Thus, crop development for winter crops have slowed down, however they remain around normal stage for the period. By the second dekad in June, winter wheat reached grain filling in Sweden and flowering in Denmark. By July 20 this crop had progressed to ripening in West Sweden (*Västsverige*) and East-Central Sweden, while remaining at grain filling in the rest of Sweden and Denmark. According to model results winter wheat and barley present above-average biomass accumulation and storage organs accumulation, suggesting high yields compared to the average. However, harvest could be delayed, as dryer and warmer conditions are needed in the following weeks. Rapeseed has reached ripening in Denmark and maturity in Sweden, and biomass accumulation and storage organ indicators suggest a higher-than-average yield estimate. Spring barley is at grain-filling stage in both countries; its growth conditions are below average, with lowest values in Denmark.





Finland, Lithuania, Latvia and Estonia

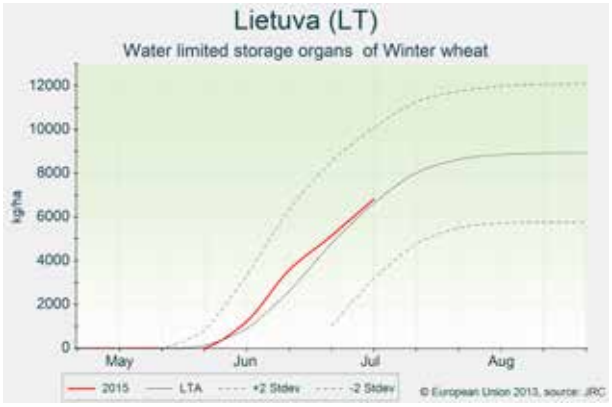
From lacklustre to moderately good expectations for spring crops

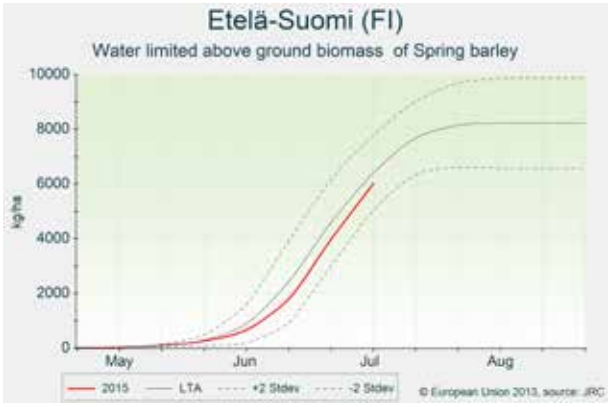
Persistent dry conditions in Lithuania have lowered the yield expectations for winter and spring crops, which still remain close to the 5-year average. Close-to-average yields are also forecast for spring crops in the Baltic countries, whereas the yield outlook for Finland is below average.

Apart from some relatively warm days (maximum temperatures around 28 °C) during the first dekad of July, temperatures during the period of review (1 June-20 July) remained below the long-term average in all regions. For the period as a whole, cumulated active temperatures (Tbase = 0 °C) were much lower than usual in Finland (12 % below the average) and slightly below average in the Baltic countries (around 4 % below average).

Overall, dry conditions prevailed in Lithuania during the month of June, which was the second-driest June recorded in our database (even drier than in 2006). As a consequence, soil moisture levels dropped to near-critical levels during the yield formation of winter crops and most of the heading and flowering stages of spring crops. In Estonia and Latvia, crop-growth indicators are close to seasonal values, despite the relatively cool conditions which slowed crop development. On the other hand, excessively wet conditions and below-average temperatures have characterised the whole season in Finland since early spring. This is reflected in delayed crop development and below-average biomass accumulation for spring crops. This tendency is less marked in one of the main agricultural areas of Finland, South Finland (Etelä-Suomi), but even in this province crop-growth indicators suggest a mediocre yield outlook.

Our crop-yield forecasts for Estonia and Latvia remain close to those of the last bulletin, whereas figures for Finland were revised downwards to below average, and slightly downwards for Lithuania, where yield expectations still remain close to or slightly above the 5-year average.





Belgium, the Netherlands and Luxembourg

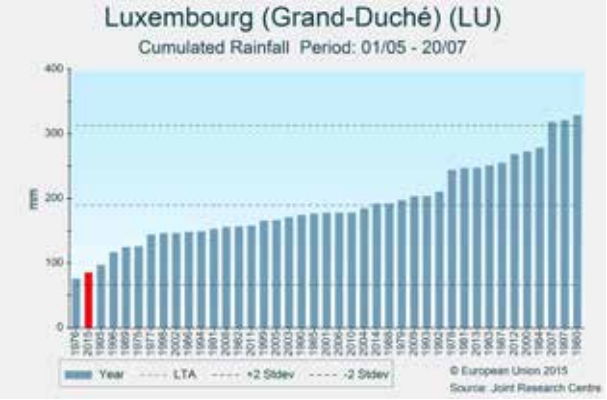
Heatwave and continued drought affect yield potentials

A heatwave at the beginning of July combined with continued water deficit negatively affected yields potentials, especially in parts of Belgium, in Luxembourg and in the southern Netherlands. Yield forecasts are now around the 5-year average for most crops.

The period of review presented strong temperature variations. Temperatures around or below average predominated until 24 June and after 6 July. The period in-between was distinctly warmer than usual, with a heatwave from 1 to 4 July, with maximum temperatures reaching 35°C in Belgium, Luxembourg and the southern Netherlands. In these regions, temperature sums for the period as a whole exceeded the long-term average (by up to 20 % in Luxembourg). Further north, temperature sums were close to the long-term average. Rainfall was below average with deficits (compared to the long-term average) exceeding 60 mm over Luxembourg and the western Netherlands to about 20 mm in the northern Netherlands.

Crop development accelerated in the regions with warmer-than-usual conditions. Winter wheat has started ripening in Belgium and Luxembourg and is nearing the end of the grain-filling stage in most of the Netherlands.

The continued water deficit combined with high temperatures affected crop growth in non-irrigated stands, particularly on light textured soils in Luxembourg and parts of Belgium and the southern Netherlands where soil moisture levels were already low. This had negative effects on the yield potentials of winter cereals during the grain-filling stage, as well as of sugar beet and potato crops. The relatively cool conditions following the heatwave, with frequent light rains, allowed crops to maintain vigour. Yield forecasts were revised downward and are now around the 5-year average for most crops.



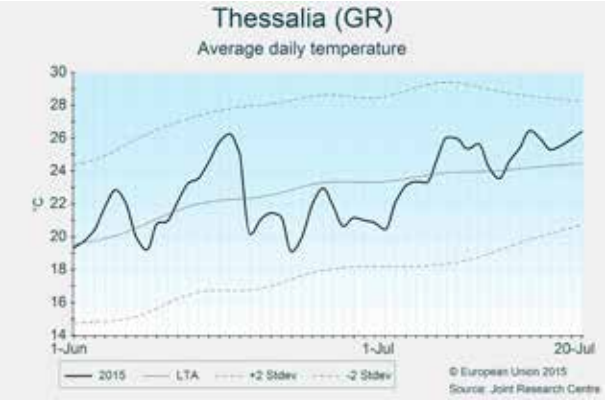
Greece and Cyprus

Moderate yields for winter cereals in Greece. Very good yields in Cyprus

In Greece, the harvesting of winter cereals delivered moderate yields, below the 5-year average. Grain maize and other spring crops are progressing well because of irrigation and the humid weather conditions in June. The season has been completed in Cyprus with very good winter barley yields.

During the first half of June and since 5 July, temperatures in Greece have fluctuated mainly above the long-term average, whereas below-average temperatures prevailed from 15 June to 5 July. Maximum temperatures remained close to average levels without any extremes throughout the review period (1 June to 20 July), except around 15 June and 10 July when maximum temperatures reached 33 to 35 °C for a limited period of 2 or 3 days. Beneficial rainfall occurred during the whole of June, which is ranked as the fourth rainiest June on our records (since 1975). However, the first two dekads of July were very dry in the whole country. The harvesting of winter cereals was completed in the beginning of July, which is later than usual, due to several interruptions caused by rainfall in June. Our forecast for winter cereals remains below the 5-year average due to the dry conditions during the grain-filling period, as reported in the May bulletin. Spring crops in Greece are mainly irrigated. The flowering of grain maize has almost completed and, together with the other spring crops, is progressing quite well, benefiting also from June's humid weather conditions.

In Cyprus, temperatures in June and the first two dekads of July fluctuated mainly below the long-term average, whereas cumulated rainfall was well below average. The harvesting of winter cereals was completed in June, and very good yields are reported.



Slovenia and Croatia

Crop yields affected by hot and dry conditions

The first two dekads of July were the warmest on our records in Croatia and Slovenia, with maximum temperatures of up to 38 °C. A rainfall deficit has developed since the beginning of summer in Croatia and eastern Slovenia. The combined heat and drought stress is reducing the yield potential of summer crops. Above-average winter crop yields are foreseen in Croatia, whereas forecasts in Slovenia remain close to the 5-year average.

The first half of June was characterised by warmer-than-usual weather, with temperature anomalies up to 6 °C above the long-term average. Maximum daily temperatures of 33 °C were recorded in eastern and coastal areas of Croatia. Weather perturbations in mid-June led to a drop in air temperatures and some beneficial rainfall. Particularly heavy rainfall was recorded on 23 June in Slovenia, exceeding 150 mm locally. Croatia and Slovenia have been affected by two severe heatwaves since the beginning of July. The first two dekads of July were the warmest on our records for Slovenia and comparable to the 2012 heatwave in Croatia. Maximum temperatures of up to 38 °C were recorded. A rainfall deficit since the beginning of summer has developed in Croatia and eastern Slovenia. The most severe rainfall deficit was recorded in eastern Croatia, with rainfall cumulates of less than 40 mm since the beginning of June.

Summer crops present advanced development due to the warmer-than-usual conditions recorded since the beginning of summer. Grain maize is mainly in the flowering or at the beginning of the grain-filling stage. Hot and dry weather with maximum daily temperatures of well above 30 °C caused heat stress, which is reducing the yield potential of summer crops. The lack of rainfall is intensifying drought stress, which is limiting crop growth especially over eastern Croatia. The yield forecast for summer crops has therefore been revised downwards. The harvest is ongoing for winter crops, for which above-average yields are foreseen in Croatia, whereas forecasts for Slovenia remain close to the 5-year average.

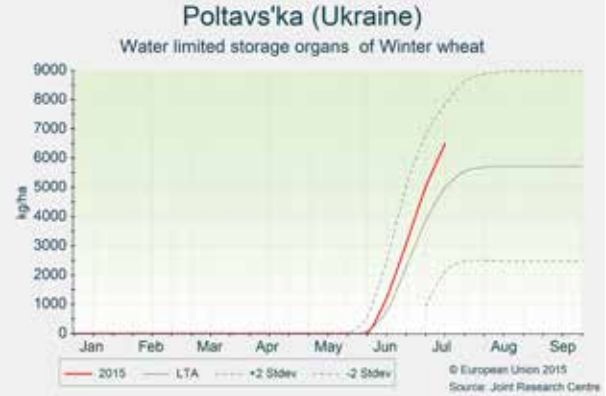
3.2 Black Sea Area

Ukraine

Dry conditions in the west lead to slightly decreased yields

While good conditions are still observed in eastern regions, the rain deficit in western Ukraine is likely to impact grain maize yields and, to a lesser extent, winter wheat. Winter-wheat yields are forecast to be well above average but below last year's record levels, while grain maize is revised downwards.

Temperatures remained slightly above average from the beginning of June until the first dekad of July. Temperatures during the second dekad of July were 4 °C below average in the easternmost oblasts, while temperatures were close to the average in the westernmost oblasts. During the first dekad of July, maximum temperatures reached 35 °C and heat stress was limited. Cumulated rainfall was close to the average for the period of analysis in eastern oblasts but largely below the average in western oblasts. Vinnyts'ka, Zhytomyrs'ka, Rivnens'ka and Khmel'nyts'ka have been experiencing a significant rain deficit since mid-May, and yield expectations are likely to fall considerably in these oblasts. Vinnyts'ka has received only 37 mm of rain since 1 June, while the long-term average is 150 mm. To a lesser extent, Kyyivs'ka and north of Odes'ka are also impacted by a rain deficit. Cumulated rainfall in all other oblasts was close to or slightly above the average. Winter-wheat harvests have started and the yield outlook is still high thanks to the continued good conditions observed since the start of the season, with the exception of the western oblasts. The dry conditions are expected to lead to a slight reduction in the national yield compared to last year's record levels. Grain maize is generally benefiting from good conditions, but national yields will be impacted by the drought in Kyyivs'ka and Vinnyts'ka, where grain maize is entering the flowering stage. The yield forecast is thus revised downwards compared to the last bulletin, to below last year's yields.

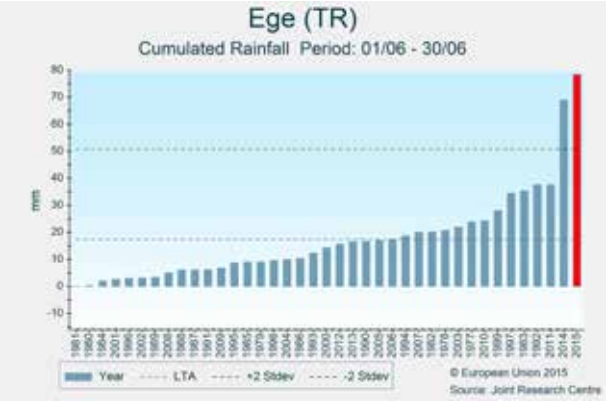


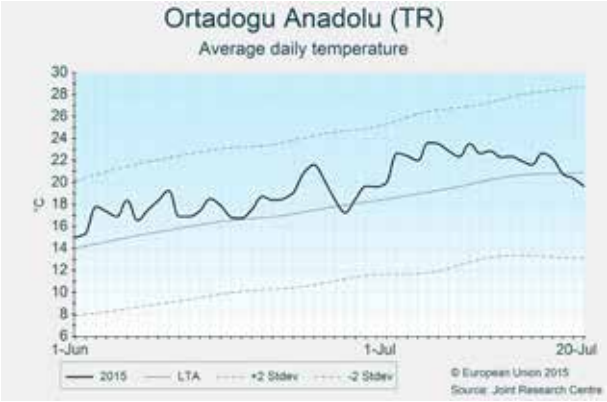
Turkey

Contrasting weather conditions. Good yields for winter cereals

June was characterised by wet conditions in the central-western regions of the country, whereas the eastern areas were drier and warmer than usual. The harvesting of winter cereals started early in June but was interrupted by frequent rainfall. It was completed in July in most regions. The yield forecast is above the 5-year average.

In the central-western regions of Turkey, the temperatures fluctuated around the long-term average throughout the period under consideration (from 1 June to 20 July). Precipitation in June was well above the long-term average in most regions of the country. For the regions of Ege, Dogu Marmara and Bati Anadolu, June 2015 proved to be the rainiest on our records (since 1975), and the second rainiest for the regions of Bati Marmara, Akdeniz and Bati Karadniz. Contrasting conditions prevailed in the south-eastern parts of the country (i.e. Ortadogu Anadolu, Guneydogu Anadolu), which have been warmer than usual and almost dry since the beginning of June. However, these areas are less important in terms of production and yields of winter cereals and spring crops. The first two dekads of July were very dry in the whole country. The harvesting of winter cereals began early in June in southern regions and somewhat later in central-northern and eastern areas. As it was interrupted several times due to rain, it was extended and completed in July in most areas. Despite the interruptions to the harvest, reports suggest good grain quality. Yields of winter wheat and winter barley are forecast to be above the 5-year average. Grain maize irrigation in Turkey is continuously increasing. The crop is currently passing from the flowering to the grain-filling development stage and is also benefiting from June's humid weather conditions in non-irrigated areas. The forecast for grain maize is also above the 5-year average.





3.3 European Russia and Belarus

European Russia

Harvest of winter wheat hampered by rain

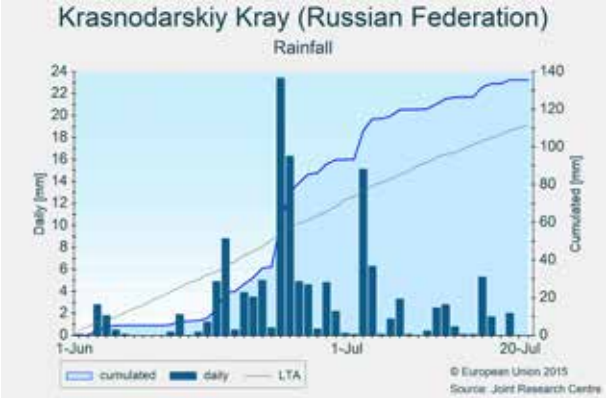
In June and July, most of Russia experienced substantial rain, but in south-eastern Russia hot and dry weather conditions prevailed. Harvest started earlier than usual this year, but ample rains caused considerable delay. The yield expectation for winter wheat is above average. The growth and yield outlook for maize crop is very positive.

From the last dekad of May until the end of June, daily mean temperatures mostly exceeded the average, resulting in 2-5 °C positive thermal anomalies in southern and eastern parts of European Russia. The regions along the Caspian coast and the Kazakh border were the warmest. Maximum temperatures reached 35-40 °C and the number of hot days (Tmax > 30 °C) was 6-20 days more than usual in these south-eastern territories. Moreover, the precipitation was 30-60 mm less than average. By the end of June, a significant soil water deficiency developed in the southern regions of Central and Near Volga Okrugs as well as in the northern and eastern areas of the Southern Okrug (e.g. Volgogradskaya and Rostovskaya oblast). In contrast, abundant rainfall occurred in the vicinity of the Black Sea and in the northern regions of Central Okrug, as well as in the far north, totalling up to 70-150 mm.

In the beginning of July, a sensible cooling started and the second dekad of the month was 2-6 °C colder than usual. In mid-July maximum temperatures remained below 20-25 °C, even in southern Russia. The Central Okrug, Near Volga Okrug and Krasnodarskiy Kray received ample rains during this period while the southern regions remained dry.

Our model simulations indicate high water-limited biomass accumulation in the western part of the Southern Okrug and western part of North Caucasus Okrug, slightly above-average biomass in the western side of the Central Chernozem Region but with a decreasing trend eastward and significantly below-average biomass accumulation in the drought affected south-eastern regions. The winter-wheat yield outlook is above the 5-year average, but below last year's excellent levels. The harvest of winter wheat started earlier than usual in southern Russia but frequent and abundant rainfall caused considerable delays. Wet weather in the northern regions of wheat cultivation was unfavourable for ripening and likely decreased grain quality.

The phenological development of maize was accelerated and maize is now in the grain-filling stage. Plentiful summer rains provided adequate soil moisture supply during flowering. Biomass accumulation is above normal and the yield expectations are good.



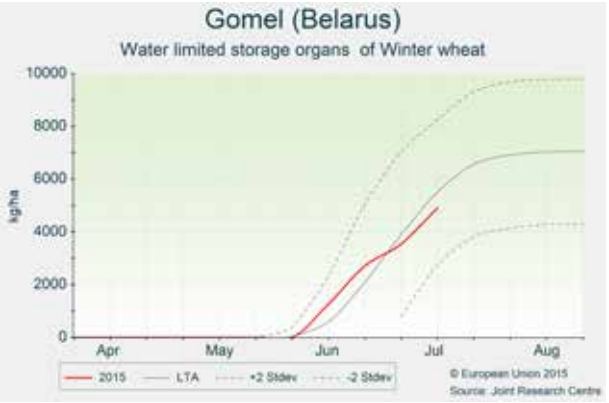
Belarus

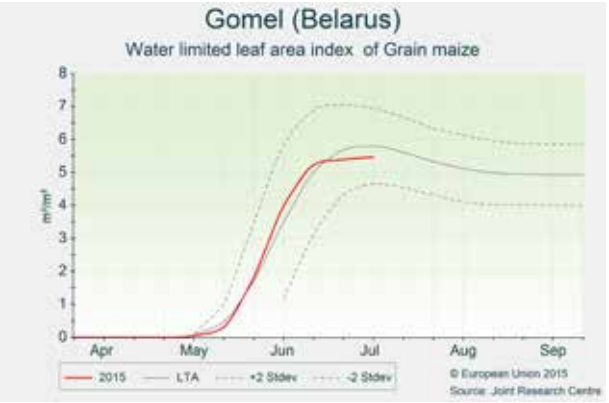
Yield forecasts revised downwards due to scarce rainfall across the country

In Belarus, rainfall during the review period was scarce, whereas average temperatures have remained higher than usual since the beginning of June. Winter, spring and summer crops were affected by drought and yield forecasts have been revised downwards.

Since 1 June, average temperatures have remained 1.5 °C higher than usual in most parts of Belarus, with maximum temperatures reaching 34 °C in southern regions such as Brest and Gomel. Precipitation was low across the country: about 70 mm of rain was registered during the period under review (from 1 June to 20 July), which is only 50 % of the long-term average.

The prolonged dry conditions combined with the high temperatures negatively influenced winter crops during the flowering and grain-filling phases. According to our model simulations, winter-wheat development is about 1 week in advance, but water-limited biomass and storage organs have been negatively impacted since the second dekad of June. The growth of spring and summer crops was also affected by the drought, losing the lead gained at the beginning of the season. Water stress has been particularly severe in south-eastern regions, where soil moisture levels have decreased sharply since mid-May. Yield forecasts were revised downwards for all crops: spring barley and winter wheat are now far below last year's record levels, but above the 5-year average, while maize is slightly below the trend.





4. Crop yield forecasts

Country	TOTAL WHEAT t/ha					TOTAL BARLEY t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	5.90	**5.57**	5.43	-5.6	+2.5	4.90	**4.61**	4.49	-5.9	+2.6
AT	5.92	**5.26**	5.26	-11.1	+0.1	5.80	**4.88**	5.03	-15.8	-3.0
BE	9.41	**8.76**	8.75	-7.0	+0.0	9.30	**8.72**	8.65	-6.2	+0.8
BG	4.22	**4.29**	3.93	+1.7	+9.1	4.00	**3.90**	3.72	-2.6	+4.7
CY	-	**-**	-	-	-	2.44	**2.57**	1.96	+5.3	+31.3
CZ	6.51	**5.67**	5.48	-12.9	+3.5	5.61	**4.71**	4.57	-16.0	+3.2
DE	8.63	**7.66**	7.63	-11.3	+0.3	7.35	**6.46**	6.36	-12.0	+1.6
DK	7.78	**7.34**	7.07	-5.8	+3.8	5.87	**5.51**	5.52	-6.2	-0.3
EE	3.99	**3.54**	3.37	-11.3	+5.2	3.64	**2.90**	2.94	-20.3	-1.1
ES	2.99	**2.95**	3.09	-1.4	-4.5	2.49	**2.51**	2.66	+0.7	-5.6
FI	4.05	**3.60**	3.69	-11.1	-2.5	3.73	**3.31**	3.44	-11.4	-3.9
FR	7.36	**7.25**	7.01	-1.5	+3.5	6.65	**6.70**	6.35	+0.6	+5.4
GR	3.08	**2.77**	2.85	-10.0	-2.9	3.05	**2.70**	2.96	-11.4	-8.7
HR	4.14	**5.22**	4.70	+26.2	+11.1	3.82	**4.67**	4.14	+22.2	+12.9
HU	4.71	**4.47**	4.21	-5.0	+6.3	4.45	**4.05**	3.87	-8.9	+4.6
IE	9.96	**9.18**	8.84	-7.8	+3.9	8.05	**7.97**	7.39	-1.0	+7.9
IT	3.81	**3.74**	3.84	-1.7	-2.5	3.64	**3.62**	3.66	-0.4	-0.9
LT	4.56	**3.95**	4.13	-13.4	-4.2	3.80	**2.95**	3.21	-22.5	-8.1
LU	6.13	**5.89**	5.98	-4.0	-1.5	-	**-**	-	-	-
LV	3.75	**3.72**	3.60	-0.7	+3.2	3.56	**2.60**	2.94	-27.1	-11.6
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	9.11	**8.85**	8.80	-2.8	+0.6	6.75	**6.14**	6.19	-9.0	-0.8
PL	4.97	**4.27**	4.32	-14.1	-1.2	4.05	**3.47**	3.54	-14.4	-1.9
PT	2.06	**1.65**	1.49	-19.9	+10.3	2.18	**1.63**	1.57	-25.2	+4.1
RO	3.65	**3.46**	3.23	-5.2	+7.1	3.36	**3.06**	2.91	-8.9	+5.1
SE	6.80	**6.12**	5.95	-10.1	+2.9	4.78	**4.67**	4.45	-2.3	+5.1
SI	5.23	**4.96**	5.02	-5.2	-1.1	4.85	**4.35**	4.48	-10.2	-2.8
SK	5.47	**4.28**	4.34	-21.8	-1.5	4.87	**3.50**	3.66	-28.1	-4.4
UK	8.58	**8.07**	7.63	-6.0	+5.7	6.40	**6.09**	5.83	-4.9	+4.4

Country	SOFT WHEAT t/ha					DURUM WHEAT t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	6.14	**5.80**	5.67	-5.4	+2.4	3.34	**3.20**	3.26	-4.3	-1.8
AT	5.98	**5.30**	5.30	-11.3	+0.1	4.78	**4.48**	4.50	-6.2	-0.5
BE	9.41	**8.76**	8.75	-7.0	+0.0	-	**-**	-	-	-
BG	4.22	**4.30**	3.94	+1.9	+9.0	3.66	**3.42**	3.18	-6.4	+7.5
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	6.51	**5.67**	5.48	-12.9	+3.5	-	**-**	-	-	-
DE	8.64	**7.67**	7.64	-11.2	+0.3	6.51	**5.44**	5.39	-16.5	+0.9
DK	7.78	**7.34**	7.07	-5.8	+3.8	-	**-**	-	-	-
EE	3.99	**3.54**	3.37	-11.3	+5.2	-	**-**	-	-	-
ES	3.04	**3.06**	3.31	+0.4	-7.5	2.67	**2.31**	2.09	-13.6	+10.6
FI	4.05	**3.60**	3.69	-11.1	-2.5	-	**-**	-	-	-
FR	7.48	**7.38**	7.16	-1.4	+3.1	5.20	**5.25**	5.14	+1.1	+2.1
GR	3.31	**2.91**	3.04	-12.3	-4.3	2.96	**2.70**	2.78	-8.8	-2.8
HR	4.14	**5.22**	4.70	+26.2	+11.1	-	**-**	-	-	-
HU	4.71	**4.48**	4.21	-4.9	+6.3	4.55	**4.32**	4.03	-5.0	+7.2
IE	9.96	**9.18**	8.84	-7.8	+3.9	-	**-**	-	-	-
IT	5.29	**5.48**	5.38	+3.5	+1.8	3.13	**2.98**	3.13	-4.9	-4.7
LT	4.56	**3.95**	4.13	-13.4	-4.2	-	**-**	-	-	-
LU	6.13	**5.89**	5.98	-4.0	-1.5	-	**-**	-	-	-
LV	3.75	**3.72**	3.60	-0.7	+3.2	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	9.11	**8.85**	8.80	-2.8	+0.6	-	**-**	-	-	-
PL	4.97	**4.27**	4.32	-14.1	-1.2	-	**-**	-	-	-
PT	2.06	**1.65**	1.49	-19.9	+10.3	-	**-**	-	-	-
RO	3.65	**3.46**	3.23	-5.2	+7.1	-	**-**	-	-	-
SE	6.80	**6.12**	5.95	-10.1	+2.9	-	**-**	-	-	-
SI	5.23	**4.96**	5.02	-5.2	-1.1	-	**-**	-	-	-
SK	5.47	**4.28**	4.34	-21.8	-1.5	-	**-**	-	-	-
UK	8.58	**8.07**	7.63	-6.0	+5.7	-	**-**	-	-	-

Country	SPRING BARLEY t/ha					WINTER BARLEY t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	4.16	**3.87**	3.91	-6.9	-1.0	5.92	**5.58**	5.36	-5.6	+4.3
AT	4.68	**3.69**	4.13	-21.1	-10.7	6.67	**5.88**	5.87	-11.8	+0.2
BE	-	**-**	-	-	-	9.30	**8.72**	8.65	-6.2	+0.8
BG	-	**-**	-	-	-	4.00	**3.90**	3.72	-2.6	+4.7
CY	-	**-**	-	-	-	2.44	**2.57**	1.96	+5.3	+31.3
CZ	5.56	**4.69**	4.52	-15.7	+3.6	5.74	**4.79**	4.69	-16.6	+2.1
DE	5.98	**5.33**	5.38	-10.9	-1.0	7.73	**6.80**	6.71	-12.0	+1.4
DK	5.68	**5.32**	5.41	-6.3	-1.6	6.63	**6.36**	6.01	-4.0	+5.9
EE	3.64	**2.90**	2.94	-20.3	-1.1	-	**-**	-	-	-
ES	2.58	**2.56**	2.70	-0.6	-4.9	1.91	**2.19**	2.44	+14.8	-10.0
FI	3.73	**3.31**	3.44	-11.4	-3.9	-	**-**	-	-	-
FR	6.12	**6.17**	6.04	+0.8	+2.1	6.88	**6.88**	6.50	+0.0	+5.8
GR	-	**-**	-	-	-	3.05	**2.70**	2.96	-11.4	-8.7
HR	-	**-**	-	-	-	3.82	**4.67**	4.14	+22.2	+12.9
HU	3.89	**3.47**	3.36	-10.8	+3.1	4.67	**4.31**	4.15	-7.8	+3.8
IE	7.56	**7.37**	6.99	-2.5	+5.5	9.32	**9.18**	8.86	-1.5	+3.7
IT	-	**-**	-	-	-	3.64	**3.62**	3.66	-0.4	-0.9
LT	3.80	**2.95**	3.21	-22.5	-8.1	-	**-**	-	-	-
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	3.56	**2.60**	2.94	-27.1	-11.6	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	6.75	**6.14**	6.19	-9.0	-0.8	-	**-**	-	-	-
PL	3.82	**3.23**	3.39	-15.4	-4.7	4.67	**4.15**	4.07	-11.2	+2.0
PT	-	**-**	-	-	-	2.18	**1.63**	1.57	-25.2	+4.1
RO	2.44	**2.33**	2.09	-4.7	+11.0	3.69	**3.40**	3.28	-8.0	+3.5
SE	4.71	**4.60**	4.40	-2.4	+4.4	6.41	**6.26**	5.46	-2.4	+14.6
SI	-	**-**	-	-	-	4.85	**4.35**	4.48	-10.2	-2.8
SK	4.78	**3.34**	3.61	-30.1	-7.4	5.24	**4.10**	3.99	-21.8	+2.7
UK	5.86	**5.71**	5.37	-2.6	+6.3	7.22	**6.61**	6.57	-8.4	+0.6

Country	GRAIN MAIZE t/ha					RYE t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	8.07	**6.71**	7.02	-16.9	-4.4	4.24	**3.71**	3.58	-12.4	+3.7
AT	10.79	**9.49**	10.16	-12.1	-6.7	4.87	**4.25**	4.25	-12.6	-0.0
BE	10.50	**10.60**	10.98	+0.9	-3.5	-	**-**	-	-	-
BG	7.68	**6.26**	5.77	-18.5	+8.5	1.96	**1.92**	1.79	-2.0	+7.4
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	8.43	**7.10**	7.74	-15.8	-8.3	4.99	**4.46**	4.61	-10.7	-3.3
DE	10.69	**9.62**	10.00	-10.0	-3.8	6.12	**5.38**	5.31	-12.1	+1.4
DK	-	**-**	-	-	-	6.36	**5.86**	5.83	-7.9	+0.4
EE	-	**-**	-	-	-	3.22	**2.94**	2.67	-8.6	+10.3
ES	11.24	**11.09**	10.90	-1.3	+1.8	1.72	**1.87**	2.05	+8.7	-8.8
FI	-	**-**	-	-	-	3.17	**2.73**	2.87	-13.9	-4.9
FR	10.02	**8.63**	9.19	-13.8	-6.0	4.90	**4.97**	4.91	+1.4	+1.2
GR	11.96	**11.38**	11.53	-4.9	-1.4	2.11	**1.85**	2.11	-12.2	-12.2
HR	8.11	**5.71**	6.06	-29.6	-5.8	-	**-**	-	-	-
HU	7.74	**5.88**	5.92	-24.1	-0.7	2.91	**2.80**	2.52	-3.9	+11.1
IE	-	**-**	-	-	-	-	**-**	-	-	-
IT	10.62	**9.15**	9.21	-13.9	-0.7	-	**-**	-	-	-
LT	-	**-**	-	-	-	2.25	**2.23**	2.17	-1.1	+2.4
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	3.57	**3.18**	2.90	-10.9	+9.7
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	13.06	**10.77**	11.35	-17.5	-5.1	-	**-**	-	-	-
PL	6.59	**5.99**	6.47	-9.1	-7.4	3.19	**2.83**	2.72	-11.4	+3.9
PT	8.44	**8.48**	8.05	+0.5	+5.3	0.94	**0.98**	0.87	+4.2	+12.5
RO	4.72	**3.24**	3.75	-31.3	-13.6	-	**-**	-	-	-
SE	-	**-**	-	-	-	6.51	**6.21**	5.75	-4.6	+8.0
SI	9.16	**7.96**	7.78	-13.1	+2.3	-	**-**	-	-	-
SK	8.39	**5.49**	6.47	-34.6	-15.1	3.66	**3.39**	3.29	-7.4	+3.3
UK	-	**-**	-	-	-	-	**-**	-	-	-

Country	TRITICALE t/ha					RAPE AND TURNIP RAPE t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	4.53	**4.18**	4.16	-7.7	+0.6	3.62	**3.23**	3.13	-10.8	+3.0
AT	5.90	**5.29**	5.16	-10.3	+2.5	3.76	**3.30**	3.26	-12.0	+1.5
BE	-	**-**	-	-	-	4.81	**4.43**	4.33	-7.9	+2.4
BG	3.18	**3.00**	2.87	-5.6	+4.3	2.78	**2.60**	2.47	-6.2	+5.4
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	5.03	**4.47**	4.51	-11.2	-0.9	3.95	**3.44**	3.19	-13.0	+7.7
DE	7.11	**6.29**	6.12	-11.5	+2.8	4.48	**3.77**	3.80	-15.8	-0.7
DK	6.19	**5.66**	5.27	-8.5	+7.3	4.27	**3.90**	3.76	-8.7	+3.7
EE	-	**-**	-	-	-	2.08	**1.82**	1.76	-12.4	+3.4
ES	2.33	**2.17**	2.28	-6.8	-4.9	2.46	**2.30**	2.22	-6.5	+3.3
FI	-	**-**	-	-	-	1.44	**1.15**	1.37	-20.2	-16.1
FR	5.22	**5.04**	5.30	-3.5	-5.0	3.67	**3.43**	3.37	-6.4	+1.7
GR	-	**-**	-	-	-	-	**-**	-	-	-
HR	3.63	**3.65**	3.76	+0.7	-2.8	3.10	**2.94**	2.68	-5.0	+9.9
HU	3.96	**3.90**	3.56	-1.5	+9.6	3.19	**2.57**	2.52	-19.6	+1.7
IE	-	**-**	-	-	-	-	**-**	-	-	-
IT	-	**-**	-	-	-	2.40	**2.40**	2.36	+0.0	+1.8
LT	3.29	**3.12**	3.03	-5.2	+2.9	2.33	**2.18**	2.09	-6.3	+4.5
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	1.97	**2.35**	2.11	+19.0	+11.3
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	-	**-**	-	-	-	-	**-**	-	-	-
PL	4.02	**3.61**	3.53	-10.2	+2.2	3.43	**3.08**	2.78	-10.2	+11.0
PT	1.48	**1.51**	1.25	+1.8	+20.7	-	**-**	-	-	-
RO	3.68	**3.45**	3.36	-6.1	+2.8	2.62	**2.21**	2.15	-15.6	+2.9
SE	5.92	**5.67**	5.14	-4.2	+10.4	3.38	**3.16**	2.82	-6.6	+12.0
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	3.57	**3.28**	3.24	-8.2	+1.1	3.57	**2.64**	2.53	-26.1	+4.5
UK	4.45	**4.05**	3.98	-9.1	+1.6	3.70	**3.73**	3.49	+0.7	+6.8

Country	SUGAR BEETS t/ha					POTATO t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	76.53	**71.91**	70.35	-6.0	+2.2	35.10	**33.05**	31.59	-5.9	+4.6
AT	83.87	**68.55**	71.96	-18.3	-4.7	35.10	**33.24**	32.15	-5.3	+3.4
BE	81.75	**77.68**	76.05	-5.0	+2.1	54.00	**44.58**	46.89	-17.5	-4.9
BG	-	**-**	-	-	-	-	**-**	-	-	-
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	70.28	**65.75**	62.19	-6.4	+5.7	29.07	**29.16**	27.25	+0.3	+7.0
DE	79.86	**70.70**	70.36	-11.5	+0.5	47.42	**45.13**	43.54	-4.8	+3.6
DK	59.70	**61.59**	62.65	+3.2	-1.7	43.12	**39.47**	39.91	-8.5	-1.1
EE	-	**-**	-	-	-	-	**-**	-	-	-
ES	92.21	**92.02**	85.06	-0.2	+8.2	31.89	**31.10**	30.14	-2.5	+3.2
FI	38.21	**36.15**	36.25	-5.4	-0.3	27.93	**25.70**	25.80	-8.0	-0.4
FR	93.26	**91.01**	88.11	-2.4	+3.3	47.94	**46.41**	44.03	-3.2	+5.4
GR	-	**-**	-	-	-	24.51	**25.96**	25.59	+5.9	+1.4
HR	63.60	**41.60**	51.03	-34.6	-18.5	17.00	**17.70**	16.67	+4.1	+6.1
HU	66.37	**53.27**	53.47	-19.7	-0.4	26.27	**25.23**	23.82	-4.0	+5.9
IE	-	**-**	-	-	-	39.00	**35.30**	33.72	-9.5	+4.7
IT	57.01	**57.97**	57.44	+1.7	+0.9	26.20	**25.60**	25.07	-2.3	+2.1
LT	53.00	**50.25**	50.90	-5.2	-1.3	18.00	**15.19**	16.07	-15.6	-5.4
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	18.00	**17.61**	17.45	-2.1	+0.9
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	87.40	**80.73**	79.19	-7.6	+1.9	45.00	**43.48**	43.88	-3.4	-0.9
PL	54.80	**55.00**	52.16	+0.4	+5.4	23.60	**22.11**	21.40	-6.3	+3.3
PT	-	**-**	-	-	-	19.63	**18.89**	17.10	-3.8	+10.5
RO	40.99	**31.70**	34.61	-22.7	-8.4	16.73	**14.25**	14.60	-14.8	-2.5
SE	59.77	**58.84**	58.91	-1.6	-0.1	32.51	**32.29**	32.08	-0.7	+0.7
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	61.04	**54.81**	54.33	-10.2	+0.9	-	**-**	-	-	-
UK	72.67	**65.36**	67.75	-10.1	-3.5	42.17	**40.82**	40.61	-3.2	+0.5

Country	SUNFLOWER t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	2.15	**1.95**	1.91	-9.2	+2.0
AT	2.83	**2.55**	2.58	-9.9	-1.3
BE	-	**-**	-	-	-
BG	2.38	**2.33**	2.12	-2.3	+9.9
CY	-	**-**	-	-	-
CZ	2.27	**2.34**	2.36	+3.1	-0.8
DE	2.30	**1.94**	2.12	-15.6	-8.6
DK	-	**-**	-	-	-
EE	-	**-**	-	-	-
ES	1.25	**1.06**	1.14	-15.5	-7.2
FI	-	**-**	-	-	-
FR	2.37	**2.33**	2.32	-2.0	+0.3
GR	3.43	**2.68**	2.27	-21.7	+18.3
HR	2.83	**2.46**	2.51	-13.2	-1.9
HU	2.60	**2.50**	2.31	-3.9	+8.1
IE	-	**-**	-	-	-
IT	2.20	**2.16**	2.22	-1.7	-2.6
LT	-	**-**	-	-	-
LU	-	**-**	-	-	-
LV	-	**-**	-	-	-
MT	-	**-**	-	-	-
NL	-	**-**	-	-	-
PL	-	**-**	-	-	-
PT	1.05	**0.55**	0.65	-47.9	-16.2
RO	2.15	**1.67**	1.72	-22.3	-2.7
SE	-	**-**	-	-	-
SI	-	**-**	-	-	-
SK	2.62	**2.28**	2.28	-12.9	+0.0
UK	-	**-**	-	-	-

NB: Yields are forecast for crops with more than 10 000 ha per country.
Sources: 2009-2015 data come from DG Agriculture and Rural Development short-term Outlook data (dated June 2015, received on 9.7.2015), Eurostat Eurobase (last update: 3.7.2015) and EES (last update: 13.5.2015)
2015 yields come from MARS Crop Yield Forecasting System (output up to 20.7.2015).

Country	WHEAT (t/ha)				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs
BY	4.00	**3.49**	3.39	-12.8	+3.1
DZ	1.48	**1.72**	1.59	+15.9	+7.6
MA	1.71	**2.04**	1.65	+19.5	+23.8
TN	2.09*	**2.14**	1.91	+2.3	+12.0
TR	2.40	**2.72**	2.59	+13.4	+5.0
UA	4.01	**3.68**	3.27	-8.4	+12.5

Country	BARLEY (t/ha)				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs
BY	3.60	**3.34**	3.15	-7.3	+5.9
DZ	1.18	**1.65**	1.39	+39.9	+18.4
MA	0.97	**1.24**	1.10	+27.7	+12.6
TN	1.41	**1.51**	1.19	+6.7	+26.8
TR	2.31	**2.73**	2.56	+18.0	+6.6
UA	3.01	**2.93**	2.36	-2.8	+24.1

Country	GRAIN MAIZE (t/ha)				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs
BY	5.43	**5.43**	5.57	+0.0	-2.6
DZ	-	**-**	-	-	-
MA	-	**-**	-	-	-
TN	-	**-**	-	-	-
TR	9.07	**9.10**	7.98	+0.4	+14.0
UA	6.07	**5.93**	5.61	-2.3	+5.8

NB: Yields are forecast for crops with more than 10 000 ha per country.
Sources: 2010-2014 data come from FAO, Turkish Statistical Office, PSD-online, INRA Maroc, MinAGRI Tunisia and DSASI Algeria
*2014 yields come from MARS Crop Yield Forecasting System as reported values were not available
2015 yields come from MARS Crop Yield Forecasting System (output up to 20.7.2015).


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


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


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


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


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


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


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


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


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

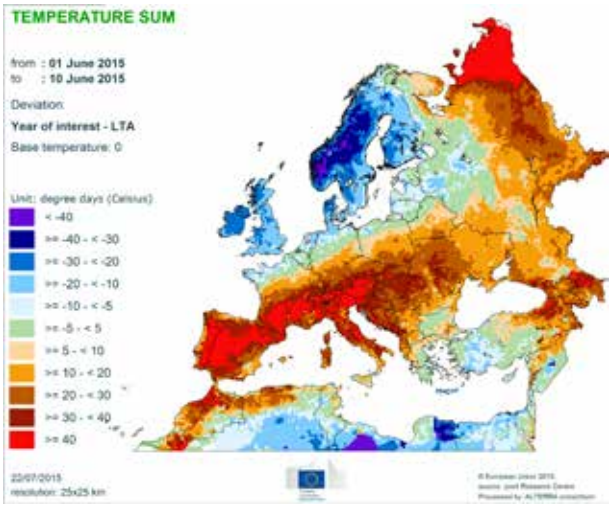

Rape and turnip - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (<-4 %)
comparable to average
better yield (>4 %)

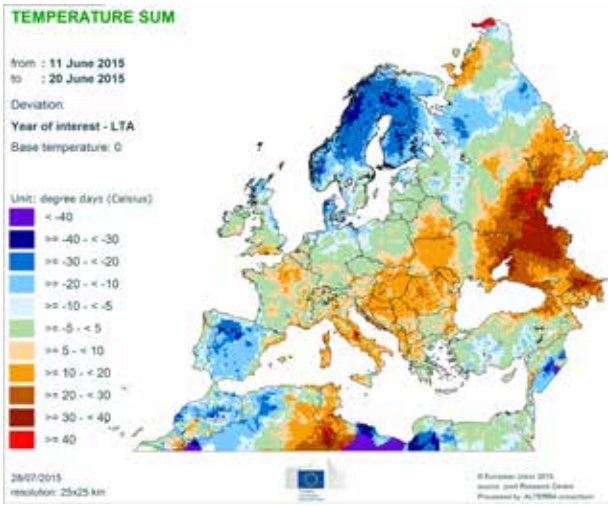

Sugar beets - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (<-4 %)
comparable to average
better yield (>4 %)

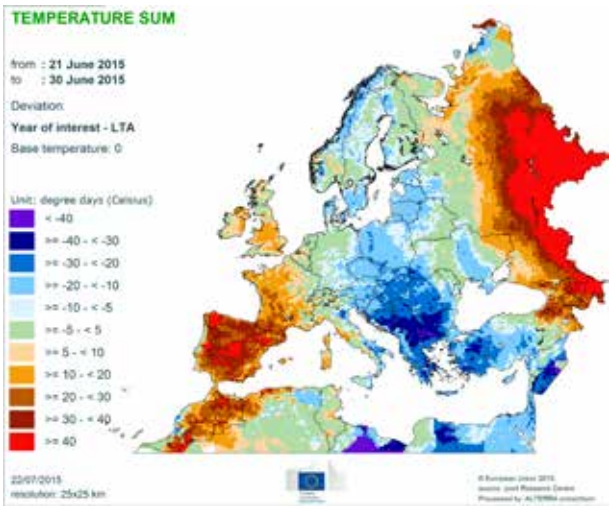

Potato - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (<-4 %)
comparable to average
better yield (>4 %)

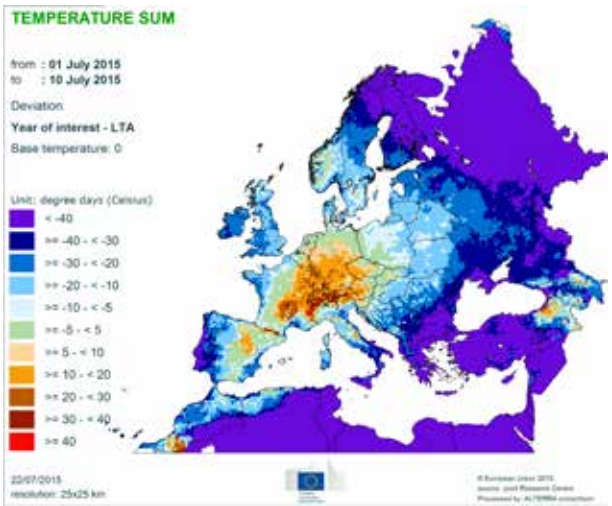
5. Atlas

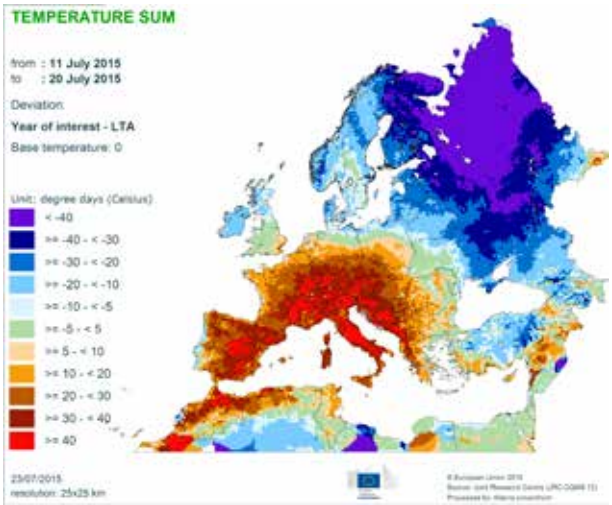
Temperatures

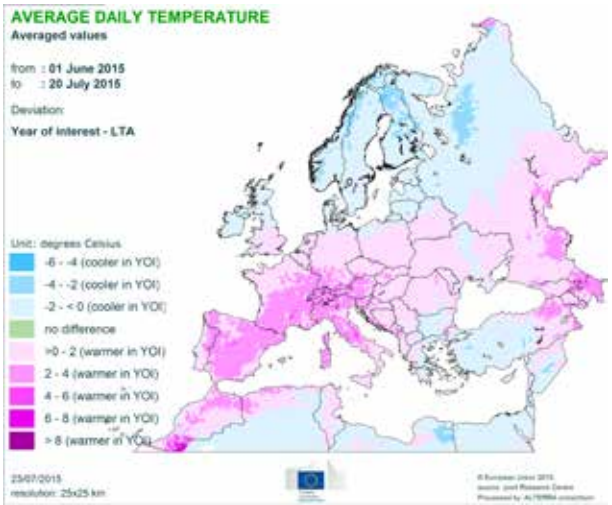




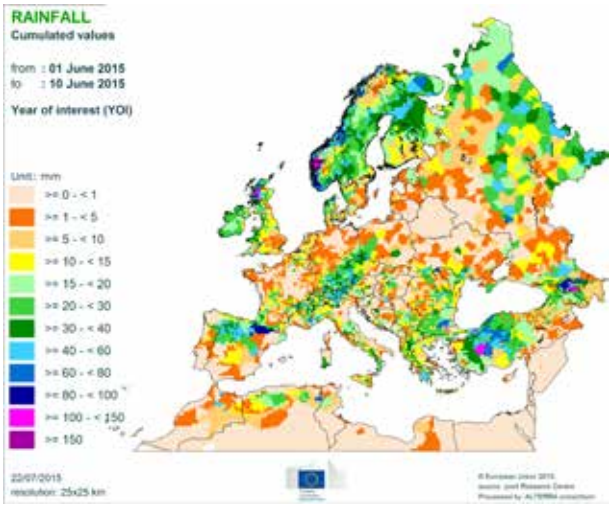


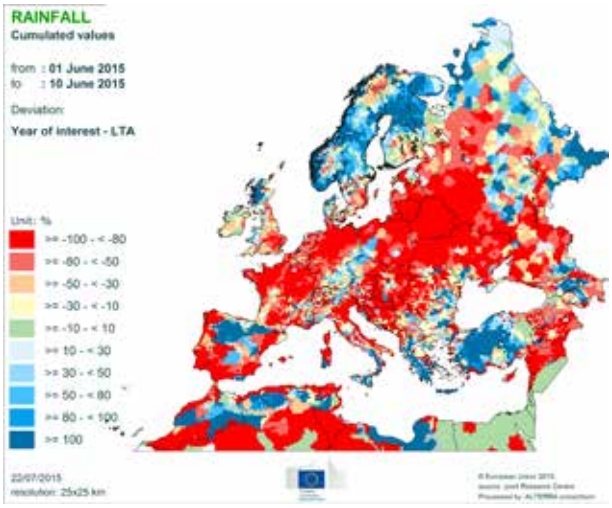


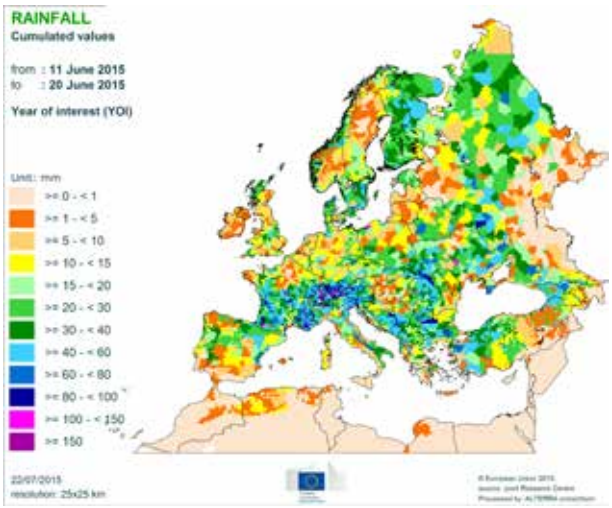


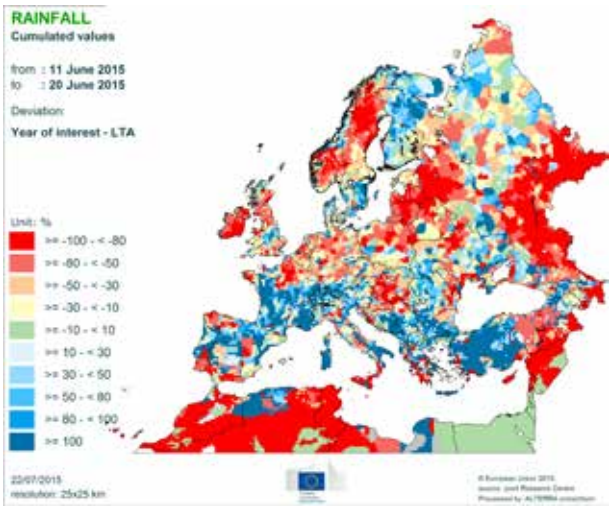


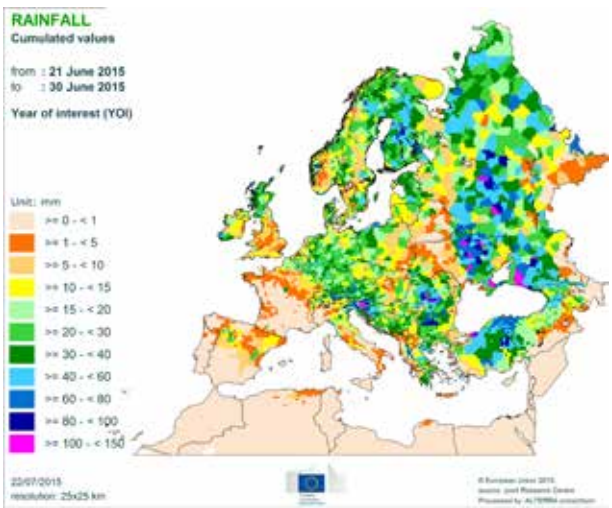
Precipitation

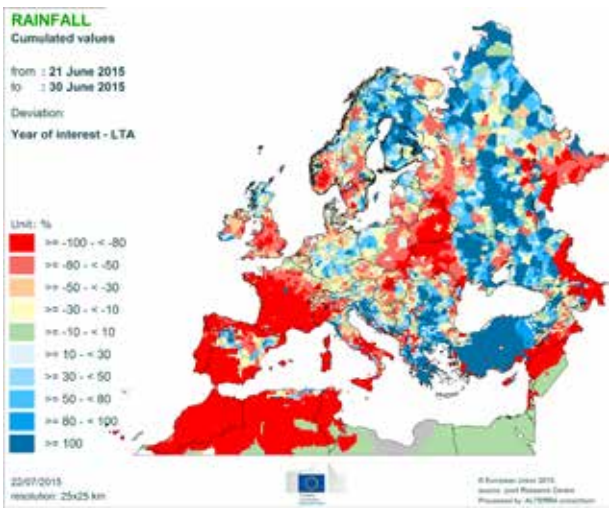


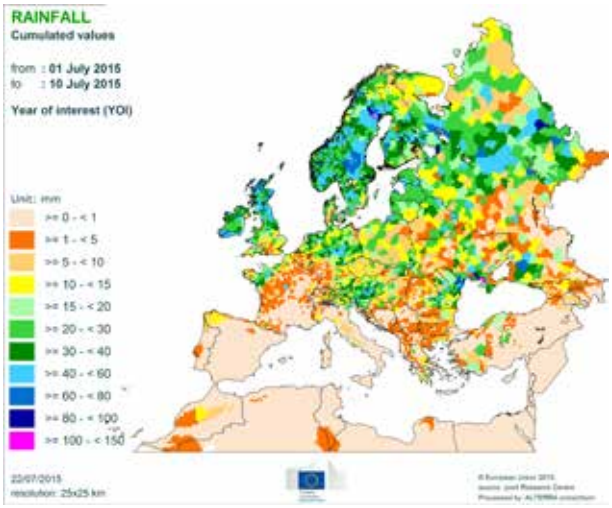


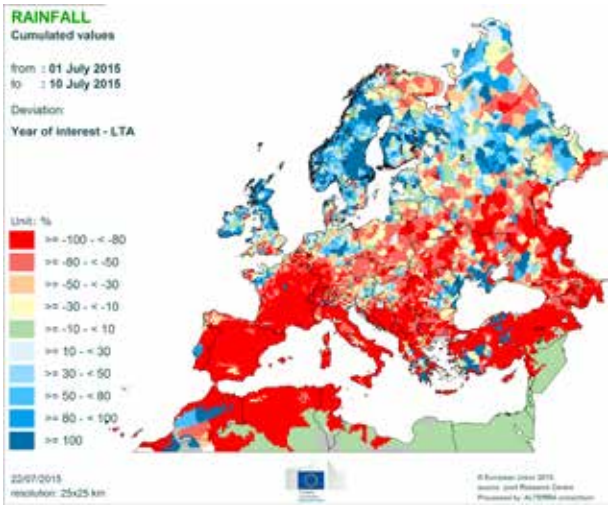


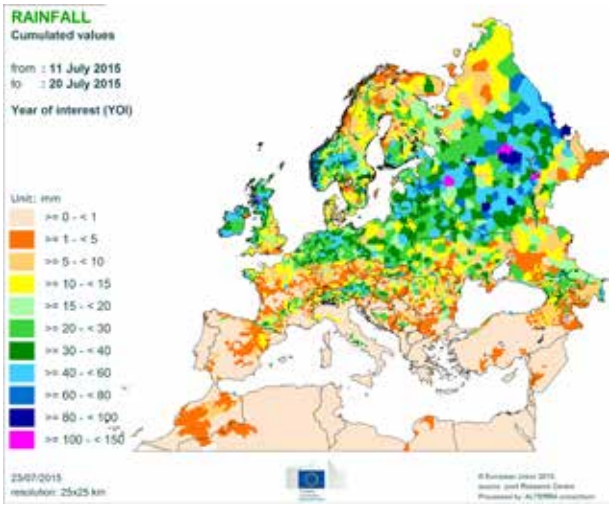


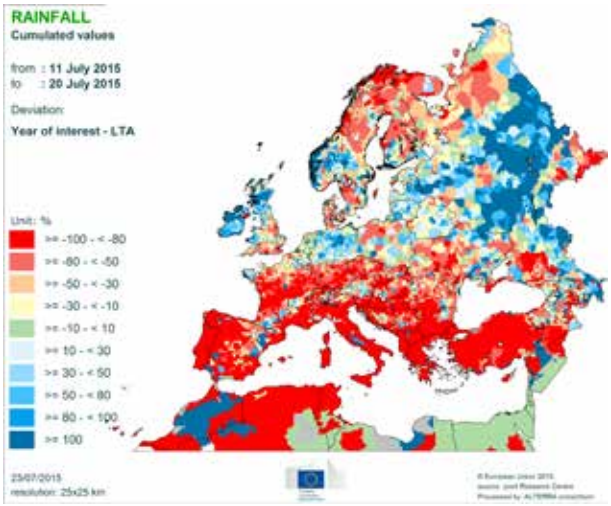




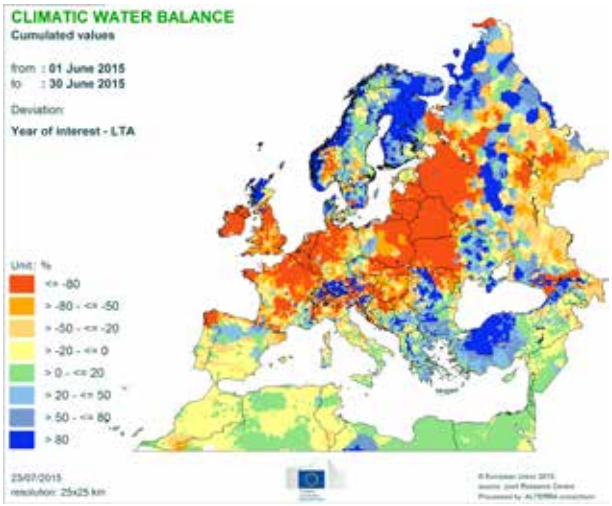


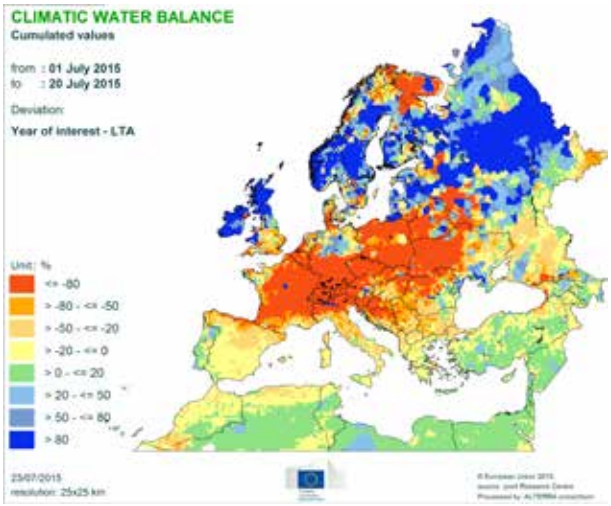




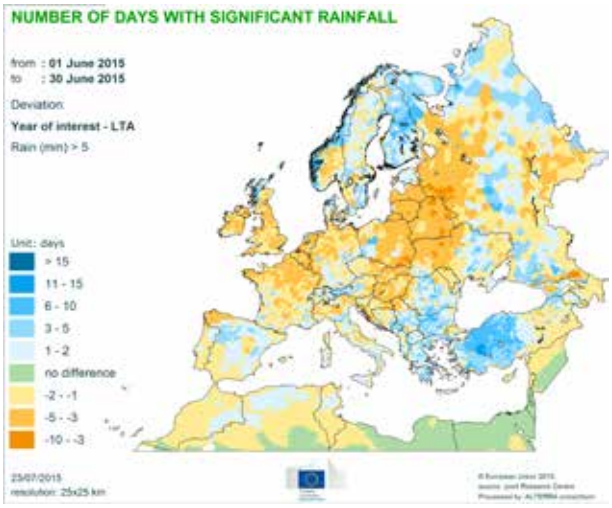


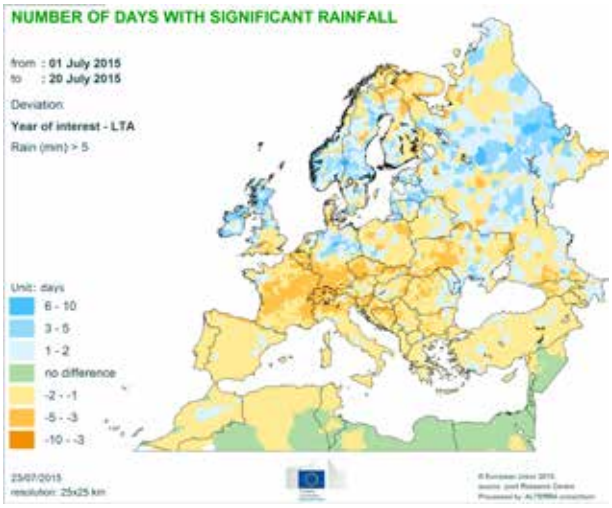
Climatic water balance

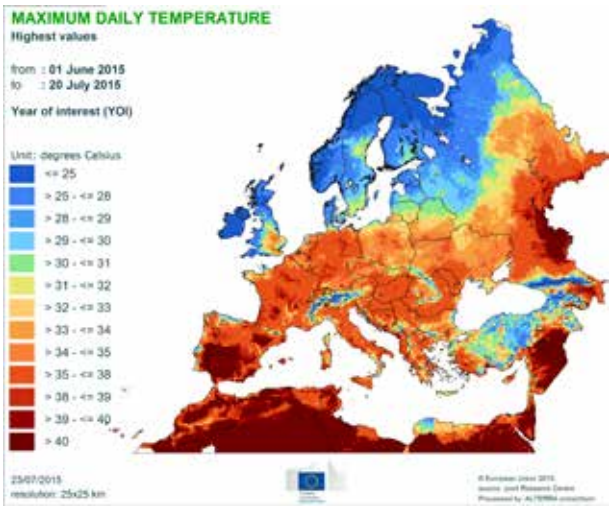


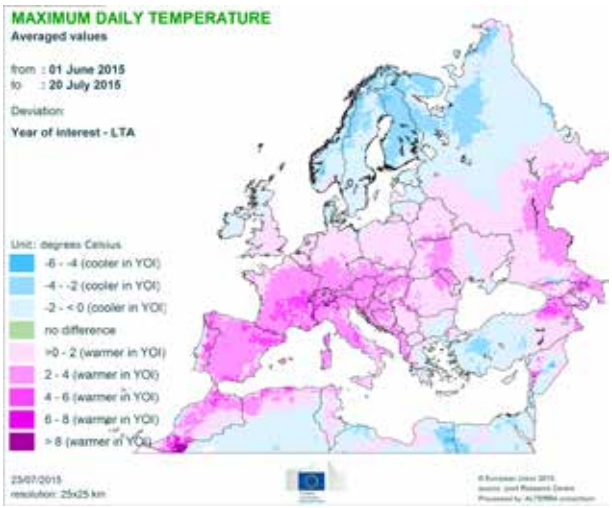


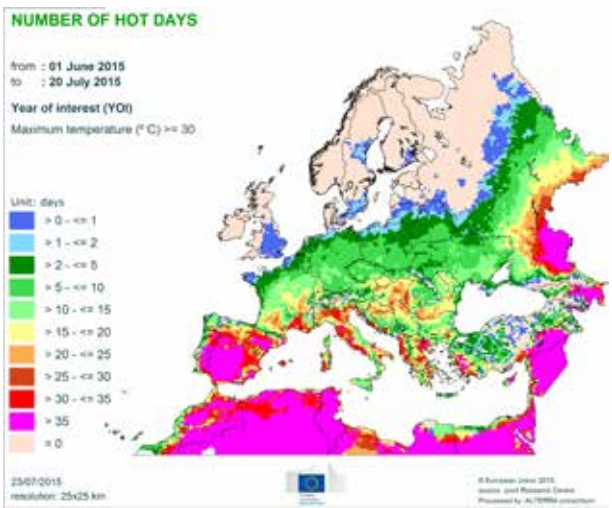
Weather events

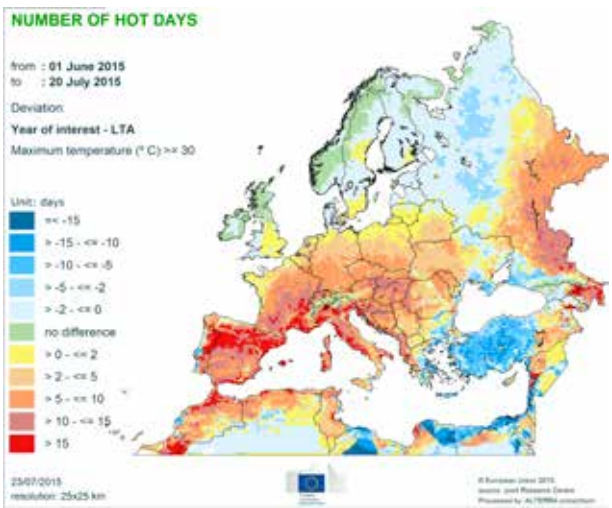




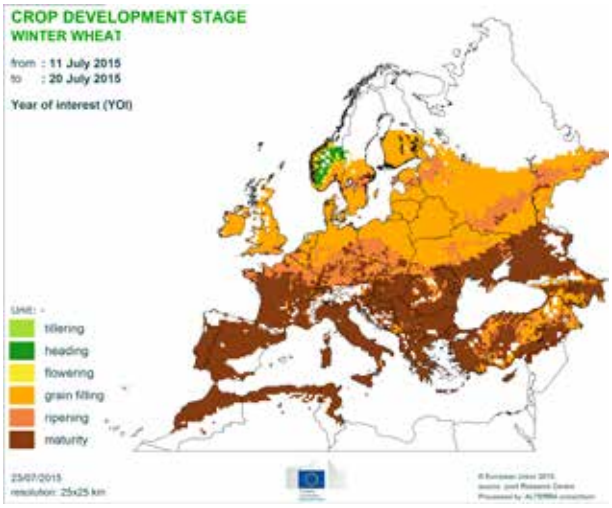


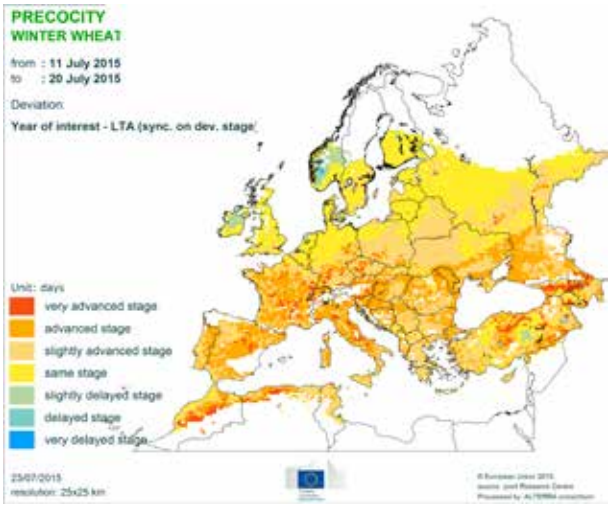


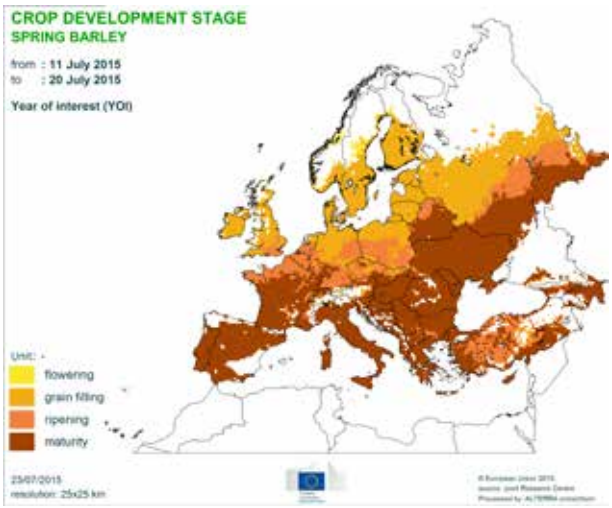


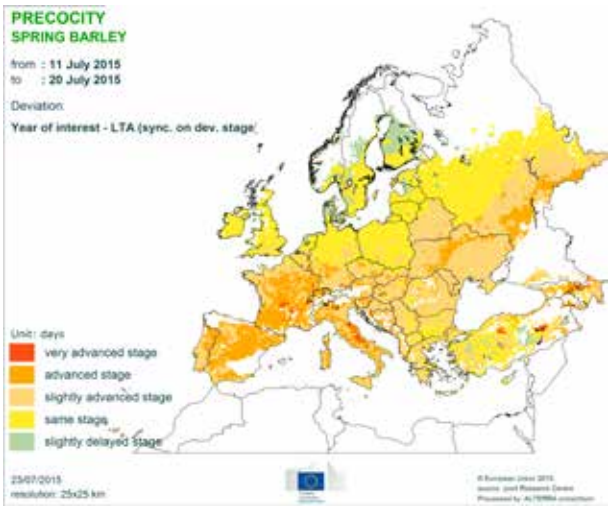


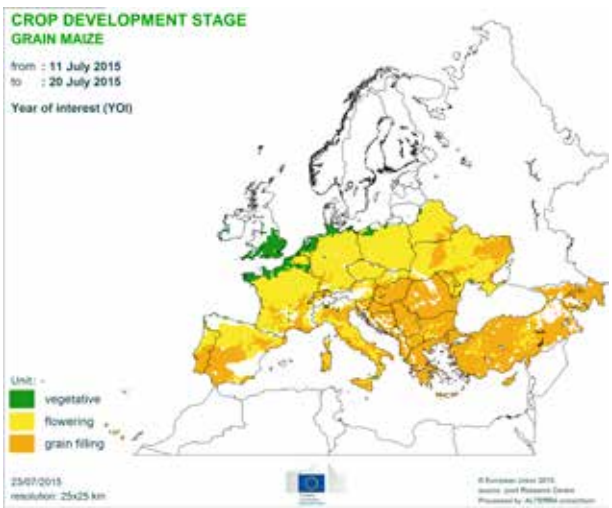
Crop development stages and precocity

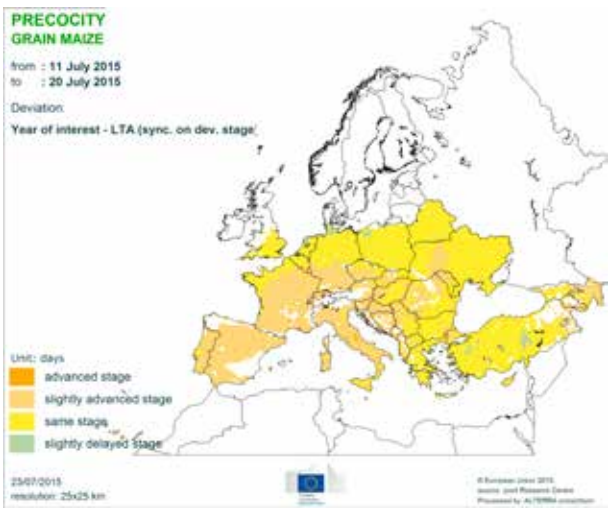


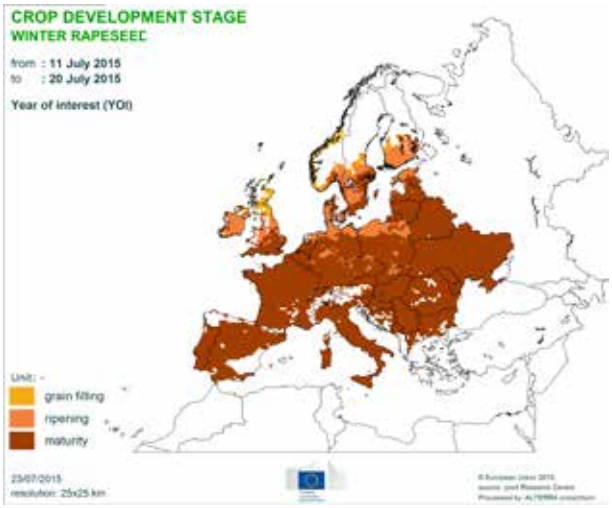


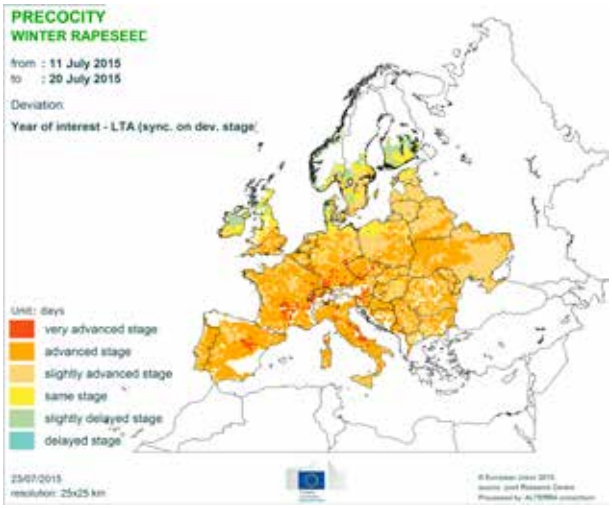


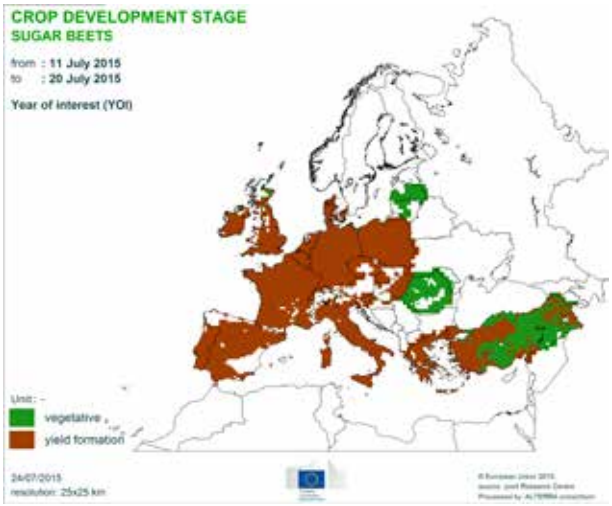


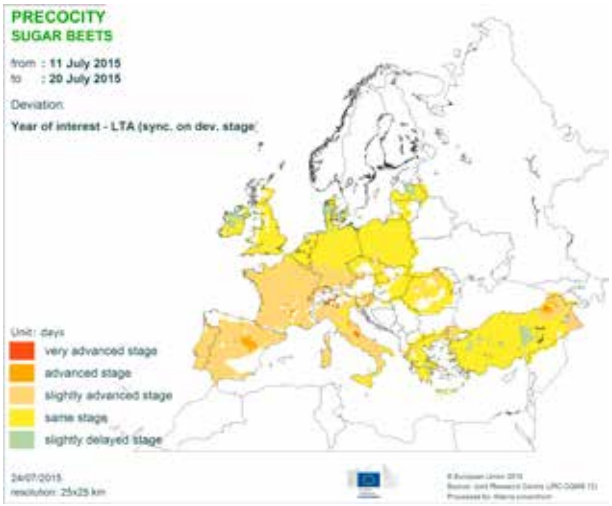




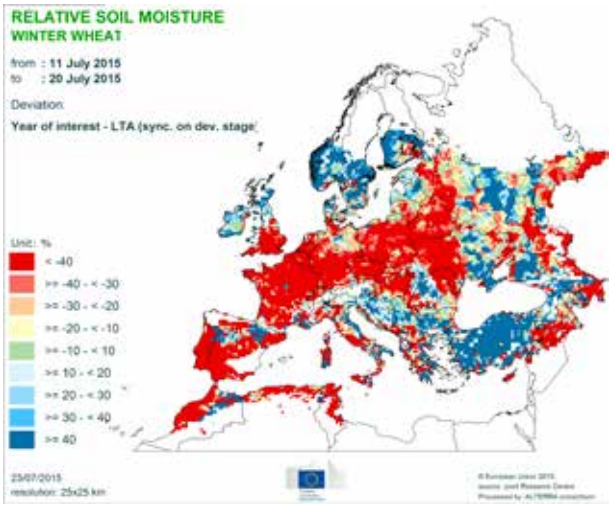

CROP DEVELOPMENT STAGE
WINTER RAPESEED
from : 11 July 2015
to : 20 July 2015
Year of interest (YOI)
Unit: -
grain filling
ripening
maturity
25/07/2015
resolution: 25x25 km

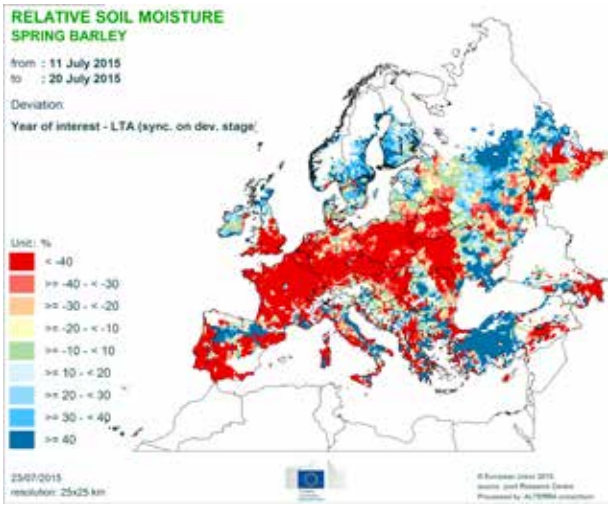

PRECOCITY
WINTER RAPESEED
from : 11 July 2015
to : 20 July 2015
Deviation:
Year of interest - LTA (sync. on dev. stage)
Unit: days
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
delayed stage
25/07/2015
resolution: 25x25 km

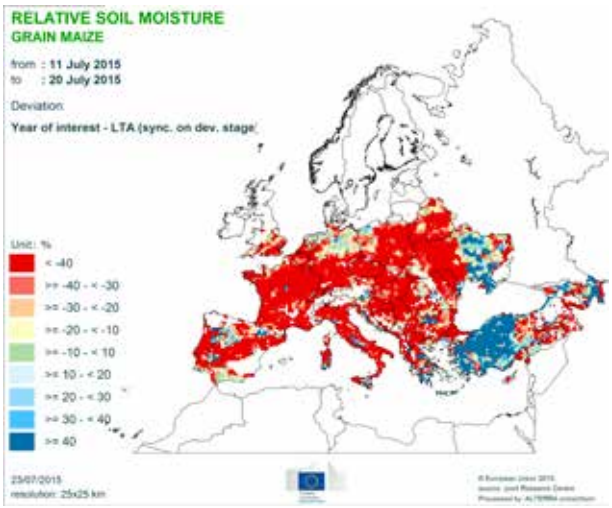

CROP DEVELOPMENT STAGE
SUGAR BEETS
from : 11 July 2015
to : 20 July 2015
Year of interest (YOI)
Unit: -
vegetative
yield formation
24/07/2015
resolution: 25x25 km

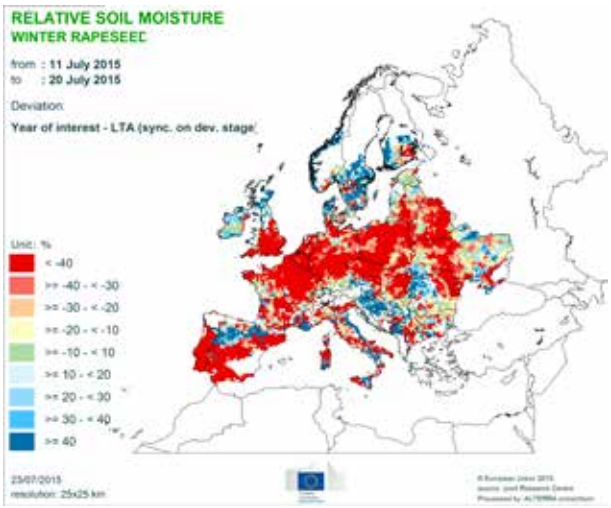

PRECOCITY
SUGAR BEETS
from : 11 July 2015
to : 20 July 2015
Deviation:
Year of interest - LTA (sync. on dev. stage)
Unit: days
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
24/07/2015
resolution: 25x25 km

Relative soil moisture

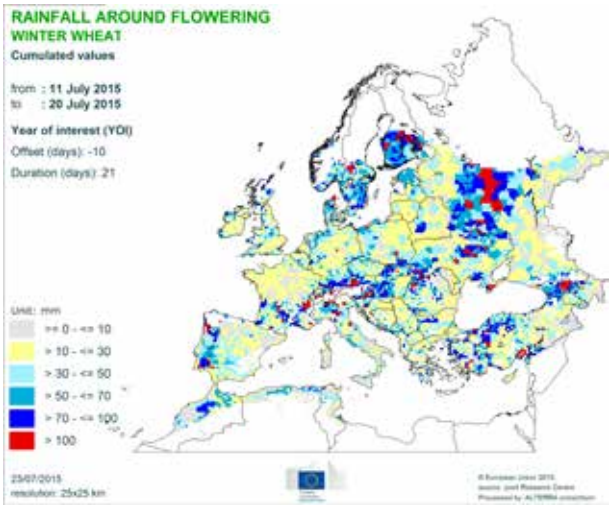


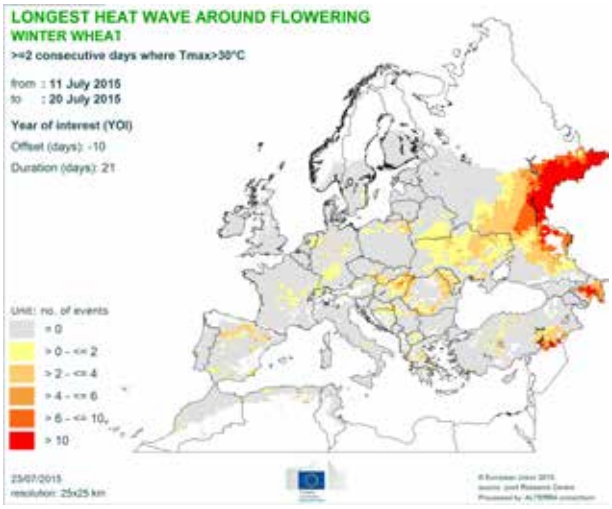


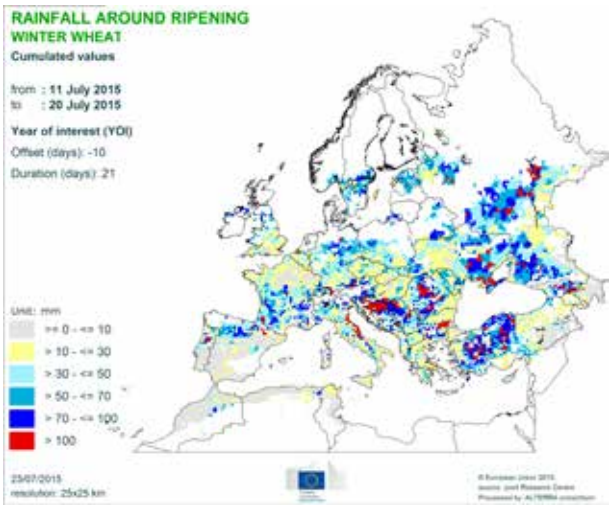


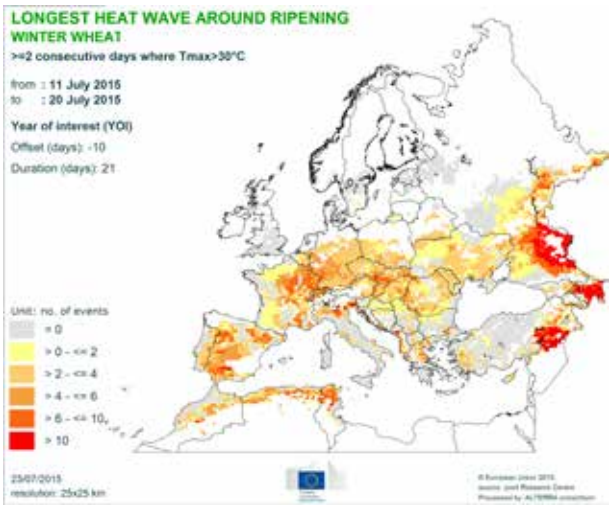


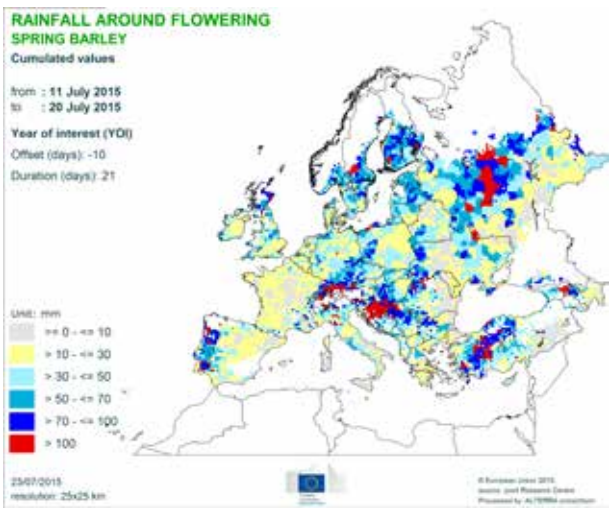
Rainfall and longest heat wave around certain crop development stages

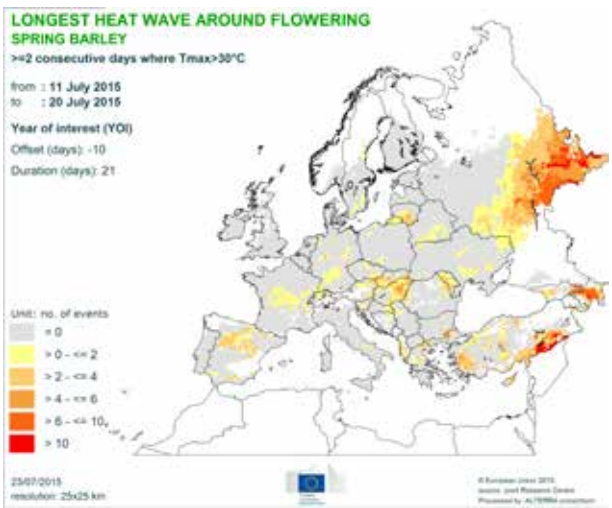


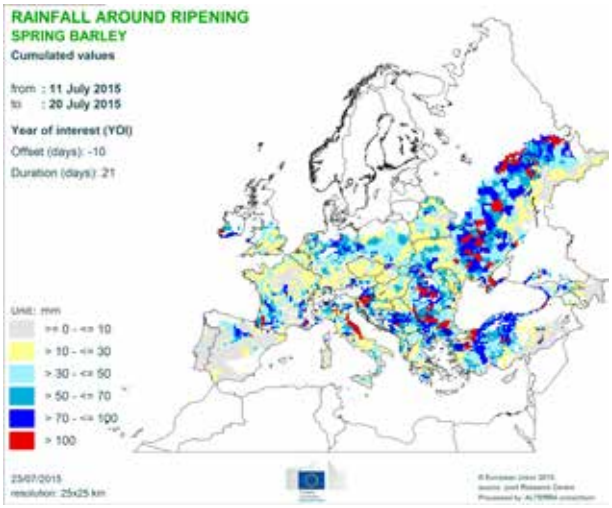


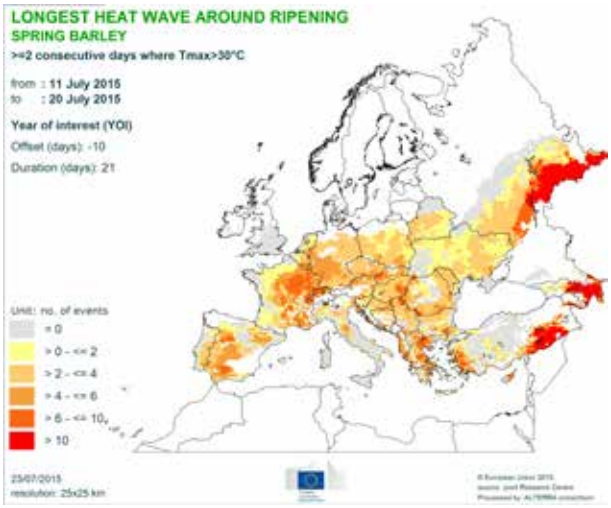


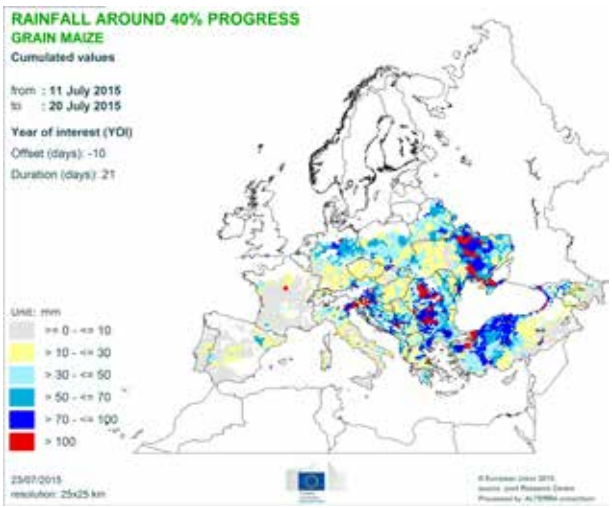


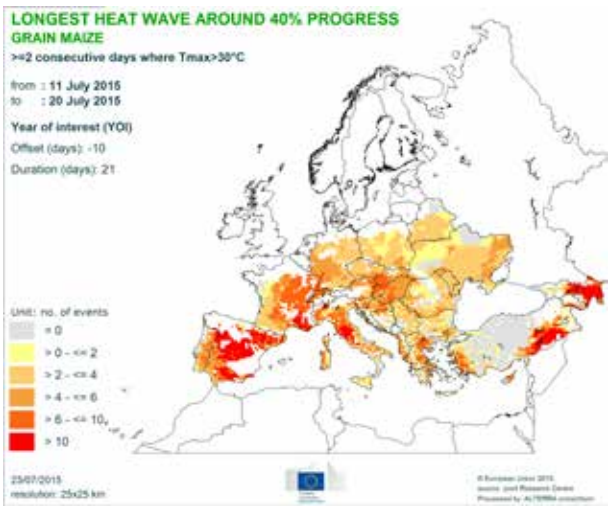


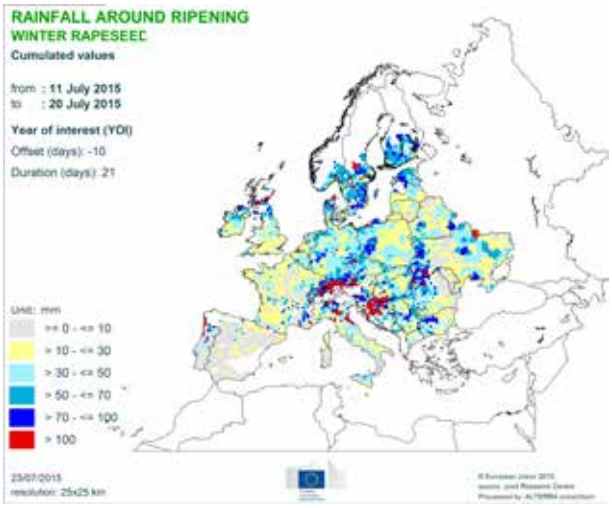


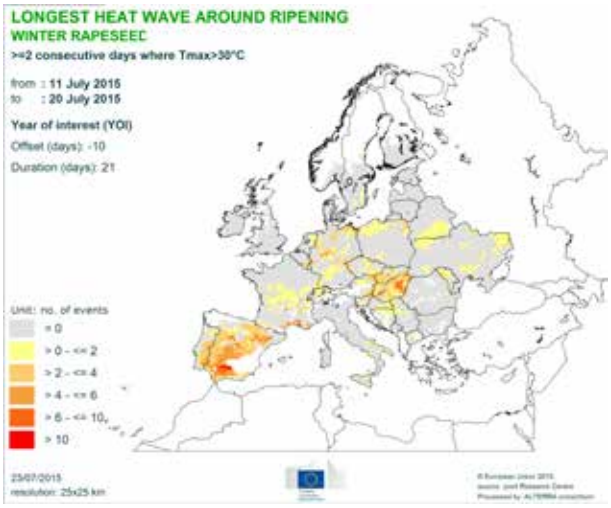

RAINFALL AROUND RIPENING
SPRING BARLEY
Cumulated values
from : 11 July 2015
to : 20 July 2015
Year of interest (YOI)
Offset (days): -10
Duration (days): 21
Unit: mm
>= 0 - <= 10
> 10 - <= 30
> 30 - <= 50
> 50 - <= 70
> 70 - <= 100
> 100
23/07/2015
resolution: 25x25 km


LONGEST HEAT WAVE AROUND RIPENING
SPRING BARLEY
>=2 consecutive days where Tmax>30°C
from : 11 July 2015
to : 20 July 2015
Year of interest (YOI)
Offset (days): -10
Duration (days): 21
Unit: no. of events
= 0
> 0 - <= 2
> 2 - <= 4
> 4 - <= 6
> 6 - <= 10
> 10
23/07/2015
resolution: 25x25 km


RAINFALL AROUND 40% PROGRESS
GRAIN MAIZE
Cumulated values
from : 11 July 2015
to : 20 July 2015
Year of interest (YOI)
Offset (days): -10
Duration (days): 21
Unit: mm
>= 0 - <= 10
> 10 - <= 30
> 30 - <= 50
> 50 - <= 70
> 70 - <= 100
> 100
23/07/2015
resolution: 25x25 km


LONGEST HEAT WAVE AROUND 40% PROGRESS
GRAIN MAIZE
>=2 consecutive days where Tmax>30°C
from : 11 July 2015
to : 20 July 2015
Year of interest (YOI)
Offset (days): -10
Duration (days): 21
Unit: no. of events
= 0
> 0 - <= 2
> 2 - <= 4
> 4 - <= 6
> 6 - <= 10
> 10
23/07/2015
resolution: 25x25 km


RAINFALL AROUND RIPENING
WINTER RAPESEED
Cumulated values
from : 11 July 2015
to : 20 July 2015
Year of interest (YOI)
Offset (days): -10
Duration (days): 21
Unit: mm
>= 0 - <= 10
> 10 - <= 30
> 30 - <= 50
> 50 - <= 70
> 70 - <= 100
> 100
23/07/2015
resolution: 25x25 km


LONGEST HEAT WAVE AROUND RIPENING
WINTER RAPESEED
>=2 consecutive days where Tmax>30°C
from : 11 July 2015
to : 20 July 2015
Year of interest (YOI)
Offset (days): -10
Duration (days): 21
Unit: no. of events
= 0
> 0 - <= 2
> 2 - <= 4
> 4 - <= 6
> 6 - <= 10
> 10
23/07/2015
resolution: 25x25 km

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MARS Bulletins 2015

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

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*MARS stands for Monitoring Agricultural Resources

Technical note
The long-term average (LTA) used within this Bulletin as a reference is based on an archive of data covering 1975-2014.

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