European Commission

Period covered: 1 July–18 August
Issued: 24 August 2015

Crop monitoring in Europe

MARS Bulletin Vol. 23 No 8 (2015)

Yield outlook for summer crops drops further

Yield forecasts for spring and summer crops at the EU-28 level have been revised downwards for the second consecutive bulletin due to continued hot and mostly dry conditions in large parts of Europe. Maize and sunflower crops were particularly affected. The yield outlook for winter cereals is slightly improved thanks to favourable weather conditions in northern parts of Europe. Overall, the yield forecast for total cereals dropped to almost 10 % below last year's level, and to 1 % below the 5-year average.

Large areas of Europe have been negatively impacted by high temperatures and dry conditions, hitting summer crops during their most critical grain-filling stage. In southern Spain, the already weak development of summer crops has been further impacted by very high temperatures. In Italy, grain yield expectations were further reduced due to the latest heat wave at the beginning of August. Record temperatures and critically low soil moisture levels led to critical situations in eastern France and southern Germany. Another area of concern is the status of summer crops in Poland, which have been affected by the hot and dry conditions. The combined effect of persistently high temperatures since mid-August and the absence of relevant precipitation also impacted the grain formation of maize in the Czech Republic, northern Austria, Slovakia, Hungary, Romania and Bulgaria. However, recent rain led to a partial recovery of crop conditions in those countries.

AREAS OF CONCERN - EXTREME WEATHER EVENTS

Crop	Yield t/ha				
	2014	MARS 2015 forecasts	Avg 5yrs	% 15/14	% 15/5yrs
TOTAL CEREALS	5.70	**5.15**	5.21	-9.7	-1.1
Total Wheat	5.90	**5.57**	5.44	-5.5	+2.5
soft wheat	6.14	**5.81**	5.67	-5.4	+2.5
durum wheat	3.35	**3.20**	3.26	-4.5	-1.9
Total Barley	4.90	**4.62**	4.49	-5.8	+2.8
spring barley	4.16	**3.87**	3.91	-6.9	-1.0
winter barley	5.92	**5.61**	5.36	-5.3	+4.7
Grain maize	8.06	**6.40**	7.02	-20.5	-8.8
Rye	4.22	**3.72**	3.58	-12.0	+3.8
Triticale	4.53	**4.09**	4.16	-9.8	-1.7
Other cereals	3.13	**2.85**	3.56	-8.7	-19.7
Rape and turnip rape	3.62	**3.25**	3.13	-10.2	+3.8
Potato	34.95	**31.83**	31.45	-8.9	+1.2
Sugar beet	77.08	**71.35**	70.46	-7.4	+1.3
Sunflower	2.15	**1.83**	1.91	-14.9	-4.0

Issued: 22 May 2015

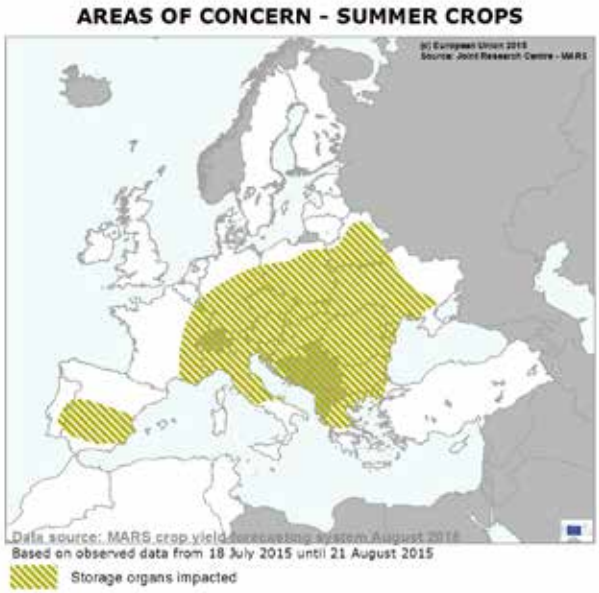
Joint Research Centre

1. Agro-meteorological overview

1.1 Areas of concern

The extreme weather map displays large areas in Europe where high temperatures and soil moisture deficits have negatively impacted summer crops in the most critical grain-filling stage.

In southern Spain, the already weak development of summer crops has been further impacted by very high temperatures at the end of July. In Italy, the latest heat wave at the beginning of August further reduced grain-yield expectations, especially for non-irrigated crops. Extremely high temperatures were recorded in eastern France and southern Germany during the same period. Soil moisture is critically low in those regions, in some places reaching only around 10 %, and irrigation is essential to avoid crop failure. Another area of concern is the status of summer crops in Poland, where the persistent lack of precipitation caused a general water shortage and irrigation is not guaranteed. Summer crop conditions are critical locally. In the Czech Republic, northern Austria, Slovakia, Hungary, Romania and Bulgaria, the combined effect of persistently high temperatures since mid August and the absence of relevant precipitation impacted the grain formation of maize. However, recent rainfall led to a partial recovery of crop conditions. Summer crops are also affected in north-western Ukraine and Belarus, due to low soil moisture levels.



1.2 Meteorological review (1 July-18 August)

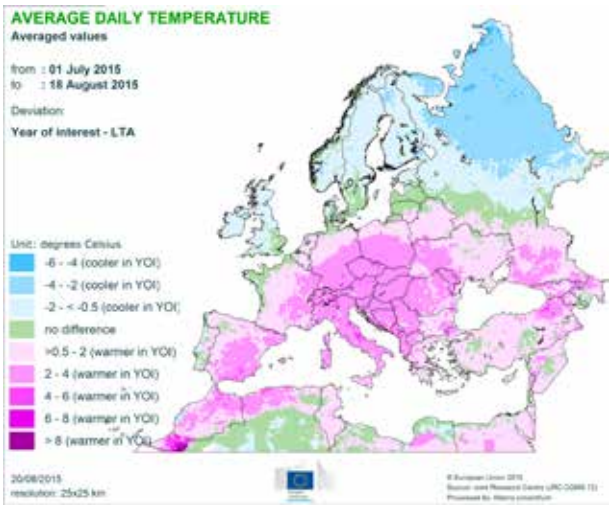
The period since the beginning of July has been characterised by substantially warmer-than-average weather conditions in central Europe, Spain, France, the Balkan peninsula and the Black Sea regions. This period was the warmest in our records in many regions of central Europe, Italy and the Balkan peninsula, where a series of heat waves has affected the growth of summer crops. A rainfall deficit was recorded in eastern France, northern Italy, major parts of central and eastern Europe, and the Balkan peninsula.

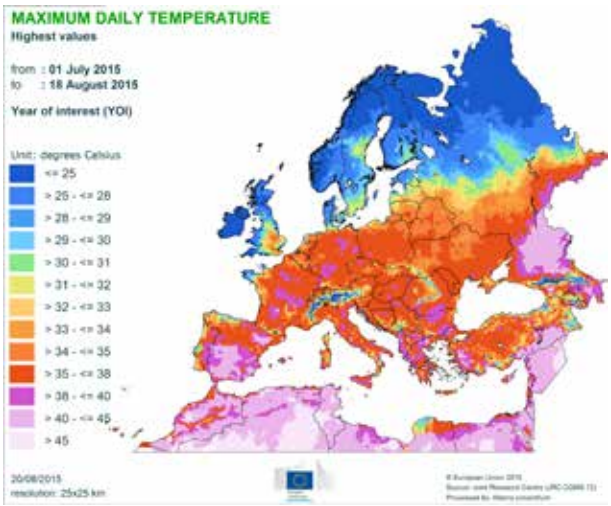
Observed temperatures

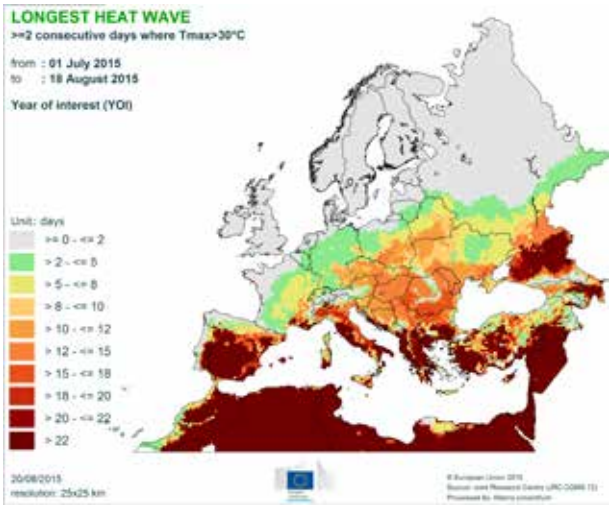
The period since the beginning of July was characterised by substantially warmer-than-average weather in central Europe, Spain, France, the Balkan peninsula and the Black Sea regions. This period was the warmest in our records in many regions of central Europe, Italy and the Balkan peninsula, where a series of heat waves has affected the growth of summer crops. At the beginning of July, a severe heat wave affected large parts of southern, central and eastern Europe. Maximum daily temperatures were close to or even exceeded 40 °C in the Iberian peninsula, locally in France, and in the southern part of European Russia. Maximum daily temperatures were close to 38 °C in other regions affected by the heat wave. A second heat wave struck southern Europe, France and large parts of central Europe during the second dekad of July, with maximum temperatures rising to close to 38 °C in most of the affected regions. A weather perturbation at the end of July, moving from the west towards eastern Europe, interrupted the heat wave in western and central Europe as well as the northern Balkans. However, high temperatures persisted over central

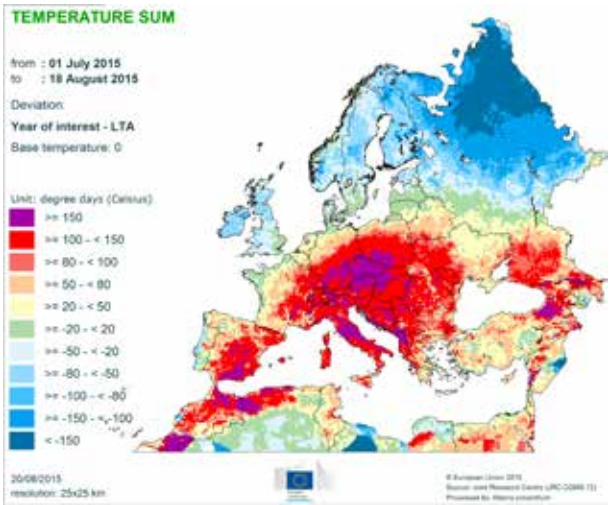
and southern Italy, central and southern parts of the Balkan peninsula, the Black Sea regions, the southern part of European Russia, and Turkey. At the beginning of August, a third heat wave episode occurred in major parts of central, southern and eastern Europe. The maximum daily temperature exceeded 35 °C in the agricultural areas most affected, and temperatures close to 40 °C were observed locally. The latest heat wave episode was interrupted by a weather perturbation in the middle of August, which led to a drop in temperatures in affected areas. On the other hand, the northern part of the British Isles, Ireland, northern and north-eastern Europe remained colder than usual during the period of analysis, with air temperatures close to 2 °C below the long-term average.

Episodes of heat stress can reduce crop yield considerably as they lead to low resource-use efficiency and accelerated senescence. The exceptionally high temperatures have lowered the summer crop yield potential; crops have suffered most in areas where heat stress was accompanied by a severe soil moisture deficit. Active temperature sums considerably exceeded the long-term average in central, southern and eastern Europe, and eastern France. By contrast, a delay in crop development was observed in the northern British Isles, Ireland and major parts of northern Europe.





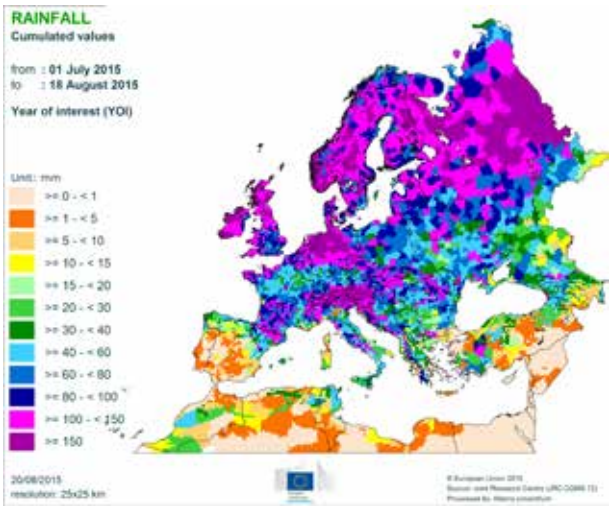


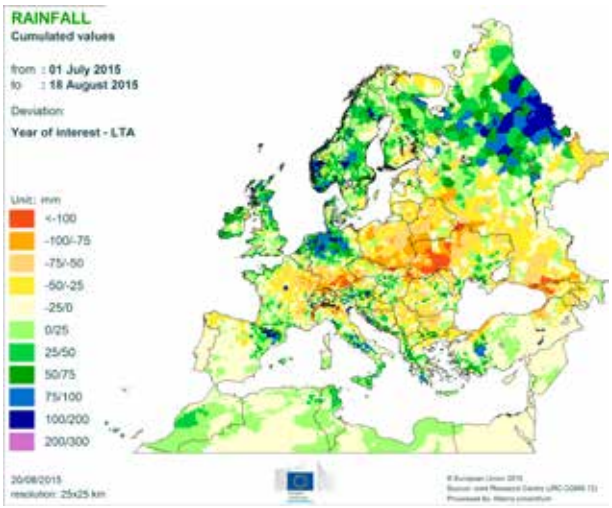


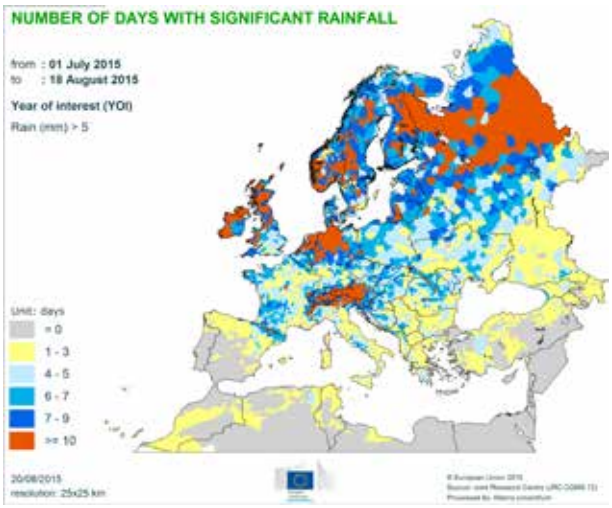
Observed precipitation

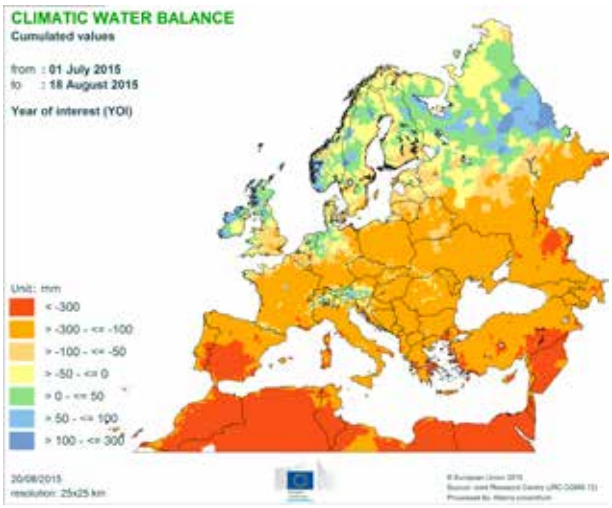
A pronounced rainfall deficit was recorded in July in central, eastern and southern France, southern parts of the Iberian peninsula, central and northern Italy, southern Germany, the Czech Republic, western Poland, central and southern parts of the Balkan peninsula, Turkey, the western half of Ukraine and southern parts of European Russia. A rainfall surplus was recorded in northern Germany, the British Isles and northern Europe. Dry weather was observed in the southern part of the Iberian peninsula, northern Italy, some areas of the central Balkans and large areas of Turkey. During the first half of August, substantially drier-than-usual conditions were observed in eastern Europe, Poland, southern Romania, Bulgaria, the Iberian peninsula, the south-eastern United Kingdom, Sweden and Finland. Dry weather was recorded in the Iberian peninsula and many regions of eastern Europe. The first half of August was wetter than usual in central and southern Italy, south-western France, the western Balkans, north-western Germany, western Turkey and the northernmost part of Europe.

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



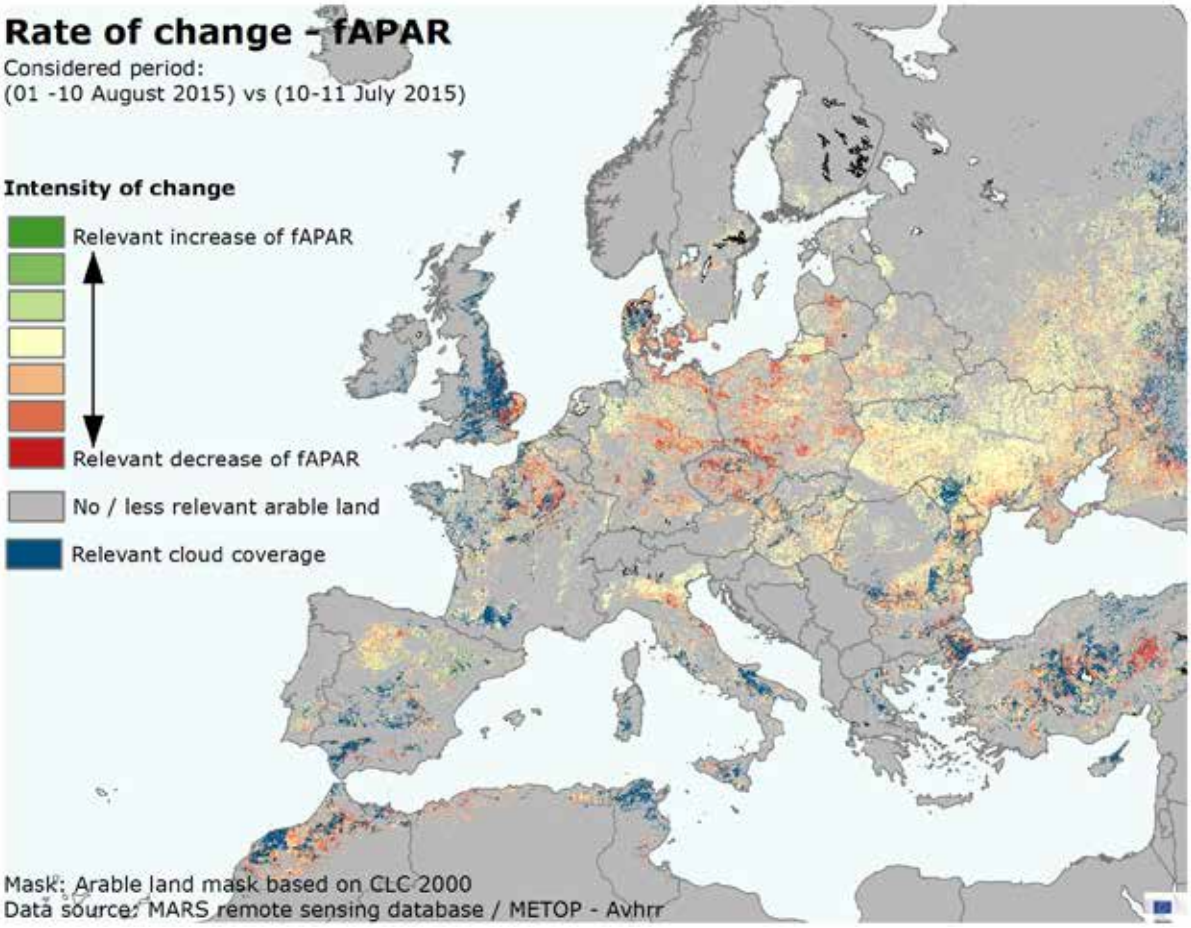




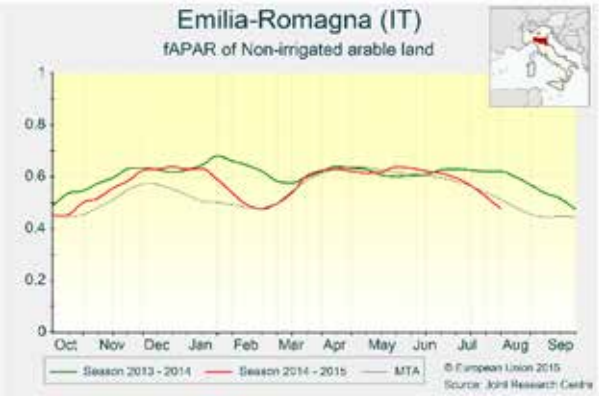


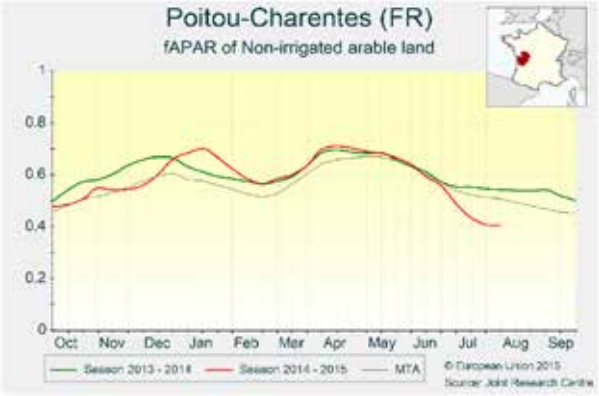
2. Remote sensing — Observed canopy conditions

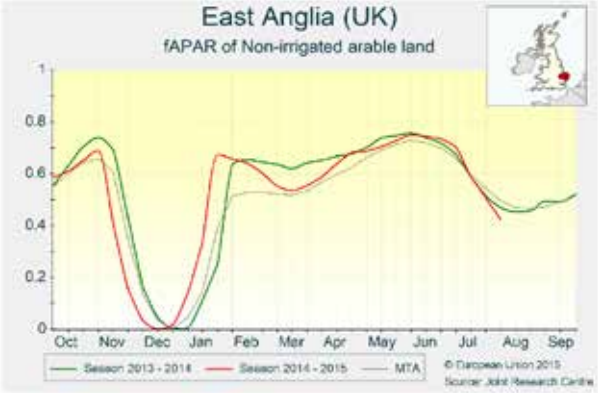
The hot and dry conditions reduced the growth of summer crops and threatened flower fertility and grain filling.

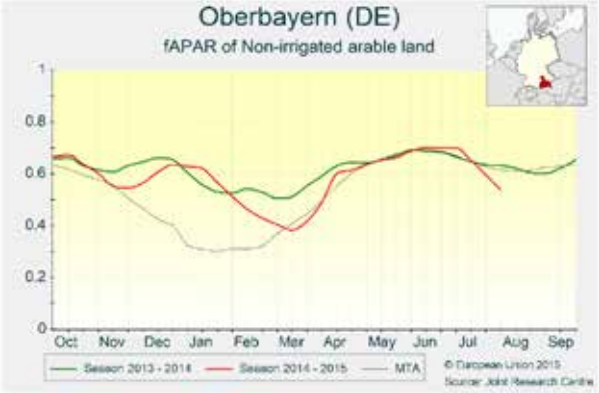


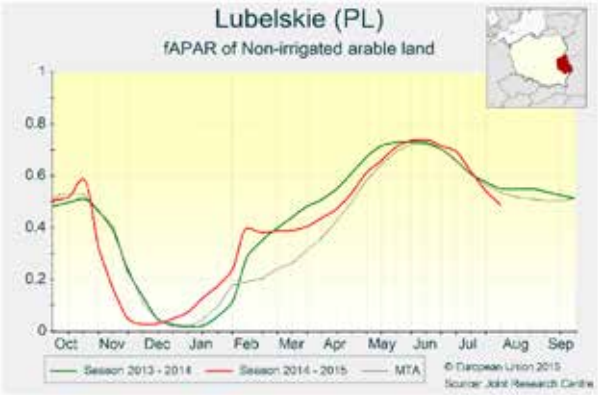
The map above displays the fAPAR (fraction of Absorbed Photosynthetically Active Radiation) indicator at the end of the analysis period (1-10 August), expressed as a percentage of the fAPAR at the beginning of the analysis period (10-20 July). Detailed fAPAR trends for specific regions, as presented in the graphs below, are needed for a correct interpretation. The Aragón province in Spain is the only region in Europe for which fAPAR increased slightly. The dominant land use in this region is fully irrigated maize. The green colours indicate where canopy growth has proceeded at normal rates despite the high temperatures. In Italy, the main maize-producing regions of the Po valley present contrasting conditions: western areas (e.g. in Emilia-Romagna) present suboptimal growth due to a combination of low soil moisture levels and very high temperatures, while crop conditions in eastern regions are favourable and good yields are expected, mainly thanks to substantial and well-distributed precipitation. The decrease of fAPAR in central and northern parts of France is mainly associated with the accelerated senescence of winter and spring crops just after the grain-filling phase. Summer crops in western and southern France (e.g. Poitou-Charentes) suffered from the dry and hot conditions in July, resulting in poor canopy development. The beneficial effects of the recent rains will be visible only in the coming days. In the United Kingdom, the ripening of winter crops was slightly accelerated during July, leading to the season ending slightly early, similar to last year (e.g. in East Anglia). In southern Germany, the hot and dry weather conditions of July caused stress to maize growth and flowering (e.g. Oberbayern), leading to a significant decrease in the fAPAR signal. In northern Germany and western Poland, the sharp decrease of the fAPAR signal is associated with the senescence of winter crops and does not represent any threat to crop yields. By contrast, eastern and southern Poland, which are dominated by summer crops, present lower-than-usual fAPAR levels (e.g. Lubelskie), reflecting the damage caused by the ongoing drought. The heat waves of July significantly affected the summer crop canopy in the main agricultural regions of the Czech Republic, Slovakia and along the Danube valley, in Austria, Hungary and western Romania (e.g. Macroregiunea Patru). In eastern Ukraine, summer crops are developing under optimal conditions and fAPAR values are actually above the average (e.g. Poltavs'ka). In western regions, the unfavourable weather conditions due to the persistent lack of precipitation have led to suboptimal crop canopy conditions. In Russia, fAPAR values are high, with the likelihood of good yields.

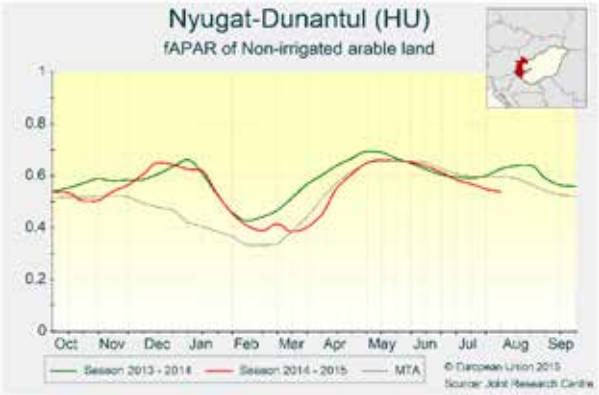

Emilia-Romagna (IT)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre

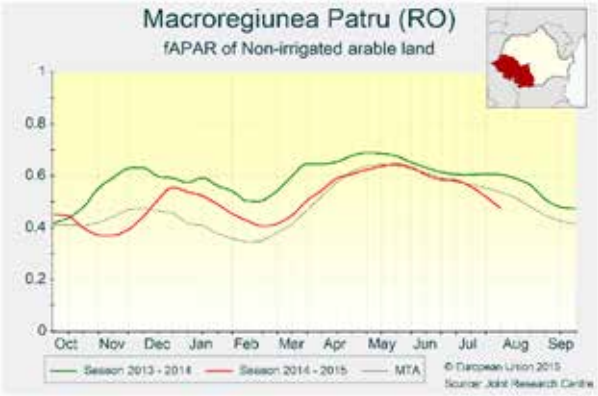

Poitou-Charentes (FR)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre

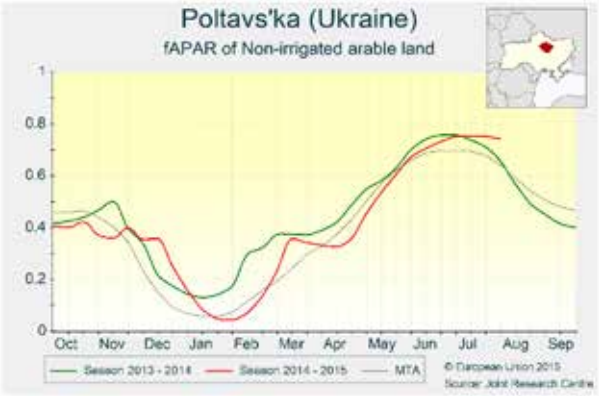

East Anglia (UK)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre


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


Lubelskie (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


Nyugat-Dunantul (HU)
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

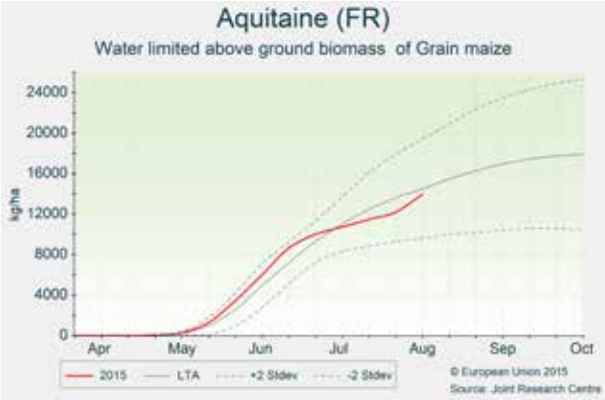

Poltavs'ka (Ukraine)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2013 - 2014
Season 2014 - 2015
MTA
© European Union 2015
Source: Joint Research Centre

3. Country headlines

3.1 European Union

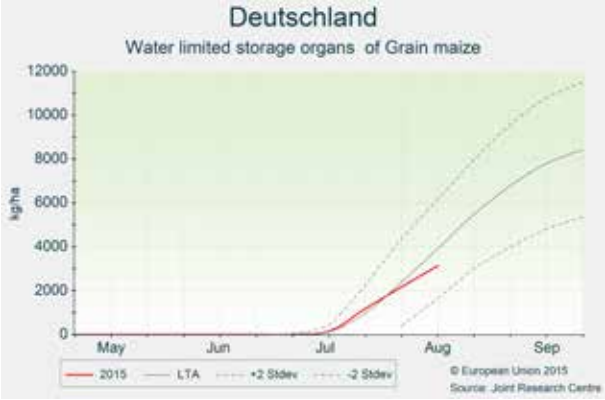
France

Weather conditions since 1 July have been rather unfavourable for summer crops, with unusually hot temperatures and below-average precipitation. The rainfall received during the first half of August in south-western regions of Aquitaine, Poitou-Charentes and Midi-Pyrénées was crucial to maintain the biomass production of maize close to the average during the initial grain-filling stages. By contrast, crops are still suffering from dry conditions in Rhône-Alpes and Centre. The yield outlook for maize is below the average of previous years, and rainfall is needed in the coming 2 weeks in order to avoid further damage.



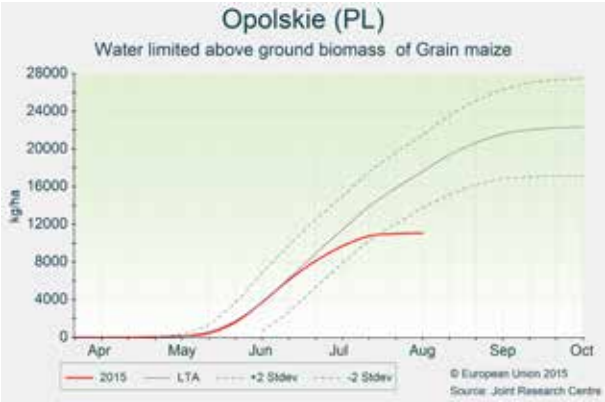
Germany

Distinct heat waves during July and August with record temperatures have significantly compromised maize yield potential, particularly in the south. Cooler periods with low night-time temperatures occurred in between the heat waves. There was a clear rain surplus during the period of review in the north and a clear rain deficit in the south, where soil moisture levels are critically low. Frequent rainy days in the north hampered harvest activities towards the end of July and from 10 August onwards. Cereal yield forecasts are well below those of last year, but are still average. Forecasts remain mostly unchanged compared to our last bulletin, with the exception of a lowered maize forecast.



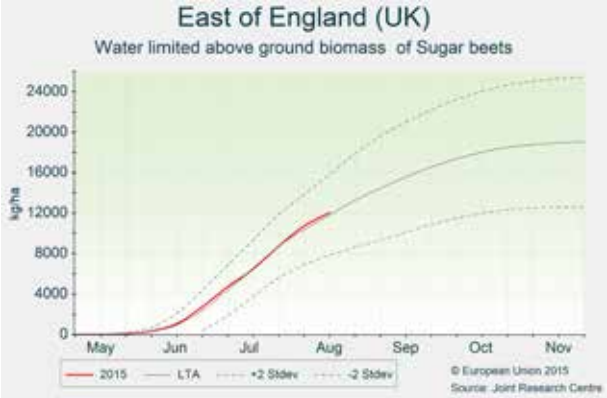
Poland

July and August were exceptionally hot in central and southern Poland, where maximum daily temperatures were frequently above 30 °C during the first half of August. Precipitation during that period was below the average in most of the country and was mainly concentrated in the first half of July, with almost no rainfall registered since then. These dry and hot conditions have negatively impacted the yield potential of summer crops, especially maize, producing an early senescence that is particularly noticeable in the western half of the country (Dolnoslaskie, Opolskie). Yield expectations for summer crops have been revised downwards.



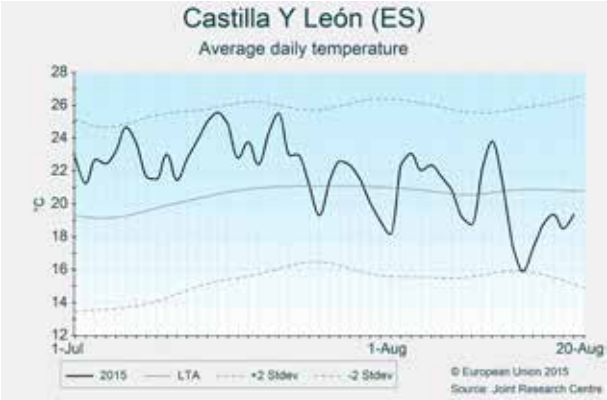
The United Kingdom and Ireland

Overall, average temperatures presented a gradient from around average in south-eastern England to 2 °C below average in parts of Ireland and Scotland. Rainfall was around or above average. Barley and oilseed rape have mostly been harvested, and the harvesting of wheat is well under way. First reports suggest good yields and quality, despite the fact that frequent rains hampered the harvest in Ireland and the northern United Kingdom. In south-eastern England, rains were concentrated in fewer large rainfall events, which particularly benefited sugar beet and potato crops. For most crops, the yield forecasts were revised slightly upward, and remain above the 5-year average.



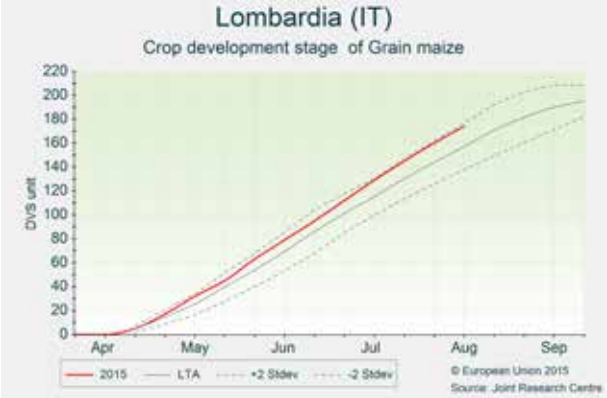
Spain and Portugal

The dry and hot conditions experienced in early summer continued from July onwards. In the north of the peninsula, temperatures fell to seasonal values in the first half of August, with heavy thunderstorms registered in Aragón. The lack of precipitation in summer has constrained the yield potential of sunflower crops, which are now being harvested, and results are expected to be substantially below the average. The outlook is average for the other summer crops, as water storage has been sufficient to satisfy irrigation demands.



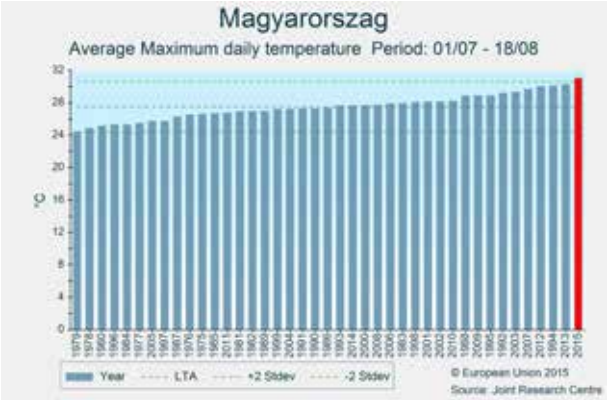
Italy

This summer has so far been one of the warmest experienced in many regions across Italy, with average temperatures higher than seasonal values by about 3 °C. Rainfall was slightly below average in the north (Lombardia and Emilia Romagna), and above average in the south (Sicily, Calabria and Lazio). Summer crops are in advanced development stages, but the prolonged high temperatures could negatively affect crop growth. However, irrigation and some beneficial rainfall should partially limit the damage. Yields are expected to be below last year's values for maize and durum wheat, and close to average for soft wheat and sugar beets.



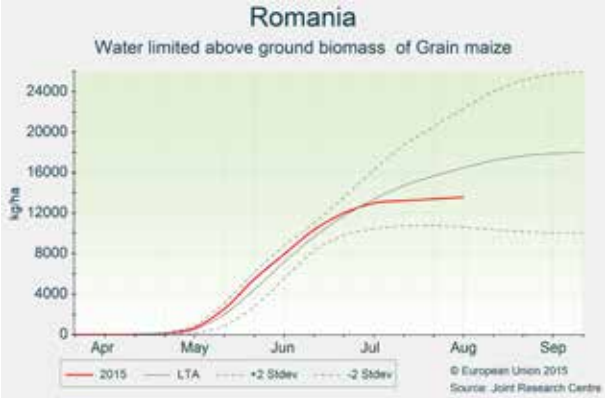
Hungary

The period under review (1 July-18 August) was the hottest of the past 40 years. Since 1 July, Hungary has experienced three long heat waves. Daily maximum temperatures dropped to slightly below average in mid July and around the turn of July and August. Precipitation was moderate, approximately half of the average until mid August. This was followed by excessive, very intense and even locally devastating rainfall events (up to 100 mm/day). Thanks to the dry weather conditions, grain cereals were harvested quickly and with no losses. The very high temperatures and water scarcity considerably compromised the pollination and yield formation of maize. The biomass accumulation of potatoes and sugar beets was also badly affected. The yield outlook for summer crops was revised downwards.



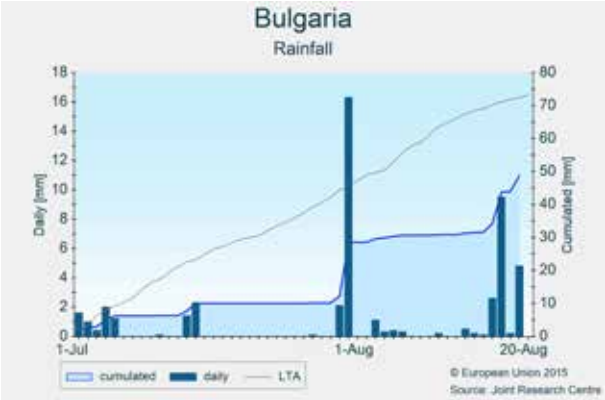
Romania

The year 2015 saw one of the warmest summers in Romania since 1975. A short heat wave occurred in the first dekad of July, and daily maximum temperatures almost persistently exceeded 30 °C after the middle of the month. The number of hot days was 14 to 21 more than usual. During the period under review, rainfall remained below the average by 40-70 mm in the western half of Romania, while in eastern areas it was 10-40 mm lower than usual. The development of summer crops is advanced by 1 to 2 weeks. Soil moisture supply was below optimal primarily for grain maize, but also for sunflowers during the flowering and the first half of the grain-filling stages, with the exception of the Centru and Sud-Muntenia regions. The high temperatures led to reduced photosynthetic activity in potatoes and sugar beets, and to an early senescence of the canopy of all crops. The model simulations indicate constrained biomass accumulation.



Bulgaria

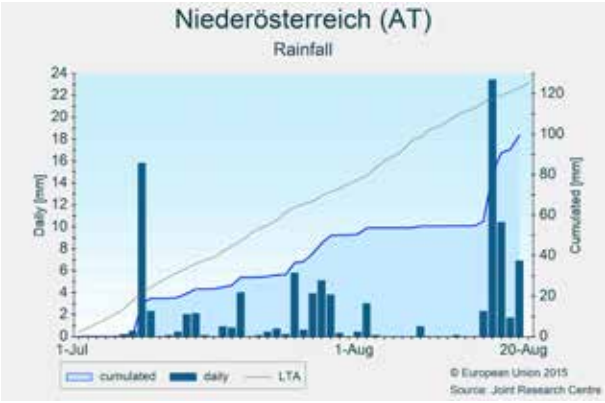
Daily temperatures generally fluctuated above the long-term average, resulting in a positive thermal anomaly of 1-3 °C. The last dekad of July was particularly warm, with daily maxima exceeding 35 °C, and reaching 40 °C in some places on the hottest days. In July, precipitation was scarce (< 10 mm) in southern Bulgaria, and the northern half of the country received only 10-40 mm of rainfall, which facilitated the harvest. Precipitation was plentiful (up to 100 mm) in some south-western regions on the last day of July. The first half of August was again very dry in Bulgaria. Due to high evaporative demand and below-average precipitation, the soil moisture content fell below average under maize and sunflower crops in July. Biomass accumulation was considerably reduced from mid July for summer crops, and the water-limited biomass remained slightly below the average in the second dekad of August.



Austria, Slovakia and the Czech Republic

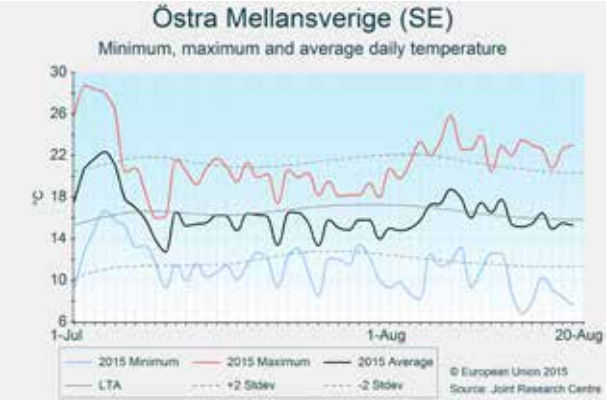
The period from early July to mid August was characterised by the warmest conditions in our records. The long-term average temperature has been exceeded by 4 °C, and by up to 6 °C in the Czech Republic. Three heat waves have occurred since the beginning of July, with daily maximum temperatures well above 30 °C. Maximum temperatures of close to 38 °C were recorded in major agricultural areas.

Rainfall cumulates were substantially below the long-term average, especially in the Czech Republic. A pronounced soil moisture deficit and extremely high temperatures at the end of July and during the first half of August limited the growth of summer crops. Forecasts for summer crop yields are therefore revised slightly downwards.



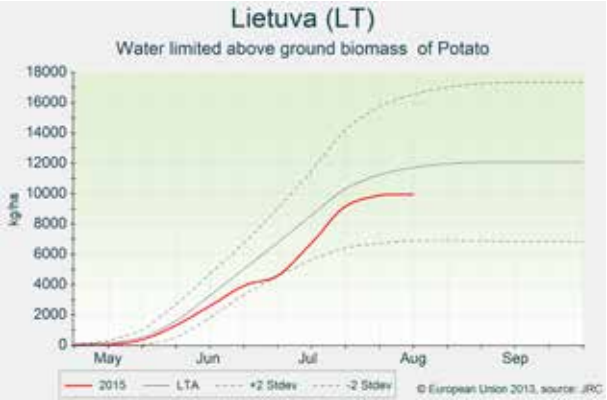
Denmark and Sweden

During this period, both countries experienced lower-than-average temperatures from 10 July to early August, mostly due to lower-than-average night temperatures. Cumulative active temperatures were below the long-term average in all regions. However, rainfall conditions have been generally good in both countries, except for some excessive accumulation (30-50 mm above the mean) in Sweden (Östra Mellansverige) and northern Denmark during recent days in August. The winter barley harvest got under way in some areas. All winter crops present excellent accumulation of biomass and storage organs. Spring barley has reached maturity, presenting average biomass accumulation. Rapeseed continues to show growth that is considerably above the long-term average. The crop forecast is unchanged for this period, remaining mostly around average for spring and summer crops and above average for winter crops, particularly barley and rapeseed.



Finland, Lithuania, Latvia and Estonia

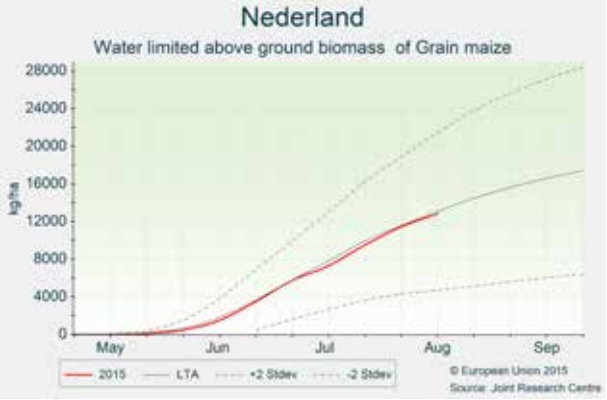
In all countries, the second half of July finished as a rainy period with below-average temperatures. Summer crops in the Baltics benefited from this rainfall. Yield expectations are slightly above average in Latvia but below average in Lithuania due to the dry period of June and August. While yield expectations for spring crops are above average in Latvia and Estonia, they are closer to the average in Lithuania. Warm temperatures and dry conditions in August provided optimal conditions for the harvesting of winter crops in the Baltics. In Finland, the persistent wet and cold conditions during July led to a decrease in both spring and summer crop expectations, and have delayed harvesting activities.



Belgium, the Netherlands and Luxembourg

A distinct heatwave occurred at the beginning of July. Overall, temperatures exceeded the average by very little in coastal areas, and by up to 3 °C in Luxembourg. Rainfall tended to be above average in the Netherlands, around average in Belgium and well below average in Luxembourg.

The first 12 days of August were generally dry, providing good harvest conditions for winter crops. Wheat, barley and oilseed rape have mostly been harvested, and first reports suggest good yields and quality. Grain maize, sugar beet and potato crops benefited from improved soil-water conditions. Yield forecasts were revised slightly upwards for most crops and remain around the 5-year average.



Greece and Cyprus

Temperatures in July and August fluctuated consistently above or greatly above the long-term average in mainland Greece, while they were around average in the islands. High temperatures (Tmax > 40 °C) were recorded around 30 July for a very short period (1 or 2 days). July was very dry, especially in central and northern regions. However, the first half of August was rainy in all agricultural areas of the country. Biomass accumulation is above average for grain maize, which is currently in the grain-filling stage. In Cyprus, the period under consideration was completely dry and temperatures were mainly above average.

Slovenia and Croatia

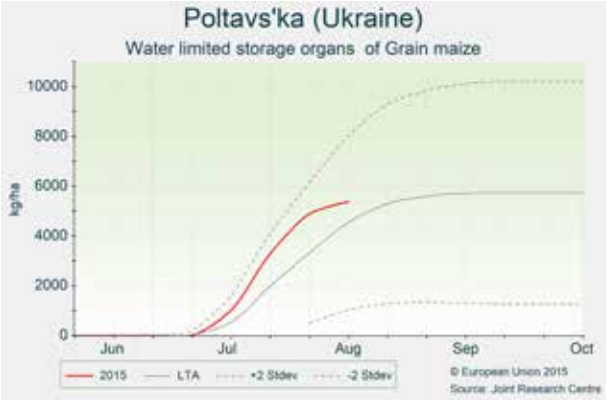
The period between the beginning of July and the middle of August was characterised by the warmest conditions in our records. A series of heat waves occurred, with maximum air temperatures close to 38 °C. The longest heat wave occured during the second half of July, with daily maximum temperatures over 30 °C. Rainfall cumulates since the beginning of July were substantially below the long-term average in eastern Croatia and north-eastern Slovenia. Extremely hot and dry weather limited the summer crop growth in major agricultural areas. Soil moisture was most severely depleted over the eastern parts of Croatia. Heat and drought stress during the flowering and grain-filling period reduced the number of grains as well as starch accumulation, thereby lowering the yield potential of grain maize. Summer crop yields have been revised downwards due to unfavourable weather conditions.

3.2 Black Sea area

Ukraine

The end of July and August were drier and warmer than usual, especially in the westernmost regions of the country. These conditions were favourable to the completion of the wheat and barley harvest, following a rather favourable season which led to yields that are above the average of the past 5 years. Maize is currently in the grain-filling stage and exhibits a highly positive vegetative status, especially in central and eastern regions. Currently, the dry conditions observed since July have had no appreciable effect on crop growth, except in some regions of the north-west.

The yield outlook is therefore high, and close to the excellent levels of 2014.



Turkey

The temperatures in the central-eastern regions fluctuated above or greatly above the long-term average throughout the period of review, and from 15 July in western areas. Temperatures near or above 40 °C were recorded around 30 July in several central and western regions (e.g. Ege) as well as in Guneydogu Anadolu (i.e. south-eastern Turkey). During July, which is ranked among the driest in our database (i.e. since 1975), soil moisture fell to below-average levels. However, several rainy days were recorded in August in most of the country. Grain maize is currently in the grain-filling stage and presents advanced biomass accumulation.

3.3 European Russia and Belarus

European Russia

During the period under review, mostly above-average thermal conditions characterised the southern and south-western regions of European Russia, while the eastern and northern regions were colder than usual. Frequent and plentiful rainfall was experienced from mid June until mid July in the western part of the Southern Okrug, most of the Central Okrug and the northern territories of the Near Volga Okrug. The abundant precipitation is likely to have caused a considerable delay to the harvest of winter cereals in the Central Chernozem Region (Central Okrug), where harvest losses and a decrease in grain quality are likely. Harvest conditions improved from late July and especially in August, when the weather became dry. The biomass accumulation of winter wheat was favourable in the Southern and North Caucasian Okrugs, while it was below average primarily in the southern half of the Near Volga Okrug and in the Central Okrug due to the extremely high temperatures of late May and early June combined with inadequate water supply conditions.

Belarus

Average temperatures remained higher than usual during the period of analysis, whereas precipitation was low throughout the country. The prolonged dry conditions combined with the high temperatures negatively influenced summer crop growth. The yield forecast has therefore been revised downwards for maize. Spring barley and winter wheat yield forecasts are well below last year's record levels, but above the 5-year average.

4. Crop yield forecasts

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	-4.5	-1.9
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	6.51	**5.44**	5.39	-16.5	+0.9
DK	7.78	**7.34**	7.07	-5.8	+3.8	-	-	-	-	-
EE	3.99	**3.76**	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	4.07	**3.60**	3.70	-11.6	-2.7	-	-	-	-	-
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**	1.49	-19.9	+10.3	-	-	-	-	-
RO	3.65	**3.46**	3.23	-5.2	+7.1	-	-	-	-	-
SE	6.80	**6.12**	5.95	-10.1	+2.9	-	-	-	-	-
SI	5.23	**4.96**	5.02	-5.2	-1.1	-	-	-	-	-
SK	5.47	**4.28**	4.34	-21.8	-1.5	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	**3.87**	3.91	-6.9	-1.0	5.92	**5.61**	5.36	-5.3	+4.7
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	**5.32**	5.41	-6.4	-1.6	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	3.75	**3.25**	3.44	-13.1	-5.6	-	-	-	-	-
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	+4.1
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	**6.26**	5.46	-2.4	+14.6
SI	-	-	-	-	-	4.85	**4.35**	4.48	-10.2	-2.8
SK	4.78	**3.34**	3.61	-30.1	-7.4	5.24	**4.10**	3.99	-21.7	+2.7
UK	5.86	**5.64**	5.37	-3.8	+5.0	7.22	**6.61**	6.57	-8.4	+0.6

Country	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	-5.5	+2.5	4.90	**4.62**	4.49	-5.8	+2.8
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	**7.66**	7.63	-11.3	+0.3	7.35	**6.51**	6.36	-11.4	+2.4
DK	7.78	**7.34**	7.07	-5.8	+3.8	5.87	**5.51**	5.52	-6.2	-0.3
EE	3.99	**3.76**	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	+0.8	-5.6
FI	4.07	**3.60**	3.70	-11.6	-2.7	3.75	**3.25**	3.44	-13.1	-5.6
FR	7.36	**7.25**	7.01	-1.5	+3.5	6.65	**6.69**	6.35	+0.6	+5.3
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**	1.49	-19.9	+10.3	2.18	**1.63**	1.57	-25.2	+4.1
RO	3.65	**3.46**	3.23	-5.2	+7.1	3.36	**3.07**	2.91	-8.7	+5.4
SE	6.80	**6.12**	5.95	-10.1	+2.9	4.78	**4.67**	4.45	-2.2	+5.1
SI	5.23	**4.96**	5.02	-5.2	-1.1	4.85	**4.35**	4.48	-10.2	-2.8
SK	5.46	**4.22**	4.32	-22.8	-2.3	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	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	8.06	**6.40**	7.02	-20.5	-8.8	4.22	**3.72**	3.58	-12.0	+3.8
AT	10.79	**9.49**	10.16	-12.1	-6.7	4.87	**4.25**	4.25	-12.6	-0.0
BE	10.50	**11.08**	10.98	+5.5	+0.9	-	**-**	-	-	-
BG	7.68	**5.33**	5.77	-30.7	-7.6	-	**-**	-	-	-
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	**9.47**	10.00	-11.4	-5.3	6.12	**5.38**	5.31	-12.1	+1.4
DK	-	**-**	-	-	-	6.36	**5.86**	5.83	-7.9	+0.4
EE	-	**-**	-	-	-	3.22	**2.94**	2.67	-8.6	+10.3
ES	10.81	**11.00**	10.81	+1.7	+1.7	1.72	**1.87**	2.05	+8.7	-8.8
FI	-	**-**	-	-	-	2.57	**2.83**	2.73	+10.2	+3.7
FR	10.02	**8.63**	9.19	-13.8	-6.0	4.90	**4.97**	4.91	+1.4	+1.2
GR	11.96	**11.59**	11.53	-3.1	+0.5	2.11	**1.85**	2.11	-12.2	-12.2
HR	8.11	**5.14**	6.06	-36.6	-15.3	-	**-**	-	-	-
HU	7.74	**5.15**	5.92	-33.5	-13.0	2.91	**2.80**	2.52	-3.9	+11.1
IE	-	**-**	-	-	-	-	**-**	-	-	-
IT	10.62	**9.47**	9.21	-10.8	+2.8	-	**-**	-	-	-
LT	6.05	**5.92**	6.69	-2.2	-11.5	2.25	**2.23**	2.17	-1.1	+2.4
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	3.57	**3.18**	2.90	-10.9	+9.7
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	13.06	**10.97**	11.35	-16.0	-3.4	-	**-**	-	-	-
PL	6.59	**5.42**	6.47	-17.8	-16.3	3.15	**2.83**	2.71	-10.3	+4.2
PT	8.44	**8.54**	8.05	+1.3	+6.1	0.94	**0.98**	0.87	+4.2	+12.5
RO	4.72	**3.00**	3.75	-36.4	-20.1	-	**-**	-	-	-
SE	-	**-**	-	-	-	6.51	**6.21**	5.75	-4.6	+8.0
SI	9.16	**7.32**	7.78	-20.0	-5.9	-	**-**	-	-	-
SK	8.39	**5.95**	6.47	-29.1	-8.0	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	-9.8	-1.7	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	**5.66**	5.27	-8.5	+7.3	4.27	**3.90**	3.76	-8.7	+3.7
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	-13.6	-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	**71.35**	70.46	-7.4	+1.3	34.95	**31.83**	31.45	-8.9	+1.2
AT	83.87	**68.64**	71.96	-18.2	-4.6	35.10	**33.34**	32.15	-5.0	+3.7
BE	81.75	**77.77**	76.05	-4.9	+2.3	54.00	**42.54**	46.89	-21.2	-9.3
BG	-	**-**	-	-	-	13.00	**14.43**	14.23	+11.0	+1.4
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	70.28	**63.66**	62.19	-9.4	+2.4	29.07	**26.09**	27.25	-10.3	-4.3
DE	79.86	**70.10**	70.36	-12.2	-0.4	47.42	**42.88**	43.54	-9.6	-1.5
DK	59.70	**61.59**	62.65	+3.2	-1.7	43.12	**39.47**	39.91	-8.5	-1.1
EE	-	**-**	-	-	-	-	**-**	-	-	-
ES	92.21	**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	**90.41**	88.11	-3.1	+2.6	47.94	**44.26**	44.03	-7.7	+0.5
GR	-	**-**	-	-	-	24.51	**25.92**	25.59	+5.8	+1.3
HR	63.60	**45.12**	51.03	-29.1	-11.6	17.00	**12.79**	16.67	-24.8	-23.3
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	**81.24**	79.19	-7.1	+2.6	45.00	**43.84**	43.88	-2.6	-0.1
PL	54.80	**51.43**	52.16	-6.2	-1.4	23.60	**21.46**	21.40	-9.1	+0.3
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	**58.84**	58.91	-1.6	-0.1	32.51	**32.29**	32.08	-0.7	+0.7
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	61.04	**53.12**	54.33	-13.0	-2.2	-	**-**	-	-	-
UK	80.26	**69.27**	69.25	-13.7	+0.0	42.29	**41.02**	40.63	-3.0	+1.0

Country	SUNFLOWER t/ha				
	2014	2015	Avg 5yrs	% 15/14	% 15/5yrs
EU-28	2.15	**1.83**	1.91	-14.9	-4.0
AT	2.83	**2.51**	2.58	-11.4	-2.9
BE	-	-	-	-	-
BG	2.38	**2.26**	2.12	-5.2	+6.6
CY	-	-	-	-	-
CZ	2.27	**2.52**	2.36	+11.0	+6.8
DE	2.30	**1.94**	2.12	-15.6	-8.6
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	1.26	**1.03**	1.14	-18.1	-9.9
FI	-	-	-	-	-
FR	2.42	**2.18**	2.33	-10.1	-6.5
GR	-	-	-	-	-
HR	2.83	**2.65**	2.51	-6.5	+5.7
HU	2.60	**2.29**	**2.31**	-12.0	-1.0
IE	-	-	-	-	-
IT	2.20	**2.18**	2.22	-0.7	-1.7
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	1.05	**0.58**	0.65	-44.4	-10.7
RO	2.15	**1.52**	1.72	-29.3	-11.5
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	2.62	**2.29**	2.28	-12.8	+0.2
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 July 2015, received on 5.8.2015), Eurostat Eurobase (last update: 24.7.2015) and EES (last update: 15.7.2015).
2015 yields come from the MARS Crop Yield Forecasting System (output up to 20.8.2015).

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	**5.37**	5.57	-1.1	-3.7
DZ	-	**-**	-	-	-
MA	-	**-**	-	-	-
TN	-	**-**	-	-	-
TR	9.07	**9.08**	7.98	+0.1	+13.8
UA	6.07	**6.22**	5.61	+2.4	+11.0

NB: Yields are forecast for crops with more than 10 000 ha per country.
Sources: 2010-2014 data come from the FAO, Turkish Statistical Office, PSD-online, INRA Maroc, MinAGRI Tunisia and DSASI Algeria.
*2014 yields come from the MARS Crop Yield Forecasting System as reported values were not available.
2015 yields come from the MARS Crop Yield Forecasting System (output up to 20.8.2015).


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

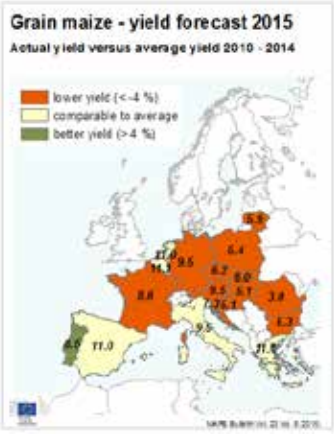

Durum wheat - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (<-4 %)
comparable to average
better yield (>4 %)


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


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

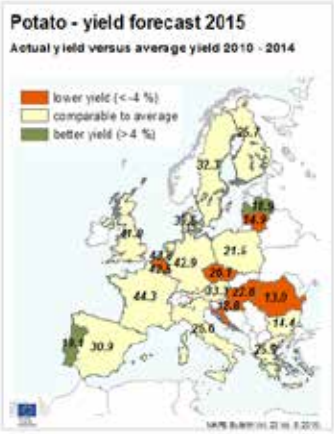

Winter barley - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (<-4 %)
comparable to average
better yield (>4 %)


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


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


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


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

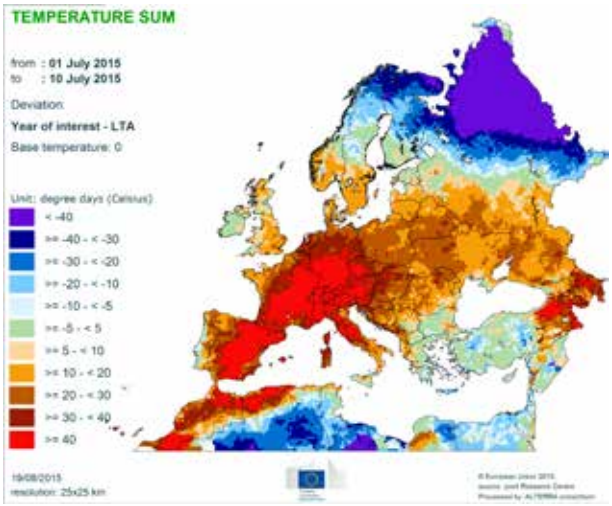

Potato - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (<-4 %)
comparable to average
better yield (>4 %)

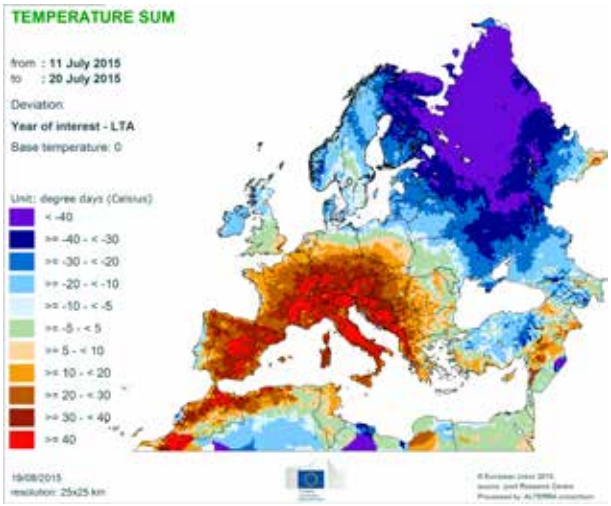

Rape and turnip - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (<-4 %)
comparable to average
better yield (>4 %)

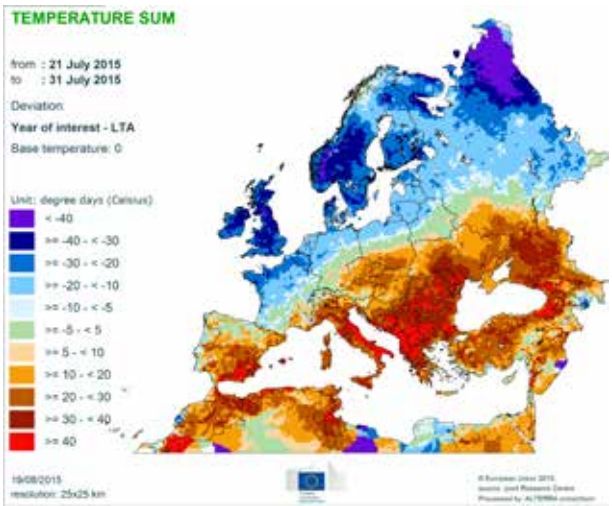

Sunflower - yield forecast 2015
Actual yield versus average yield 2010 - 2014
lower yield (<-4 %)
comparable to average
better yield (>4 %)

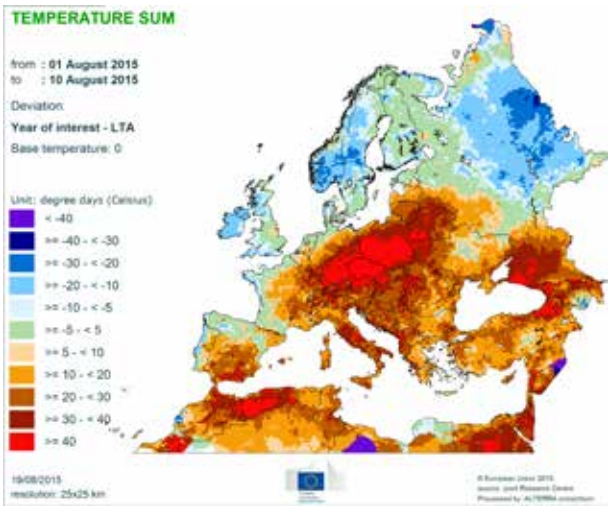
5. Atlas

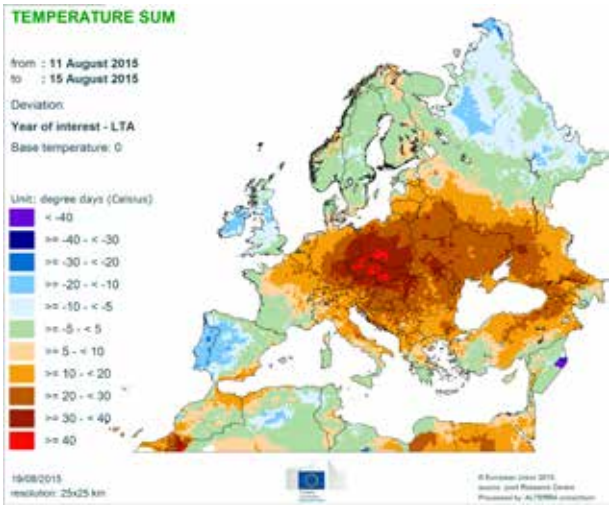
Temperature

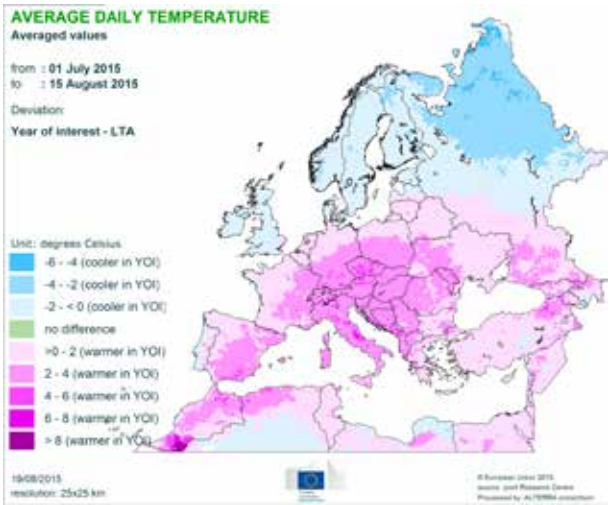




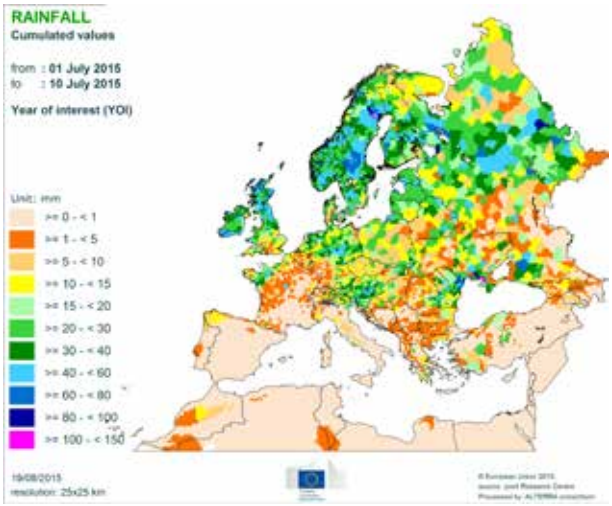


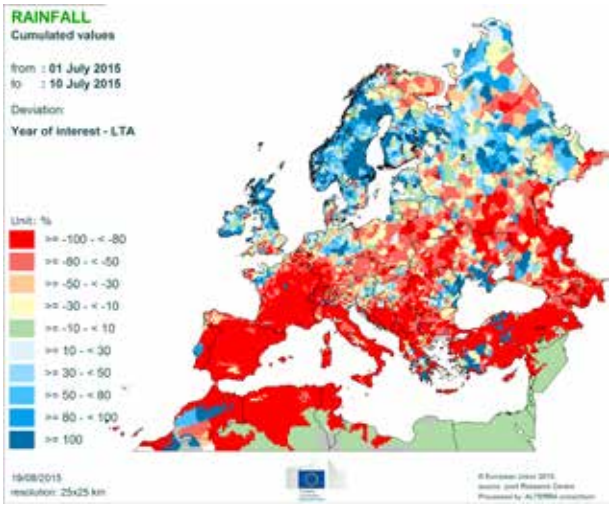


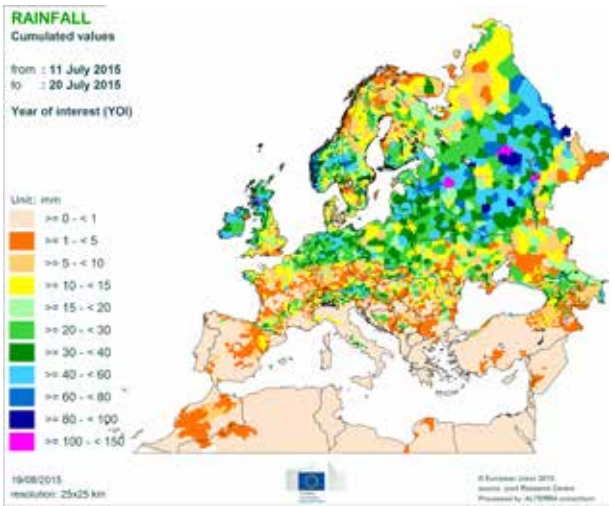


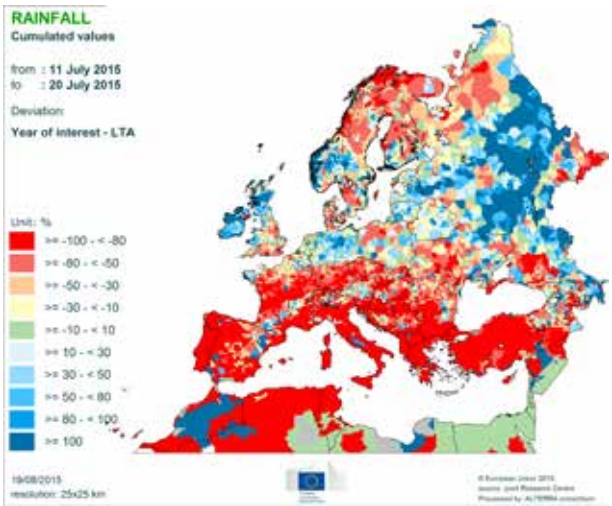


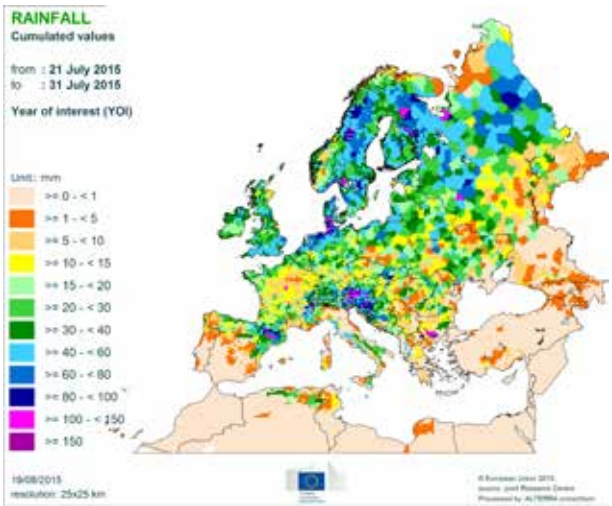
Precipitation

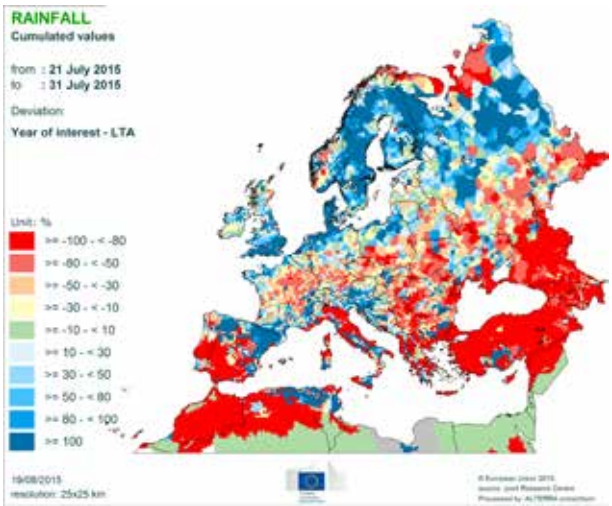


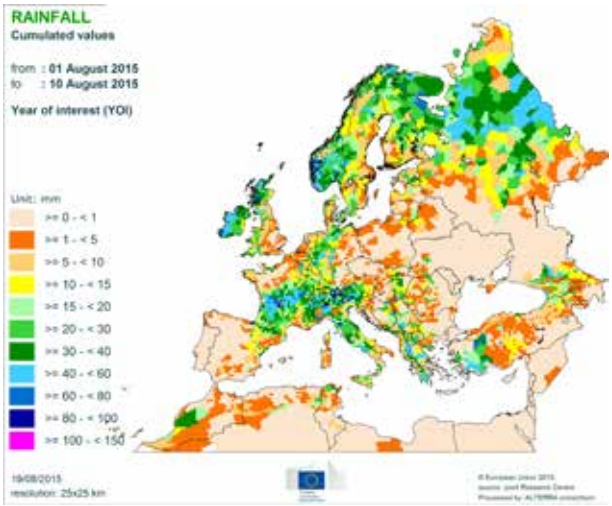


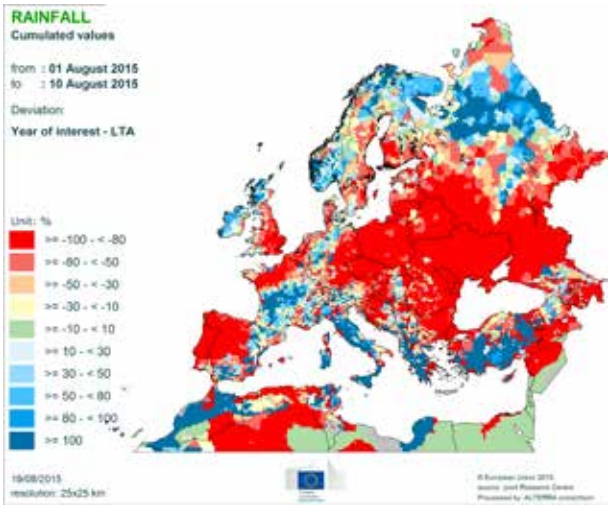


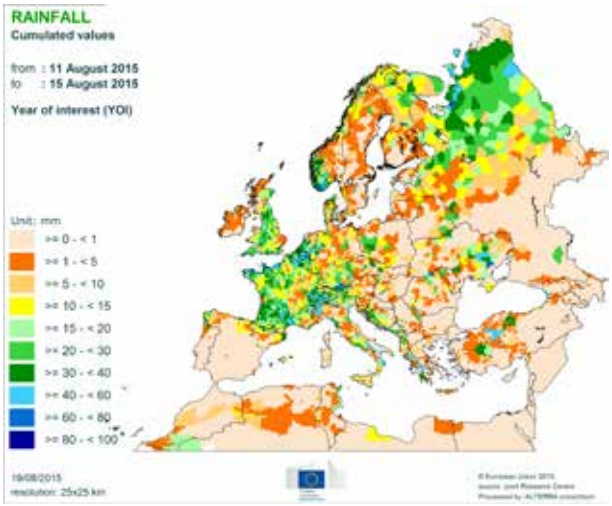


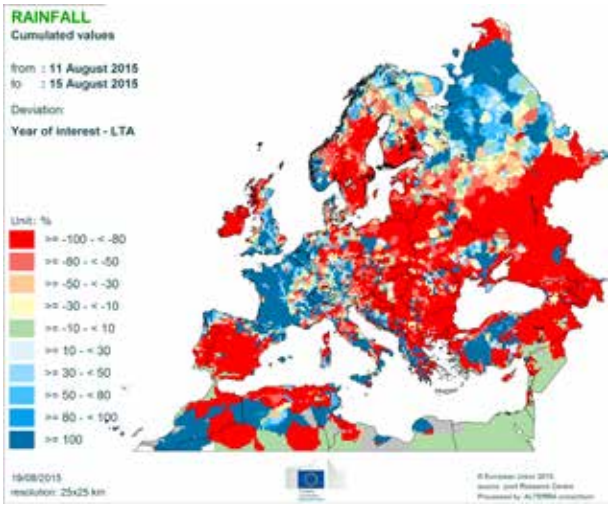




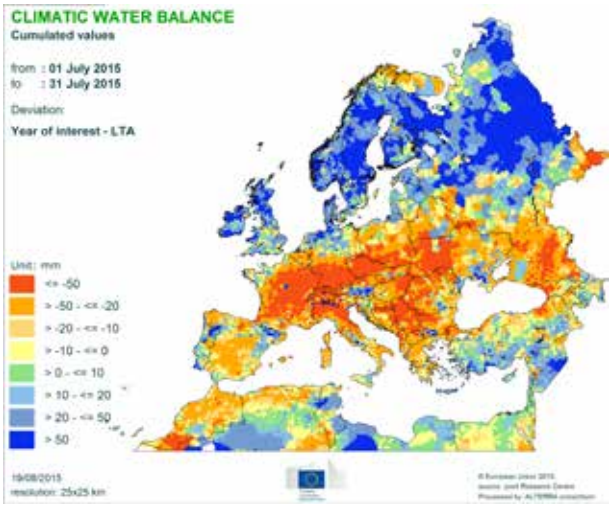


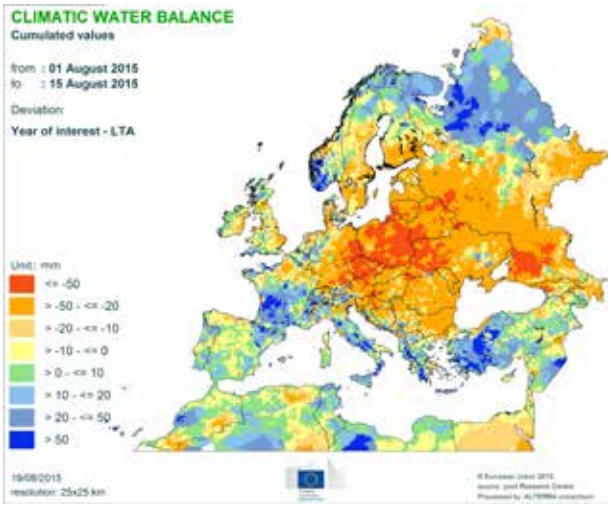




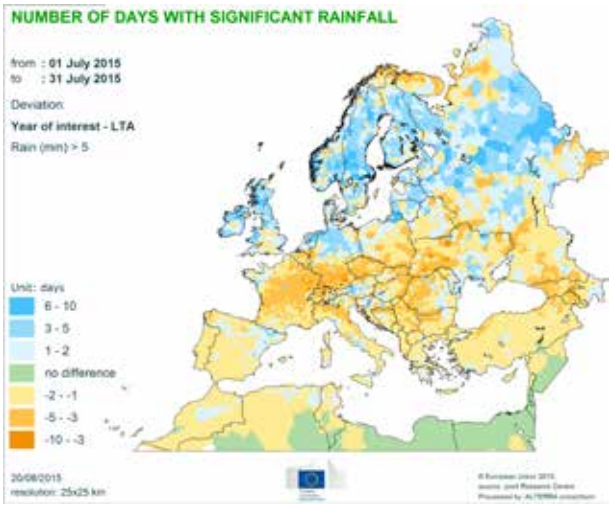


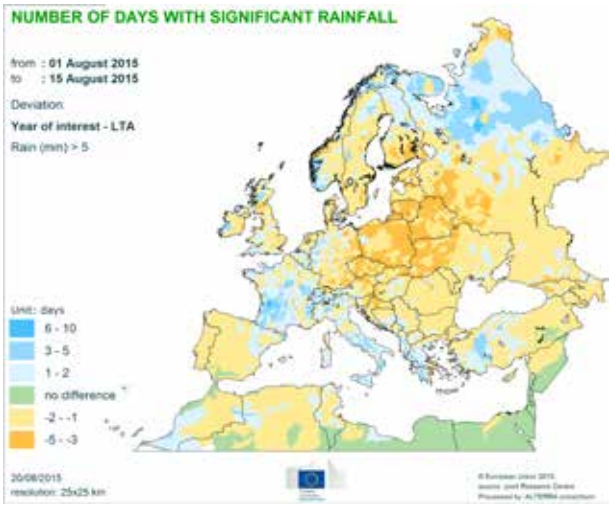
Climatic water balance

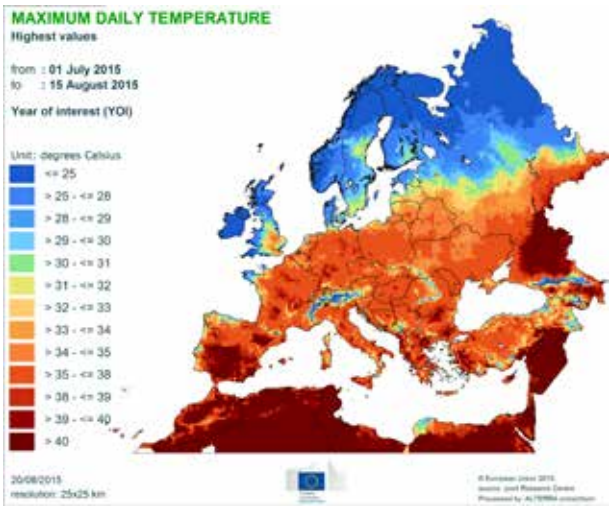


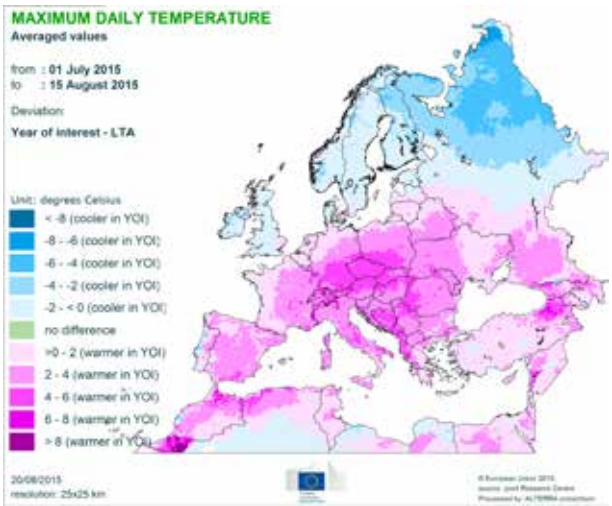


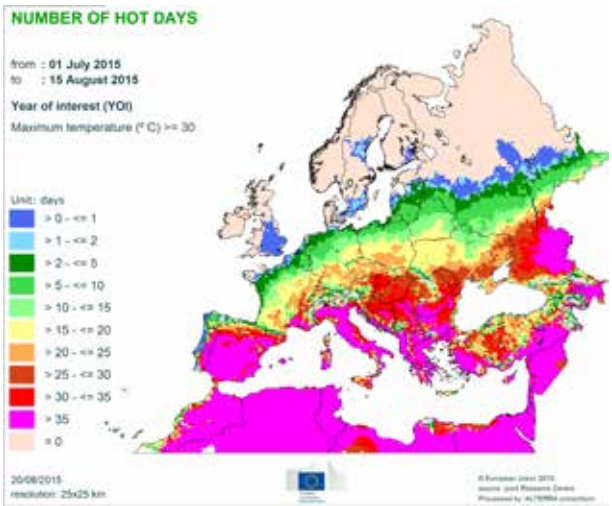
Weather events

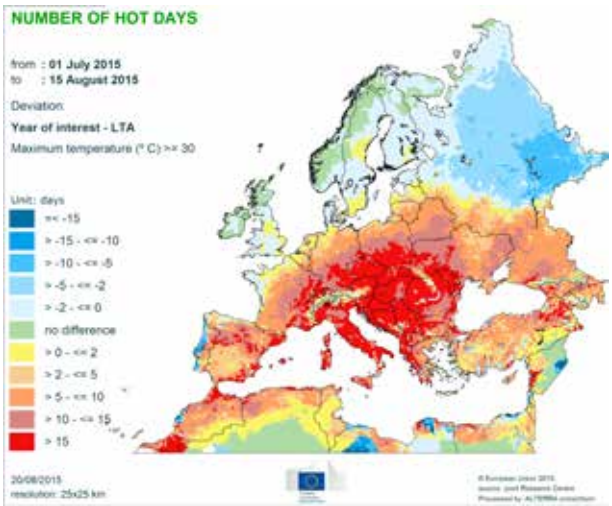




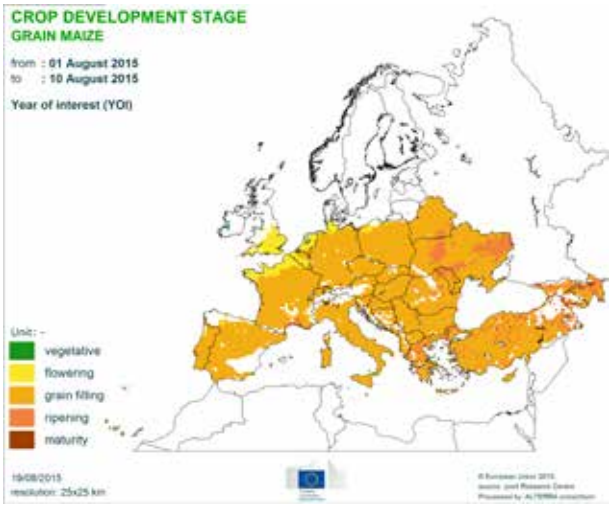


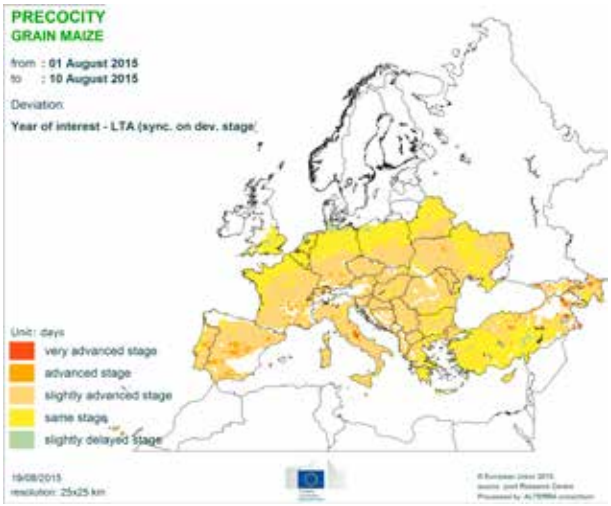


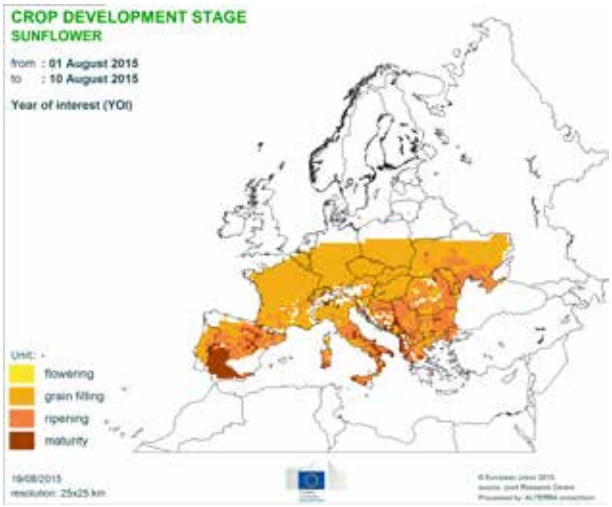


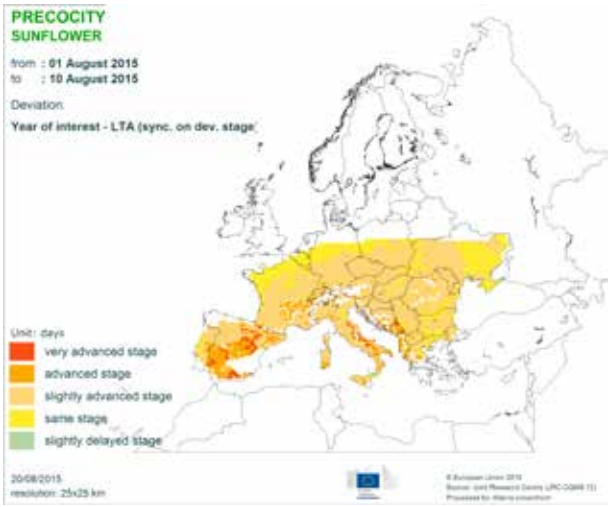


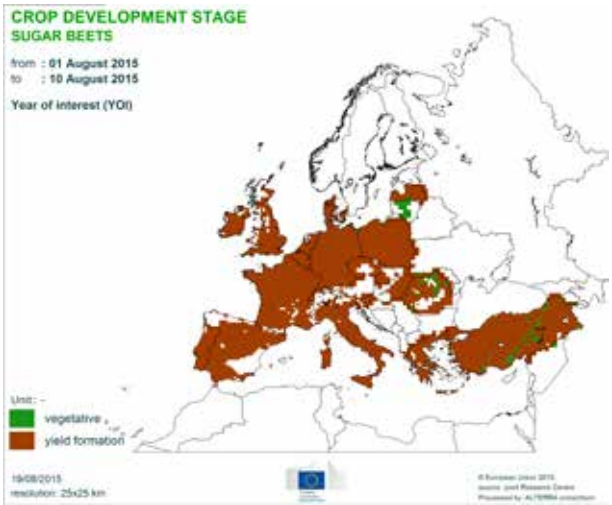
Crop development stages and precocity

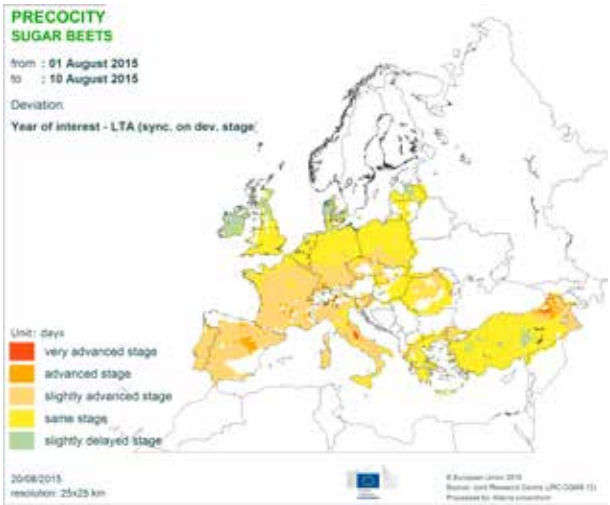


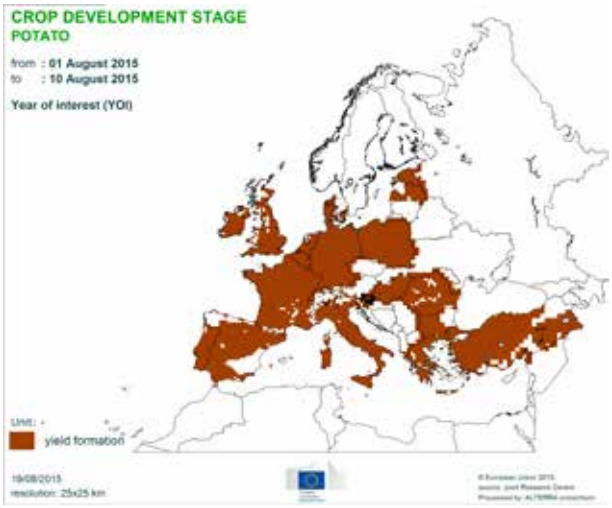


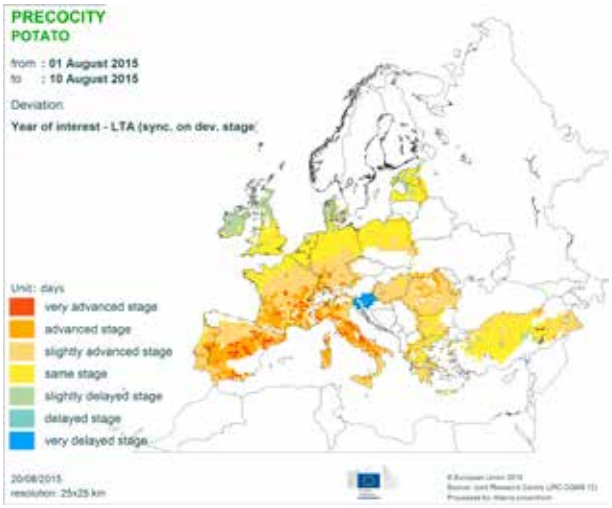




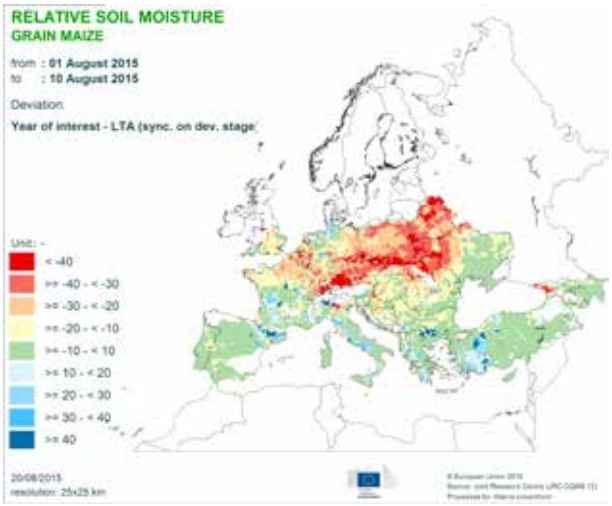


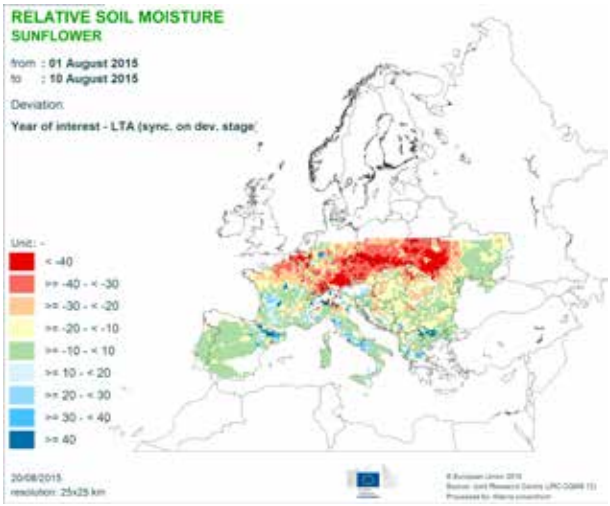


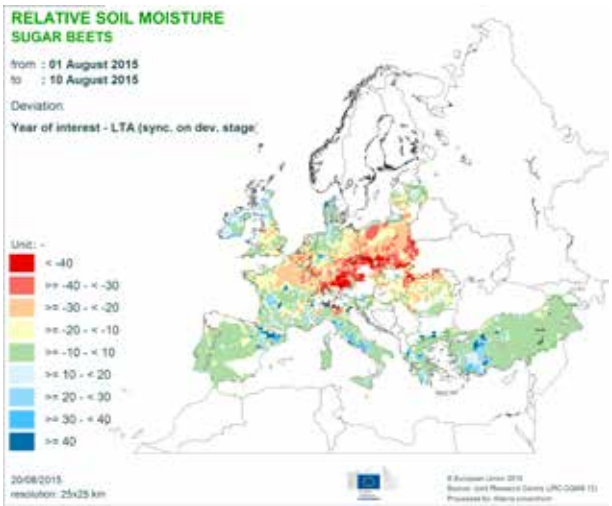

CROP DEVELOPMENT STAGE
POTATO
from : 01 August 2015
to : 10 August 2015
Year of interest (YOI)
Unit: -
yield formation
19/08/2015
resolution: 25x25 km

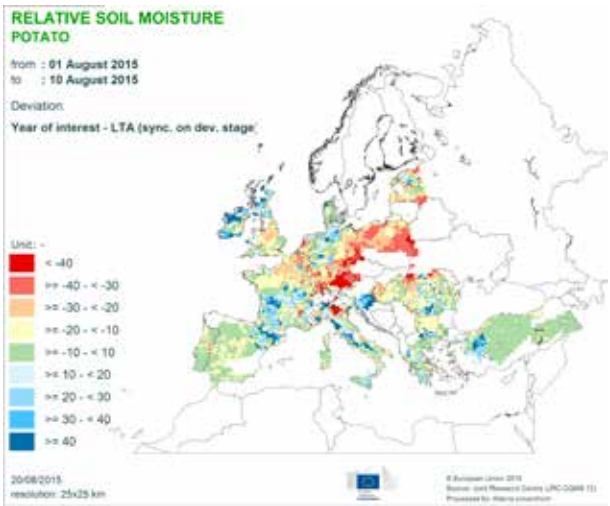

PRECOCITY
POTATO
from : 01 August 2015
to : 10 August 2015
Deviation:
Year of interest - LTA (sync. on dev. stage)
Unit: days
very advanced stage
advanced stage
slightly advanced stage
same stage
slightly delayed stage
delayed stage
very delayed stage
20/08/2015
resolution: 25x25 km

Relative soil moisture

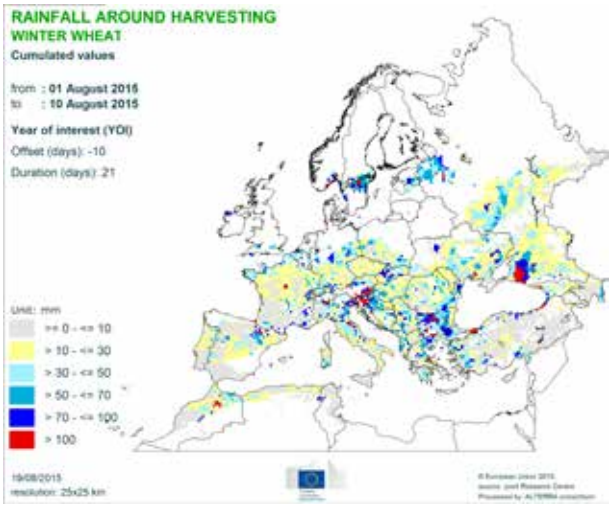


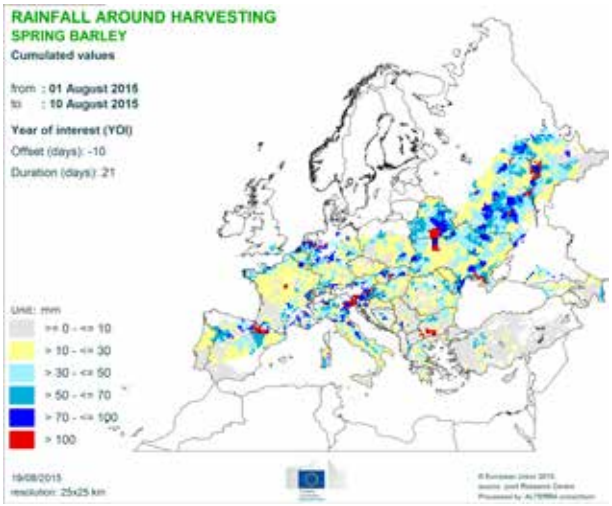


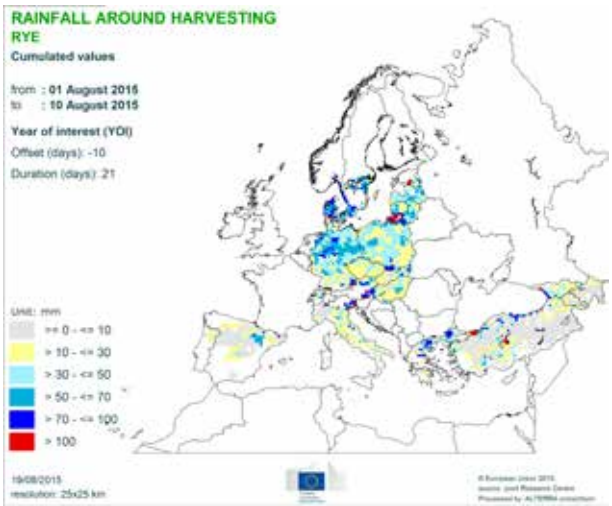


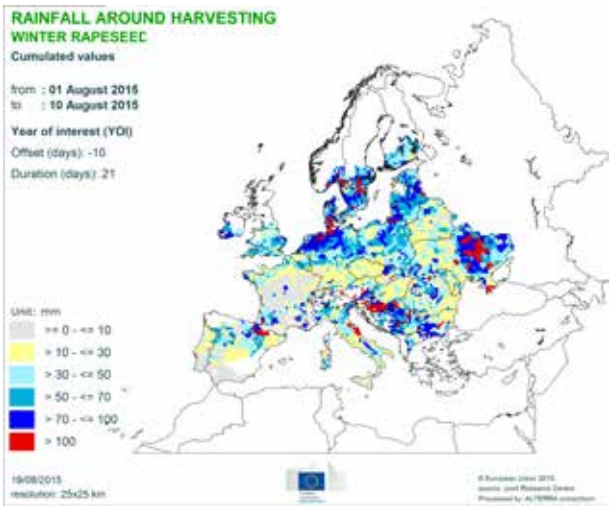


Rainfall around harvesting

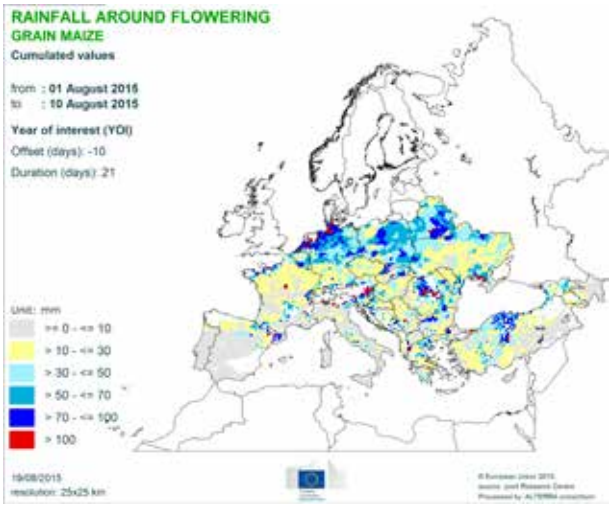


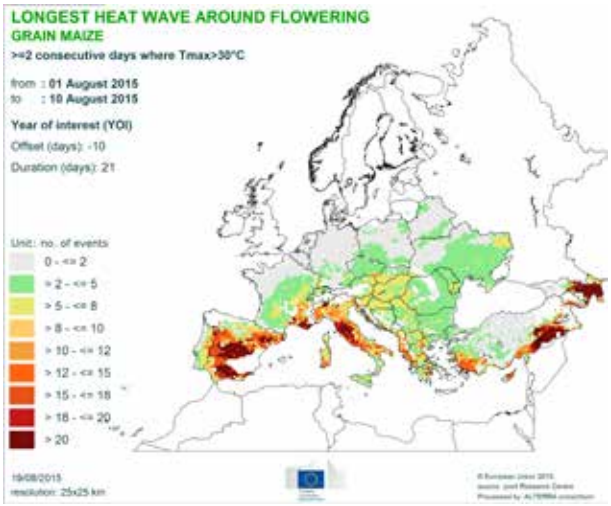


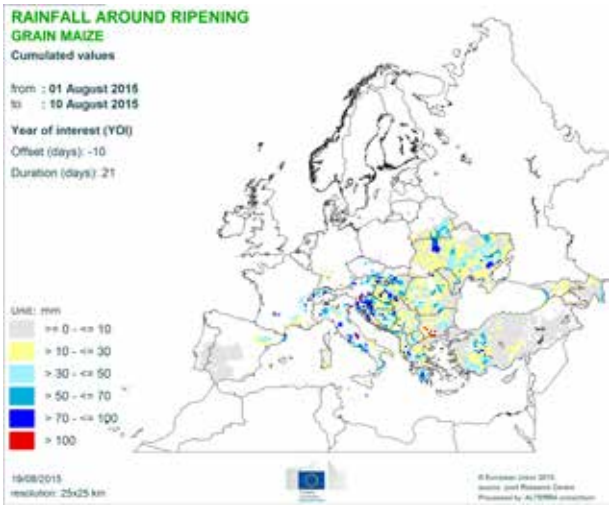


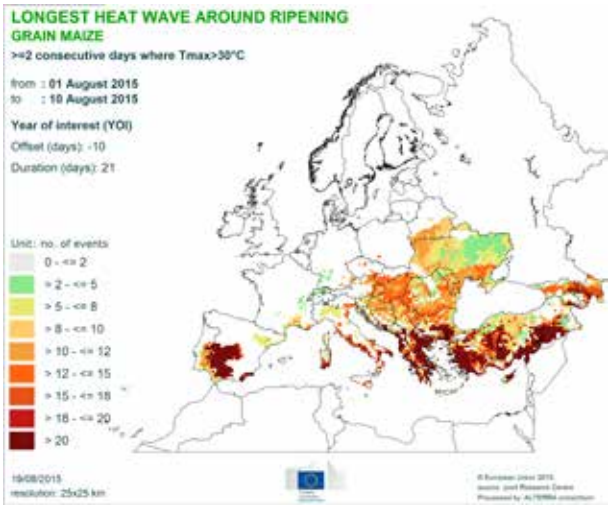


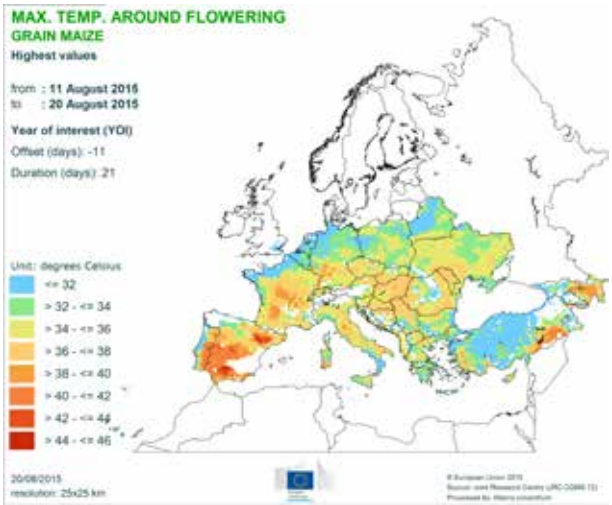
Rainfall and longest heat wave around certain crop development stages

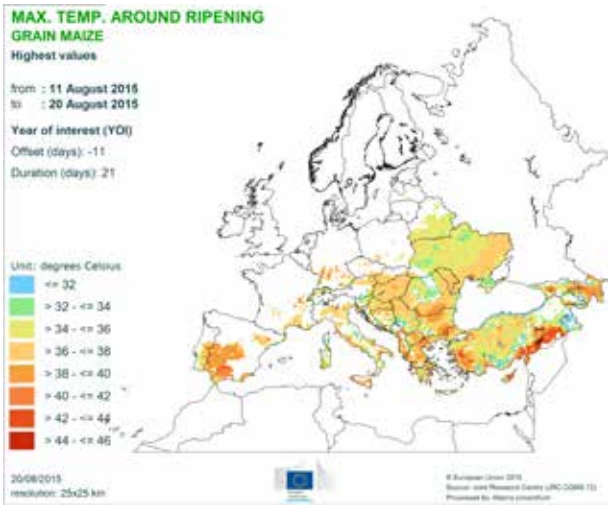












LB-AM-15-008-EN-N

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

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle. Working in close cooperation with policy directorates-general, the JRC addresses key societal challenges while stimulating innovation through developing new standards, methods and tools, and sharing and transferring its know-how to the Member States and the international community.

The mission of the JRC-IES is to provide scientific-technical support to the European Union's policies for the protection and sustainable development of the European and global environment.

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

All MARS Bulletins are available at:
http://mars.jrc.ec.europa.eu/mars/Bulletins-Publications

Analysis and reports
B. Baruth, I. Biavetti, A. Bussay, A. Ceglar, G. De Sanctis, S. Garcia Condado, J. Hooker, S. Karetsos, R. Lecerf, R. Lopez, L. Nisini, J. Rodriguez, L. Seguini, A. Toreti, M. Van den Berg, M. Van der Velde.

Reporting support
G. Mulhern

Editing
B. Baruth, M. Van den Berg, S. Niemeyer

Data production
MARS Unit AGRI4CAST/JRC, ALTERRA (NL), Meteogroup (NL), VITO (BE) and CMCC (IT)

Contact
JRC–IES-MARS/AGRI4CAST
info-agri4cast@jrc.ec.europa.eu

*MARS stands for Monitoring Agricultural Resources

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

Publications Office

ISSN Print 1831-9793
ISSN PDF 2314-9736