European Commission

Period covered: 1 August–20 September
Issued: 21 September 2015

Crop monitoring in Europe

MARS Bulletin Vol. 23 No 9 (2015)

Little relief for summer crops

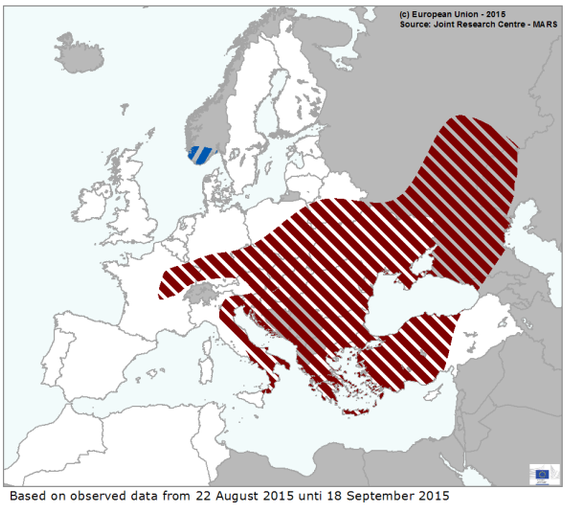
Yield forecasts for summer crops at the EU-28 level remain low and are comparable to last month's forecast. Slight upward revisions are partly due to improved weather conditions in western Europe, and partly to the expected diversion of the most affected grain maize crops to green maize.

In late August, large areas of central and eastern Europe experienced a heat wave and little or no significant rainfall. As most summer crops had already reached maturity in eastern Europe, this latest episode of dry and hot conditions did not have a relevant negative impact, and may even have been beneficial for ripening.

In central European regions, however, where summer crops were still in the grain-filling phase, crop conditions remain critical. The growth of non-irrigated crops in these regions was already stunted due to heat waves in July and early August. Southern Poland and southern Germany were particularly affected. All non-irrigated crops in these regions are in poor condition.

In France, rainfall in late August led to a significant improvement in the conditions of summer crops in western and southern regions, but conditions remain poor in eastern cropland areas.

AREAS OF CONCERN - EXTREME WEATHER EVENTS



Based on observed data from 22 August 2015 unti 18 September 2015

Rain surplus Hot and Dry

Crop	Yield t/ha				
	2014	MARS 2015 forecasts	Avg 5yrs	% 15/14	% 15/5yrs
TOTAL CEREALS	5.71	**5.16**	5.21	-9.6	-1.0
Total Wheat	5.90	**5.57**	5.44	-5.6	+2.5
soft wheat	6.14	**5.81**	5.67	-5.4	+2.5
durum wheat	3.35	**3.20**	3.26	-4.3	-1.7
Total Barley	4.90	**4.63**	4.49	-5.5	+3.1
spring barley	4.16	**3.90**	3.91	-6.2	-0.3
winter barley	5.92	**5.60**	5.36	-5.4	+4.5
Grain maize	8.07	**6.43**	7.02	-20.4	-8.5
Rye	4.23	**3.72**	3.58	-12.1	+3.9
Triticale	4.53	**4.09**	4.16	-9.7	-1.6
Other cereals	3.14	**2.87**	3.56	-8.6	-19.5
Rape and turnip rape	3.62	**3.25**	3.13	-10.2	+3.8
Potato	34.95	**31.62**	31.45	-9.5	+0.6
Sugar beet	77.08	**70.54**	70.46	-8.5	+0.1
Sunflower	2.15	**1.87**	1.91	-13.0	-2.0

Issued: 22 May 2015

Joint Research Centre

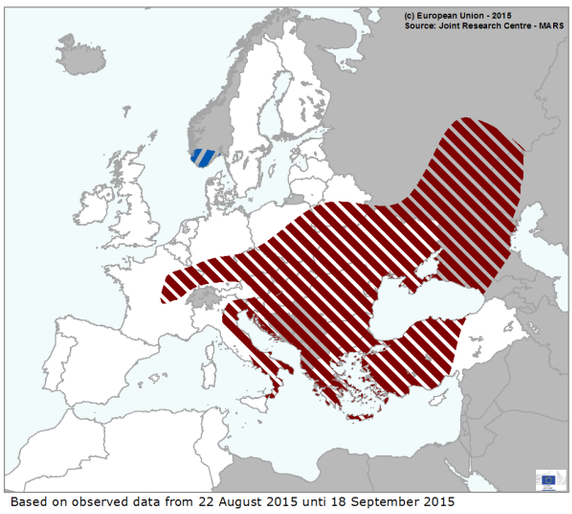
1. Agro-meteorological overview

1.1 Areas of concern

Summer crops once again affected by heat wave in central and eastern Europe.

The above maps relate to the events and associated impacts during the period from 22 August to 18 September.
The map of extreme weather events shows that large areas of **central** and **eastern Europe** experienced a heat wave in late August and little or no significant rainfall by the time of the analysis. In most of these regions, summer crops were already near or at the end of the phenological cycle by the end of August. As a consequence, the dry and hot conditions did not have a relevant negative impact and may even have been beneficial for ripening. In central European regions, however, where summer crops were still in the grain-filling phase, crop conditions are quite critical. The growth of non-irrigated crops in these regions was already stunted due to heat waves in July and early August. In southern **Poland**, few significant amounts of rain fell in the period of analysis, preventing any recovery; all non-irrigated crops are in poor condition, which is also the case for southern **Germany**. Similar weather conditions occurred in the **Czech Republic**, **Slovakia**, eastern **Austria** and western **Hungary**. In those countries, however, most of the maize had already matured around mid-August, and only late-sown maize would have been impacted by the most recent drought.

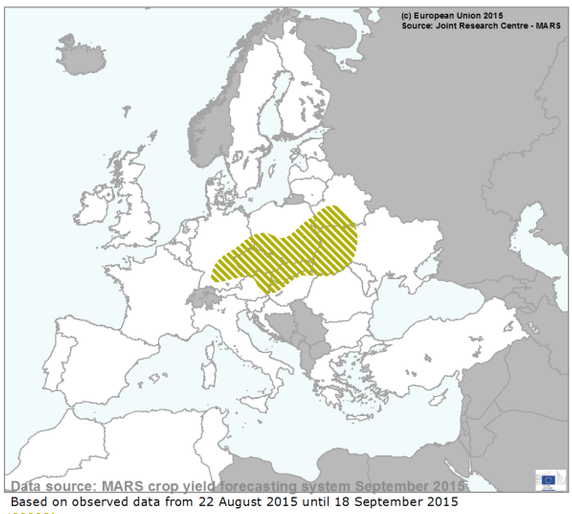
AREAS OF CONCERN - EXTREME WEATHER EVENTS



Based on observed data from 22 August 2015 unti 18 September 2015

Rain surplus Hot and Dry

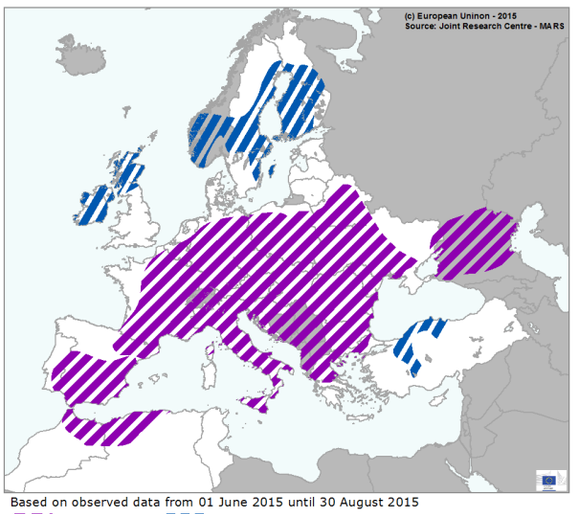
AREAS OF CONCERN - SUMMER CROPS



Based on observed data from 22 August 2015 until 18 September 2015

Storage organs impacted

AREAS OF CONCERN - EXTREME WEATHER EVENTS

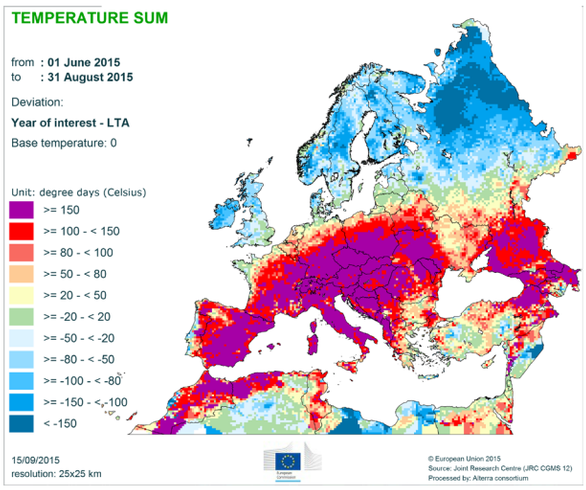


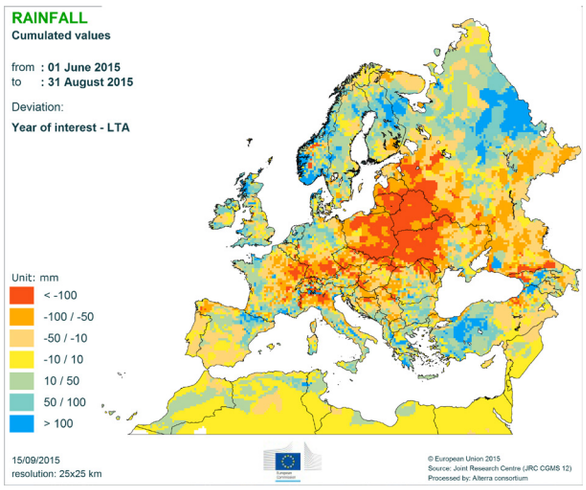
Based on observed data from 01 June 2015 until 30 August 2015

Heat waves Rain surplus

1.2 Meteorological summer review (June — July — August)

Large areas of southern, central and eastern Europe were affected by severe drought and heat waves during the summer. Many regions of southern and central Europe, where a large rainfall deficit was experienced, recorded exceptionally high daily maximum air temperatures, often reaching record values in our archive. Hot and dry conditions limited summer crop growth, especially in rain-fed areas. The weather conditions in northern Europe and the northern part of the British Isles were colder than seasonal, with rainfall surplus.

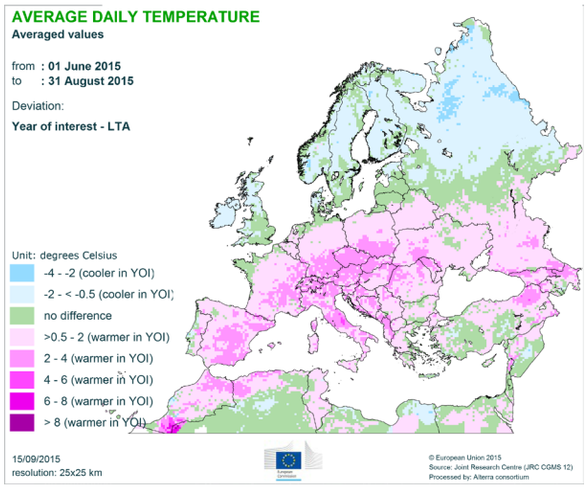


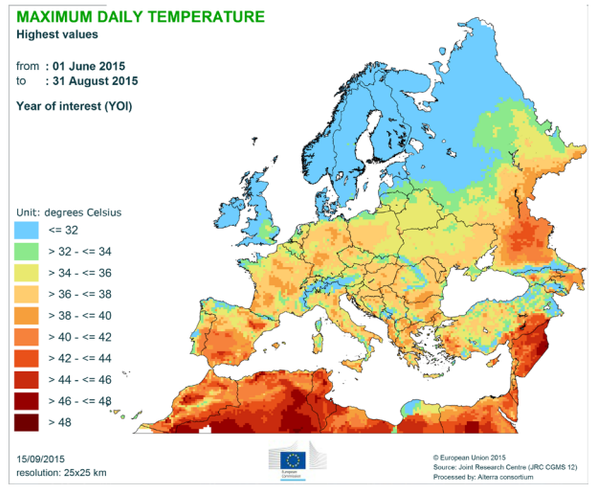


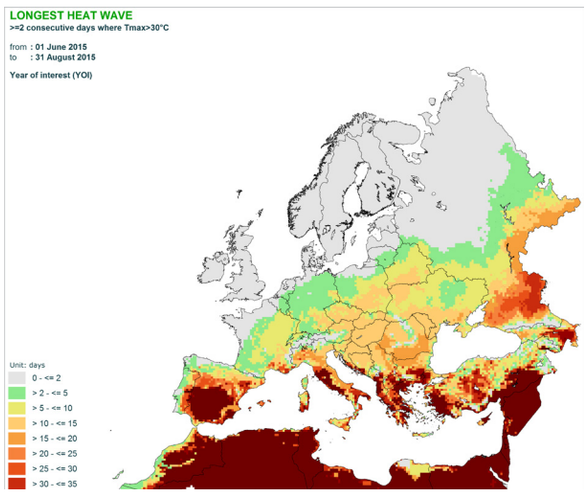
Observed temperatures

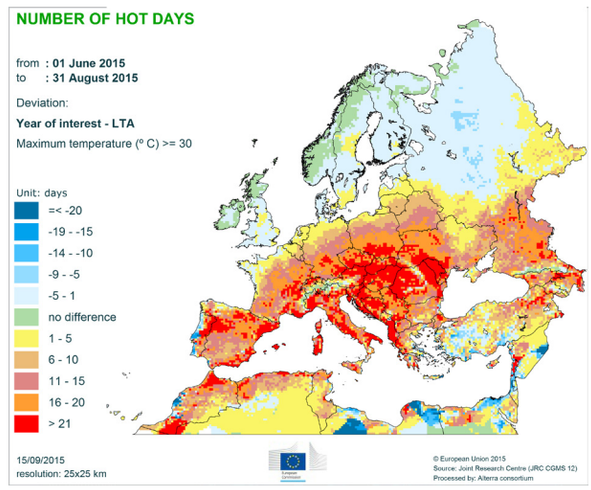
The first half of **June** was characterised by warmer-than-usual weather conditions in southern, central and eastern Europe, with air temperatures mainly between 2 and 4 °C above the long-term average. A heat wave occurred in the south-eastern Iberian Peninsula, southern France, the central and southern parts of the Balkan Peninsula and south-eastern European Russia. Temperatures below the seasonal average were recorded in northern Europe during the same period. Warmer-than-usual weather conditions continued during the second half of June in the Iberian Peninsula, Italy, Russia and the Black Sea region. Meanwhile, south-eastern, central and northern Europe experienced colder-than-usual weather conditions. A severe heat wave affected large parts of southern, central and eastern Europe at the beginning of **July**. In many places, maximum daily temperatures exceeded 38 °C. A short weather perturbation towards the end of the first dekad of July led to a fall in temperatures in major parts of the heat-affected regions, except the Iberian Peninsula. A second heat wave struck southern Europe, France and a large part of central Europe during the second dekad of July. A weather perturbation at the end of July interrupted the heat wave in western and central Europe as well as in the northern Balkans, but high temperatures persisted in central and southern Italy, central and southern parts of the Balkan Peninsula, the Black Sea region, the southern part of European Russia and Turkey. Temperatures in northern Europe remained below the long-term average in July. At the beginning of **August**, another heat wave occurred in major parts of central, southern and eastern Europe. Maximum daily temperatures reached above 35 °C in the most affected agricultural areas. This heat wave was interrupted by a weather perturbation in the middle of August. Meanwhile, the northern part of the British Isles, Ireland and northern and north-eastern Europe remained colder than usual, with air temperatures close to 2 °C below the long-term average. During the second half of August, however, positive air temperature anomalies were observed in major parts of central and northern Europe. Towards the end of August, another heat wave struck major parts of southern and central Europe, Belarus and Ukraine.

Active temperature sums (Tbase = 0 °C) since the beginning of summer were substantially above the long-term average (> 150 growing degree days) in large parts of the continent, extending from the Iberian Peninsula to southern Russia. Exceptionally high temperatures in these areas led to accelerated crop development and leaf senescence. Heat stress also reduces crop yield potential when extremely high temperatures occurred around the sensitive stage of flowering. By contrast, northern Europe and the British Isles experienced below-average active temperature sums, resulting in a slight delay in crop development.





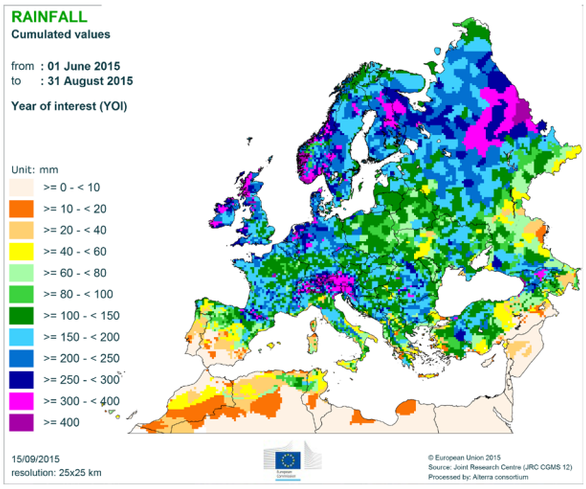


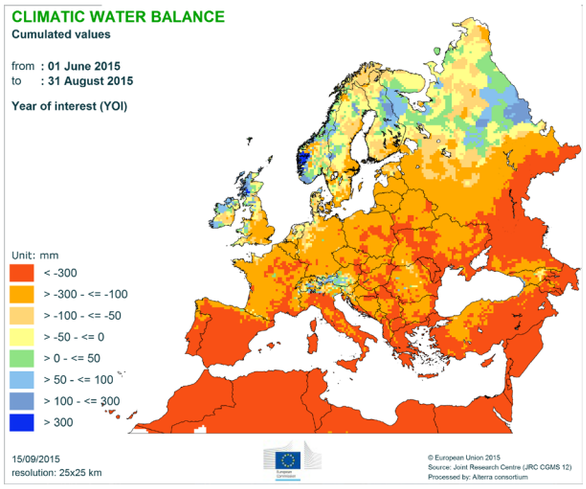


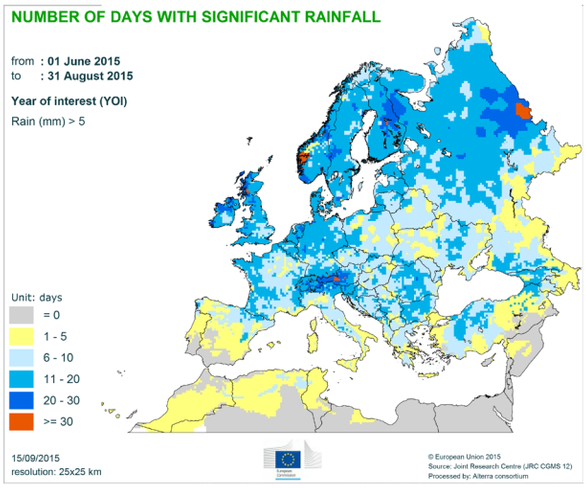
Observed precipitation

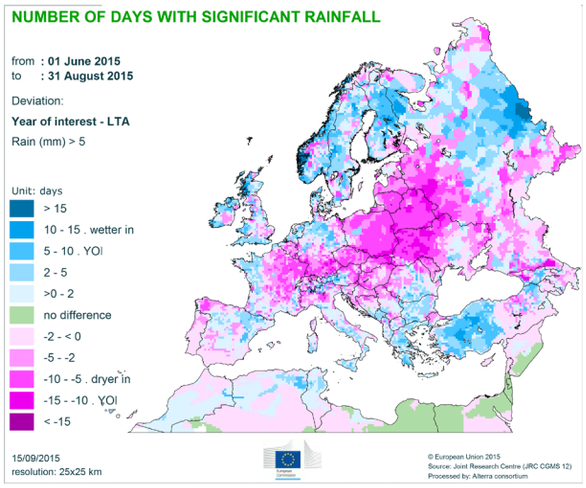
A pronounced rainfall deficit was recorded in June in the British Isles, northern France, the Benelux countries, northern and central Germany, northern Italy, Croatia, Hungary, Slovakia, Poland, Belarus, the Baltic countries and western Ukraine. Northern Spain, the southern Balkans, western Turkey and Finland received a rainfall surplus in June. In July, a substantial rainfall deficit was recorded in central, eastern and southern France, southern parts of the Iberian Peninsula, central and northern Italy, southern Germany, the Czech Republic, western Poland, central and southern parts of the Balkan Peninsula, Turkey, the western half of Ukraine and southern parts of European Russia. The southern part of the Iberian Peninsula, northern Italy, some areas of the central Balkans and major parts of Turkey remained practically dry. A rainfall surplus was recorded in northern Germany, the British Isles and northern Europe. August was substantially drier than usual in eastern and central parts of Europe, with the exception of central and northern Germany. Totally dry conditions prevailed in central Ukraine, the southern part of the Iberian Peninsula and several regions of Belarus and Poland. Rainfall was greater than seasonal in major parts of France, central and southern Italy, central and northern Germany, the UK and regionally in the Balkans and Turkey.

The pronounced rainfall deficit, combined with high atmospheric evaporative demand, affected many regions of southern, central and eastern Europe. The resulting depletion of soil moisture limited crop growth, especially in rain-fed agricultural regions and on light-textured soils.







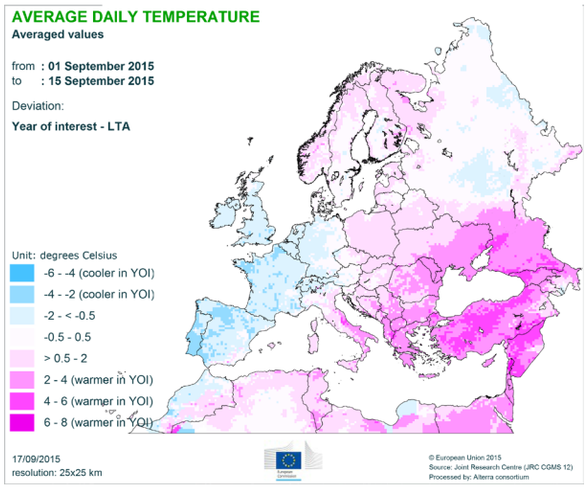


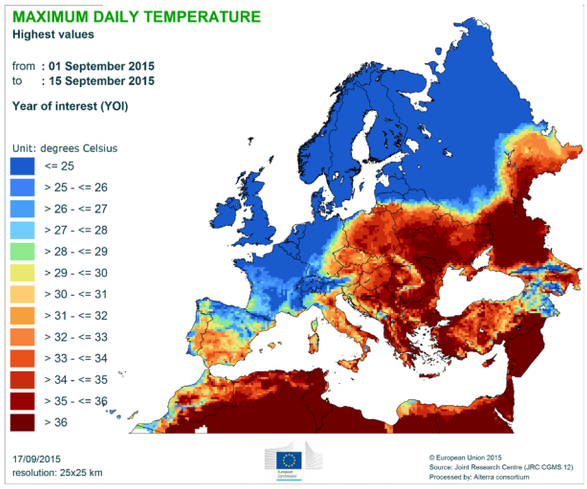
1.3 Meteorological review (1-15 September)

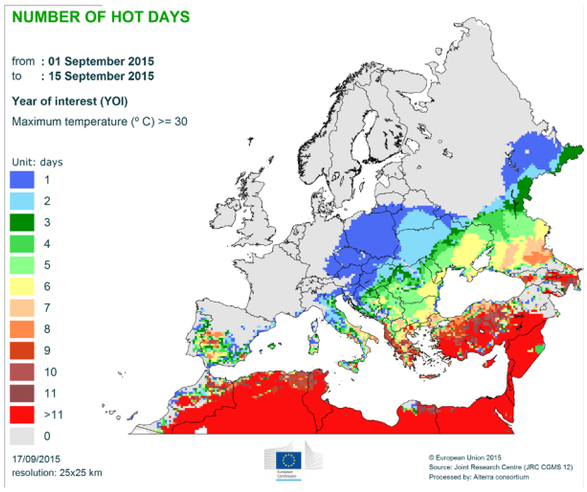
Significantly warmer-than-usual conditions were observed in eastern and south-eastern Europe, with daily maximum temperatures exceeding 36 °C. Colder-than-usual conditions prevailed in western and central Europe, with negative anomalies locally exceeding 2 °C. Turkey experienced mainly dry conditions, with less than 3 mm rainfall during the entire period.

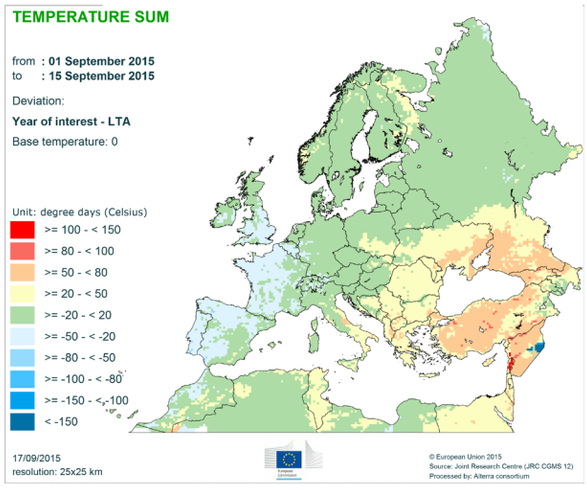
Observed temperatures

During the period under analysis (1-15 September), colder-than-usual conditions were observed over western and central Europe and the British Isles. Pronounced negative anomalies (exceeding 2 °C with respect to the long-term average) were recorded locally, mainly over Portugal, north-western Spain and northern France. Active temperature sums (threshold at 0 °C) in these regions were 20 to 50 growing degree days lower than usual. By contrast, warmer-than-usual conditions were observed in eastern and south-eastern Europe. Positive anomalies (with respect to the long-term average) ranging from 2 to 4 °C, and daily maxima often exceeding 36 °C, were recorded over a large area mainly covering the southern Balkans, south-eastern Ukraine, east of the Black Sea and Turkey. In Turkey, positive anomalies locally exceeded 4 °C, and there were more than 11 hot days (mean daily temperature of 30 °C or above) during the period under analysis.


AVERAGE DAILY TEMPERATURE
Averaged values
from : 01 September 2015
to : 15 September 2015
Deviation:
Year of interest - LTA
Unit: degrees Celsius
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
-2 - < -0.5
-0.5 - 0.5
> 0.5 - 2
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
17/09/2015
resolution: 25x25 km
© European Union 2015
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

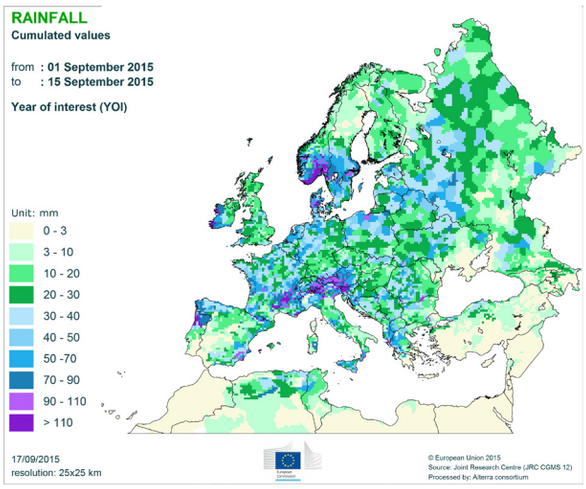

MAXIMUM DAILY TEMPERATURE
Highest values
from : 01 September 2015
to : 15 September 2015
Year of interest (YOI)
Unit: degrees Celsius
<= 25
> 25 - <= 26
> 26 - <= 27
> 27 - <= 28
> 28 - <= 29
> 29 - <= 30
> 30 - <= 31
> 31 - <= 32
> 32 - <= 33
> 33 - <= 34
> 34 - <= 35
> 35 - <= 36
> 36
17/09/2015
resolution: 25x25 km
© European Union 2015
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

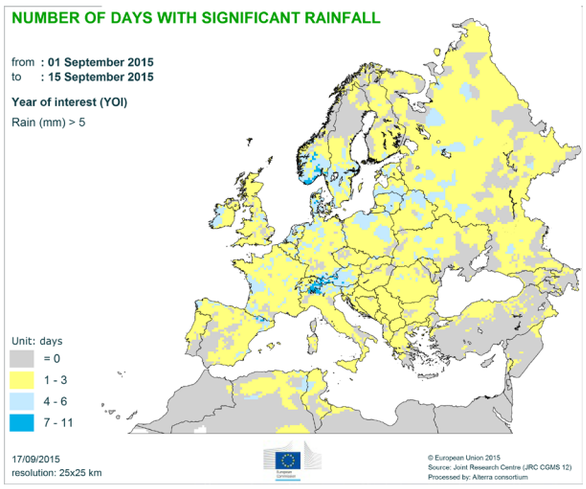

NUMBER OF HOT DAYS
from : 01 September 2015
to : 15 September 2015
Year of interest (YOI)
Maximum temperature (° C) >= 30
Unit: days
1
2
3
4
5
6
7
8
9
10
11
>11
0
17/09/2015
resolution: 25x25 km
© European Union 2015
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium


TEMPERATURE SUM
from : 01 September 2015
to : 15 September 2015
Deviation:
Year of interest - LTA
Base temperature: 0
Unit: degree days (Celsius)
>= 100 - < 150
>= 80 - < 100
>= 50 - < 80
>= 20 - < 50
>= -20 - < 20
>= -50 - < -20
>= -80 - < -50
>= -100 - < -80
>= -150 - < -100
< -150
17/09/2015
resolution: 25x25 km
© European Union 2015
Source: Joint Research Centre (JRC CGMS 12)
Processed by: Alterra consortium

Observed precipitation

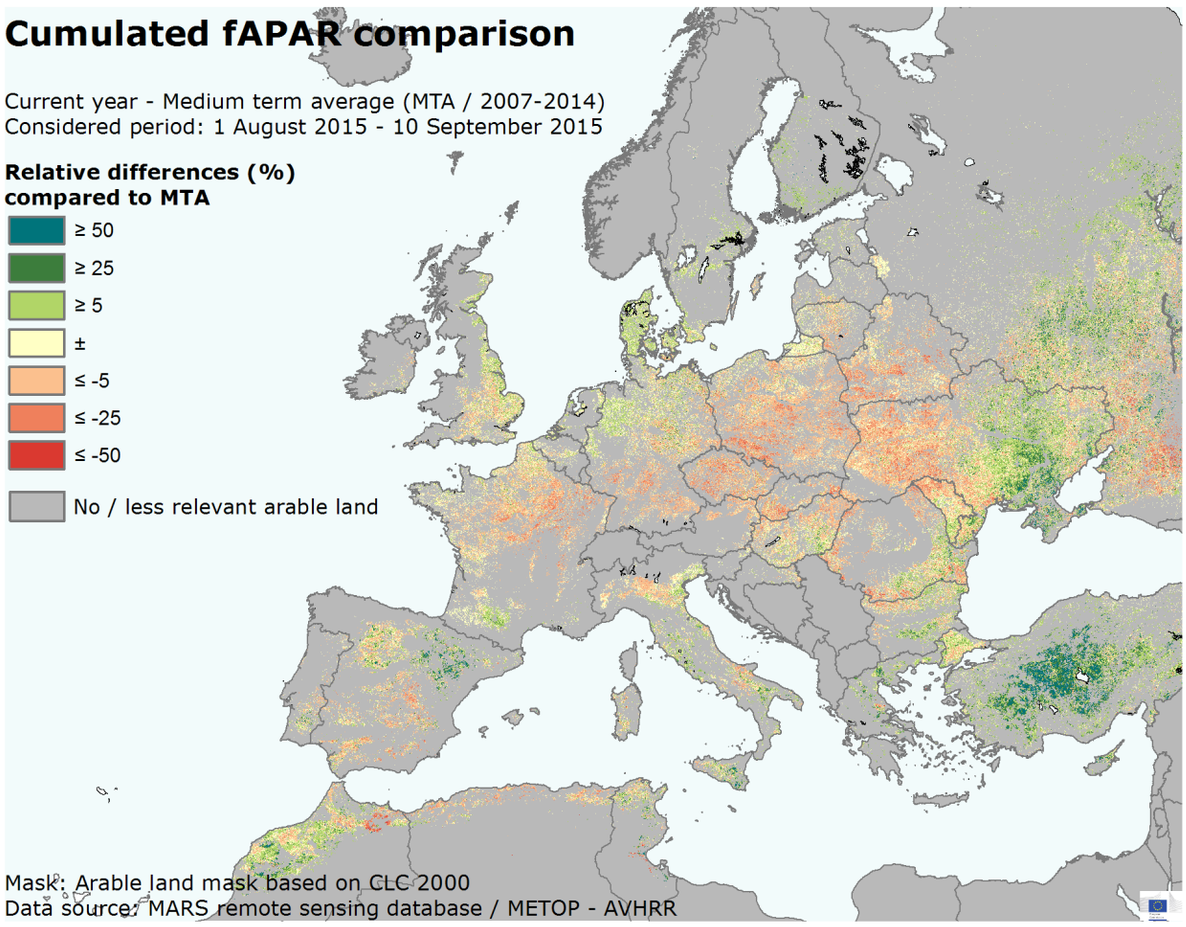
During the analysis period, dry conditions (with accumulated moisture levels of less than 3 mm) were observed over a large area covering Turkey, southern Greece, south-western Ukraine, southern Portugal and western Spain. Precipitation exceeding 90 mm (locally greater than 110 mm) was observed in the Alps, south-western France and southern Norway. 10 to 70 mm cumulated rainfall was recorded in most European areas, and only 3 days or less experiencing significant rainfall (daily cumulated precipitation greater than 5 mm).



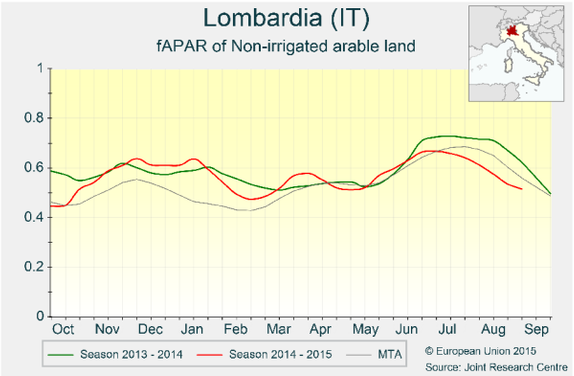


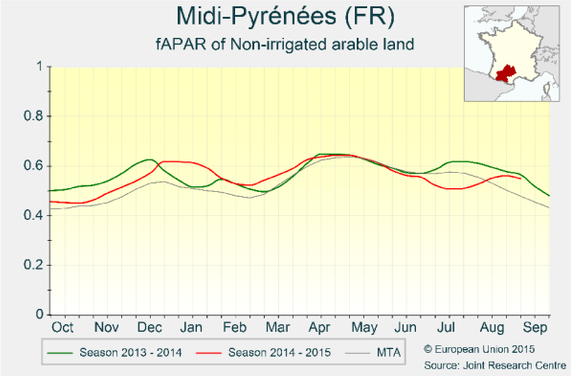
2. Remote sensing — Observed canopy conditions

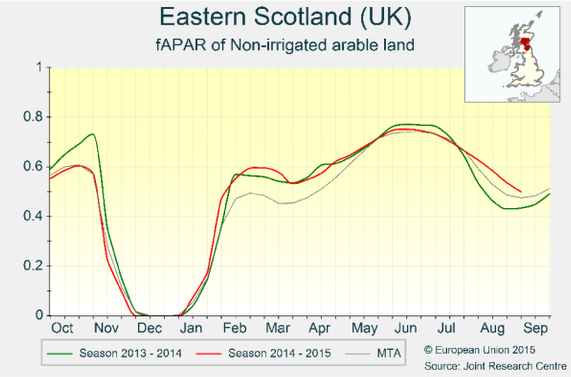
Troubled summer crops season in central Europe.

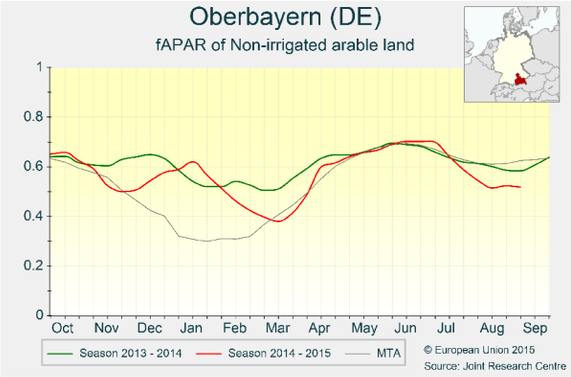


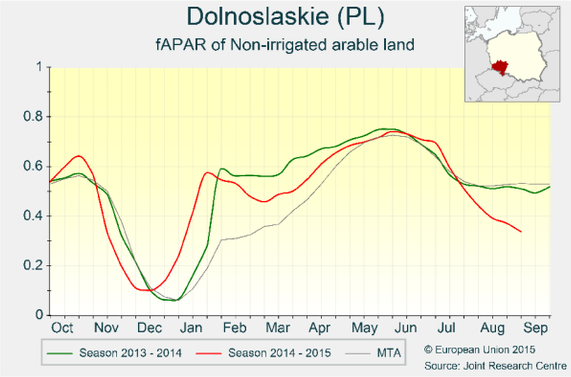
The map above displays the relative differences of the fAPAR (fraction of absorbed photosynthetically active radiation) indicator cumulated over the period 1 August-10 September of the current season against the cumulated fAPAR values of the same period's medium-term average (2007-2014). The maize season in northern **Spain** continues under optimal conditions thanks to the high temperatures and the sufficient irrigation supply. In **Italy**, summer crops are reaching maturity in the main northern producing regions. The negative impact of the summer heat waves was mainly limited to the northwestern parts of these regions (e.g. *Lombardia*), where a shortening of the grain-filling period due to the high temperatures was most evident. In **France**, the rainfall of late August determined a significant improvement in the canopy conditions of summer crops in the western and southern regions (e.g. *Midi-Pyrenees*). In the eastern cropland areas, however, the negative impacts of the hot and dry summer were only partially mitigated, and crop conditions remain poor. In the **United Kingdom**, the cereals season is ending with some delay in northern regions due to the colder-than-usual summer temperatures (e.g. *eastern Scotland*). In **Germany**, the beneficial rains at the end of August mitigated the impact of the latest heat wave, but summer crops had already been significantly damaged during the previous weeks (e.g. *Oberbayern*). In **Poland**, almost no significant rainfall occurred in August, especially in the southern regions (e.g. *Dolnoslaskie*), and rain-fed summer crops were seriously damaged during the most important development phases. The conditions of croplands in the eastern parts of the country are less critical, but still worrying. The situation is similar in the rest of central Europe, from the **Czech Republic** to **Hungary**, including **Slovakia** (e.g. *Zapadne Slovensko*) and eastern **Austria**, where the heat wave at the end of August hit the already weakened maize plants during the ripening phase. Regions in western **Romania** (e.g. *Macroregiunea*) and western **Bulgaria** were also affected. The weather conditions at the end of summer were also adverse for the summer crops in **Belarus** and western **Ukraine**, where the fAPAR regional profiles (e.g. *Vinnyts'ka*) reflect very poor crop conditions due to the persistent hot and dry conditions. In **Russia**, the high temperatures at the end of August shortened the ripening stage and allowed for an early harvest.

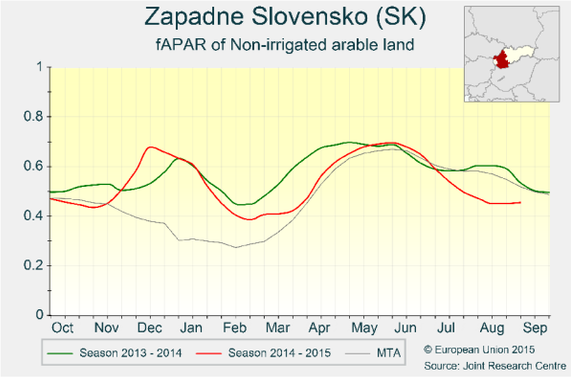

Lombardia (IT)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre

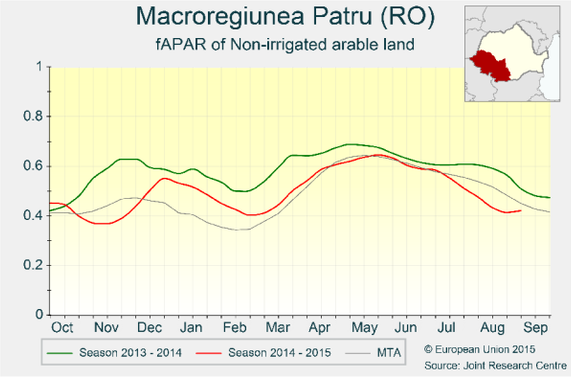

Midi-Pyrénées (FR)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre

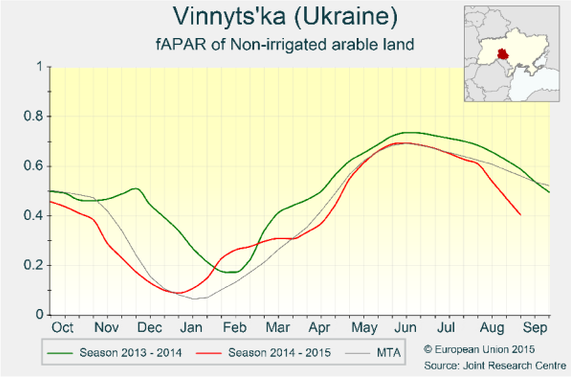

Eastern Scotland (UK)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre


Oberbayern (DE)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre


Dolnoslaskie (PL)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre


Zapadne Slovensko (SK)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre


Macroregiunea Patru (RO)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre


Vinnyts'ka (Ukraine)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
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3. Country analysis

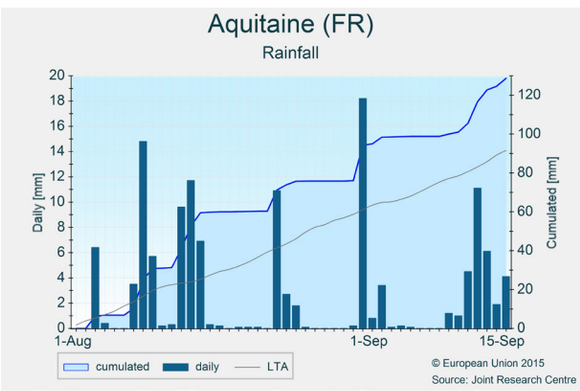
3.1 European Union

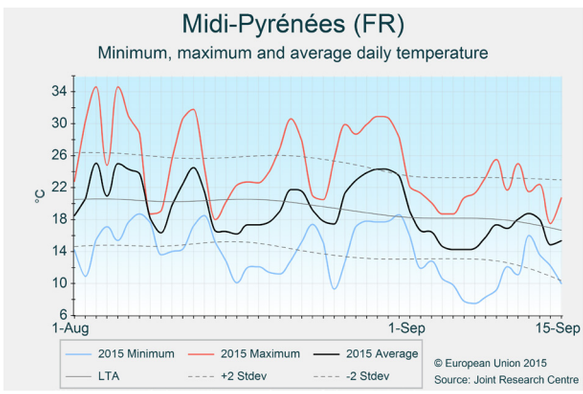
France

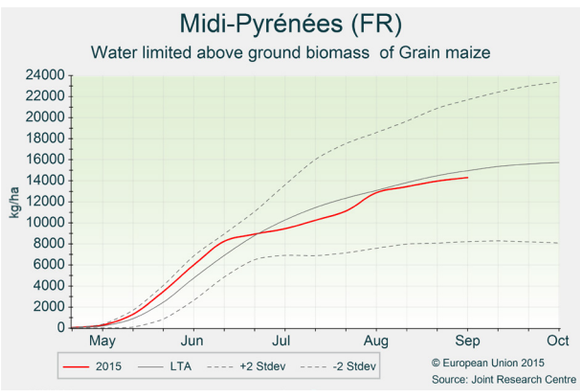
Favourable conditions since August mitigated losses in yield potentials

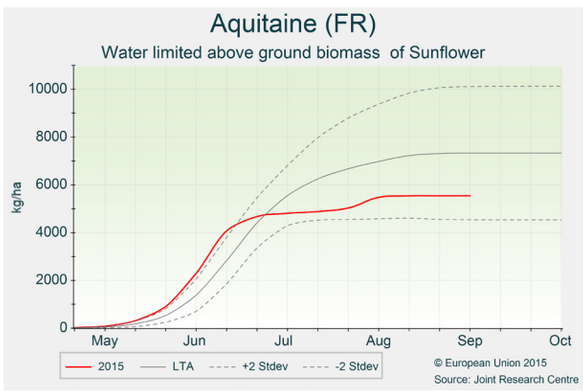
Temperatures since the beginning of August were close to average, and rainfall has been above average in most of the country. However, the beneficial conditions observed were insufficient for crops to recuperate after the exceptionally dry and warm conditions in July. Yields of summer crops are thus forecast to be below last year's levels, and close to the average.

After a predominantly hot and dry July, August was slightly rainier than usual except in the north-east (Alsace, Lorraine and Franche-Comté). Cumulated rainfall over the period of analysis was 30 to 70 mm above average in western parts, and 10 to 40 mm below average in north-eastern parts of the country. Temperatures were around average except in north-eastern regions, where they were 1 °C higher than average. While the first dekad of August was warmer than usual, maximum temperatures remained below 35 °C. Rainfall compensated the deficit observed in July but came too late for crops to recover, as they had already been affected by water deficit and heat stress by the end of July. As most of the grain maize from fields that were seriously impacted by the dry conditions in July has been converted to green maize (silage maize), the yields of grain maize will remain close to average. Potatoes and sugar beets are also expected to have been impacted by the unfavourable conditions observed in July. As a result of the dry and hot conditions, some water-use restrictions were put in place, restricting irrigation, which will also impact the yields of irrigated areas. Thus, the yields of summer crops are forecast to be well below those of last year and slightly below the 5-year average.









Germany

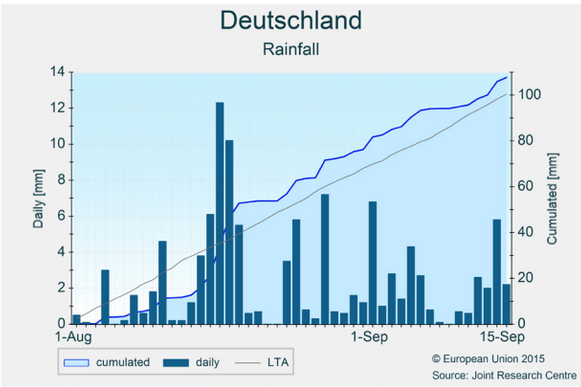
Dry and hot in the south, partial recovery in the north

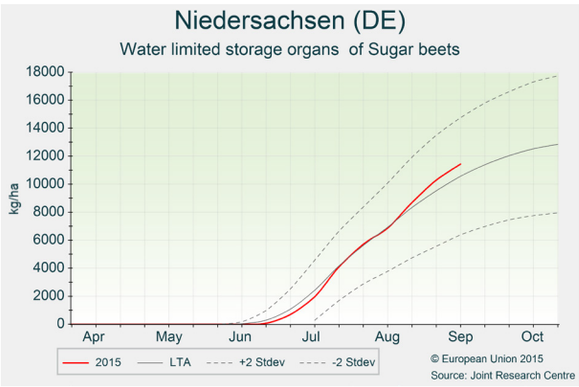
After another heat wave in the first half of August (during which temperatures reached up to 36 °C in the south), temperatures fell to average levels in the second half of the month and early September, except for the south where another heat wave (with temperatures up to 34 °C) occurred at the end of August. While precipitation was average or above in northern and western Germany, the south and southern parts in the east remained drier than average throughout the period of analysis. Soil moisture storage levels were replenished in the north-west, while the lack of rain in southern (*Baden-Württemberg* and *Bayern*) and eastern Germany (*Sachsen, eastern Thüringen,* and southern *Brandenburg*) added to the effects of the heat wave until the end of August. The average rainfall events that occurred in early September were also insufficient to restore soil moisture deficit in the south.

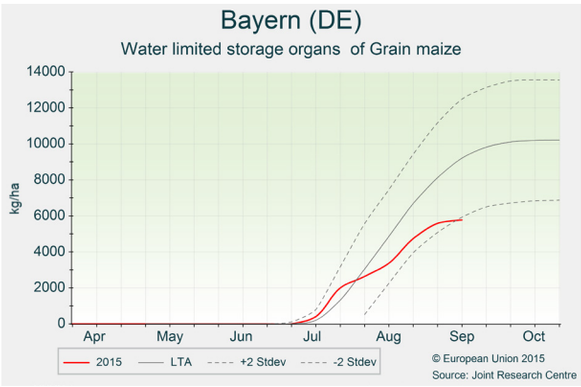
The north-south contrasting weather conditions are reflected in the development of maize, which is significantly below average in *Baden-Württemberg* and *Bayern*, but has good prospects in *Nordrhein-Westfalen* and *Niedersachsen*. The maize yield expectations remain below average in eastern Germany, confirming the negative overall outlook of the past 2 months, and the resulting yield forecast is once again slightly reduced compared to August.

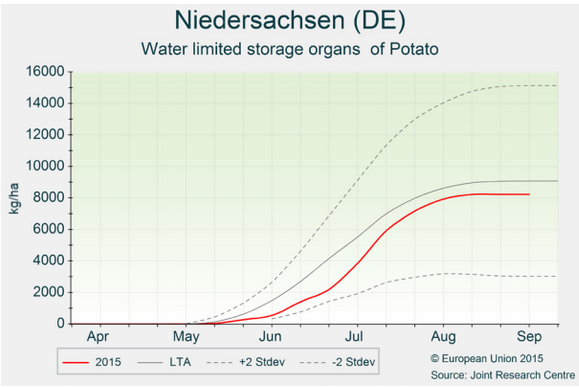
Yield expectations for sugar beet are very low in *Baden-Württemberg, Bayern* and *Rheinland-Pfalz* due to the summer drought, while yields in *Sachsen-Anhalt* and *Nordrhein-Westfalen* are expected to be close to average. Niedersachsen can expect above-average yields as a result of the replenished soil moisture levels. However, as the crops in the north did not recover from the negative impacts of the first half of the summer, the overall yield forecast for sugar beet is once again revised slightly downwards.

Despite a minor upward correction of the yield forecast, potato yields remain below average for Germany. While the situation remains difficult in Bavaria, favourable weather conditions partly compensated for the difficult June in Niedersachsen.







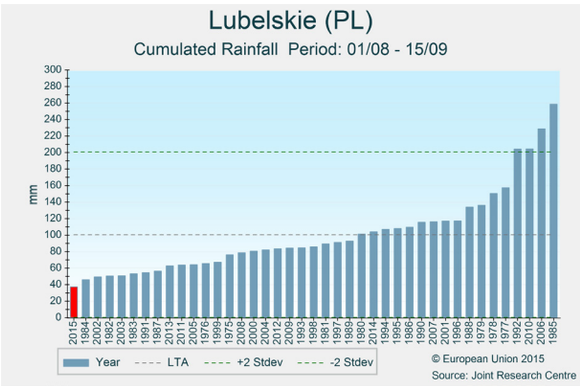


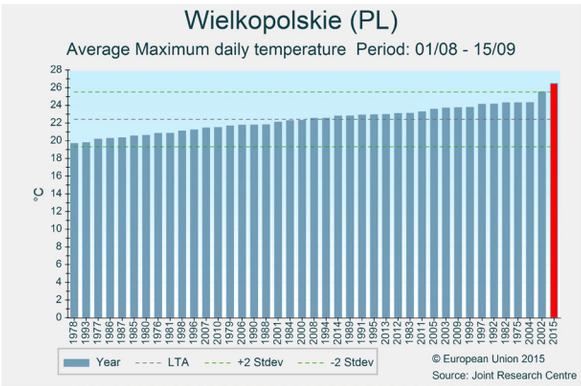
Poland

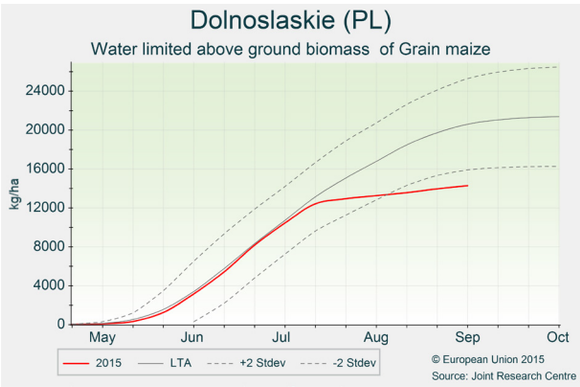
Exceptionally warm and dry weather conditions

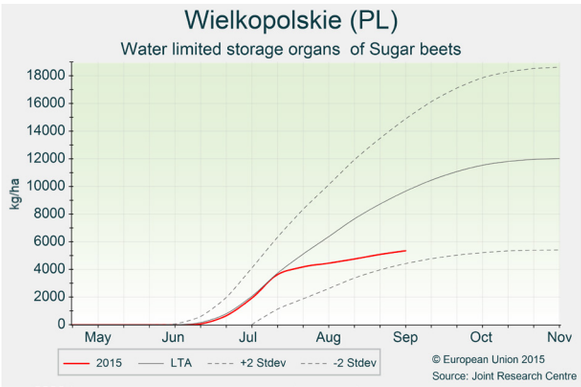
In August, while temperatures reached record highs, rainfall was close to a record low. Crops have been exposed to water and heat stress several times this season and the forecasts for summer crop yields are well below average.

In August, temperatures were 2.5 to 3 °C above the long-term average, with daily maxima reaching more than 35 °C in most regions during the first dekad and at the end of the month. No significant rainfall was recorded. Cumulated rainfall for the whole month remained below 20 mm, reaching 30 mm only in *Małopolskie*. Temperatures dropped to around average levels by the beginning of September, when some rainfall was also observed. As a consequence of the exceptional conditions in August, summer crops have been suffering from heat and water stress, which has affected their growth and the development of storage organs. The worst conditions are observed in central Poland, from *Dolnośląskie* to *Lubelskie*. Our model simulations show soil moisture levels to be below critical for grain maize in all regions except *Małopolskie*. The yield forecasts for grain maize and sugar beet are well below the 5-year average and a considerable part of the maize crop might be used as green maize rather than grain maize. Potato yields are expected to be less affected, as the largest potato crops are irrigated. The dry conditions observed this summer will delay the sowing of winter crops, as more rain is needed for emergence.









The United Kingdom and Ireland

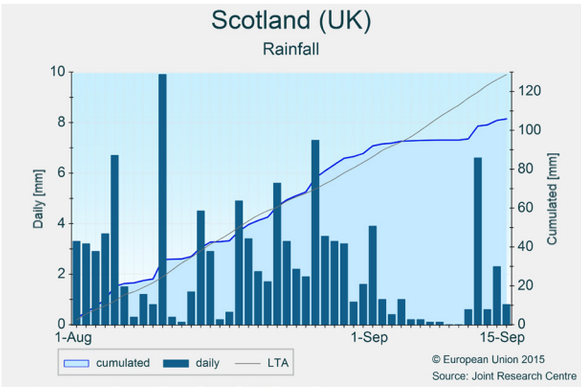
Slow harvest in Ireland and northern UK; good conditions for root crops

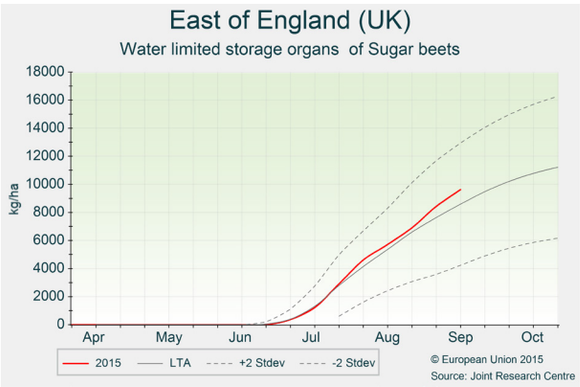
The winter crops' harvest has finished (or is still finishing) later than usual in most of Ireland and northern UK due to cooler-than-usual conditions throughout the growing season, combined with frequent rainfall during the harvesting period. Weather conditions during the review period were favourable for potatoes and sugar beets.

Temperatures were below average throughout most of the British Isles during the first half of August and the first half of September, and around average during the second half of August. Rainfall was around or above average, with periods of abundant rainfall in the second half of August and the beginning of September. In Scotland, rainfall was 20 mm below average, but with very frequent small events.

In the main cereal-producing areas of southern and eastern UK, these conditions provided sufficient opportunities for harvesting winter crops and spring barley. In Ireland and Scotland, however, where the season was already delayed due to the persistent cooler-than-usual conditions throughout the season, the combination of slow ripening and frequent rainfall events has caused (and in several places is still causing) additional harvest delays, locally affecting grain quality.

The relatively cool and moist weather conditions have been favourable for potatoes and sugar beets. The yield forecasts for these crops are revised slightly upwards, above the 5-year average.





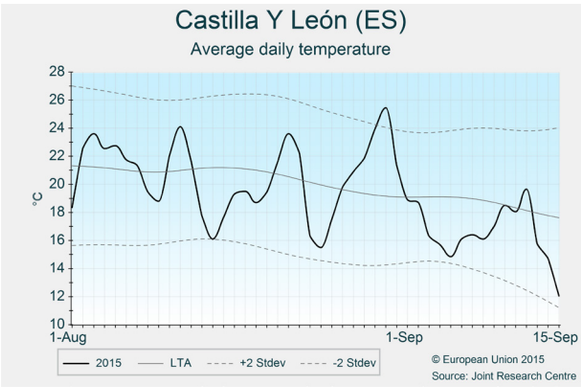
Spain and Portugal

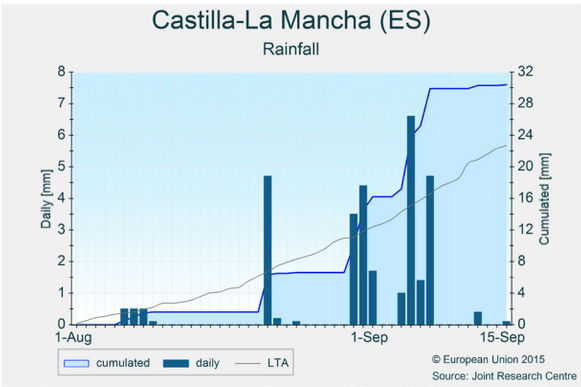
Grain maize yield forecast to be on average

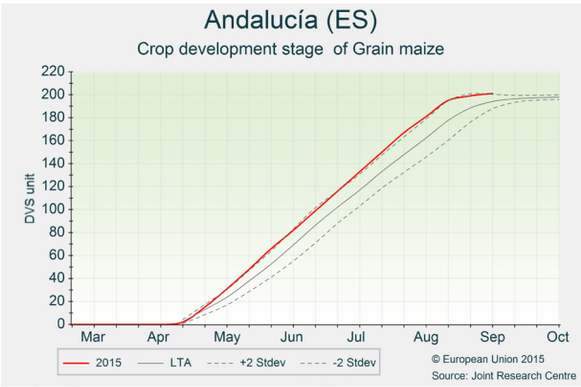
Following a warm first half of the summer, temperatures fell in August and September. Grain maize has started to ripen in the northern half of the Peninsula. There were no major limitations to irrigation during summer and the outlook for grain maize yields is average.

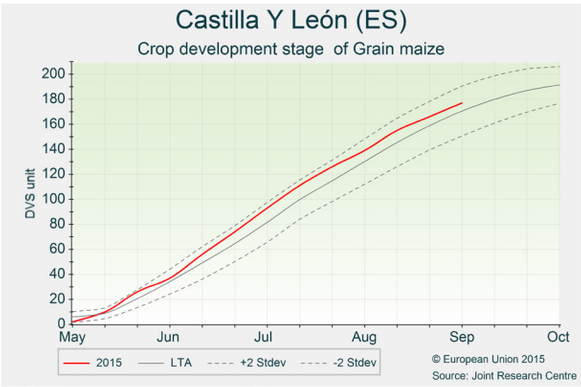
After an unusually warm June and July, temperatures fell substantially in August and September to near-seasonal values in the east and 1 to 2 °C below seasonal values in the western half of the Peninsula (Castilla y León and Centro). Precipitation in August-September has been scarce in north-western Spain (Galicia and the western provinces of Castilla y León), continuing the dry conditions experienced during most of the summer. By contrast, rainfall was more substantial in eastern and southern Spain, especially at the end of August and the beginning of September.

Thanks to the warm temperatures experienced from May to July, summer crops have developed faster than in an average year. Grain maize has reached maturity in the southern half of Spain — about 3 weeks earlier than usual — and harvesting is currently underway. Crops have started ripening in the northern half of the Peninsula, about 1 week earlier than in an average year. In general, yield expectations are close to the average of the past 5 years, since no major irrigation constraints have been experienced in the main producing regions. The harvest of sugar beets and potatoes is currently being completed and yields of these crops are also expected to be average.







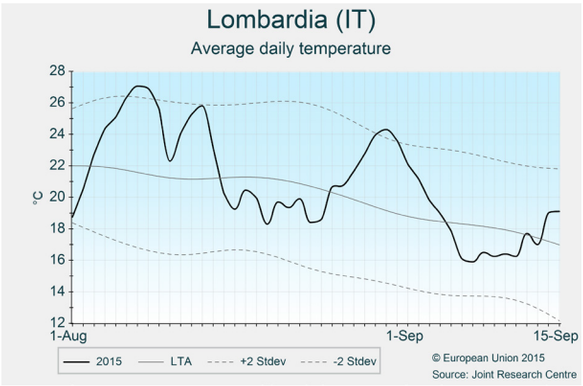


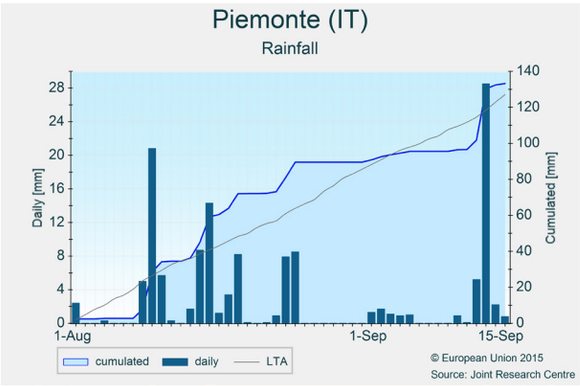
Italy

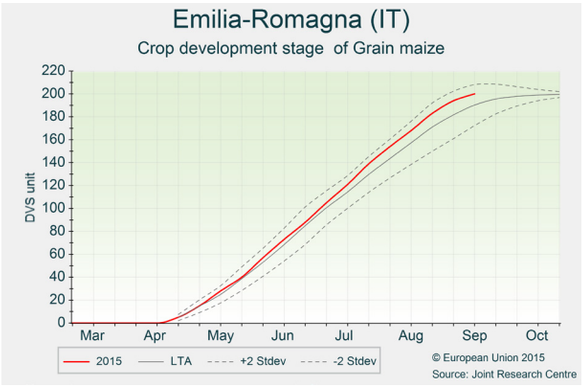
Recent rains only partially improved summer crop conditions

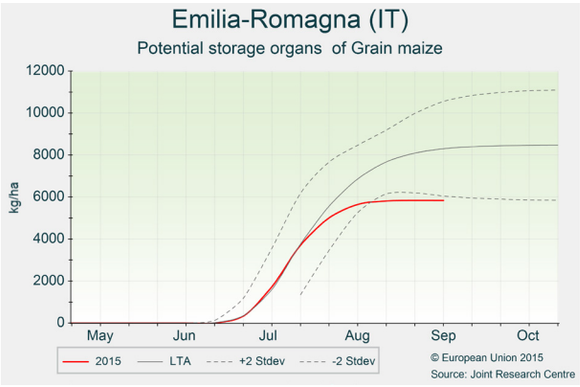
After the dry and warm conditions of the previous months, near- or above-average rainfall was registered from 1 August to 15 September across Italy. Although the beneficial rainfall partially limited the damage to summer crops, the yield forecast for maize remains far below last year's record level.

In Italy, weather conditions up to the first dekad of August were among the warmest experienced in many regions of the country, with temperatures about 3 °C higher than seasonal values. Although temperatures returned to normal from the second dekad of August, the review period from 1 August to 15 September was warmer than usual by about 1 °C. Cumulated rainfall across Italy was around average (Piemonte and Lombardia) and above average (Marche, Umbria, Calabria and Sicily) during the period analysed. Some severe thunderstorms were recorded in September causing local waterlogging, particularly in Emilia Romagna. Summer crops are in advanced development stages, but the prolonged high temperatures and dry conditions of the previous months have negatively affected crop growth, especially in rain-fed areas. Maize is reaching the maturity stage thanks to the warm conditions, whereas the harvesting of winter cereals was completed in July. Irrigation and recent rainfall partially limited the damage to summer crops. While the yield forecast for maize remains well below last year's record level, it is close to the 5-year average. The yield forecast for sunflowers is slightly below the 5-year average due to the unfavourable weather conditions. Yields below trend levels are also expected for durum wheat and potatoes, whereas they are expected to be close to average for soft wheat and sugar beets.









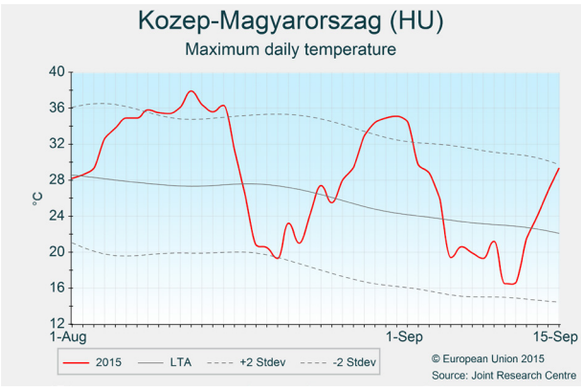
Hungary

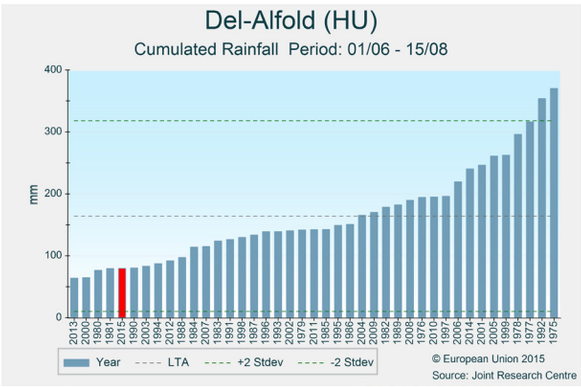
Extremely hot weather negatively affected maize production

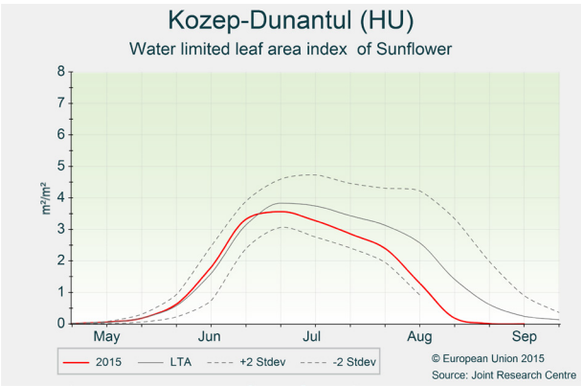
This year, Hungary experienced one of the hottest summers on record. Water supply conditions of summer crops were below optimal during most of the yield-formation period. The yield expectations are below the 5-year average for maize, potato and sugar beet.

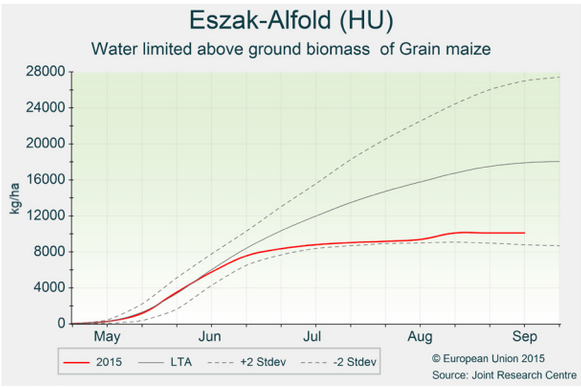
In the first days of August, an intense warming pushed daily temperatures to extreme levels. The maximum temperatures were persistently greater than 30 °C and even reached 35 °C on the hottest days until mid-August. According to our climate records (since 1975), the period of July-August was the first or second hottest to occur in Hungary. In addition to the negative effect of the daytime maxima, the hot nights also intensified plant respiration. Rainfall was scarce from early June until mid-August, with accumulated precipitation generally remaining below 100 mm. Between 15 and 20 August, temperatures fell to well below the average and substantial rains arrived in Hungary totalling 15-100 mm, but with considerable spatial variability. Although the precipitation arrived late, it had a slightly positive effect on the yield formation of summer crops. The hot weather returned during the last days of August, but near or below-average thermal conditions dominated in September.

The extremely high temperatures considerably accelerated the development of all crops by at least 2 weeks. The crop canopy suffered early senescence. The heat wave of early July had a negative effect on the pollination of maize and the high temperatures of late July and August constrained grain-filling. The biomass accumulation is very low in eastern Hungary (Észak-Alföld, Dél-Alföld and Észak-Magyarország regions) and below average in the whole of western Hungary (Dunántúl). While yield expectations are low, there are large spatial differences due to local conditions. A decrease in grain maize acreage is also likely as the most damaged fields are being harvested as silage maize. Sunflowers are more drought-tolerant, but significant yield losses are likely due to the recurring heat waves. Low potato and sugar beet yields are forecast. The precipitation of the past 30 days was favourable for the emergence and establishment of rape-seed sowings.









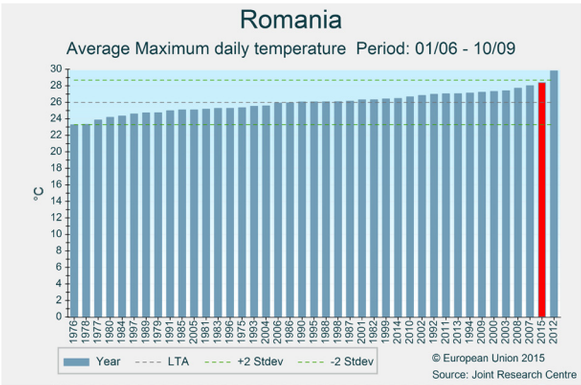
Romania

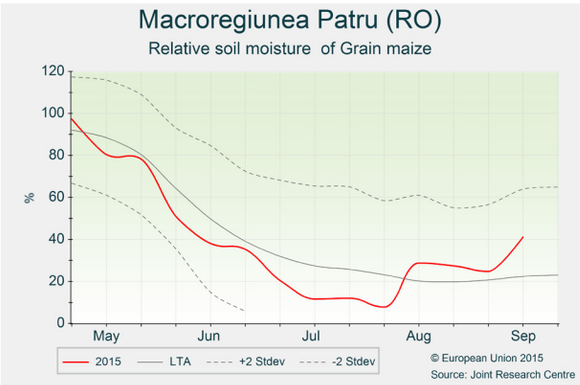
Reduced yield outlook due to drought

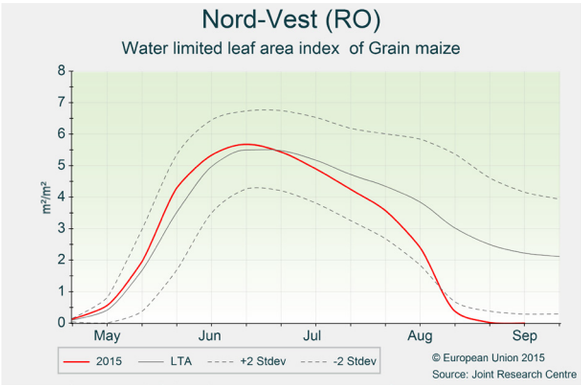
Daily temperatures fluctuated close to record-high levels for most of the period between mid-July and early September. Precipitation remained scarce until mid-August. Summer crops were exposed to heat and water stress, which had a negative impact on yield formation. Consequently, the yield forecasts are maintained below the 5-year average.

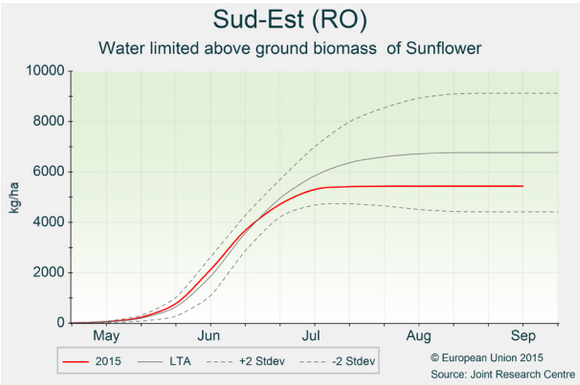
Hotter-than-usual thermal conditions characterised Romania between mid-July and mid-August. Daily maximum temperatures generally exceeded the average, reaching 32 to 35 °C. Only some days at the turn of July to August provided relief. The dry spell that started in early July continued in the first half of August, and precipitation reached only 40 to 60 % of the average during the period from 1 July to 15 August. Temperatures cooled temporarily after mid-August, accompanied by abundant (typically 30 to 60 mm) rainfall. Warm and dry weather conditions returned towards the end of the month, but temperatures dropped back to near-average levels after 5 September. This summer was the second warmest on our records, just after the summer of 2012.

The high temperatures accelerated the phenological development of summer crops, shortening the period of biomass accumulation by 20 to 30 days. The harvest, especially of maize, is likely to occur early. Soil moisture contents remained below average until mid-August due to the rainfall shortage and high evaporative demand. The soil moisture deficiency was particularly serious in western and north-eastern Romania, but less pronounced in the *Sud-Muntenia* and *Sud-Est* regions. The less-than-optimal water supply and recurring heat spells led to a moderate expansion of the leaf area index and early senescence of the plant canopy, resulting in reduced photosynthetic activity and low biomass accumulation. Notable yield losses are expected for all summer crops due to the severe drought of this year. As a consequence, the yield outlook is well below the 5-year average.









Bulgaria

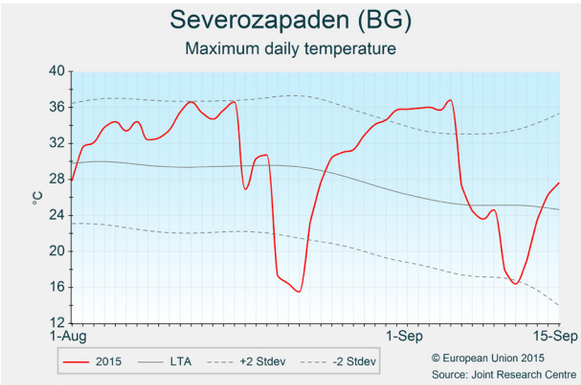
Rains arrived too late for summer crops

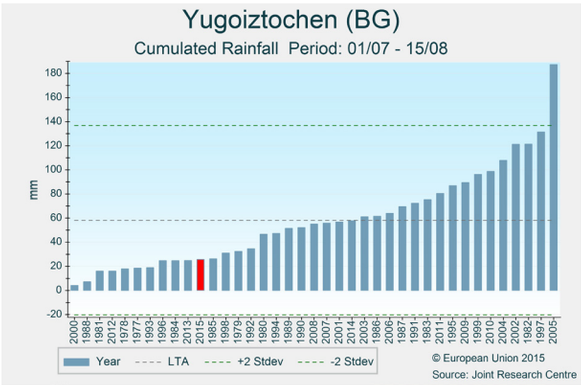
Recurring heat waves and water deficiency constrained the grain-filling of maize and sunflowers. Abundant rainfall after mid-August brought few benefits to summer crops, which had nearly reached maturity. The yield outlook for summer crops remains well below both last year's levels and the trend value.

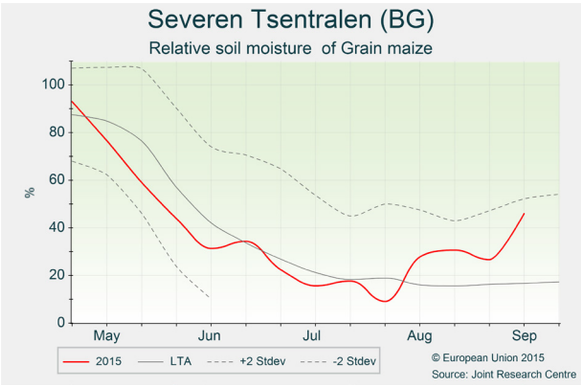
Significantly warmer-than-usual weather conditions prevailed in August and the first dekad of September. Daily temperatures remained below average only for a few days around 20 August and 10 September. The number of hot days (Tmax > 30 °C) exceeded the climatological norm by 8 to 12 days during the review period. The eastern and southern regions experienced particularly hot weather conditions.

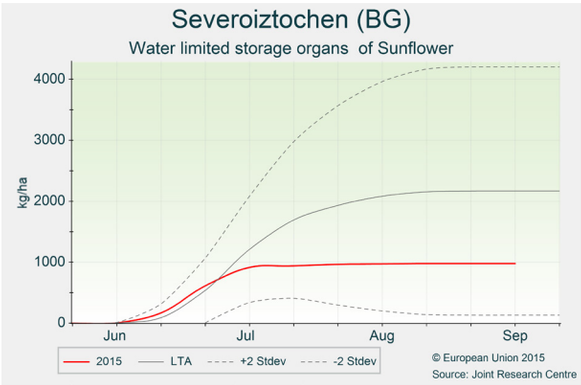
After the beneficial rains of June, the precipitation tendency decreased considerably in July. Large areas in north-western and south-eastern Bulgaria received little or no precipitation (< 20 mm) during 45-50 days from the beginning of July until mid-August. Between 17 and 22 August and in the second dekad of September, significant rainfall was experienced in most of the country. The precipitation sum over the past 30 days reached 50-120 mm in the northern half of Bulgaria, while the southern territories remained drier (30-70 mm).

The phenological development of all crops was advanced by 2 to 3 weeks due to the extreme warm conditions. The very high maximum temperatures even had negative (albeit not dramatic) effects on irrigated stands. In rain-fed areas, soil moisture content decreased sharply during July under summer crops, and from mid-July onwards it became inadequate to satisfy the crop water demand of yield formation. The rainfall in the second half of August and in September helped to restore soil water levels but was of little benefit to summer crops, which had already entered the ripening phase. Our yield outlook remains below last year's level and the projected trend of historical yields.









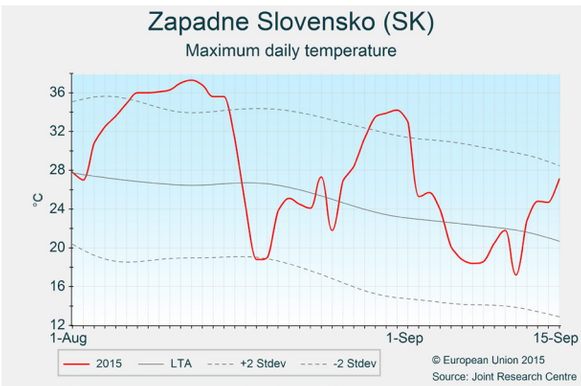
Austria, Slovakia and the Czech Republic

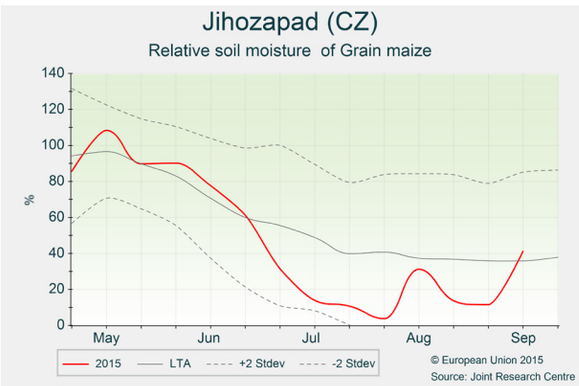
Hot and dry weather continued in August

A heat wave with dry conditions occurred during the first half of August. A weather perturbation in the middle of August brought milder temperature conditions with some beneficial rainfall. Temperatures rose for a short period at the end of the month, with maximum daily temperatures well above 30 °C. The first half of September was generally characterised by normal temperature conditions, with few rainfall episodes. Overall, summer crop yield forecasts remain below the 5-year average.

August started with a heat wave that lasted until the middle of the month. Maximum daily temperatures generally exceeded 36 °C in the major agricultural areas. A period of hot and dry weather was interrupted in the middle of August, when average daily temperatures dropped below seasonal values and some beneficial rainfall was recorded. A period of dry weather followed, with a warming tendency. As a consequence, another heat wave with maximum daily temperatures well above 30 °C developed during the last days of August and the beginning of September. The first half of September was generally characterised by air temperatures that were close to the long-term average. Rainfall in September was spatially highly variable; a substantial rainfall deficit was recorded over the western part of Slovakia and the northern part of the Czech Republic, whereas values close to or above the long-term average were observed elsewhere.

The yields of summer crops, which have mainly reached maturity, has been significantly limited by the unfavourably hot and dry conditions of the summer months, particularly by the heat waves and soil moisture deficits during the sensitive flowering and grain-filling stages. The rainfall during the middle of August did not substantially improve the growing conditions for grain maize. The crop yield outlook for grain maize therefore remains well below the values recorded last year.



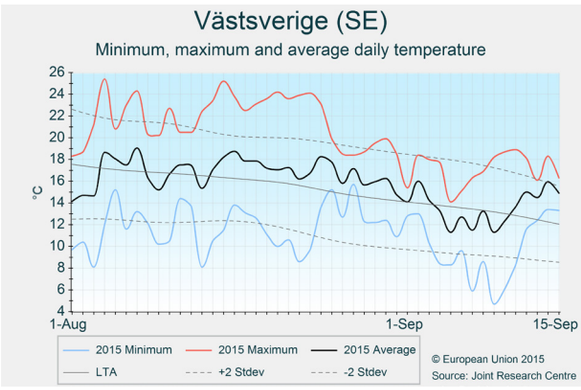


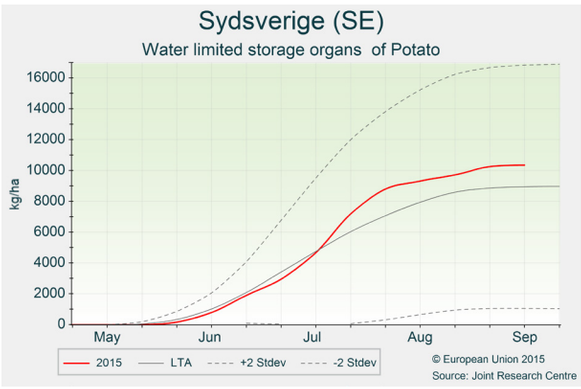
Denmark and Sweden

Improved growth indicators for root crops and spring crops

Positive yield forecasts for winter crops are confirmed. Forecasts for spring crops were revised upwards thanks to the favourable, relatively warm weather conditions during August and September.

During the review period (1 August to 15 September), weather conditions were mostly favourable in both countries. In Sweden, temperatures were cooler during the first half of August but increased steadily thereafter. The weather in Sweden was slightly dry, with only one wet period occurring in late August and early September. Denmark also experienced a wet period around the same time but with higher rainfall levels, including two events of more than 19 mm in northern and central regions. Solar radiation was above the long-term average in both countries. For most of August, these weather conditions were favourable for the harvesting of winter crops, which started in early August in the early-sown fields in southern Sweden and Denmark. The last winter crops were harvested in central Sweden between the first and second dekad of September. The winter crop forecast, which had already been above the 5-year average, was revised slightly upwards. In response to the favourable weather conditions, our crop simulation models also show significant improvement in the growth indicators for spring cereals, sugar beets and potato crops. The yield forecast for these crops is revised upwards, to near or slightly above the 5-year average.



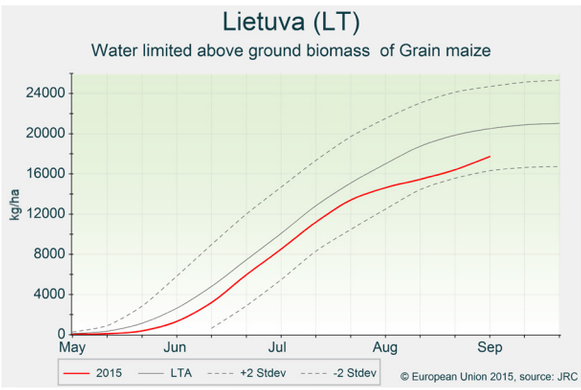


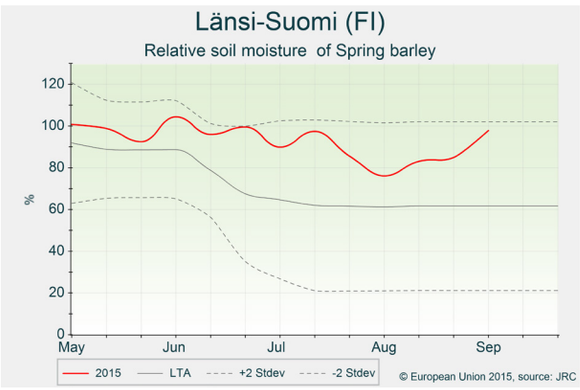
Finland, Lithuania, Latvia and Estonia

Optimal conditions for harvesting activities

Summer crops in Lithuania have been negatively affected by exceptionally warm and dry conditions during August, whereas the yield expectation for summer crops in Latvia is slightly above average. Overall, it has been a good season for winter and spring crops in the Baltics, especially in Estonia, but yields in Finland are below average.

Across the whole area, August was characterised by drier and warmer-than-usual weather conditions. Considering the whole month, daily temperatures were above average by 2 °C in Lithuania, 1.4 °C in Latvia, 0.5 °C Estonia and 1.3 °C in Finland. This hot weather was accompanied by unusually dry conditions in all countries, especially in Lithuania, where cumulated rainfall was 80 % below average and maximum temperatures reached 34 °C. These conditions (along with another dry period in July) have negatively affected the growth of summer crops (grain maize, potatoes and sugar beets) in Lithuania, where yields are forecasted to be below the 5-year average. In Latvia, where weather conditions were less extreme, the outlook for summer crops is slightly above average. The dry and mild temperatures created beneficial conditions for the harvesting of spring and winter crops in the Baltics. Spring crops in Finland benefited from the warm temperatures in August. This led them to reach maturity across the whole country (according to our simulations), but forecasted yields remain below average due to the adverse weather conditions experienced during most of the growing season. In Finland, the persistent overly wet soil moisture levels have fallen due to scarce rainfall and farmers have started harvesting activities with a delay of about 2-3 weeks. The area as a whole has experienced normal temperatures and some rainy days since 1 September. This rainfall, which could further delay the harvest in Finland, was beneficial for the winter crops already sown in the Baltics. More precipitation in the coming days could be beneficial for their emergence, especially in Lithuania.





Belgium, the Netherlands and Luxembourg

Predominantly favourable conditions for crop growth and harvesting

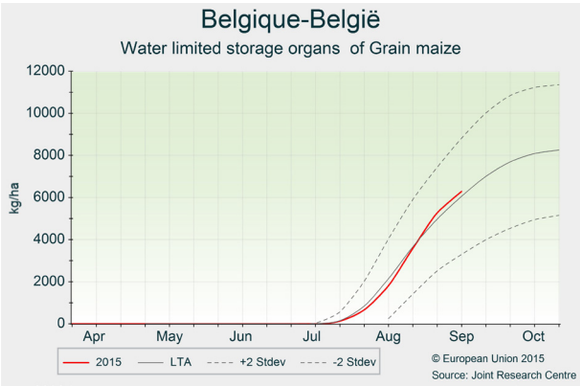
The period of review generally presented favourable weather conditions for the growth of spring and summer crops and for the harvesting of winter crops. Yield forecasts remain around the 5-year average for most crops.

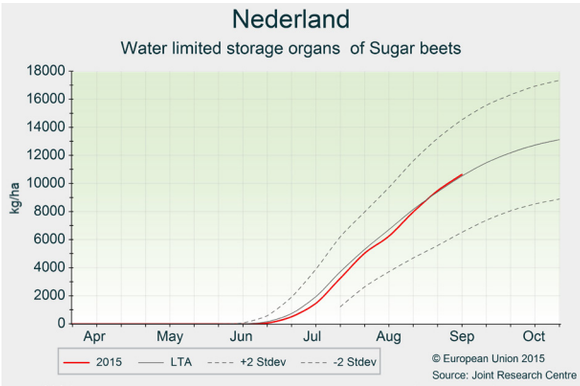
Above-average temperatures predominated in August, with the exception of 4-6 days in mid-August that were cooler than usual. While maximum temperatures remained mostly below 30 °C, they reached up to 34 °C in Luxembourg in the first half of August, but only for short periods of 1 or 2 days. Temperatures dropped sharply at the turn of the month, and September has been cooler than usual throughout the Benelux region to date. Rainfall was above average for the period as a whole and was mainly concentrated in a few days around 15 August, the last week of August and the first week of September.

These weather conditions were generally favourable for the growth of spring and summer crops and for harvesting winter crops.

Rain in mid-August was particularly welcome for maize, sugar beets and potatoes, which had been affected by a long period of unusually dry conditions. Our model results indicate that the growth and development of these crops have been restored to about average levels, except for potatoes, which were most heavily impacted by the hot and dry conditions earlier in the season, especially in Belgium. A complicating factor with potatoes is that cool and moist weather conditions following a hot and dry period induces the formation of small secondary tubers at the cost of main tubers.

As the improved conditions since early August have already been accounted for in the previous forecast, yield forecasts remain stable, around the 5-year average for most crops.



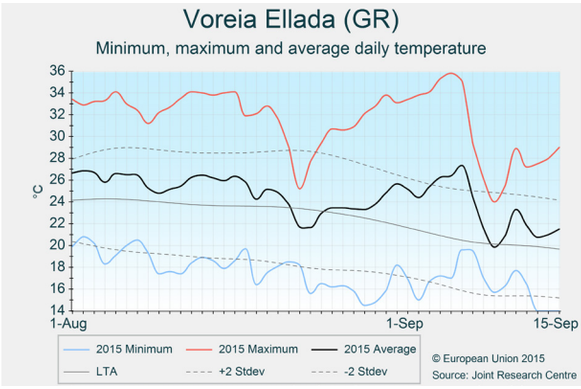


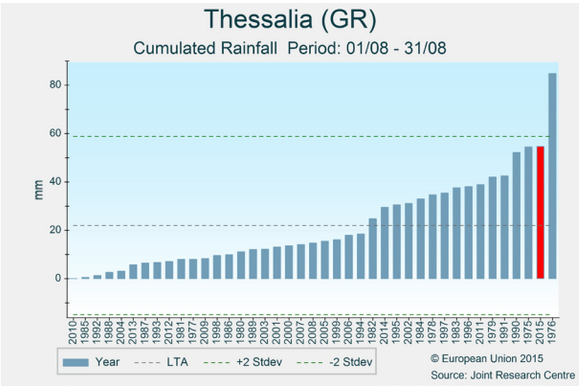
Greece and Cyprus

Favourable outlook for spring crops

During the entire review period, temperatures in Greece fluctuated above the long-term average. August was one of the rainiest in our records in several areas. Grain maize and other spring crops are progressing well with good yield outlooks. In Cyprus, temperatures were consistently above the long-term average, but rainfall was scarce.

In all parts of Greece, temperatures fluctuated mainly above the long-term average throughout the review period (1 August to 15 September). Very high temperatures were recorded from 1 to 7 September, with maximum temperatures reaching or even exceeding 40 °C, particularly in central regions (e.g. Thessaly). Overall, this review period is ranked among the warmest in our records. In August, most of the regions presented above-average rainfall, with several beneficial rainfall events, especially in the central-southern regions of the country. It has been the second rainiest August in our records for the region of Thessaly. Conditions were very dry at the beginning of September. Beneficial precipitation occurred in central-northern regions around 10 September, whereas conditions in southern areas (i.e. Peloponnese) and the islands remain dry. Grain maize is reaching maturity and in some regions the harvesting of early varieties has already started. Sunflower crops are generally in good condition despite some local problems due to the Orobanche sp. Parasite, which affected some areas of northern Greece, especially Evros. Harvesting started in the last dekad of August and good yields are reported. In Cyprus, temperatures in August and the first half of September fluctuated consistently above the long-term average. Cumulated rainfall was well below average.





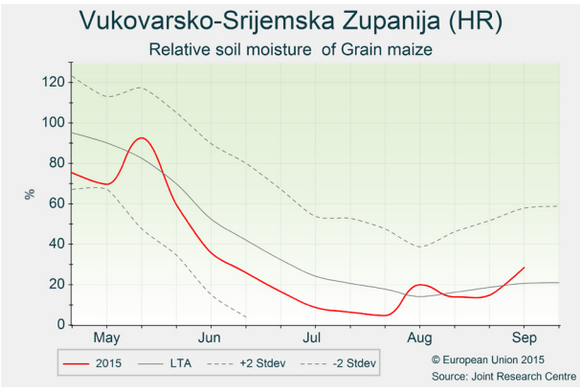
Slovenia and Croatia

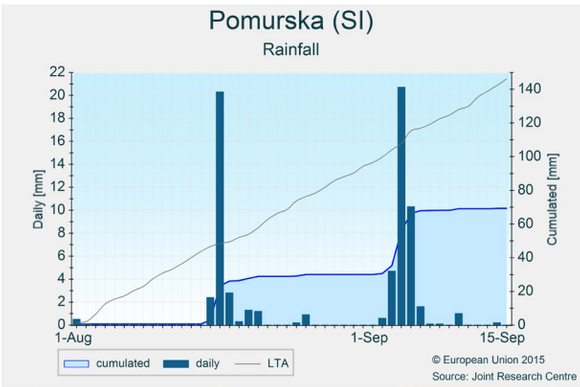
Summer crop yields affected by heat stress and rainfall deficit

Hot and dry conditions prevailed during the first half and the end of August. These periods were interrupted by an inflow of fresh air and some beneficial rainfall. The first half of September was generally characterised by seasonal temperatures, with some rainfall episodes. Summer crop yield forecasts remain below the 5-year average.

The first half of August was characterised by dry and substantially warmer-than-usual conditions, with average daily temperatures almost 4 °C above the long-term average. Maximum daily temperatures exceeded 34 °C in the main agricultural areas (in eastern Croatia, temperatures exceeded 36 °C). This intense heat wave was interrupted by a fresh air inflow in the middle of August, which lowered air temperatures to close to the long-term average. The weather perturbation in mid-August also brought some beneficial rainfall, partially replenishing depleted soil moisture levels. The latest heat wave occurred between 28 August and 2 September, and was followed by a period of seasonal temperatures and some rainfall episodes.

Summer crops have mostly reached maturity and are currently being harvested. Hot and relatively dry weather conditions have impacted crop growth since the beginning of July. The yield potential of summer crops was reduced by an intense heat wave and a substantial rainfall deficit around the sensitive anthesis and grain-filling stages. Moreover, warmer-than-usual conditions shortened the grain-filling period. Summer crop yield forecasts therefore remain mainly below the 5-year average.





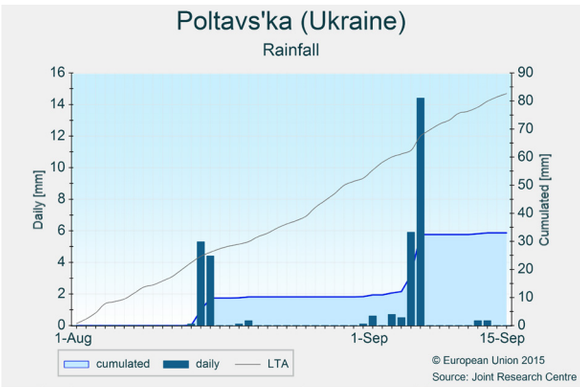
3.2 Black Sea area

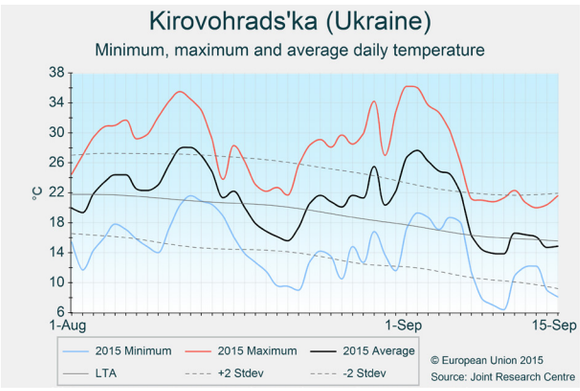
Ukraine

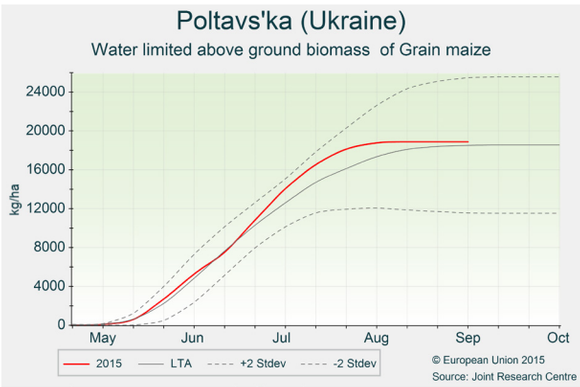
Warm and dry conditions prevailed

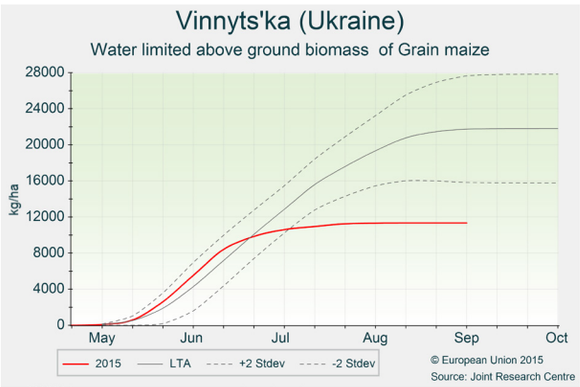
Conditions since the beginning of August were warmer and drier than usual, specifically in western regions. The long dry periods and hot temperatures decreased the yield outlook of grain maize, even though average weather conditions returned at the beginning of September.

In August, weather conditions were drier than usual in the whole country, with the driest conditions being observed in the western regions. Most of the rain recorded occurred during thunderstorms, and the number of significant rainfall events was significantly lower than usual. Most regions only experienced a rain deficit in August, but regions such as the Vinnitsa and Kiev oblasts have been accumulating an important deficit since May, with less than 50 % of the average rainfall from May to mid-September. Temperatures stayed largely above average by 1.5 °C to 3 °C, the warmest temperatures being recorded in western regions. Exceptionally warm conditions were observed during the first dekad of August and the end of August-beginning of September, with maximum temperatures exceeding 35 °C. Weather conditions returned to normal during the first half of September, when temperatures returned to close to average and substantial rainfall was recorded. Yields of summer crops are expected to be very heterogeneous: far below average from the western part of the country to the Kiev and Vinnitsa oblasts and slightly above average in the central and eastern parts of the country. The yield of grain maize is forecast to be below that of the past 2 years and, as some of the grain maize will be converted to silage maize, the overall production is expected to decrease.







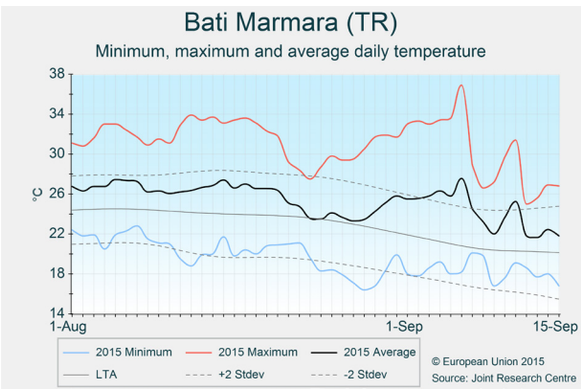


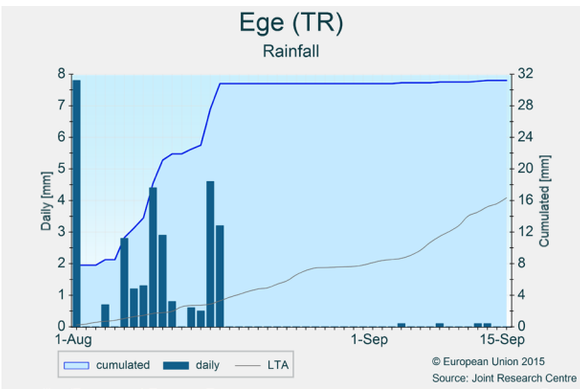
Turkey

Warm period, good yield outlook for grain maize

August and the first half of September were warm but with several rainfall events which were beneficial for spring crops in non-irrigated areas. The harvesting of grain maize started in September and the yields are forecast to be above the 5-year average.

Temperatures in the regions of Ege and Bati Marmara were consistently above average throughout the period under consideration (from 1 August to 15 September). In the rest of the country, a short period of 5 days (from 25 to 30 August) was recorded during which temperatures dropped slightly below average. At country level, this period is ranked as the third warmest since recording began in 1975, and slightly warmer than the corresponding period of the previous year (which was characterised by drought). Even though this summer was warmer than the last one, several rainfall events during August and September, and rainfall prior to this, prevented the occurrence of drought. More specifically, the first two dekads of August were rainy in the western parts of the country, while the rest of the review period was almost dry. This picture is gradually reversed towards eastern regions, which experienced a rainy September and dry August. Much of the grain maize in the southern regions is irrigated and is progressing well. However, it is expected that the rainfall events throughout the summer were also beneficial for the non-irrigated areas, which are mainly located in the northern areas. Harvesting has already started in several southern regions and is expanding to the northern areas. Overall, the outlook for grain maize is positive and the forecast is above the 5-year average.





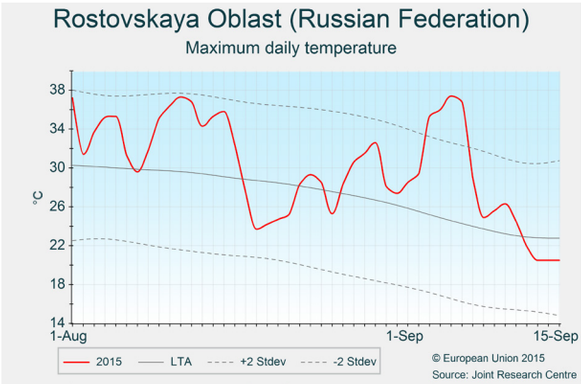
3.3 European Russia and Belarus

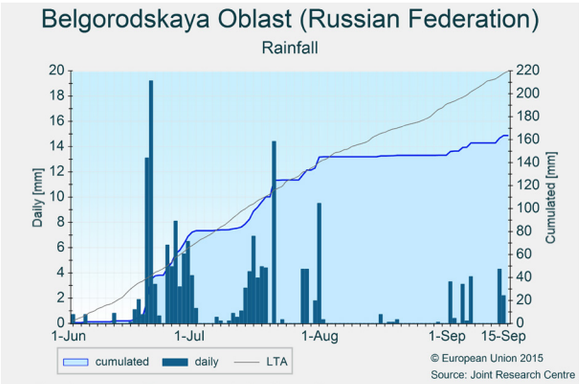
European Russia

Scarce precipitation in southern Russia

Dry weather prevailed in southern Russia during August, and the situation improved only slightly in early September. The scarce precipitation accelerated the wheat and barley harvest. Topsoil is dry, and rain is needed for a successful sowing campaign of winter wheat. The yield potential of grain maize remains high despite the dry August.

A positive thermal anomaly (1 to 3 °C) characterised the region between the Black Sea, the Caspian Sea and the western side of the Central Okrug during the review period (1 August-15 September). The first half of August and the first dekad of September were particularly warm in these areas. By contrast, daily mean temperatures in the Near Volga Okrug were 1 to 2 °C below the seasonal average for the period as a whole. After a rainy July, precipitation became scarce in southern Russia. The monthly precipitation sums were less than 20 mm in the Central and Southern Districts as well as in the southern regions of the Near Volga Okrug. This dry period allowed for the completion of the previously hampered harvesting of winter and spring cereals in these areas. Only the northern and north-eastern areas received near- or above-average precipitation in August. In September, the precipitation tendency increased in the northern half of the Central Okrug, some areas north of the Caucasus Mountains and along the Kazakh border, but a broad belt between the Sea of Azov and the South Ural Mountains remained quite dry. As a consequence, topsoil is very dry, raising concern about soil preparation, the sowing of winter cereals, the germination of seeds and crop emergence. The dry August conditions had little effect on the maize yield outlook in the Central and Near Volga okrugs, where water supply was mostly adequate in July during the flowering and early grain-filling phases. More relevant negative effects on yields are expected in the regions of the Southern, Near Volga and North Caucasian okrugs, where dry conditions started in early summer. The yield outlook for maize remains positive for the country as a whole.





Belarus

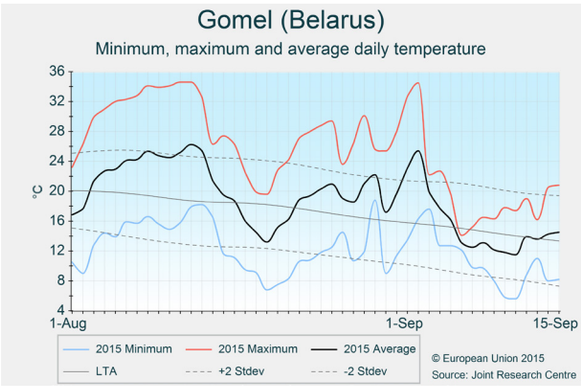
Unfavourable conditions for maize

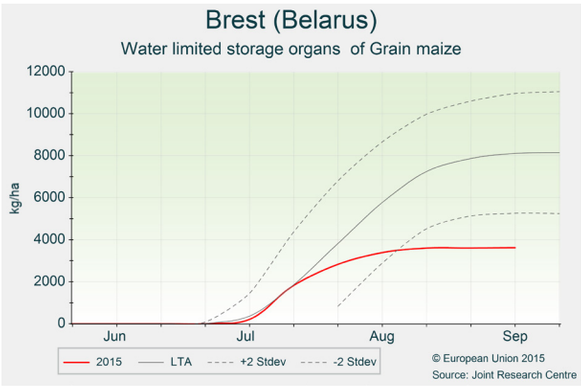
Temperatures were higher than usual since the beginning of August, and rainfall was scarce during the review period. As drought and hot temperatures affected summer crops during the grain-filling stage, the yield forecast has been revised downwards for maize.

August was extremely hot in Belarus, where maximum temperatures reached 34 °C for several days, particularly during the first half of the month. Although weather conditions returned to normal in September, the review period as a whole (from 1 August to 15 September) was the warmest recorded in our database since 1975. Rainfall levels were very low compared to the long-term cumulated values: only 30-50 mm of precipitation were registered compared to a normal range of about 100-110 mm.

The prolonged dry conditions combined with the high temperatures, negatively influenced summer crops during the grain-filling phases. Water and heat stress were particularly intense in the southern regions (Brest and Gomel), which experienced the hottest and driest period recorded in our database. According to our model simulations, maize development is about 2 weeks in advance, but storage organs biomass has been negatively impacted since the end of July. As some of the grain maize fields significantly impacted by the weather conditions may be converted to green maize, changes in cultivated area could contribute to a decrease in the total production.

Due to these unfavourable conditions, the yield forecast for maize was revised further downwards below the 5-year average and last year's levels. Spring barley and winter wheat yields remain far below last year's record levels, but above the 5-year average.





4. Crop yield forecasts

Country	TOTAL WHEAT t/ha					TOTAL BARLEY t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	5.90	**5.57**	5.44	-5.6	+2.5	4.90	**4.63**	4.49	-5.5	+3.1
AT	5.92	**5.50**	5.26	-7.2	+4.5	5.80	**4.91**	5.03	-15.4	-2.4
BE	9.41	**8.93**	8.75	-5.2	+2.0	9.30	**8.69**	8.65	-6.5	+0.5
BG	4.22	**4.30**	3.94	+1.9	+9.0	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	**7.65**	7.63	-11.3	+0.3	7.35	**6.52**	6.36	-11.3	+2.4
DK	7.78	**7.47**	7.07	-4.1	+5.6	5.87	**5.98**	5.52	+1.8	+8.2
EE	3.99	**3.76**	3.37	-5.8	+11.7	3.64	**3.18**	2.94	-12.8	+8.2
ES	2.99	**2.95**	3.09	-1.4	-4.5	2.49	**2.51**	2.66	+0.7	-5.7
FI	4.06	**3.60**	3.70	-11.3	-2.6	3.73	**3.18**	3.44	-14.6	-7.5
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	-11.5	-8.7
HR	4.14	**5.22**	4.70	+26.2	+11.1	3.82	**4.67**	4.14	+22.3	+12.9
HU	4.71	**4.48**	4.21	-4.9	+6.3	4.45	**4.06**	3.88	-8.7	+4.8
IE	9.96	**9.33**	8.84	-6.3	+5.6	8.05	**8.06**	7.39	+0.0	+9.1
IT	3.81	**3.71**	3.84	-2.8	-3.5	3.64	**3.62**	3.66	-0.4	-0.9
LT	4.56	**4.16**	4.13	-8.8	+0.8	3.80	**3.20**	3.21	-15.9	-0.3
LU	6.13	**6.00**	5.98	-2.2	+0.4	-	**-**	-	-	-
LV	3.75	**4.03**	3.60	+7.5	+11.8	3.56	**2.79**	2.94	-21.6	-5.0
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	9.11	**8.88**	8.80	-2.6	+0.8	6.75	**6.37**	6.19	-5.7	+3.0
PL	4.97	**4.27**	4.32	-14.1	-1.2	4.05	**3.45**	3.54	-14.8	-2.3
PT	2.06	**1.65**	1.50	-19.9	+9.6	2.18	**1.63**	1.57	-25.2	+3.7
RO	3.65	**3.46**	3.23	-5.2	+7.1	3.36	**3.07**	2.91	-8.7	+5.4
SE	6.80	**6.12**	5.95	-10.1	+2.9	4.78	**4.68**	4.45	-2.0	+5.4
SI	5.23	**4.96**	5.02	-5.2	-1.1	4.85	**4.35**	4.48	-10.2	-2.8
SK	5.46	**4.31**	4.32	-21.2	-0.3	4.87	**3.52**	3.66	-27.7	-3.9
UK	8.58	**8.09**	7.63	-5.7	+6.0	6.40	**6.05**	5.83	-5.5	+3.8

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	**5.81**	5.67	-5.4	+2.5	3.35	**3.20**	3.26	-4.3	-1.7
AT	5.98	**5.55**	5.30	-7.1	+4.8	4.78	**4.48**	4.50	-6.2	-0.5
BE	9.41	**8.93**	8.75	-5.2	+2.0	-	**-**	-	-	-
BG	4.22	**4.30**	3.94	+1.9	+9.0	-	**-**	-	-	-
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	6.51	**5.67**	5.48	-12.9	+3.5	-	**-**	-	-	-
DE	8.64	**7.67**	7.64	-11.2	+0.3	-	**-**	-	-	-
DK	7.78	**7.47**	7.07	-4.1	+5.6	-	**-**	-	-	-
EE	3.99	**3.76**	3.37	-5.8	+11.7	-	**-**	-	-	-
ES	3.04	**3.06**	3.31	+0.4	-7.5	2.67	**2.31**	2.09	-13.6	+10.6
FI	4.06	**3.60**	3.70	-11.3	-2.6	-	**-**	-	-	-
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	**9.33**	8.84	-6.3	+5.6	-	**-**	-	-	-
IT	5.29	**5.48**	5.38	+3.5	+1.8	3.13	**2.98**	3.13	-4.9	-4.7
LT	4.56	**4.16**	4.13	-8.8	+0.8	-	**-**	-	-	-
LU	6.13	**6.00**	5.98	-2.2	+0.4	-	**-**	-	-	-
LV	3.75	**4.03**	3.60	+7.5	+11.8	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	9.11	**8.88**	8.80	-2.6	+0.8	-	**-**	-	-	-
PL	4.97	**4.27**	4.32	-14.1	-1.2	-	**-**	-	-	-
PT	2.06	**1.65**	1.50	-19.9	+9.6	-	**-**	-	-	-
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	**4.37**	4.34	-20.1	+0.6	5.32	**3.31**	3.77	-37.8	-12.1
UK	8.58	**8.09**	7.63	-5.7	+6.0	-	**-**	-	-	-

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	**3.90**	3.91	-6.2	-0.3	5.92	**5.60**	5.36	-5.4	+4.5
AT	4.68	**3.69**	4.13	-21.1	-10.7	6.67	**5.88**	5.87	-11.9	+0.2
BE	-	-	-	-	-	9.30	**8.69**	8.65	-6.5	+0.5
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	**6.87**	6.71	-11.2	+2.3
DK	5.68	**5.89**	5.41	+3.6	+8.9	6.63	**6.36**	6.01	-4.0	+5.9
EE	3.64	**3.18**	2.94	-12.8	+8.2	-	-	-	-	-
ES	2.58	**2.56**	2.70	-0.5	-4.9	1.91	**2.19**	2.44	+14.7	-10.0
FI	3.73	**3.18**	3.44	-14.6	-7.5	-	-	-	-	-
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	-11.5	-8.7
HR	-	-	-	-	-	3.82	**4.67**	4.14	+22.3	+12.9
HU	3.89	**3.47**	3.36	-10.8	+3.1	4.67	**4.31**	4.15	-7.9	+3.8
IE	7.56	**7.43**	6.99	-1.7	+6.3	9.32	**9.18**	8.86	-1.5	+3.7
IT	-	-	-	-	-	3.64	**3.62**	3.66	-0.4	-0.9
LT	3.80	**3.20**	3.21	-15.9	-0.3	-	-	-	-	-
LU	-	-	-	-	-	-	-	-	-	-
LV	3.56	**2.79**	2.94	-21.6	-5.0	-	-	-	-	-
MT	-	-	-	-	-	-	-	-	-	-
NL	6.75	**6.37**	6.19	-5.7	+3.0	-	-	-	-	-
PL	3.82	**3.23**	3.39	-15.4	-4.7	4.68	**4.15**	4.07	-11.3	+2.0
PT	-	-	-	-	-	2.18	**1.63**	1.57	-25.2	+3.7
RO	2.44	**2.33**	2.09	-4.8	+11.0	3.69	**3.40**	3.28	-8.0	+3.5
SE	4.71	**4.60**	4.40	-2.5	+4.4	6.41	**6.44**	5.46	+0.4	+17.8
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	-21.7	+2.7
UK	5.86	**5.64**	5.37	-3.8	+5.0	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	**6.43**	7.02	-20.4	-8.5	4.23	**3.72**	3.58	-12.1	+3.9
AT	10.79	**9.76**	10.16	-9.6	-4.0	4.87	**4.25**	4.25	-12.6	+0.0
BE	10.50	**11.15**	10.98	+6.1	+1.5	-	-	-	-	-
BG	7.68	**4.94**	5.77	-35.8	-14.4	-	-	-	-	-
CY	-	-	-	-	-	-	-	-	-	-
CZ	8.43	**6.18**	7.74	-26.7	-20.2	4.99	**4.46**	4.61	-10.7	-3.3
DE	10.69	**9.44**	10.00	-11.7	-5.6	6.12	**5.38**	5.31	-12.1	+1.4
DK	-	-	-	-	-	6.36	**5.92**	5.83	-6.9	+1.5
EE	-	-	-	-	-	3.22	**2.94**	2.67	-8.6	+10.3
ES	11.24	**11.08**	10.90	-1.4	+1.7	1.72	**1.87**	2.05	+8.7	-8.8
FI	-	-	-	-	-	3.17	**2.87**	2.87	-9.7	-0.2
FR	10.02	**8.90**	9.19	-11.2	-3.2	4.90	**4.97**	4.91	+1.4	+1.2
GR	11.96	**11.81**	11.53	-1.3	+2.4	2.11	**1.85**	2.11	-12.2	-12.2
HR	8.11	**5.29**	6.06	-34.7	-12.7	-	-	-	-	-
HU	7.74	**5.25**	5.92	-32.1	-11.3	2.91	**2.80**	2.52	-3.9	+11.1
IE	-	-	-	-	-	-	-	-	-	-
IT	10.62	**9.35**	9.21	-12.0	+1.5	-	-	-	-	-
LT	6.05	**5.95**	6.69	-1.6	-11.0	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	**11.98**	11.35	-8.2	+5.6	-	-	-	-	-
PL	6.59	**5.42**	6.47	-17.8	-16.3	3.15	**2.83**	2.71	-10.3	+4.2
PT	8.44	**8.51**	8.05	+0.9	+5.7	0.94	**0.98**	0.87	+4.2	+12.5
RO	4.72	**2.95**	3.75	-37.5	-21.4	-	-	-	-	-
SE	-	-	-	-	-	6.51	**6.39**	5.75	-1.8	+11.1
SI	9.16	**7.52**	7.78	-17.9	-3.4	-	-	-	-	-
SK	8.39	**6.11**	6.47	-27.2	-5.5	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	**4.09**	4.16	-9.7	-1.6	3.62	**3.25**	3.13	-10.2	+3.8
AT	5.90	**5.29**	5.16	-10.3	+2.5	3.76	**3.30**	3.26	-12.0	+1.5
BE	-	-	-	-	-	4.81	**4.52**	4.33	-6.0	+4.5
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	**5.72**	5.27	-7.5	+8.5	4.27	**3.83**	3.76	-10.3	+1.9
EE	-	-	-	-	-	2.08	**1.94**	1.76	-6.9	+10.0
ES	2.33	**2.17**	2.28	-6.8	-4.9	2.46	**2.30**	2.22	-6.5	+3.3
FI	-	-	-	-	-	1.44	**1.29**	1.37	-10.4	-5.8
FR	5.22	**5.04**	5.30	-3.5	-5.0	3.66	**3.43**	3.37	-6.3	+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	**3.47**	3.53	-13.5	-1.6	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	**4.09**	3.98	-8.3	+2.6	3.70	**3.73**	3.49	+0.8	+6.9

Country	SUGAR BEETS t/ha					POTATO t/ha				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs	2014	2015	Avg 5yrs	%15/14	%15/5yrs
EU-28	77.08	**70.54**	70.46	-8.5	+0.1	34.95	**31.62**	31.45	-9.5	+0.6
AT	83.87	**68.67**	71.96	-18.1	-4.6	35.10	**32.04**	32.15	-8.7	-0.3
BE	81.75	**77.66**	76.05	-5.0	+2.1	54.00	**43.61**	46.89	-19.2	-7.0
BG	-	-	-	-	-	13.00	**13.84**	14.23	+6.5	-2.7
CY	-	-	-	-	-	-	-	-	-	-
CZ	70.28	**63.61**	62.19	-9.5	+2.3	29.07	**26.09**	27.25	-10.3	-4.3
DE	79.86	**69.61**	70.36	-12.8	-1.1	47.42	**43.02**	43.54	-9.3	-1.2
DK	59.70	**61.59**	62.65	+3.2	-1.7	43.12	**41.16**	39.91	-4.5	+3.1
EE	-	-	-	-	-	-	-	-	-	-
ES	92.21	**93.25**	85.06	+1.1	+9.6	31.89	**30.89**	30.14	-3.1	+2.5
FI	38.21	**36.15**	36.25	-5.4	-0.3	27.93	**25.70**	25.80	-8.0	-0.4
FR	93.26	**87.99**	88.11	-5.7	-0.1	47.94	**42.38**	44.03	-11.6	-3.8
GR	-	-	-	-	-	24.51	**25.92**	25.59	+5.8	+1.3
HR	63.60	**43.64**	51.03	-31.4	-14.5	-	-	-	-	-
HU	66.37	**53.08**	53.47	-20.0	-0.7	26.27	**22.84**	23.82	-13.1	-4.1
IE	-	-	-	-	-	-	-	-	-	-
IT	57.01	**57.97**	57.44	+1.7	+0.9	26.20	**25.65**	25.07	-2.1	+2.3
LT	53.00	**50.25**	50.90	-5.2	-1.3	18.00	**14.92**	16.07	-17.1	-7.1
LU	-	-	-	-	-	-	-	-	-	-
LV	-	-	-	-	-	18.00	**18.89**	17.45	+4.9	+8.2
MT	-	-	-	-	-	-	-	-	-	-
NL	87.40	**80.92**	79.19	-7.4	+2.2	45.00	**44.03**	43.88	-2.2	+0.3
PL	54.80	**49.80**	52.16	-9.1	-4.5	23.60	**20.90**	21.40	-11.4	-2.3
PT	-	-	-	-	-	19.84	**19.05**	17.14	-4.0	+11.1
RO	40.99	**29.73**	34.61	-27.5	-14.1	16.73	**13.00**	14.60	-22.3	-11.0
SE	59.77	**61.35**	58.91	+2.7	+4.2	32.51	**33.48**	32.08	+3.0	+4.4
SI	-	-	-	-	-	-	-	-	-	-
SK	-	-	-	-	-	-	-	-	-	-
UK	80.26	**71.72**	69.25	-10.6	+3.6	42.29	**41.43**	40.63	-2.0	+2.0

Country	SUNFLOWER t/ha				
	2014	2015	Avg 5yrs	% 15/14	% 15/5yrs
EU-28	2.15	**1.87**	1.91	-13.0	-2.0
AT	2.83	**2.62**	2.58	-7.3	+1.5
BE	-	-	-	-	-
BG	2.38	**2.24**	2.12	-5.9	+5.8
CY	-	-	-	-	-
CZ	2.27	**2.52**	2.36	+11.0	+6.8
DE	2.30	**2.01**	2.12	-12.8	-5.6
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	1.26	**1.03**	1.14	-18.1	-9.9
FI	-	-	-	-	-
FR	2.42	**2.28**	2.33	-6.1	-2.2
GR	1.96	**2.43**	2.16	+23.7	+12.1
HR	2.83	**2.65**	2.51	-6.6	+5.6
HU	2.60	**2.41**	**2.31**	-7.4	+4.2
IE	-	-	-	-	-
IT	2.20	**2.18**	2.22	-0.9	-1.9
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	1.05	**0.58**	0.65	-44.4	-10.7
RO	2.15	**1.54**	1.72	-28.4	-10.4
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	2.62	**2.27**	2.28	-13.5	-0.7
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 August 2015, received on 7.9.2015), Eurostat Eurobase (last update: 18.8.2015) and EES (last update: 18.8.2015). 2015 yields come from MARS crop yield forecasting system (output up to 20.9.2015).

Country	WHEAT (t/ha)				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs
BY	4.00	**3.49**	3.39	-12.7	+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

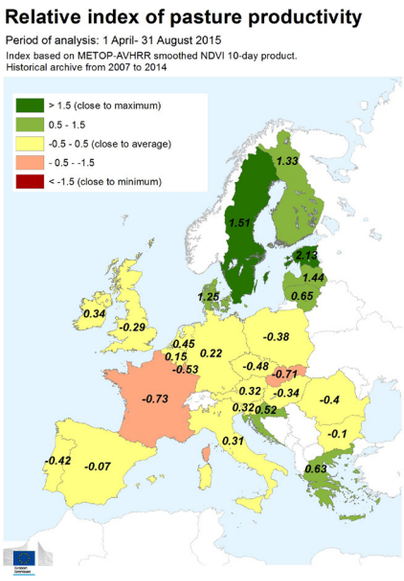
Country	GRAIN MAIZE (t/ha)				
	2014	2015	Avg 5yrs	%15/14	%15/5yrs
BY	5.43	**5.23**	5.57	-3.6	-6.1
DZ	-	**-**	-	-	-
MA	-	**-**	-	-	-
TN	-	**-**	-	-	-
TR	9.07	**9.13**	7.98	+0.7	+14.4
UA	6.07	**5.59**	5.61	-8.0	-0.3

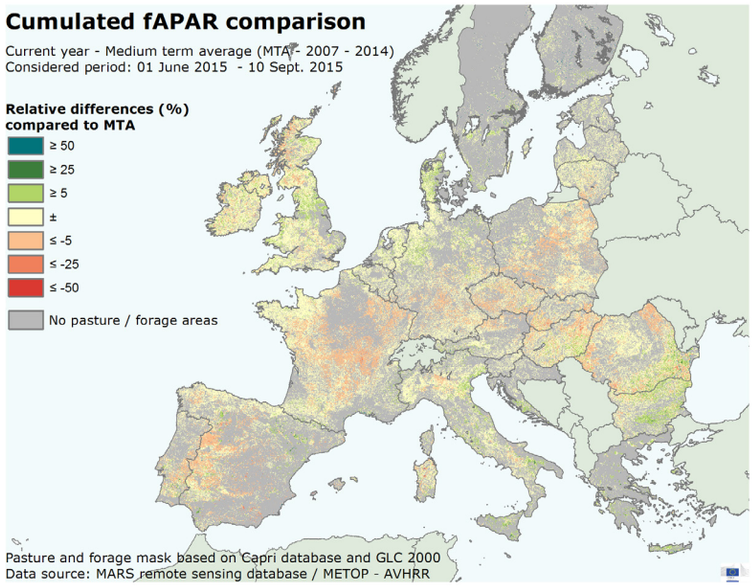
NB: Yields are forecast for crops with more than 10 000 ha per country.
Sources: 2010-2014 data come from FAO, Turkish Statistical Office, PSD-online, INRA Maroc, MinAGRI Tunisia and DSASI Algeria.
*2014 yields come from MARS crop yield forecasting system as reported values were not available.
2015 yields come from MARS crop yield forecasting system (output up to 20.9.2015).

5. Pastures in Europe — regional monitoring

Hot and dry conditions affected grassland growth in Central and Eastern Europe

Successive heat waves affected central and southern Europe during July and August, and caused a sharp decrease in biomass production in France, southern Germany, the Czech Republic, Slovakia and Poland. In northern Europe, by contrast, slightly colder-than-usual conditions and sufficient rainfall helped pasture areas attain average to high productivity levels.





Methodological note

The relative index of pastures productivity is a synthetic indicator of biomass formation based on the integration of the NDVI remote sensing product over pasture areas at country level for a certain period of time (from 1 April to 10 September in this bulletin). The spatial aggregation from remote sensing image pixels to a country-level index was made using a pasture mask from the Common Agricultural Policy regionalised impact model (CAPRI, http://www.capri-model.org). The index shows the relative position of the current season within the historical series from 2007 to 2014. A value of 0 indicates that biomass production in the current season is similar to the medium-term average. Values greater than 1.5 and less than - 1.5 indicate that biomass production in the current season is close to, respectively, the historical maximum and minimum of the period 2007-2014.

Dry conditions limited grasslands growth in northern Spain; biomass production on average in Italy

Higher-than-usual temperatures and scarce precipitation have characterised this summer in northern **Spain**. After a rather favourable spring for pasture productivity, the summer conditions led to a reduction in growth rates in Galicia and Asturias from July onwards. The reduction in grassland productivity was less evident in Cantabria and País Vasco thanks to a rainy period in mid-June that helped maintain satisfactory growth rates. Weather conditions since the second half of August have been more favourable — with mild temperatures and substantial rainfall — and therefore an improvement of grassland conditions is expected for the second half of September. Overall, the 2015 pasture productivity index is average for the country as a whole.

Unusually hot temperatures during the summer months were also registered in northern **Italy**: daily averages were often close to 30 °C from mid-July to mid-August. As a consequence of these high temperatures, the high biomass production rates at the end of spring in the grassland and green maize areas of Veneto, Emilia-Romagna and Piemonte fell to seasonal levels in July and August. Close-to-average precipitation during that period prevented further damages. In Lombardia, by contrast, the adverse effects of the summer heat waves were more appreciable since no significant rainfall was registered in July. This led to a sudden drop in soil moisture levels and, therefore, an early senescence of green maize in the second half of the month. For the country as a whole and aggregated for the entire season, the pasture productivity index is slightly above average.

Grassland areas in France affected by hot and dry conditions; normal conditions in the UK

After a favourable spring, the summer weather conditions in the centre and north-east of **France** were adverse for pastures. Temperatures increased in June and remained unusually high until mid-August. Rainfall was sparse and insufficient to satisfy the increasing water requirements of grasslands. Remote sensing imagery revealed exceptionally low levels of photosynthetic activity as a consequence of these dry conditions. From the second half of August, a progressive recovery towards average growth rates was observed in central France (*Limousin and Auvergne*) thanks to abundant rainfall and a moderate decrease in temperatures. Adverse weather persisted, however, in the north-east (Lorraine and *Champgane-Ardenne*), and also in **Luxembourg**, where biomass production rates remain unusually low. Pasture productivity has been near average throughout the summer in western regions (*Bretagne, Poitou-Charentes*, and *Midi-Pyrenees*), the **Netherlands** and **Belgium**.

Grasslands in the **UK** and **Ireland** presented average biomass production rates during summer. Temperatures were slightly colder than usual and rainfall slightly above the long-term average in the main grassland areas. In northern **Scotland**, however, chilly conditions until the end of June constrained grassland development. Since then, biomass production rates increased, reaching seasonal values by mid-August.

Unfavourable conditions in Central Europe

The spatial distribution of pasture productivity in **Germany** during summer depicts two contrasting regions. Grasslands in the northern half of the country (e.g. Weser-Ems, Schleswig-Holstein and Sachsen-Anhalt) present higher-than-usual biomass production levels, thanks to mild temperatures and abundant precipitation, mainly concentrated in the second half of July and August. In the southern region of Bayern, by contrast, rainfall scarcity and unusually warm temperatures constrained pasture productivity, which has been substantially below seasonal levels during most of the summer. Overall, the results for the whole country are close to those of previous years. In **Austria**, biomass production in pastures is also around average.

In the **Czech Republic** and **Slovakia**, grasslands experienced similar conditions to those in southern Germany. Temperatures were exceptionally high in July and August, and cumulated precipitation during that period was half that of an average year, with only a short period of 5 days in mid-August experiencing considerable precipitation. As a consequence, this season's results to date are below average.

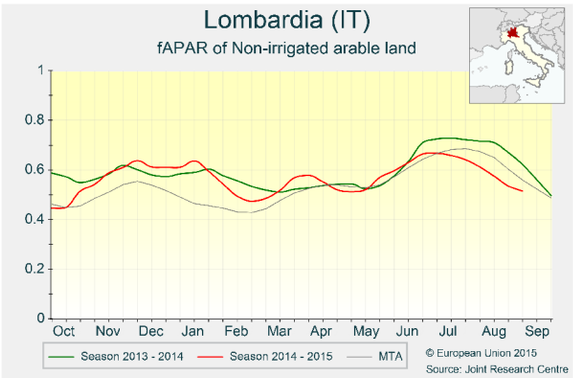
Dry conditions affect grasslands in Poland; positive season in the other Baltic countries

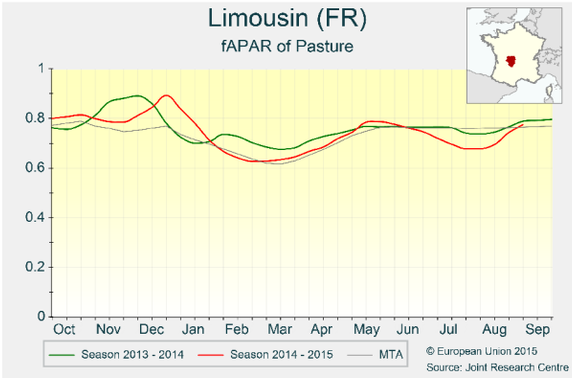
Hot and dry conditions in July and August negatively impacted pasture growth in most of **Poland**. The regions in the centre and south of the country (e.g. *Mazowieckie, Wielopolskie* and *Dolnośląskie*) exhibited a progressive decrease in grasslands' photosynthetic activity from mid-July onwards. Only in the north (*Warwińsko-Mazurskie* and *Pomorskie*), where temperatures in June-July were close to the average, did pasture areas present average production rates.

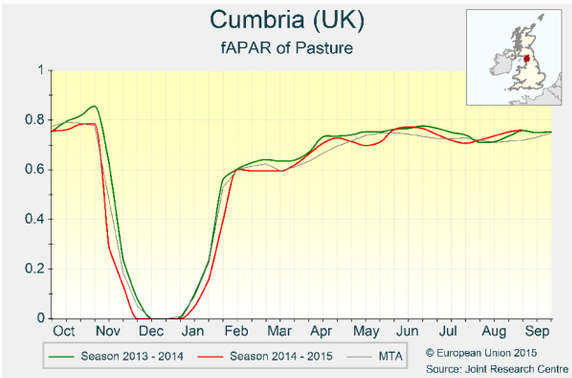
The season is highly positive for the other Baltic countries, where weather conditions in summer were favourable for pastures. Temperatures in **Finland**, **Sweden, Denmark, Estonia** and **Latvia** were slightly below seasonal values during most of the summer period, and precipitation was sufficient to support high productivity rates. In **Lithuania**, the lack of rainfall in August somewhat curbed the high productivity rates observed during most of the growing season.

Heat wave constrained pasture growth in the south-east

Exceptionally warm temperatures observed in July and August limited pasture productivity in most of **Romania** and the east of **Hungary** (*Alföld és Észak*), where the total precipitation registered during the summer months was insufficient to satisfy the water demand of grasslands. That resulted in the early senescence of pastures, shown by the significant decrease in the photosynthetic activity of pasture areas observed through remote sensing images since mid-July. Weather conditions were slightly more favourable in the western half of Hungary, south-western Romania (*Sud-Est* and *Sud-Muntenia*) and **Bulgaria**. Cumulative rainfall from June to August was close to seasonal values in these regions, which helped maintain average levels of biomass production in grassland and fodder maize areas throughout the summer period.


Lombardia (IT)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre


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


Cumbria (UK)
fAPAR of Pasture
1
0.8
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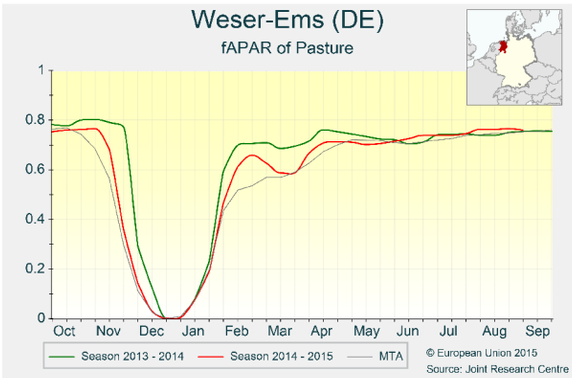
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre


Weser-Ems (DE)
fAPAR of Pasture
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0.8
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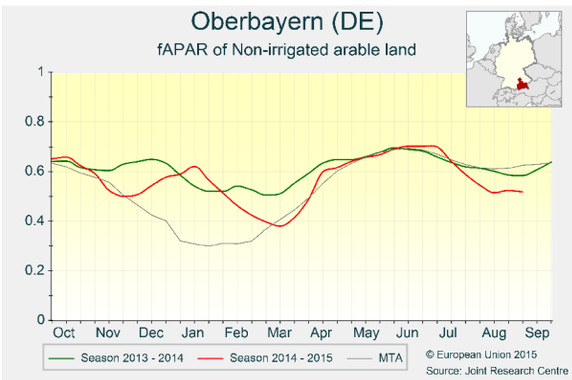
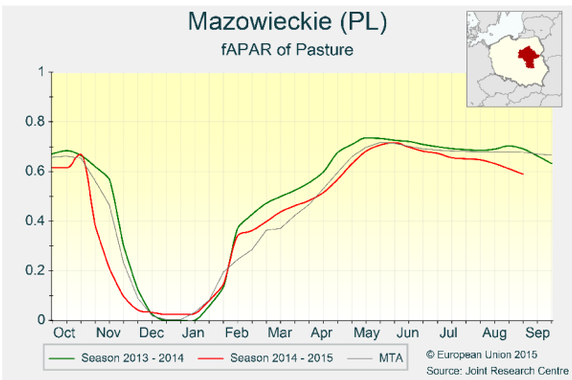
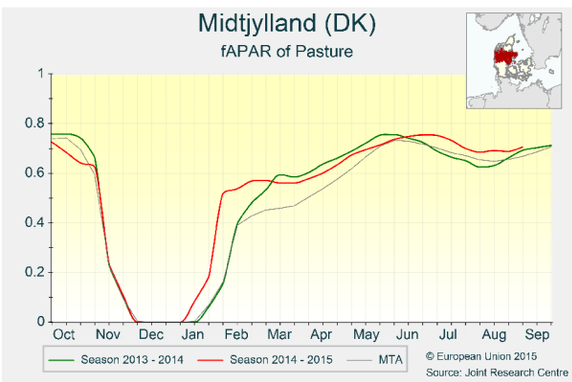
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre


Oberbayern (DE)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre


Mazowieckie (PL)
fAPAR of Pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre


Midtjylland (DK)
fAPAR of Pasture
1
0.8
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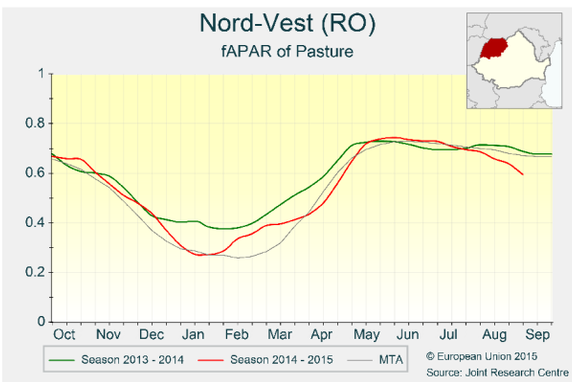
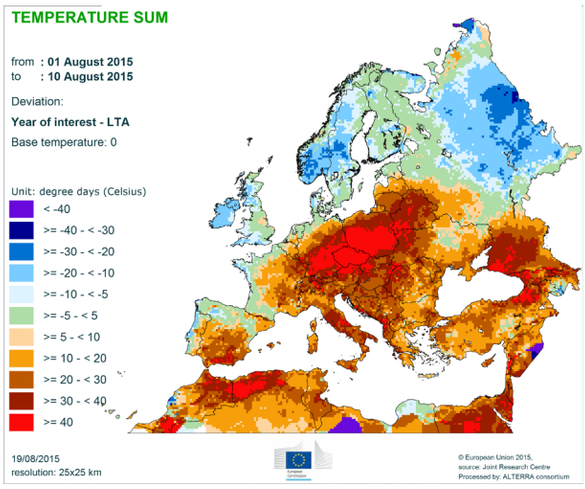
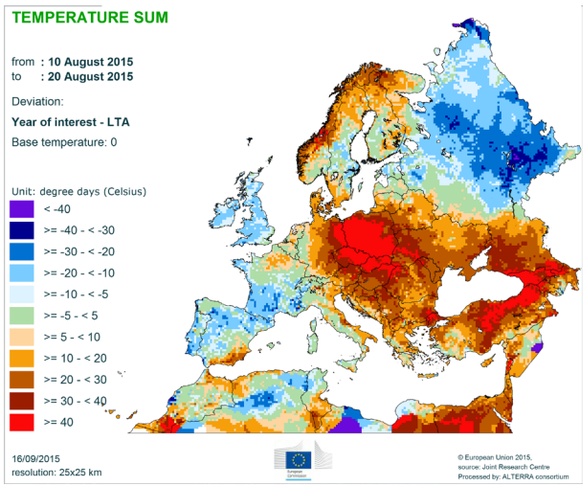
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre

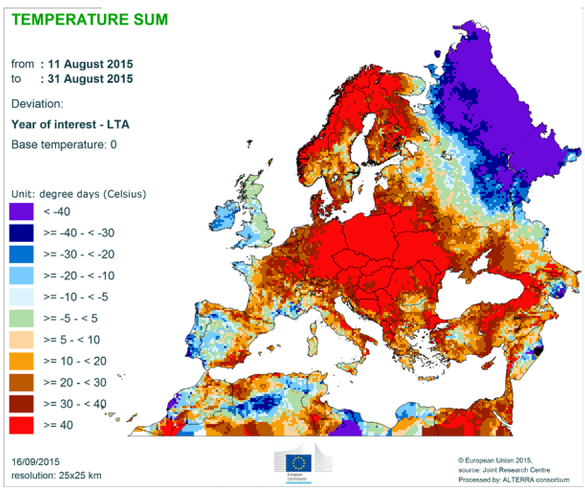

Nord-Vest (RO)
fAPAR of Pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre

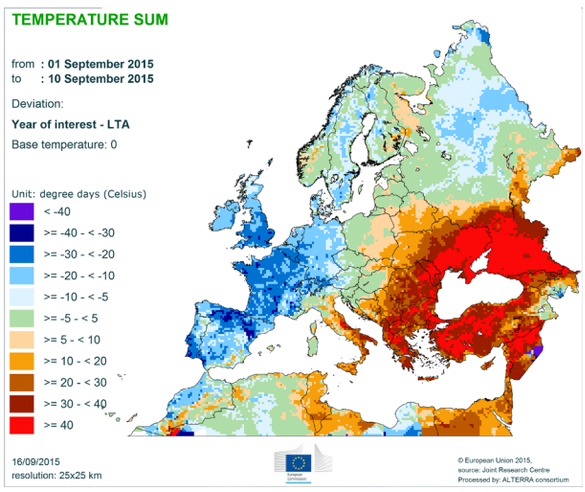
6. Atlas

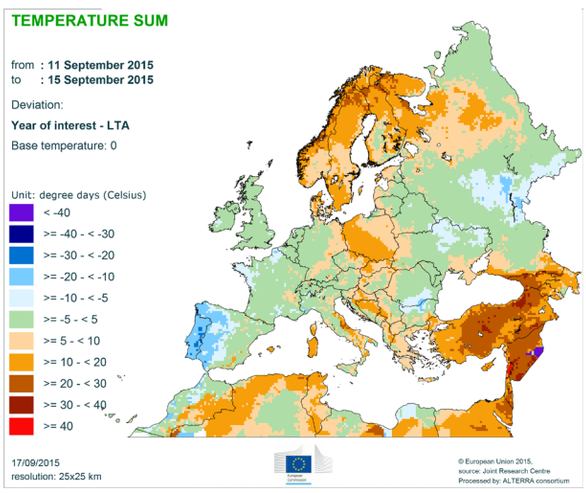
Temperature

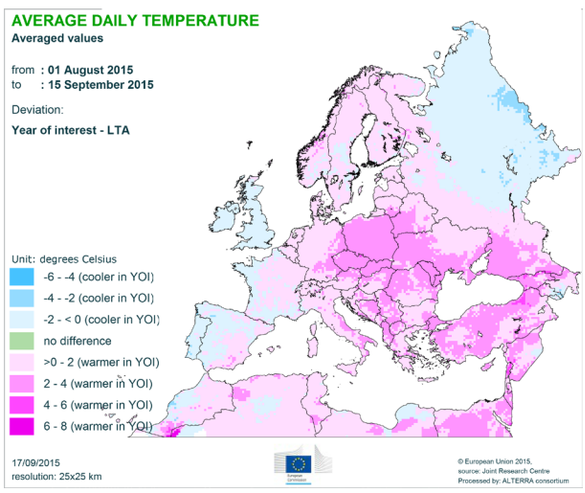




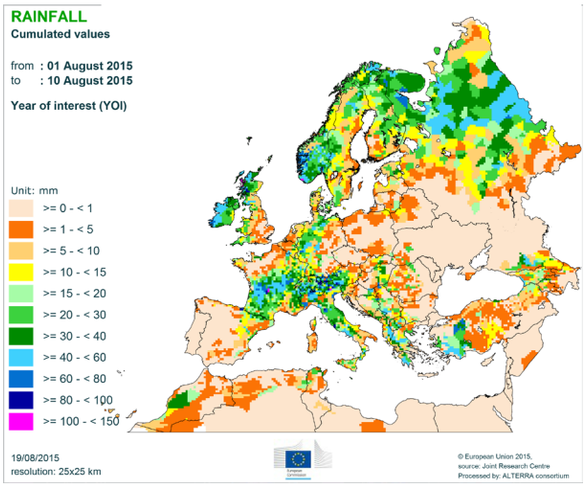


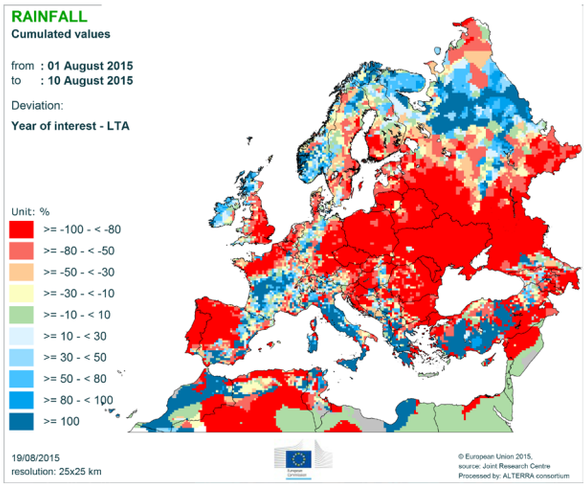


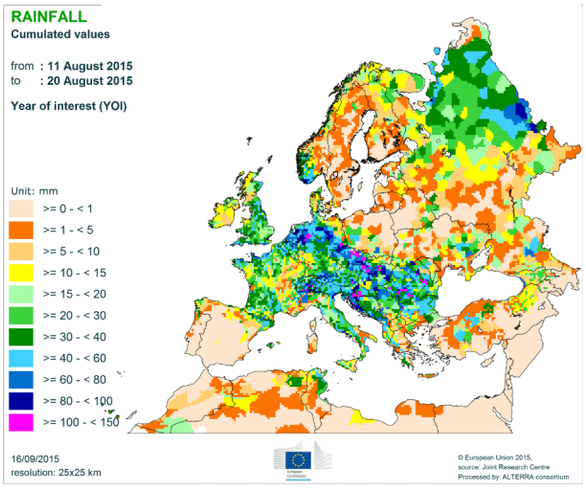


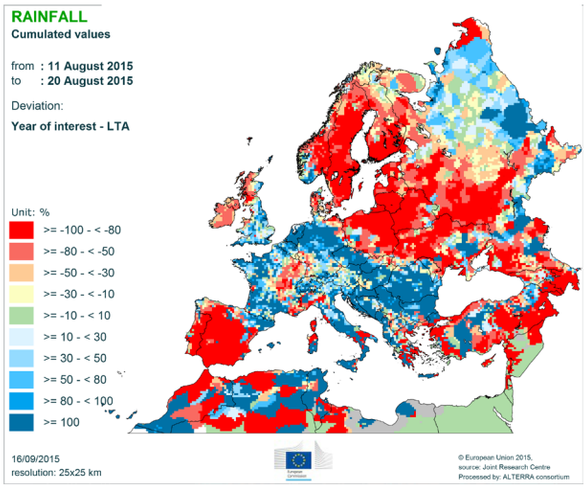


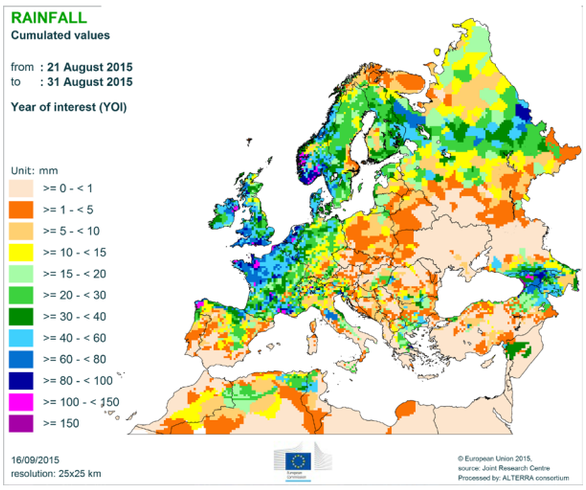
Precipitation

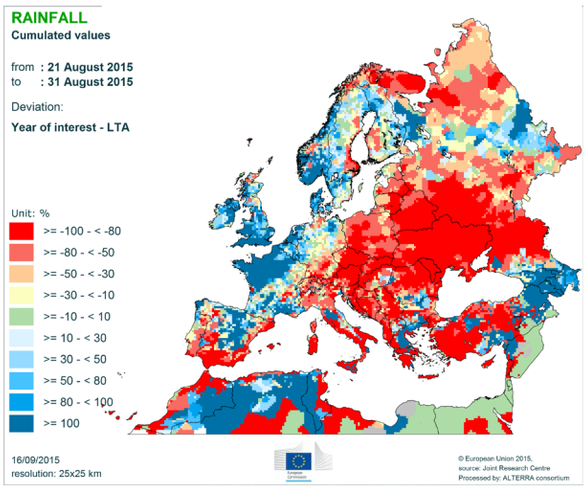


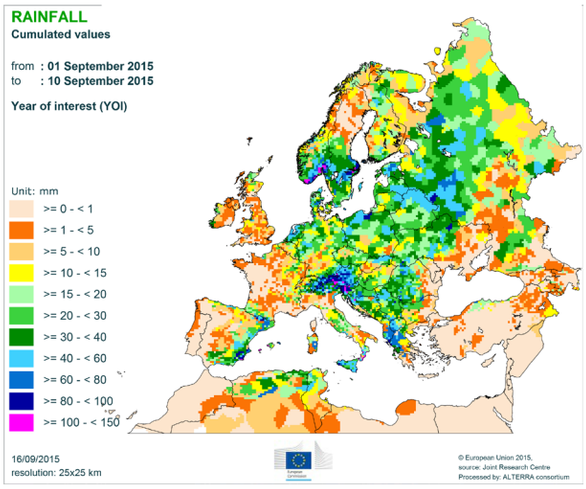


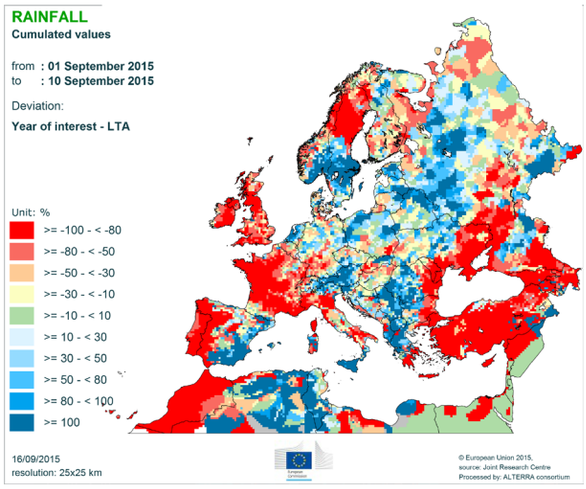


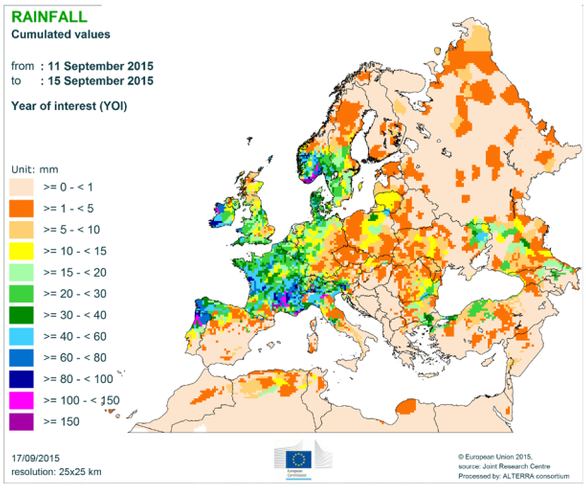


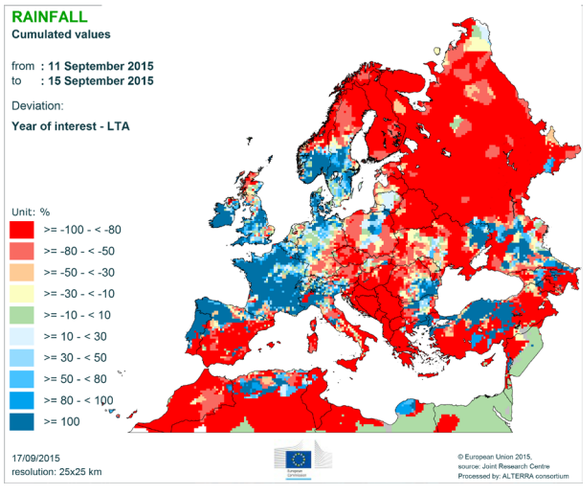




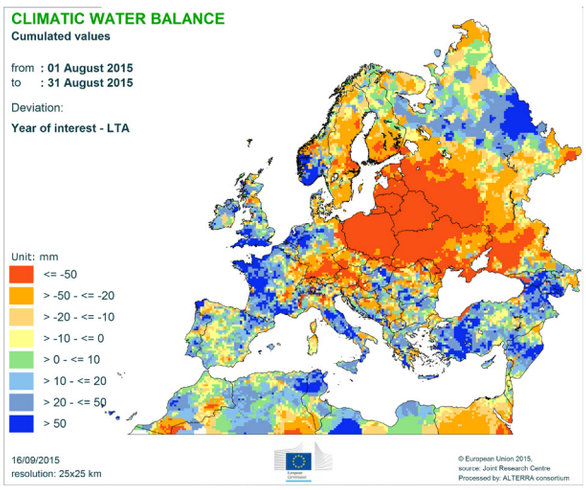


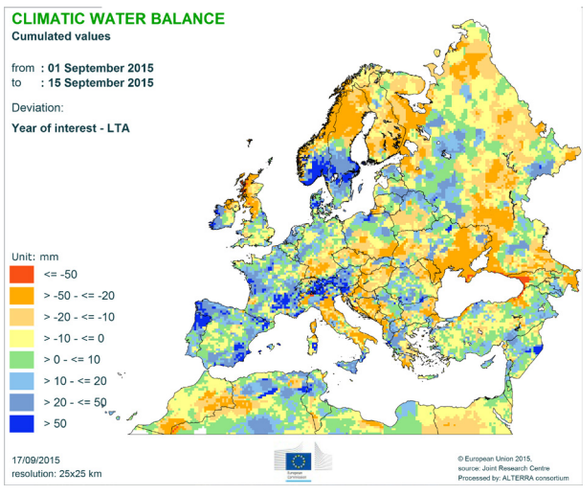




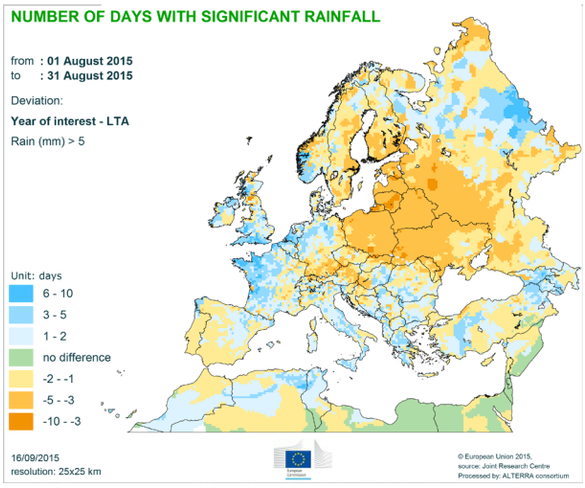


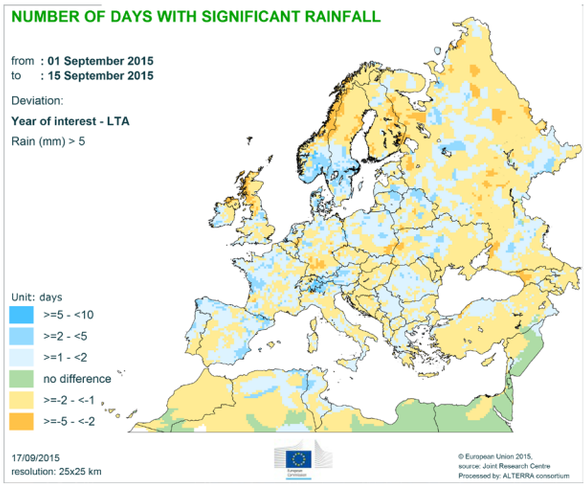
Climatic water balance

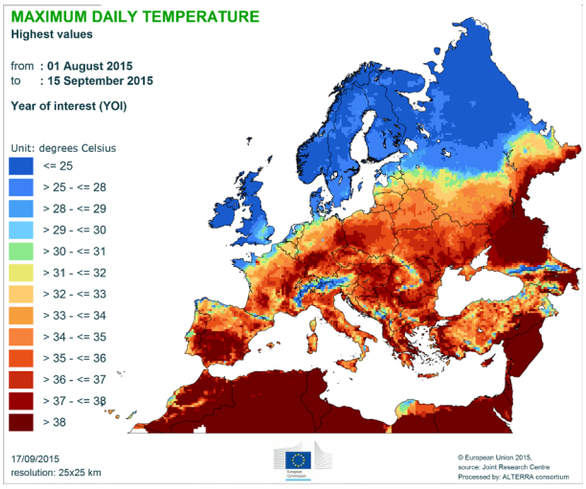


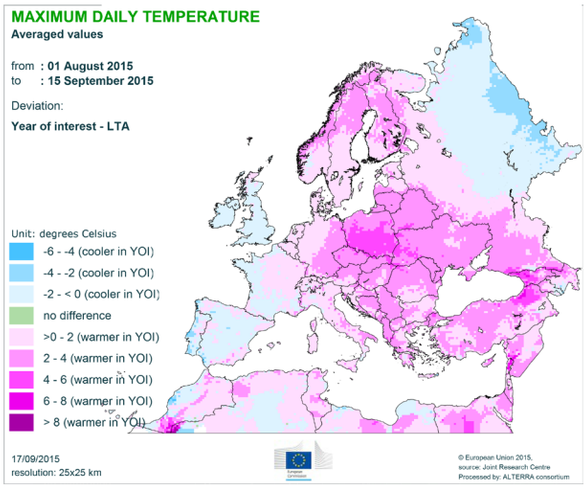


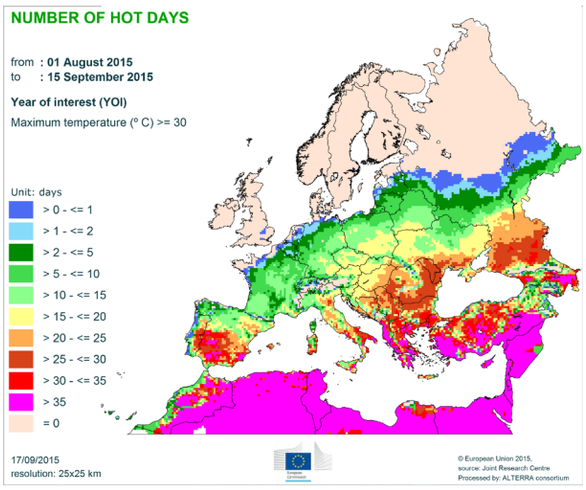
Weather events

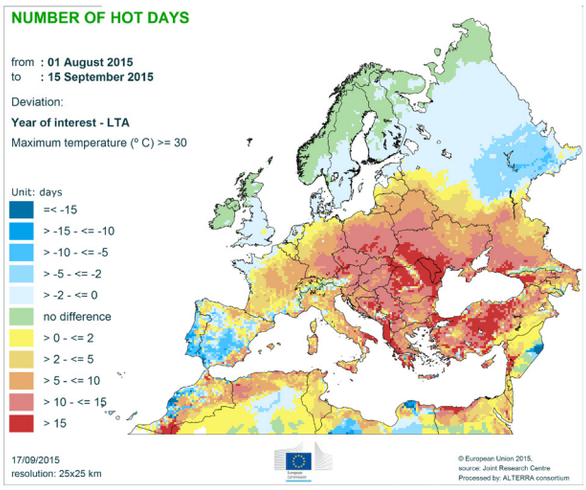




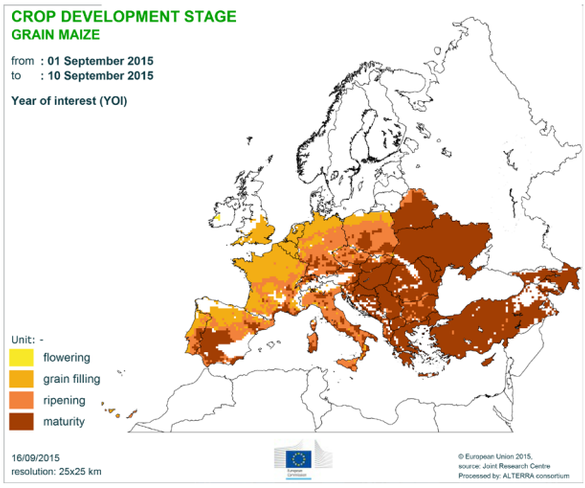


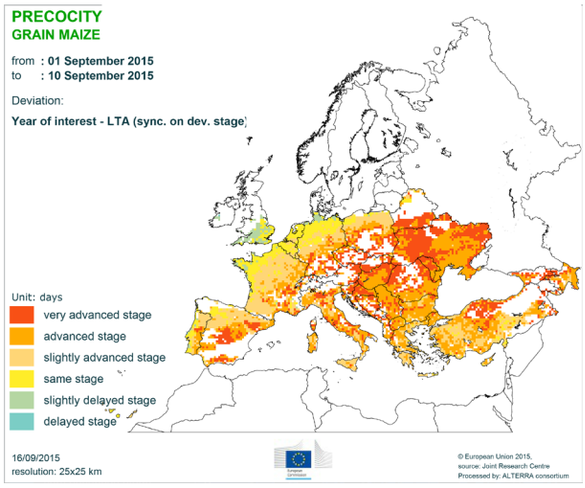


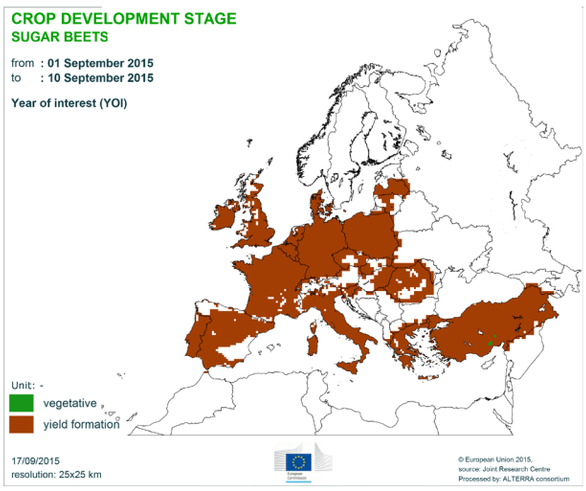


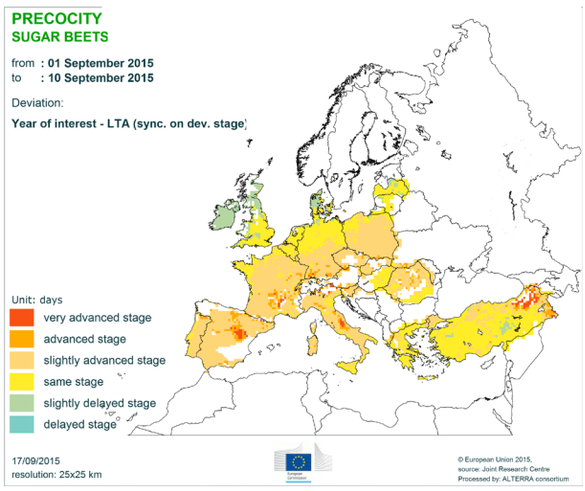


Crop development stages and precocity

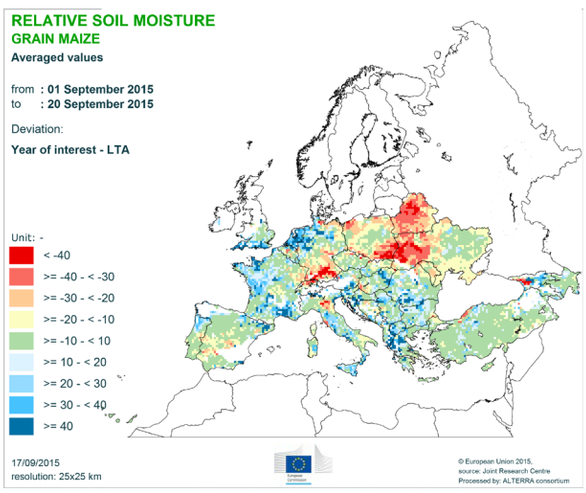


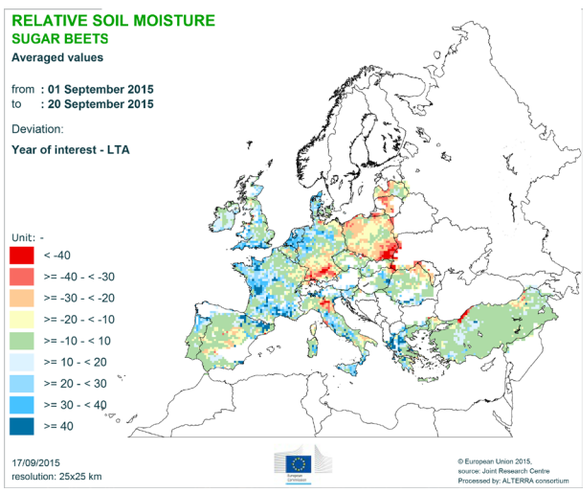




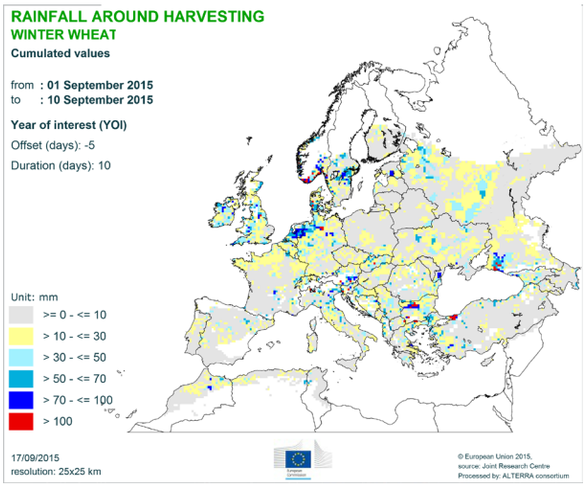


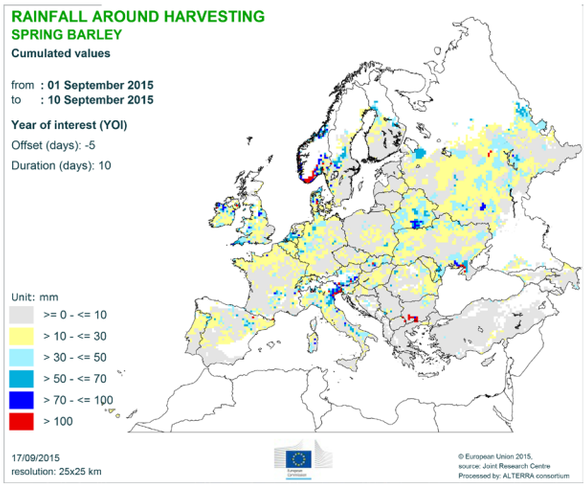
Relative soil moisture



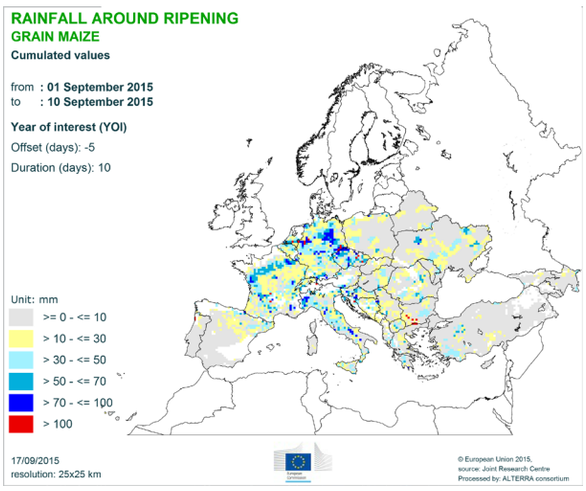


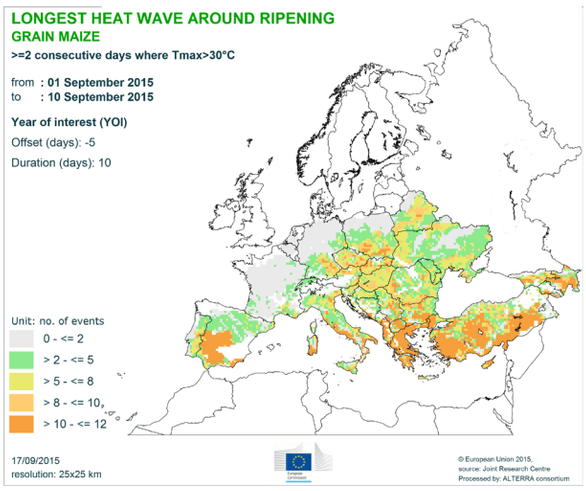
Rainfall around harvesting

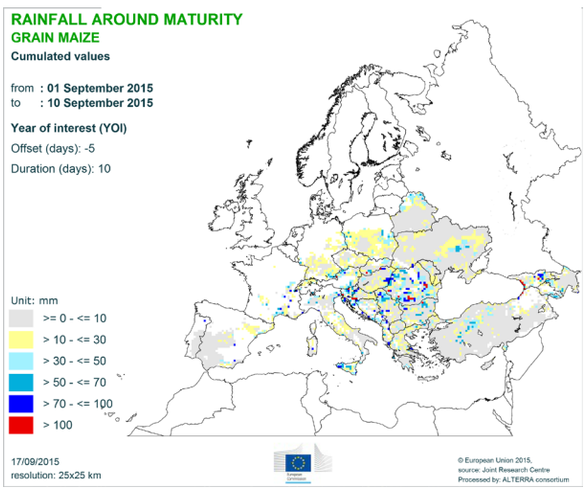


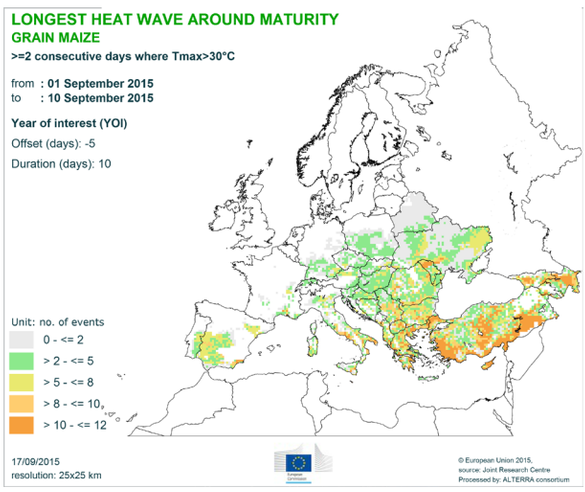


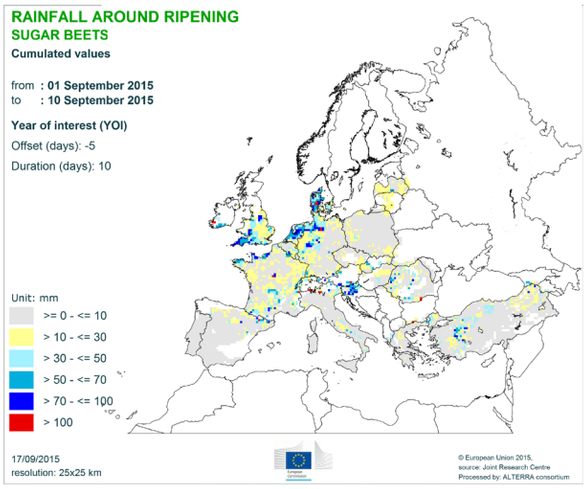
Rainfall and longest heat wave around certain crop development stages

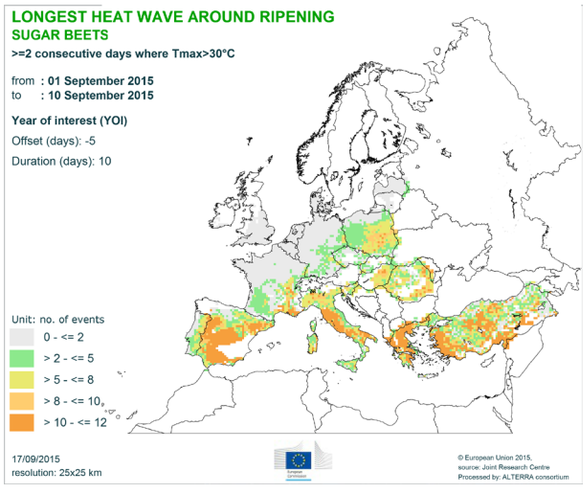









RAINFALL AROUND RIPENING
SUGAR BEETS
Cumulated values
from : 01 September 2015
to : 10 September 2015
Year of interest (YOI)
Offset (days): -5
Duration (days): 10
Unit: mm
>= 0 - <= 10
> 10 - <= 30
> 30 - <= 50
> 50 - <= 70
> 70 - <= 100
> 100
17/09/2015
resolution: 25x25 km
© European Union 2015.
source: Joint Research Centre
Processed by: ALTERRA consortium


LONGEST HEAT WAVE AROUND RIPENING
SUGAR BEETS
>=2 consecutive days where Tmax>30°C
from : 01 September 2015
to : 10 September 2015
Year of interest (YOI)
Offset (days): -5
Duration (days): 10
Unit: no. of events
0 - <= 2
> 2 - <= 5
> 5 - <= 8
> 8 - <= 10
> 10 - <= 12
17/09/2015
resolution: 25x25 km
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LB-AM-15-009-EN-C

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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The current MARS* Bulletin is a European Commission publication from AGRI4CAST (JRC/IES MARS Unit).

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*MARS stands for Monitoring Agricultural Resources

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Publications Office

ISSN Print 1831-9793
ISSN PDF 2314-9736