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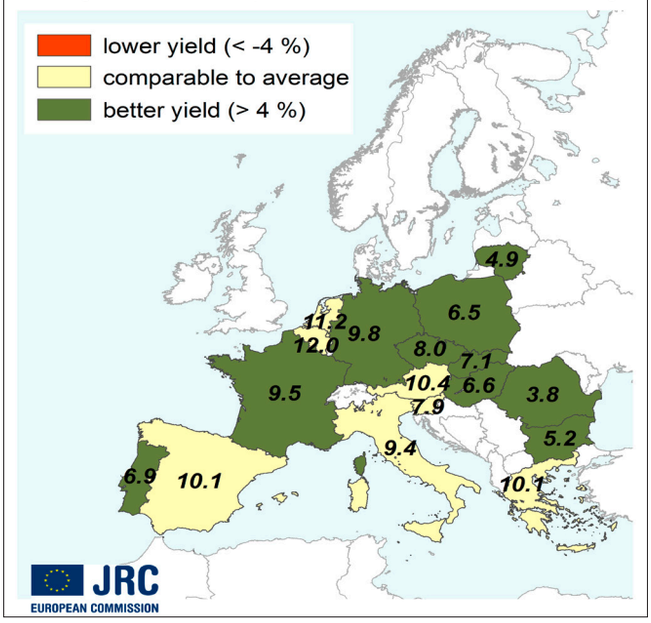
Overview of the 2010/11 crop season. Agrometeorological analysis and sowing conditions for the 2011/12 season

Grain maize - yield forecast 2011

Actual yield versus average yield 2006- 2010

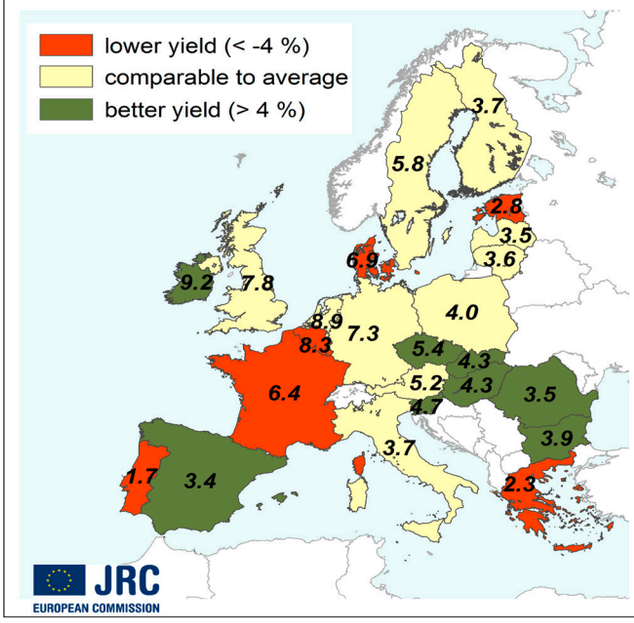
Yield figures 2011 are expressed in t/ha and rounded to 100 kg



Total wheat - yield forecast 2011

Actual yield versus average yield 2006- 2010

Yield figures 2011 are expressed in t/ha and rounded to 100 kg



EU27 Cereals and other crops yield forecasts as of 15 November 2011					
Crops	Yield t/ha				
	2010	2011	Avg 5yrs	%11/10	%11/5yrs
TOTAL CEREALS	4.98	**5.03**	4.93	+1.0	+1.9
Total Wheat	5.29	**5.31**	5.26	+0.4	+0.9
soft wheat	5.55	**5.54**	5.54	-0.1	+0.0
durum wheat	3.15	**3.17**	3.11	+0.6	+2.0
Total Barley	4.34	**4.36**	4.32	+0.5	+1.0
spring barley	3.7	**3.87**	3.75	+4.7	+3.3
winter barley	5.22	**5.09**	5.17	-2.4	-1.5
Grain maize	7.03	**7.11**	6.71	+1.2	+6.0
Other cereals	3.11	**3.13**	3.55	+0.6	-11.8
Rape seed	2.97	**2.89**	3.01	-2.8	-4.3
Potato	28.43	**31.06**	28.45	+9.3	+9.2
Sugar beets	67.55	**70.47**	65.75	+4.3	+7.2
Sunflower	1.86	**1.89**	1.72	+1.9	+9.8

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 100 kg

Sources: 2006-2010 data come from EUROSTAT Eurobase (last update: 24/10/2011) and EES (last update: 21/10/2011)
2011 yields come from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 31/10/2011)

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PART A. Synthesis of the 2010/11 season

Highlights

Exceptional good season for maize but winter cereals yields in western Europe compromised by the dry spell in spring.

The yield forecast for total cereals is 5.03 t/ha and therefore 1 % above last year's yield and close to 2 % above the 5-year average.

Autumn 2010 was decidedly mild in the Black Sea and eastern Mediterranean but there were severe frosts in Russia, and it was colder than the long term average in the higher latitudes. Western Europe experienced a cold December, with anticipated winter crop dormancy and, in part, lower biomass accumulation. Almost everywhere there was good precipitation. From January to March 2011, for most of the European continent temperature accumulation was above the norm, leading to an anticipated crop cycle. No particular winter kill damage in Europe was noted despite the de-hardening due to mild temperatures in February. Cumulated precipitation during the three months was below average for most of France, Benelux and Germany as well as Slovakia, Hungary and Ukraine, mainly due to a very dry March. The dry period continued and Western Europe experienced a pronounced dry spell leading to critical soil moisture values in the United Kingdom, Benelux, France, Germany and northern Italy. This was coupled with warm temperatures in April leading to a large GDD surplus, further accelerating crop development and jeopardising the yield potential, especially for winter crops. The countries around the Black Sea experienced a rather cold spring and in general a water surplus. Towards the end of May the dry spring was replaced by unsettled weather, with a mix of rain and sunshine. A rather wet summer followed for Western Europe, partially offsetting the drought impact.

Nevertheless the dry spring left its mark, and soft wheat production for the three main producers France, Germany and United Kingdom is below the average. The same holds for winter barley, which was affected even more due to the shorter cycle. The low production levels in these countries are partially offset by good yields and an increase in planted areas for soft wheat in Bulgaria, the Czech Republic and Poland and Hungary (the latter two for yields only). With the summer turning out excessively wet in some regions, the result was deteriorated grain quality and harvesting problems for winter cereals in Western Europe, especially in Denmark and around the Baltic Sea. September brought back stable weather conditions. On the other hand, the absence of heat waves and the wet summer meant beneficial conditions for summer crops with record high yields for maize in France, accounting for almost 24 % of European production. Also sugar beet yields are clearly above the five-year average. The crop hit most at European level by the adverse weather conditions this year is rapeseed. Especially in Germany yields are very low (-10 % compared to the average) due to an unfavourable combination of a weakened crop after the winter and too much rain alternating with dry periods.

I. Agrometeorological overview

Autumn 2010 (October — December)

In the east and west of the continent temperature anomalies were recorded: decidedly milder in the Black Sea and eastern Mediterranean but with severe frosts in Russia, colder than the LTA in the higher latitudes. Western Europe experienced a cold December with anticipated winter crop dormancy and, in part, lower biomass accumulation. Good snow cover protected the crops. Almost everywhere precipitation was good, with possibly an excess in northern Poland, the Po Valley, Andalucía, and northern Germany. There was persistent and damaging water scarcity in Cataluña and Aragon.

Temperature

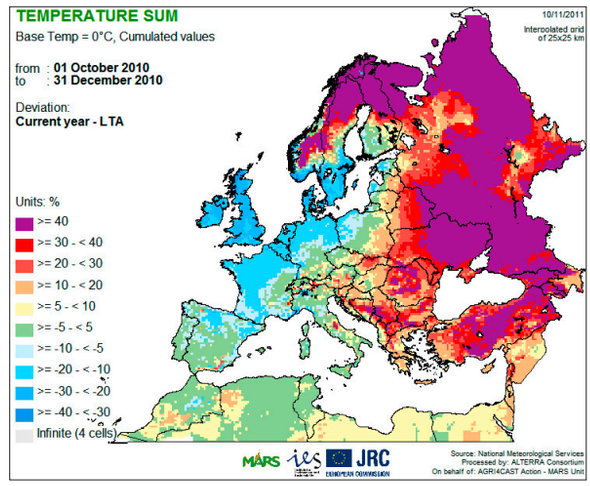
In autumn the GDD accumulation data clearly showed the presence of anomalous thermal conditions in the east and west of Europe: most of France, Germany, Benelux, Denmark, UK and Ireland as well as the Baltic States experienced lower than seasonal GDD accumulation, whereas eastern Europe, the Balkans and the Black Sea area showed significantly higher thermal accumulation compared to the LTA. This was due to anomalies in both the maximum and minimum daily values: 4°- 5 °C above the average on the eastern and 2°-3 °C below on the western side. However, in Russia, Sweden and Finland severe frost events (-28°/-32 °C) were recorded at the beginning of December. This was due to abnormal synoptic circulation generating an arctic blast all over the central and northern latitudes. In these areas, the low temperatures coupled with limited snow cover probably had a negative impact on the winter crops. At the same time, in the north-west of Europe and in particular in all the areas facing the English Channel, North Sea and Baltic, the cooler than seasonal conditions anticipated winter crops› dormancy and blocked biomass accumulation. An African flux over the Mediterranean and Black Sea Basin from the beginning of November onwards led to unusually mild temperatures: for example in Bulgaria (22 °C recorded versus 5 °C LTA) southern Spain (27 °C versus 13 °C), Romania (24 °C versus 8 °C). In these areas, the unusual conditions persisted for 15 days and brought about and almost complete 'de-hardening' of the winter cereals, exposing them to a higher frost risk.

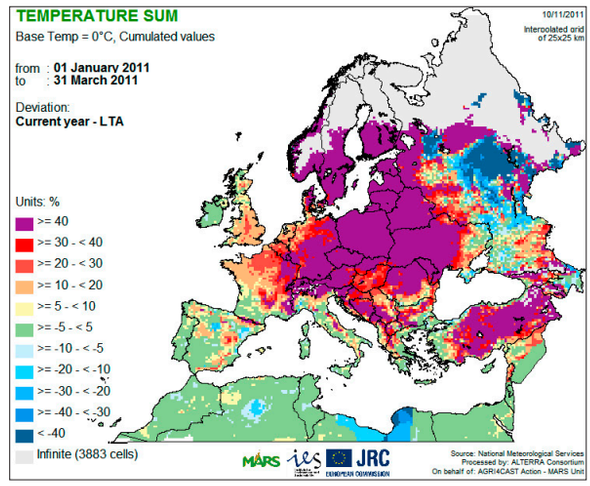
Precipitation

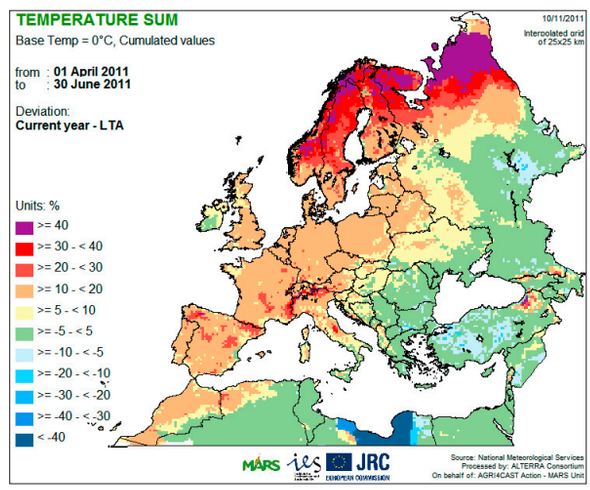
During the autumn, the rain was mainly concentrated on the western Atlantic coasts and in the central Mediterranean. In Portugal, southern Spain, northern Morocco, Italy and the Adriatic basin the rain was particularly persistent and abundant: > 450-500 mm and in some cases (Andalucía, central Italy) even above 600 mm in November and December. In the heaviest soils excessive water supplies very likely caused temporary soil saturation with root asphyxia. In the southern areas (in particular in the Maghreb, Greece, southern Italy, southern France) the rainfall completely refilled the soils reservoirs with positive effects for the coming months. On the other hand, rainfall was very scarce in south-west Spain (*Aragon, Cataluña*: 15 mm), Greece (50 mm) and the United Kingdom (70-90 mm). In these areas, the autumn water shortage hampered winter cereal sowings or timely germination.

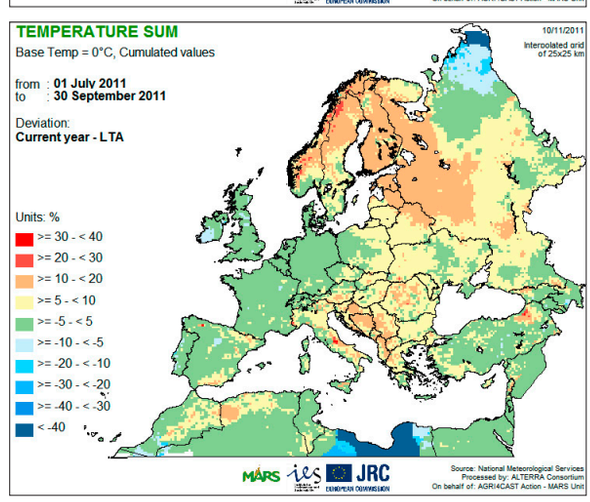
Winter 2011 (January — March)

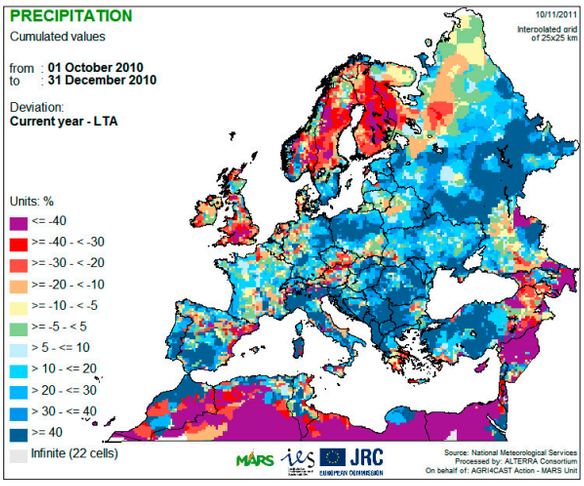
For most of the European continent temperature accumulation was above the norm. Severe frosts occurred in January and at the end of February / beginning of March. There was no particular winter kill damage in Europe despite the de-hardening, due to mild temperatures in February. Cumulated precipitation over the three months was below average for most of France, Benelux

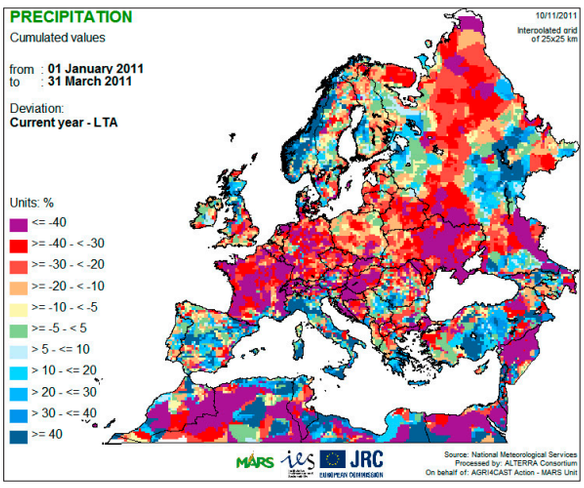


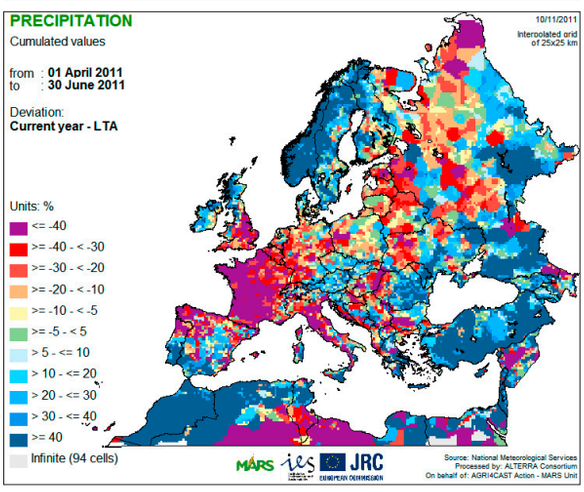


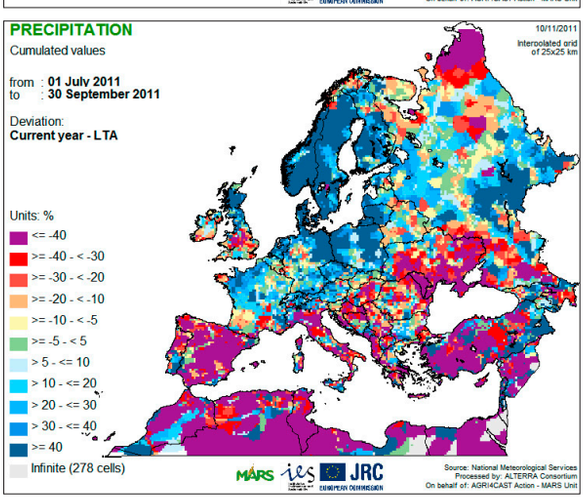












and Germany as well as Slovakia, Hungary and Ukraine, mainly due to a very dry March.

Temperature

Winter started with seasonal conditions in the east of the continent whilst milder conditions moved westward, affecting the central and eastern EU, as well as the Maghreb. However, in **January,** severe frosts (-20 °C or even lower) occurred in eastern Germany, between Germany and the Czech Republic and in Poland. At the end of January, GDD surpluses were recorded in practically all the EU countries. In **February** milder temperatures persisted, in particular along the English Channel and in Italy. The maximum daily temperatures were on average 3-4 °C above the seasonal average. In the British Isles, France, Germany and Benelux the minimum daily values were even 4 °C above the LTA. Late February — early **March** brought back some harsh frost in Central and Eastern Europe as well as in Germany. In the *Volga* region the absolute minimum values plummeted to nearly -30 °C. Around 10 March the weather turned warmer and supported vegetation. The average temperature was higher, at +2/+5 °C over the LTA, in a large area between the Atlantic, Baltic, Mediterranean and Black Sea as well as in the northern territory of Russia.

The sum of active temperatures (base temperature = 0 °C) from January to March was markedly above the seasonal average in eastern England, Benelux, France, Germany, Poland, Austria, the Czech Republic, Slovakia, Slovenia, Hungary, Romania, parts of Bulgaria and Greece as well as Turkey and western Ukraine. So for most of the European continent temperature accumulation was above the norm. The weather conditions in March in central Europe favoured snow melt and crops recovering after winter dormancy.

Precipitation

Precipitation in **January** and **February** was scarce as compared with the LTA in the EU belt between eastern Spain and Hungary, including the whole of France, north and central Italy, Slovenia, the Czech Republic and Slovakia, and partially also Austria and southern Germany. Similar conditions were recorded in eastern Greece and north-west Turkey. Reduced amounts of rainfall were recorded in central-east Ukraine and the Volga valley too. In the other areas, more seasonal amounts of rain occurred. However, locally and spatially erratically large — and in some cases beneficial — amounts of rain (+40/+50 % as compared to the LTA)were recorded in central Spain (*Extremadura, Castilla la Mancha*), southern Italy (*Sicily and Sardinia*), southern Greece (*Peloponnesus*), Scotland, Denmark, north-east Poland and the Baltic area, northern Morocco, Algeria and southern Russia. This picture changed in **March**, bringing plentiful rain to the hitherto dry areas, especially in Spain and France along the Mediterranean border, and in Italy (where a large surplus was recorded). Germany, England, Ireland, Benelux, Poland, Eastern Europe and Ukraine remained almost dry throughout March. In some places it was the driest March on record. As a consequence of the lack of precipitation, France, southern UK and especially large areas f Germany experienced high irradiance (+30—40 % with respect to the LTA) leading, in conjunction with the high temperature, to unusually high evapo-transpirative demand early in the season.

Spring 2011 (April-June)

Western Europe experienced a pronounced dry spell that started as early as March, leading to critical soil moisture values in the United Kingdom, Benelux, France, Germany and northern Italy. This was coupled with warm temperatures in April, leading to a large GDD surplus, and accelerating crop development. The countries around the Black Sea experienced a rather cold period and in general a water surplus. Towards the end of May the persistent high-pressure system responsible for the extremely dry spring was replaced by a general western current, moving low-pressure systems repeatedly into Western Europe with a mix of rain and sunshine. Countries that had been hit by the dry conditions received beneficial rain, ending the dry spell.

Temperature

The mild conditions of March continued in **April**, with unusually high maximum temperatures in Sweden, Finland, Germany, the United Kingdom, Benelux and northern Italy.

In these countries cumulated temperatures in April showed a large surplus, in some cases of more than 40 %. As a consequence crop growth in these countries was accelerated. The countries around the Black Sea (Ukraine, Romania, Bulgaria, Greece and Turkey) accumulated a moderate deficit, and crop growth was partially delayed. At the beginning of **May** a cold spell settled on the continent from Poland to Turkey, leading to some late frost in central Europe with potential negative impact on the young maize seedlings. The frost was even accompanied by some snowfall in Poland. The month of May was warmer than the long-term average (LTA), with higher temperature sums for Germany, Benelux, United Kingdom, France, Italy, and the Iberian Peninsula. The remaining European countries experienced cooler than normal conditions. Since the beginning of **June** temperature accumulation showed the opposite behaviour, being warmer than the LTA in central and eastern Europe, partially compensating for the delayed crop growth and bringing crop development back to average or slightly advanced growth rates. Average to cooler conditions characterised June for most of Western Europe. End of May and beginning of June temperatures peaked high (above 30 °C) in northern Italy, east Germany, Poland, Ukraine and the border region of Romania and Hungary, as well as in Spain, Portugal and Greece, where such values are within the average range. Apart from the *Mediterranée* region, France was spared high temperatures, thus avoiding additional negative pressure on crops.

Precipitation

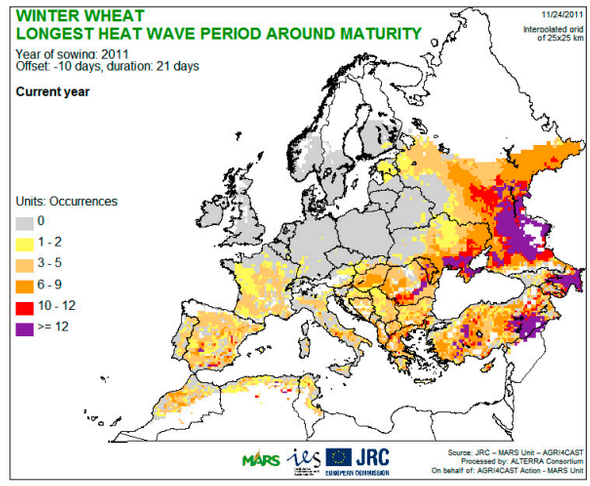
Precipitation was extremely scarce in Western Europe (UK, Ireland, Benelux, France and Germany) in **April** and **May.** This dry spell, which started in March and settled on a line intersecting Western Europe, continued in April, becoming more and more pronounced for France, UK and northern Italy, whereas the situation for Germany did not worsen, at least in the eastern part of the country. The rainfall recorded in the countries which were affected constitute one of the driest periods in our database since 1975, pushing down soil moisture content and partially jeopardising yield potential. The main cereal areas in the UK received only around 10 mm of rain in March and April. Record low values were also observed for Benelux and northern Germany. For most of France the accumulated precipitation deficit from March to the end of May was in the range 50 – 80 %.

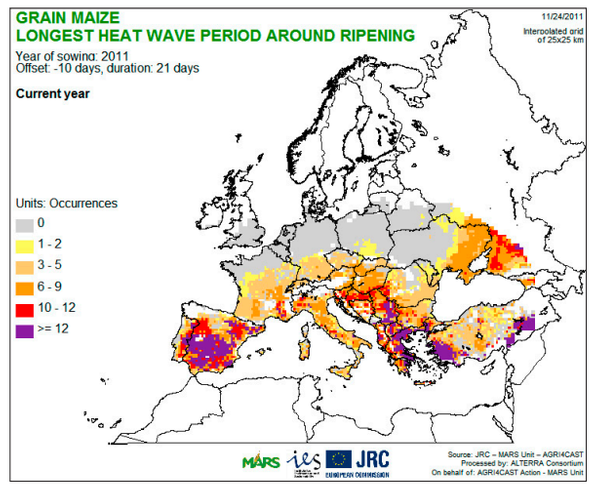
The long-lasting dry spell ended at the beginning of **June**, with different levels of rainfall received in the regions affected. For Germany precipitation in June was generally above average, as it was in the Benelux. In France, however, precipitation remained below the monthly average in June for *Aquitaine*, *Midi Pyrenées* and *Centre Est*. The rain arrived too late for winter crops to recover fully, but it was still beneficial for spring and summer crops. Northern Italy saw a very rainy beginning of June, bringing the extremely low soil moisture values back to average.

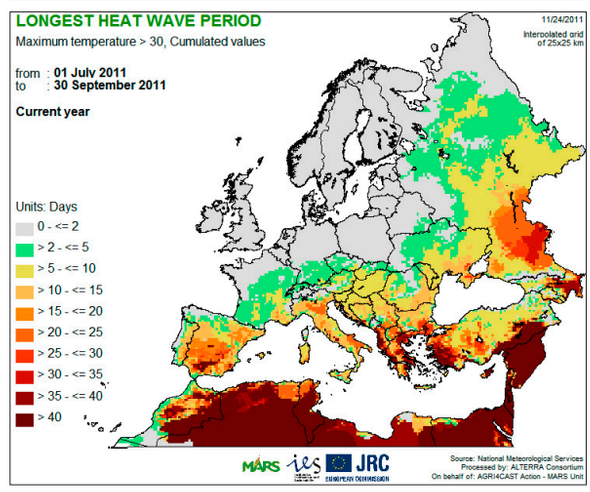
A general surplus of cumulated precipitation from April to the end of June was recorded for the south of Portugal, large areas of Spain, Austria and most of Romania. Scotland and Scandinavia experienced a wet spring, leading to large surpluses. The same is true for Turkey.

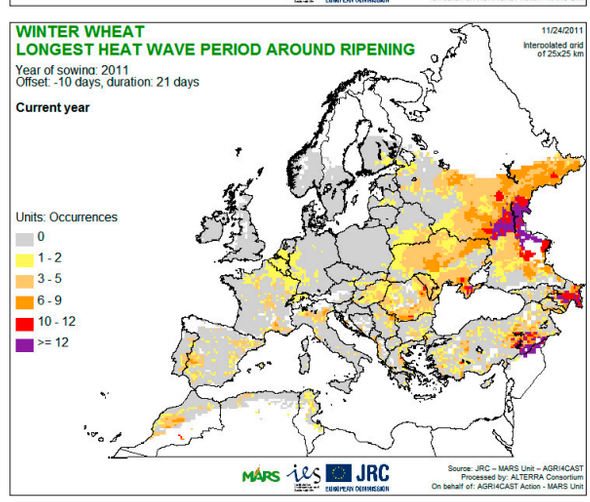
Summer 2011 (July — September)

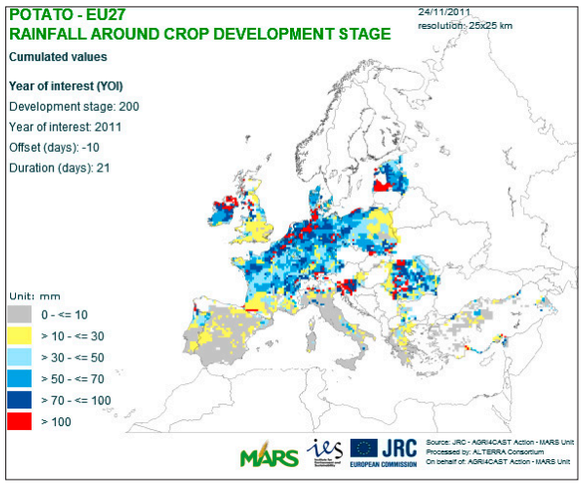
Unsettled weather in Western Europe with plenty of rain and low temperatures. Only September saw stable weather conditions return. Beneficial conditions for summer crops. Frequent and abundant precipitation in August hampered cereals harvesting in Western Europe and around the Baltic Sea. GDD accumulation just around average for Spain, United Kingdom, Benelux, Denmark and Germany for the three summer months July, August and September. Central and eastern Europe and Italy with accumulated temperatures above the average, mainly due to a warm September.

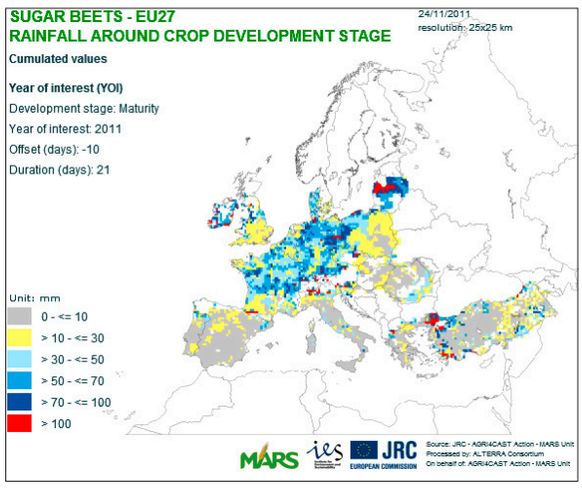


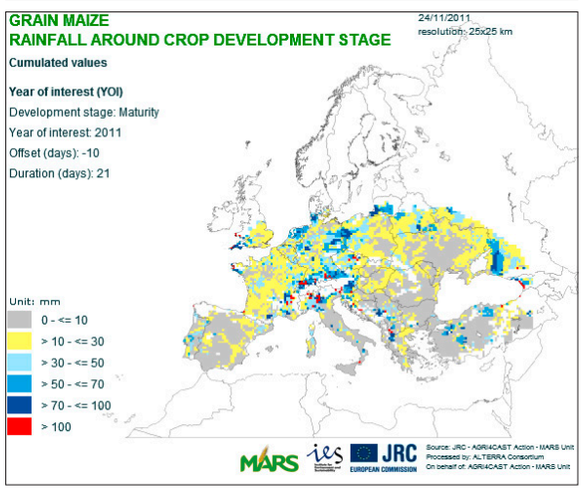


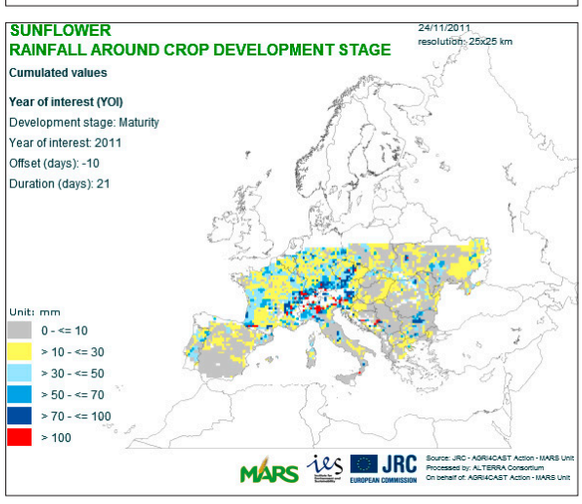












Temperature

July was a cool month for most of Western Europe; GDD accumulation was below the long-term average for Ireland, United Kingdom, France, Benelux and Germany. This was driven by a pronounced cold spell at the beginning of July. These weather conditions slowed down crop development, which had already reached an advanced stage. The remaining European countries experienced normal temperature accumulation with the exception of the Baltic States, Belarus and Ukraine, which had higher than average temperature accumulation. Persistent high maximum temperatures were observed for Spain, Hungary and the Black Sea area in July. **August** was slightly warmer for most of Western Europe, pushing temperature accumulation up to average values. No particular heat waves with damaging effects on crops were recorded for Western, Northern and Eastern Europe. Very high temperatures persisted only in the Mediterranean region and around the Adriatic Sea. A very long hot spell of more than 12 days was recorded in northern Italy and north-eastern Spain. The sum of active temperatures was above the long-term average in Italy, Slovenia and the Dalmatian coast, as well in Austria, the Czech Republic, Slovakia and eastern Spain (by >10 %).

September finally brought summer to Western Europe, and Europe in general experienced a warm period with mean temperatures higher than the long-term average, pushing accumulated temperatures well above the average. In Italy and the Balkans this was coupled with maximum temperatures above 30 °C caused by an expansion of the subtropical anticyclone belt on the central-western Mediterranean. Higher than usual accumulated temperatures were also recorded in France, Germany and Eastern Europe, along with higher than average maximum temperatures. Cold days (tmin<=0 °C) have been recorded since the middle of September in the Scandinavian Peninsula, Finland, and in the northern and eastern territory of Russia and Turkey (*Konya*).

Precipitation

July was a wet period, with some large rainfall surpluses for France (with the exception of the north-east), Germany, the Netherlands, Scotland, Denmark, the Baltic States, Poland, the Czech Republic, Slovakia and Romania. Scarce rainfall was recorded for *Emilia-Romagna* (Italy), *Weser Ems* (Germany) and Ireland. The weather conditions were good for grain maize, tuber and root crops. From the end of July until the beginning of **August** the rain was centred in central Europe. The area on the border between Germany (*Mecklenburg and Brandenburg*) and Poland received above 100 mm precipitation; in *Mecklenburg* up to 200 mm were recorded locally. Over-wet conditions, with precipitation exceeding 100 mm, were observed too in *Mazowieckie* in Poland, along the border of Poland and Ukraine, in centre-south Lithuania, and Slovenia, but also locally in Belgium, south Sweden, central Finland, Estonia, Austria, south Hungary and western Romania. From 10 August onwards rain was concentrated in the areas around the North Sea and Baltic Sea, taking accumulated values up to a surplus for August (+120 mm locally in Denmark compared to the LTA), and exceeding by far the LTA number of rainy days. Fields were too wet for harvesting, mainly in Poland and north-eastern Germany, following persistent rainfalls in July (>150 % LTA). Since 10 August the highest number of days with rainfall above 5 mm/day was recorded in western Lithuania and Latvia (>10 days); more than seven days of intense precipitation in Denmark, the Netherlands, northern Germany and north-western Poland and locally in Belgium, United Kingdom and southern Sweden. Very scarce precipitation was recorded around the Mediterranean Sea, in the Black Sea region and between Black Sea and Adriatic, where the weather was good for harvesting.

September continued to be dry in these regions; and in France, Germany (except northern Germany), most of the United Kingdom, Austria and Poland the weather remained rather dry at the beginning of September, favouring harvesting and field preparations. The long-lasting dry weather, primarily in Hungary, Romania and Ukraine, hampered field preparation and sowing, postponing the emergence of winter crops. Wetter than normal conditions occurred in Ireland, northern parts of the British Isles, Scandinavia, in the Alps and big parts of Russia, where precipitation exceeded 100 mm.

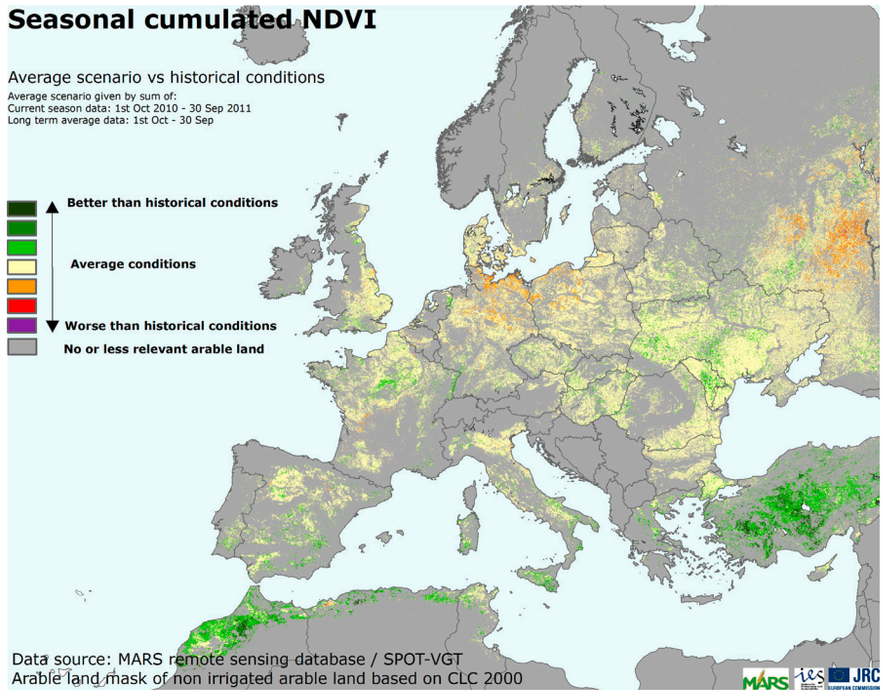
II. SPOT Vegetation satellite analysis

Map highlights — North-eastern Germany and Russia's eastern plains affected by a bad start to the season. Good campaign in Mediterranean and Black Sea regions. Bad summer conditions did not affect canopy development in France and United Kingdom.

NDVI cumulative analysis

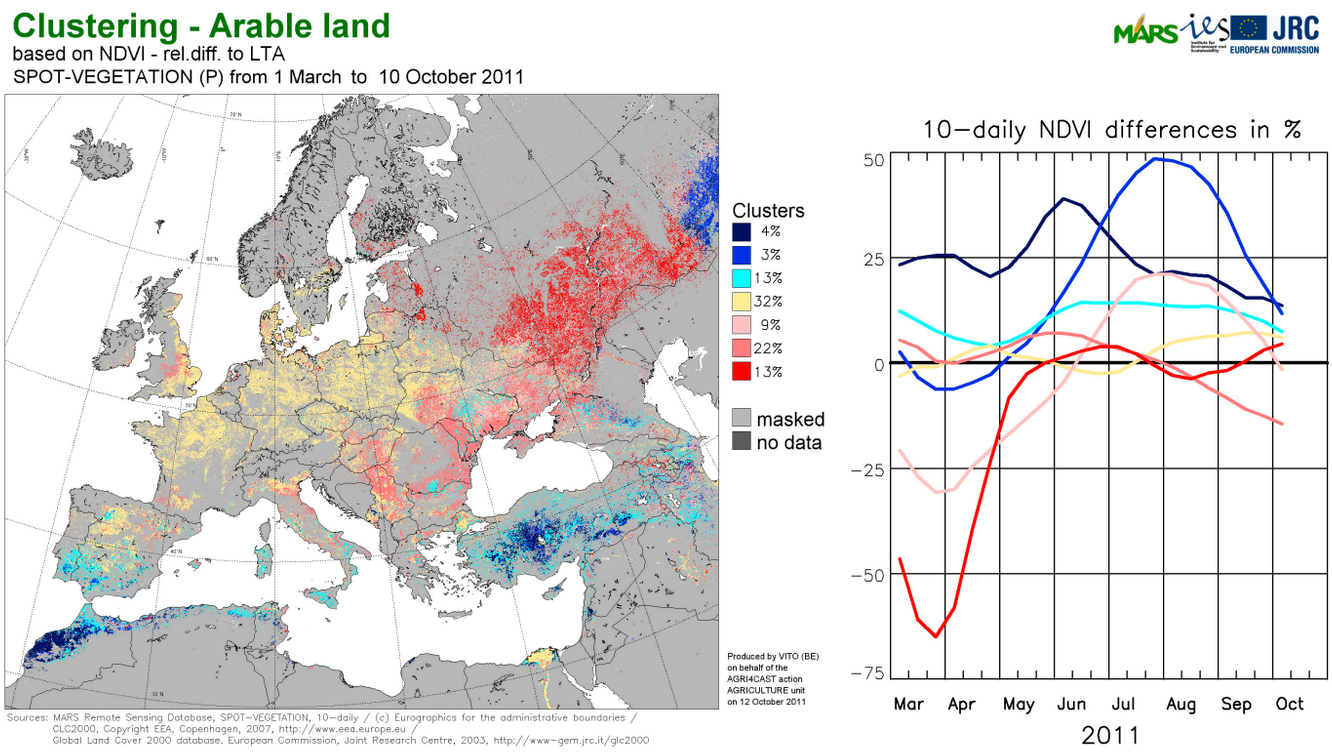
2010/2011 canopy development is described in the **seasonal cumulated NDVI map**, showing seasonal NDVI values from October 2010 to September 2011.

Mediterranean regions had very good biomass accumulation, especially in Turkey. In Western Europe the dry period in spring / early summer did not affect major agricultural areas, in terms of cumulated NDVI values. Southern Baltic areas suffered from sub-optimal starting conditions and never fully recovered. Good weather conditions for Eastern Europe generated fairly good biomass accumulation. In Russia the starting conditions suffered from the 2010 drought and caused reduced and delayed canopy development.



fAPAR clustering time-series analysis

The cluster maps below show the average time profiles of seven main fAPAR classes across Europe. Delayed spring crop development is displayed by the **red profile.** The **Pink profile** highlights regions where late-summer dry conditions affected canopy conditions at the end of the cycle. The **yellow one** describes the NDVI trend in regions with biomass development similar to the historical trend. **Blue profiles** indicate regions with from good to very good canopy growth across the whole season for both winter and summer crops.



III. Crop yield forecast at EU-27 level*

1. AGRI4CAST crop yield forecasts at national level for EU-27 (15 November 2011)

Country	TOTAL WHEAT (t/ha)					SOFT WHEAT (t/ha)					DURUM WHEAT (t/ha)				
	2010	2011	Avg 5yrs	%11/10	%11/ 5yrs	2010	2011	Avg 5yrs	%11/10	%11/ 5yrs	2010	2011	Avg 5yrs	%11/10	%11/ 5yrs
EU27	5.29	**5.31**	5.26	+0.4	+0.9	5.55	**5.54**	5.54	-0.1	+0.0	3.15	**3.17**	3.11	+0.6	+2.0
AT	5.01	**5.24**	5.06	+4.6	+3.5	5.04	**5.28**	5.10	+4.7	+3.4	4.50	**4.50**	4.37	+0.0	+3.1
BE	9.35	**8.27**	8.68	-11.5	-4.6	9.35	**8.27**	8.68	-11.5	-4.6	-	**-**	-	-	-
BG	3.74	**3.87**	3.34	+3.5	+15.8	3.74	**3.87**	3.34	+3.5	+15.8	-	**-**	-	-	-
CY	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
CZ	4.99	**5.41**	5.09	+8.3	+6.3	4.99	**5.41**	5.09	+8.3	+6.3	-	**-**	-	-	-
DE	7.23	**7.25**	7.46	+0.3	-2.8	7.24	**7.26**	7.47	+0.3	-2.8	5.35	**5.41**	5.48	+1.1	-1.3
DK	6.63	**6.88**	7.22	+3.8	-4.7	6.63	**6.88**	7.22	+3.8	-4.7	-	**-**	-	-	-
EE	2.74	**2.83**	2.97	+3.3	-4.6	2.74	**2.83**	2.97	+3.3	-4.6	-	**-**	-	-	-
ES	3.01	**3.39**	3.08	+12.7	+10.1	3.37	**3.56**	3.31	+5.5	+7.4	1.95	**2.78**	2.47	+42.8	+12.6
FI	3.43	**3.70**	3.71	+8.0	-0.2	3.43	**3.70**	3.71	+8.0	-0.2	-	**-**	-	-	-
FR	6.87	**6.43**	6.89	-6.5	-6.6	7.04	**6.57**	7.07	-6.6	-7.1	5.06	**4.70**	4.81	-7.2	-2.3
GR	2.59	**2.25**	2.54	-13.0	-11.2	2.91	**2.66**	2.79	-8.7	-4.7	2.49	**2.12**	2.45	-14.7	-13.3
HU	3.72	**4.25**	4.05	+14.2	+5.1	3.73	**4.26**	4.05	+14.1	+5.1	3.32	**3.95**	3.82	+19.1	+3.5
IE	8.60	**9.20**	8.68	+7.0	+6.0	8.60	**9.20**	8.68	+7.0	+6.0	-	**-**	-	-	-
IT	3.70	**3.73**	3.65	+0.8	+2.3	5.16	**5.22**	5.19	+1.1	+0.6	3.04	**3.12**	2.97	+2.5	+4.9
LT	3.31	**3.61**	3.61	+9.1	+0.0	3.31	**3.61**	3.61	+9.1	+0.0	-	**-**	-	-	-
LU	5.96	**5.82**	6.15	-2.4	-5.5	5.96	**5.82**	6.15	-2.4	-5.5	-	**-**	-	-	-
LV	3.28	**3.49**	3.43	+6.3	+1.7	3.28	**3.49**	3.43	+6.3	+1.7	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	8.91	**8.86**	8.52	-0.5	+4.0	8.91	**8.86**	8.52	-0.5	+4.0	-	**-**	-	-	-
PL	3.94	**4.01**	3.87	+1.8	+3.5	3.94	**4.01**	3.87	+1.8	+3.5	-	**-**	-	-	-
PT	1.38	**1.74**	1.92	+25.9	-9.5	1.38	**1.74**	1.92	+25.9	-9.5	-	**-**	-	-	-
RO	2.80	**3.46**	2.58	+23.5	+33.9	2.80	**3.46**	2.58	+23.5	+33.9	-	**-**	-	-	-
SE	5.40	**5.81**	5.86	+7.6	-0.9	5.40	**5.81**	5.86	+7.6	-0.9	-	**-**	-	-	-
SI	4.80	**4.67**	4.33	-2.7	+7.9	4.80	**4.67**	4.33	-2.8	+7.9	-	**-**	-	-	-
SK	3.47	**4.30**	4.01	+24.0	+7.2	3.46	**4.29**	4.00	+24.0	+7.2	3.58	**4.52**	4.33	+26.2	+4.5
UK	8.05	**7.78**	7.89	-3.5	-1.5	8.05	**7.78**	7.89	-3.5	-1.5	-	**-**	-	-	-

Country	TOTAL BARLEY (t/ha)					SPRING BARLEY (t/ha)					WINTER BARLEY (t/ha)				
	2010	2011	Avg 5yrs	%11/10	%11/ 5yrs	2010	2011	Avg 5yrs	%11/10	%11/ 5yrs	2010	2011	Avg 5yrs	%11/10	%11/ 5yrs
EU27	4.34	**4.36**	4.32	+0.5	+1.0	3.70	**3.87**	3.75	+4.7	+3.3	5.22	**5.09**	5.17	-2.4	-1.5
AT	4.50	**4.71**	4.58	+4.7	+3.0	3.59	**3.90**	3.92	+8.7	-0.5	5.39	**5.49**	5.47	+1.8	+0.3
BE	8.62	**7.59**	8.24	-11.9	-7.9	-	**-**	-	-	-	8.62	**7.59**	8.24	-11.9	-7.9
BG	3.41	**3.50**	3.21	+2.7	+9.1	-	**-**	-	-	-	3.41	**3.50**	3.21	+2.7	+9.1
CY	1.77	**1.52**	1.26	-14.4	+20.2	-	**-**	-	-	-	1.77	**1.52**	1.26	-14.4	+20.2
CZ	4.08	**4.33**	4.12	+6.3	+5.2	3.91	**4.19**	3.98	+7.1	+5.3	4.50	**4.73**	4.53	+5.1	+4.5
DE	6.30	**5.94**	6.05	-5.6	-1.8	4.95	**4.73**	4.76	-4.5	-0.7	6.66	**6.33**	6.48	-4.9	-2.3
DK	5.11	**5.06**	5.07	-1.0	-0.2	5.00	**4.91**	4.88	-1.8	+0.6	5.43	**5.55**	5.69	+2.3	-2.5
EE	2.43	**2.57**	2.49	+5.8	+3.3	2.43	**2.57**	2.49	+5.8	+3.3	-	**-**	-	-	-
ES	2.84	**3.22**	2.94	+13.6	+9.5	2.94	**3.28**	3.02	+11.7	+8.6	2.29	**2.88**	2.61	+25.6	+10.4
FI	3.07	**3.46**	3.45	+12.7	+0.3	3.07	**3.46**	3.45	+12.7	+0.3	-	**-**	-	-	-
FR	6.38	**5.75**	6.36	-9.9	-9.5	6.06	**5.53**	6.06	-8.7	-8.8	6.50	**5.85**	6.48	-10.0	-9.7
GR	2.84	**2.38**	2.42	-16.3	-1.7	-	**-**	-	-	-	2.84	**2.38**	2.42	-16.3	-1.7
HU	3.37	**3.75**	3.60	+11.4	+4.3	3.02	**3.33**	3.17	+10.3	+5.2	3.57	**4.02**	3.88	+12.6	+3.5
IE	7.00	**7.28**	6.75	+4.0	+7.8	6.70	**6.96**	6.56	+3.9	+6.1	8.50	**8.55**	8.22	+0.6	+4.0
IT	3.62	**3.70**	3.64	+2.3	+1.7	-	**-**	-	-	-	3.62	**3.70**	3.64	+2.3	+1.7
LT	2.70	**2.77**	2.64	+2.7	+5.2	2.70	**2.77**	2.64	+2.7	+5.2	-	**-**	-	-	-
LU	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
LV	2.80	**2.63**	2.38	-6.1	+10.4	2.80	**2.63**	2.38	-6.1	+10.4	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	5.56	**6.12**	6.00	+10.1	+1.9	5.56	**6.12**	6.00	+10.1	+1.9	-	**-**	-	-	-
PL	3.15	**3.24**	3.08	+2.6	+4.9	2.98	**3.04**	2.94	+2.0	+3.4	3.92	**3.97**	3.84	+1.2	+3.2
PT	1.51	**1.97**	2.00	+30.7	-1.2	-	**-**	-	-	-	1.51	**1.97**	2.00	+30.7	-1.2
RO	2.54	**2.78**	2.33	+9.6	+19.4	1.76	**2.15**	1.83	+22.4	+17.8	2.89	**3.13**	2.66	+8.4	+17.9
SE	3.97	**4.31**	4.18	+8.6	+3.0	3.93	**4.26**	4.15	+8.4	+2.7	4.63	**5.31**	5.18	+14.8	+2.5
SI	4.30	**4.09**	3.82	-5.0	+7.0	-	**-**	-	-	-	4.30	**4.09**	3.82	-5.0	+7.0
SK	2.72	**3.35**	3.39	+22.9	-1.2	2.67	**3.30**	3.37	+23.6	-2.1	3.17	**3.72**	3.57	+17.5	+4.5
UK	6.00	**5.67**	5.87	-5.5	-3.4	5.56	**5.33**	5.43	-4.1	-1.9	6.72	**6.24**	6.54	-7.1	-4.5

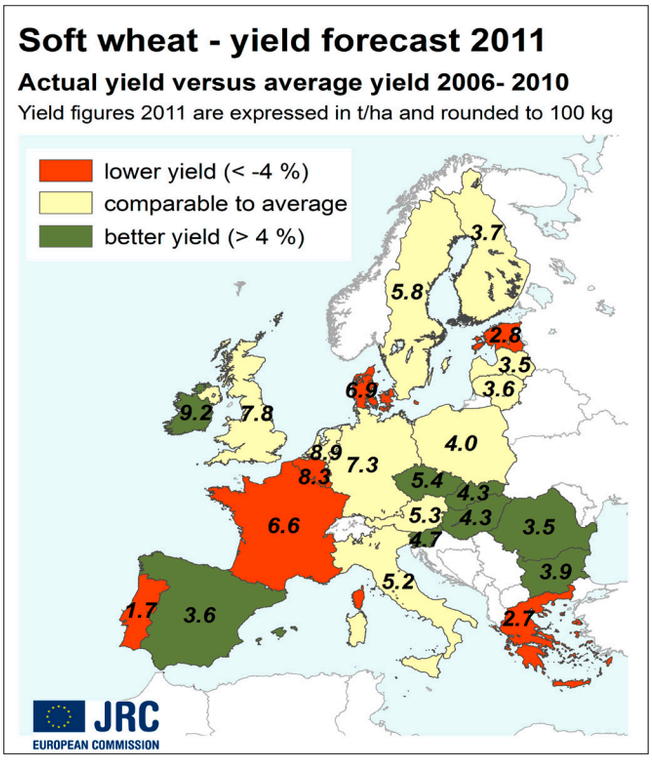
* Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 100 kg.
Sources: 2006-2010 data come from EUROSTAT Eurobase (last update: 24/10/2011) and EES (last update: 21/10/2011).
2011 yields come from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 31/10/2011).

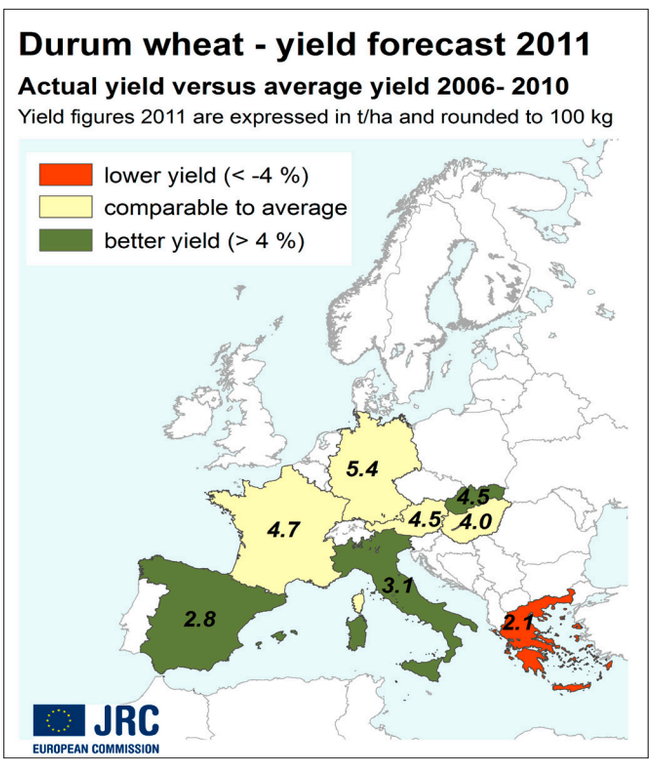
Country	GRAIN MAIZE (t/ha)					RAPE SEED (t/ha)					POTATO (t/ha)				
	2010	2011	Avg 5yrs	%11/10	%11/ 5yrs	2010	2011	Avg 5yrs	%11/10	%11/ 5yrs	2010	2011	Avg 5yrs	%11/10	%11/ 5yrs
EU27	7.03	**7.11**	6.71	+1.2	+6.0	2.97	**2.89**	3.02	-2.8	-4.3	28.43	**31.06**	28.45	+9.3	+9.2
AT	9.28	**10.39**	10.02	+12.0	+3.7	3.17	**2.95**	3.10	-6.9	-4.7	30.57	**33.04**	31.12	+8.1	+6.1
BE	12.12	**11.98**	11.67	-1.1	+2.6	4.03	**3.42**	3.89	-15.1	-12.1	44.73	**47.56**	44.22	+6.3	+7.6
BG	6.24	**5.21**	4.11	-16.5	+26.6	2.57	**2.44**	2.18	-5.0	+12.0	15.60	**16.55**	15.44	+6.1	+7.2
CY	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
CZ	6.71	**7.96**	7.21	+18.6	+10.4	2.83	**2.92**	3.00	+3.4	-2.6	24.56	**28.83**	25.07	+17.4	+15.0
DE	8.79	**9.80**	9.17	+11.5	+6.9	3.90	**3.45**	3.82	-11.4	-9.7	39.98	**45.02**	41.39	+12.6	+8.8
DK	-	**-**	-	-	-	3.48	**3.60**	3.57	+3.4	+0.8	35.27	**39.70**	38.68	+12.6	+2.6
EE	-	**-**	-	-	-	1.33	**1.40**	1.52	+5.0	-7.8	-	**-**	-	-	-
ES	9.92	**10.06**	9.94	+1.5	+1.2	1.81	**1.86**	1.70	+2.9	+9.4	29.54	**30.06**	29.07	+1.8	+3.4
FI	-	**-**	-	-	-	1.13	**1.47**	1.37	+30.1	+7.0	26.15	**27.78**	25.30	+6.2	+9.8
FR	8.74	**9.48**	9.01	+8.4	+5.2	3.29	**3.15**	3.25	-4.3	-3.0	41.40	**42.16**	42.87	+1.8	-1.7
GR	10.18	**10.13**	9.92	-0.5	+2.1	2.60	**-**	-	-	-	25.25	**24.93**	24.94	-1.3	-0.1
HU	6.63	**6.62**	6.21	-0.1	+6.7	2.16	**2.19**	2.32	+1.5	-5.6	21.73	**25.68**	24.24	+18.2	+6.0
IE	-	**-**	-	-	-	-	**-**	-	-	-	34.40	**32.66**	32.20	-5.0	+1.4
IT	9.11	**9.41**	9.11	+3.3	+3.2	2.46	**2.03**	2.10	-17.5	-3.3	24.97	**25.04**	24.91	+0.3	+0.5
LT	4.79	**4.94**	4.10	+3.2	+20.6	1.65	**1.76**	1.75	+6.4	+0.1	12.99	**12.99**	12.17	+0.0	+6.7
LU	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	2.13	**2.06**	2.06	-3.1	+0.3	16.03	**16.23**	15.84	+1.2	+2.4
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	9.74	**11.19**	11.05	+14.9	+1.3	-	**-**	-	-	-	43.59	**45.22**	43.94	+3.7	+2.9
PL	5.75	**6.49**	5.70	+12.8	+13.7	2.70	**2.47**	2.77	-8.4	-10.6	17.86	**19.30**	18.53	+8.1	+4.2
PT	6.88	**6.88**	6.15	+0.0	+11.8	-	**-**	-	-	-	14.90	**15.38**	15.01	+3.2	+2.4
RO	4.06	**3.77**	3.20	-7.1	+17.8	1.79	**1.90**	1.51	+6.0	+25.4	13.45	**15.87**	14.34	+18.0	+10.7
SE	-	**-**	-	-	-	2.54	**2.91**	2.69	+14.5	+8.3	30.01	**28.92**	29.80	-3.6	-2.9
SI	8.54	**7.94**	7.63	-7.0	+4.0	-	**-**	-	-	-	-	**-**	-	-	-
SK	5.49	**7.10**	6.04	+29.4	+17.5	1.97	**2.31**	2.21	+17.3	+4.5	11.45	**18.76**	15.43	+63.8	+21.5
UK	-	**-**	-	-	-	3.50	**3.55**	3.25	+1.5	+9.5	42.90	**43.94**	42.14	+2.4	+4.3

Country	SUGAR BEETS (t/ha)					SUNFLOWER (t/ha)				
	2010	2011	Avg 5yrs	%11/10	%11/ 5yrs	2010	2011	Avg 5yrs	%11/10	%11/ 5yrs
EU27	67.55	**70.47**	65.75	+4.3	+7.2	1.86	**1.89**	1.72	+1.9	+9.8
AT	69.84	**70.46**	67.62	+0.9	+4.2	2.62	**2.72**	2.60	+3.8	+4.4
BE	82.70	**79.73**	75.28	-3.6	+5.9	-	**-**	-	-	-
BG	-	**-**	-	-	-	2.10	**1.89**	1.59	-10.2	+18.5
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	54.36	**59.53**	54.85	+9.5	+8.5	2.11	**2.49**	2.25	+18.1	+10.6
DE	65.01	**69.03**	63.01	+6.2	+9.6	2.11	**2.32**	2.21	+9.9	+4.8
DK	60.10	**57.90**	56.64	-3.7	+2.2	-	**-**	-	-	-
EE	-	**-**	-	-	-	-	**-**	-	-	-
ES	76.74	**79.80**	76.30	+4.0	+4.6	1.27	**1.17**	1.15	-8.0	+1.4
FI	37.13	**39.49**	38.24	+6.4	+3.3	-	**-**	-	-	-
FR	82.16	**89.26**	85.16	+8.6	+4.8	2.35	**2.60**	2.40	+10.6	+8.2
GR	-	**-**	-	-	-	2.53	**1.24**	1.44	-51.2	-14.2
HU	58.34	**57.08**	53.01	-2.2	+7.7	1.97	**2.45**	2.25	+24.3	+8.6
IE	-	**-**	-	-	-	-	**-**	-	-	-
IT	56.65	**56.45**	55.02	-0.3	+2.6	2.12	**2.18**	2.20	+2.7	-0.9
LT	47.22	**47.51**	43.49	+0.6	+9.2	-	**-**	-	-	-
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	74.37	**74.96**	71.73	+0.8	+4.5	-	**-**	-	-	-
PL	49.13	**53.54**	48.98	+9.0	+9.3	-	**-**	-	-	-
PT	-	**-**	-	-	-	0.54	**0.71**	0.61	+32.2	+16.3
RO	38.36	**37.58**	33.24	-2.0	+13.0	1.56	**1.57**	1.32	+0.8	+18.8
SE	52.07	**56.26**	53.67	+8.0	+4.8	-	**-**	-	-	-
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	54.52	**60.01**	53.26	+10.1	+12.7	1.81	**2.40**	2.15	+32.6	+11.8
UK	72.86	**67.29**	64.33	-7.6	+4.6	-	**-**	-	-	-

* Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 100 kg.
Sources: 2006-2010 data come from EUROSTAT Eurobase (last update: 24/10/2011) and EES (last update: 21/10/2011).
2011 yields come from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 31/10/2011).

2. Crop by crop analysis and yield maps





Cereals

Wheat — The marked dry spell which occurred in the western part of Europe during the spring impacted negatively on winter wheat yield, mainly in France and the Benelux countries. Thereafter, the rain from May onwards and the rather cool summer had a positive impact, particularly during the grain-filling process. As a result, yield losses were not as severe as first feared, even if this very local, with considerable variation within a single region. Furthermore, the durum wheat acreage was down for all European producers.

Total wheat production is estimated at 135,94 Mt which is 2.4 % less than in 2010 but still 0.9 % up on the 5-year average. The five main producers will most probably record a fall in their total wheat production over 2010. 2011 production is expected to be below the 5-year average in Italy, Germany and France, due to the reduction in areas but also — in the case of France mainly — to a lower yield forecast as a consequence of the dry spring.

Forecast soft wheat production at EU27 level (128,20 Mt) is higher than the 5-year average by 1.9 % but 1.7 % lower than last year's production. Among the five main producers (> 70 % of total production in 2010), only Romania is likely to register an increase: +20.0 % and +26.6 % in comparison to 2010 and the fiv5-year average respectively. This is the consequence of the favourable weather conditions, and so the yield forecast is up by 23.5 % compared to 2010, despite the slight decrease in acreage. France on the contrary will — as the leading producer in EU — probably register a production decrease of 13.7 % in comparison to 2010, whereas the estimated decrease is likely to be less substantial in Germany (-1.6 %), UK (-1.3 %) and Poland (-3.3 %).

Among the other producers, a substantial increase in production is likely in Slovakia (+35.3 %), Ireland (+33.3 %) and Finland (+29.9 %) compared with last year. On the other side of the coin, production will probably be much lower than in 2010 for Italy and Belgium.

Durum wheat production (7,74 Mt) at EU27 level is forecast to be lower than in 2010 (-12.6 %) and lower than the 5-year average (-13.6 %). A decrease in production is likely for all important European producers: Italy (-12.4 %), France (-23.1 %) and Greece (-15.3 %), in the exception being Spain (+19.9 %), which benefited from exceptionally good weather conditions (yield forecast +12.6 % compared with the 5-year average). All producers have reduced their acreage, including the main producers with -14.5 % for Italy, -17.2 % for France and -16.1 % for Spain.

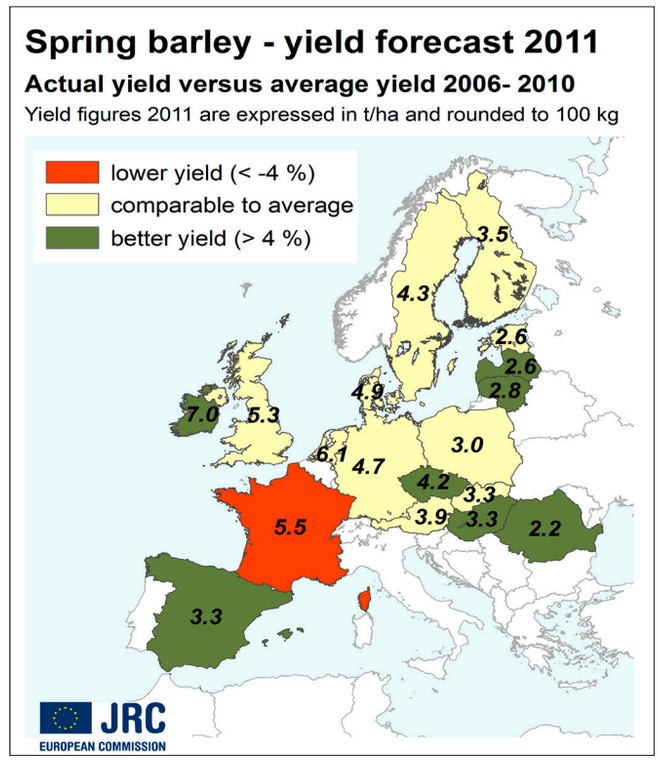
Barley — Barley production at EU27 level is forecast to be 52,09 Mt which is much lower than the 5-year average (-11.3 %). Compared to 2010, winter barley production will probably be 9.9 % down. Spring barley production, on the other hand, could be as much as 5.2 % higher, as a consequence of the generally better weather conditions. At European level, yield forecast for spring barley is higher than in 2010 (+4.7 %) and the last five years' average (+3.3 %). Figures for winter barley are -2.4 % and -1.5 % respectively.

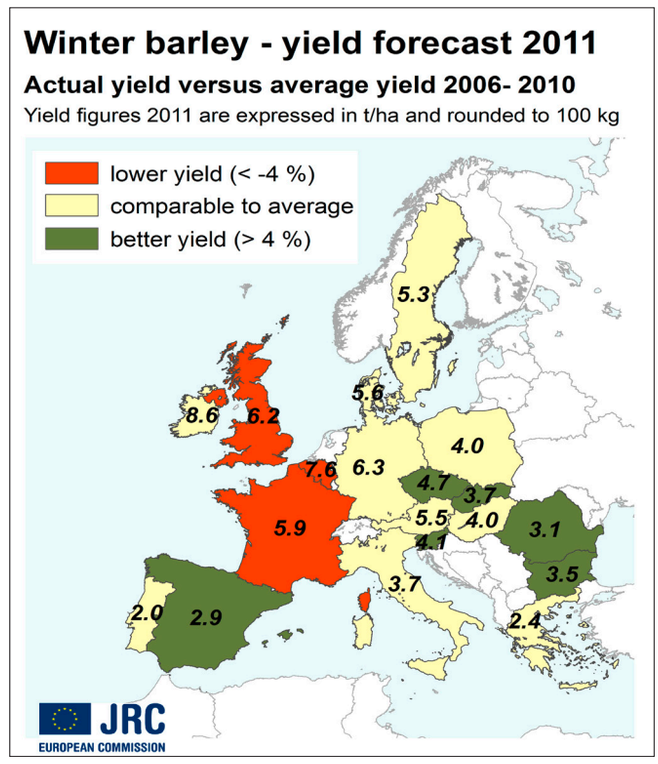
Winter barley in Germany, France and the United Kingdom suffered from the unfavourable weather conditions during the spring 2011, leading to a lower yield forecast in comparison to 2010 and to the 5-year average (-2.3 %, -9.7 % and -4.5 % respectively vs. 5-year average). The situation is better, though, for Spain (+10.4 % vs. 5-year average), Romania (+17.9 %) and Italy (+1.7 %). But only Spain will most likely register an increase in production (+15.5 % vs. 2010, but still -24.7 % as compared to the average).

Among the other producers, the countries of Central Europe (HU, CZ, AT and SK) had a favourable season and yields are forecast +12.6 %, +5.1 %, +1.8 % and +17.5 % higher than in 2010.

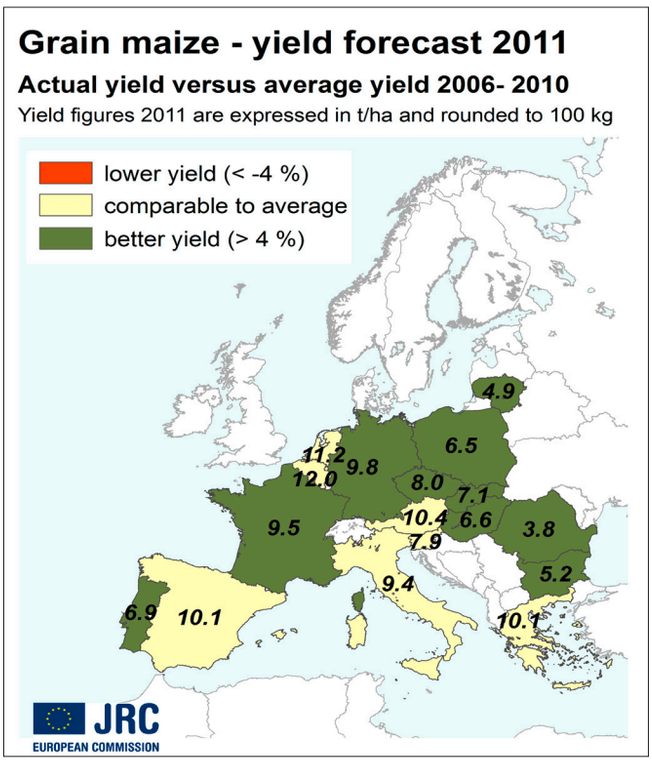
The season was particularly positive for spring barley in Spain. As the leading producer in EU27, the yield is forecast at 3.3 t/ha, which is 11.7 % and 8.6 % higher than the yield in 2010 and the 5-year average respectively. Acreage decreased over 2010 (-4.1 %). Production is therefore likely to be 7.2 % higher vs. 2010 but will probably remain 1.6 % lower than the average. Producers accounting for more than 2 Mt will be United Kingdom, Poland, France and Denmark, production levels in comparison to 2010 being -0.5 %, -5.5 %, +3.6 % and +3.2 % respectively. Except for Poland, the season was thought to be rather poor in France (-8.7 % vs. 2010) and United Kingdom (-4.1 %),and average in Denmark (-1.8 %).

For the other important producers, production will probably be higher than in 2010 for Germany (+6.3 %), Finland (+19.9 %), Sweden (+14.0 %) and Czech Republic (+4.6 %). Except for Germany, the yield forecasts are higher than both the yield in 2010 and the 5-year average. For Germany, the increased acreage (+11.2 %) is the factor behind the production increase for 2011.





Maize — Very good season at EU27 level, illustrated by higher yield forecast for all producers compared to the 5-year average. Production will most likely be higher than in 2010 for all forecasting countries, except Greece and Bulgaria.



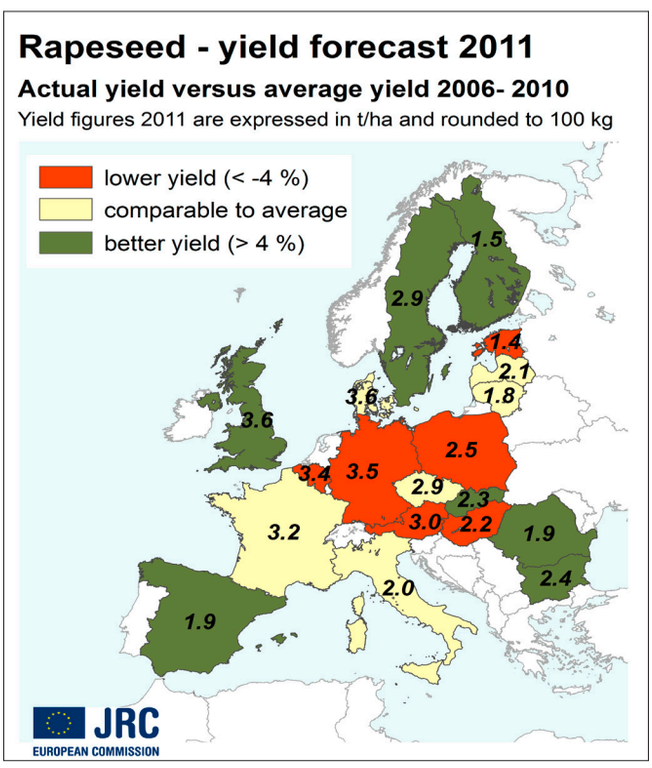
At EU27 level production is put at 62,76 Mt which is 8.0 % and 11.1 % higher than both last year›s production and the 5-year average, respectively. At European level, this high production is the result of an acreage increase (+6.8 % vs. 2010) and a positive yield forecast (+1.2 %).

Among the main producers in Europe (France, Romania, Italy, Hungary, Germany and Spain), production will most likely be better than in 2010 (increase from +4.0 % in Italy to +16.6 % in Spain). The good production expectations for France and Germany are mainly due to the very good weather conditions generating a higher yield forecast than last year (+8.4 % and +11.5 % respectively). On the other hand, the increased acreage is the main factor behind the good production estimates for Romania (+16.1 % vs. 2010), Hungary (+12.5 %) and Spain (+14.9 %).

Among the other producers, only Greece and Bulgaria will probably register lower production, down 25.8 % and 23.5 % respectively in comparison to the 2010 figures, mainly due to lower acreage in Greece (-2.4 % vs. 2010) and a lower yield forecast in Bulgaria (-16.5 % vs. 2010, the acreage remaining similar to the 5-year average).

Oilseed crops

Rapeseed — The final yield forecast for rapeseed at EU-27 level is put at 2.89 t/ha, which is 2.8 % less than 2010 and 4.3 % below the five-year average. Compared to the previous year the three main rapeseed producer countries are expected to have lower yield forecast: France (3.15 t/ha, -4.3 %); Germany (3.45 t/ha; -11.4 %) and Poland (2.47 t/ha, -8.4 %). Good yields are forecast in Romania (1.9 t/ha, +25.4 % above average); Bulgaria (2.44 t/ha, +12.0 %); United Kingdom (3.55 t/ha, +9.5 %) and Spain (1.86 t/ha, +9.4 %).

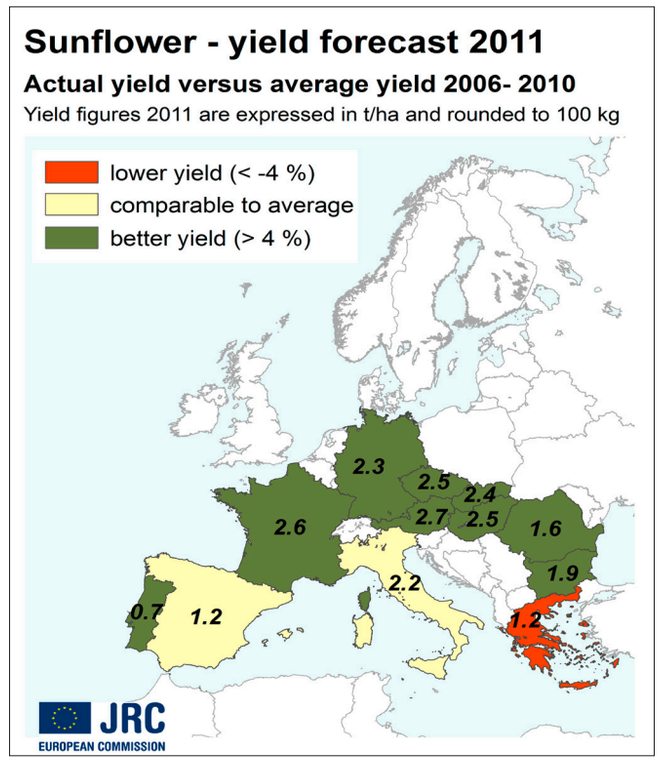


Rapeseed had a bad start to the season, being underdeveloped before the dormancy period in several places, resulting in post-winter gaps in rapeseed fields in significant areas of Germany, Poland and the Baltic countries.

Spring was favourably rainy in Spain, Czech Republic and on the Balkan Peninsula as well as in Romania and Bulgaria, with the crop developing appropriately. This was the foundation for the good yields this season. On the other hand, the precipitation deficit in spring was more than 100 mm in France, the Benelux countries and Germany, resulting in low biomass accumulation and weak leaf area expansion. Additionally, in Germany and Poland an Arctic cold air intrusion during the first dekad of May had a damaging effect on the flowering crop. In June the plentiful rains and scarce thermal extremes were favourable for grain filling. Improved water supply alleviated the possible extreme yield losses in France. Later the persistent and abundant rains disturbed or hampered the harvest in Germany, Poland, the Baltic countries and smaller regions of Scandinavia and Central Europe, causing further yield losses and decreasing the grain quality.

Sunflower — The expected yield for sunflower is about 1.89 t/ha at EU-27 level, exceeding the 5-year average by 9.8 % and moderately higher than last year (+1.9 %). The increase in EU production is also due to the significant expansion of cultivated areas. Romania is expecting an excellent yield of 1.57 t/ha, which is similar to 2010, but still 18.8 % better than the 5year average. Following an exceptionally good year in 2010, Bulgaria had less favourable conditions and therefore the forecast yield is 1.89 t/ha (+18.5 % on the five-year average but 10.2 % less than in 2010). Hungary also experienced a good year, with 2.45 t/ha yield (+24.3 % on 2010 and +8.6 % on the 5-year average). Spain is forecast to have 1.17 t/ha yield, which is only just than average, but 8.0 % lower than last year.

Romania benefited from rainy weather until the end of grain filling. Sunflower enjoyed good water supply and near-average thermal conditions with few extremes in this time-period, all of which contributed to the high production this season. The drought from mid-August onwards had little effect on the final yield. A similar weather pattern was present in Bulgaria, with near-average relative soil moisture content for flowering and initiation of grain filling. From the end of July more rain was good for grain filling, though it fell short of last year's optimal conditions. In France the soil and thermal conditions were favourable for sowing and emergence, but later on spring was much warmer and drier than usual. The summer provided well distributed and ample precipitation, with no thermal extremes, resulting in high biomass accumulation and a rich harvest. The high temperatures from May to mid-July in Spain accelerated crop development, but the below-average cumulated rainfall had a damaging effect on grain filling and impacted severely on the final yield. In Hungary April and May were characterised by below-average rainfall with irregular distribution, but the timely precipitation of June and July provided satisfactory conditions for flowering and good yield formation, despite the rainless weather from mid-August.

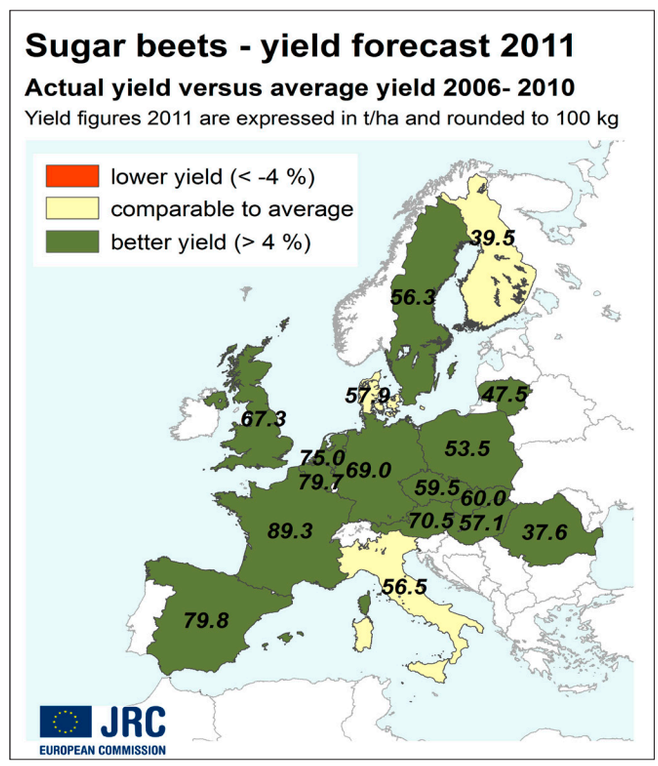


Roots and Tuber crops

Sugar beet — Sugar beet yields for 2011 are expected to be positive at EU level. The estimated average yield is +70.47 t/ha, which is 4.3 % up on the previous year and 7.2 % higher than the 5-year average.

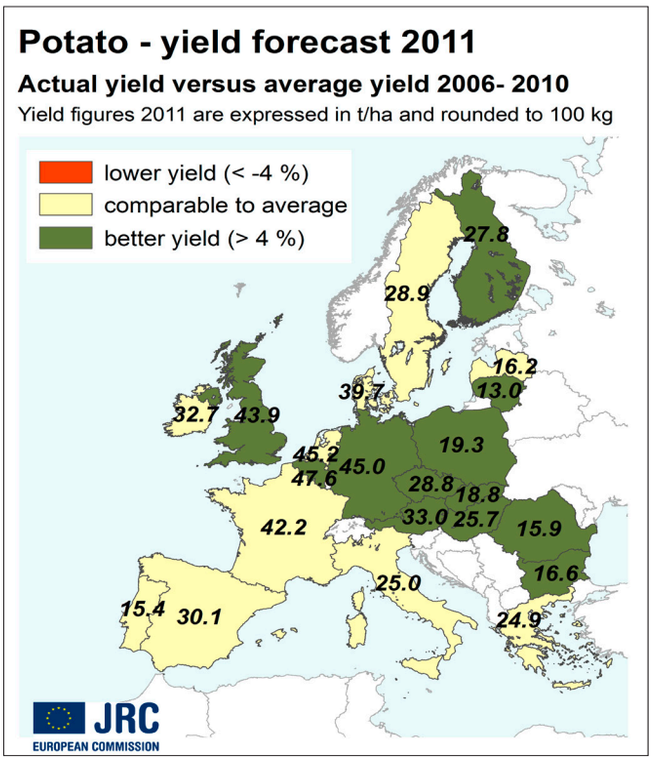
The yield forecast for all European sugar beet producing countries is positive compared to the 5-year average, ranging from +2.2 % for Denmark to +13.0 % for Romania. France, the biggest producer, is forecast to have the highest yields in 2011, with 89.3 t/ha, followed by Spain (79.8 t/ha) and Belgium (79.7 t/ha). The expected 2011 yields of the second and third sugar beet producers, Germany (69.0 t/ha) and Poland (53.5 t/ha), are up 6.2 % and 9.0 % respectively compared to 2010, and by 9.6 % and 9.3 % compared to the 5-year average.

The good yields throughout Europe can be explained by the generally adequate growing conditions without significant stresses for the generally robust crop. The high yield expected in northern and central Europe can be more specifically attributed to abundant rains in summer combined with normal temperature sums, which allowed good formation of the canopy, along with beneficial conditions for accumulation of biomass and storage organs.



Potato — Potato is forecast to yield 31.06 t/ha at EU-27 level. This is well up on both last year's figure (+9.3 %) and the 5-year average (+9.2 %).

Only a few countries experienced conditions worse than the 5-year average: France 42.16 t/ha (-1.7 %), Sweden 28.92 t/ha (-2.9 %), Greece 24.93 t/ha (-0.1 %); in Greece and Sweden the yield is also forecast to be lower than in 2010, at -1.3 % and -3.6 % respectively.



Forecast yields comparable to the 5-year average were recorded mostly in Western and Southern Europe, e.g. Portugal (15.38 t/ha, +2.4 %), Spain (30.06 t/ha, +3.4 %), Italy (25.04 t/ha, +0.5 %), UK (43.94 t/ha, +4.3 %), Ireland (32.66 t/ha, +1.4 %), Denmark (39.70 t/ha, +2.6 %) and Netherlands (45.22 t/ha, +2.9 %).

In Central and Eastern Europe the season was exceptionally favourable, leading to yield expectations well above the 5-year average — Belgium 47.56 t/ha (+7.6 %), Germany 45.02 t/ha (+8.8 %), Austria 33.04 t/ha, (+6.1 %), Slovakia 18.76 t/ha (+21.5 %), Czech Republic 28.83 t/ha (15.0 %), Poland 19.30 t/ha (4.2 %), Hungary 25.68 t/ha (+6.0 %), Romania 15.87 t/ha (+10.7 %), and Bulgaria 16.55 t/ha (+7.2 %). In Finland and Latvia the yield expectation (27.78 t/ha and 16.23 t/ha respectively) is higher than the average (by +9.8 % and 2.4 % respectively).

The beginning of the season was characterised by rainy weather in the Mediterranean countries, whereas in Eastern and Central-Northern Europe the dry conditions were optimal for sowing. In spring the dry conditions persisted, in conjunction with high temperatures, allowing optimal emergence, followed by more variable conditions favourable to the flowering phase. In summer the abundant precipitation in the western part of Europe led to positive canopy development and the ensuing tuber formation. During the final part of the growing cycle it was dry and warm. Though this shortened the final growing stage slightly, it did ensure optimal conditions for harvesting and for high product quality.

IV. Rice monitoring in Europe

Country	Yield t/ha				
	2010*	MARS 2011 forecasts	Avg 5yrs	%11/10	%11/5yrs
EU27	6.5	**6.5**	6.5	+0.2	+0.5
BG	5.2	**4.7**	4.9	-10.6	-4.5
ES	7.6	**7.4**	7.2	-1.9	+3.5
FR	5.0	**5.7**	5.5	+14.0	+2.8
GR	6.8	**7.3**	7.5	+8.7	-1.9
HU	4.4	**4.2**	3.9	-2.8	+7.8
IT	6.3	**6.4**	6.4	+1.6	+0.3
PT	5.8	**5.8**	5.8	-0.1	+1.3
RO	5.0	**4.4**	4.4	-12.3	+0.1

* Source EUROSTAT New Cronos and EES: last update 2011-09-26

Despite a slight fall since the previous analysis, rice yield at EU-27 level is confirmed as being similar to the 5-year average (+0.5 %) and to last year›s yield (+0.2 %).

Compared with 2010, **rice production is forecast** to be lower. This is mainly due to the smaller area under rice. The decrease in total area was offset by satisfactory yield potential in the main EU-27 districts. Though the heat wave at the end of August enhanced the risk of blast infection (*Po delta*, *Valencia*), other districts experienced optimal conditions for satisfactory yield potential. Rice yield is forecast for Italy at 6.4 t/ha (+0.3 % with respect to the 5-year average), for Spain at 7.4 t/ha (+3.5 %) and for France at 5.7 t/ha (+2.8 %).

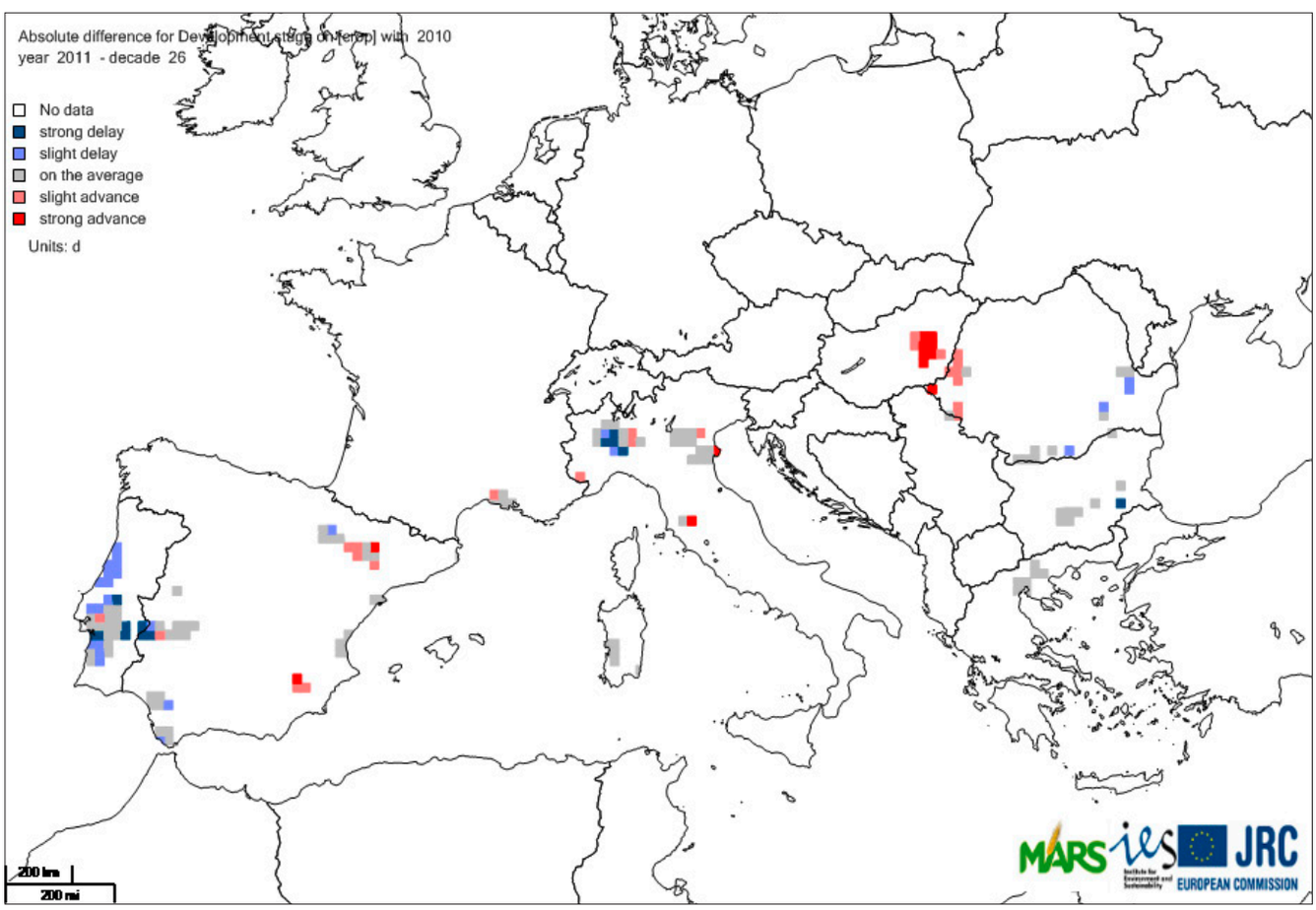
In **France**, though the forecast yield is above the 5-year average due to the continuous hot conditions, the advance in canopy senescence impacted negatively on the grain filling phase.

In **Portugal**, conditions seem normal and similar to those of recent years, leading to a final yield expectation which is around the average (5.8 t/ha, +1.3 %). Biotic and abiotic damage appears to have had less impact on grain biomass accumulation.

Since the beginning of the season conditions were sub-optimal in **eastern countries**, mainly due to the cold and wet weather.

In **Greece** (7.3 t/ha, -1.9 %) and **Hungary** (4.2 t/ha, +7.8 %) conditions improved over the summer, allowing the unfavourable biomass accumulation rates to recover somewhat, whereas in **Romania** and **Bulgaria** the persistence of sub-optimal climatic conditions confirmed the low yield expectation. The final forecast is 4.4 t/ha for Romania and 4.7 t/ha for Bulgaria (+0.1 % and -4.5% respectively).

A more detailed country-by-country analysis of the current campaign can be found twice a year in the special rice bulletin on the MARS website: http://mars.jrc.ec.europa.eu/mars/Bulletins-Publications.



V. Pasture monitoring in Europe

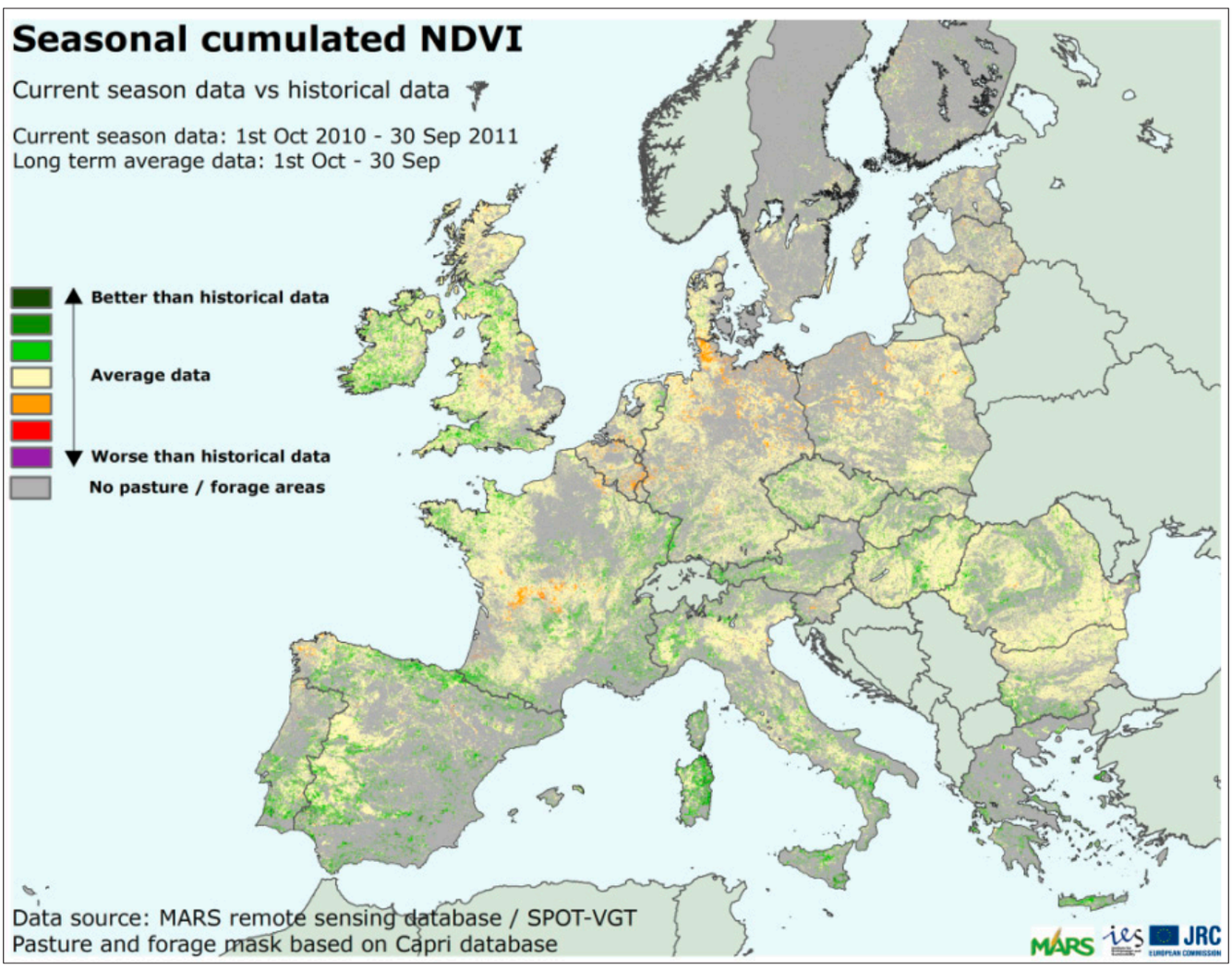
Overall seasonal production was on or above average in most countries. Favourable meteorological conditions — intense precipitation and warm temperatures —during the summer benefited pasture recovery after a particularly dry spring in France, Benelux and Germany. In the Mediterranean region, Romania and the UK production levels are reported to be above average.

Generally speaking, the season has been favourable for most of Europe. A milder than usual spring boosted biomass production, resulting in anticipated plant development. Although this was of significant benefit for production levels during April and May, the dry period in northern Europe — the countries most affected were France, Germany and Benelux — resulted in an early stop to biomass production, thus placing these regions in a vulnerable situation at the beginning of summer. The intense rainfall during July and August in the northern half of Europe helped production levels to recover, as reflected in the analysis of seasonal cumulated NDVI. This recovery was only partial in eastern and central Germany, while in the French regions of *Bretagne* and *Normandie* production levels are expected to be even slightly higher than the average year.

The current season was particularly favourable in the Mediterranean basin, since the warm spring was accompanied by rainfall significantly higher than seasonal values, increasing biomass accumulation throughout the season. The *Dehesa* area in the southern Iberian Peninsula, the Cantabrian basin (with the exception of western Galicia) and Italy (mainly the South, Sicily and Sardinia) present season-cumulated NDVI profiles within in the first quartile of the historical series, suggesting pasture production significantly better than the average year. A similar outlook holds true for Romania, Austria, Slovakia and the Czech Republic.

In UK and Ireland the production of biomass throughout the season as a whole is also reckoned to be above the average year, with the exception of the Midlands — low precipitation — and northern Scotland — low temperatures — in the summer. In the Baltic countries the warmth made for positive biomass production during the summer. NDVI analysis suggests slightly better than average pasture production.

More details on pasture monitoring on the MARS website: http://mars.jrc.ec.europa.eu/mars/Bulletins-Publications.



VI. Overview of the campaign in the EU27 neighbourhood

BLACK SEA AREA

Turkey — Exceptionally warm winter followed by a wet season

TURKEY					
	Yield t/ha				
	2010	MARS 2011 forecasts	Avg 5yrs	%11/10	%11/5yrs
barley	2.39	**2.54**	2.31	+6.1	+9.8
grain maize	-	**7.48**	7.08	-	+5.7
wheat	-	**2.38**	2.32	-	+2.4

The season started with favourable thermal conditions around sowing time. The negative impact of the intensive rainfall in October was limited. The period from October to February was characterised by exceptionally high temperatures. The average temperature in this period was 5 °C higher than the long-term average. Concurrently, the most important agricultural region *Bati Anadolu* experienced 40 % surplus rainfall. These conditions significantly hastened crop development, which in the central regions was almost three months in advance. Positive conditions characterised the spring, with over-sufficient rainfall and average temperatures. The continuous rainfall in June and July, however, led to a slow-down in crop development due to the waterlogged soil and to the deficit in accumulated solar radiation. Crops reached maturity in favourable average conditions, with slightly higher temperatures and limited rainfall. Weather conditions for harvesting were also advantageous and no losses were observed. Yield forecasts for all crops under review are higher than the 5-year average, though the situation is not as optimistic as might have been expected at the beginning of the season after the winter vegetation boost.

Ukraine — Varying, but mostly positive, weather conditions leading to above-average yields

UKRAINE					
	Yield t/ha				
	2010	MARS 2011 forecasts	Avg 5yrs	%11/10	%11/5yrs
barley	-	**2.34**	2.26	-	+3.3
grain maize	-	**4.85**	4.33	-	+12.0
wheat	-	**3.22**	2.91	-	+10.6

After favourable sowing conditions, Ukraine experienced close-to-average weather in the autumn. Winter months brought some significant sudden drops in temperature; however, the frost impact on crops was limited thanks to sufficient snow cover. Spring brought average temperatures, but very limited rainfall. In the period from March to the middle of June most of the country received less than 60 % of normal precipitation. This led to insufficient soil moisture which noticeably slowed down crop development and reduced yield expectations. Crops were, however, saved from serious drought by the exceptionally wet summer, with rainfall up to 150 % of the average. The crops recovered and were harvested in favourably dry and warm conditions. The yield forecast is higher than the 5-year average for all crops under review.

EASTERN EUROPEAN COUNTRIES

Belarus — High yields for maize; cereals average

BELARUS					
	Yield t/ha				
	2010	MARS 2011 forecasts	Avg 5yrs	%11/10	%11/5yrs
barley	-	**3.29**	3.16	-	+3.9
grain maize	-	**5.37**	4.52	-	+18.8
wheat	-	**3.53**	3.39	-	+4.1

Winter crops started promisingly after conditions had been favourable for sowing. Winter brought several sudden drops in temperature, but crops were largely protected by snow. Spring commenced with a dry period of low precipitation, but the relative soil moisture remained sufficient for normal crop development. Above-average temperatures led to an advancement in winter crops growth and to a good start for maize. Summer brought beneficial mild conditions without stressing heat events and with valuable rain. Wheat and barley reached maturity slightly in advance, and the yield expectations are slightly above average. The season was evidently good for maize, and a noticeably higher yield than average is expected.

Russia — Good season for maize; average for cereals

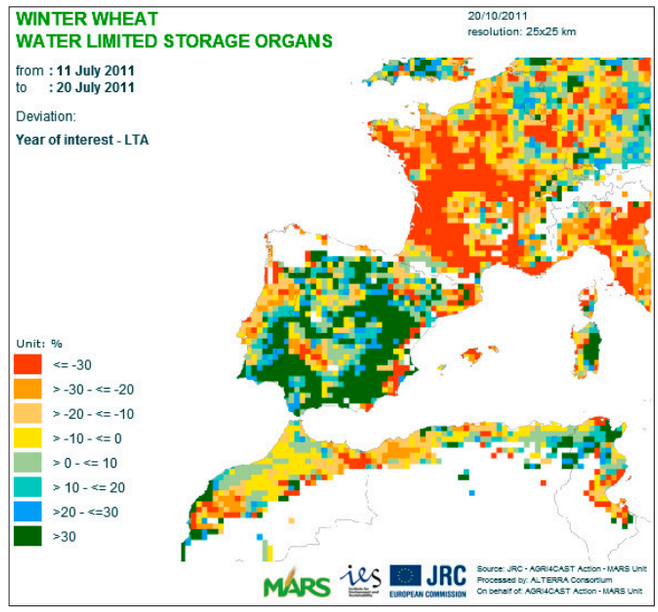
Winter crops started with difficulties, sowing being delayed or even abandoned due to insufficient soil moisture. Thereafter, intensive frost events in November and mid-February harmed any crops which were not covered by snow, and significant losses were expected. Spring was chilly, and precipitation was distributed patchily, so that some oblasts in the Central and Southern districts experienced a noticeable soil moisture deficit. This added to the existing delay in winter crop development. The beginning of summer brought favourable wet and warm conditions, allowing winter crops to recover and hastening maize growth. End of season was characterised by rainy conditions, but dry periods were long enough to complete harvesting. In general, it was an average year for wheat and barley, while maize is expected to achieve higher yields than usual.

THE MAGHREB COUNTRIES

Morocco, Algeria, Tunisia — Average to good crop season for cereals; situation better for wheat than for barley

Sowing conditions in autumn 2010 were generally favourable in the main regions of cereals production in the three countries, thanks to beneficial and well distributed rainfall. At the end of winter, the relative soil moisture levels were around or even much higher than the average in many important production regions, which had a significant impact on crop growth. In March, the flowering and grain-filling development stages benefited from the particularly low maximum temperatures compared to the long-term average. The situation was not so favourable, though, in the southern provinces of Morocco, the northern part of the Moroccan-Algerian border and the north-eastern governorates in Tunisia.

The situation even worsened in those regions with maximum temperature soaring above the upper limit of the normal range of variation. In those regions, harvesting started two weeks earlier than usual with generally lower performances than expected. Elsewhere rainfall occurred again at the end of April, allowing the harvest campaign to start as usual at the end of May. No major problems were reported during the harvest, except locally because of the late rain in May. The yield forecast at the end of June was 5,2 Mt and 10,5 Mt, for barley and wheat respectively, as a total for the three countries.



Yield t/ha for wheat (durum and soft)					
	2010	MARS 2011 forecasts	Avg 5yrs	%11/10	%11/5yrs
MA	1.71	**2.05**	1.57	+19.8	+30.4
TN	1.15	**1.94**	1.54	+68.1	+26.0
DZ	1.50	**1.47**	1.44	-2.1	+2.3

Yield t/ha for barley					
	2010	MARS 2011 forecasts	Avg 5yrs	%11/10	%11/5yrs
MA	1.34	**1.49**	1.06	+11.3	+40.9
TN	0.47	**1.57**	1.12	+234.5	+39.8
DZ	1.20	**1.23**	1.39	+2.1	-11.4

PART B. New crop season 2011/12

I. Agrometeorological overview

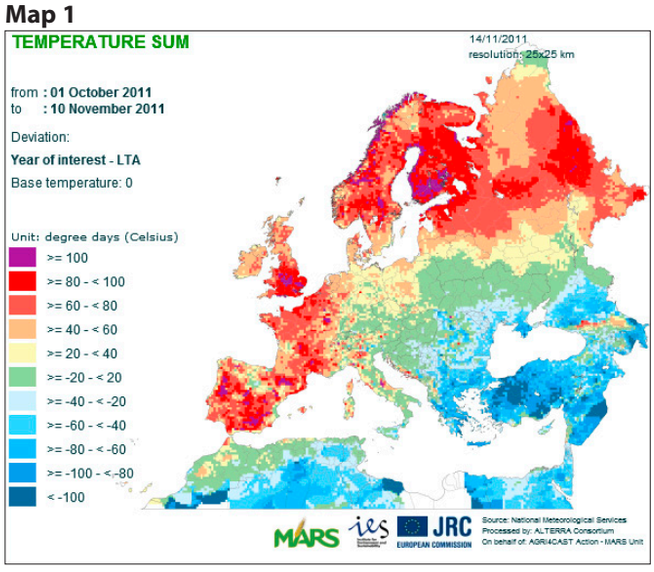
Temperature — Mean temperatures were higher than the long-term average in Spain, France, United Kingdom and northern regions of Europe. Areas around the Black Sea were colder.

The thermal conditions from October until 10 November were milder than average in western and northern Europe, while the south-eastern areas were significantly colder than usual. The cumulated active temperatures (Tbase=0 °C) significantly exceeded the seasonal values on the Iberian Peninsula, in France, the Benelux countries, the British Isles, Scandinavia and wide areas of Russia, accelerating the development of winter crops. Colder than usual temperatures were recorded in Hungary, Romania and the Balkan Peninsula and surrounding areas of the Black Sea. In some regions of Bulgaria, Greece and Turkey the GDD deficit was more than 100.

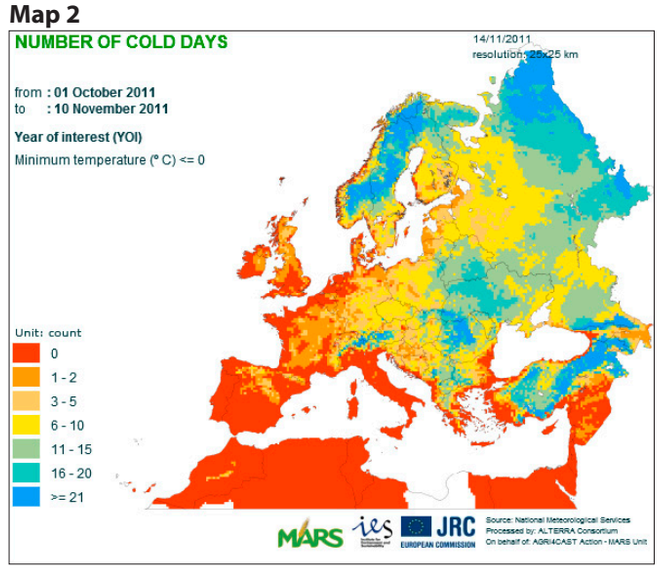
The most severe frost events happened during October but remained within a moderate range. Frost events were more frequent than usual in Central Europe. A particularly high number of cold days (Tmin<0 °C) occurred in a wide strip between Greece and Belarus, in Turkey, western Ukraine and in Russia north of the Caucasus, exceeding the long-term average by five days. The western part of the Mediterranean region and areas along the Atlantic remained frost-free.

The maximum temperatures reached seasonal values in Central and Eastern Europe meanwhile. Countries from Spain up to Finland enjoyed 2—4 °C higher daytime values on average. In Greece, Turkey and North Africa the daily maxima were lower than expected, by 2 to 4 °C.

Map 1



Map 2



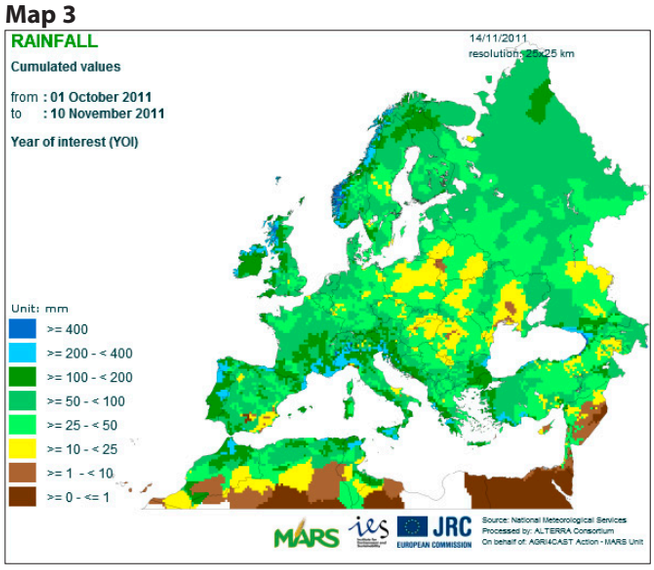
Rain — Abundant rain in Bulgaria and western Turkey, and in Sicily, southern France and northern Italy, coupled with extreme events. Plentiful rain in Morocco. Dry period for eastern Europe.

Rain was abundant in Bulgaria, western Turkey, along the western coastline of Iberia, the Scandinavian Peninsula, Ireland, Sicily, southern France and northern Italy, with some extreme events causing flooding. All over these areas the

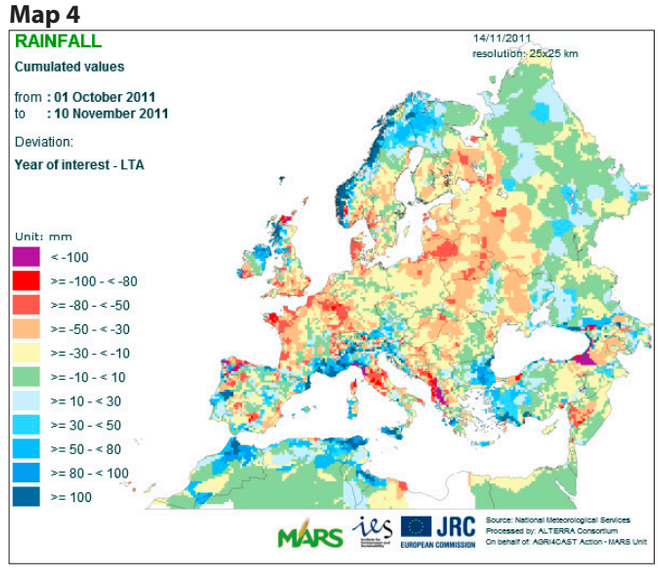
cumulated amounts exceeded 100-150 mm. The wet soils in these regions could have delayed winter crop sowing. Some spots in Scotland and Norway proved to be the wettest, with more than 400 mm total rainfall. Very unusual and ample precipitation occurred in northern Morocco, northern Tunisia and north-eastern Algeria (>150 mm).

Little or no rainfall was measured in eastern Spain, central Italy and widely scattered areas of Eastern Europe. Due to the long-lasting water deficit since mid-August, soils are dry in Hungary, Romania, Moldavia and Ukraine, causing problems in field preparation and sowing, and postponing or hampering the emergence of winter cereals.

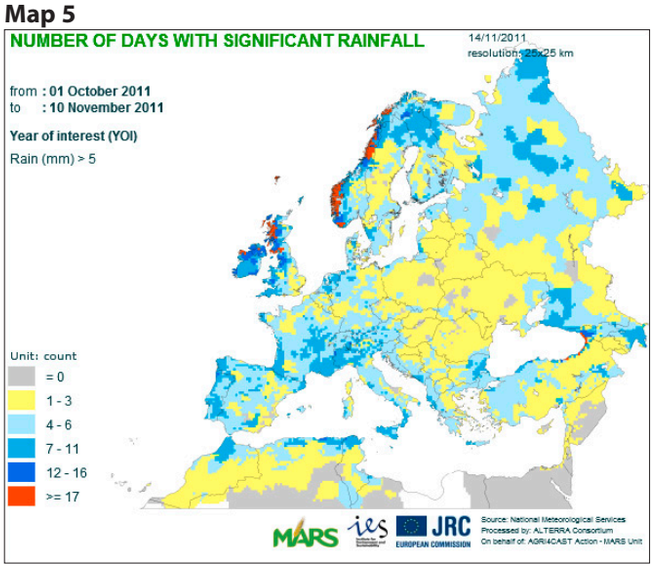
Map 3



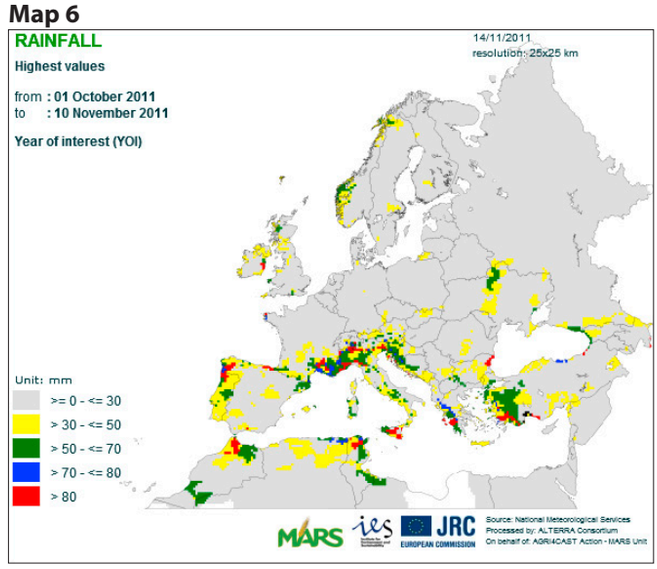
Map 4



Map 5



Map 6



II. Crop monitoring

1. Sowing conditions

Winter wheat

Most of Europe, especially the wide central part of the continent, experienced a good and dry sowing period for winter wheat; the above-average thermal conditions were favourable to quick germination.

The weather conditions meant drawbacks in smaller regions. The northern part of the British Isles and southern Scandinavia experienced a wet spell. The cumulated precipitation during sowing exceeded the long-term average by 50-100 mm. Abundant rains around sowing time affected Portugal, north-eastern Italy, Slovenia and Bulgaria and created problems accessing the fields.

The long dry period and resulting dry soil conditions in Hungary, Romania, Moldavia and Ukraine led to greater fuel consumption and more effort going into soil preparation and hampered sowing. For Romania the situation eased in October with beneficial rains received. Dry conditions in the normal sowing period were present in Spain, southern France and the middle of Italy.

Below-average temperatures were measured in most of Central and South-Eastern Europe, the likely effect being to delay emergence and adversely affect crop growth and development before dormancy, increasing the risk of winter frost damage.

Sowed area of winter wheat will probably benefit from the failed rapeseed areas, for example in northern Germany, Hungary and Romania.

Winter barley

Generally favourable weather conditions with the exception of over-wet regions in Denmark, south Sweden and northern Germany.

Weather conditions have been generally favourable throughout Europe for sowing winter barley in 2011. For most parts of Europe, the time when winter barley is usually sown has coincided with a slightly warmer temperature than the long-term average. Similarly, the number of cold (min temperature ≤ 0 °C) or hot (max temperature ≥ 30 °C) days has been no different from what is normally expected. Temperature conditions have therefore been optimal for good germination.

Soil moisture patterns are more varied. Winter barley has been sown in rather dry soil in England, France, Belgium, western Germany and Hungary. Over these regions, some slight rain following the sowing periods suggest that germination should be successful despite the dry soil. In southern Germany, Czech Republic and Poland, soil moisture was higher than average and should provide sufficient water for germination — even in Poland, where there was less rain than usual during the sowing period. Areas of concern due to excessive water are Denmark, southern Sweden and northern Germany. In Denmark, the late harvest of cereals due to the extremely wet summer conditions delayed sowing, which was hampered further by the heavier than usual rain that continued during September, resulting in sub-optimal sowing for Denmark.

Winter rapeseed

Wet sowing conditions in the north, very dry in south-east EU; favourable weather in central Europe.

The main producers of rapeseed are France (23 % of the five-year average surface), Germany (21 %), Poland (12 %) and United Kingdom (10 %). In general the four main producers in the EU experienced favourable weather around sowing and emergence of rapeseed. Farmers managed to finish their planting in time. Other rapeseed areas are in south-eastern EU — Romania (6 %), Czech Republic (5 %) and Hungary (4 %), and in northern EU — Denmark and Lithuania (both >2.5 %).

During the second half of August farmers in the majority of France, southern and eastern Germany, United Kingdom, Poland and Czech Republic benefited from normal weather conditions and a relatively dry period for rapeseed sowing. Farmers in north-western areas of Germany and France, across Denmark and locally in southern UK, faced difficulties because of heavy and frequent rainfalls. Here sowing could have been postponed. In the second half of September the weather was favourable for the early growth of rapeseed in Germany, Poland, Czech Republic, United Kingdom and the majority of France. These areas received average or slightly lower than usual precipitation and slightly above the long-term average accumulation of active temperatures. Solar radiation was also above the LTA. In October the crop grew under mild weather conditions, slightly drier than usual in France and UK and wetter than usual in Germany, Czech Republic and Bulgaria.

Very dry conditions were recorded in Hungary, Romania, Slovakia, western Romania, southern France and northern/central Italy. In general weather conditions were not favourable for planting rapeseed in south-eastern EU. As a consequence of the limited rainfall and high temperatures which persisted during August-September, soil moisture was not sufficient for planting, and sowing has been delayed or not taken place. In September the number of hot days (tmax >30 °C) in these areas and all over southern Europe exceeded the LTA by at least seven days. Nevertheless western Hungary received beneficial rainfall (10-20 mm) for late sowing, and in Romania and northern Bulgaria rain came in early October.

Black Sea area

Slight delay in sowing due to low soil moisture in the agriculturally important regions of Ukraine and Turkey

The end of August / early September period was dry, so access to fields was no problem. However in some regions insufficient soil moisture was observed. Significantly low values were measured in south-eastern Ukraine (*Mykolayivska, Khersonska, Krym*) and locally in the western part of the country (*Khmelnytska*). Similar difficulties with insufficient soil moisture were observed in the agriculturally important central region of Turkey — *Orta Anadolu*.

Weather conditions for early crop development were difficult, with dry conditions in Ukraine and low temperatures in Turkey. September was dry in Ukraine, and not until October was there a noticeable amount of precipitation, albeit excluding southern and western Ukraine (*Volynska, Odeska*), which still had dry conditions. Concurrently, September was remarkably warm, whereas in October the air temperature fell below the LTA. The western part of Turkey experienced a dry and warm September and a very wet and chilly October. Central and eastern regions experienced precipitation close to the average, but the air temperature remained slightly below the average.

Eastern countries

Difficult dry conditions in Russia, favourable situation in Belarus.

Belarus experienced favourable conditions for winter crop sowing. Relatively dry conditions allowed access to the fields. Despite a lack of rain, soil moisture was sufficient except in northern *Vitebsk*, where a minor water deficit was observed. Air temperatures above the average in September-October should have had a positive impact on crop development before winter dormancy.

Sowing conditions in Russia were more complex. The distribution of rainfall and, as a consequence, soil moisture was uneven. In the last dekad of August soil moisture was clearly below the average, apart from the southern part of the Central District and some areas within *Tatarstan, Samarsakaya, Rostovskaya* and *Krasnodarskiy Kray*. September brought significant rainfall, but mainly in the North-western District and in the northern part of the *Volga* District. The air temperature was close to the LTA apart from the less agricultural northern oblast, which experienced an exceptionally warm September. October was slightly colder than average in the southern and north Caucasian Districts, but no significant delay in crop development is expected.

Maghreb countries

Despite delayed rainfall, sowing will start in good soil moisture conditions. September was, except in the northern regions of Tunisia, unusually dry compared to the long-term average. The rain finally came from mid-October onwards, with varying intensity from western Morocco to eastern Tunisia. Cumulated rainfall values are above the average in the most important regions of cereals production. Significant water supply (> 30 mm) and appropriate temperatures favoured the emergence of weeds before field works proper and the sowing, which generally take place from mid-November onwards. The large amount of rain generated floods in many places, mainly in the northern part of Tunisia, with probable loss of seed stocks for sowing.

September was generally wetter in **Tunisia** than in the other two countries. The cumulated rainfall from 1 September to 5 November in the northern governorates of *Bizerte*, *Beja* and *Siliana* was above the 2 standard deviation mark. There was even a post-1975 record for *Jendouba* (+132 % in comparison to the LTA), *Le Kef* and *Manouba*. In those regions there was rain as early as the first days of October, but more regularly and significantly from the end of October onwards. On the other hand, the regions of *Kasserine* and *Kairouan* did not benefit from the rain in early October, and the cumulated rainfall is slightly below the average, or even much lower than the average in *Monastir* (-42 %). Nevertheless, the situation can be considered as positive to very positive in terms of water supply conditions for all regions of cereals production.

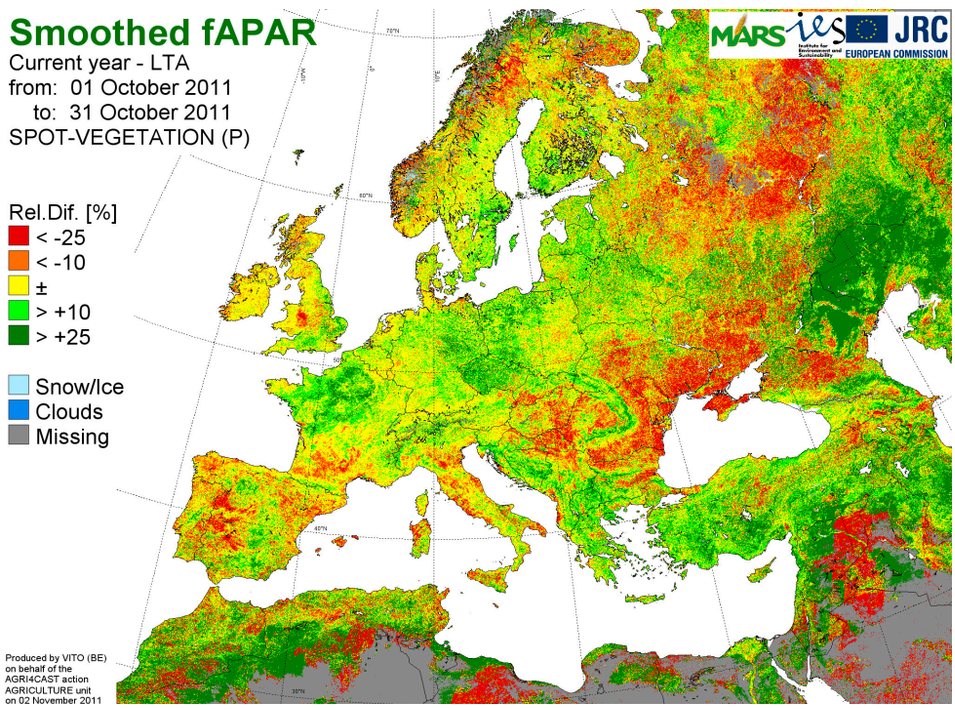
In **Algeria**, the situation is also positive, though the picture is more favourable in the eastern part of the country than for the western regions. Regular and significant rain occurred in the eastern part from mid-October to 5 November, resulting in cumulated rainfall above the average in *Constantine* (112 mm as average), and even above the upper limit of the seasonal range of variation in *Gelman* (150 mm) and *Souk Ahras* (+ 65 % compared to the LTA). Despite the rain *Setif* faces a deficit of about 12 %. In the central part of the country, the rain started a little later, from 25 October onwards. The cumulated rainfall there is generally above the average in the areas of production of *Medea* and *Ain Defla*. The situation in the western part is less favourable, rainfall having occurred mainly at the end of October only. Cumulated rain ranges from 50 to 80 mm from *Tlemcen* to *Tiaret* and *Chlef*.

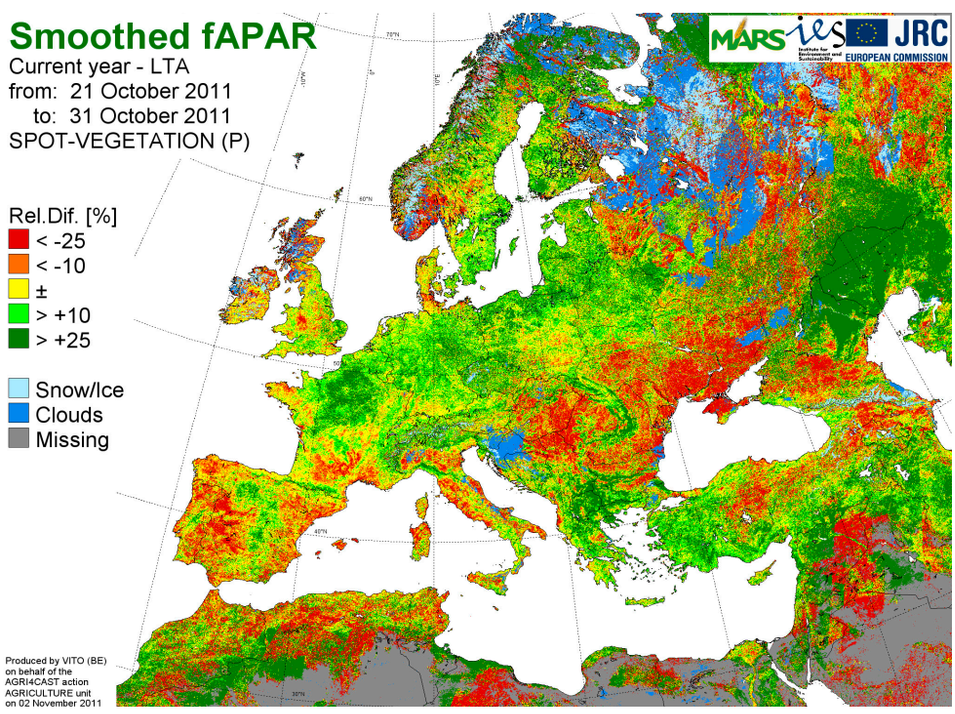
Morocco also faced a very long dry period in September and until the end of the second dekad of October. In the main regions of production, the rain finally arrived in the third dekad of October and — more intensively — the first days of November in the northern areas of production, from *Nord Ouest* to *Oriental*. The cumulated rainfall is higher than the long-term average in *Tensift* (40 mm averaged across the region), close to the upper limit of the normal range of variation in *Centre Sud* (+ 99 % compared to the LTA), *Centre* (+79 %) and *Oriental* (+88 %). The cumulated value is above the 2 standard deviation mark in *Centre Nord* (177 mm, +133 %) and *Nord Ouest* (with significant variations among the 25 x 25 km grid cells, from +30 % to 230 %).

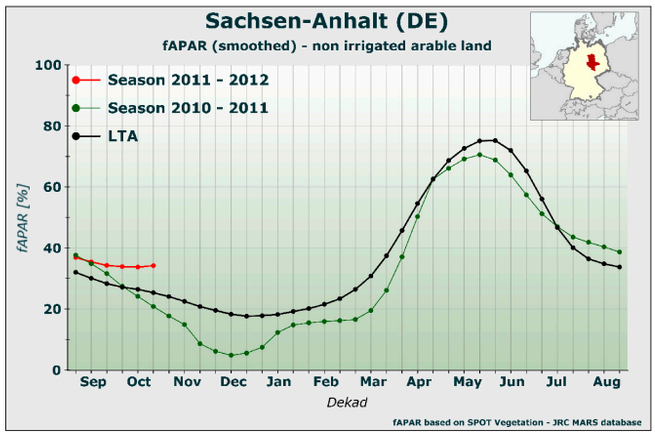
2. Remote sensing — SPOT vegetation

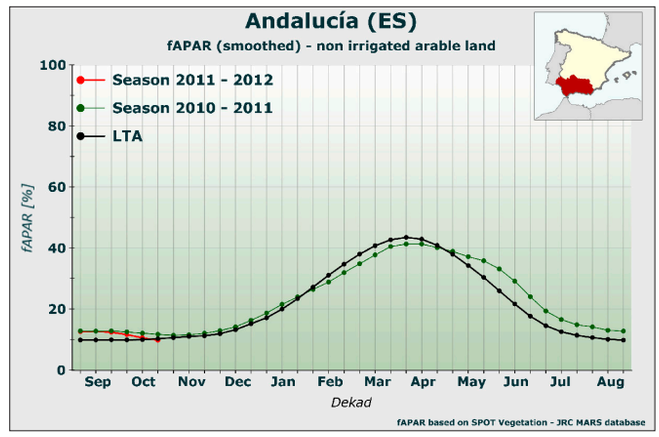
New winter crops not yet emerged. Normal conditions in western Mediterranean basin; good conditions in continental Europe; sub-optimal conditions in eastern countries and Italy

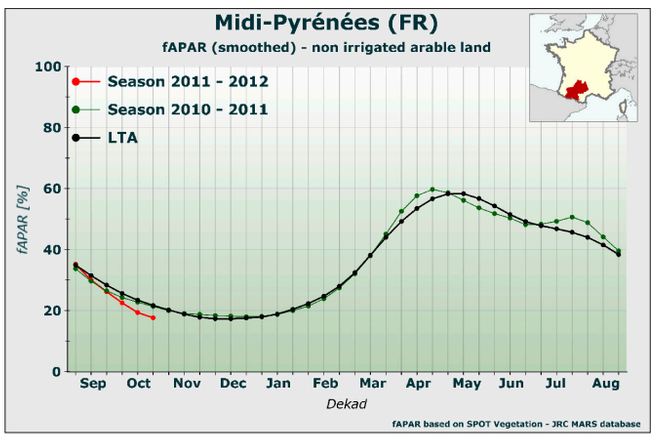
The map shows the relative differences in the fAPAR maximum composite values for the current season (2011/2012) compared to the long-term average for the month of October. The western Mediterranean basin has normal to quite good canopy development. As is evident from the fAPAR profile of **Morocco** (*Centre* region) and **Spain** (*Andalucia* region) the new season is only just beginning. In **Italy** (e.g. Puglia), **southern France** (e.g. Midi-Pyrenee) and eastern Spain the lack of precipitation over recent weeks may have created sub-optimal conditions for crop germination, In central and northern European countries average to good conditions are present, as evidences by the fAPAR graphs of crop land in *Sachsen Anhalt* (**Germany**) and *East Anglia* (***United Kingdom***). In the eastern countries new winter crops could face problems in **Hungary** due to dry conditions (*Del Alfold* profile), and in **Bulgaria** due to dry conditions followed by wet conditions. In Romania, the lack of water was offset by late October rains (e.g. *Sud Muntenia* profile).

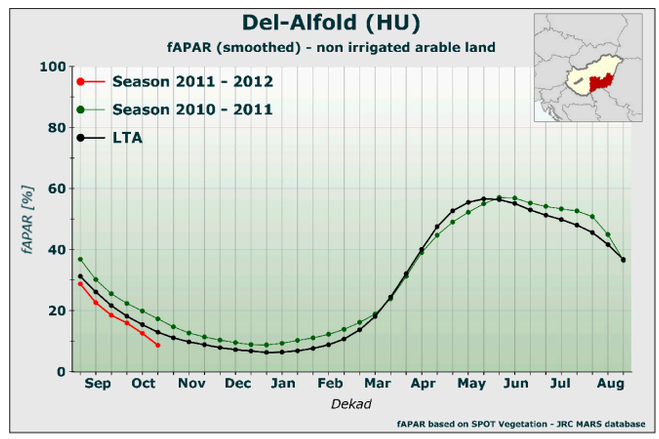


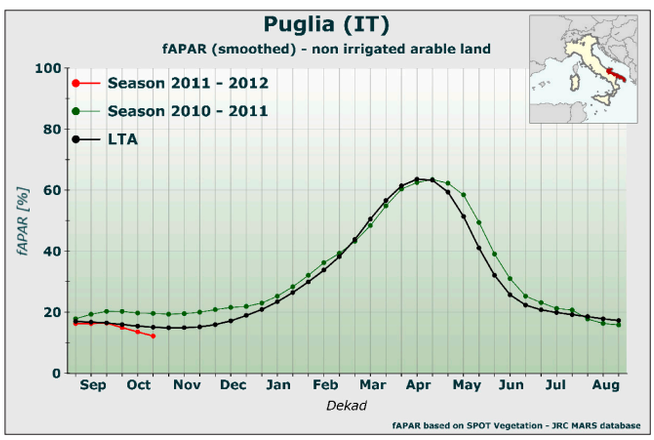


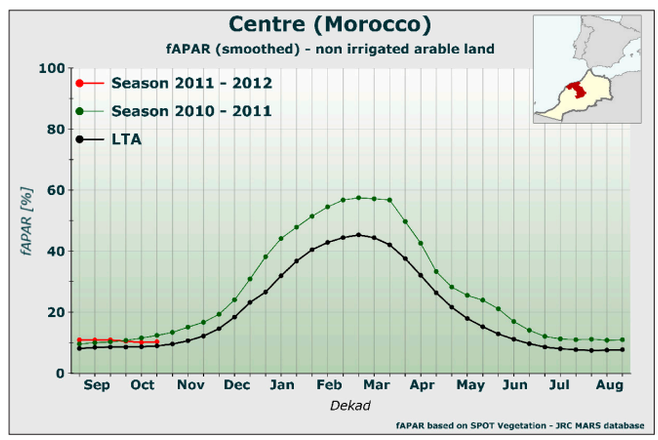

Sachsen-Anhalt (DE)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

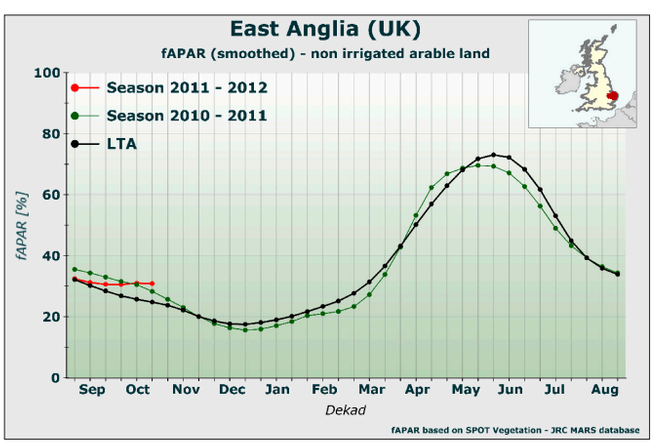

Andalucía (ES)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

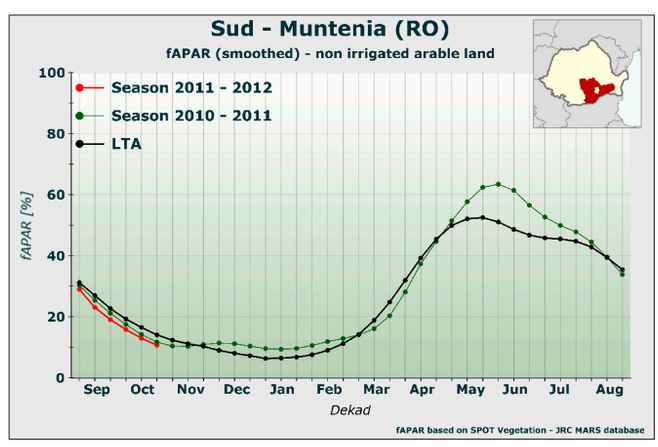

Midi-Pyrénées (FR)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database


Del-Alfold (HU)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database


Puglia (IT)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

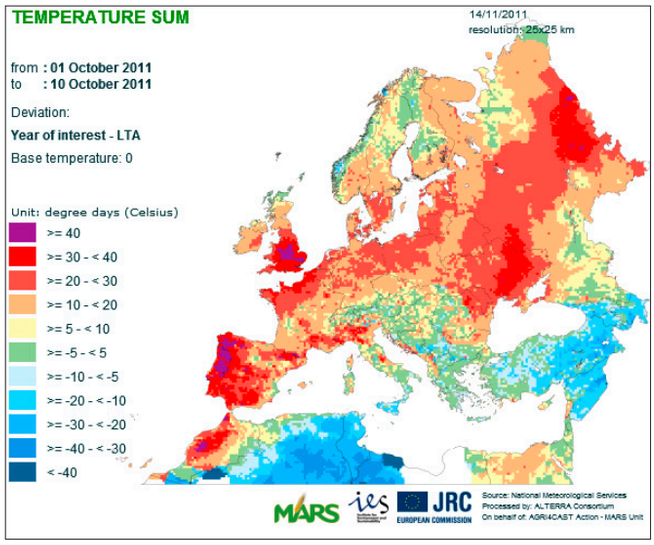

Centre (Morocco)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

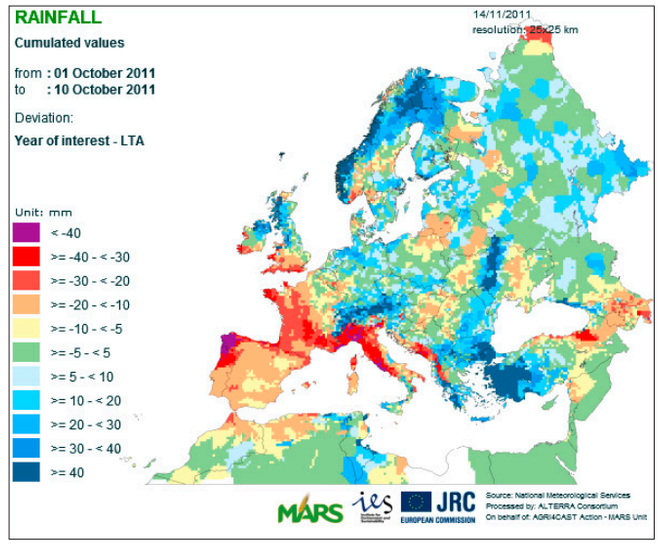

East Anglia (UK)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

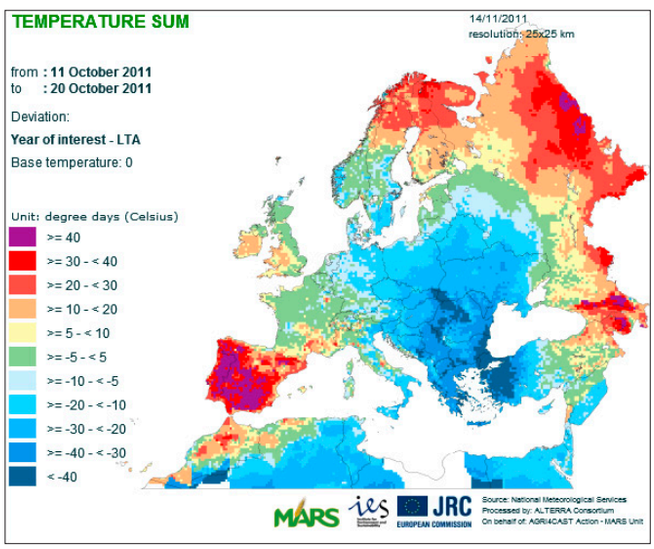

Sud - Muntenia (RO)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

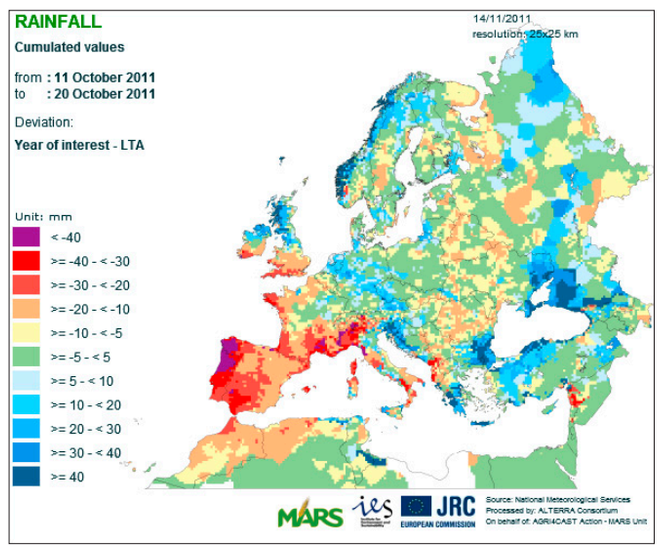
III. Atlas maps

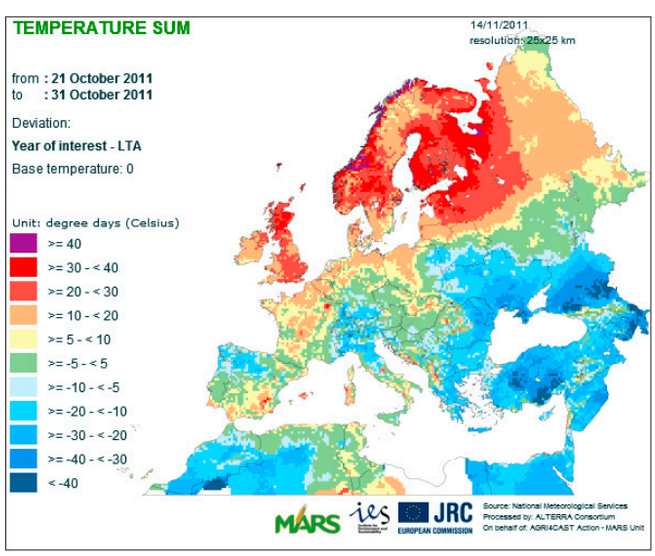
Temperature and Precipitation (01.10.2011 – 10.11.2011)

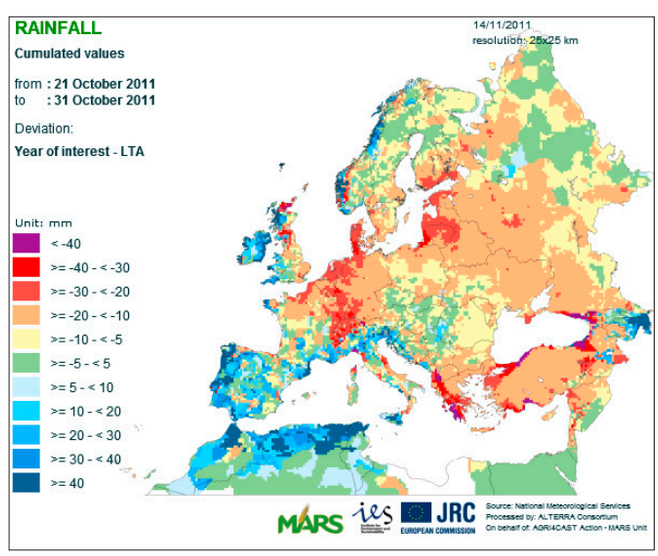


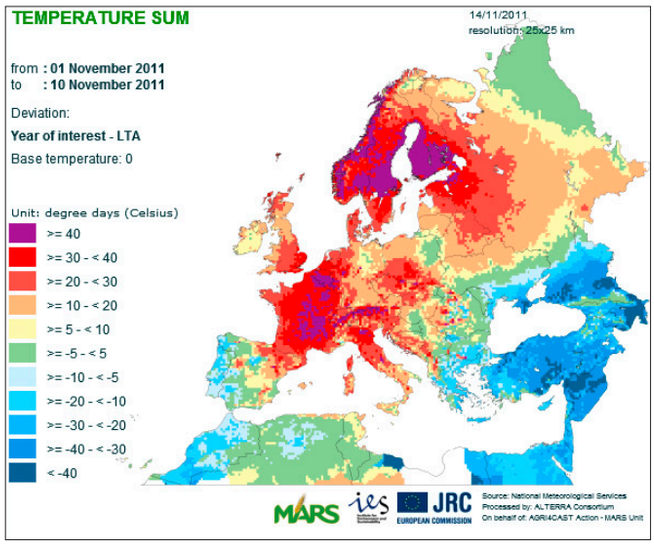


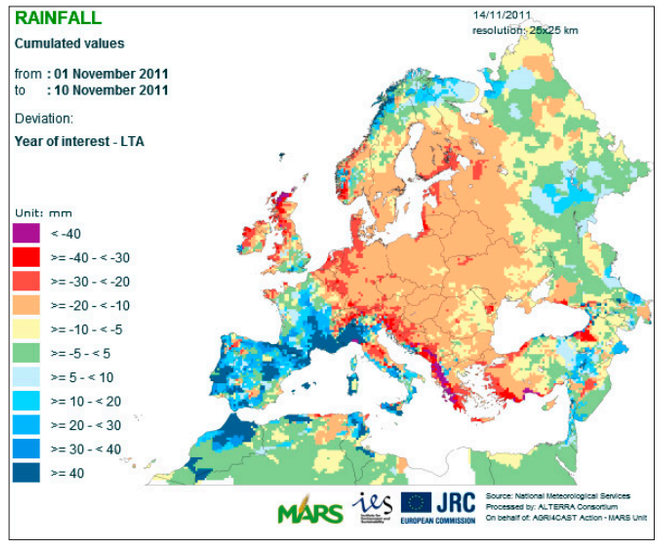




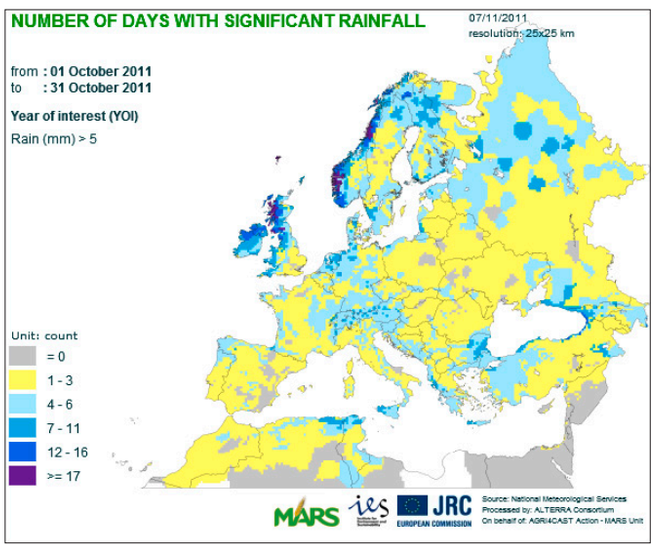


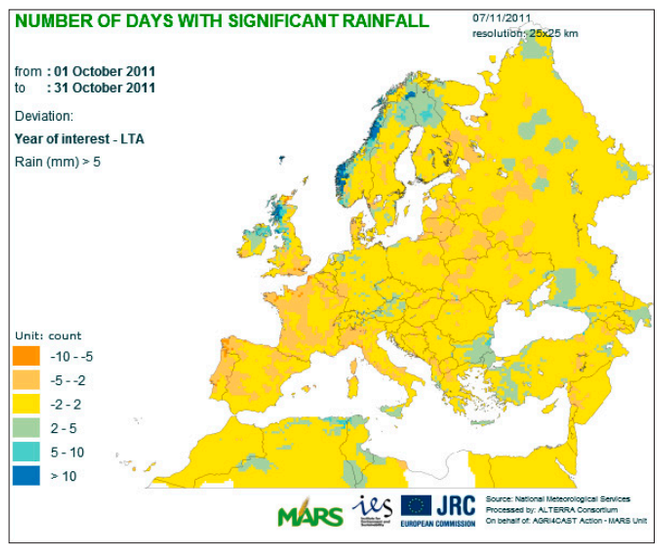


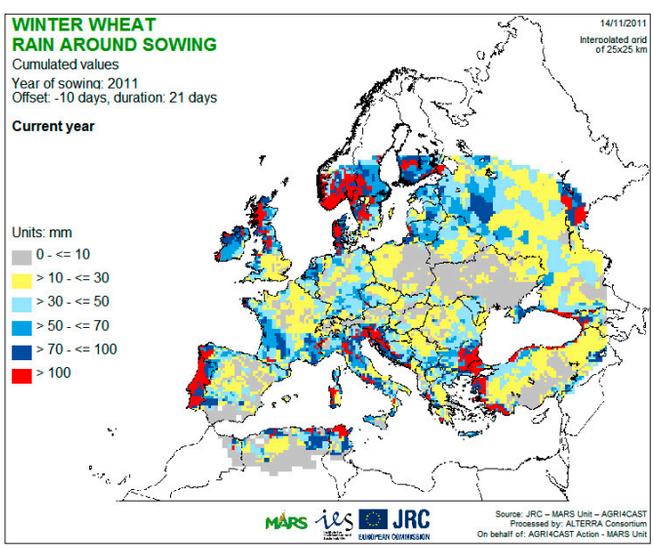


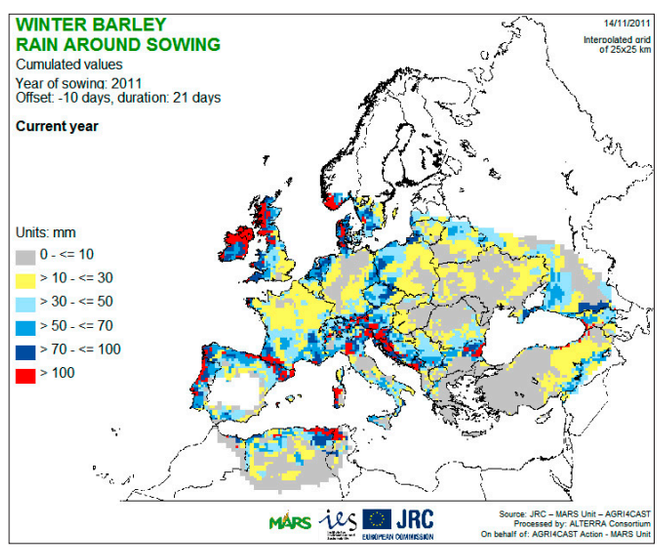


Days of rain and rain at sowing









2011 MARS Bulletin (update)

Publication date in 2011	Publication	Reference
8 Feb	Agrometeorological analysis and weather forecast	Vol. 19 No. 1
8 Mar	**Agromet. analysis, remote sensing and yield forecast**	**Vol. 19 No. 2**
22 Mar	Agrometeorological analysis and weather forecast	Vol. 19 No. 3
12 Apr	Crop yield forecast	Vol. 19 No.4
12 Apr	Agrometeorological analysis and weather forecast	Vol. 19 No. 5
17 May	**Agromet. analysis, remote sensing and yield forecast**	**Vol. 19 No. 6**
14 Jun	Agrometeorological analysis and weather forecast	Vol. 19 No. 7
28 Jun	**Agromet. analysis, remote sensing and yield forecast**	**Vol. 19 No. 8**
28 Jun	Pasture monitoring in Eu-rope	Vol. 19 No. 9
12 Jul	Agrometeorological analysis and weather forecast	Vol. 19 No. 10
26 Jul	**Agromet. analysis, remote sensing and yield forecast**	**Vol. 19 No. 11**
26 Jul	Rice monitoring in Europe	Vol. 19 No. 12
9 Aug	Agrometeorological analysis and weather forecast	Vol. 19 No. 13
23 Aug	Crop yield forecast	Vol. 19 No.14
6 Sep	Agrometeorological analysis and weather forecast	Vol. 19 No. 15
20 Sep	**Agromet. analysis, remote sensing and yield forecast**	**Vol. 19 No. 16**
4 Oct	Agrometeorological analysis and weather forecast	Vol. 19 No. 17
4 Oct	Rice monitoring in Europe	Vol. 19 No. 18
18 Oct	Pasture monitoring in Eu-rope	Vol. 19 No. 19
25 Oct	Crop yield forecast	Vol. 19 No. 20
8 Nov	Agrometeorological analysis and weather forecast	Vol. 19 No. 21
√ 15 Nov	**Agromet. analysis, remote sensing and yield forecast**	**Vol. 19 No. 22**
13 Dec	Agrometeorological analysis and weather forecast	Vol. 19 No. 23

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