European Commission

Issued: 15 December 2014

Campaign review 2014

Crop Monitoring in Europe

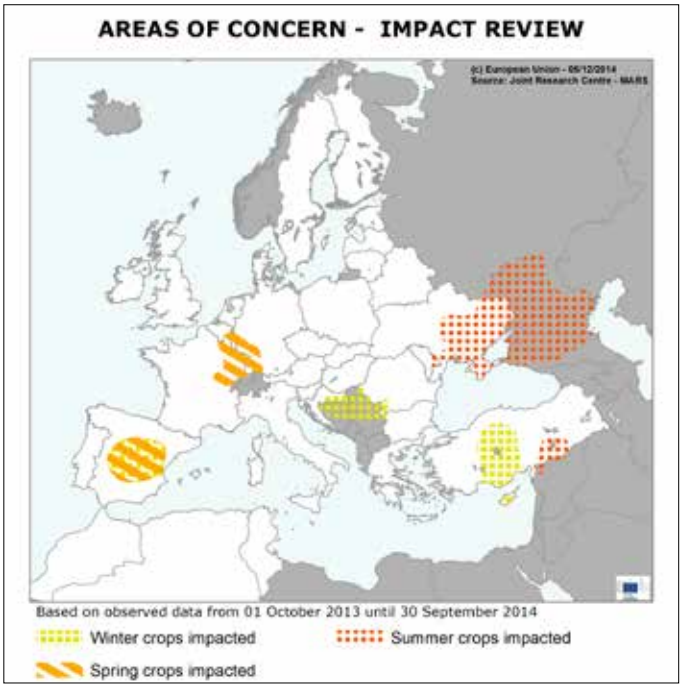
MARS BULLETIN Vol.22 No. 13 (2014)

Excellent season for grain maize with record yields

This agricultural year has been marked by an unusually mild and wet winter resulting in an early start to the growing season. As from early spring, drier conditions and continued above-average temperatures in most of the EU created good conditions for timely spring sowing, and boosted the growth and development of winter crops. However, persistent dry conditions in eastern France and Turkey had a negative impact on crops. In Spain, a lack of rain coupled with high temperatures from May onwards also affected winter and spring crops. May and June brought beneficial rain to large parts of Europe, laying the foundation for a good season. Summer was characterised by excess precipitation over extensive areas. Wetter and colder-than-usual weather occurred in large parts of central and western Europe, creating good growing conditions for summer crops, but hampering the harvest of winter crops. However, very high summer temperatures were registered in Ukraine, negatively affecting summer crops.

Generally favourable conditions across the EU-28 led to forecasted cereal yields that are above the five-year average with the exception of durum wheat and spring barley.

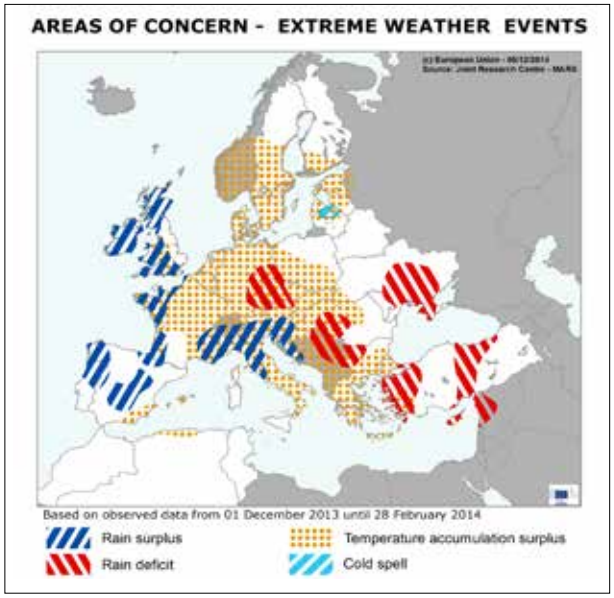
Soft wheat yields in France are comparable to those of 2013 and above the five-year average. In Germany, yields are above those of last year, and clearly above the five-year average. EU-28 yield forecasts for durum wheat were comparable to the five-year average but less than the 2013 yields. Due to wet conditions, yields in Italy are noticeably below the five-year average. EU-28 spring barley yields were well below those of last year and of the five-year average, mainly due to the low yields in Spain. The main winter barley producers, Germany and France, recorded yields that were above the five-year average. In the case of rye, yields are well above the five-year average thanks to the decent yields obtained by the dominant producers, Germany and Poland. The season was also beneficial for rapeseed, with good yields in Germany and France. Grain maize producers in Europe experienced an excellent season that led to record yields for the EU-28 as a whole. Yields are at least 25% above the five-year average in Romania, Hungary and Bulgaria. Sunflower yields in Romania are pushing the overall EU-28 yields well above the average. The root and tuber crops season was excellent, especially for sugar beet.



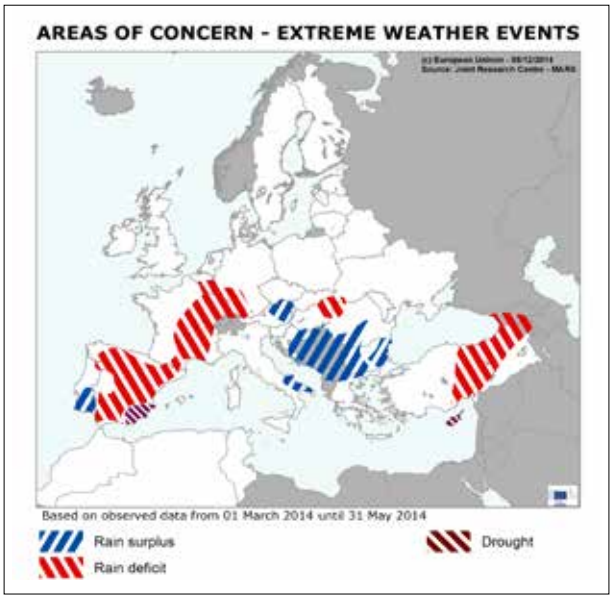
Joint Research Centre

1. Synthesis of the season: an agro-meteorological view

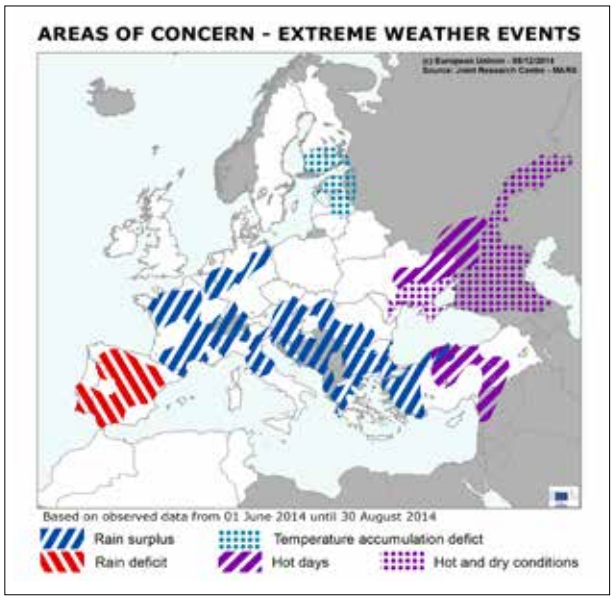
Autumn 2013 was warmer than usual in most of Europe, aside from Germany, the British Isles, Turkey and the eastern Black Sea areas, where normal temperatures prevailed. Rainfall was above the seasonal average in the Alpine areas, France, Germany, the Balkan Peninsula, the UK and most of eastern Europe. The Iberian Peninsula, southern France, northern Italy, Turkey and regions surrounding the Baltic Sea experienced a rainfall shortage. The sowing of winter crops was mainly delayed due to rainfall over parts of central and western Europe. Sowing conditions were more favourable over eastern Europe and the southern Mediterranean. In general the prevailing mild temperatures were beneficial for plant emergence.



Winter 2013/2014 was exceptionally mild and very wet in several regions of Europe and the positive temperature anomalies lasted for the whole **winter season** over the main European territories, resulting in an early start to the growing season. In northern Italy, major parts of the British Isles and southeastern France, this period was the wettest on our records (since 1975), with persistent and heavy rains. Some agricultural areas in these regions were flooded and many others were waterlogged. Above-average rainfall was also recorded in the Iberian Peninsula, the remainder of France, the southern part of the Scandinavian Peninsula and Italy. By contrast, the Czech Republic, southeastern Germany, Bulgaria, Ukraine and Turkey experienced one of the driest winter seasons since 1975. Generally warmer-than-usual conditions were observed across Europe. The positive thermal anomaly was especially pronounced in northwestern and southeastern Europe. The frost kill this winter was very limited in Europe due to warmer-than-usual conditions, except for some damages in the Baltic States that was hit by a brief but strong cold wave.



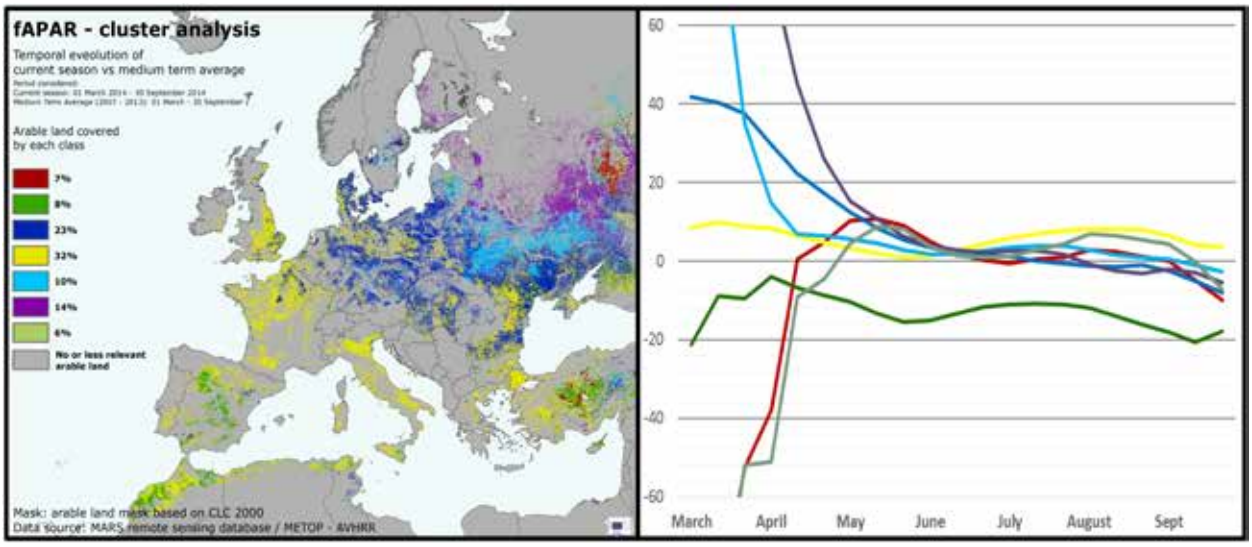
Spring 2014 was exceptionally wet in the Balkan Peninsula, where the wettest period on our records was observed for many areas. Rainfall accumulation in Austria, Croatia, Bosnia and Serbia locally exceeded 400 mm. Wetter-than-usual weather was also experienced in Poland, western Ukraine, the British Isles and Scandinavia. The start of the spring was characterised by dry conditions in eastern France and Turkey, which lasted for several weeks: this had a relevant impact on the winter crops in Turkey and on the spring crops in France. In large parts of Spain's agricultural areas, the lack of rain coupled with high temperatures from May onwards affected the development of crop storage organs. Drier-than-seasonal weather was also observed southern German, and Russia, with seasonal rainfall accumulation well below the long-term average. A major part of Europe was also warmer than usual. In eastern Europe, Spain and Turkey, air temperatures were between 2 and 4°C above seasonal values. Dry conditions with above-average temperatures during spring led to a significant deficit in the water balance, mainly over the Iberian Peninsula and eastern France. Wet conditions over the Balkans in the middle of May resulted in widespread flooding and waterlogging. Above-average air temperatures in spring determined a significant advance in the development of winter crops, and were also generally favourable for the early sowing of spring crops.



Summer 2014 was characterised by excess precipitation over extensive areas. The most relevant events were registered in July and August in France, northern Italy, Austria, the Balkan regions, Romania and Bulgaria. Heavy rainfall and severe thunderstorms caused widespread flooding and waterlogging. The summer was one of the wettest on our climatological records with cumulated rainfall exceeding 400 mm in these regions. Abundant rainfall continued even in September in many of these regions, with a mainly beneficial impact on crops, especially maize, although the wet conditions delayed the harvest in some countries. In Spain, the dry conditions of spring lasted until July, affecting rain-fed summer crops, mainly sunflowers. Southern and eastern regions of Ukraine experienced very high summer temperatures from late spring onwards. In these regions, the heat waves of July were coupled with scarce precipitation around the time of the flowering of winter and spring crops, reducing flower fertility and thus yields. A similar situation prevailed in central Turkey, where very high temperatures occurred in the regions affected by low soil moisture during spring. Winter and summer crops were affected. Cumulated active temperatures (Tbase=0°C) since June were well above the long-term average (>150 GDD) in Turkey, southern Russia and the western part of the Scandinavian Peninsula. Wetter and colder-than-usual weather occurred in large parts of central and western Europe and here growing conditions during summer were generally mild and favourable for crop growth.

2. Arable land in Europe - canopy conditions by remote sensing

March – September summary: Early start to spring growth. Average biomass conditions throughout the season in the main European regions. Canopy affected by dry conditions in Spain and Turkey.

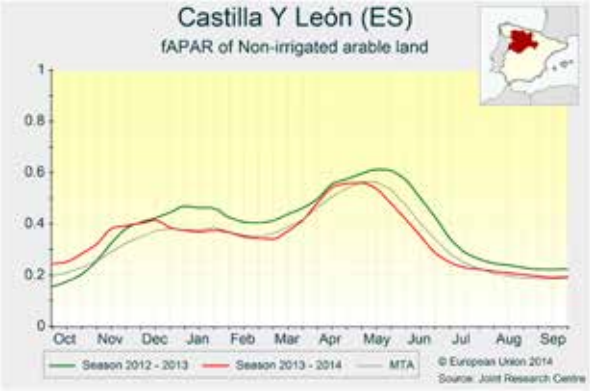


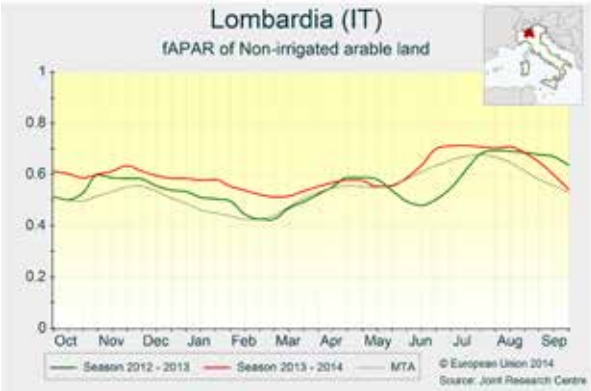
The cluster map displays the fAPAR (fraction of Absorbed Photosynthetically Active Radiation) behaviour of the current season, 1 March to 30 September, as compared to the medium-term average (MTA / 2007 – 2013). The **green profile** (which represents 8% of arable land). describes the average trend of large regions in **Spain**. Canopy conditions were around average at the beginning of spring, but crops were hampered by scarce rainfall during the following months. The winter crops were only marginally affected (e.g. in *Castilla y Leon*), but the spring crops experienced sub-optimal canopy development. The same trend is visible in the main central agricultural areas of Turkey, where water stress at the very beginning of the season hampered the canopy growth of both winter and spring crops.

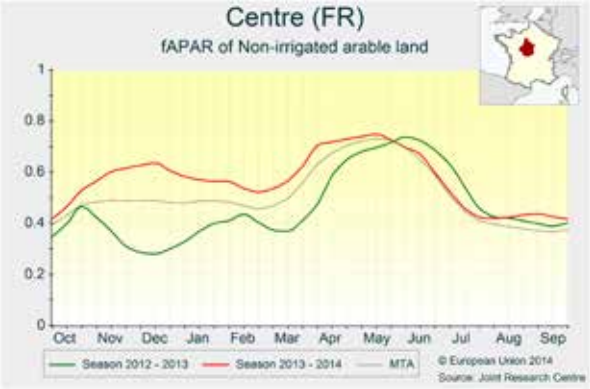
The **dark blue** (23% of arable land) regions stretch from Germany towards the Danube plain, and cover the main arable land areas in eastern Europe. The crop season in those areas was characterised by an early re-growth in spring due to the mild temperatures that remained above average from March to May. In those regions, the fAPAR values remained above average until June, when the winter crops' senescence started, and then fell to normal values. Consequently, the crop season was longer than usual, with no relevant impacts on the crop canopy status. This trend is visible in the main crop-growing regions of the **United Kingdom** (e.g *East Anglia*) and **Germany** (e.g. *Mecklenburg*), as well in **Central Europe**.

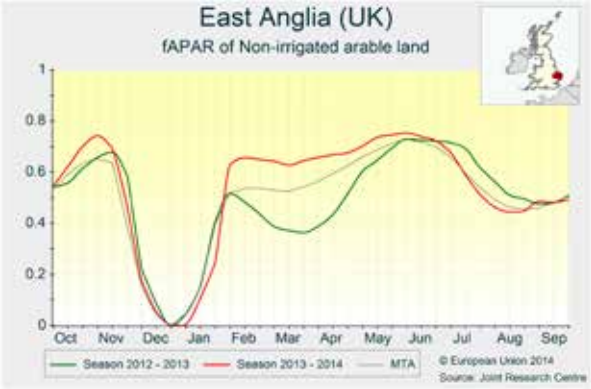
Regions in **yellow** (32% of arable land) have in common an early end to the winter dormancy period and an early start to the phenological cycle for both winter and spring crops. In some regions, crop conditions were slightly hampered during the season (dry conditions in eastern **France**, wet conditions in northern **Italy**), but the overall prospect remained positive (e.g. *Centre de la France*). The summer period for these regions was marked by above-average fAPAR values, mainly due to the optimal canopy development of summer crops: ideal temperatures and abundant rains boosted vegetative growth. The best canopy conditions are visible in **Romania** as shown by the *Sud-Est* fAPAR profile.

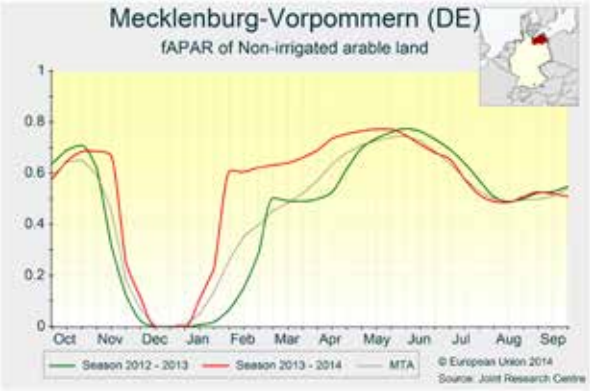
Areas represented in **cyan** (10% of arable land) experienced ideal development conditions for winter crops, particularly in the northern plains of **Ukraine**, where the optimal starting conditions lasted for the whole agricultural season, determining an exceptional biomass accumulation for all crops (e.g. *Kharkivs'ka*). The **purple** profile (14% of arable lands) shows Russian regions where above-average temperatures in spring determined optimal early canopy development. The advanced stages and good growing conditions lasted until the end of July, when hot and dry conditions accelerated winter crop senescence and negatively impacted the grain-filling phase of spring crops. The **light green** (6%) and **red** profiles (7% of arable land) describe similar trends present in Russian croplands; the main issue that characterises these regions is the late and deep snow coverage that lasted until the beginning of April.

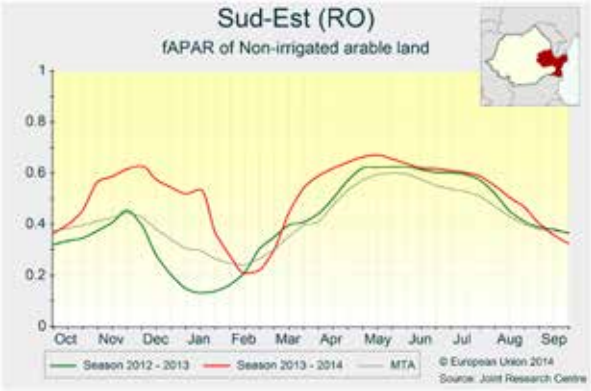

Castilla Y León (ES)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre

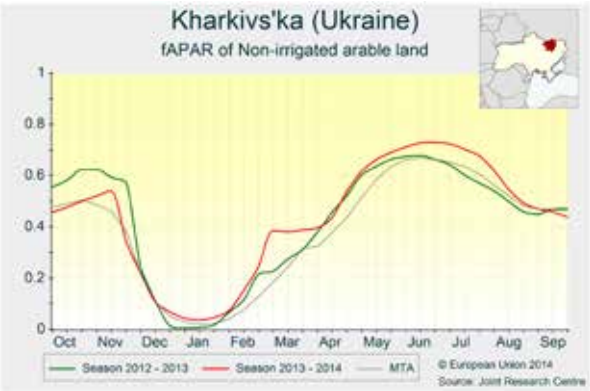

Lombardia (IT)
fAPAR of Non-irrigated arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre


Centre (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


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


Mecklenburg-Vorpommern (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


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


Kharkivs'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


Volgogradskaya Oblast (Russian Federation)
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. Crop speficic analysis EU-28 and neighbourhood countries

Generally favourable conditions across the EU-28 have led to forecasted cereal yields that are above the five-year average, except for durum wheat and spring barley. All final cereal crop yields – except those for spring barley – were higher than forecast at the start of the season.

EU-28 Cereals

Soft wheat

Good season concluded by difficult harvest

The average EU-28 soft wheat yield estimate for the 2013-14 season is well above the five-year average and just above last year's figure. Yield estimates are particularly high for most countries in the central, eastern and northern parts of the EU, such as Germany, the UK, Romania, Denmark and Poland. The yield estimate for France is closer to the five-year average and similar to last year's result. The estimates for Spain, Slovakia, and Croatia are well below the five-year average.

The overall above-average yields resulted after a season with predominantly favourable conditions in most of the EU. Winter sowing experienced some delays due to excessive rainfall in France, the western UK, the Benelux countries, and parts of Germany and northern Italy, but sowing conditions were particularly favourable in eastern Europe and the southern Mediterranean region. Even where sowing was delayed, emergence and early crop establishment generally progressed well, thanks to above-average temperatures and good soil-moisture conditions. Mild temperature conditions continued into the winter months, raising some concerns as the build-up of frost tolerance lagged behind or occurred only partially. As mild conditions continued, however, frost kill was restricted mainly to Lithuania and Latvia, due to an abrupt cold spell in the second half of January, while crops were only partially hardened and insufficiently protected by snow cover. Very wet winter weather conditions occurred in northern Italy, major parts of the British Isles and western and south-eastern France, but crops generally withstood these conditions well. As from early spring, drier conditions and continued above-average temperatures in most of the EU created good conditions for timely spring sowing and boosted the growth and development of winter wheat. Predominantly favourable conditions continued in May and June, except in Spain, eastern France, southern parts of the Benelux countries, southern Germany, Slovenia and Slovakia, where crop growth was affected by a persistent rain deficit. This situation was more serious in Spain, where the rain deficit occurred during the grain-filling phase, thus directly impacting yields. By contrast, the excessive precipitation that occurred in May from western Austria to northern Croatia affected crop growth due to water logging, especially in Croatia. Thermal conditions during summer were relatively mild, with few or no days with excessively high temperatures that would have compromised yields.

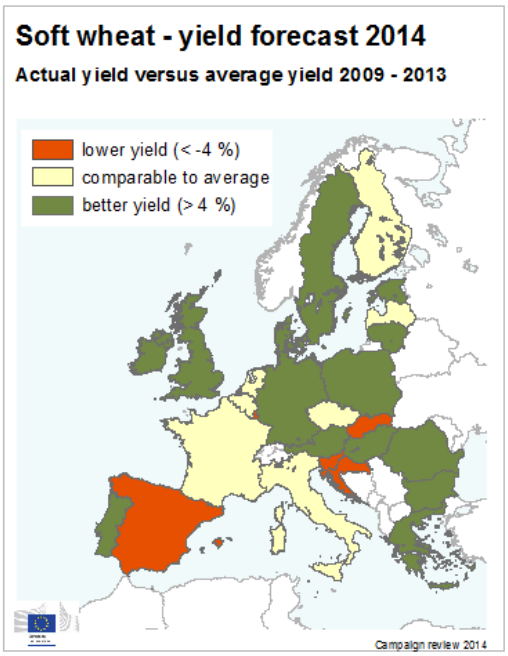
Thanks to the predominantly above-average temperatures during most of the season, crops matured early and harvesting got underway two to three weeks earlier than usual. However, harvesting activities were hampered in much of Europe due to the high rainfall levels in July and August. This would have had little effect on wheat yields, but long harvesting delays affected grain quality, especially in France.

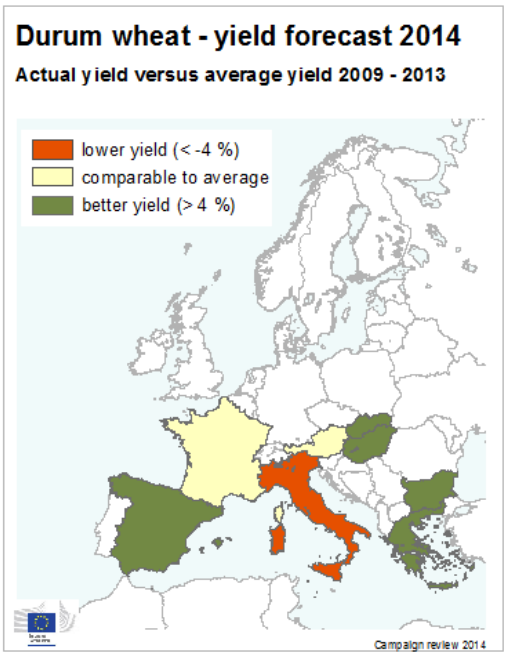
Durum Wheat

Below-average yields in Italy and favourable season in Spain

The average EU-28 durum wheat yield estimates for the 2013-14 season are slightly below the five-year average.

In Italy, the growing season of durum wheat differed from region to region. In central regions, quality and yields are around average, thanks to normal weather conditions. By contrast, wetter and colder spring conditions affected the growth of durum wheat in southern regions. The yield estimate in *Sicilia* is slightly below to the five-year average, but well below the average in Puglia. In fact, the heavy rainfalls that occurred in Puglia during the maturity and the harvest periods increased the pressure of pests and diseases, and reduced the quality of the grain. At national level, durum wheat yields are therefore clearly below the five-year average. By contrast, the campaign was positive for the final yield and grain quality in Spain, which experienced abundant rainfall during spring and generally average temperatures during the summer as a whole. Similarly, higher yields than usual are forecast for Bulgaria, Hungary, Slovakia and Greece, thanks to average thermal conditions and adequate soil moisture content during the growing season. In France, final yields are forecast to be around the average, given the dry conditions during spring in south-eastern regions, where most of the production takes place.





Barley

Satisfactory results, but below the excellent 2013 season

EU-28 yields are slightly above the average of the past five years, but below the excellent results of 2013. The season was positive in most of Europe, with the exception of Spain, which was affected by dry weather conditions in spring.

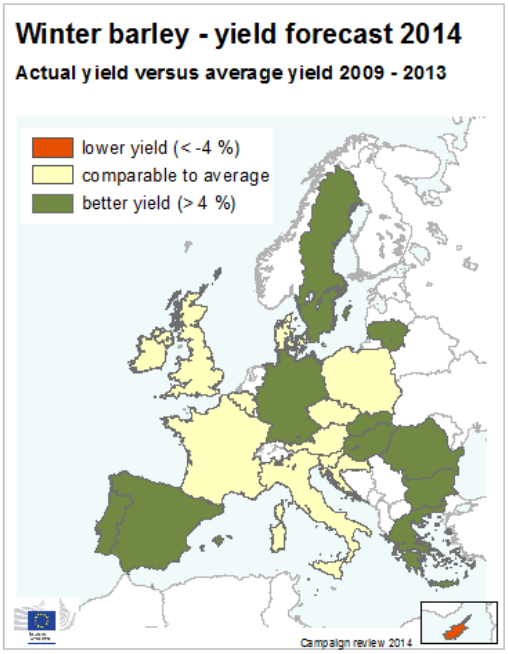
EU-28 barley yields for the current season are satisfactory, as they are above the average of the past five years but not as high as the 2013 yield, which was one of the best ever. Overall, the season was positive for all the main producers, aside from those in Spain.

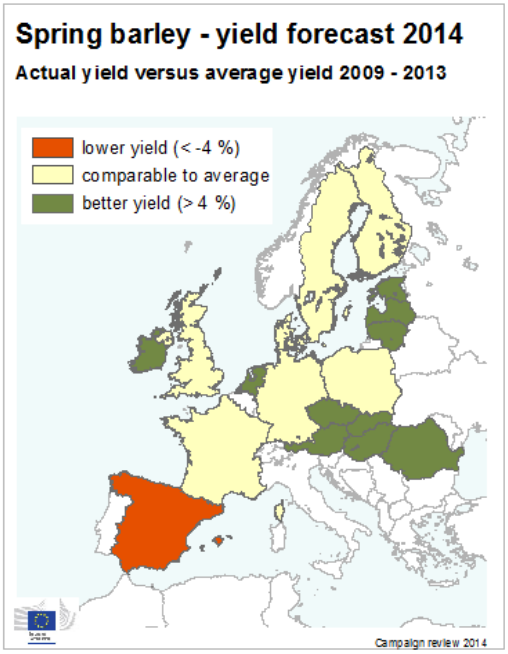
The start to the season was quite favourable in Spain, with abundant rainfall and average temperatures from January to March. That was followed by a period from mid-April until May that was characterised by a sharp increase in temperature and an absence of significant rainfall events, especially in the northern half of the country. Although weather conditions became chillier than usual in June and July, precipitation remained scarce, constraining grain filling and affecting crop yields.

In north-eastern France, the lack of precipitation in March and April constrained the vegetative growth of spring varieties, leading to final yields that were below last year's average. Nevertheless, the weather conditions in the rest of the country were quite positive for winter barley throughout the season, with abundant rainfall resulting in high yields which compensated for the spring barley yields.

Yields were quite good in central and eastern Europe, with extremely positive yields in Germany, especially for winter varieties. The abundant rainfall at the end of May replenished soil moisture and improved crop conditions during the grain-filling period, leading to high yields. Similar conditions were observed in the Czech Republic and Poland. In Romania and Hungary, spring and early summer experienced significant amounts of rainfall, which benefitted crop growth and yields.

Yields were close to the average in northern EU countries. In the UK and Ireland, weather conditions were in general favourable for crop growth, and no water constraints were experienced during the growing season. Finland also had average yields. By contrast, yield potentials in Denmark and Sweden were quite high during most of the season thanks to abundant rainfall and higher-than-usual temperatures, but an excess of rainfall during the harvest period reduced yields to average levels.





Rye

Above-average yields for the largest producers

At the EU-28 level, yields are well above the five-year-average, mainly due to sizable yields in Germany and Poland (which are responsible for 80% of the production), albeit not reaching the exceptionally high levels of last year.

Given the importance of Poland and Germany as rye producers, we concentrate on those two countries.

Weather conditions generally allowed for timely sowing, except in the eastern part of Poland and some smaller areas of Germany, where abundant rainfall hampered sowing activities in late September and early October 2013. Sufficient rains during October and the first half of November provided adequate soil moisture supply for the germination of the seeds. This, coupled with above-average thermal conditions, primarily over northern and central regions of Europe, led to rapid emergence, early development, and well-established crop stands before the start of winter.

As with other winter cereals, rye development was also advanced at the end of April due to the exceptional mild conditions during winter and early spring. Precipitation in March and April was average in Poland, but Germany was rather dry. Nevertheless, rye was not strongly negatively affected as it is quite drought-resistant due to its deep rooting system, and May brought plentiful rainfall. Throughout summer, growth conditions in both countries continued to be favourable and, apart from a few days in June and July, rye was not exposed to particular heat stress, even though temperature sums in Poland were high and July was one of the warmest since 1975. Harvest conditions were also satisfactory, despite plenty of rain especially in Germany which delayed and hampered the harvest.

Rye yields in both countries are forecast to be above the five-year average but below the high yields of last year (2013 was marked by record yields in Poland). Note that these overall high yields are not reflected in high production levels compared to previous years, because the area sown with rye has strongly decreased.

Triticale

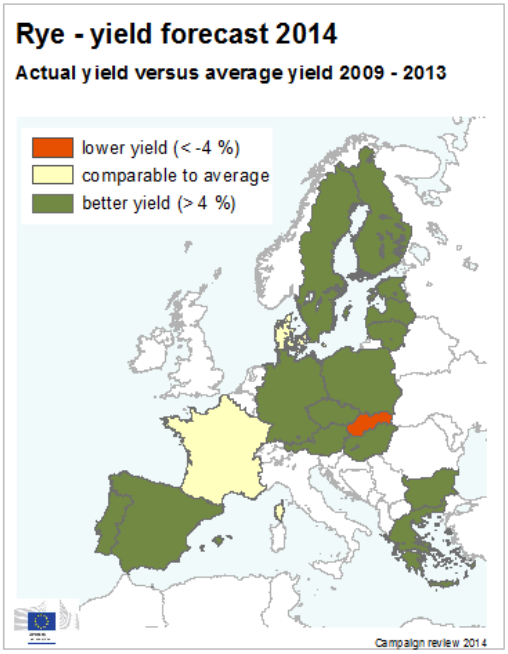
Record yields in central Europe

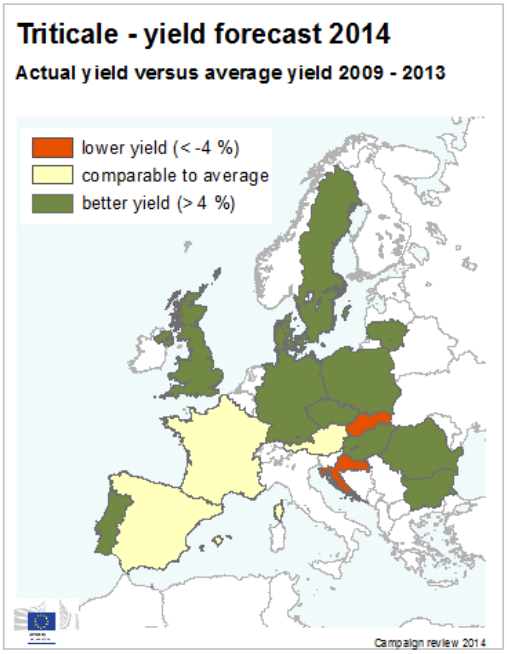
Triticale benefited from good conditions in central Europe, particularly in Poland and Germany, where yields are at record levels. Yields are close to the average in France and Spain due to slightly drier–than-average conditions.

Last winter was particularly mild all across Europe, and no frost kill damages were observed. From February to April, temperatures remained above the average across Europe, which guaranteed a good start to the season and optimal growth before flowering. During the same period, rainfall was below average in Germany, Belgium and north-western France. These dry conditions occurred early in the season, before flowering, and grain formation was not impacted. In May and June, temperatures stayed close to the average in most parts of Europe and, with the exception of Spain, the southern half of France and southern Germany, rainfall remained close to or above the average. Triticale therefore benefited from very

good conditions during the flowering and grain-filling stages in entral and eastern Europe. The slightly drier-than-average conditions in France and Spain led to somewhat limited yield formation. In France, substantial rainfall in July delayed the harvesting, but no impacts on yields were reported. The harvests were completed under good conditions in all other main producing areas.

As a consequence of the particularly good conditions observed in central Europe, particularly in Poland and Germany (the EU's largest triticale producers) where yields are at record levels, the overall EU yields are well above average.





Grain maize

Excellent season with the highest ever maize yield for EU-28

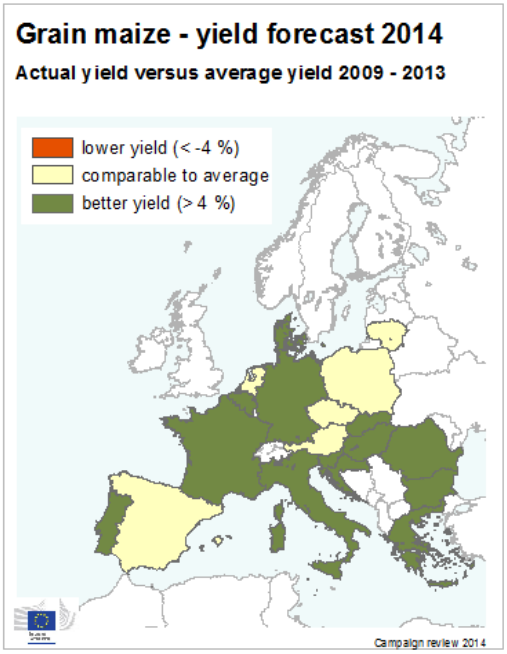
Yields are at least 25 % above the five-year average in Romania, Hungary and Bulgaria.. A slightly positive campaign is expected in Spain, Poland, the Netherlands, Austria and Lithuania.

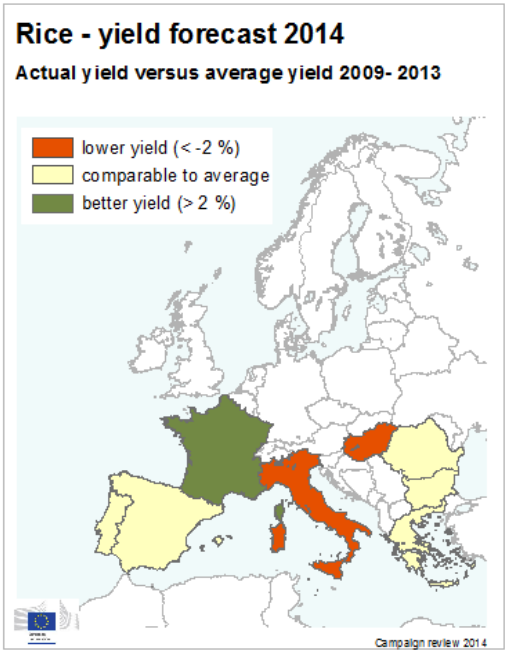
The unusually dry and sufficiently warm soil conditions during spring facilitated the sowing of grain maize throughout Europe. However, in Romania, Hungary, Bulgaria and Croatia, the early development stages of grain maize were suboptimal due to the colder-than-usual weather that prevailed at emergence, with negative effects on leaf area and root expansion as well as biomass accumulation.

During June, sufficient and locally even excessive rainfall (e.g. in the Balkan Peninsula) replenished the soil moisture reserves in all of the main producing regions, and laid the foundation for a good season. The rains of July were especially beneficial to the growth of maize in eastern France, southern Germany, northern Italy and the eastern European Member States. Canopy expansion was remarkably vigorous in Romania, Bulgaria and southern France. Ample soil moisture levels sustained the flowering phase and the subsequent early grain-filling period with a very positive effect on yield formation. The only considerable precipitation deficiency was observed in Lithuania and in the northern half of Poland.

Fewer hot days (Tmax>30°C) than usual were recorded in July and August, with the exception of some smaller regions of the Mediterranean. Consequently, no drought or extraordinary hot spells compromised the pollination of crops. The rainy weather continued in August, keeping the water supply at near optimal levels during the grain-filling stages. There were no major constraints on irrigation in Italy, Spain and Greece, as water storage levels were high in most of the catchment areas. The maize crop cycle was only shortened by up to two weeks in Greece, Poland, and in some smaller regions of Spain and Romania because of the above-average temperatures that prevailed from mid-July.

The harvesting of grain maize was on time and free of significant problems in western Europe, with only some slight delays such as those incurred in Italy. However, heavy rains and overly wet soil conditions in September hampered and caused significant delays to the harvest in Austria, Hungary and in the Balkan Peninsula. These adverse weather conditions mostly affected the grain quality and increased the drying costs, but did not cause considerable yield losses. The yield forecast exceeds the average throughout Europe, thanks to the continuous adequate water supply and near-average thermal conditions. Maize production in Romania, Hungary and Bulgaria was especially high, near or above the historical record.





Rice

Poor season in Italy

The overall 2014 EU rice yield is less than that of both last year and the five-year average, mainly due to poor performance in Italy, which is responsible for about 50% of EU rice production. Total EU rice production dropped even further due a contraction of the area under rice, especially in France.

Above-average yields are expected in France, Greece and Spain, because of favourable meteorological conditions that ensured high biomass accumulation and a low risk of biotic or abiotic damages. Significantly below-average yields are forecast for Italy, Hungary and Portugal due to excessively wet weather conditions, which increased the number of days with a high risk of blast infections. Moreover, the negative thermal anomalies recorded during summer in Italy and Portugal led to a significant delay in phenological development (locally by more than 10 days). The slow-down in ripening caused by lower-than-usual temperatures is known to negatively affect grain weight.

EU-28 Oilseed crops

Rapeseed

Close to a record campaign

Overall beneficial conditions for rapeseed crops during this campaign resulted in an excellent season in Germany and Poland (forecast yields are among the highest in our database) and a very good season in the UK and France (forecast yields are above the five-year average).

An exceptional rapeseed campaign places 2013/2014 as one of the best seasons along with 2003/2004 and 2008/2009. This is due to overall favourable conditions throughout the whole season in the main rapeseed-producing countries, Germany, France, the UK, and Poland, which together account for about three quarters of EU rapeseed production.

The season started with good sowing conditions and a mild autumn that benefited the early development and establishment of rapeseed crops across Europe. These conditions were followed by a warmer-than-usual winter, one of the driest in Germany according to our historical time series. By contrast, western and south-eastern France and the UK experienced exceptionally wet winter conditions.

Vegetative growth concerns that arose due to the persistent warm and dry conditions in Germany after winter were relieved by very beneficial rainfall in April and good growing conditions during May (especially in the northern regions), which led to optimal and earlier-than-usual flowering. Similar good conditions during the flowering stage also prevailed in Poland, the UK and eastern France (despite some rain deficits recorded in north-eastern regions). In general, good conditions continued until the end of the growth cycle in these countries. Harvesting started this year early due to the advanced development of crops over the whole season across most

of Europe. Exceptional rainfall during summer hampered the harvest in France, Germany (especially in the south), and to a lesser extent in the UK. Despite these difficulties, the rapeseed harvest was completed with no serious consequences to yields, which remained above average. High yields (compared to the five-year average) are also estimated for Poland, Romania, Denmark and Hungary. The yield estimate for the Czech Republic is below average, mainly because of persistent dry conditions from the end of winter until the beginning of May, with rapeseed crops suffering from water stress during most of the flowering phase.

Sunflower

Yields above average

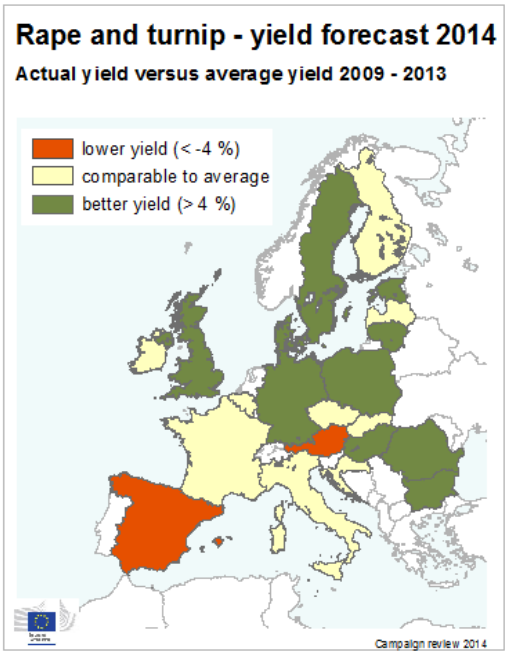
The overall sunflower yield estimate at EU-28 level is above the five-year average. Particularly high yields are expected in France, Italy and eastern European countries.

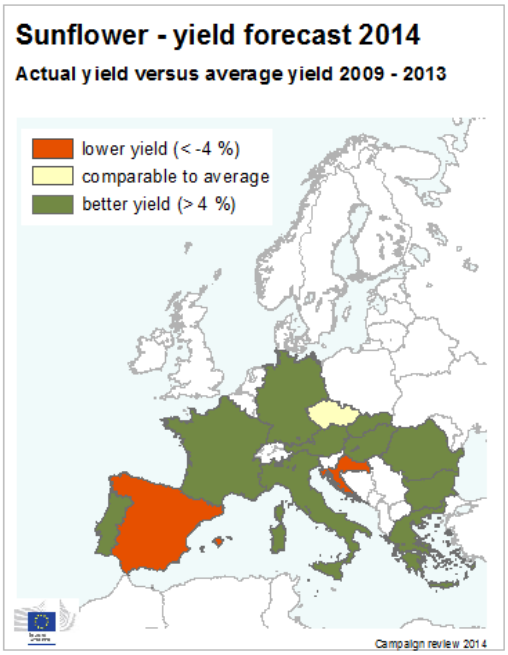
The overall average yield expected for the EU-28 is above 2 tha $^{-1}$, well above the average of the past five years.

Sowing conditions were mostly good in the main European sunflower areas. Early sowing was possible, thanks to the mild temperatures of winter and sufficiently long periods without substantial rainfall. In western and central Europe, after a wet winter, consecutive days without any significant rainfall were observed in March and April, followed by little rainfall, which favoured a rapid germination and emergence. According to our model and remote sensing indicators, good water supply and normal thermal conditions during the vegetative growth and also during the yield formation period resulted in high biomass in France, Italy, and in most of the eastern European sunflower-producing countries. In Spain, however, drier-than-usual weather conditions from April to July constrained crop growth and grain-filling.

Harvesting started with difficulties due to excessive rainfall in early September, causing considerable delays, especially in Bulgaria and Croatia. This did not cause significant damage to crops in most regions, as drier weather conditions during the second dekad of September facilitated the progress of harvest, except in Croatia, were the harvest was seriously hampered and crop losses were incurred.

In Hungary, the yield forecast is the highest of the past 20 years, and similarly good yields are forecast for France, Italy, Romania, Bulgaria and Greece. Below-average yields are expected in Spain and Croatia.





EU-28 roots and tuber crops

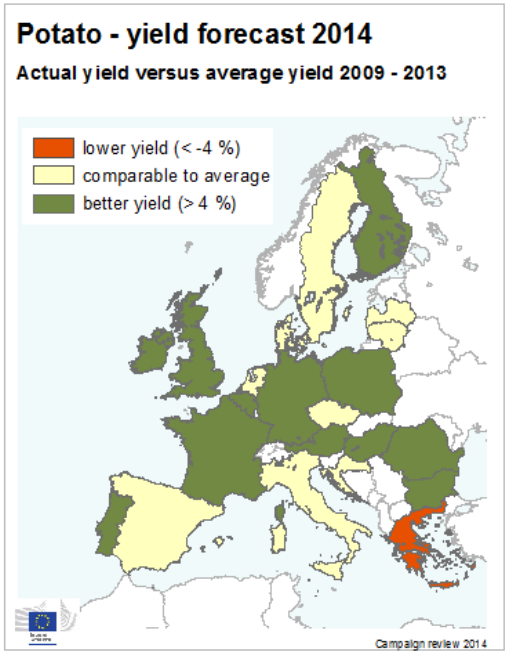
Potato

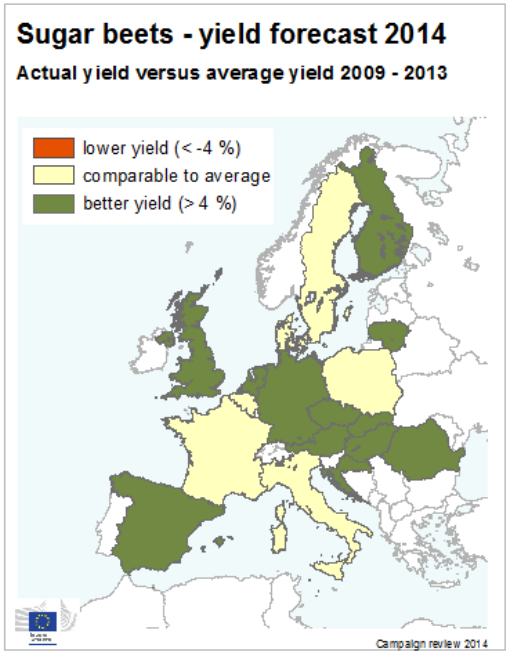
High yields in EU's main potato-producing countries

At EU level, the predominantly favourable weather conditions resulted in potato yields that are well above those of last year and the five-year average. Yields of the EU's five largest potato producers (Germany, Poland, France, Netherlands and the UK) all increased significantly.

Weather conditions were generally favourable for the timely

or early planting of potatoes across the EU. Early planting in Germany generally resulted in good development, helped by supplementary irrigation in drought-affected areas and the use of protective films to protect young plants against frost. Relatively early planting in the Netherlands was locally affected by damage to seedlings due to frost in early May. In France, wet weather conditions caused some delays during the start of the campaign, but conditions after sowing improved and allowed for normal development. Generally favourable sowing conditions also prevailed in Poland, the EU's second-largest potato producer. Wet summer conditions in central Europe, France, the UK, Ireland and south-eastern Europe ensured a good supply of water for potato growth. On the other hand, disease pressure was high due to high soil moisture levels and humid conditions, especialy in southern and western Germany, Austria, Slovakia, Hungary and the Balkans. Warm and dry weather in September provided good conditions for harvesting in France, the UK, Benelux and western Germany. However, the harvesting of potatoes was hampered and delayed in many areas of central Europe and the western Balkans due to excessive rainfall. High moisture content in potato tubers in these areas may decrease their storage life. Dry weather in July and overly wet conditions in August constrained potato yields in northern Europe.





Sugar beet

Excellent season

2014 was an excellent year for sugar beet in the EU, given the combination of an early start to the season followed by predominantly favourable conditions for growth and harvesting.

The sugar beet season got off to a good and very early start, which is generally considered to be conducive to high sugar-beet yields. Thanks to the prevalence of mild and dry conditions, sowing was advanced by two weeks or more compared to an average year in the main EU sugar-beet-producing regions of France, Germany, Poland, the UK and Benelux. Weather conditions also allowed for timely or early sowing in the other EU sugar-beet-producing regions. Favourable conditions for growth continued during summer, with temperatures and rainfall levels that were mainly above-average but without harmful extremes. However, farmers had to cope with high risks of pests and disease throughout the season, due to the mild preceding winter conditions and the predominantly warm and humid summer conditions.

September, the start of the harvesting campaign, coincided with a relatively dry period which enhanced beet sugar accumulation and created good conditions for the harvest. Since then, the harvesting campaign has faced some difficulties due to frequent high levels of rainfall, but is progressing well overall. The situation was somewhat different in Poland, the EU's third-largest sugar beet producer after France and Germany, particularly in the northern parts of Poland, where rainfall since mid-June has been consistently below average, thus limiting the overall yield estimate for the country to around average.

EU neighbourhood countries

Turkey

Low yields of winter cereals; good conditions for grain maize

The closing season was characterised by exceptionally low levels of precipitation, and mainly above-average temperatures. These conditions led winter cereals to early maturity and low yields. Good yields of grain maize were realised, despite initial concerns regarding limited water availability for irrigation.

The sowing of winter cereals for the 2013-2014 season occurred on time, but winter started with a cold spell which lasted until the end of December in the western part of the country, and until mid-January in the eastern areas. The area of Kuzeydogu Anadolu experienced another cold spell from 1 to 7 February, with temperatures dropping steeply by almost 20°C. Yet another cold spell affected the areas of Ortadogu Anadolu, Dogu Karadeniz and Kuzeydogu Anadolu between 29 and 31 March, with minimum temperatures reaching -14°C. However, our models suggested that no frost kill occurred in any of these areas, because of a protective snow cover. Otherwise, temperatures mostly fluctuated above the long-term average making the spring-summer period one of the warmest since 1975.

Precipitation during the winter period was well below the long-term average throughout the country, making this the third-driest winter at country level on our records, which date back to 1975. Levels of precipitation were also low in March and April. These conditions impacted winter cereals and led them to early maturity and harvesting, with resulting low yields.

In spring, the sowing of grain maize was completed without any delay. However, serious concerns arose about its emergence and progress because of the drought and low levels of water reserves for irrigation. Nevertheless, farmers were supplied with water and were allowed to irrigate. Emergence succeeded and maize crops were also benefited by the rainy months of May and June. After the warm and almost dry months of July and August, autumn temperatures fell back to average values, and frequent rainy days occurred. The harvesting of grain maize extended into October due to frequent rainfalls in September, and good yields are recorded.

Ukraine

Exceptionally good year for winter crops

Winter cereal yields are at record levels, thanks to the good weather conditions that prevailed throughout the whole year. However, summer crops were impacted by a dry and hot summer, which limited grain maize yield to the 5-year average.

After a mild winter, the re-growth of crops began earlier than usual. Temperatures remained above the long-term average from autumn until the beginning of spring, with only one cold spell observed in late January - early February. Although last winter was also characterised by thin and non-persistent snow cover, no frost-kill damage was observed. The conditions during spring allowed for sowing to commence on time or even early, as soils were not too wet and temperatures were mild. The good conditions were prolonged by rainfall and above-average temperatures in April, May and June, sustaining high yield expectations for winter and spring crops. Continued good weather conditions allowed for a trouble-free harvest for winter and spring cereals. Winter and spring crop yields are at record levels, particularly winter wheat for which the yield was a 20-year record. After July, meteorological conditions took a turn for the worse. From July onwards, scarce rainfall was observed, accompanied by a remarkable hot spell during the first half of August. While eastern regions were mostly affected by hot temperatures, with temperatures above 35°C for more than 35 days between July and September, central and southern regions experienced a very dry period as grain maize was reaching the flowering stage. Thus, summer crops were impacted by the dry conditions in southern regions, where soils have a lower water retention capacity. Yields of summer crops, particularly grain maize, are close to the five-year average, but largely below the trend.

Belarus

Favourable conditions for high cereal yields

Winter wheat and spring barley yields are above the five-year average, because of good conditions experienced throughout their growing seasons. The grain maize yield estimate is close to average, as some water stress occurred in the south-east of the country.

Thermal conditions during autumn and winter were mainly above average. These mild conditions suddenly changed in mid-January: temperatures dropped to well below average during the entire third dekad of January, but a sufficient snow cover and almost fully hardened crops prevented frost kill damage.

As of February, warmer-than-usual temperatures prevailed until the end of the cropping season, with a particularly hot period from 1 July until mid-August. Rainfall was close to the average throughout the country and well distributed until the end of July, when lack of rain in the south-eastern districts led to below-average soil moisture levels. These conditions had little impact on winter wheat and spring barley which were already in the ripening stage. Winter wheat development was well-advanced throughout the season. According to our simulations, the crop reached maturity around 15 days early compared to an average season.

Spring barley and maize benefited from early sowing, and warm conditions during summer led to advanced crop development of maize by about one dekad. Water stress may have locally limited maize yields, however, due to the lower-than-usual soil moisture during summer. The overall cereal yield is largely positive for the present year. Winter wheat and spring barley yields are high, and maize is close to the five-year average but lower than last year's yield.

Russia

Near record winter and spring cereal yields; maize yields around average

Winter and spring cereals enjoyed above-average temperatures and sufficient water supply, leading to very high yields. Maize crops experienced favourable conditions during the vegetative growth stage, but the dry and hot period after mid-summer affected these crops during the sensitive flowering and grain filling stages, thus reducing the yield potential to the average level.

In September 2013, abundant rainfall hampered the autumn sowing campaign in the *Central*, *Near Volga* and *Southern Okrugs*. Once sown, the establishment and wintering of cereals was successful, however, and frost-kill damages remained limited, thanks to the mild temperatures. The past winter and spring are among the warmest on our meteorological records. Precipitation typically remained below average during winter in Central and Southern Okrugs and little rainfall was also recorded later in spring in the Near Volga Okrug. The sowing campaign for spring crops had no significant problems thanks to dry weather and warmer-than-usual thermal conditions. The development of both winter and spring cereal crops was significantly advanced. Soil moisture under winter wheat and spring barley was mostly satisfactory until mid or late July, and biomass accumulation reached near- or above-average levels. Rainfall became sparse from mid-July onwards, and in the first two dekads of August a hot period was experienced in the southern half of Russia. Water supply remained adequate for spring cereals, but the maize yield formation was compromised, primarily in the *Central* and *Near Volga Okrugs*. Dry weather led to a speedy and successful harvest of winter and spring cereals. The yield estimates for winter and spring cereals are high. The expectations for maize are slightly above average, but considerably below last year's excellent results.

Morocco, Algeria and Tunisia

A dry season in Morocco, mixed conditions in Algeria, a positive season in Tunisia.

The autumn rains that typically accompany the start of the agricultural season in the Maghreb were delayed in Morocco, and whilst there was above-average rainfall in January and February, rainfall was substantially reduced again from mid- March onwards. The effect of this delayed start to the rains was evident in the NDVI signal, which showed a much delayed 'green-up'. Levels appeared to recover from the end of January (with higher values than the long-term average) but dropped again in April/May, suggesting earlier and more rapid senescence than the long-term average. Modelled grain growth effectively stopped in mid-April along with the rain. Mean seasonal cumulated rainfall was well below the long-term average.

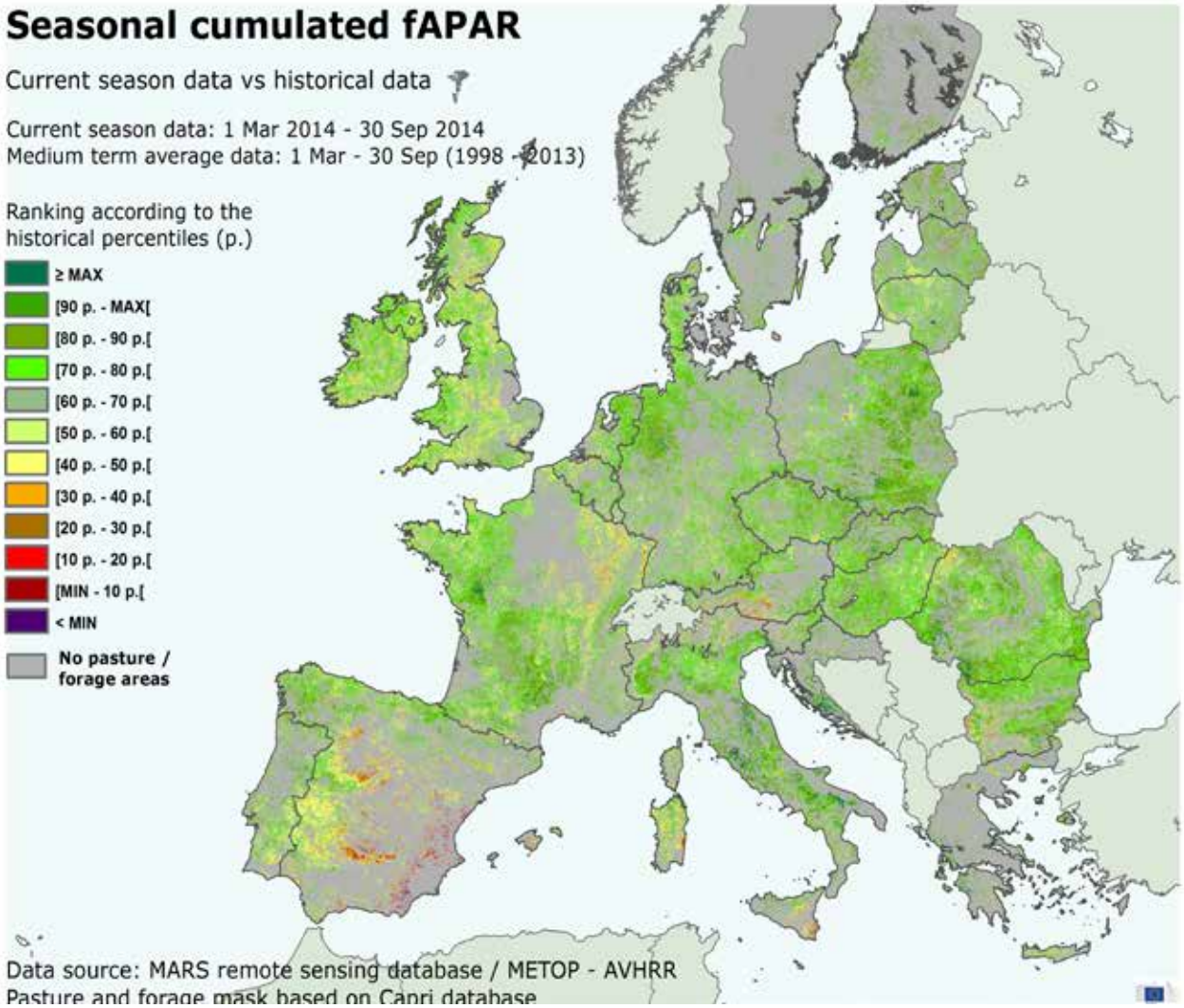
Algeria received much more rainfall than Morocco. There was substantial rain at the start of October, and then consistently more rainfall than the long-term average from the middle of November. Rainfall dropped off during April, but total seasonal rainfall remained well above average. Modelled grain-filling started positively, but levelled off in April, influenced by the reduced rainfall from April onwards. The continued absence of rain through much of May further reduced yield potential.

Tunisia received good amounts of rain during this campaign, with consistent rainfall throughout the season. Seasonal totals were well above average, and NDVI profiles indicated good vegetative growth. Modelled soil moisture levels remained above their long-term averages, and modelled grain growth was exceptionally high.

4. Pastures in Europe

High pasture productivity in most of Europe

Weather conditions were favourable for pasture growth in most of Europe. The warm temperatures registered since the end of winter led to a favourable start to the season, especially in central and northern Europe. Rainfall was sufficient to maintain high biomass production rates in most of the main production regions. Only in western Spain and north-eastern France did rainfall scarcity during late spring and early summer constrain pasture growth.



Average season in the Iberian Peninsula, high yields in Italy

The 2013-2014 growing season in the **Iberian Peninsula** was marked by a humid winter with unusually warm temperatures. This resulted in high biomass production in the grasslands of the *Dehesa* area from January until the end of April. The end of spring and summer were relatively dry, however, and senescence was accelerated by water constraints experienced from May onwards. The overall results for the season as a whole are close to the average in that region. In northern Spain, by contrast, grasslands were less affected by water constraints during summer, resulting in above-average overall production levels.

In **Italy**, weather conditions were extraordinarily favourable in the main producing regions. In the fodder maize areas of the north (*Lombardia, Veneto, Piemonte*., etc.) the current season was one of the most humid of the past four decades. Therefore, biomass production levels in these regions were substantially above average. In the centre and the south of Italy, grassland productivity was above seasonal values, thanks to mild temperatures and sufficient rainfall.

High biomass production levels in north-western Europe

Abundant precipitation and above-average temperatures characterised the growing season in the **UK** and **Ireland**. Thanks to these favourable weather conditions, the vegetative growth of grasslands was substantially higher than in an average year, especially in Wales, northern England, Scotland and north-western Ireland, and the season can be considered as positive.

Similar conditions were observed in **France**, especially in the centre and the western half of the country (*Limousin*, *Auvergne*, *Bretagne*, *Poitou-Charentes*), and in the Benelux region. Vegetative growth was favoured by the abundant precipitation registered during most of the growing season, resulting in above-average biomass accumulation of grasslands and fodder maize. In north-eastern France (*Lorraine, Bourgogne*), by contrast, pastures were affected by a dry spell during spring and the beginning of summer, constraining biomass growth in June. Nevertheless, abundant rainfall in July permitted the recovery of biomass by the end of summer. The results for the whole season are around average in these areas.

Favourable season in central Europe

In northern **Germany** and **Denmark**, the results of the 2013-2014 season are satisfactory. The temperatures were unusually warm in the period February-April, resulting in rapid grassland development. Therefore, biomass production was high from the start of the growing season, and remained high during the rest of spring and summer, thanks to sufficient precipitation. While the season in southern Germany can also be considered as positive, a lack of precipitation during late spring constrained biomass production in July and August, and the yields are not as high as in the north.

The season was also positive in **Slovakia** and the **Czech Republic**, especially thanks to the favourable weather conditions of warm temperatures and sufficient rainfall during the first quarter of the year. The absence of dry spells during summer permitted above-average biomass production levels to be maintained. In Austria, overall grassland productivity for the season is also expected to be above average.

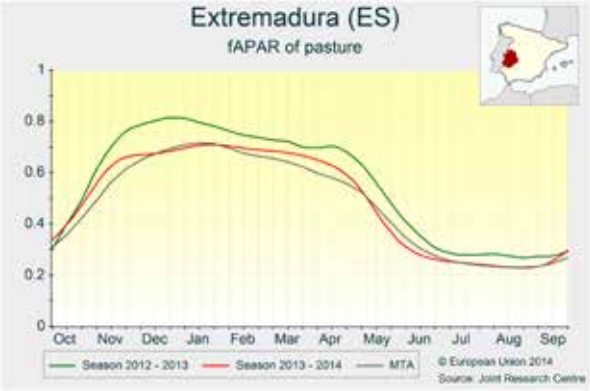
Warm temperatures along the season boosted biomass in north-eastern Europe

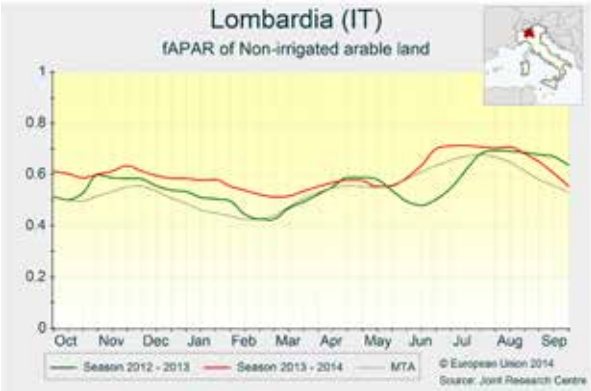
Grassland yields are also high in the main pasture regions of eastern **Poland**. The weather throughout the season was favourable for grasslands' growth. Temperatures from February to April were substantially above the average, boosting biomass production unusually early in the season. Precipitation was close to the average during spring and summer, thus permitting high biomass formation levels up to September.

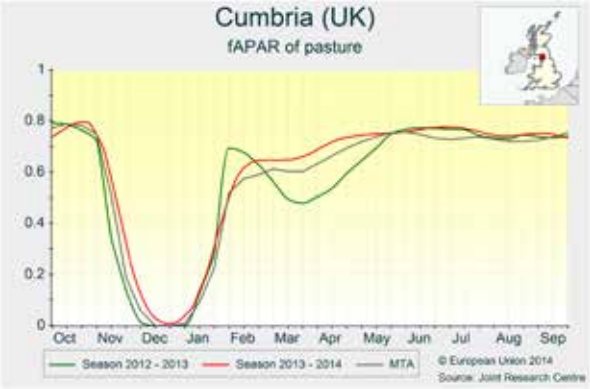
Unusually high temperatures at the end of the winter period also led to an early start to the growing season in the main grassland areas of **Lithuania**, **Latvia** and **Estonia**. Biomass formation from February to mid-April was markedly higher than in an average year. Temperatures were also higher than usual during the second half of May and during July and August, which helped to keep biomass growth rates above average during summer, with no water constraints. Similar conditions were observed in **Finland** and **Sweden**.

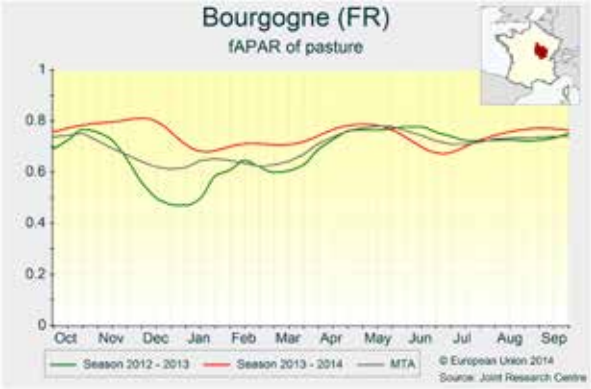
Satisfactory results in south-eastern Europe

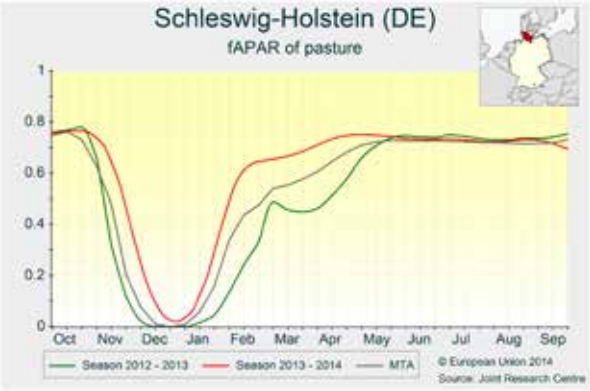
The 2013-2014 growing season was also favourable in the main pasture areas of **Hungary** and **Romania**. With the exception of a cold period at the end of January, winter temperatures were milder than usual, permitting rapid development of grasslands during the first quarter of the year. Weather conditions remained favourable thereafter, with abundant rainfall during April and May and, especially, from the second half of July, whereas temperatures remained close to seasonal values. As a result, biomass production rates were substantially higher than in an average year, especially in the fodder maize areas of the Danube basin.

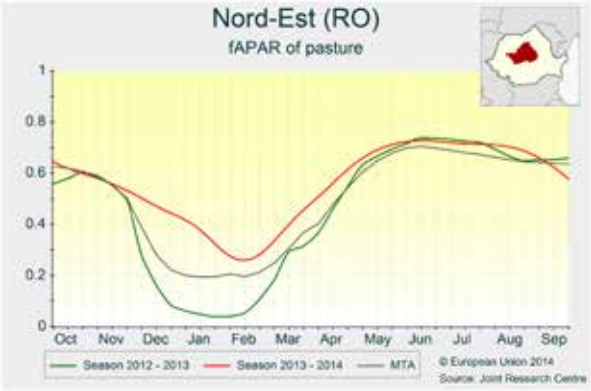

Extremadura (ES)
fAPAR of pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre


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


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

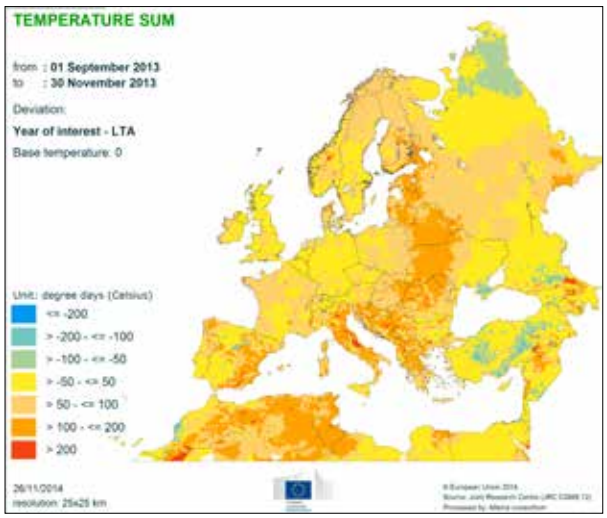

Bourgogne (FR)
fAPAR of pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre

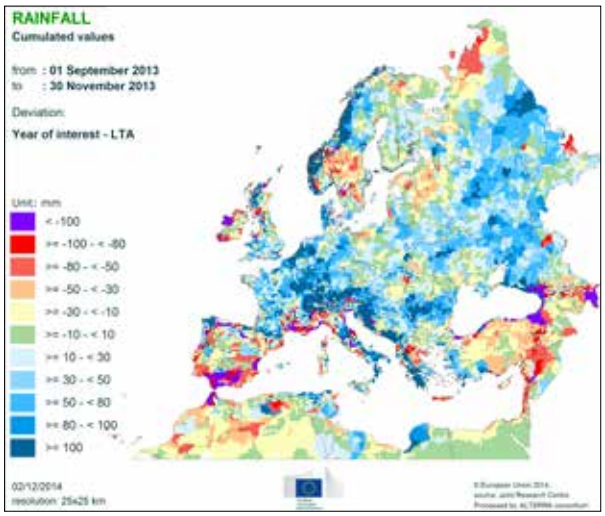

Schleswig-Holstein (DE)
fAPAR of pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre


Nord-Est (RO)
fAPAR of pasture
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2012 - 2013
Season 2013 - 2014
MTA
© European Union 2014
Source: Joint Research Centre

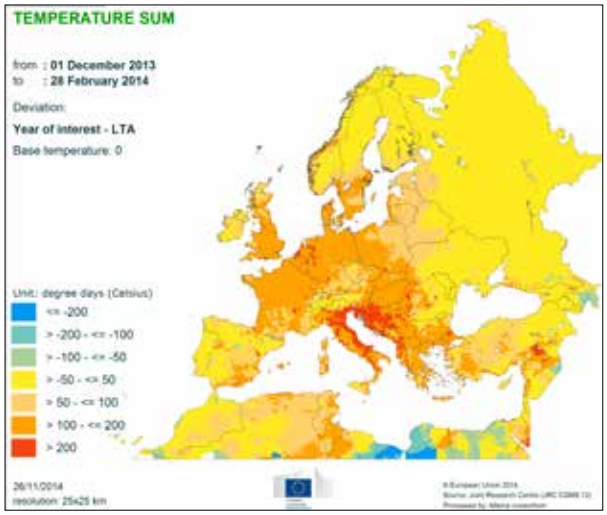
5. Atlas maps

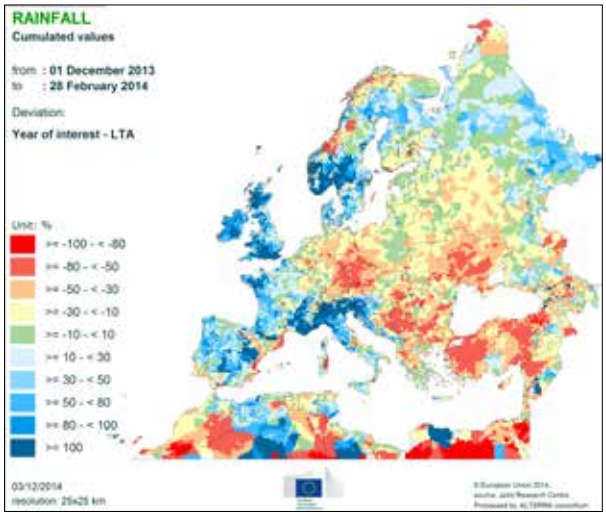
Autumn 2013 (September - November)



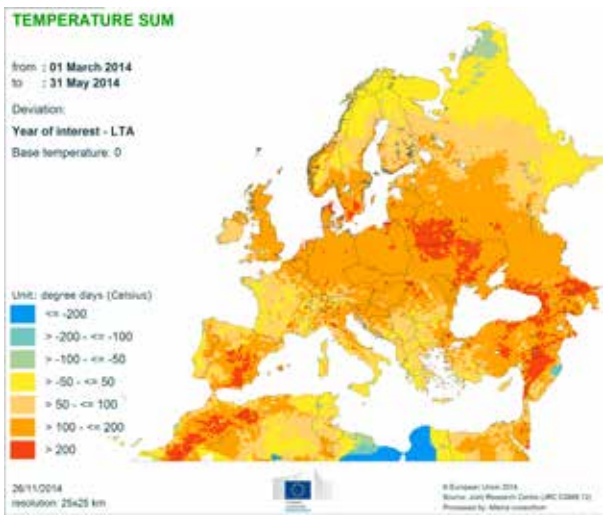


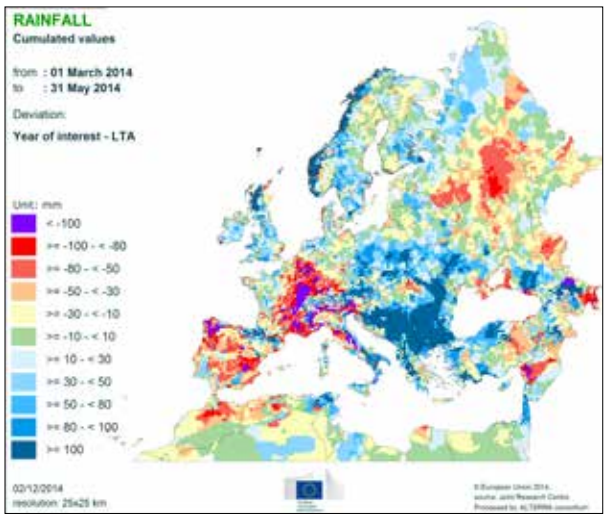
Winter 2013/2014 (December – February)



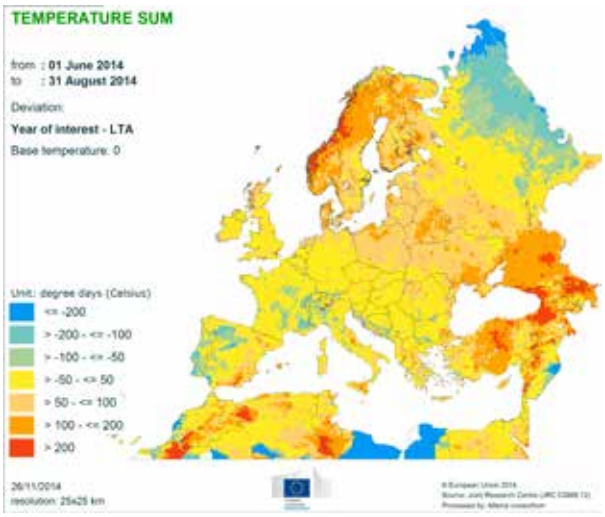


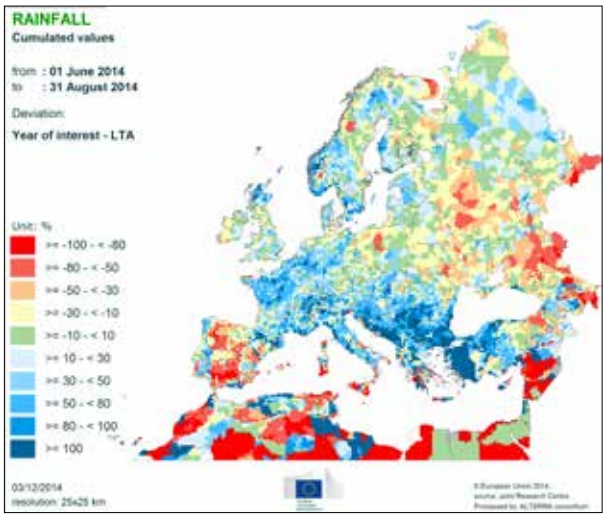
Spring 2014 (March - May)

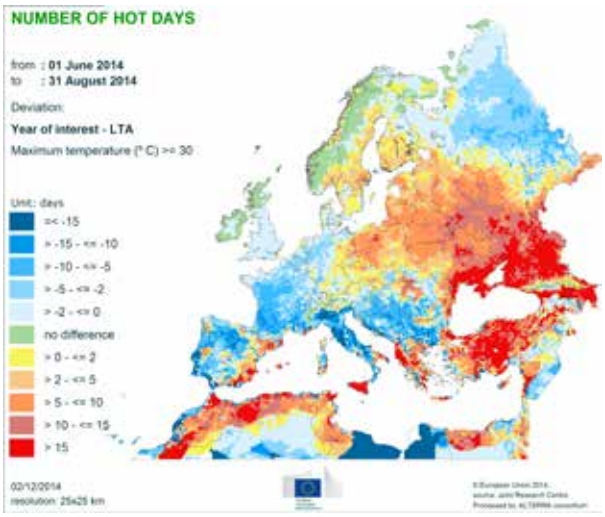


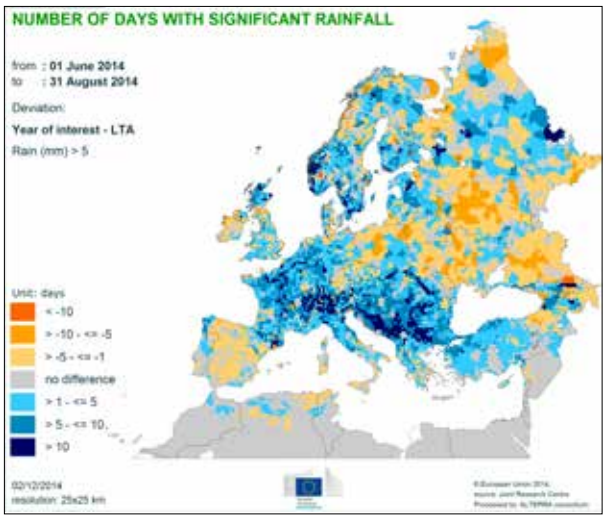


Summer /2014 (June – August)









LB-AM-14-014-EN-N

2014 MARS Bulletins

Date	Publication	Reference
27 Jan	Agromet. analysis	Vol. 22 No. 1
24 Feb	Agromet analysis	Vol. 22 No. 2
24 Mar	Agromet analysis and yield forecast	Vol. 22 No. 3
14 Apr	Agromet analysis, remote sensing and yield forecast	Vol. 22 No. 4
12 May	Agromet analysis, remote sensing, yield forecast and pasture analysis	Vol. 22 No. 5
23 Jun	Agromet analysis, remote sensing, yield forecast and pasture update	Vol. 22 No. 6
21 Jul	Agromet analysis, remote sensing, yield forecast, pasture update and rice analysis	Vol. 22 No. 7
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
24 Nov	Agromet analysis and yield forecast, sowing conditions	Vol. 22 No. 11
15 Dec	Agromet analysis	Vol. 22 No. 12
15 Dec	Campagin 2013/14 review	Vol. 22 No. 13

A great deal of additional information on the European Union is available on the Internet. It can be accessed through the Europa server http://europa.eu.

Luxembourg: Publications Office of the European Union

Printed in Italy

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 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.

Publications Office

The current MARS* Bulletin is an EC publication from AGRI4CAST (JRC/IES MARS Unit)

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

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

Reporting support
G. Mulhern

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

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

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

JRC 88391
EUR 24736 EN
ISSN 1831-9424
ISSN 2314-9736

***MARS** stands for Monitoring Agricultural Resources

Legal Notice:
Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of this publication.

Disclaimer:
The geographic borders are purely a graphical representation and are only intended to be indicative. The boundaries do not necessarily reflect the official EC position.

Technical note:
The long term average (LTA) used within this Bulletin as a reference is based on an archive of data covering 1975-2013.