European Commission

Period covered: 1 July - 20 August
Issued: 25 August 2014

Crop Monitoring in Europe

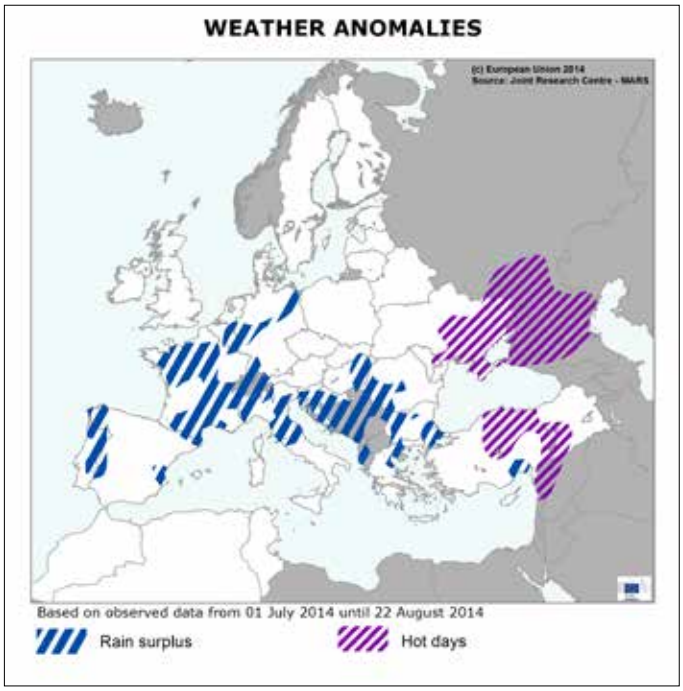
MARS BULLETIN Vol.22 No. 8 (2014)

Good yield despite difficult harvest, good prospects for maize

The overall forecasted EU-28 cereal yield for 2014 remains favourable, at the level of last year and above the last five years' average (+6.1%). Yield prospects for grain maize are excellent at the moment, forecasts are 11% above the level of last year and the last five year's average.

Large parts of Europe, from France to south-western Romania, experienced exceptionally high rainfall levels. Although this led to a slowing down and interruption of harvesting activities, the negative impact on winter and spring cereals was limited, with severe problems only occurring locally.

Conditions for summer crops are good to excellent in most of Europe. Near-average temperatures and the humid weather have boosted the growth of summer crops, especially for maize. However, maize crop yields have been negatively impacted in Ukraine and Turkey, where persistent high temperatures were recorded at the end of the flowering period and the start of the grain-filling stages.



Crop	Yield t/ha				
	2013	MARS 2014 forecasts	Avg 5yrs	%14/13	%14/5yrs
TOTAL CEREALS	5.32	**5.40**	5.09	+1.6	+6.1
Total Wheat	5.59	**5.62**	5.33	+0.5	+5.3
soft wheat	5.81	**5.85**	5.57	+0.7	+5.1
durum wheat	3.35	**3.17**	3.22	-5.5	-1.7
Total Barley	4.85	**4.61**	4.49	-5.0	+2.7
spring barley	4.43	**3.91**	3.94	-11.7	-0.8
winter barley	5.50	**5.61**	5.31	+2.0	+5.8
Grain maize	6.74	**7.53**	6.78	+11.8	+11.1
Rye	3.99	**3.71**	3.46	-7.1	+7.1
Triticale	4.29	**4.27**	4.07	-0.4	+4.9
Other cereals	3.22	**3.25**	3.42	+0.9	-5.2
Rape and turnip rape	3.11	**3.33**	3.07	+7.2	+8.6
Potato	30.94	**32.34**	30.61	+4.5	+5.7
Sugar beet	67.94	**72.18**	69.36	+6.2	+4.1
Sunflower	2.02	**2.03**	1.86	+0.5	+8.8

Issued: 22 August 2014

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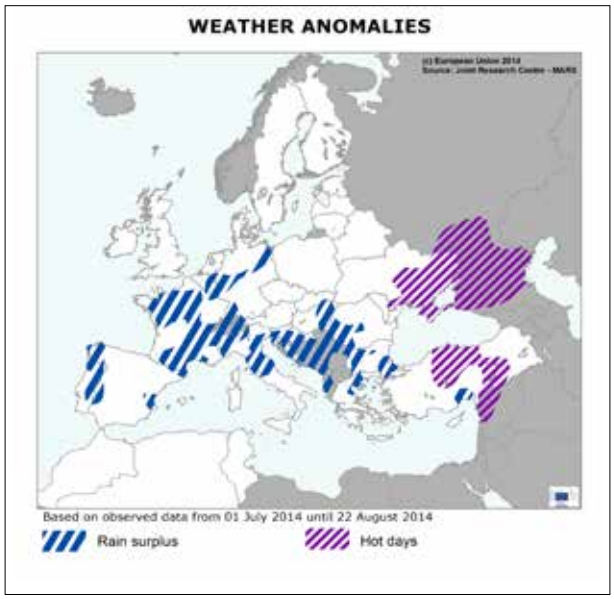
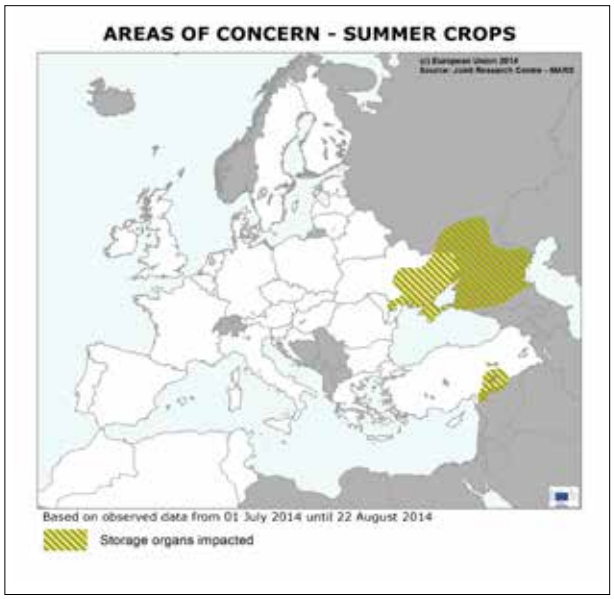
Joint Research Centre

1. Agro-meteorological overview

1.1 Areas of concern





Large parts of Europe, from France to south-western Romania, experienced exceptionally high rainfall levels. Although this led to a slowing down and interruption of harvesting activities, the negative impact on winter and spring cereals was limited, with severe problems only occurring locally.

Conditions for summer crops are good to excellent in most of Europe. Near-average temperatures and the humid weather have boosted growth of summer crops, especially for maize. However, maize crop yields have been negatively impacted in Ukraine and Turkey, where persistent high temperatures were recorded at the end of the flowering period and the start of the grain-filling stages of maize.

1.2 Meteorological review (1 July - 20 August)

The summer period was unusually wet in large parts of western, central and south-eastern Europe, with cumulated rainfall locally above 300 mm. By contrast, warmer and drier conditions prevailed in northern and eastern Europe. Cumulated active temperatures (Tbase = 0°C) were normal or slightly below the average in most of western Europe, whereas they exceeded the long-term average by more than 100 growing degree days in northern Europe, Poland, eastern Europe and the central part of Turkey. A persistent heat wave with scarce rainfall is depleting the soil water for summer crops in Ukraine and southern Russia.

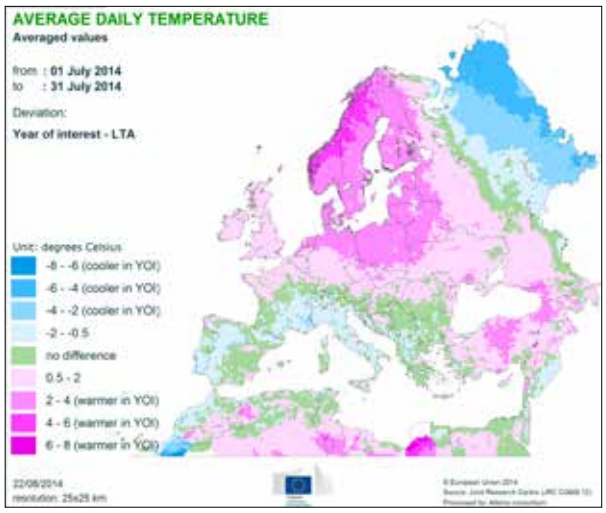
Observed temperatures

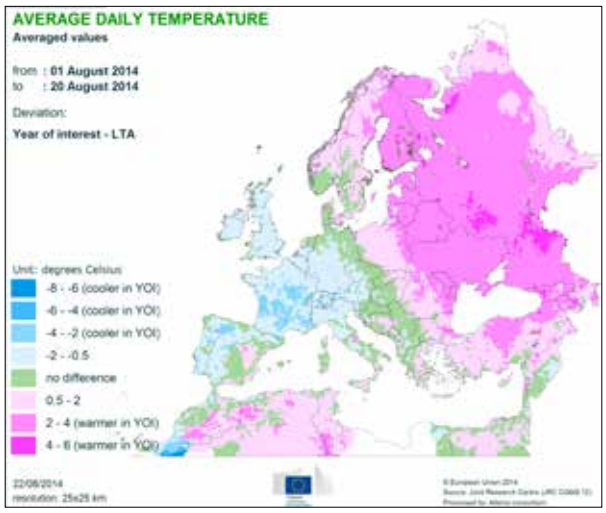
Warmer-than-usual conditions prevailed during July in most of northern Europe. The first half of July was characterised by colder-than-usual conditions which were as much as 2-4°C below the average in western Europe, Italy and the coast of the Balkan Peninsula. By contrast, warmer conditions were recorded in northern Europe, Ukraine and Turkey. During the second half of July, positive thermal anomalies in the range of 2-4°C above average were also experienced in north-western and eastern Europe. These positive anomalies were particularly pronounced in the Scandinavian Peninsula, Denmark and northern Poland, with average temperatures as much as 6 to 8°C above the long-term average. By contrast, slightly colder-than-usual conditions were observed during the same period in the western part of the Iberian Peninsula, southern France, Italy and locally in the Balkan Peninsula. Negative thermal anomalies continued to prevail and even intensified during the first half of August in the northern part of the Iberian Peninsula, France, and north-western Italy. Colder-than-usual weather conditions were also observed in central Europe and southern Scandinavia. Warmer conditions continued in eastern Europe, where average daily air temperatures significantly exceeded the long-term average. The longest heat wave (locally more than 20 days) persisted over southern Russia, eastern Ukraine and eastern Romania,

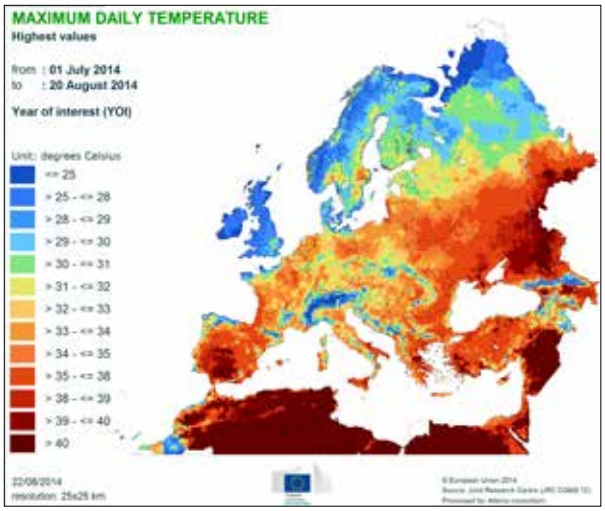
with recorded maximum daily air temperatures above 35°C. The air temperature dropped at the end of the analysis period, ending the heat wave over Ukraine and eastern Romania. The heat wave, however, still persists over southern Russia.

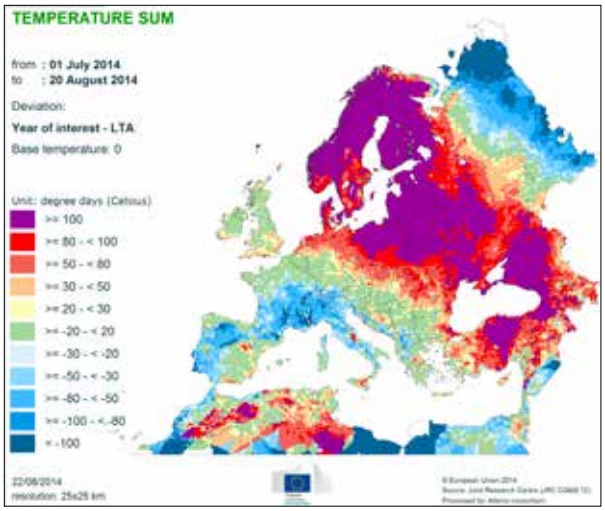
Observed precipitation

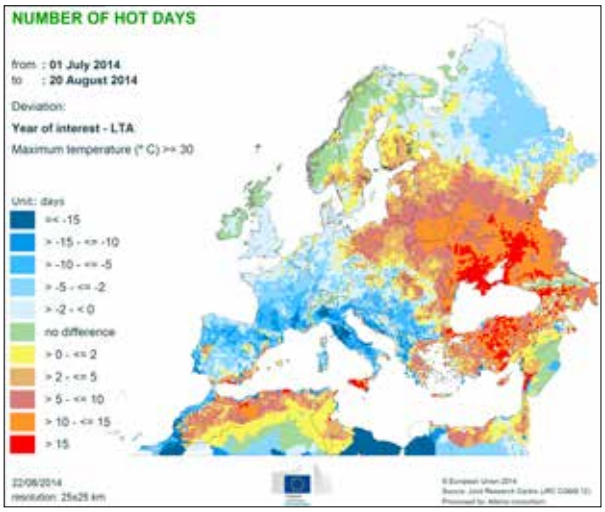
The period of review was characterised by wetter-than-usual conditions in large parts of western and central Europe and the Balkans. The cumulated rainfall during July was well above the long-term average in the central and eastern parts of France, western Germany, the Benelux countries, the pre-Alpine and Alpine regions, northern and central Italy, Slovakia, Hungary, and the Balkan Peninsula. During this period, heavy rainfall and severe thunderstorms were recorded, locally causing waterlogging mainly during the last dekad of July. By contrast, drier-than-usual conditions were recorded over the north-eastern European regions, with cumulated rainfall up to 50 mm below the average. During the first half of August, wetter-than-usual conditions were observed over the British Isles, northern and western France, the Alpine region, Croatia, western Hungary, Slovakia, Denmark, Sweden, and the Baltic Countries. Below-average rainfall was observed in eastern Europe, the southern part of the Iberian Peninsula, and parts of Scandinavia. Very scarce rainfall, locally with cumulative levels of less than 30 mm, occurred in southern Russia, eastern Ukraine and eastern Romania. High atmospheric evaporative demand and scarce rainfall have depleted the soil moisture in large parts of Ukraine and southern Russia, negatively affecting the growth of summer crops.

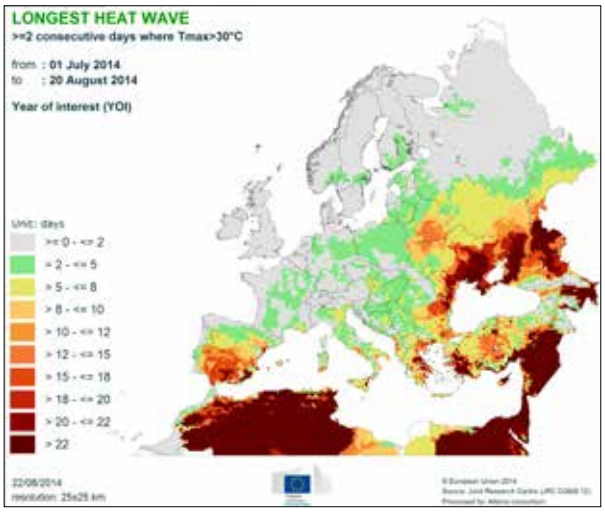


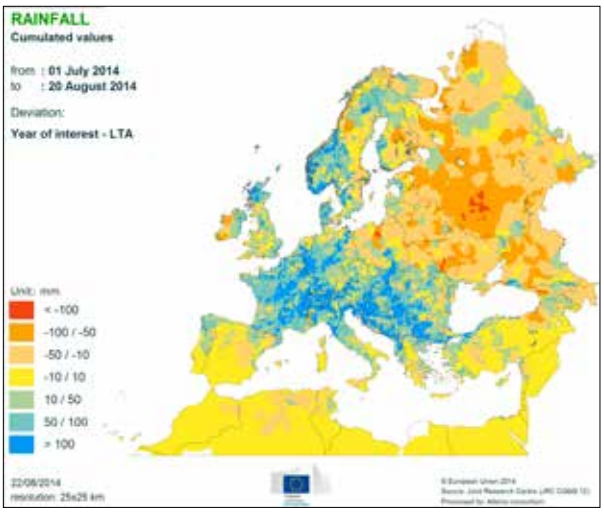


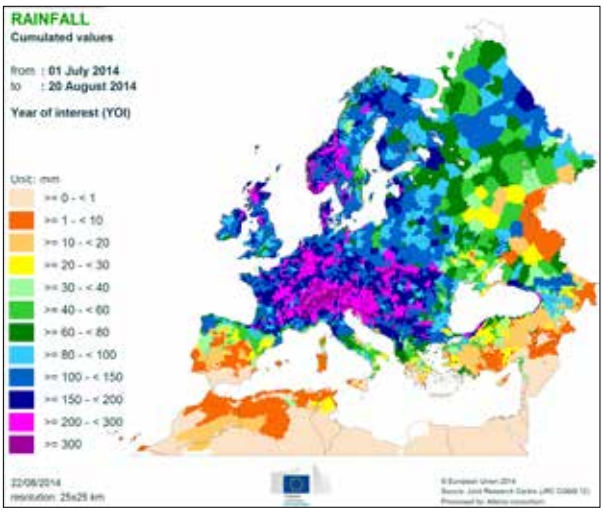


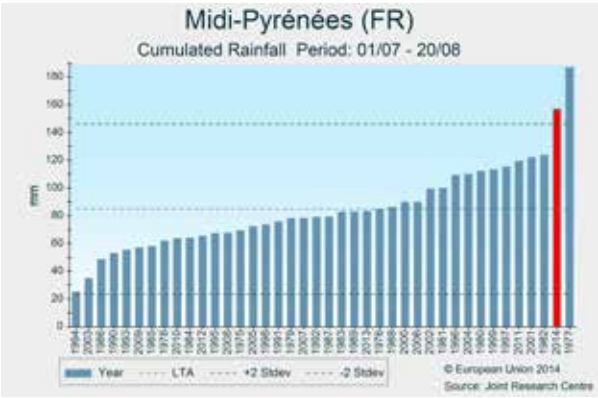


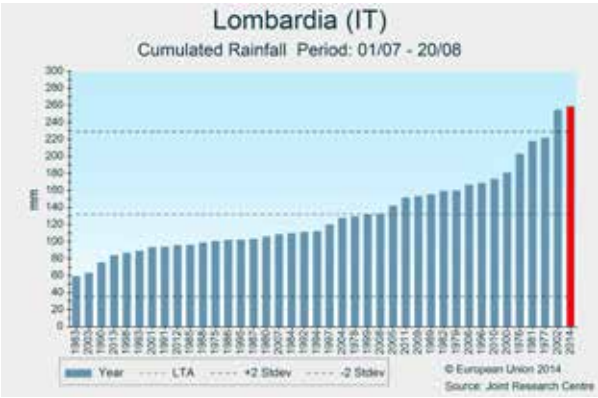

NUMBER OF HOT DAYS
from : 01 July 2014
to : 20 August 2014
Deviation:
Year of interest - LTA
Maximum temperature (° C) >= 30
Unit: days
=< -15
> -15 - <= -10
> -10 - <= -5
> -5 - <= -2
> -2 - < 0
no difference
> 0 - <= 2
> 2 - <= 5
> 5 - <= 10
> 10 - <= 15
> 15
22/08/2014
resolution: 25x25 km


LONGEST HEAT WAVE
>=2 consecutive days where Tmax>30°C
from : 01 July 2014
to : 20 August 2014
Year of interest (YOI)
Unit: days
>= 0 - <= 2
> 2 - <= 5
> 5 - <= 8
> 8 - <= 10
> 10 - <= 12
> 12 - <= 15
> 15 - <= 18
> 18 - <= 20
> 20 - <= 22
> 22
22/08/2014
resolution: 25x25 km


RAINFALL
Cumulated values
from : 01 July 2014
to : 20 August 2014
Deviation:
Year of interest - LTA
Unit: mm
< -100
-100 / -50
-50 / -10
-10 / 10
10 / 50
50 / 100
> 100
22/08/2014
resolution: 25x25 km

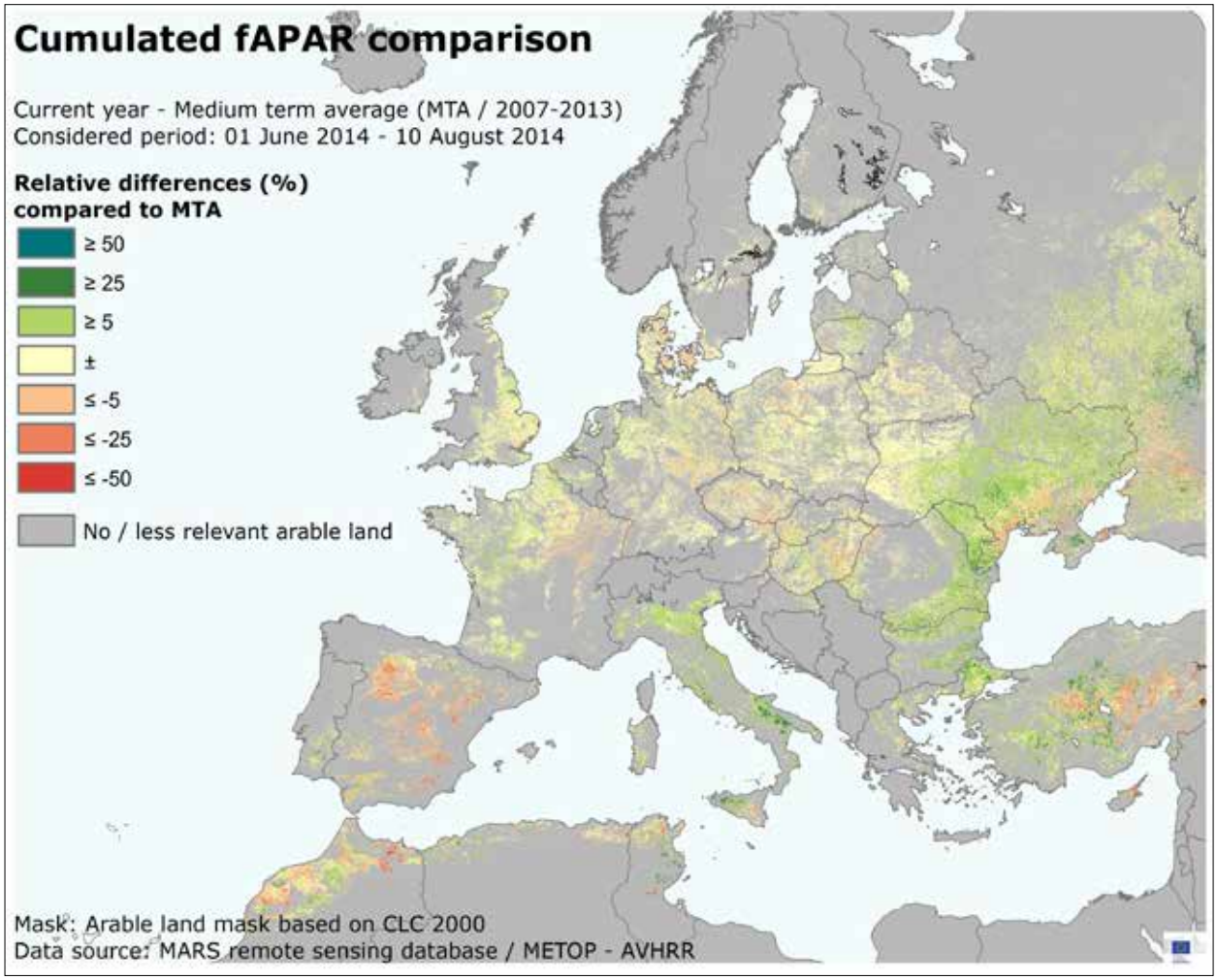

RAINFALL
Cumulated values
from : 01 July 2014
to : 20 August 2014
Year of interest (YOI)
Unit: mm
>= 0 - < 1
>= 1 - < 10
>= 10 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150 - < 200
>= 200 - < 300
>= 300
22/08/2014
resolution: 25x25 km


Midi-Pyrénées (FR)
Cumulated Rainfall Period: 01/07 - 20/08
mm
Year
LTA
+2 Stdev
-2 Stdev
© European Union 2014
Source: Joint Research Centre

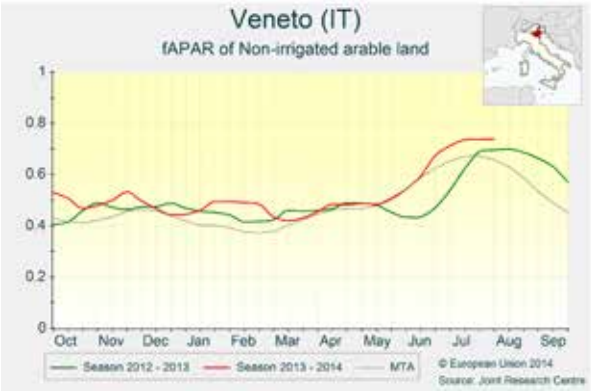

Lombardia (IT)
Cumulated Rainfall Period: 01/07 - 20/08
mm
Year
LTA
+2 Stdev
-2 Stdev
© European Union 2014
Source: Joint Research Centre

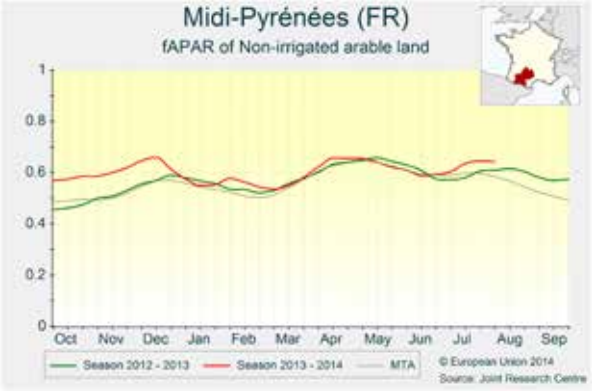
2. Remote Sensing - observed canopy conditions

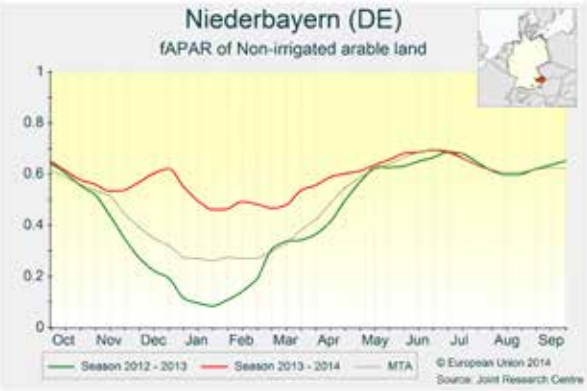
Very positive conditions for summer crops in Italy and eastern European countries

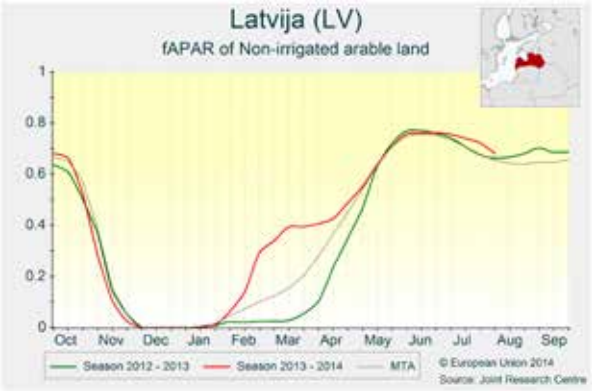


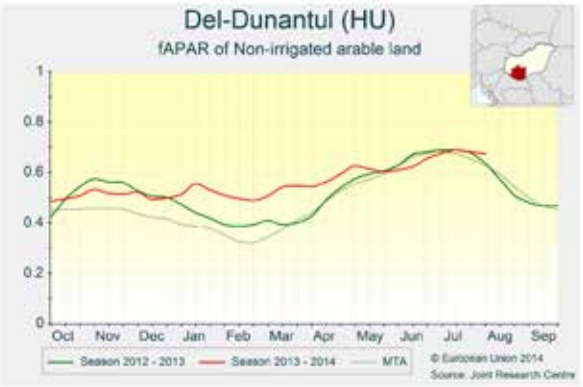
The map displays the observed cumulated values of fAPAR (fraction of Absorbed Photosynthetically Active Radiation) from the beginning of June to 10 July, compared to the medium-term average (MTA of 2007 – 2013). In **Spain**, the negative anomalies are mainly due to the early completion of the winter crops cycle this year. For *Castilla y Léon*, the negative anomalies are partially explained by the sub-optimal growth of the rainfed sunflower fields. In northern **Italy**, the rainfall surplus benefitted maize growth, and the fAPAR indicator values for the main producing regions are clearly above average (e.g. in *Veneto*). In southern **France**, the maize conditions are similar to those in Italy (e.g. *Midi Pyrénées*): average temperatures and abundant rains determined strong canopy growth. Negative anomalies of fAPAR accumulation are visible in the central-eastern regions due to dry conditions in June: even though the effect is visible on the map, the rains in July mitigated the impact on the crops. In the **United Kingdom**, close-to-average temperature and rainfall conditions led to a normal senescence process in the southern regions. In northern regions, crops reacted more strongly to the warm summer temperatures, which led to early senescence. In **Germany**, summer crops experienced optimal growth temperatures and their biomass is now around average in southern regions (e.g. *Niederbayern*) and above average in northern regions. The **Baltic countries** experienced above-average temperatures in July: spring and winter crops benefited from these temperatures and reached maturity almost everywhere, allowing the start of harvest activities (e.g. *Latvija*). In central Europe, the summer crop season is proceeding without any significant concern. The July rains mitigated the dry conditions in eastern **Hungary**, and the main summer crops regions are displaying above-average biomass growth (e.g. *Del-Dunantul*). Maize and sunflower canopy growth is exceptionally vigorous in the border region between **Bulgaria** and **Romania**, where it is sustained by very positive precipitation anomalies and temperatures that are slightly above average (e.g. *Severozapaden* and *Sud Est)*. In **Ukraine**, the crops in the central regions showed positive fAPAR anomalies throughout the season and are now advanced to maturity under optimal conditions. Less positive conditions prevail in the eastern and southern regions of the country (e.g. Poltavs'ka), where the high temperatures of the past 20 days may have hampered the fertility, or shortened the grain-filling phase, of summer crops.

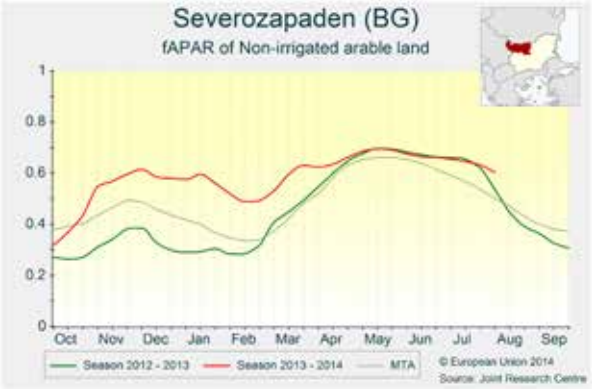

Veneto (IT)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre

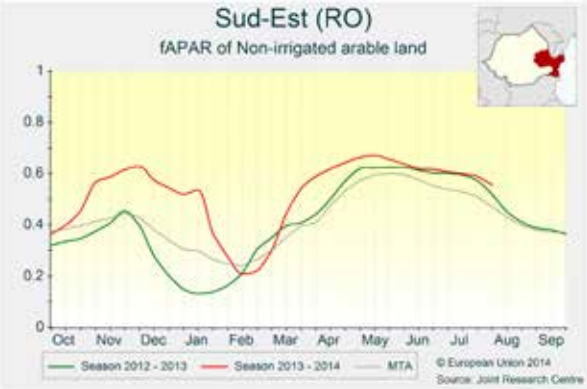

Midi-Pyrénées (FR)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre


Niederbayern (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 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre


Latvija (LV)
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 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre


Del-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 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre


Severozapaden (BG)
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 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre


Sud-Est (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 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
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 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre

3. Country headlines

3.1 European Union

France

Since 1st July, cumulated rainfall was exceptionally higher than average, particularly in the southeast, and temperatures were colder than average. Although the exceptional rainfall hampered the harvesting of winter and spring cereals and impacted the quality of grains, yields are forecast to be above average for all crops aside from durum wheat and spring barley. Conditions are favourable for summer crops.

Germany

Temperatures were around average but dropped sharply from 11 August. Rain was plentiful, and weather conditions were generally unstable. Overall, conditions in the north were more favourable than in the south. Good yields are forecast for spring and winter cereals, and rape seed is also well above average. However, the unstable weather and rains slowed harvesting activities. Conditions are beneficial for the development of maize, which has entered the grain-filling stage.

Poland

Temperatures stayed above average during the whole period of analysis, but no heatwaves were observed. While cumulated rainfall was below average in the northern half of the country, this is not expected to impact crop yields. Yields are forecast to be above average for all crops, and close to the exceptional levels of last year.

United Kingdom and Ireland

Temperatures during most of the period of review fluctuated around the average, whereas rainfall was above average in the main crop-producing regions. A warmer period with relatively little rain occurred from 20 July until the first few days of August. While this period offered good harvesting conditions, the harvest was hampered by frequent rains during the remainder of the review period. The relatively high yield forecasts of the July bulletin remained practically unchanged, despite continued high pressure from pests and diseases.

Spain and Portugal

While weather conditions have been close to the norm in most regions, daily temperatures have been 2-3°C below the long-term average in *Castilla y Léon*. The yield outlook in Spain is average for all summer crops except sunflowers, which have been negatively affected by dry conditions during the previous months.

Italy

This summer is one of the most humid of the past two decades in the northern half of Italy, with temperatures slightly below seasonal values. Yield expectations for grain maize, which is currently in the grain-filling stage, are good since crop vegetative growth has been quite high, favoured by abundant precipitation.

Hungary

Near-average thermal conditions prevailed, with no extreme temperatures. Abundant rain typically exceeded 150 mm during the period of review (+70 mm surplus). Although frequent rains delayed the harvest and lowered the grain quality (reduced gluten and protein content, increased chance of fungal infections), the previous forecast was confirmed as the resulting yield losses are minimal. As the wet conditions were favourable to the flowering/grain-filling stages of maize and sunflowers, the yield expectations are high. Potatoes and sugar beets also benefited from the plentiful water supply.

Romania

Romania experienced a slightly positive (+1-2°C) thermal anomaly and an above-average number of hot days (Tmax >30°C), but no heat wave. (In a limited area of the Sud-Est region, Tmax >+35°C was recorded during a period of 3-7 days.) The precipitation was plentiful in the western and central areas (100-200 mm, locally 200-300 mm), but eastern and south-eastern areas (e.g. the Sud-Est region) received near- or slightly below-average precipitation. The harvest was difficult due to the rain, with poor yield quality. However, good yields of summer crops are forecast, the phenological development is normal, with biomass accumulation greatly exceeding the average.

Bulgaria

Normal thermal conditions were experienced in Bulgaria, with a short heat wave in the second dekad of August. Accumulated precipitation was almost double (130 mm) the usual climatological levels. The south-western part of Bulgaria experienced particularly excessive precipitation. (Considering the period since 1 April, this is the wettest year for Bulgaria in our 40-year archive.) The harvest was hampered by frequent and plentiful precipitation. Harvest losses occurred locally in the rainiest regions. Biomass accumulation of maize and sunflowers is simulated to be very high. The yield outlook is considerably above average.

Austria, Slovakia and the Czech Republic

Warmer-than-usual weather prevailed during the analysis period. In general, above-average rainfall levels were recorded in Austria, Slovakia and the southern part of the Czech Republic, locally exceeding the long-term average by more than 100 mm. Summer crops are generally in good condition due to favourable soil moisture. The grain maize yield is expected to exceed the 5-year average in Austria and Slovakia, whereas the yield in the Czech Republic is expected to be close to average. High levels of rainfall in August may have provided favourable conditions for the occurrence of late potato blight.

Belgium, the Netherlands and Luxembourg

The rainfall pattern was characterised by alternating periods of a few days of rainy weather followed by several days of dry weather. Above-average temperatures prevailed, but maxima remained below 30°C, except on 19 July, when they reached 30-35°C. Temperatures gradually dropped in August, reaching below-average values in the 2nd dekad. These conditions were favourable for root crops and grain maize, and generally provided sufficient harvesting opportunities for winter and spring cereals, despite frequent interruptions due to rain. Heavy rain storms caused damage to crops locally. Overall, the forecasts remain practically unchanged from those of the July bulletin.

Denmark and Sweden

The second half of July was characterised by warmer-than-usual conditions over major agricultural areas, with daily temperatures 2-4°C above the LTA. Rainfall was scarce during that period. Spring and winter crops were not affected, since they have mainly reached the maturity stage. The crop yield outlook for spring and winter crops therefore remains above the 5-year average. The beginning of August was wetter than usual, with air temperatures slightly above the long-term average. Rainfall was beneficial for summer crops. Our models therefore simulate yields to be above the 5-year average.

Greece and Cyprus

Temperatures in July and August fluctuated above the long-term average in central-southern Greece, while they were around average in northern areas. Temperatures near or even above 40°C were recorded around 15 August in central-southern Greece. Precipitation in central Greece gradually increased moving northwards. Grain maize is progressing well, as are other spring crops. In Cyprus, temperatures were above average, and almost no precipitation has been recorded since 1 July.

Finland, Lithuania, Latvia and Estonia

The weather during the period analysed was characterised by warm temperatures and dry conditions, interrupted by some rain. These conditions were favourable for winter crops, the harvesting of which is almost complete. High temperatures have advanced the maturity of spring crops with no negative consequences. Summer crops were not (or only slightly) affected by dry conditions, with the exception of the potato. Overall, the outlook is good for winter and spring crops, and moderate for summer crops.

Slovenia and Croatia

Slovenia and Croatia experienced warmer-than-usual air temperatures and significantly wetter-than-usual weather during the period under review. Locally, rainfall exceeded the long-term average by more than 100 mm. Favourable soil moisture provided good conditions for grain maize, which is now in the grain-filling stage. Consequently, grain maize yields are expected to exceed the 5-year average. In many areas, excessive rainfall may cause leaning in sunflower crops, affecting their further growth and potentially leading to decreased yields.

3.2 Black Sea Area

Turkey

Turkey is experiencing a warm period, with temperatures in July and August fluctuating significantly above the long-term average in central-eastern and northern areas. A few exceptions, with near average values, were observed in western parts. Regarding precipitation, almost all parts of the country experienced rainy days, and rainfall levels in northern parts (e.g. *Kocaeli*, *Kastamonu*) exceeded the average. Grain maize presents advanced development and is gradually entering into the maturity stage.

Ukraine

The period of analysis was drier than usual, with temperatures staying above average. The first half of August was particularly warm, with temperatures reaching 35°C on some days. Conditions were optimal for the harvesting of winter and spring cereals, and close-to-record yields are expected. By contrast, conditions are expected to negatively impact the yields of grain maize.

3.3 European Russia and Belarus

European Russia

A moderately positive thermal anomaly was recorded along the western border, while temperatures were slightly below average along the Ural Mountains. Aside from some eastern and northern regions, rainfall was scarce in most of European Russia. The harvest probably progressed well. Wheat and barley yields are expected to be high. As the water deficiency could compromise the biomass accumulation, yields of maize, potatoes and sugar beet are likely to be mediocre.

Belarus

During the period analysed, temperatures were among the warmest on record in our database. Rain levels were slightly lower than usual throughout the country. The outlook for cereal production is positive. Winter wheat is in generally good condition, and yields are above average. Good conditions are also reported for grain maize and spring barley, which benefited from early sowing and adequate soil moisture, due to the abundant precipitation that occurred in the previous months.

4. Crop yield forecasts

Country	TOTAL WHEAT t/ha					TOTAL BARLEY t/ha				
	2013	2014	Avg 5yrs	%14/13	%14/5yrs	2013	2014	Avg 5yrs	%14/13	%14/5yrs
EU28	5.59	**5.62**	5.33	+0.5	+5.3	4.85	**4.61**	4.49	-5.0	+2.7
AT	5.37	**5.45**	5.06	+1.5	+7.8	5.15	**5.10**	4.83	-0.9	+5.7
BE	9.13	**8.66**	8.78	-5.2	-1.4	8.54	**8.41**	8.51	-1.5	-1.1
BG	4.19	**4.19**	3.68	-0.2	+13.7	3.72	**4.09**	3.59	+9.8	+14.0
CY	-	**-**	-	-	-	1.58	**0.98**	1.73	-37.9	-43.4
CZ	5.67	**5.33**	5.23	-5.9	+2.1	4.57	**4.51**	4.35	-1.3	+3.6
DE	8.00	**8.01**	7.48	+0.1	+7.1	6.59	**6.79**	6.23	+3.2	+9.1
DK	7.28	**7.69**	7.14	+5.6	+7.7	5.77	**5.65**	5.54	-2.1	+2.0
EE	3.26	**3.25**	3.14	-0.3	+3.4	3.30	**3.17**	2.81	-4.0	+12.7
ES	3.58	**2.92**	3.05	-18.4	-4.1	3.63	**2.56**	2.81	-29.7	-9.1
FI	3.84	**3.61**	3.71	-6.1	-2.6	3.91	**3.49**	3.52	-10.8	-0.9
FR	7.25	**7.26**	7.02	+0.1	+3.4	6.30	**6.48**	6.42	+2.7	+0.8
GR	3.43	**3.46**	2.88	+1.1	+20.4	3.53	**3.59**	2.95	+1.7	+21.8
HR	4.89	**4.20**	4.81	-14.0	-12.6	3.78	**4.18**	4.09	+10.7	+2.2
HU	4.62	**4.53**	4.03	-2.0	+12.4	4.07	**4.15**	3.62	+1.9	+14.6
IE	8.97	**9.02**	8.53	+0.5	+5.7	7.49	**7.52**	7.05	+0.4	+6.8
IT	3.71	**3.62**	3.79	-2.5	-4.4	3.62	**3.55**	3.61	-2.2	-1.7
LT	4.30	**4.36**	4.03	+1.4	+8.2	3.27	**3.36**	3.04	+2.5	+10.2
LU	6.37	**5.63**	6.07	-11.6	-7.1	-	**-**	-	-	-
LV	3.89	**3.72**	3.68	-4.3	+1.1	2.73	**2.70**	2.65	-1.2	+1.8
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	8.72	**8.70**	8.74	-0.2	-0.5	6.95	**6.84**	6.41	-1.6	+6.8
PL	4.44	**4.42**	4.15	-0.4	+6.5	3.57	**3.53**	3.41	-1.1	+3.5
PT	1.71	**1.77**	1.43	+3.2	+24.0	1.69	**1.75**	1.54	+3.5	+13.7
RO	3.48	**3.50**	2.97	+0.8	+18.0	3.25	**3.16**	2.73	-2.7	+15.8
SE	5.78	**6.27**	5.77	+8.4	+8.7	4.62	**4.67**	4.46	+1.1	+4.8
SI	4.38	**4.40**	4.75	+0.3	-7.4	4.00	**4.03**	4.20	+0.8	-3.9
SK	4.58	**3.80**	4.00	-17.1	-5.1	3.93	**3.80**	3.43	-3.4	+10.8
UK	7.38	**8.24**	7.49	+11.6	+10.0	5.85	**5.81**	5.74	-0.6	+1.3

Country	SOFT WHEAT t/ha					DURUM WHEAT t/ha				
	2013	2014	Avg 5yrs	%14/13	%14/5yrs	2013	2014	Avg 5yrs	%14/13	%14/5yrs
EU28	5.81	**5.85**	5.57	+0.7	+5.1	3.35	**3.17**	3.22	-5.5	-1.7
AT	5.39	**5.50**	5.10	+2.1	+7.9	5.09	**4.42**	4.33	-13.1	+2.2
BE	9.13	**8.66**	8.78	-5.2	-1.4	-	**-**	-	-	-
BG	4.20	**4.19**	3.69	-0.2	+13.6	3.17	**3.77**	3.22	+19.0	+17.1
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	5.67	**5.33**	5.23	-5.9	+2.1	-	**-**	-	-	-
DE	8.00	**8.01**	7.48	+0.1	+7.1	-	**-**	-	-	-
DK	7.28	**7.69**	7.14	+5.6	+7.7	-	**-**	-	-	-
EE	3.26	**3.25**	3.14	-0.3	+3.4	-	**-**	-	-	-
ES	3.76	**3.03**	3.29	-19.4	-7.7	2.64	**2.35**	2.13	-11.2	+10.0
FI	3.84	**3.61**	3.71	-6.1	-2.6	-	**-**	-	-	-
FR	7.39	**7.39**	7.19	+0.0	+2.8	5.27	**5.01**	5.12	-5.0	-2.2
GR	3.44	**3.50**	3.10	+1.7	+13.0	3.42	**3.45**	2.80	+0.8	+23.2
HR	4.89	**4.20**	4.81	-14.0	-12.6	-	**-**	-	-	-
HU	4.63	**4.54**	4.03	-1.9	+12.5	4.43	**4.08**	3.84	-8.0	+6.3
IE	8.97	**9.02**	8.53	+0.5	+5.7	-	**-**	-	-	-
IT	5.22	**5.22**	5.34	-0.1	-2.2	2.97	**2.86**	3.08	-3.9	-7.2
LT	4.30	**4.36**	4.03	+1.4	+8.2	-	**-**	-	-	-
LU	6.37	**5.63**	6.07	-11.6	-7.1	-	**-**	-	-	-
LV	3.89	**3.72**	3.68	-4.3	+1.1	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	8.72	**8.70**	8.74	-0.2	-0.5	-	**-**	-	-	-
PL	4.44	**4.42**	4.15	-0.4	+6.5	-	**-**	-	-	-
PT	1.71	**1.77**	1.43	+3.2	+24.0	-	**-**	-	-	-
RO	3.48	**3.50**	2.97	+0.8	+18.0	-	**-**	-	-	-
SE	5.78	**6.27**	5.77	+8.4	+8.7	-	**-**	-	-	-
SI	4.38	**4.40**	4.75	+0.3	-7.4	-	**-**	-	-	-
SK	4.58	**3.79**	4.00	-17.3	-5.4	4.68	**4.16**	3.95	-11.0	+5.4
UK	7.38	**8.24**	7.49	+11.6	+10.0	-	**-**	-	-	-

Country	SPRING BARLEY t/ha					WINTER BARLEY t/ha				
	2013	2014	Avg 5yrs	%14/13	%14/5yrs	2013	2014	Avg 5yrs	%14/13	%14/5yrs
EU28	4.43	**3.91**	3.94	-11.7	-0.8	5.50	**5.61**	5.31	+2.0	+5.8
AT	4.38	**4.26**	4.03	-2.8	+5.7	5.77	**5.78**	5.59	+0.1	+3.3
BE	-	**-**	-	-	-	8.54	**8.41**	8.51	-1.5	-1.1
BG	-	**-**	-	-	-	3.72	**4.09**	3.59	+9.8	+14.0
CY	-	**-**	-	-	-	1.58	**0.98**	1.73	-37.9	-43.4
CZ	4.61	**4.50**	4.29	-2.3	+5.0	4.47	**4.52**	4.51	+1.2	+0.3
DE	5.41	**5.42**	5.25	+0.1	+3.2	6.93	**7.16**	6.56	+3.2	+9.0
DK	5.68	**5.54**	5.43	-2.4	+2.1	6.26	**6.10**	6.01	-2.6	+1.5
EE	3.30	**3.17**	2.81	-4.0	+12.7	-	**-**	-	-	-
ES	3.70	**2.56**	2.87	-30.7	-10.8	3.21	**2.50**	2.45	-22.2	+1.8
FI	3.91	**3.49**	3.52	-10.8	-0.9	-	**-**	-	-	-
FR	6.08	**5.96**	6.18	-2.0	-3.7	6.40	**6.70**	6.52	+4.6	+2.7
GR	-	**-**	-	-	-	3.53	**3.59**	2.95	+1.7	+21.8
HR	-	**-**	-	-	-	3.78	**4.18**	4.09	+10.7	+2.2
HU	2.98	**3.60**	3.09	+20.6	+16.3	4.48	**4.39**	3.91	-2.1	+12.0
IE	7.10	**7.17**	6.71	+1.1	+6.9	9.51	**8.69**	8.73	-8.6	-0.5
IT	-	**-**	-	-	-	3.62	**3.55**	3.61	-2.2	-1.7
LT	3.27	**3.36**	3.04	+2.5	+10.2	-	**-**	-	-	-
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	2.73	**2.70**	2.65	-1.2	+1.8	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	6.95	**6.84**	6.41	-1.6	+6.8	-	**-**	-	-	-
PL	3.39	**3.37**	3.26	-0.7	+3.2	4.06	**4.07**	3.98	+0.4	+2.4
PT	-	**-**	-	-	-	1.69	**1.75**	1.54	+3.5	+13.7
RO	2.34	**2.42**	1.96	+3.6	+23.9	3.64	**3.47**	3.13	-4.5	+10.9
SE	4.58	**4.62**	4.42	+1.0	+4.5	5.74	**5.86**	5.31	+2.2	+10.3
SI	-	**-**	-	-	-	4.00	**4.03**	4.20	+0.8	-3.9
SK	3.88	**3.79**	3.40	-2.2	+11.7	4.20	**3.81**	3.66	-9.4	+4.0
UK	5.66	**5.45**	5.39	-3.6	+1.2	6.40	**6.51**	6.38	+1.7	+2.0

Country	GRAIN MAIZE t/ha					RYE t/ha				
	2013	2014	Avg 5yrs	%14/13	%14/5yrs	2013	2014	Avg 5yrs	%14/13	%14/5yrs
EU28	6.74	**7.53**	6.78	+11.8	+11.1	3.99	**3.71**	3.46	-7.1	+7.1
AT	8.12	**10.31**	10.10	+27.1	+2.1	4.18	**4.37**	4.04	+4.4	+7.9
BE	11.29	**11.96**	11.32	+6.0	+5.6	-	**-**	-	-	-
BG	6.39	**6.73**	5.12	+5.2	+31.5	1.88	**1.99**	1.76	+6.0	+13.1
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	6.97	**7.45**	7.75	+6.9	-3.9	4.65	**5.24**	4.55	+12.7	+15.1
DE	8.83	**10.47**	9.75	+18.6	+7.4	5.98	**5.58**	5.24	-6.7	+6.5
DK	5.86	**5.98**	5.49	+2.1	+9.0	6.14	**5.69**	5.58	-7.2	+2.0
EE	-	**-**	-	-	-	1.89	**2.80**	2.52	+48.5	+11.1
ES	11.01	**10.95**	10.68	-0.5	+2.5	2.47	**2.07**	1.95	-16.4	+5.8
FI	-	**-**	-	-	-	2.20	**2.60**	2.68	+18.4	-3.1
FR	8.14	**9.46**	8.99	+16.2	+5.3	4.38	**4.88**	4.84	+11.3	+0.8
GR	12.87	**11.27**	11.25	-12.4	+0.2	1.80	**2.30**	2.02	+27.6	+13.8
HR	6.50	**7.43**	5.94	+14.4	+25.0	-	**-**	-	-	-
HU	5.36	**7.03**	5.65	+31.1	+24.4	3.05	**2.79**	2.29	-8.5	+22.0
IE	-	**-**	-	-	-	-	**-**	-	-	-
IT	8.05	**9.25**	8.85	+15.0	+4.6	-	**-**	-	-	-
LT	7.36	**6.98**	6.65	-5.2	+4.9	1.96	**2.52**	2.27	+28.8	+11.0
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	2.67	**3.14**	2.70	+17.6	+16.4
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	11.52	**12.10**	11.58	+5.0	+4.4	-	**-**	-	-	-
PL	6.59	**6.48**	6.41	-1.7	+1.1	2.91	**2.83**	2.63	-2.6	+7.6
PT	8.31	**8.65**	7.70	+4.2	+12.4	0.90	**0.95**	0.87	+5.9	+9.8
RO	4.41	**4.43**	3.56	+0.4	+24.3	-	**-**	-	-	-
SE	-	**-**	-	-	-	5.67	**6.15**	5.65	+8.5	+8.7
SI	5.66	**7.75**	7.53	+36.9	+3.0	-	**-**	-	-	-
SK	5.07	**7.21**	5.94	+42.2	+21.4	3.86	**2.87**	3.10	-25.8	-7.6
UK	-	**-**	-	-	-	-	**-**	-	-	-

Country	TRITICALE t/ha					RAPE AND TURNIP RAPE t/ha				
	2013	2014	Avg 5yrs	%14/13	%14/5yrs	2013	2014	Avg 5yrs	%14/13	%14/5yrs
EU28	4.29	**4.27**	4.07	-0.4	+4.9	3.11	**3.33**	3.07	+7.2	+8.6
AT	4.98	**5.05**	4.97	+1.4	+1.6	3.39	**2.72**	3.12	-19.8	-12.8
BE	-	**-**	-	-	-	4.26	**4.31**	4.22	+1.3	+2.1
BG	2.82	**3.31**	2.76	+17.0	+19.7	2.54	**2.61**	2.37	+2.8	+10.4
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	4.58	**4.51**	4.33	-1.4	+4.3	3.45	**2.95**	3.03	-14.4	-2.8
DE	6.57	**6.46**	5.94	-1.8	+8.7	3.95	**4.20**	3.77	+6.3	+11.4
DK	5.71	**5.45**	5.14	-4.7	+5.9	3.87	**3.88**	3.68	+0.1	+5.3
EE	-	**-**	-	-	-	2.02	**2.01**	1.71	-0.3	+17.7
ES	2.79	**2.30**	2.26	-17.7	+2.0	2.56	**1.87**	2.04	-27.0	-8.3
FI	-	**-**	-	-	-	1.52	**1.37**	1.43	-9.8	-3.9
FR	5.31	**5.37**	5.39	+1.1	-0.2	3.04	**3.45**	3.39	+13.4	+1.6
GR	-	**-**	-	-	-	**-**	**-**	-	-	-
HR	3.40	**3.00**	3.64	-11.6	-17.4	2.66	**2.70**	2.62	+1.4	+3.0
HU	3.87	**3.68**	3.27	-4.9	+12.5	2.60	**2.67**	2.31	+2.3	+15.2
IE	-	**-**	-	-	-	3.53	**3.55**	3.48	+0.6	+1.8
IT	-	**-**	-	-	-	2.17	**2.27**	2.26	+4.3	+0.2
LT	3.13	**3.31**	3.00	+5.4	+10.1	2.13	**2.15**	2.06	+1.0	+4.4
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	2.60	**2.75**	2.72	+5.9	+0.9	2.36	**2.11**	2.18	-10.5	-3.2
MT	-	**-**	-	-	-	**-**	**-**	-	-	-
NL	-	**-**	-	-	-	-	**-**	-	-	-
PL	3.63	**3.64**	3.43	+0.3	+5.9	2.80	**3.06**	2.69	+9.3	+13.5
PT	1.55	**1.45**	1.21	-6.8	+19.2	-	**-**	-	-	-
RO	3.66	**3.61**	3.18	-1.3	+13.7	2.42	**2.47**	1.86	+2.1	+32.7
SE	4.90	**5.69**	4.82	+16.0	+18.0	2.65	**2.93**	2.76	+10.4	+6.1
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	3.35	**2.92**	3.06	-12.8	-4.6	2.74	**2.24**	2.27	-18.2	-1.2
UK	3.75	**4.14**	3.90	+10.4	+6.1	2.98	**3.81**	3.43	+28.1	+11.4

Country	SUGAR BEETS t/ha					POTATO t/ha				
	2013	2014	Avg 5yrs	%14/13	%14/5yrs	2013	2014	Avg 5yrs	%14/13	%14/5yrs
EU28	67.94	**72.18**	69.36	+6.2	+4.1	30.94	**32.34**	30.61	+4.5	+5.7
AT	68.16	**71.73**	69.07	+5.2	+3.8	28.59	**34.39**	31.65	+20.3	+8.6
BE	74.07	**77.21**	76.30	+4.2	+1.2	46.15	**47.25**	44.97	+2.4	+5.1
BG	-	**-**	-	-	-	15.69	**18.84**	14.86	+20.1	+26.8
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	60.00	**62.90**	59.66	+4.8	+5.4	23.12	**28.81**	26.68	+24.6	+8.0
DE	63.88	**71.38**	68.06	+11.7	+4.9	39.83	**45.11**	42.95	+13.2	+5.0
DK	60.52	**62.43**	60.76	+3.2	+2.7	40.00	**40.96**	39.59	+2.4	+3.5
EE	-	**-**	-	-	-	-	**-**	-	-	-
ES	89.85	**89.44**	83.93	-0.5	+6.6	30.49	**30.46**	30.17	-0.1	+1.0
FI	38.78	**37.58**	36.19	-3.1	+3.9	27.56	**27.23**	26.03	-1.2	+4.6
FR	85.40	**90.82**	88.10	+6.3	+3.1	43.39	**43.40**	43.16	+0.0	+0.6
GR	-	**-**	-	-	-	25.36	**25.97**	25.69	+2.4	+1.1
HR	52.00	**58.16**	48.91	+11.8	+18.9	17.00	**16.99**	17.26	-0.1	-1.6
HU	47.00	**63.48**	50.36	+35.1	+26.1	21.83	**27.09**	23.66	+24.1	+14.5
IE	-	**-**	-	-	-	34.00	**34.09**	31.41	+0.3	+8.5
IT	53.00	**56.42**	56.22	+6.5	+0.4	25.60	**24.87**	24.82	-2.9	+0.2
LT	51.00	**52.08**	48.69	+2.1	+7.0	18.00	**15.48**	15.80	-14.0	-2.0
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	19.00	**17.13**	17.40	-9.8	-1.6
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	76.00	**80.74**	77.43	+6.2	+4.3	41.50	**45.86**	44.13	+10.5	+3.9
PL	52.90	**52.79**	52.08	-0.2	+1.4	21.40	**21.11**	20.55	-1.4	+2.7
PT	-	**-**	-	-	-	18.00	**17.71**	16.39	-1.6	+8.1
RO	32.28	**38.51**	33.60	+19.3	+14.6	15.03	**15.59**	14.47	+3.7	+7.7
SE	64.20	**61.36**	59.07	-4.4	+3.9	33.79	**33.72**	31.93	-0.2	+5.6
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	49.77	**62.04**	53.79	+24.6	+15.3	-	**-**	-	-	-
UK	68.40	**70.54**	68.03	+3.1	+3.7	40.10	**42.52**	41.07	+6.0	+3.5

Country	SUNFLOWER t/ha				
	2013	2014	Avg 5yrs	%14/13	%14/5yrs
EU28	2.02	**2.03**	1.86	+0.5	+8.8
AT	2.35	**2.58**	2.58	+9.6	+0.1
BE	-	-	-	-	-
BG	2.40	**2.26**	2.05	-5.9	+10.3
CY	-	-	-	-	-
CZ	2.20	**2.43**	2.38	+10.7	+2.3
DE	2.11	**2.23**	2.20	+5.8	+1.5
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	1.21	**1.02**	1.11	-16.0	-8.4
FI	-	-	-	-	-
FR	2.05	**2.46**	2.32	+20.1	+6.3
GR	2.54	**2.26**	2.19	-10.9	+3.4
HR	3.24	**2.40**	2.65	-26.1	-9.7
HU	2.48	**2.66**	**2.25**	+7.3	+18.0
IE	-	-	-	-	-
IT	2.09	**2.17**	2.24	+3.6	-3.3
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	0.64	**0.61**	0.56	-4.5	+8.8
RO	2.00	**2.01**	1.65	+0.5	+22.0
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	2.33	**2.38**	2.17	+2.4	+9.8
UK	-	-	-	-	-

Notes: Yields are forecast for crops with more than 10000 ha per country
Sources: 2009-2014 data come from DG AGRICULTURE short term Outlook data (dated July 2014, received on 28/07/2014), EUROSTAT Eurobase (last update: 16/08/2014) and EES (last update: 01/08/2014)
2014 yields come from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/08/2014)

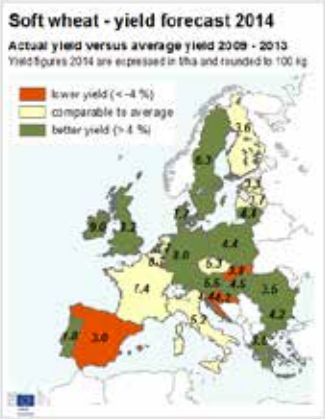
Country	WHEAT (t/ha)				
	2013	2014	Avg 5yrs	%14/13	%14/5yrs
BY	3.33*	**3.67**	3.31	+10.2	+11.0
DZ	1.72*	**1.69**	1.62	-1.5	+4.4
MA	2.10*	**1.71**	1.75	-22.8	-2.3
TN	1.55*	**2.09**	1.92	+34.7	+8.6
TR	2.78	**2.52**	2.63	-9.5	-4.3
UA	3.39	**3.74**	3.08	+10.4	+21.7

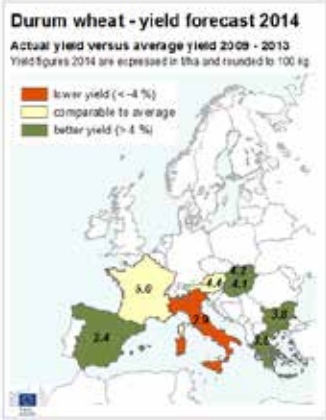
Country	BARLEY (t/ha)				
	2013	2014	Avg 5yrs	%14/13	%14/5yrs
BY	3.09	**3.29**	3.12	+6.4	+5.2
DZ	1.65*	**1.42**	1.53	-14.1	-7.1
MA	1.24*	**1.16**	1.27	-6.5	-8.6
TN	0.94*	**1.41**	1.24	+50.3	+13.5
TR	2.89	**2.47**	2.58	-14.7	-4.6
UA	2.34	**2.56**	2.25	+9.5	+13.8

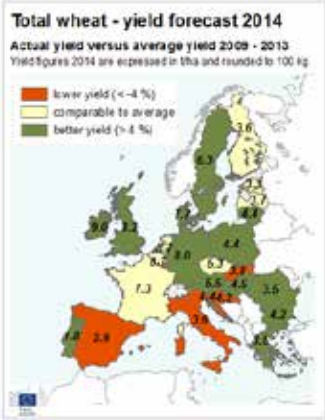
Country	GRAIN MAIZE (t/ha)				
	2013	2014	Avg 5yrs	%14/13	%14/5yrs
BY	6.00*	**5.77**	5.64	-3.8	+2.3
DZ	-	-	-	-	-
MA	-	-	-	-	-
TN	-	-	-	-	-
TR	8.90	**8.14**	7.60	-8.5	+7.2
UA	6.40	**5.67**	5.56	-11.4	+2.1

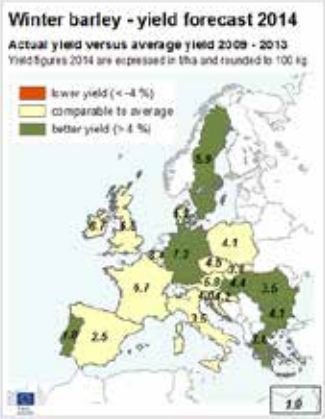
Notes: Yields are forecast for crops with more than 10000 ha per country
Sources: 2009-2013 data come from FAO, PSD-online, INRA Maroc, MinAGRI Tunisia and DSASI Algeria
*2013 yields come from MARS CROP YIELD FORECASTING SYSTEM as reported values were not available
2014 yields come from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/08/2014; for DZ, MA and TN CGMS output was used up to 10/06/2014 as the season has finished)

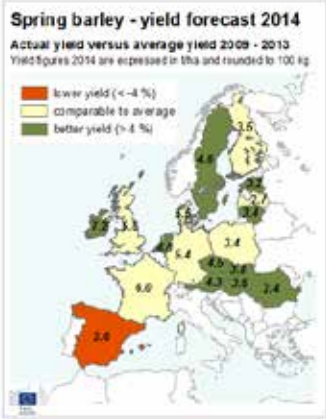
Yield maps

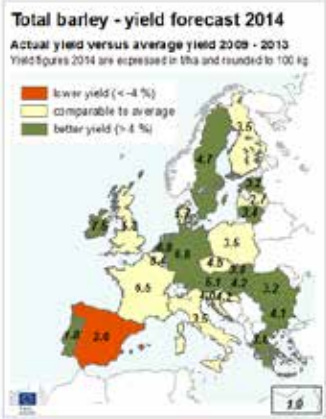

Soft wheat - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

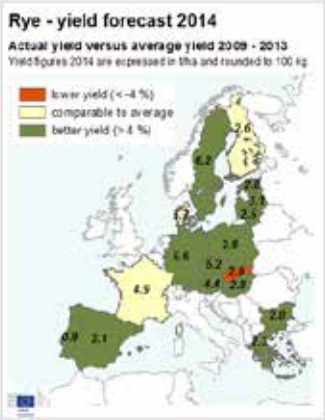

Durum wheat - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

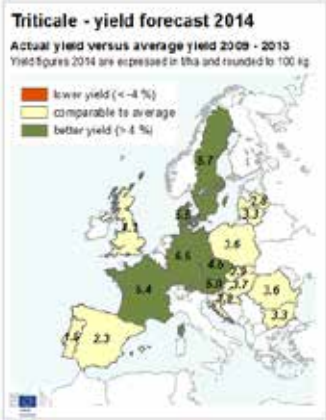

Total wheat - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

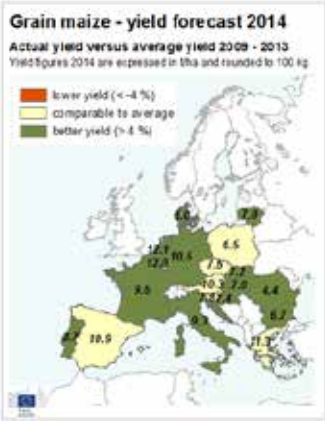

Winter barley - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

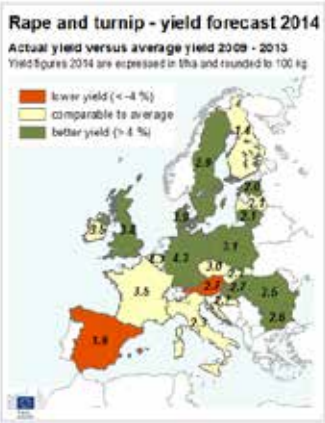

Spring barley - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Total barley - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

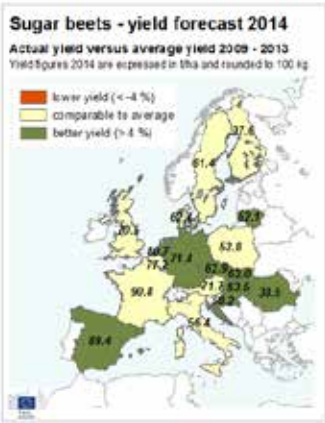

Rye - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Triticale - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Grain maize - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Rape and turnip - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

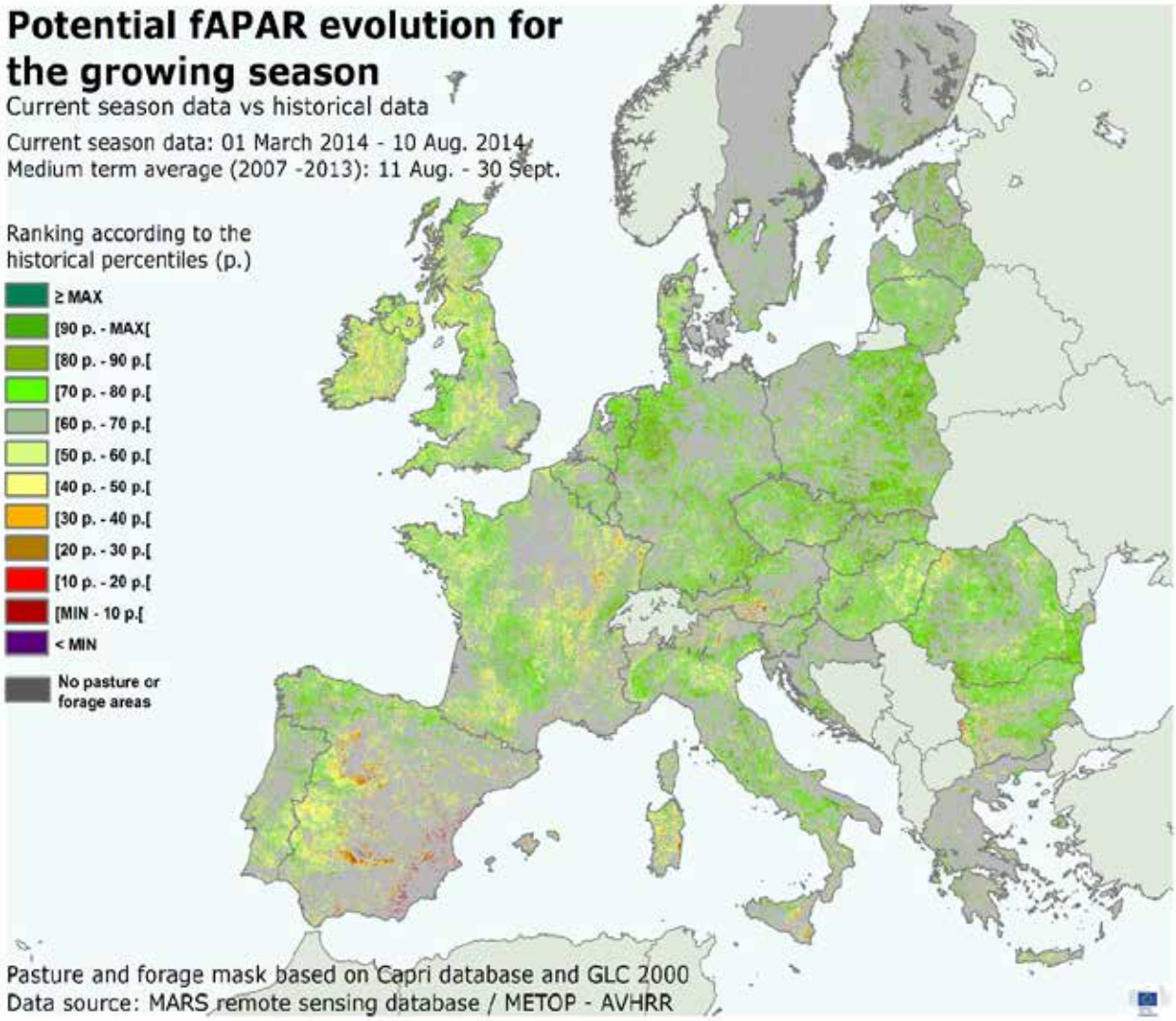

Sunflower - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Sugar beets - yield forecast 2014
Actual yield versus average yield 2009 - 2013
Yield figures 2014 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

5. Pastures in Europe - Remote sensing monitoring update

Positive conditions thanks to the rainfall in July and August

Abundant precipitation favoured vegetative growth across Europe. Biomass production is therefore high in most countries. There are no major concerns expected for the coming months.



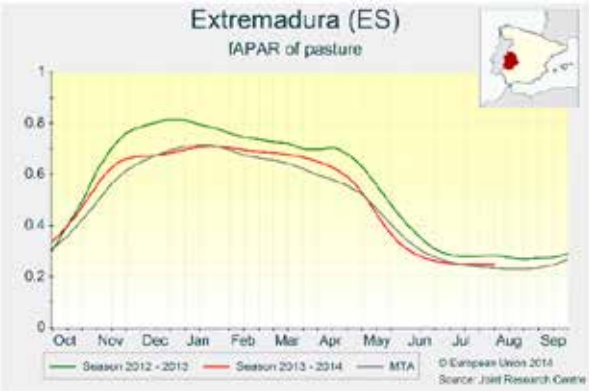
In northern **Spain**, temperatures and precipitation have been close to the norm, and the vegetative status of grasslands is positive. Total biomass production throughout the season is above the long-term average. In the *Dehesa* area, the growing season has already concluded and the results have been positive thanks to the favourable weather during spring. In northern **Italy**, this summer is one of the most humid of the past 20 years. Biomass formation of fodder maize is far above average, and the outlook for the rest of the season is quite favourable. In central and southern regions, the vegetative conditions of pastures are also positive, thanks to the abundant rainfall registered during the second half of July.

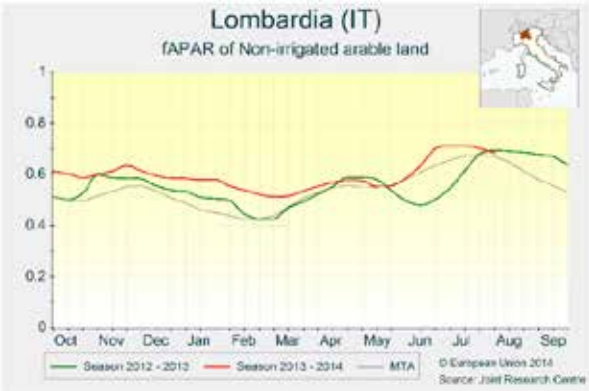
Pasture growth in north-eastern **France** has substantially improved since June, when a lack of water was constraining biomass production. In July and August, frequent rainfall has permitted a complete recovery of green biomass formation, which is currently average. Overall, the vegetative status of grasslands in France is quite positive. Similar conditions were observed for the **Benelux**. In the **UK** and **Ireland** the outlook is also favourable. Temperatures have been warmer than usual in the second half of July, leading to an increase in the biomass production in the main grassland areas. Water constraints are not expected for the rest of the summer, as precipitation has been quite abundant during the first two weeks of August.

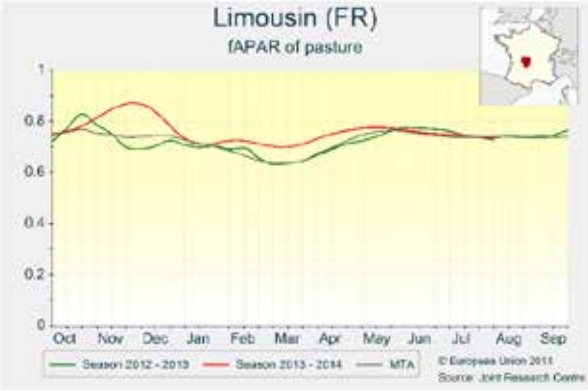
Weather conditions have also been favourable for pasture growth in **Germany**. In the north, the abundant precipitation registered during July permitted the higher-than-usual biomass formation levels to be maintained during summer. In the south, the copious rainfall registered during the second half of July helped avoid water constraints of pasture growth, since the period April-June was rather dry. The growing season has been very positive up to now, since biomass production rates were extremely high in spring and remained average during the summer months. Similar pasture conditions have

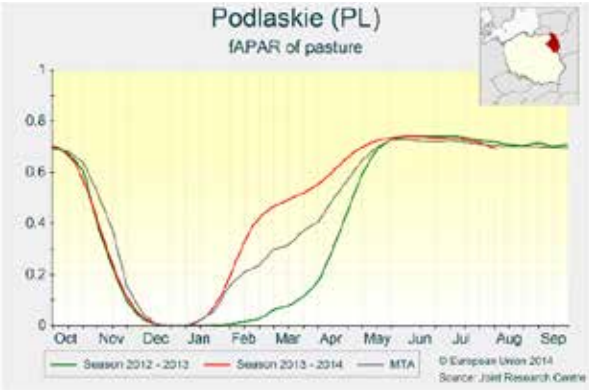
been observed in **Austria**, **Slovakia** and the **Czech Republic**. Pastures in **Hungary** started to recover average production rates from the second half of July. The season was quite dry until June, especially in the east, which negatively affected vegetative vigour. By contrast, frequent rainfall events occurred in July and the first week of August, permitting an acceleration of biomass formation, which is especially relevant for fodder maize. Although vegetative conditions have improved, further rainfall is needed during the second half of August to maintain this incipient recovery. In **Romania**, by contrast, the outlook for pastures is quite positive. Weather conditions have been extremely favourable during summer, with frequent rainfall supporting high biomass production rates, especially in the centre and the south.

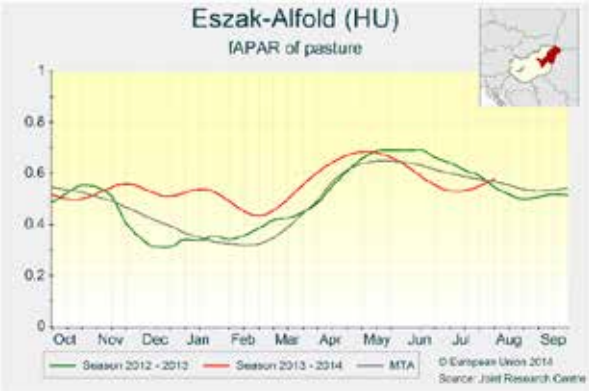
The growing season was characterised by warmer-than-usual temperatures in **Poland**, **Latvia** and **Lithuania**. Those warm conditions continued in July and August, with daily temperatures 3-4°C above the long-term average. Precipitation during that period was scarce, and came mainly from episodic thunderstorms. The season has been very positive up to now thanks to the warm conditions registered on early spring, and biomass formation is currently average. However, rainfall would be needed in the second half of August to avoid any possible water constraints, especially in the current context of high temperatures.

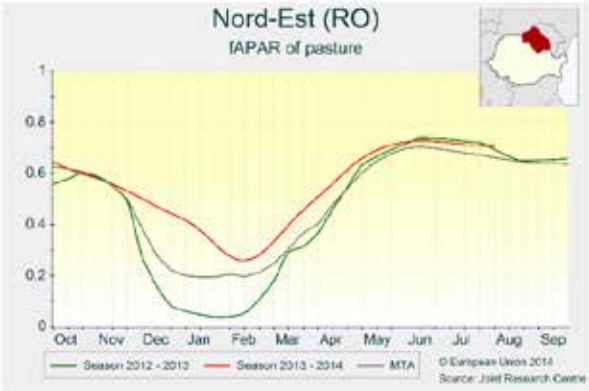






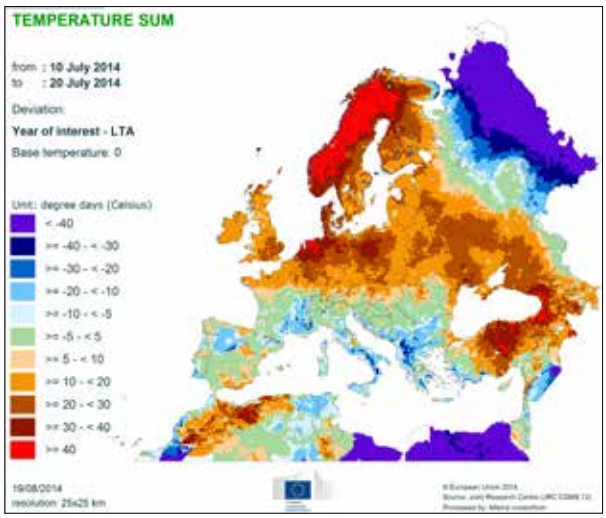


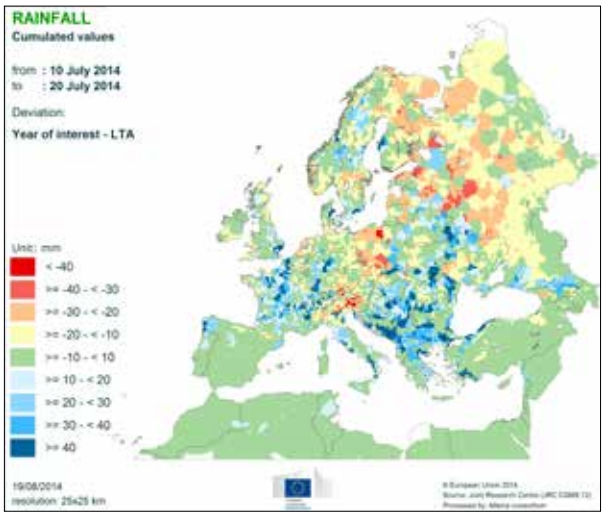


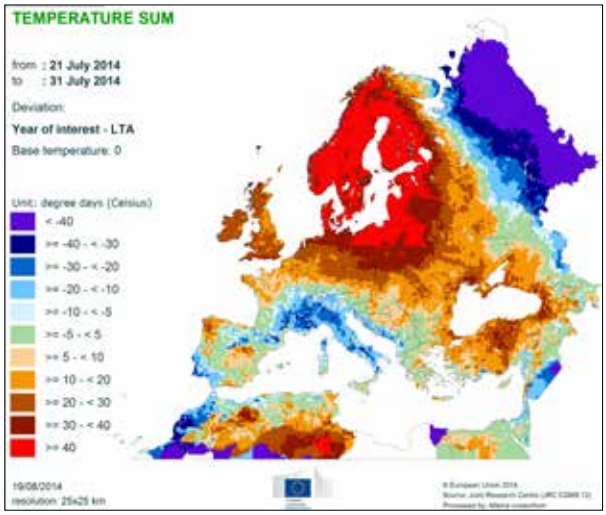


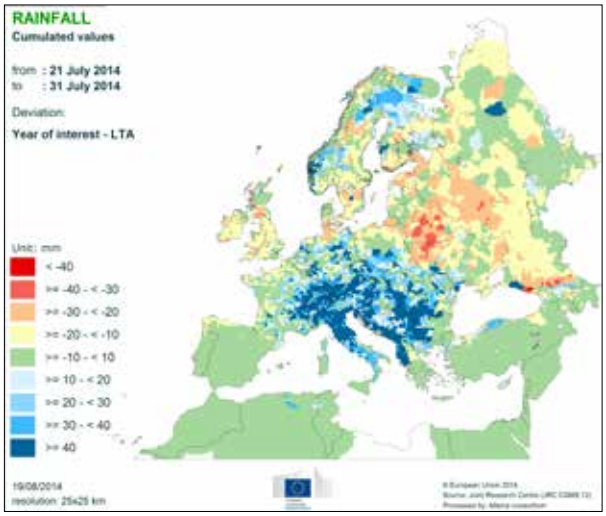
6. Atlas maps

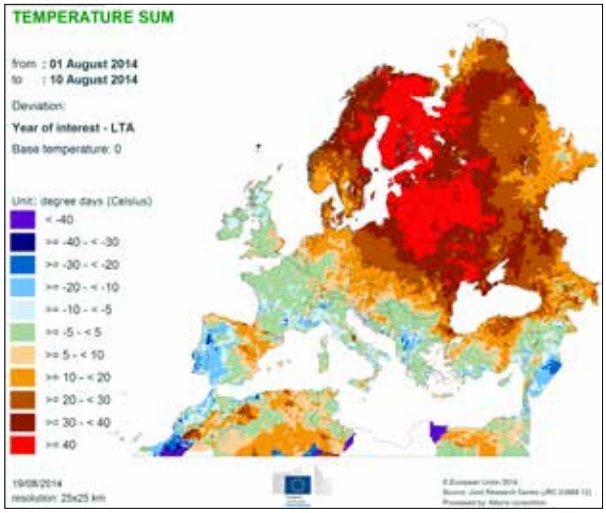
Temperatures and precipitation

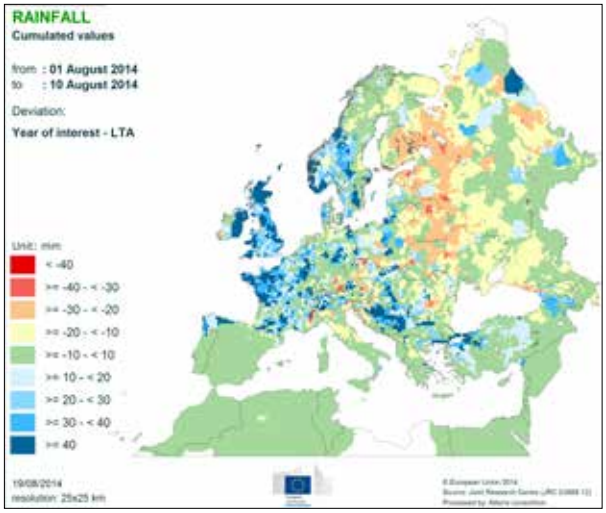


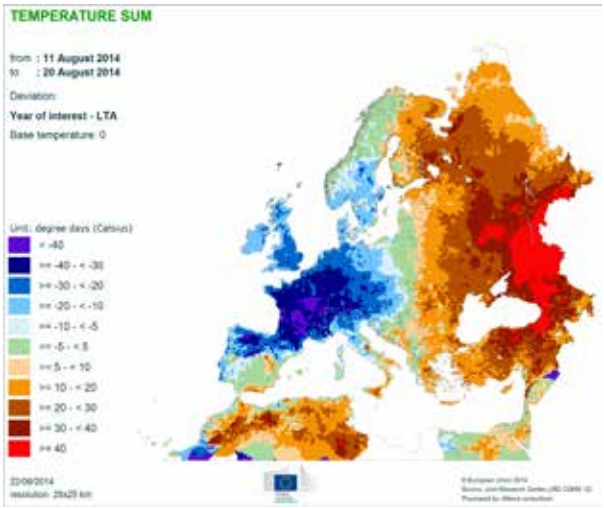


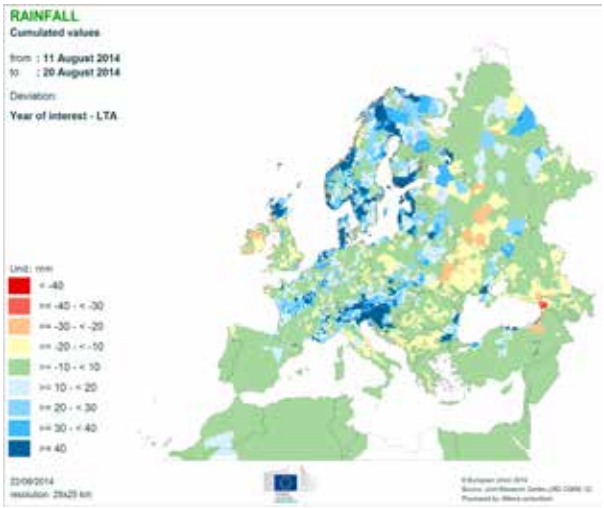




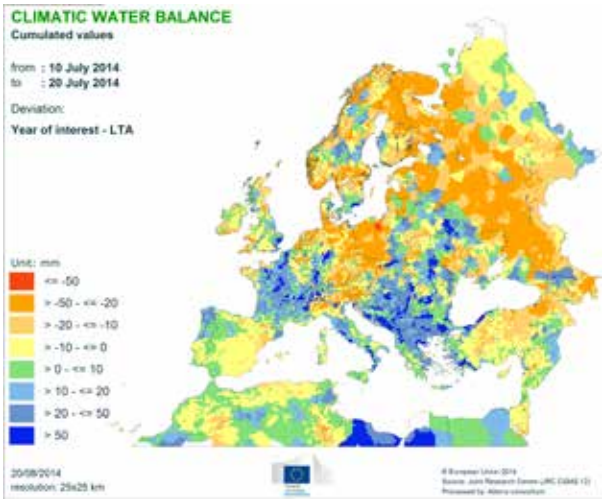


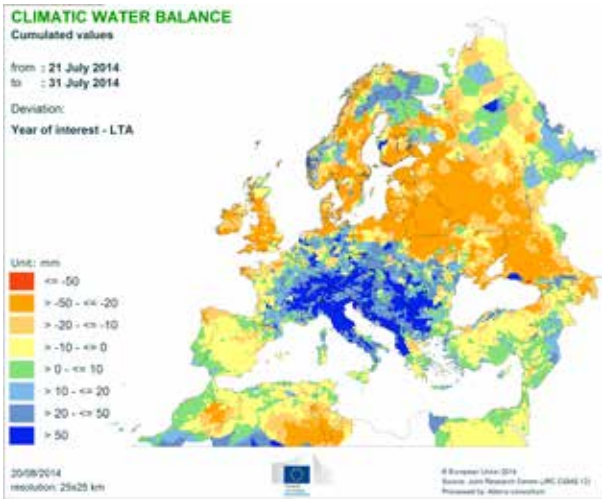


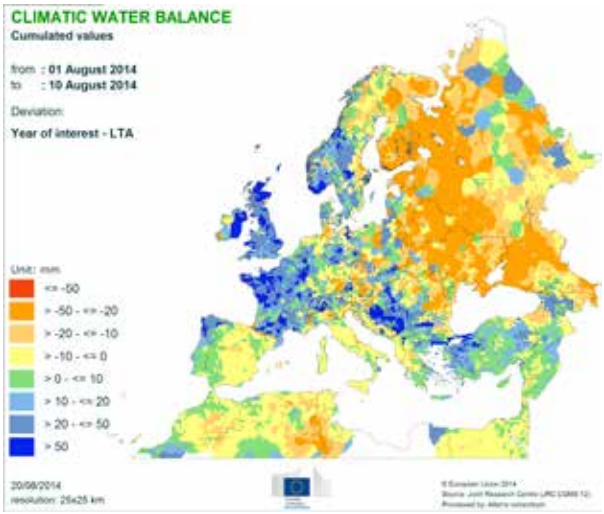


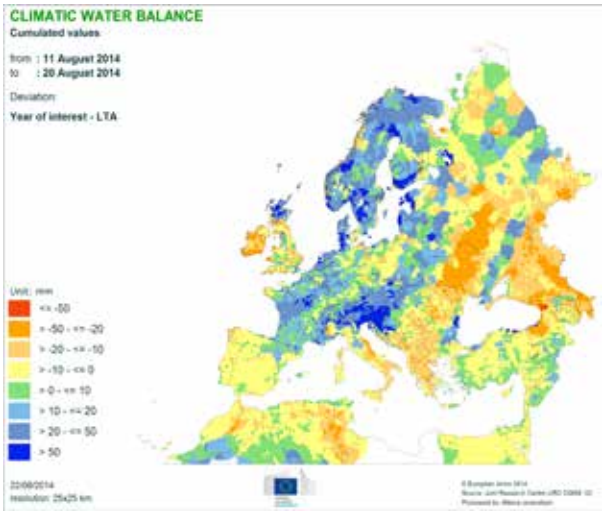


Climatic water balance

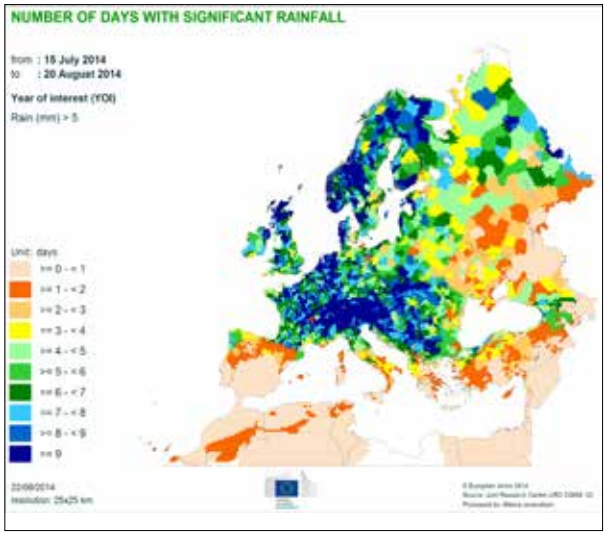


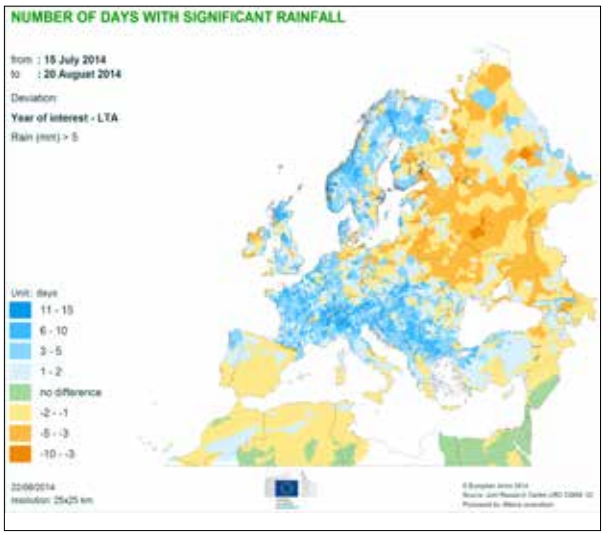


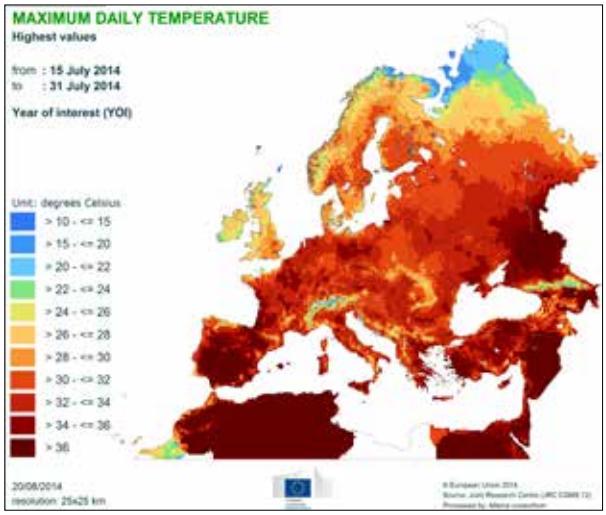


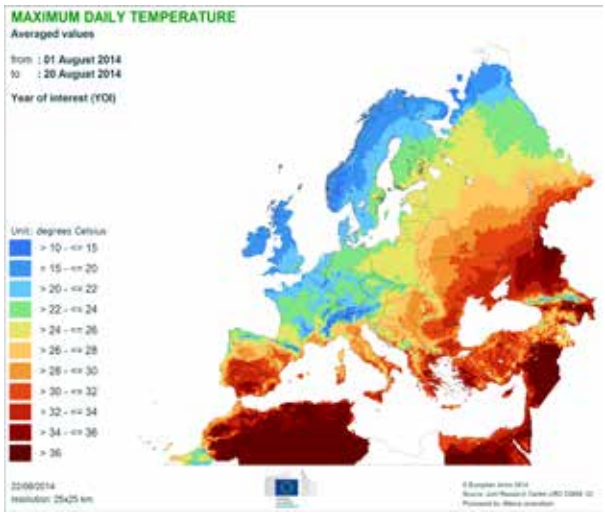


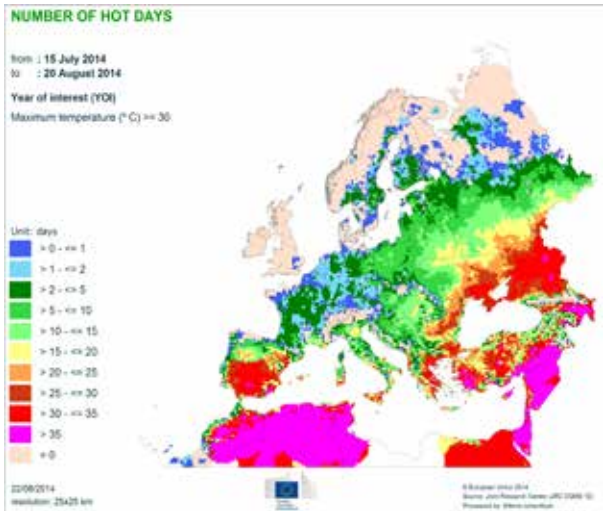
Weather events

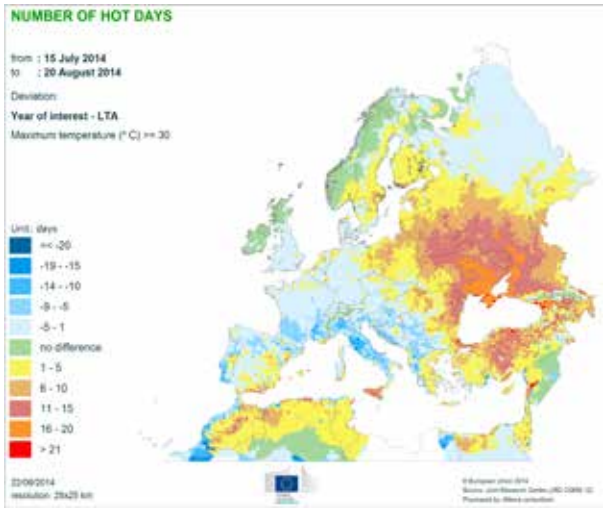




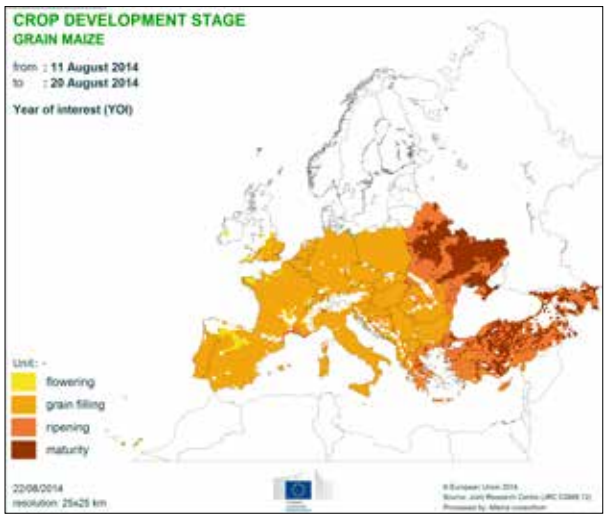


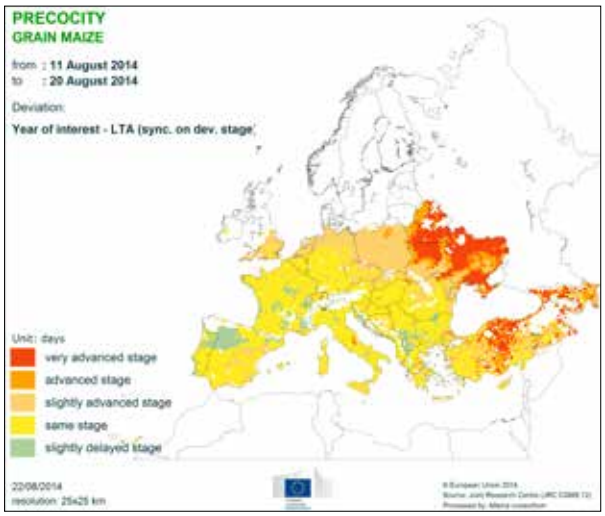


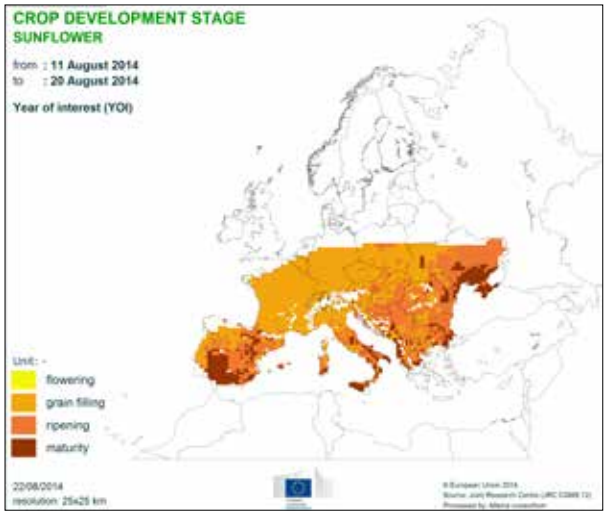


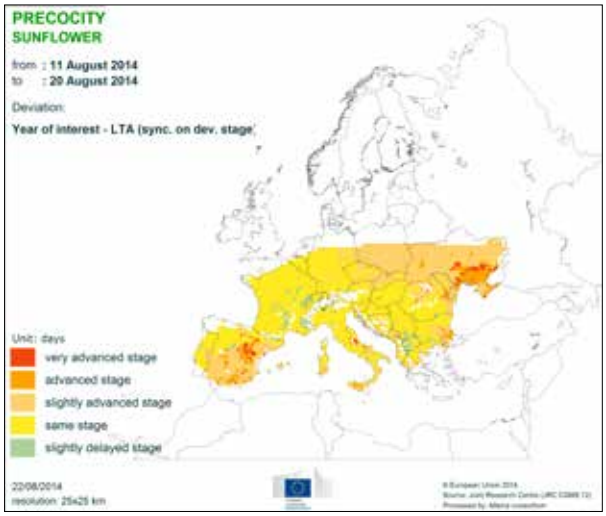


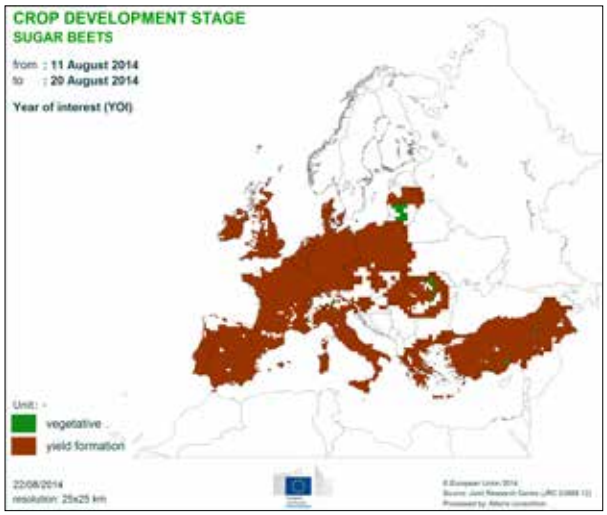
Crop development stages and precocity

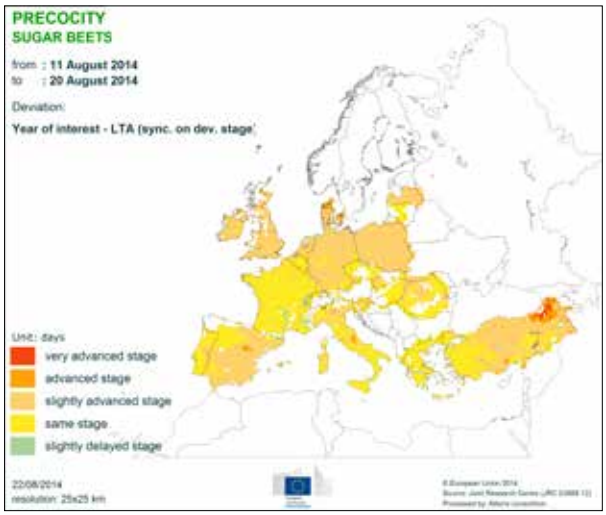




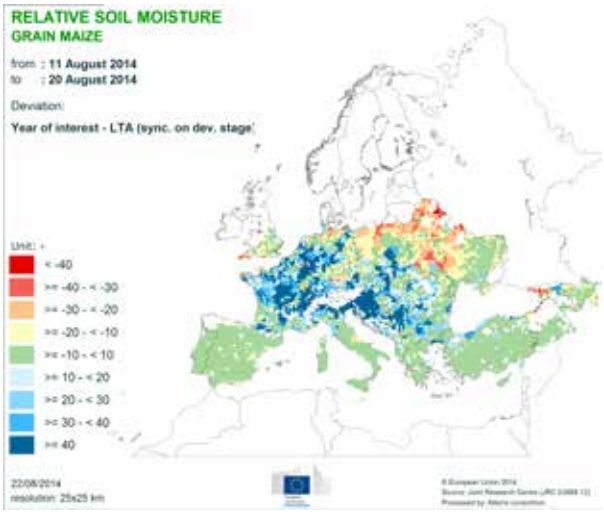


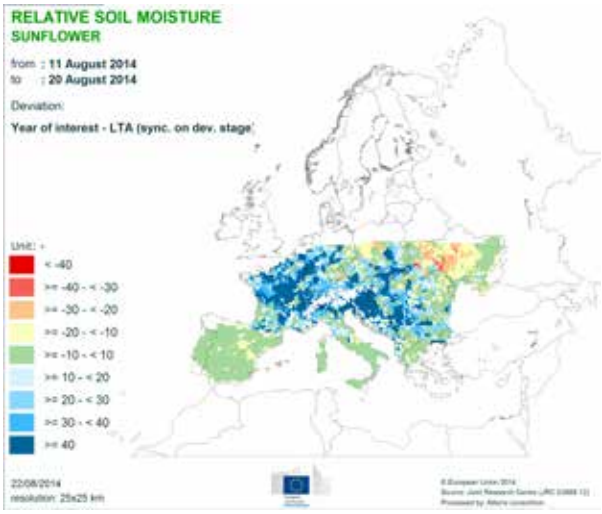


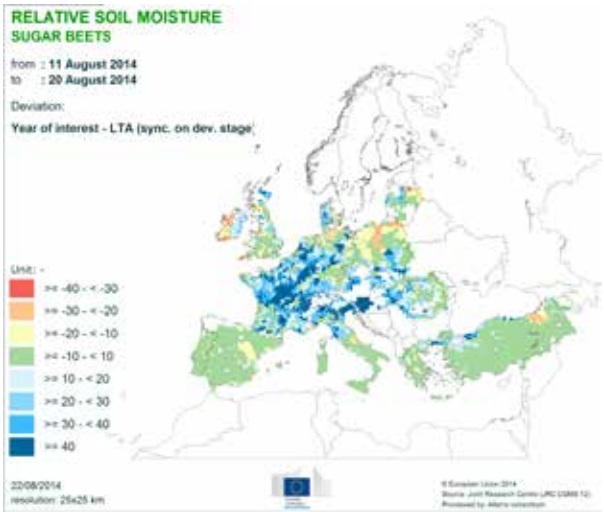


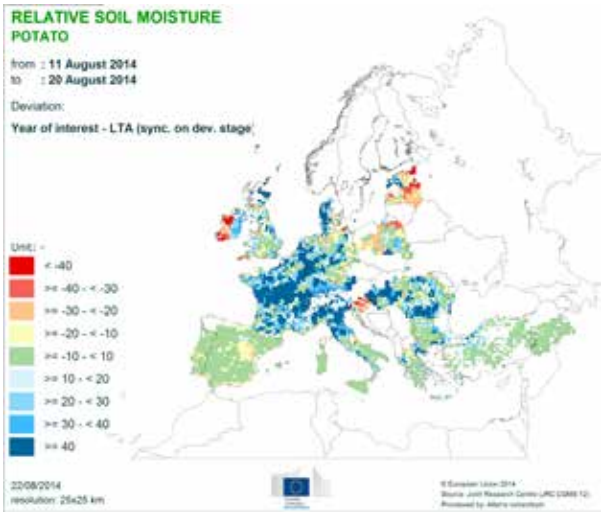


Relative soil moisture

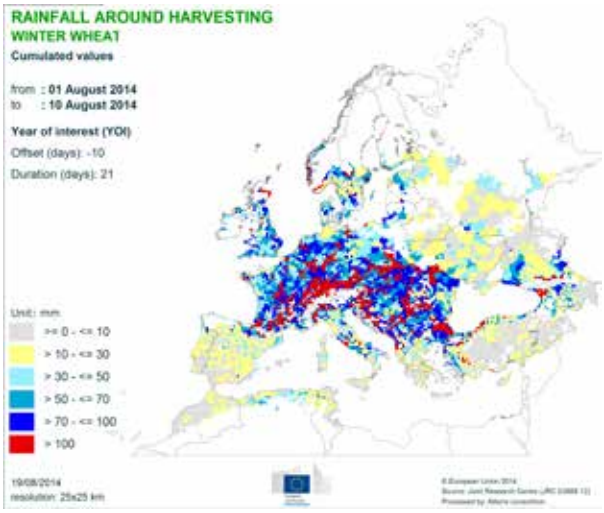


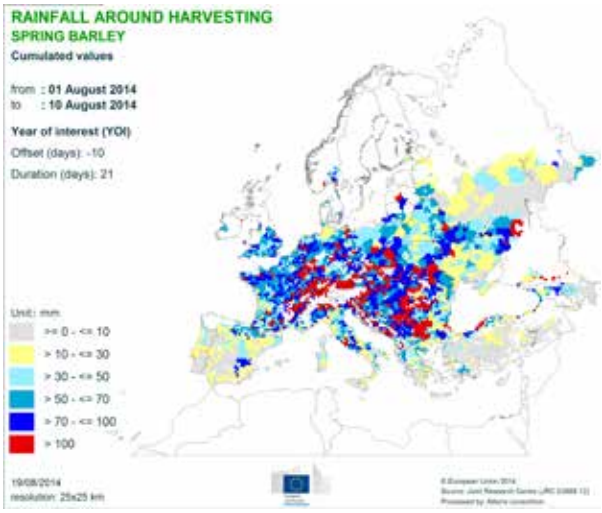


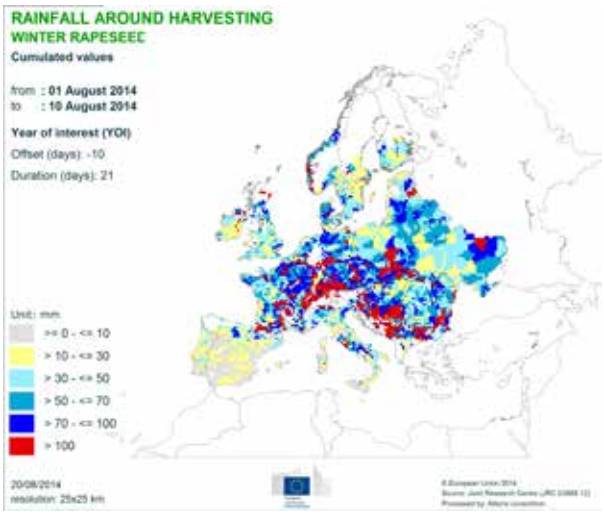


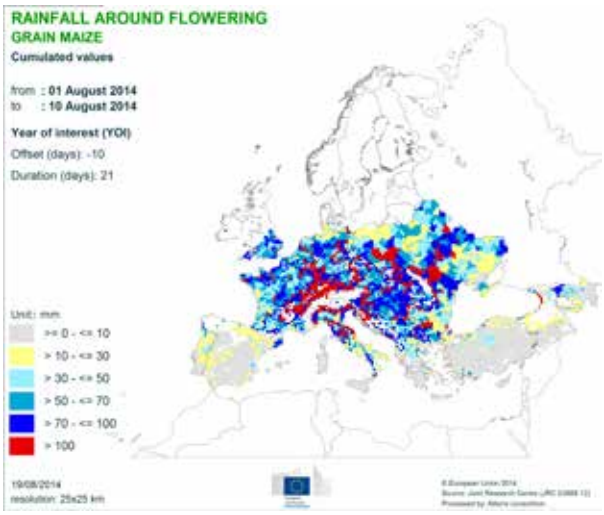


Rainfall around harvesting

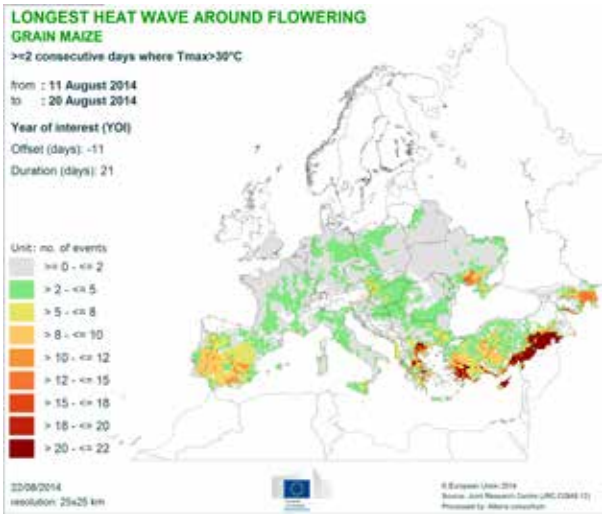


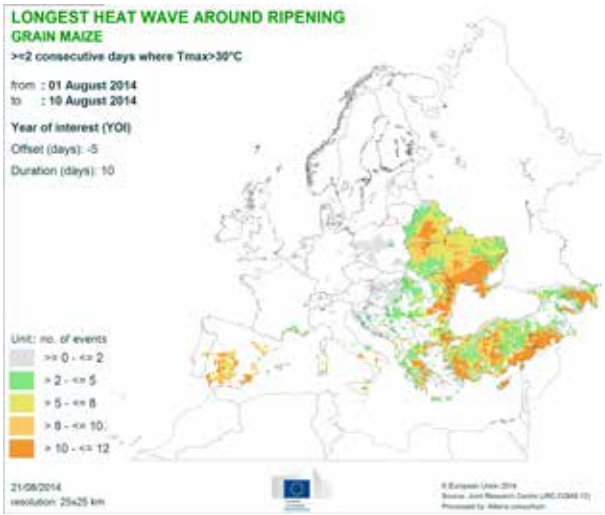






Maize – heat waves





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24 Feb	Agromet analysis	Vol. 22 No. 2
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14 Apr	Agromet analysis, remote sensing and yield forecast	Vol. 22 No. 4
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25 Aug	Agromet analysis, yield forecast and pasture update	Vol. 22 No. 8
22 Sep	Agromet analysis, remote sensing, yield forecast and pasture update	Vol. 22 No 9
27 Oct	Agromet analysis, remote sensing, yield forecast, pasture analysis and rice analysis	Vol. 22 No. 10
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