European Commission

Period covered: 1 March - 20 April
Issued: 22 April 2013

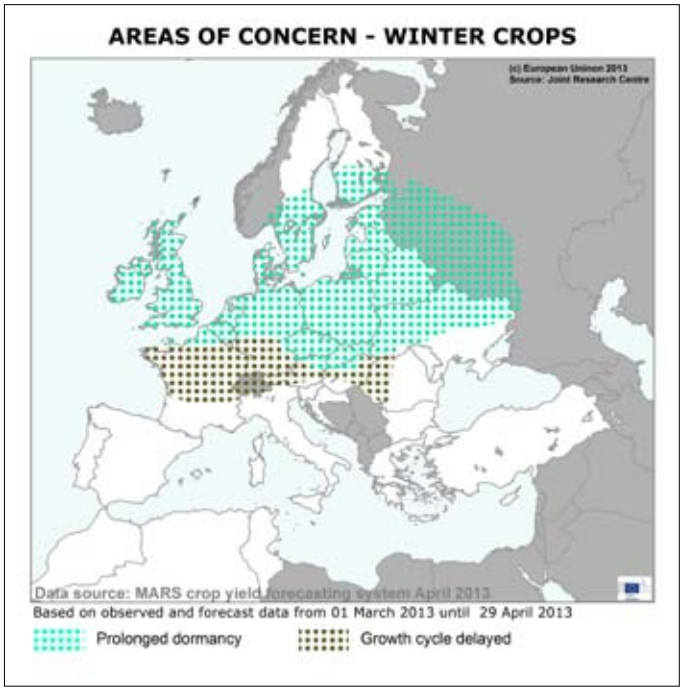
Crop Monitoring in Europe

MARS BULLETIN Vol.21 No. 4 (2013)

Delayed crop cycle in large parts of Europe

The start of spring has been characterised by temperatures below the long-term average in northern and central Europe, and March was one of the coldest months in our records. As a consequence, a significant delay in winter crop development and spring sowing was observed in most of Europe, with the exception of the Mediterranean regions and around the Black Sea. Above-average precipitation was recorded in the Mediterranean region and parts of eastern Europe. Drier-than-usual weather conditions occurred in Denmark, southern Scandinavia, the Benelux countries, northern Poland, northern Germany and the north-western part of the British Isles.

As the season advances crop model simulations are being increasingly used to forecast winter cereals. In general, the current prospects for the EU-27 yields remain average. While in northern and central Europe the likelihood of realizing full crop potentials is somewhat compromised by the long delays, it is still too early to revise the forecasts that have been made in the previous bulletin based on the temporal trends and averages of previous years.



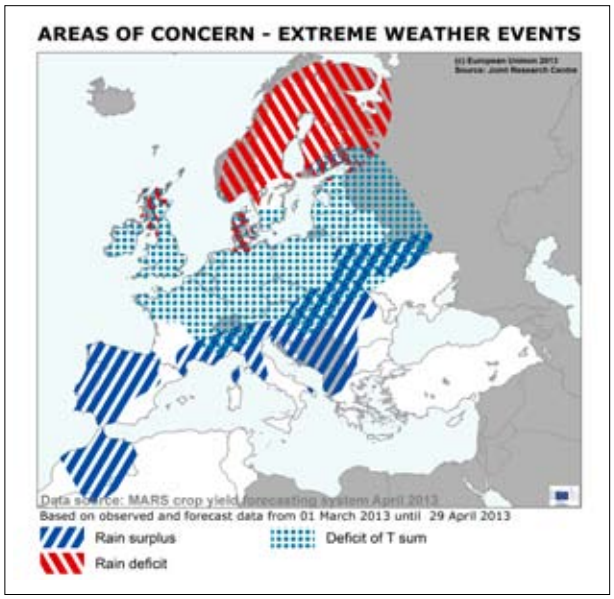
Crop	Yield t/ha				
	2012	MARS 2013 forecasts	Avg 5yrs	%13/12	%13/5yrs
TOTAL CEREALS	4.83	**5.14**	5.04	+6.3	+1.9
Total Wheat	5.17	**5.39**	5.37	+4.2	+0.3
soft wheat	5.41	**5.63**	5.63	+4.0	-0.1
durum wheat	3.15	**3.31**	3.21	+5.1	+3.2
Total Barley	4.35	**4.48**	4.38	+2.8	+2.2
spring barley	3.86	**3.99**	3.82	+3.1	+4.4
winter barley	5.23	**5.27**	5.11	+0.8	+3.2
Grain maize	5.91	**6.96**	6.97	+17.7	-0.1
Rye	3.70	**3.53**	3.33	-4.7	+5.9
Triticale	4.12	**4.09**	4.06	-0.7	+0.9
Other cereals	3.16	**3.34**	2.99	+5.6	+11.5
Rape and turnip rape	3.10	**3.09**	3.04	-0.1	+1.8
Potato	30.61	**31.53**	30.67	+3.0	+2.8
Sugar beet	70.35	**71.06**	70.01	+1.0	+1.5
Sunflower	1.65	**1.80**	1.82	+9.1	-1.2

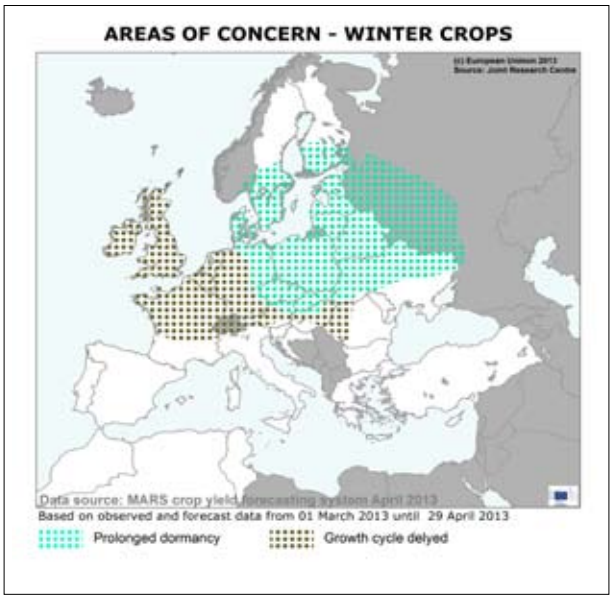
Joint Research Centre

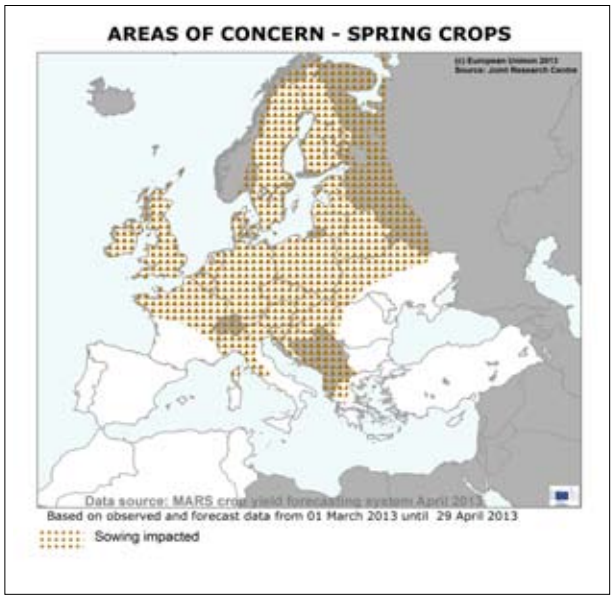
1. Agro-meteorological overview

Agro-meteorological overview (1 March – 15 April)

The start of spring has been characterised by temperatures below the long-term average in northern and central Europe, and March was one of the coldest months in our climatological records. As a consequence, a significant delay in winter crop development and spring sowing was observed in most of Europe, with the exception of the Mediterranean regions and around the Black Sea. Above-average precipitation was recorded in the Mediterranean region and parts of eastern Europe. Drier-than-usual weather conditions occurred in Denmark, southern Scandinavia, the Benelux countries, northern Poland, northern Germany and the northwestern part of the British Isles. No frost-kill damage has been simulated for EU-27.



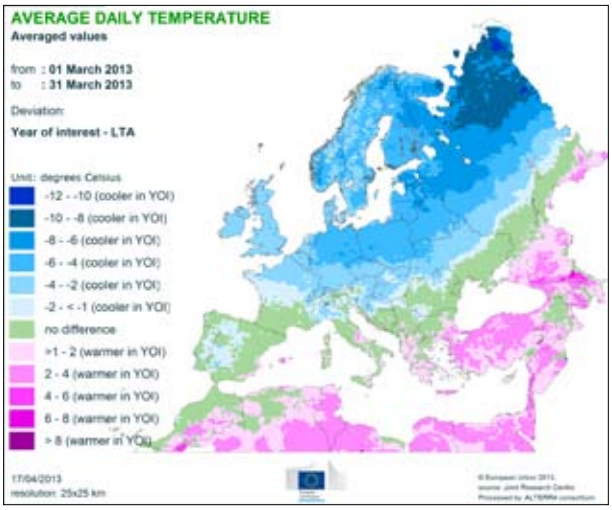


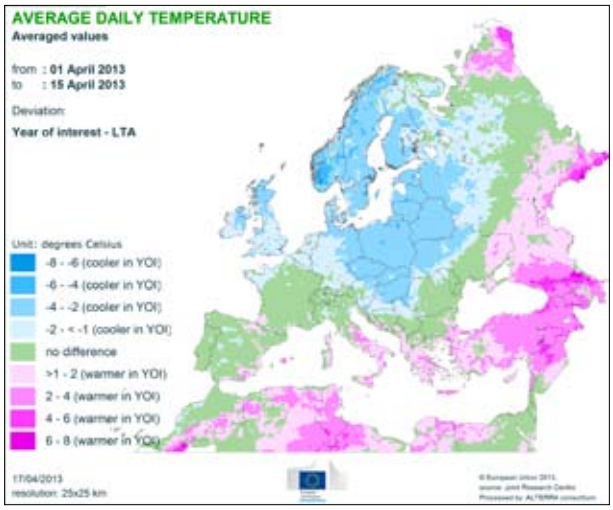


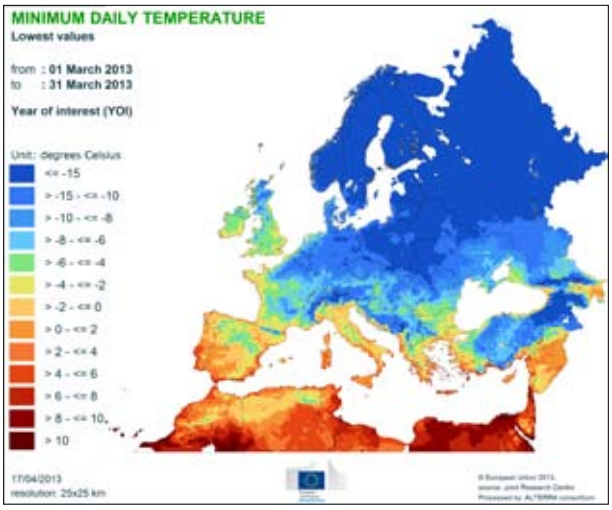
Observed temperatures

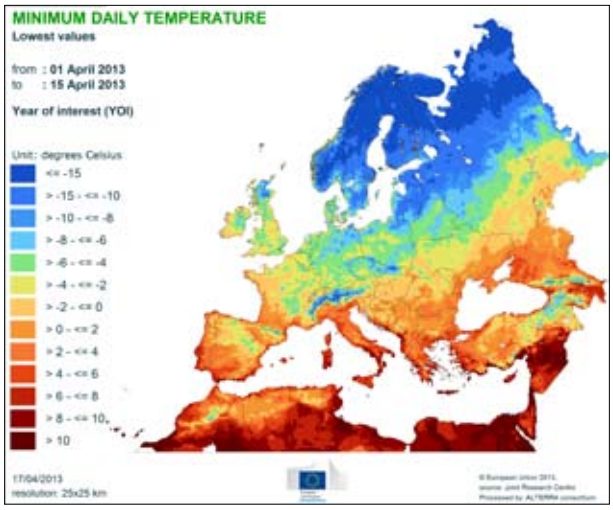
Spring started in **March** with colder-than-normal temperatures, and temperature accumulation was well below the average in northern and central Europe. Negative average temperature anomalies in the range of 6°C were recorded in Germany, Poland, and north-eastern Europe, and in the range of 4°C in northern France, the Benelux countries, Denmark, the UK, northern Italy, the Czech Republic, Slovakia, Slovenia, Hungary and Ukraine. In some areas of these regions March was one of the coldest in our climatological records. For almost an entire month, minimum temperatures did not reach positive values in Germany, Poland, Denmark, the Czech Republic, northern Ukraine, Belarus and Russia. The coldest period was recorded between 12 and 14 March with minimum temperatures of -14°C in some areas of these regions, while crops where protected by snow. On the contrary, temperatures were close to and above average (+2 to +4°C) over the Mediterranean regions and around the Black Sea respectively. Colder conditions continued to characterise northern and central Europe until 10 **April**, when an increase in temperatures was recorded all over Europe. However, the cumulated active temperatures (Tbase=0°C) since the beginning of March remained below the long-term average (-100 to -150 GDD), and a very strong delay in the development of winter cereals has been recorded mainly in Germany, Poland, northern France, the Benelux countries, Denmark, the UK and the Czech Republic.

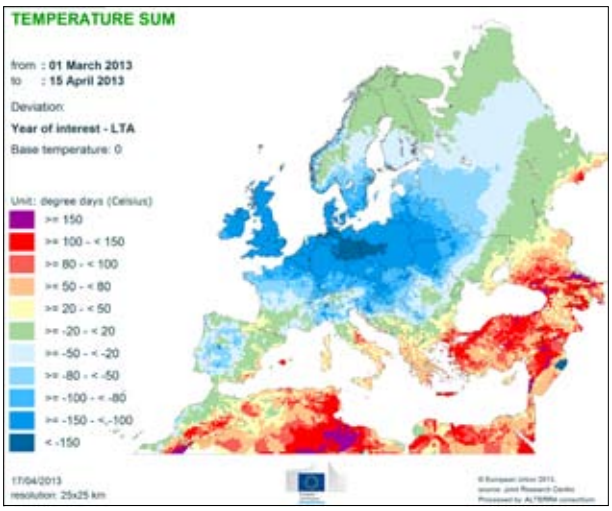
Advanced development stages are simulated in regions around the Black Sea, especially in Turkey.

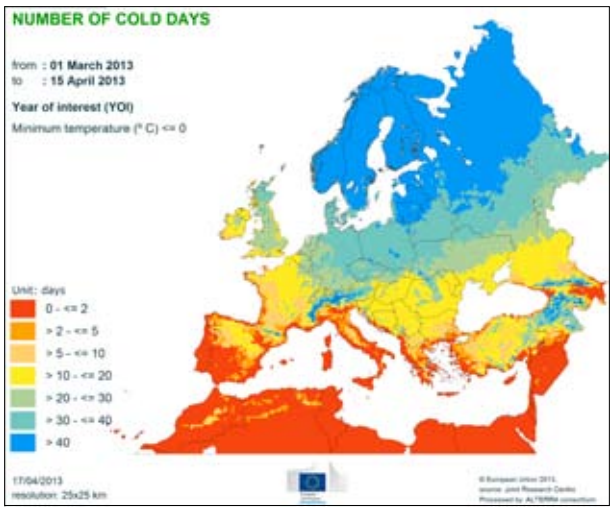

AVERAGE DAILY TEMPERATURE
Averaged values
from : 01 March 2013
to : 31 March 2013
Deviation:
Year of interest - LTA
Unit: degrees Celsius
-12 - -10 (cooler in YOI)
-10 - -8 (cooler in YOI)
-8 - -6 (cooler in YOI)
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
-2 - < -1 (cooler in YOI)
no difference
>1 - 2 (warmer in YOI)
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
> 8 (warmer in YOI)
17/04/2013
resolution: 25x25 km


AVERAGE DAILY TEMPERATURE
Averaged values
from : 01 April 2013
to : 15 April 2013
Deviation:
Year of interest - LTA
Unit: degrees Celsius
-8 - -6 (cooler in YOI)
-6 - -4 (cooler in YOI)
-4 - -2 (cooler in YOI)
-2 - < -1 (cooler in YOI)
no difference
>1 - 2 (warmer in YOI)
2 - 4 (warmer in YOI)
4 - 6 (warmer in YOI)
6 - 8 (warmer in YOI)
17/04/2013
resolution: 25x25 km


MINIMUM DAILY TEMPERATURE
Lowest values
from : 01 March 2013
to : 31 March 2013
Year of interest (YOI)
Unit: degrees Celsius
<= -15
> -15 - <= -10
> -10 - <= -8
> -8 - <= -6
> -6 - <= -4
> -4 - <= -2
> -2 - <= 0
> 0 - <= 2
> 2 - <= 4
> 4 - <= 6
> 6 - <= 8
> 8 - <= 10
> 10
17/04/2013
resolution: 25x25 km

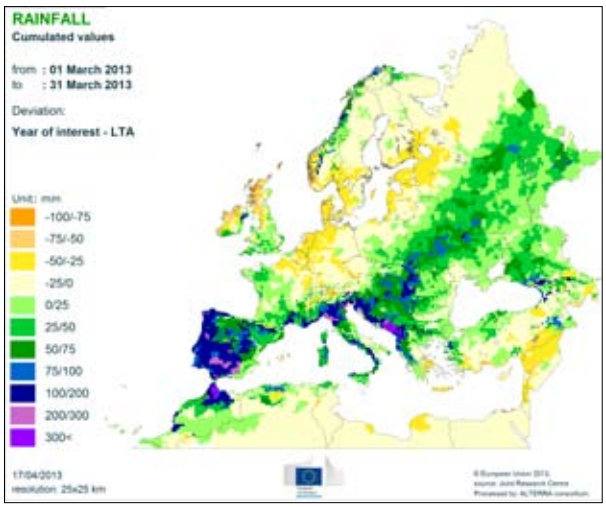

MINIMUM DAILY TEMPERATURE
Lowest values
from : 01 April 2013
to : 15 April 2013
Year of interest (YOI)
Unit: degrees Celsius
<= -15
> -15 - <= -10
> -10 - <= -8
> -8 - <= -6
> -6 - <= -4
> -4 - <= -2
> -2 - <= 0
> 0 - <= 2
> 2 - <= 4
> 4 - <= 6
> 6 - <= 8
> 8 - <= 10
> 10
17/04/2013
resolution: 25x25 km

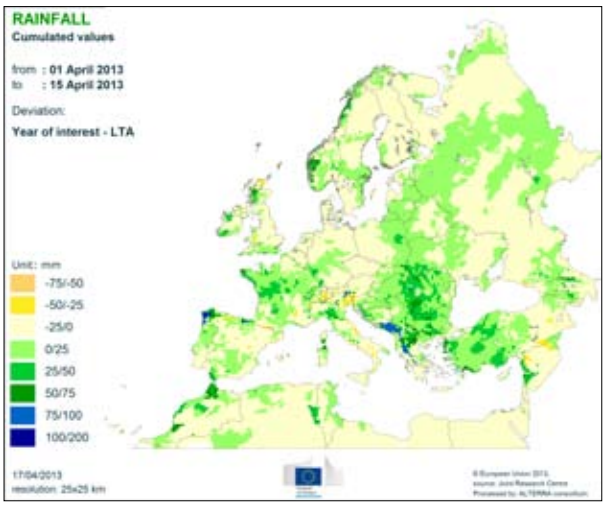

TEMPERATURE SUM
from : 01 March 2013
to : 15 April 2013
Deviation:
Year of interest - LTA
Base temperature: 0
Unit: degree days (Celsius)
>= 150
>= 100 - < 150
>= 80 - < 100
>= 50 - < 80
>= 20 - < 50
>= -20 - < 20
>= -50 - < -20
>= -80 - < -50
>= -100 - < -80
>= -150 - < -100
< -150
17/04/2013
resolution: 25x25 km

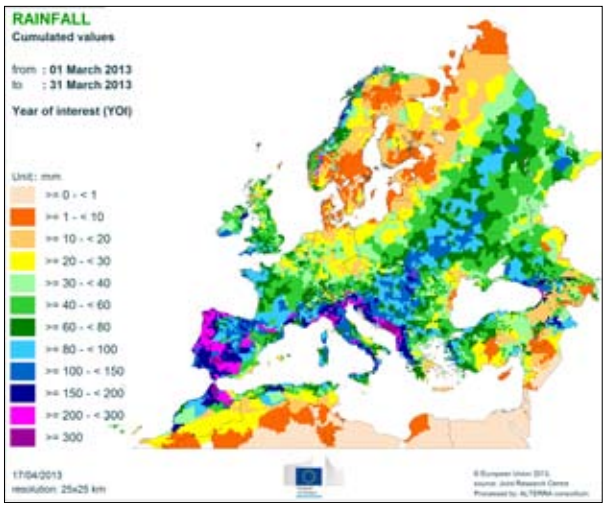

NUMBER OF COLD DAYS
from : 01 March 2013
to : 15 April 2013
Year of interest (YOI)
Minimum temperature (° C) <= 0
Unit: days
0 - <= 2
> 2 - <= 5
> 5 - <= 10
> 10 - <= 20
> 20 - <= 30
> 30 - <= 40
> 40
17/04/2013
resolution: 25x25 km

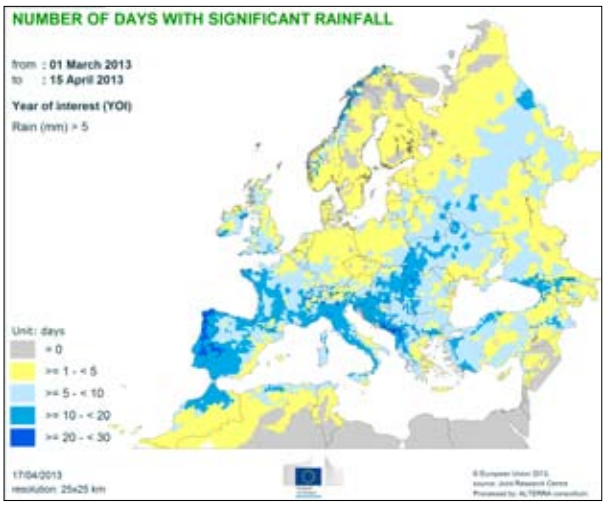
Observed rainfall

Above-average precipitation occurred in the Mediterranean region, the Balkan Peninsula and parts of eastern Europe. In **March**, precipitation exceeded the long-term average by more than 100 mm in the southern part of the Iberian Peninsula, northern Italy, southern France and the western part of Balkan Peninsula. Lower-than-usual precipitation occurred in Germany, the Benelux countries, Denmark, northern Poland, southern Scandinavia and the northwestern part of the British Isles. In most of Denmark and southern Scandinavia the total rainfall in March did not exceed 10 mm. The first two weeks of **April** have been characterised by precipitation below the long-term average in Denmark, Scandinavia, some areas of the UK, western Poland, northern Germany, eastern Ukraine, the Czech Republic, southern Italy and eastern Russia. Precipitation slightly above the average was observed mainly in the western part of Balkan Peninsula, Romania, Bulgaria, Hungary, eastern Poland, northern Italy and Turkey. Snow still covered most of the arable lands in eastern and northern Europe during the first days of April.



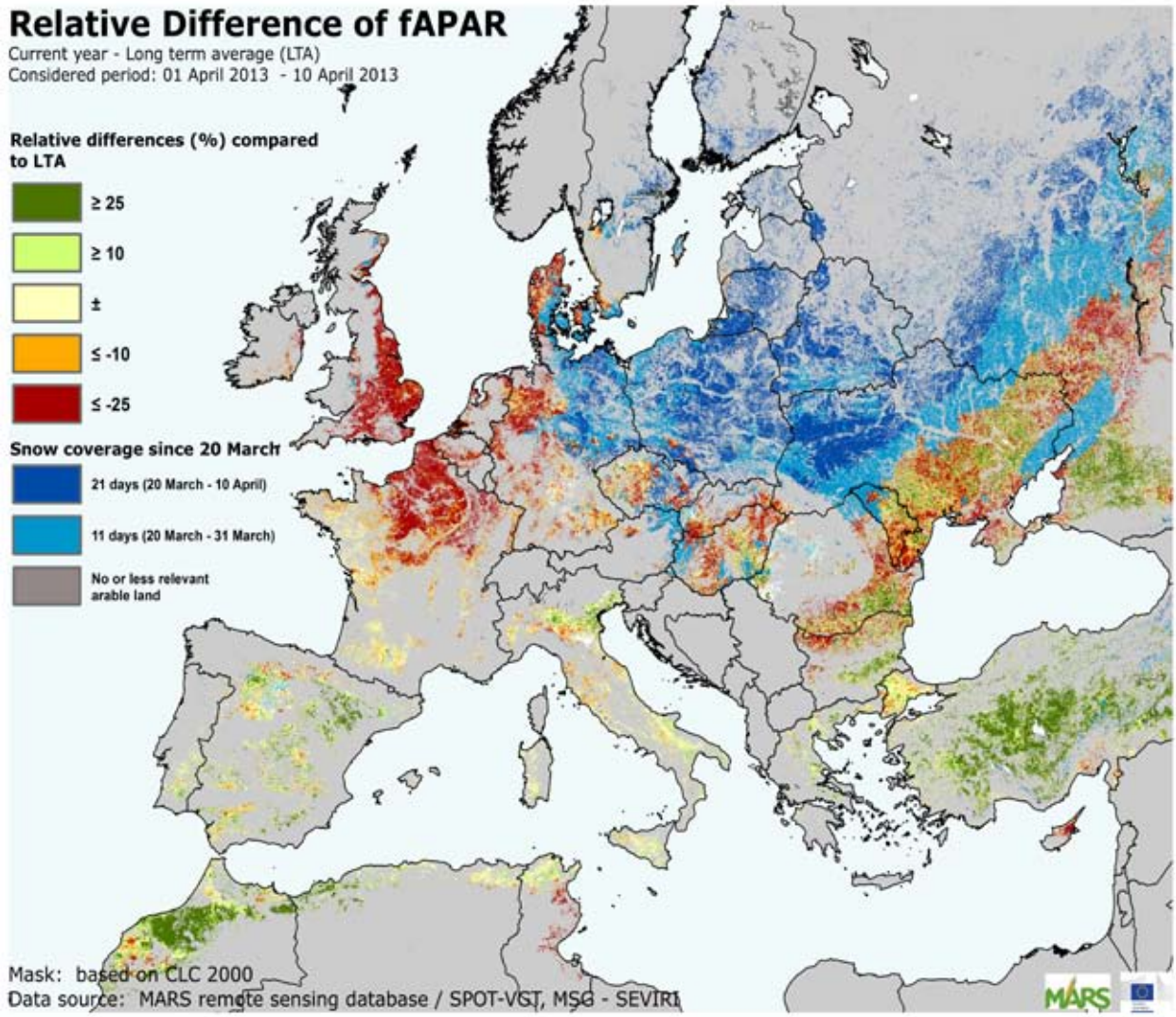




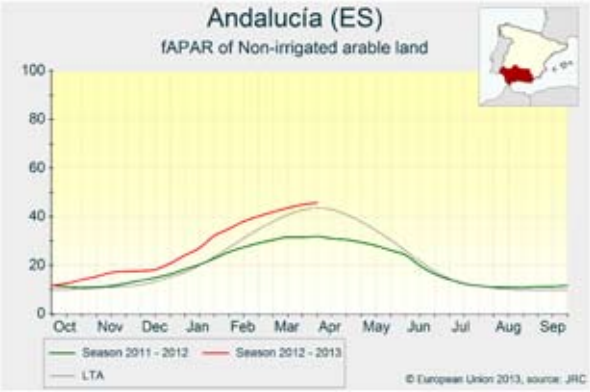


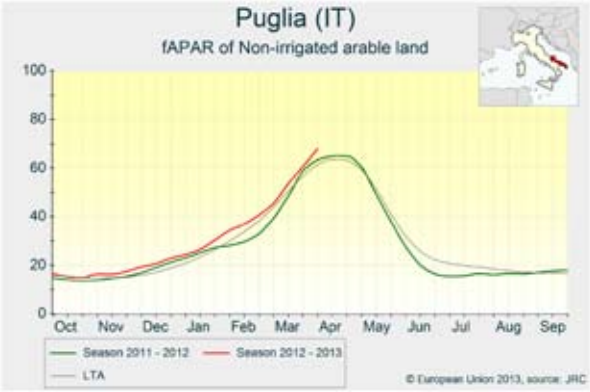
2. Remote Sensing analysis – observed canopy conditions

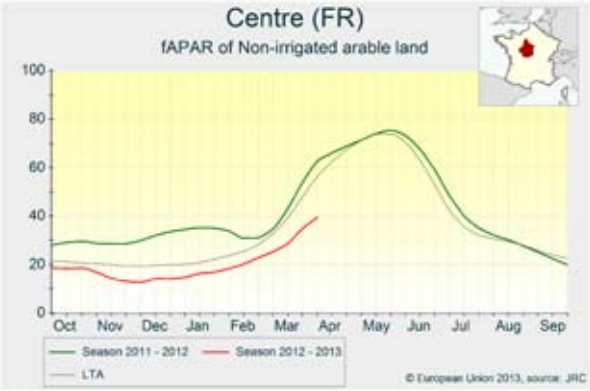
Strong delay in winter crops canopy development from western to eastern Europe. Positive biomass accumulation in the Mediterranean.

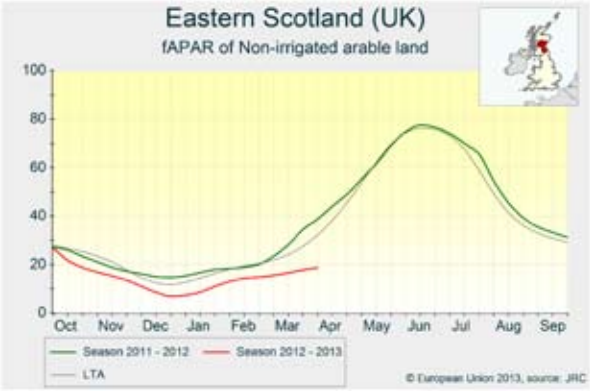


The map displays the differences between the Fraction of Absorbed Photosynthetically Active Radiation (fAPAR) during the period 1-10 April 2013 and the long-term average (1998-2010) for the same period. Arable lands with a low biomass accumulation so far or a delayed start to the season are shown in red; the opposite applies for the regions in green. Regions with recent and significant snow coverage are shown in blue. In **Spain**, abundant rainfall led to exceptional development of biomass as displayed by the fAPAR values for the current year (see the *Andalucia* fAPAR graph below). Similar vegetation conditions are present in **Greece** (e.g. *Thessalia*) while in southern **Italy**, in the main durum-wheat-producing regions (e.g. *Puglia*), green vegetation indexes are just slightly above average. Cyprus is showing low values, as drought conditions became established early in the season. In **western Europe** the late and persistent cold spell of March led to a delayed growth for winter and spring crops by one month (**France**, e.g. *Centre* region) or more (the **United Kingdom**, e.g. *Eastern Scotland)*. The vegetation period has not yet begun after the winter dormancy period in large parts of the arable lands of **eastern and northern Europe** (as of 10 April). See, for example, the fAPAR profile of the current season for the region of *Sachsen-Anhalt* in **Germany**. Warm weather triggered the early development of winter crops across Pannonian regions (e.g. *Sud Muntenia*, **Romania**). In **Turkey**, winter crops benefited from a warm winter coupled with sufficient water supply, which resulted in advanced growth stages by almost one month. Above-optimal canopy development has been established to date in agricultural regions of **Morocco** (e.g. *Centre* region) and high yield expectations are forecast for winter crops.

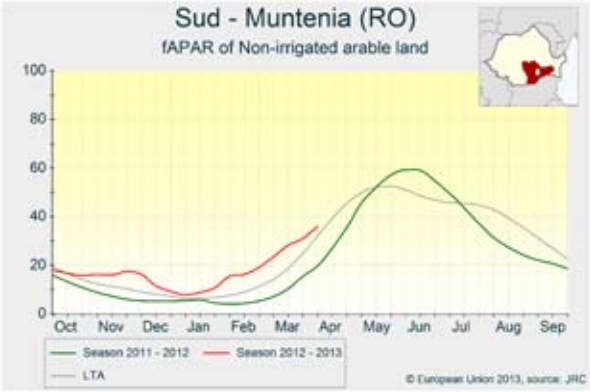

Andalucía (ES)
fAPAR of Non-irrigated arable land
100
80
60
40
20
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2011 - 2012
Season 2012 - 2013
LTA
© European Union 2013, source: JRC


Puglia (IT)
fAPAR of Non-irrigated arable land
100
80
60
40
20
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2011 - 2012
Season 2012 - 2013
LTA
© European Union 2013, source: JRC


Centre (FR)
fAPAR of Non-irrigated arable land
100
80
60
40
20
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2011 - 2012
Season 2012 - 2013
LTA
© European Union 2013, source: JRC


Eastern Scotland (UK)
fAPAR of Non-irrigated arable land
100
80
60
40
20
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2011 - 2012
Season 2012 - 2013
LTA
© European Union 2013, source: JRC


Sachsen-Anhalt (DE)
fAPAR of Non-irrigated arable land
100
80
60
40
20
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2011 - 2012
Season 2012 - 2013
LTA
© European Union 2013, source: JRC


Sud - Muntenia (RO)
fAPAR of Non-irrigated arable land
100
80
60
40
20
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Season 2011 - 2012
Season 2012 - 2013
LTA
© European Union 2013, source: JRC

3. Country analysis

3.1 European Union

As the season advances crop model simulations are being increasingly used to forecast winter cereals. In general, the current prospects for the EU-27 yields remain average. While in northern and central Europe the likelihood of realizing full crop potentials is somewhat compromised by the long delays, it is still too early to revise the forecasts that have been made in the previous bulletin based on the temporal trends and averages of previous years.

France

Important delays in crop development

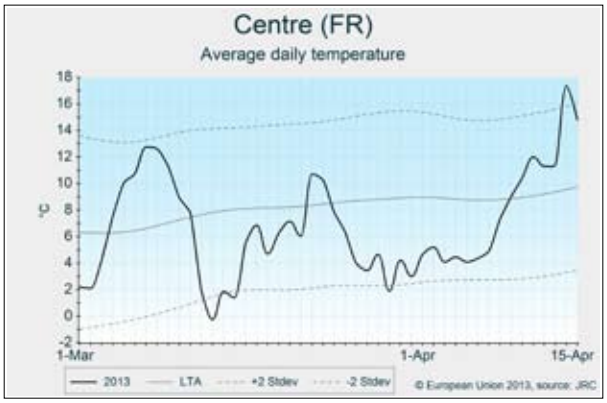
A cold spell experienced during March and April has affected the development of winter crops in the northern half of France. Conditions were near average for the southern regions.

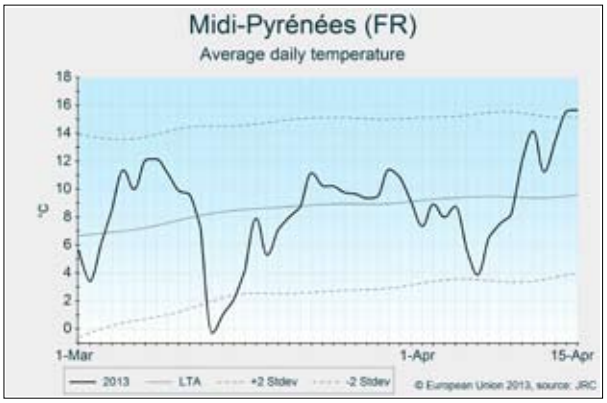
A cold spell hit the northern half of France from March until mid-April, with average temperatures 2 to 3°C below seasonal values in *Picardie, Champagne-Ardennes, Lorraine,* and *Centre*. Overall cumulated rainfall in that period was similar to the long-term average, with abundant rainfall occurring in the past two weeks.

In contrast, thermal conditions in southern regions were milder, although episodic drops of temperature were registered in mid-March and the first week of April. Abundant rainfall occurred during the past two months in *Midi-Pyrénées*, *Provence-Alpes-Côtes d'Azur* and *Languedoc Rousillon*, exceeding long-term average values by up to 60 mm.

Soft wheat and winter barley show a significant delay in their development, as a consequence of the cold temperatures registered in northern France. This depicts an unfavorable forecast scenario for both crops, which were already negatively affected by the difficult sowing conditions experienced in autumn. Yield expectations are currently slightly below the average, but weather conditions in the forthcoming weeks will be critical to evaluate more accurately yield potentials.

Durum wheat expectations, on the other hand, are on average, with no major constraints to date and favourable conditions created by the rainfall of the past weeks.





Germany

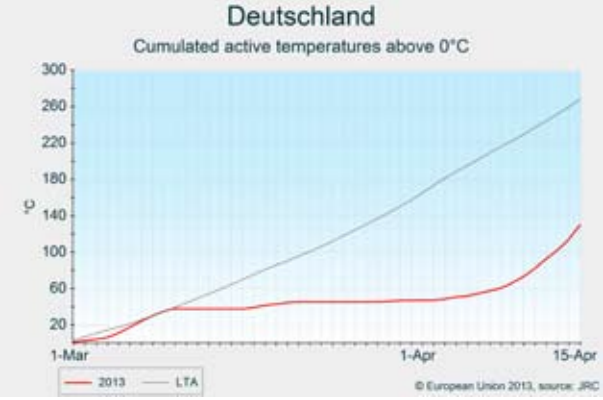
Prolonged winter dormancy after the coldest March on record

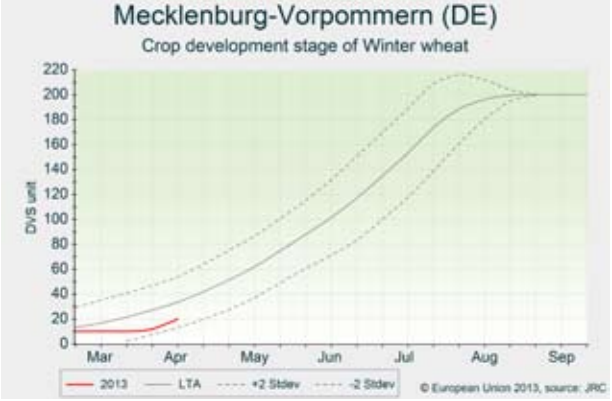
A delayed start to spring temperatures across Germany prolonged the winter dormancy period for crops and delayed spring sowings. March was the coldest month on record with constant low temperatures. Temperatures only started increasing towards mid-April.

Persistent low temperatures in March led to a prolonged dormancy period for winter cereals, and substantially delayed field activities and spring sowings. Minimum temperatures did not reach positive values for almost an entire month, albeit extreme frost did not occur and crops were still fully hardened. The coldest period was recorded between 12 and 14 March, with minimum temperatures of -14°C, while crops where protected by snow. The beginning of April continued to be chilly, with daily average temperatures only starting to climb over 0°C around 8- 9 April, peaking with a high of 25°C.

Precipitation during March was clearly below the norm, especially in the north of the country, with a deficit of more than 30 mm below average. The first days of April continued to be dry, but some precipitation was recorded with the change in air masses. Considering precipitation since the beginning of the year, a slight deficit is depicted only for the regions of *Niedersachsen* and *Nordrhein-Westfalen*.

Crop development is clearly delayed and, due to the extended crop dormancy period, the forecasts of the last Bulletin are confirmed. Spring sowings are also delayed. It is too early in the season to evaluate whether the shortened crop cycle will have negative influences that cannot be compensated further in the season.



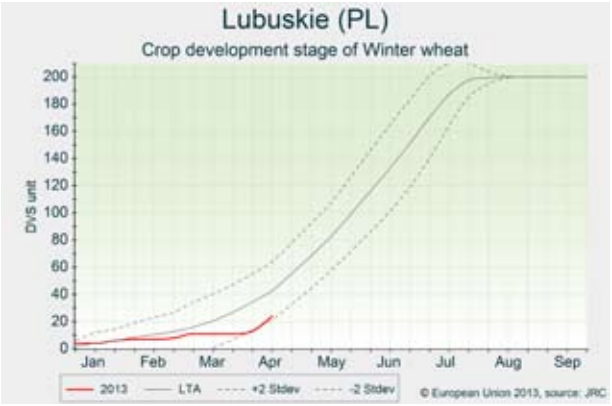


Poland

Very cold weather prolonged winter dormancy

The period from 1 March until 15 April was the coldest in our historical records, causing prolonged winter dormancy and postponing spring sowings.

Poland experienced a persistent cold spell from 8 March until 10 April. The cold weather, during which more than 30 days experienced average daily temperatures below 0°C, led to a temperature accumulation of about half of the long-term average values. The rainfall accumulation over the entire country was higher than usual, and snow cover lasted longer than usual. The cold weather prolonged winter dormancy and, according to our simulations, crop growth started only after 10 April. Winter crop development is delayed by more than 20 days. Further additional delays could negatively affect crop development, and eventually lead to reduced yields. Furthermore, there is a delay in spring sowing that usually starts in the second dekad of March. The late sowing of spring cereals will shorten tillering and stem elongation stages. A reduced number of kernels per spike usually reduces the yield. However, the proper choice of seed variety and an increased sowing density might compensate the late sowing. We maintain our forecast from the previous bulletin, where yield figures are based on trend values, as it is too early to forecast the effects of these anomalies on the crop yields.



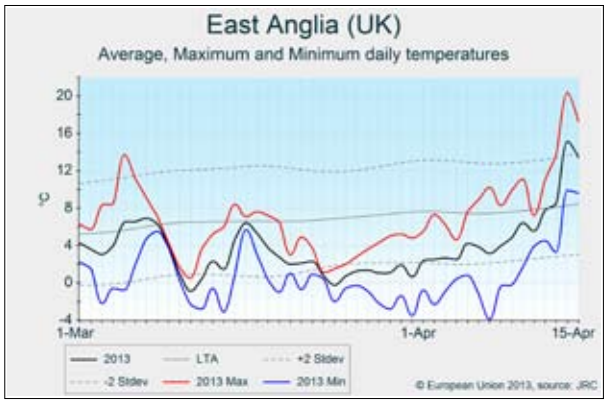
United Kingdom and Ireland

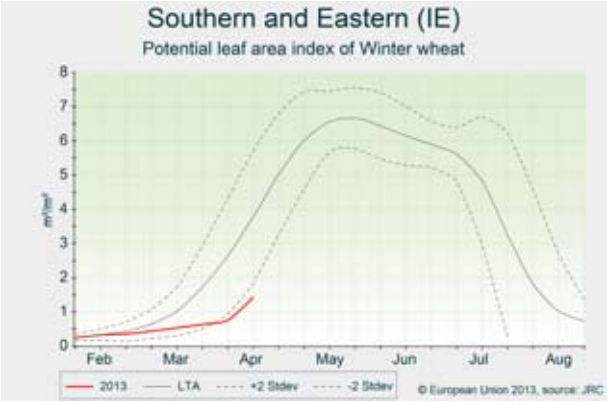
Crops growing fast after cold month of March

After a long cold and relatively dry March, crops are finally starting to resume their growth but are strongly delayed with respect to normal conditions.

As in the rest of northern continental Europe, the cold month of March has generated little accumulated temperatures over the UK and Ireland. Temperatures finally returned to normal around mid-April, along with a return of precipitation after a long dry period. These conditions have allowed winter crops to resume their growth, and they have done so at a rapid rate. Overall, the main consequence of this cold spell is not related to any damage caused by the cold temperatures, but rather to a strong delay of the crop cycle. Spring-sown crops are also expected to have their cycles shifted further along the year due to delayed sowing and emergence as a result of the cold

spell. For all crops, while the likelihood of realising their full potential is somewhat compromised by these long delays, it is still too early to revise the forecasts that have been made in the previous bulletin based on the temporal trends of previous years.





Spain and Portugal

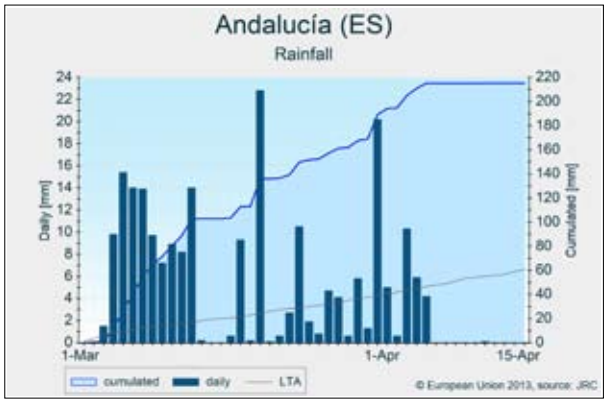
Positive development of winter cereals

Humid and chilly weather conditions were observed during these first weeks of spring. Winter crop growth continued under favorable conditions with expectations, in general, above average.

After March, which was the most humid of the past 40 years, especially in southern regions, precipitation levels in the Iberian Peninsula returned to seasonal values during the first half of April. The temperatures registered were similar to those of an average year in the eastern half of the country, whereas chilly conditions were observed in *Castilla y Leon*, *Extremadura* and the western provinces of *Castilla La Mancha*.

In most regions, the overly wet soils resulting from the intense precipitation received during March hampered weed control and fertilising. Although this may have negative consequences for yield potentials at the end of the growing period, up to now crop indicators highlight a green biomass development that is substantially higher than seasonal values, especially in the *Andalucia* and *Aragon* regions. Therefore, durum wheat yields are expected to improve significantly compared to the yields of past years, especially those of the previous season.

Forecasts for soft wheat and winter barley are positive as well, but weather conditions during May will be crucial to determine their yield potentials.



Italy and Slovenia

Spring started with cold and wet conditions

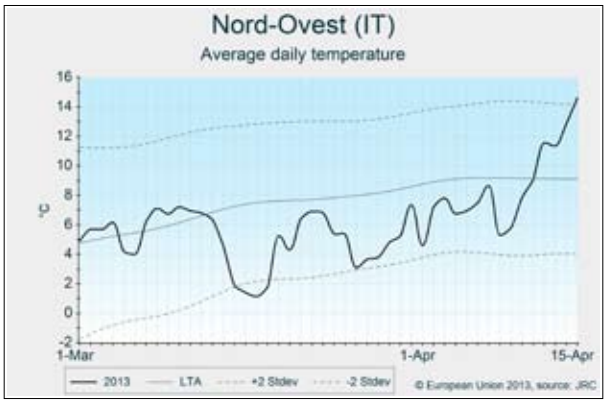
The start of spring has been characterised by above-average rainfall accumulation and below-average temperatures. Spring crop sowing has been delayed due to rain. Crop yield forecasts are near average.

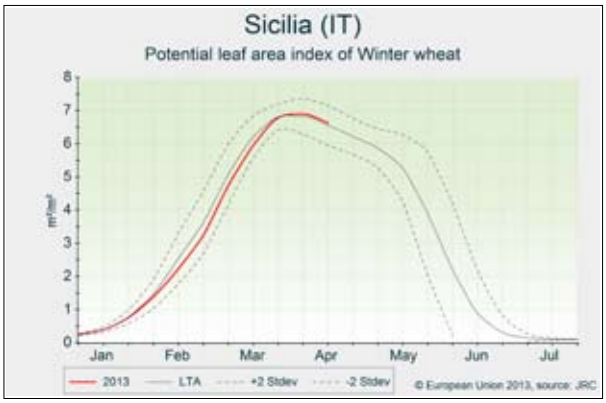
During the period from 21 March to 15 April, cumulated rainfall was 100% above the long-term average in northern Italy and Slovenia.

Furthermore, the period from mid-March to 10 April was one of the coldest (in terms of maximum and average temperatures) in our climatological record for these regions. As a consequence,

the cumulated active temperatures (Tbase=0°C) for the period under consideration remained below the long-term average (-20 to -50 GDD), delaying the development of winter cereals. The unusually high levels and frequency of precipitation probably affected crop development and complicated their management. Damp conditions severely increased the risk of disease, which was difficult to control since pesticide application was hampered by the wet conditions.

In southern Italy the soil moisture level is good, and the cumulated active temperature is now close to average. The previous crop development delay has been compensated. Winter wheat and barley are at the heading stage in northern and central Italy, while in the south flowering is starting. The forecast yield for winter crops remains close to average





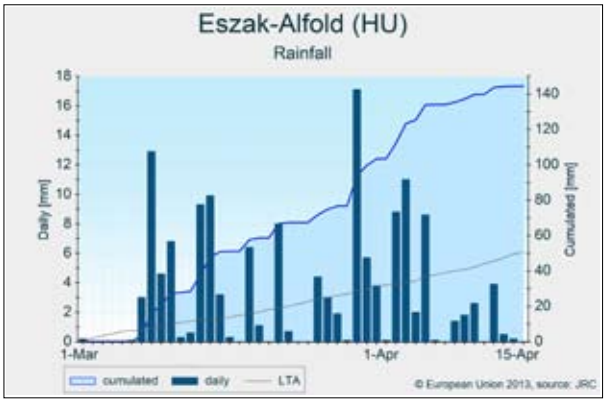
Hungary

Very cold and wet

A particularly wet start to the spring has been experienced in Hungary, with frequent and abundant snow and rainfall. Thermal conditions were far below average until 10 April, resulting in a significant shift in spring field activities

The first half of March was mild, but the temperature dropped below average in mid-March due to a cold air intrusion and intense snowfall. Between 19 and 22 March some temperate days were experienced, but cold thermal conditions returned with temperatures that were lower than usual by 4-7°C, and minimum temperatures mostly fell below 0°C. The notably colder-than-average weather conditions continued during the first days of April, but after 10 April a notable warming tendency prevailed during which mean temperatures exceeded the average. Between 21 March and 15 April rain and snow were abundant, reaching 60-110 mm. The precipitation anomaly since 1 March reached +100 to +400%.

There is a probability of inland inundation in regions of poorly drained or heavy soils. The cold and overly wet soil conditions hampered and delayed the sowing of sugar beet and spring barley by 2-3 weeks.



Romania

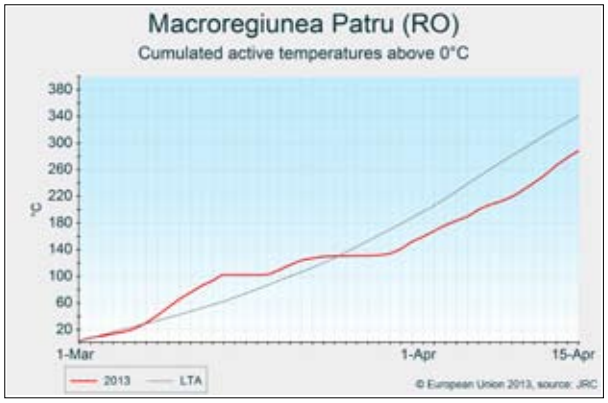
Slightly below-average biomass accumulation due to difficult weather

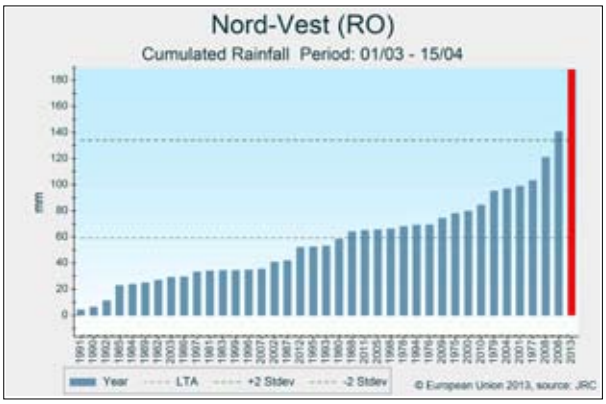
Until mid-March, warmer than average thermal conditions were experienced in Romania, but the weather situation changed abruptly in the middle of the month, which was characterised by a strong decrease (10-12°C) in temperatures. The cold weather conditions persisted until the end of March whereas April was near normal. Precipitation, which was evenly

distributed over time, was plentiful over the whole country and even excessive in the western areas.

During the second half of March, apart from some mild days around 20 March, maximum and minimum temperatures remained below average. In the southern regions some moderate frost events (-2 to -5°C) occurred, but in the northern areas close to the Ukrainian border minimum temperatures dropped below -10°C on several occasions. In the first half of April the temperatures fluctuated around the average.

During the period from 1 March until 15 April, excessive precipitation occurred in Nord-Vest and Macroregiunea Patru, where cumulated rainfall exceeded 100 mm, and values up to 150-200 mm were registered in smaller regions. To the east of the country, precipitation decreased gradually and remained in the 50-100 mm range, while to the east of the Sud-East region only 20-50 mm was measured. The excessive rainfall could have partly leached out fertilisers from the soil. Due to the overly wet conditions, the planting of the early spring crops could be delayed mainly in the western regions. The temperature sum (Tbase=0°C) indicates slightly retarded crop development in the western and northern areas of Romania, but elsewhere crop development seems to be close to normal.





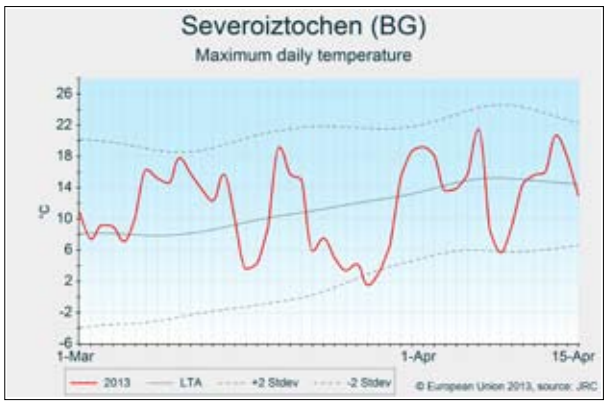
Bulgaria

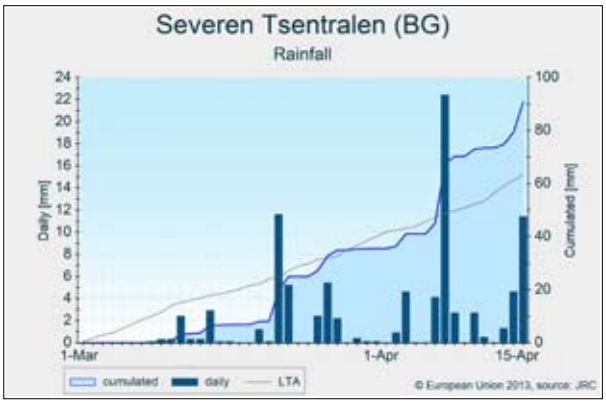
Good expectations

Very variable weather conditions characterised Bulgaria from mid-March until mid-April. The last dekad of March was colder than usual, but had no significant adverse effect on the winter crops. Precipitation was near or above the long-term average.

During the period of analysis the temperature fluctuated strongly with alternating short periods that were significantly below and above average. The last dekad of March was colder than seasonal by 2-6°C in the northern areas, but this negative thermal anomaly was less marked near the southern border of Bulgaria. Some moderate frosts (between -2 and -5°C) were recorded. April started with mild weather in most of the country, but the temperature dropped below average again for a short period from 7 April until 10 April. Precipitation was plentiful over the whole period. Precipitation surplus was pronounced in the Severozapaden, Yugozapaden and Yuzhen Tsentralen regions, reaching +40 to +90 mm, whereas rainfall exceeded the average only slightly (by +10 to +20 mm) in the coastal regions near the Black Sea. The development and growth of winter cereals is mostly adequate at this stage of the crop cycle with the exception of northwestern areas where crop development lags slightly behind. However, overall expectations are positive.

The wet soil conditions may have caused some delay in the planting of the spring crops, particularly in southwestern regions.



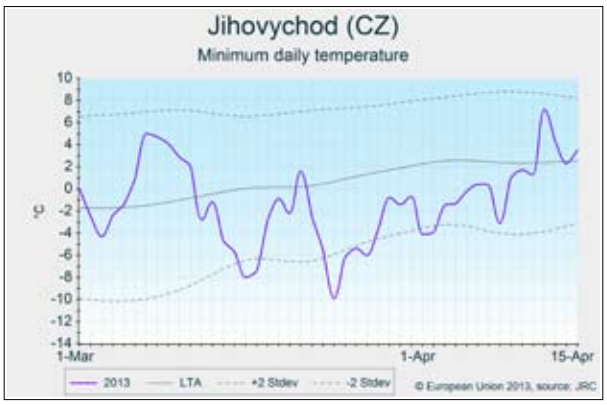


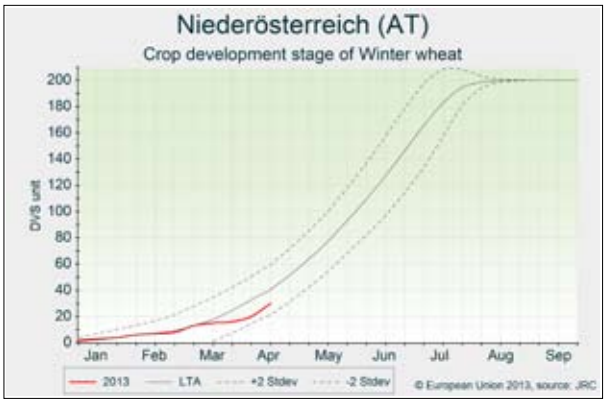
Austria, the Czech Republic and Slovakia

High rainfall accumulation since January, delayed development

Regrowth is starting with good general soil conditions, but soils might be slightly too wet in Slovakia. Cold temperatures during the last two weeks of March and the first week of April have slowed vegetative development.

Average temperatures were well below the long-term average during the last two weeks of March and the first week of April. In particular, during the last two weeks of March minimum temperatures dropped below -4°C to -6°C in Austria, and -8°C to -12°C in the Czech Republic and Slovakia. As a consequence, thermal time accumulation was approximately 30-50% lower than the long-term average and crop development was delayed. According to our simulations, no frost kill damage would have occurred during the cold spell due to snow cover and the crop development stage (end of the dormancy period). The delay in development could possibly have a negative impact on winter crops. However, the good water supply and the forecasted above-average temperatures until the end of April could easily change the situation. Therefore it is too early to forecast a negative impact, and trend values are maintained for this bulletin.



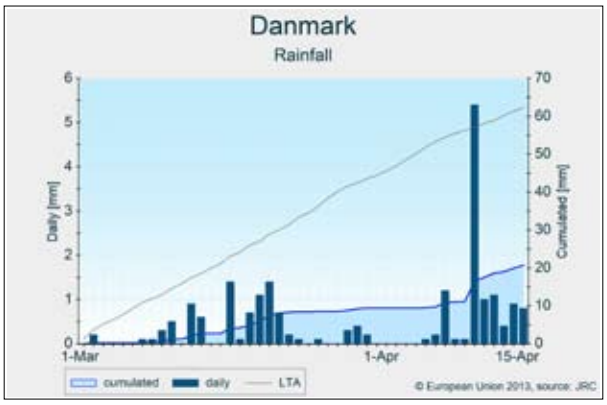


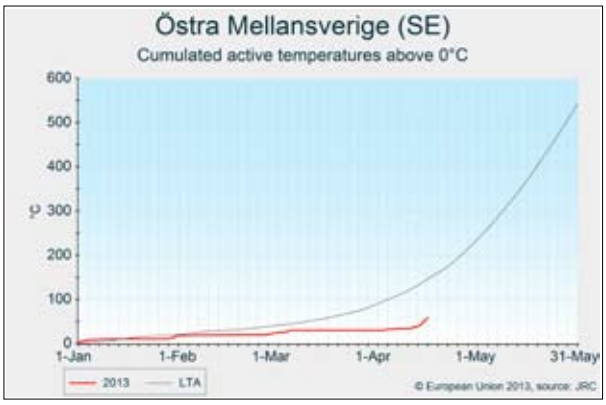
Denmark and Sweden

Prolonged cold and dry conditions delay crop development

The weather continued to be much colder than usual and rainfall remained well below the long-term average. A significant delay in winter crop development and spring sowing is recorded.

In Denmark and Sweden, March was one of the coldest in our climatological records. During the period from 8 March to 13 April temperatures remained consistently below average, with minimum temperatures of -14°C in Sodra Sverige and -8°C in Denmark recorded between 12 and 15 March. As a consequence, the cumulated active temperatures (Tbase=0°C) remained well below the long-term average (-100 to -150 GDD), resulting in a long delay in the development of winter cereals. Furthermore, March has been characterised by dry conditions, and cumulated rainfall didn't exceeded 10 mm. Significant rainfall was only recorded in the last few days of the period analysed, but was well below the amounts required to raise soil water levels to field capacity. Rainfall in the coming week will be crucial for crop growth. Development stages of crops are clearly delayed, but it is too early in the season to evaluate whether this will have negative influences that cannot be redressed later in the season. Therefore, the forecasts of the last bulletin are maintained.





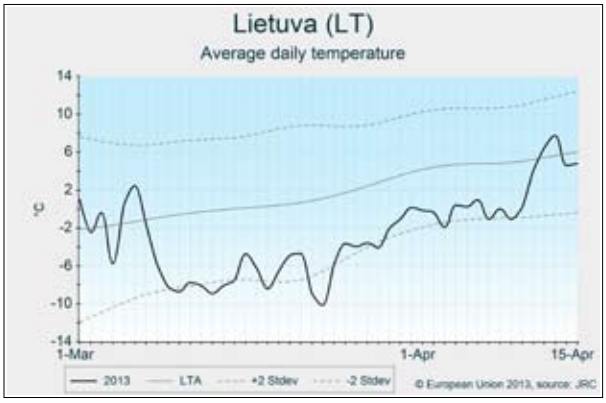
Finland and the Baltic countries

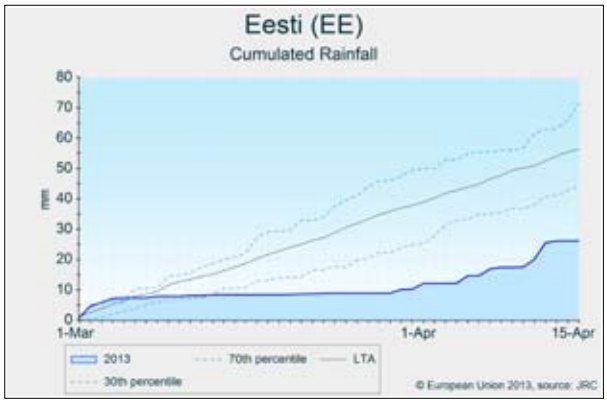
Delay in the arrival of spring

The period analysed was characterised by a cold spell that lasted about one month, causing prolonged winter dormancy. Rainfall in the whole region was below average. The weather in the coming period will determine the delay in the spring sowing and the development of the season.

The cold spell in the region that had started during the first decade of March persisted until the first decade of April. Rainfall accumulated since the beginning of the year has been below the long-term average, particularly in Finland, Estonia and Latvia, and snow cover is still present. The meteorological conditions in the region slowed the development of winter crops, prolonged winter dormancy, and delayed spring sowing. The weather in the coming period will be very important for our yield forecast because of very late spring sowing, and further delays in the development of the winter crops may jeopardise yields, considering the short growing season of Nordic agriculture. However, it is too early to forecast any reduction in yields caused by the shortened season.

Our current forecast is based on trend values and maintains the values from the last bulletin.



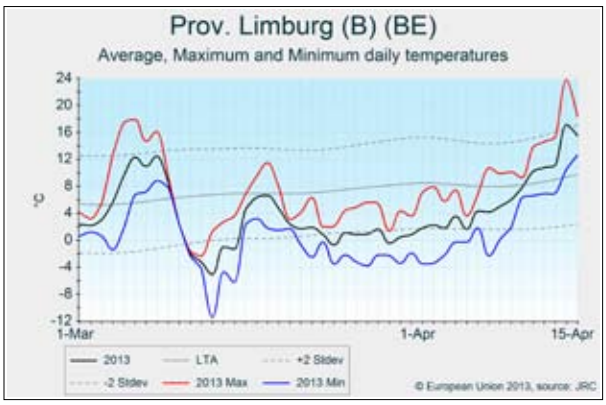


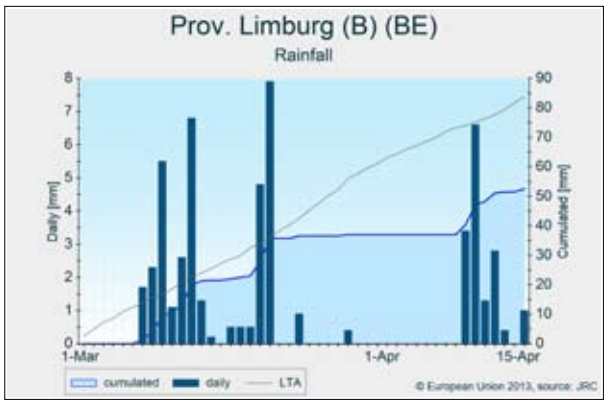
Belgium, the Netherlands and Luxembourg

Cold month of March considerably delays the season

Both winter crops and spring sowings are expected to suffer important delays due to the low temperatures of March.

March was dominated by temperatures that were much colder than normal. A first acute cold spell occurred around 11-13 March, while a second, more prolonged cold period struck between 22 March and 3 April. The major impact that these low temperatures are expected to have on crops is a delay in the growing season of winter crops (as little temperature accumulation has been observed). No major damage due to the cold is expected. The very low, but stable, satellite remote sensing estimations of fAPAR confirm both claims (delay and no damage). During the second cold wave, very little precipitation was recorded, resulting in conditions that may also substantially delay the sowing of spring and summer crops, thereby shortening their growth cycle. Towards mid-April, temperature and precipitation returned to normal levels. Although the delayed crop cycles reduce the likelihood of above-average yields, it is premature to consider that compensation cannot occur further along in the season, and therefore the forecasts of the previous bulletin (based on the trend) are maintained.





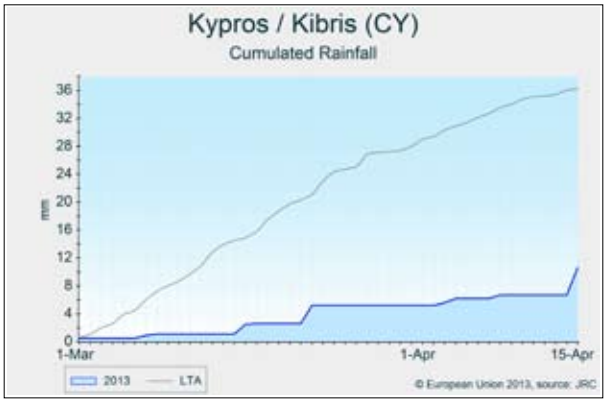
Greece and Cyprus

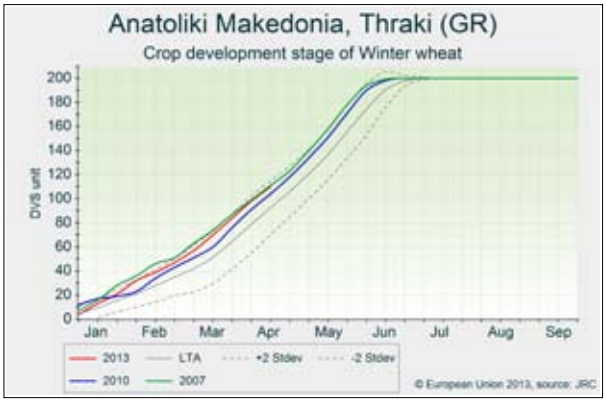
Temperatures still above average after a mild winter

Favourable temperatures and wet conditions for main agricultural areas of Greece triggered crop development to achieve advanced stages for winter cereals. On the other hand, low precipitation in Cyprus seems to compromise yields.

Abundant precipitation, high above the long-term average, was observed for the northern parts of Greece during March and the first days of April. On the contrary, precipitation in central and southern parts of Greece was below (e.g. in the *Thessalia*, *Sterea Ellada* regions) or far below (e.g. in *Attiki*) the long term-average. Temperatures remained mainly above average following a mild winter. Therefore, wet and warm conditions for most agricultural areas of Greece resulted in advanced development stages for winter cereals. Forecasted crop yields are the same as or slightly above those of the last bulletin based on trends or scenarios analyses.

After a significant period of precipitation during winter, drought conditions were recorded in Cyprus. More specifically, the cumulated rainfall is far below the long-term average while the temperature sum is above the long-term average. Therefore, inhibitory conditions occurred at this essential development stage for winter cereals. Forecasts for durum wheat and barley have been lowered compared to those of the last bulletin.





Croatia

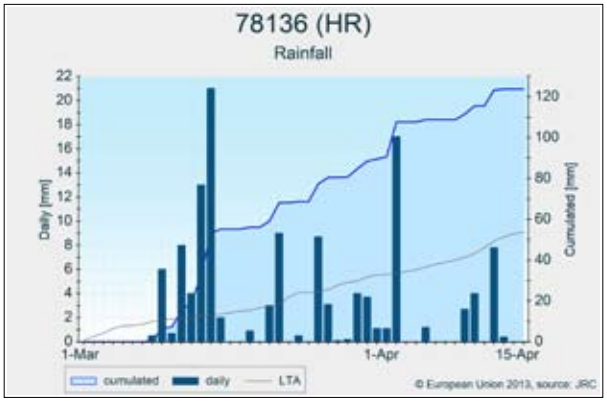
Abundant rainfall and wet soils hamper timely spring sowing

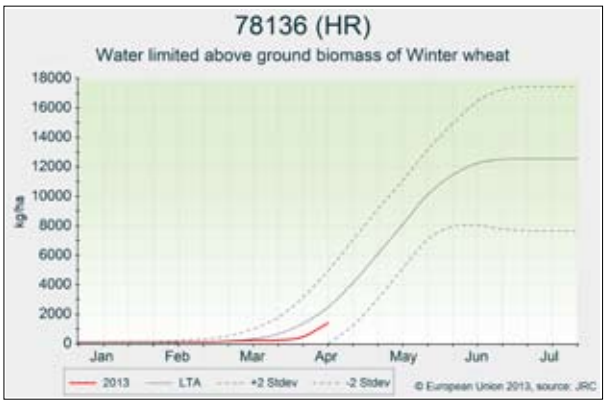
Croatia experienced abundant rainfall - almost triple the long-term average. The cold spell lowered temperature accumulation.

Temperatures during the period analysed were lower than average particularly from 14 March to 8 April. The cold spell lowered temperature accumulation by 60-80°C in the continental part of the country.

Abundant rainfall prevailed across the Croatian territory for most of the period analysed. Agricultural soils where already moist, so delays were incurred in the start of spring sowing and other field work. Solar radiation was 15-20% lower than the long-term average as a result of increased cloudiness.

The phenological development of winter crops is close to normal, but aboveground biomass accumulation is lower than average due to lower temperatures and decreased global radiation. It is too early in the season to evaluate whether or not the above anomalies will have negative influences that cannot be compensated later in the season. We maintain our forecast from the previous bulletin based on 5-year averages.





3.2 Black Sea Area

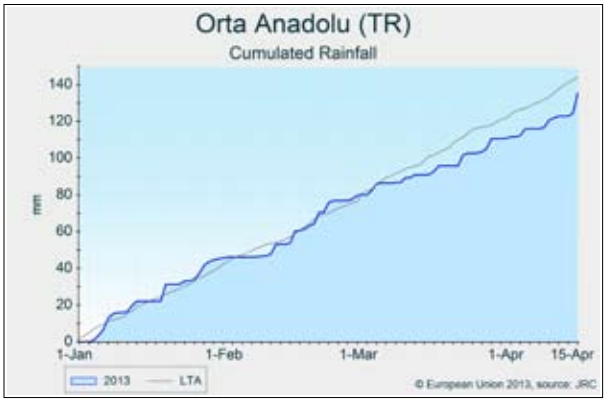
Turkey

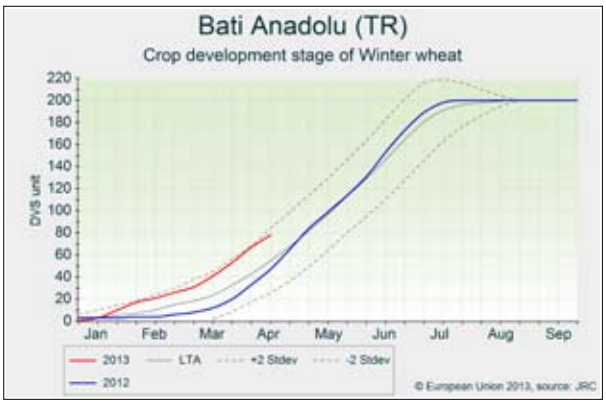
Optimal growth and development conditions prevail

Good crop yield year likely given above-average temperatures and cumulated global radiation with well-distributed rainfall.

In the main crop production areas comprising *Bati Anadolu* and *Orta Anadolu*, the weather parameters (temperature regime, rainfall pattern, cumulative solar radiation) favour crop growth. In particular, considerable and well distributed precipitation from December to date has led to a surplus of water above average values. Additionally, crop development stages are quite advanced compared to last year, which corroborates the high, above long term average, NDVI values registered. Given all these favorable aspects, a good yield for wheat and barley is expected and therefore the yield forecast is set at above the 5-year average.

A conducive environment in terms of growth and development is also foreseen for maize, with average yields forecast. However, the final yield is still subject to a large level of uncertainty.





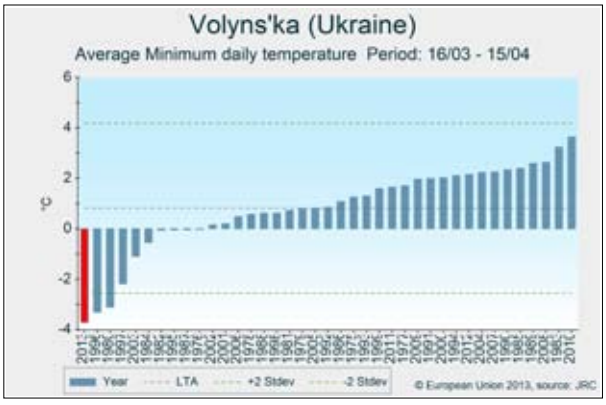
Ukraine

Extreme moist and cold period in the north-western regions

The current period from mid-March to mid-April is one of the coldest and wettest on record for north-western Ukraine in our 37-year archive. Thick snow cover (>20 cm) was prevalent in these regions, which melted only in the first days of April. The south-eastern half of Ukraine was less cold, and there rainfall was only slightly above average.

Following the normal thermal conditions of the first half of March, Ukraine suffered a freezing weather period after mid-March. Temperatures remained 6-8°C below average in the north-western areas (north of the *Chernivtsi - Kharkiv* imaginary line) and the milder southern areas were also 2-4°C colder than average. During the first dekad of April, although the very cold weather eased considerably, the below-average thermal conditions persisted in the north-western regions, whereas the southern and south-eastern parts of Ukraine warmed up quickly and the daily temperatures greatly exceeded the long-term average.

In addition to the cold weather conditions, the north-western territories were characterised by excessive precipitation throughout the period of review. Cumulated precipitation exceeded 100 mm and even reached 150-200 mm in *Zakarpats'ka*, *L'vivs'ka* and *Ivano-Frankivs'ka*. In contrast,



rainfall was near average in the area close to Black Sea, were 40-60 mm precipitation was recorded. 60-80 mm rainfall was recorded in the eastern regions.

Due to the low temperatures, winter cereals remained in the dormant stage or showed minimal vegetative activity in the north-western half of Ukraine. In the warmer southern regions the phenological development and biomass accumulation is more advanced. The current yield forecast was produced using the trend, due to the very delayed start of crop activity.

3.3 European Russia and Belarus

European Russia

Long winter

In March, thermal conditions were significantly below average in most of Russia with the exception of southern regions where warmer-than-average weather supported the development of winter crops. Precipitation was plentiful for most of European Russia, leading to replenished soil moisture levels.

During March, cold winter weather characterised the northern and central areas of Russia, that were under thick snow cover. In these regions the temperature remained below the average by 3-7°C. On the contrary, a positive thermal anomaly characterised the southern regions until 24-25 March, when a severe cold air intrusion reached this zone and reduced temperatures below the average by 3-6°C until the first days of April. Temperatures increased significantly in the *Southern*, *North-Caucasus*, *Volga* and *Central Districts* in the first dekad of April. The snow cover started to melt in the Blacksoil region (*Voronezh*, *Lipetsk*, *Belgorod*, *Tambov* and *Kursk* areas) and southern Russia has been free of snow since mid-April. The daily maximum temperatures reached +15 to +20°C in the southern regions in the first days of April, but temperatures later returned to normal levels, fluctuating around 8-12°C.

In March, precipitation was plentiful (characteristically 40-100 mm) in *Central* and *Southern* regions and remained below average only in the territories near Finland. In April, the precipitation tendency decreased significantly in the Southern regions, but soil moisture content remained adequate.

The dry weather conditions combined with above-average temperatures allowed for the sowing of spring crops in southern Russia. Due to the persistence of snow cover and cold weather conditions, winter cereals are mostly underdeveloped (especially in the *Volgogradskaya* and *Saratovskaya* regions, also partially due to a dry autumn) and only the area between the Black and Caspian Sea shows advanced crop development and above-normal biomass accumulation.

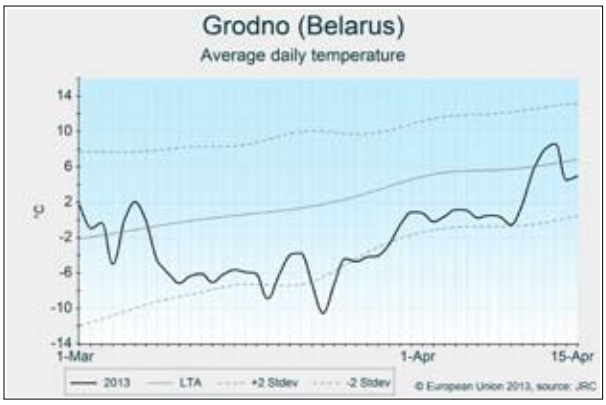
Belarus

Cold spell led to a late start of season

Cold temperatures in March and during the first dekad of April delayed the development of winter crops. Wet soil conditions due to snow melt combined with high rainfall in previous months are causing delays in the sowing of spring crops.

Wintery weather conditions prevailed in March and in the first dekad of April. Minimum temperatures dropped below -10°C on several occasions during the second half of March, and even the daily mean temperatures remained below 0°C. The surface was covered by deep snow (20-35 cm) which melted quickly between 7 and 11 April. Temperatures increased significantly during the second dekad of April. Cumulated rainfall values for the period from 1 October to 15 April are among the most extreme in our weather archive. Due to the unusually long duration of snow cover and saturated soil conditions, the sowing and planting of spring crops, which has not yet been possible, will depend on the meteorological

conditions of the coming weeks. Cold temperatures during March and in the first dekad of April have delayed the growth of winter crops. The re-growth of winter cereals is expected to start in the coming days. As the crop season is in the early stages, our forecast was based on the trend.

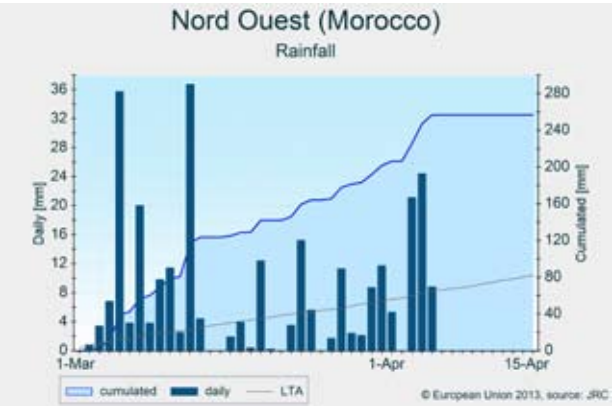


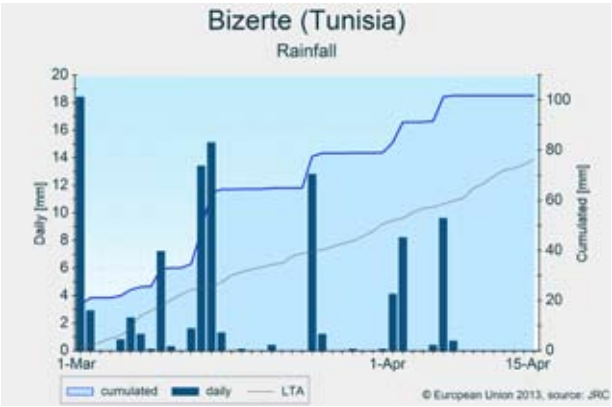
3.4 Maghreb

Good conditions continue in main cereal areas except parts of Tunisia

Many parts of northern Morocco and western Algeria have continued to experience above-average precipitation and average temperatures, leading to good growing conditions for cereals. Northern Tunisia has received average amounts of precipitation, whilst central and southern Tunisia has received limited rainfall during the past month, failing to offset the effects of much reduced rainfall through the winter.

Agricultural areas in the north of Morocco (*Nord Ouest*, *Centre Nord*, *Centre*) have experienced a good winter, with mild temperatures and very favourable precipitation levels; this pattern has continued during the past month, and remote sensing indicators confirm good vegetation condition. Further south, *Tensift* has received average rainfall in the past month but seasonal accumulations are still well below average, leading to lower yield expectations. Much of the northwest of Algeria (*Mascara*, *Relizane*, *Chlef*, *Ain-Defla*, *Oran*, *Tiaret*) has also continued to experience warm conditions and relatively high levels of precipitation; remote sensing indicators confirm good vegetation condition. Parts of north-eastern Algeria (*Constantine*, *Guelma*, *Oum El Bouaghi*) have received less rainfall in the past month, and despite relatively high levels of seasonal precipitation, remote sensing indicators show that vegetation conditions are heterogeneous and only close to average. Precipitation in northern Tunisia (*Bizerte*, *Beja*, *Manouba*, *Jendouba*) has been favourable but, despite warm conditions, remote sensing indicators show only average vegetation condition. Central and southern Tunisia (*Kasserine*, *Kairouan*, *Sidi Bouzid*, *Sousse*) have received only small amounts of rainfall in the past month, which have not offset the effects of much reduced rainfall through the winter. In general, good meteorological conditions have prevailed in soft wheat-growing areas, leading to good vegetative growth and flowering conditions; relatively abundant water stored in the soil at the start of grain-filling stages suggests good prospects for this crop in the three Maghreb countries. Barley and durum wheat yields may be closer to normal.





4. Crop yield forecasts

Country	TOTAL WHEAT (t/ha)					SOFT WHEAT (t/ha)					DURUM WHEAT (t/ha)				
	2012	2013	Avg 5yrs	%13/12	%13/5yrs	2012	2013	Avg 5yrs	%13/12	%13/5yrs	2012	2013	Avg 5yrs	%13/12	%13/5yrs
EU27	5.17	**5.39**	5.37	4.2	0.3	5.41	**5.63**	5.63	+4,0	-0.1	3.15	**3.31**	3.21	5.1	3.2
AT	4.14	**5.26**	5.13	27.1	2.6	4.19	**5.3**	5.17	26.6	2.6	3.07	**4.35**	4.34	+42,0	0.3
BE	8.27	**8.79**	8.74	6.3	0.6	8.27	**8.79**	8.74	6.3	0.6	-	**-**	-	-	-
BG	3.92	**3.9**	3.74	-0.6	4.4	3.86	**3.88**	3.72	0.3	4.2	5.85	**4.69**	4.49	-19.8	4.5
CY	1.94	**1.87**	1.95	-4,0	-4.2	-	**-**	-	-	-	1.94	**1.87**	1.95	-4,0	-4.2
CZ	4.39	**5.27**	5.23	+20,0	0.7	4.39	**5.27**	5.23	+20,0	0.7	-	**-**	-	-	-
DE	7.33	**7.49**	7.49	2.2	+0,0	7.34	**7.5**	7.5	2.2	+0,0	4.92	**5.34**	5.35	8.7	+0,0
DK	7.46	**7.24**	7.29	-3,0	-0.7	7.46	**7.24**	7.29	-3,0	-0.7	-	**-**	-	-	-
EE	3.97	**3.44**	3.14	-13.4	9.3	3.97	**3.44**	3.14	-13.4	9.3	-	**-**	-	-	-
ES	2.37	**3.29**	2.94	38.9	11.9	2.66	**3.42**	3.19	28.5	7.2	1.09	**2.69**	2.08	147.4	29.5
FI	3.76	**3.86**	3.74	2.9	3.4	3.76	**3.86**	3.74	2.9	3.4	-	**-**	-	-	-
FR	7.2	**6.92**	7.03	-3.9	-1.5	7.36	**7.08**	7.2	-3.7	-1.6	5.45	**4.94**	5.06	-9.4	-2.4
GR	2.42	**2.75**	2.74	13.4	0.1	2.83	**3.02**	2.99	6.7	0.9	2.31	**2.67**	2.66	15.7	0.3
HU	3.73	**4.27**	4.1	14.5	4.4	3.73	**4.28**	4.1	14.5	4.3	3.7	**4.11**	3.8	+11,0	8.2
IE	8.53	**9.09**	8.83	6.5	2.9	8.53	**9.09**	8.83	6.5	2.9	-	**-**	-	-	-
IT	4.07	**3.93**	3.82	-3.5	2.9	5.85	**5.53**	5.38	-5.4	2.8	3.26	**3.19**	3.13	-2.3	1.9
LT	3.93	**4.12**	3.82	4.9	7.9	3.93	**4.12**	3.82	4.9	7.9	-	**-**	-	-	-
LU	5.82	**5.97**	6.11	2.6	-2.4	5.82	**5.97**	6.11	2.6	-2.4	-	**-**	-	-	-
LV	3.8	**3.81**	3.53	0.4	8.1	3.8	**3.81**	3.53	0.4	8.1	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	8.74	**8.71**	8.69	-0.2	0.3	8.74	**8.71**	8.69	-0.2	0.3	-	**-**	-	-	-
PL	4.12	**4.26**	4.18	3.4	+2,0	4.12	**4.26**	4.18	3.4	+2,0	-	**-**	-	-	-
PT	0.86	**1.86**	1.48	116.4	25.6	0.86	**1.86**	1.48	116.4	25.6	-	**-**	-	-	-
RO	2.55	**3.07**	2.95	20.4	4.2	2.55	**3.07**	2.95	20.4	4.2	-	**-**	-	-	-
SE	6.27	**5.87**	5.85	-6.4	0.4	6.27	**5.87**	5.85	-6.4	0.4	-	**-**	-	-	-
SI	5.44	**4.75**	4.78	-12.6	-0.6	5.44	**4.75**	4.78	-12.6	-0.6	-	**-**	-	-	-
SK	3.38	**3.96**	4.05	+17,0	-2.4	3.38	**3.95**	4.05	16.7	-2.4	-	**-**	-	-	-
UK	6.68	**8.02**	7.66	20.1	4.7	6.68	**8.02**	7.66	20.1	4.7	-	**-**	-	-	-
HR	*5.34*	***4.86***	*4.86*	*-9.1*	*+0,0*	*5.34*	***4.86***	*4.86*	*-9.1*	*+0,0*	**-**	**-**	**-**	-	-

Country	TOTAL BARLEY (t/ha)					SPRING BARLEY (t/ha)					WINTER BARLEY (t/ha)				
	2012	2013	Avg 5yrs	%13/12	%13/5yrs	2012	2013	Avg 5yrs	%13/12	%13/5yrs	2012	2013	Avg 5yrs	%13/12	%13/5yrs
EU27	4.35	**4.48**	4.38	2.8	2.2	3.86	**3.99**	3.82	3.1	4.4	5.23	**5.27**	5.11	0.8	3.2
AT	4.28	**4.97**	4.83	16.1	2.8	3.19	**4.19**	4.08	31.3	2.7	5.29	**5.66**	5.61	+7,0	+1,0
BE	7.95	**8.6**	8.43	8.1	+2,0	-	**-**	-	-	-	7.95	**8.6**	8.43	8.1	+2,0
BG	3.65	**3.79**	3.66	4.1	3.7	3.83	**2.97**	2.97	-22.5	+0,0	3.64	**3.85**	3.69	5.8	4.3
CY	1.71	**1.55**	1.44	-9.4	7.5	-	**-**	-	-	-	1.71	**1.55**	1.44	-9.4	7.5
CZ	4.31	**4.25**	4.41	-1.5	-3.6	4.4	**4.19**	4.35	-4.7	-3.5	4.07	**4.43**	4.56	+9,0	-2.7
DE	6.16	**6.17**	6.11	+0,0	+1,0	5.51	**5.06**	5.06	-8.1	+0,0	6.49	**6.48**	6.48	-0.2	+0,0
DK	5.5	**5.39**	5.3	-2.1	1.6	5.35	**5.24**	5.14	-2,0	+2,0	6.41	**5.89**	5.95	-8,0	-1,0
EE	2.38	**2.7**	2.5	13.4	+8,0	2.38	**2.7**	2.5	13.4	+8,0	-	**-**	-	-	-
ES	2.23	**2.83**	2.74	26.5	3.3	2.27	**2.87**	2.8	26.3	2.6	2,00	**2.56**	2.4	27.9	6.8
FI	3.48	**3.58**	3.41	2.9	5.2	3.48	**3.58**	3.41	2.9	5.2	0,00	**-**	0,00	-	-
FR	6.74	**6.41**	6.48	-4.8	-1,0	6.66	**6.15**	6.23	-7.6	-1.3	6.79	**6.56**	6.59	-3.3	-0.4
GR	2.48	**2.55**	2.45	2.7	+4,0	-	**-**	-	-	-	2.48	**2.55**	2.45	2.7	+4,0
HU	3.6	**3.85**	3.71	+7,0	3.8	3.19	**3.38**	3.3	5.8	2.2	3.83	**4.1**	3.96	+7,0	3.6
IE	6.53	**7.12**	6.92	+9,0	2.9	6.11	**6.87**	6.62	12.4	3.7	8,00	**8.62**	8.52	7.7	1.1
IT	3.79	**3.62**	3.59	-4.5	0.8	-	**-**	-	-	-	3.79	**3.62**	3.59	-4.5	0.8
LT	3,00	**3.07**	2.9	2.3	5.8	3,00	**3.07**	2.9	2.3	5.8	-	**-**	-	-	-
LU	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
LV	2.5	**2.63**	2.49	5.1	5.5	2.5	**2.63**	2.49	5.1	5.5	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	6.7	**6.11**	6.22	-8.7	-1.7	6.7	**6.11**	6.22	-8.7	-1.7	-	**-**	-	-	-
PL	3.59	**3.42**	3.3	-4.6	3.8	3.55	**3.26**	3.15	-8.3	3.5	3.85	**4.08**	3.98	5.9	2.4
PT	0.73	**1.89**	1.52	158.7	24.5	-	**-**	-	-	-	0.73	**1.89**	1.52	158.7	24.5
RO	2.37	**2.7**	2.73	13.9	-1.1	1.94	**2.03**	2.03	4.6	-0.2	2.6	**2.94**	3.12	13.2	-5.7
SE	4.6	**4.38**	4.36	-4.9	0.4	4.54	**4.35**	4.31	-4.3	0.8	6.99	**5.27**	5.48	-24.6	-3.8
SI	4.72	**4.26**	4.21	-9.7	1.3	-	**-**	-	-	-	4.72	**4.26**	4.21	-9.7	1.3
SK	3.24	**3.46**	3.5	6.8	-1.2	3.25	**3.46**	3.49	6.3	-1,0	3.17	**3.48**	3.6	9.7	-3.3
UK	5.52	**5.52**	5.73	0.1	-3.6	4.94	**5.25**	5.3	6.1	-1,0	6.42	**6.31**	6.41	-1.7	-1.5
HR	*4.14*	***3.96***	*3.96*	*-4.4*	*+0,0*	-	**-**	-	-	-	*4.14*	***3.96***	*3.96*	*-4.4*	*+0,0*

Country	GRAIN MAIZE (t/ha)					RYE (t/ha)					TRITICALE (t/ha)				
	2012	2013	Avg 5yrs	%13/12	%13/5yrs	2012	2013	Avg 5yrs	%13/12	%13/5yrs	2012	2013	Avg 5yrs	%13/12	%13/5yrs
EU27	5.91	**6.96**	6.97	17.7	-0.1	3.7	**3.53**	3.33	-4.7	5.9	4.12	**4.09**	4.06	-0.7	0.9
AT	9.72	**10.67**	10.48	9.8	1.8	3.9	**4.08**	3.96	4.5	+3,0	4.7	**5.09**	4.99	8.3	1.9
BE	12.02	**12.34**	11.99	2.6	2.9	-	**-**	-	-	-	-	**-**	-	-	-
BG	3.73	**4.99**	4.78	33.8	4.3	-	**-**	-	-	-	2.72	**3,00**	3.16	10.5	-5,0
CY	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
CZ	7.15	**7.77**	7.69	8.7	1.1	4.79	**4.39**	4.5	-8.2	-2.3	4.46	**4.23**	4.29	-5.2	-1.4
DE	8.78	**9.6**	9.6	9.3	+0,0	5.48	**5.06**	4.99	-7.8	1.2	6.04	**5.81**	5.79	-3.8	0.4
DK	5.62	**-**	5.22	-	-	6.2	**5.5**	5.35	-11.3	2.9	5.41	**5.21**	5.17	-3.6	0.8
EE	-	**-**	-	-	-	3.55	**2.98**	2.68	-16.2	11.1	-	**-**	-	-	-
ES	10.71	**10.44**	10.54	-2.5	-0.9	1.61	**1.93**	1.98	+20,0	-2.6	1.68	**2.19**	2.24	30.1	-2.4
FI	-	**-**	-	-	-	2.91	**2.84**	2.71	-2.3	4.9	-	**-**	-	-	-
FR	9.18	**9.27**	9.24	0.9	0.3	5.05	**4.67**	4.92	-7.5	-5.1	5.58	**5.28**	5.41	-5.4	-2.4
GR	10.61	**10.79**	10.79	1.7	+0,0	2.11	**2.3**	2.08	9.1	10.6	-	**-**	-	-	-
HU	3.56	**6.4**	6.08	79.4	5.2	2.25	**2.52**	2.2	12.2	14.7	3.11	**3.75**	3.27	20.5	14.7
IE	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
IT	8.74	**9.21**	9.23	5.3	-0.2	-	**-**	-	-	-	-	**-**	-	-	-
LT	6.5	**7.24**	5.84	11.4	23.9	2.7	**2.49**	2.38	-7.9	4.5	3.39	**3,00**	2.92	-11.3	3.1
LU	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	3.1	**3.12**	2.97	0.6	+5,0	2.7	**2.3**	2.48	-14.6	-7.1
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	11.3	**12.19**	11.92	7.9	2.2	-	**-**	-	-	-	-	**-**	-	-	-
PL	6.74	**6.51**	6.39	-3.4	+2,0	2.75	**2.53**	2.52	-8.1	0.2	3.36	**3.44**	3.41	2.5	+1,0
PT	7.39	**7.34**	7.09	-0.6	3.6	0.9	**0.94**	0.92	4.2	+2,0	0.87	**1.49**	1.32	70.5	12.4
RO	1.96	**3.46**	3.49	76.5	-0.9	-	**-**	-	-	-	2.98	**3.18**	3.03	+7,0	+5,0
SE	-	**-**	-	-	-	6.07	**5.9**	5.76	-2.7	2.4	5.72	**4.94**	4.99	-13.6	-1,0
SI	7.64	**8,00**	8.01	4.8	+0,0	-	**-**	-	-	-	-	**-**	-	-	-
SK	5.64	**6.16**	6.72	9.2	-8.4	3.13	**2.82**	2.89	-9.9	-2.5	-	**-**	-	-	-
UK	-	**-**	-	-	-	-	**-**	-	-	-	3.57	**3.9**	4.03	9.2	-3.2
HR	*6.95*	***6.99***	*6.99*	*0.5*	*+0,0*	-	**-**	-	-	-	-	**-**	-	-	-

Country	RAPE AND TURNIP RAPE (t/ha)					POTATO (t/ha)				
	2012	2013	Avg 5yrs	%13/12	%13/5yrs	2012	2013	Avg 5yrs	%13/12	%13/5yrs
EU27	3.10	**3.09**	3.04	-0.1	+1.8	30.61	**31.53**	30.67	+3.0	+2.8
AT	2.67	**3.03**	3.06	+13.3	-1.2	30.55	**32.43**	32.51	+6.2	-0.2
BE	3.93	**4.17**	4.09	+6.2	+1.9	45.42	**46.26**	45.73	+1.9	+1.2
BG	1.99	**2.72**	2.32	+36.6	+17.0	11.16	**16.87**	15.30	+51.2	+10.3
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	2.76	**2.86**	2.90	+3.7	-1.4	27.98	**27.20**	27.01	-2.8	+0.7
DE	3.69	**3.78**	3.71	+2.5	+2.0	44.76	**43.69**	43.69	-2.4	+0.0
DK	3.70	**3.61**	3.63	-2,4	-0.4	39.00	**39.85**	39.36	+2.2	+1.2
EE	1.89	**1.83**	1.59	-3.2	+15.4	-	**-**	-	-	-
ES	1.80	**2.00**	1.81	+11.2	+10.7	30.06	**29.90**	29.71	-0.5	+0.7
FI	1.28	**1.26**	1.36	-1.7	-7.4	23.65	**27.41**	26.37	+15.9	+4.0
FR	3.41	**3.32**	3.45	-2.6	-3.7	40.87	**43.77**	43.43	+7.1	+0.8
GR	-	**-**	-	-	-	25.47	**26.61**	25.60	+4.5	+3.9
HU	2.46	**2.52**	2,33	+2.5	+8.4	23.13	**26.81**	25.46	+15.9	+5.3
IE	-	**-**	-	-	-	-	**-**	-	-	-
IT	2.58	**2.40**	2.33	-6.8	+3.0	25.43	**24.69**	24.90	-2.9	-0.8
LT	2.43	**2.03**	2.05	-16.3	-0.6	17.11	**15.36**	14.95	-10.2	+2.8
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	2.65	**2.38**	2.25	-10.2	+5.9	19.57	**16.97**	17.61	-13.3	-3.7
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	-	**-**	-	-	-	45.18	**44.93**	45.43	-0.6	-1.1
PL	2.59	**2.81**	2.60	+8.6	+8.2	24.24	**22.63**	21.36	-6.7	+5.9
PT	-	**-**	-	-	-	14.71	**15.95**	15.33	+8.4	+4.0
RO	1.60	**1.92**	1.70	+20.2	+13.3	10.76	**14.36**	14.09	+33.4	+1.9
SE	2.57	**2.70**	2.73	+5.1	-0.9	32.55	**31.78**	31.58	-2.4	+0.6
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	1.99	**2.18**	2.24	+9.8	-2.4	-	**-**	-	-	-
UK	3.40	**3.50**	3.47	+3.0	+0.8	35.00	**40.50**	41.45	+15.7	-2.3
HR	*2.67*	***2.62***	*2.62*	*-1.7*	*+0.0*	*14.73*	***17.15***	*16.56*	*+16.4*	*+3.6*

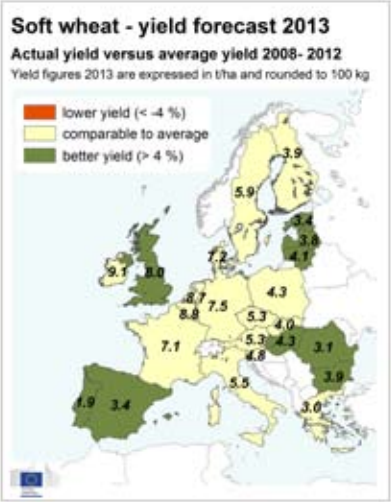
Country	SUGAR BEETS (t/ha)					SUNFLOWER (t/ha)				
	2012	2013	Avg 5yrs	%13/12	%13/5yrs	2012	2013	Avg 5yrs	%13/12	%13/5yrs
EU27	70.35	**71.06**	70.01	+1,0	1.5	1.65	**1.8**	1.82	9.1	-1.2
AT	63.22	**70.19**	69.88	+11,0	0.4	2.27	**2.58**	2.69	13.5	-4.1
BE	73.68	**77.23**	78.39	4.8	-1.5	-	**-**	-	-	-
BG	-	**-**	-	-	-	1.8	**1.92**	1.91	6.7	0.5
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	63.26	**61.89**	59.91	-2.2	3.3	2.31	**2.33**	2.35	0.9	-1,0
DE	69.36	**67.57**	67.57	-2.6	+0,0	2.33	**2.12**	2.12	-9.3	+0,0
DK	67.61	**62.57**	61.05	-7.5	2.5	-	**-**	-	-	-
EE	-	**-**	-	-	-	-	**-**	-	-	-
ES	88.71	**93.46**	85.6	5.4	9.2	0.81	**1.06**	1.1	31.4	-3.6
FI	34.67	**40.53**	38.38	16.9	5.6	-	**-**	-	-	-
FR	87.52	**92.32**	89.16	5.5	3.5	2.32	**2.39**	2.42	3.1	-1.3
GR	58.98	**-**	64.73	-	-	1.28	**1.46**	1.46	14.2	+0,0
HU	43.86	**56.34**	54.52	28.4	3.3	2.15	**2.41**	2.29	+12,0	+5,0
IE	-	**-**	-	-	-	-	**-**	-	-	-
IT	54.92	**57.07**	56.14	3.9	1.7	1.66	**2.22**	2.13	33.7	4.3
LT	52.24	**51.46**	46.49	-1.5	10.7	-	**-**	-	-	-
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	78.86	**79.24**	76.95	0.5	+3,0	-	**-**	-	-	-
PL	58.25	**55.03**	52.94	-5.5	+4,0	-	**-**	-	-	-
PT	-	**-**	-	-	-	0.56	**0.58**	0.57	+3,0	0.5
RO	26.93	**35.29**	34.76	31.1	1.5	1.37	**1.43**	1.53	4.2	-6.7
SE	55.78	**56.63**	56.99	1.5	-0.6	-	**-**	-	-	-
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	45.41	**56.21**	56.35	23.8	-0.2	2.19	**2.04**	2.21	-6.8	-7.8
UK	70,00	**67.46**	67.72	-3.6	-0.4	-	**-**	-	-	-
HR	*39.1*	***51.32***	*51.14*	*31.2*	*0.3*	*2.68*	***2.65***	*2.7*	*-1.1*	*-2,0*

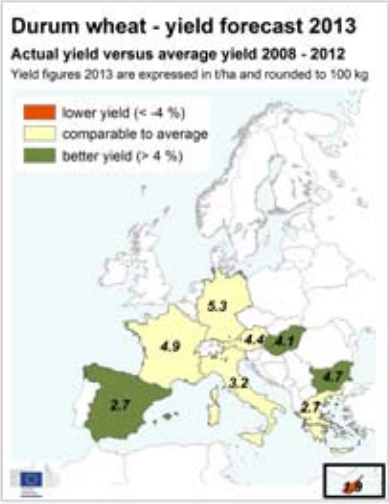
Notes: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 100 kg
Sources: 2008-2013 data come from DG AGRICULTURE short term Outlook data (dated March 2013, received on 02/04/2013), EUROSTAT Eurobase (last update: 04/04/2013) and EES (last update: 19/03/2013)
2013 yields come from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 20/04/2013)

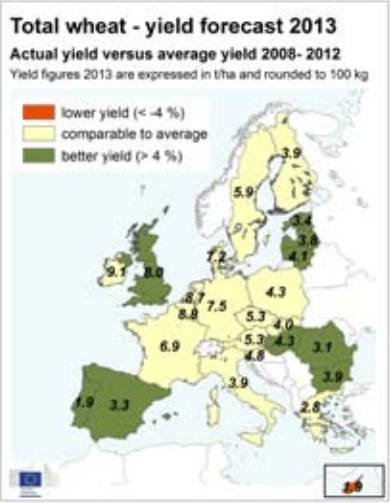
Country	WHEAT (t/ha)					BARLEY(t/ha)					GRAIN MAIZE (t/ha)				
	2012	2013	Avg 5yrs	%13/12	%13/5yrs	2012	2013	Avg 5yrs	%13/12	%13/5yrs	2012	2013	Avg 5yrs	%13/12	%13/5yrs
BY	3.5	**3.67**	3.44	4.7	6.6	3.23	**3.39**	3.24	5.1	4.8	5.26	5.95	**5.17**	13,00	+15,0
DZ	1.76	**1.71**	1.5	-3.3	14.1	1.54	**1.54**	1.36	+0,0	13.7	-	-	**-**	-	-
MA	**-**	**-**	**-**	-	-	0.63	**1.25**	1.13	+99,0	10.8	-	-	-	-	-
TN	1.93	**1.66**	1.86	-14.2	-10.9	1.16	**1.06**	1.26	-8.4	-15.6	-	-	**-**	-	-
TR	-	**2.68**	-	-	-	2.58	**2.59**	2.42	0.2	7.1	7.38	7.23	**7.23**	-2,00	+0,0
UA	2.8	**2.95**	3.12	5.5	-5.3	2.11	**2.34**	2.39	10.7	-2.2	4.79	5.3	**5.09**	10.7	4.1

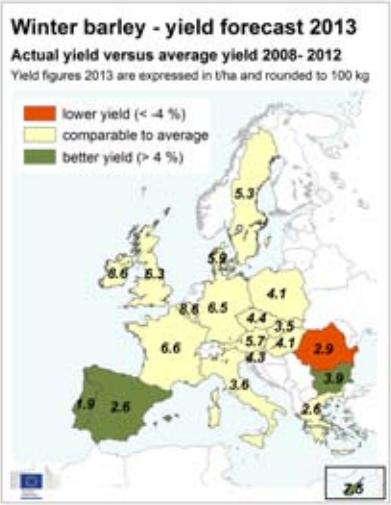
Notes: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 100 kg
Sources: 2008-2013 data come from FAO, PSD-online, INRA Maroc, Min AGRI Tunisia and DSASI Algeria
2013 yields come from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 20/04/2013)

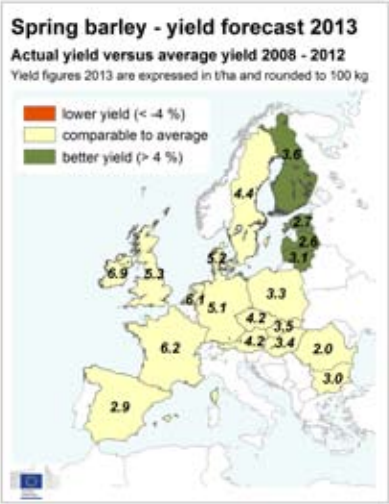
Yield maps

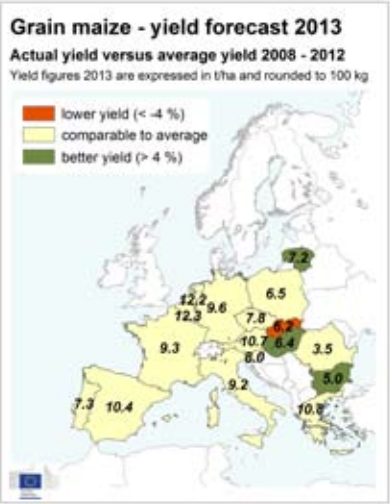

Soft wheat - yield forecast 2013
Actual yield versus average yield 2008- 2012
Yield figures 2013 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

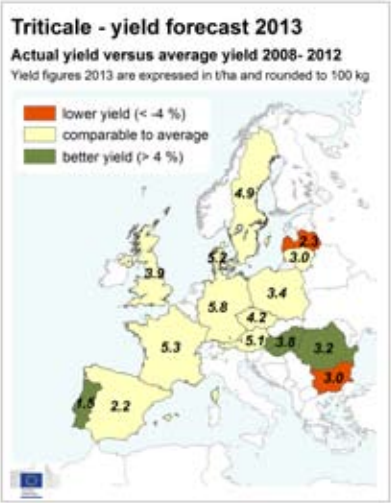

Durum wheat - yield forecast 2013
Actual yield versus average yield 2008 - 2012
Yield figures 2013 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

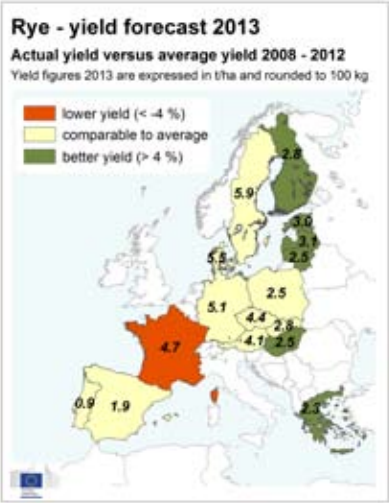

Total wheat - yield forecast 2013
Actual yield versus average yield 2008- 2012
Yield figures 2013 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

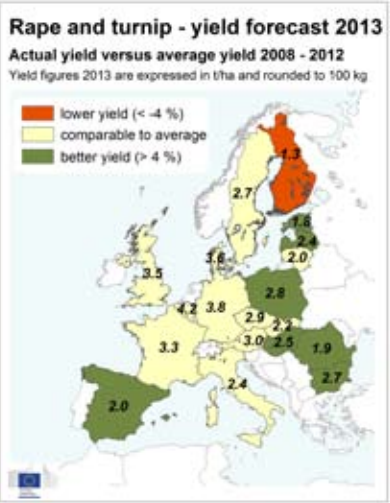

Winter barley - yield forecast 2013
Actual yield versus average yield 2008- 2012
Yield figures 2013 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Spring barley - yield forecast 2013
Actual yield versus average yield 2008 - 2012
Yield figures 2013 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)


Grain maize - yield forecast 2013
Actual yield versus average yield 2008 - 2012
Yield figures 2013 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

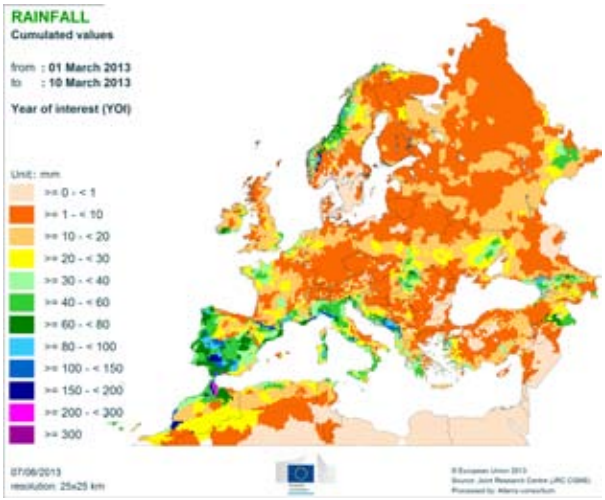

Triticale - yield forecast 2013
Actual yield versus average yield 2008- 2012
Yield figures 2013 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

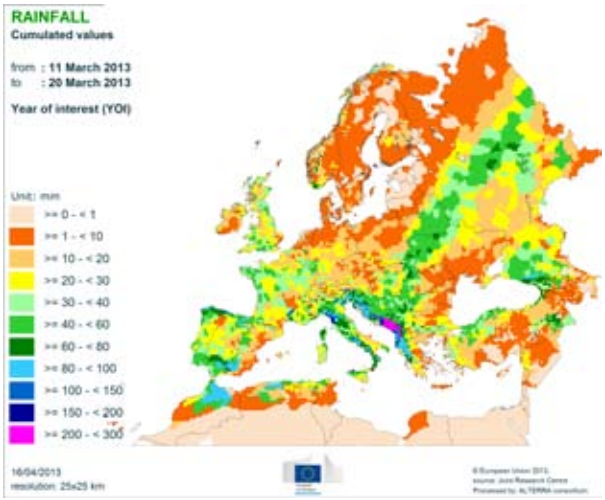

Rye - yield forecast 2013
Actual yield versus average yield 2008 - 2012
Yield figures 2013 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

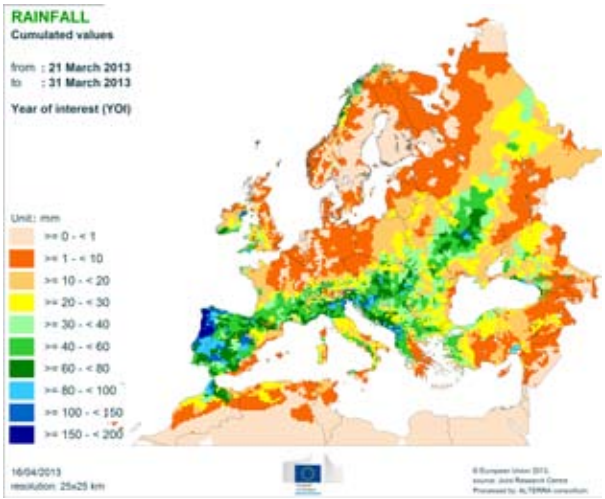

Rape and turnip - yield forecast 2013
Actual yield versus average yield 2008 - 2012
Yield figures 2013 are expressed in t/ha and rounded to 100 kg
lower yield (< -4 %)
comparable to average
better yield (> 4 %)

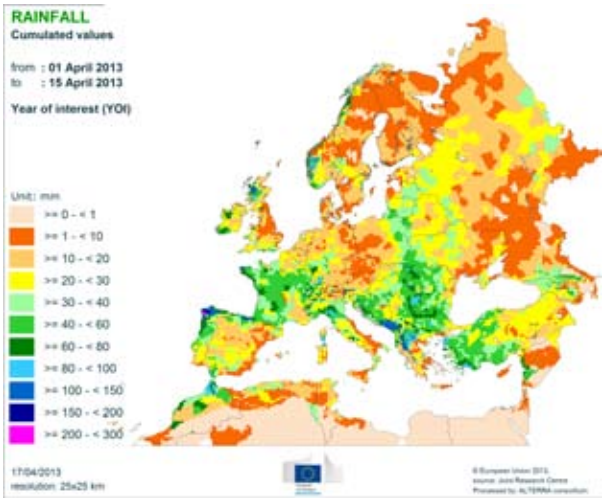
5. Atlas maps

Precipitation

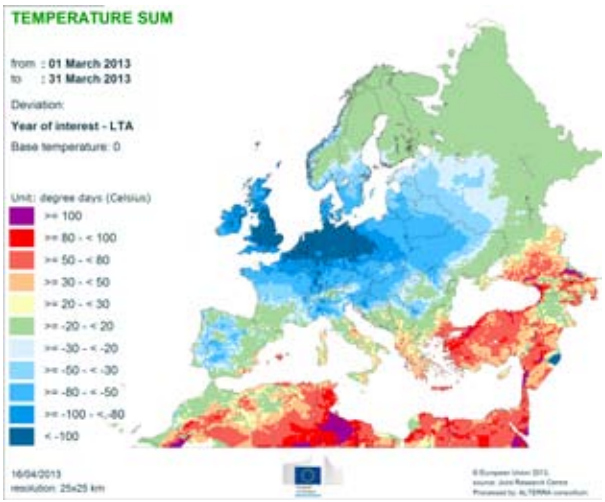


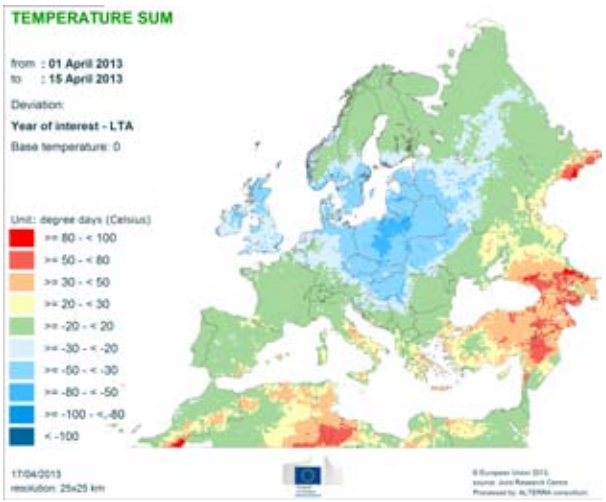




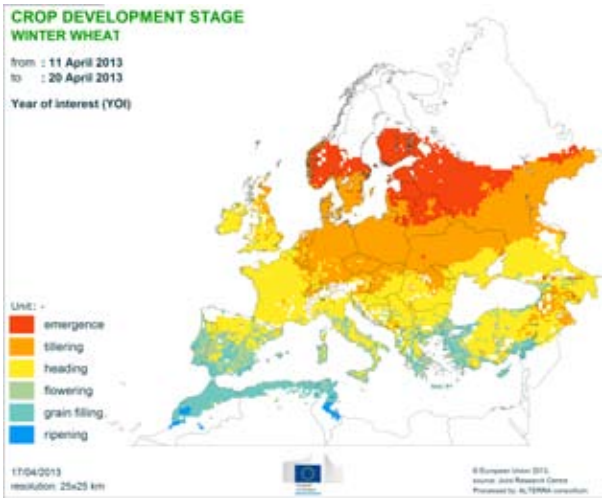


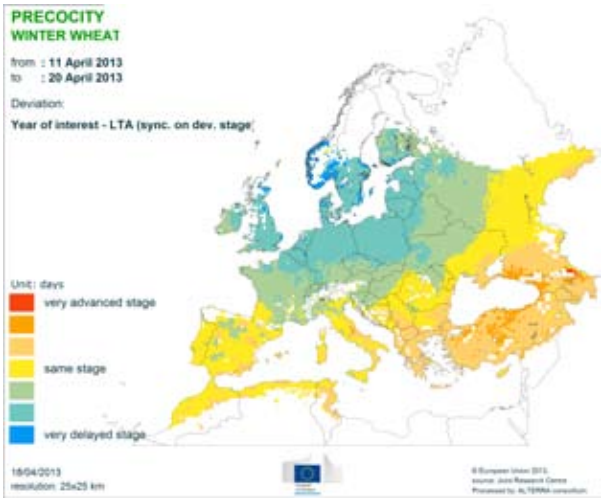
Temperature regime

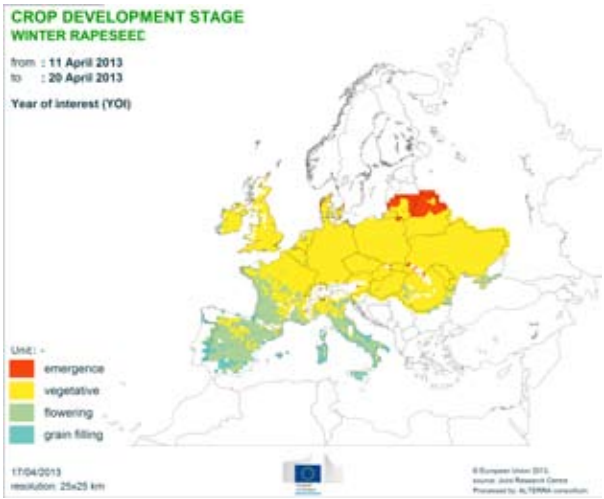


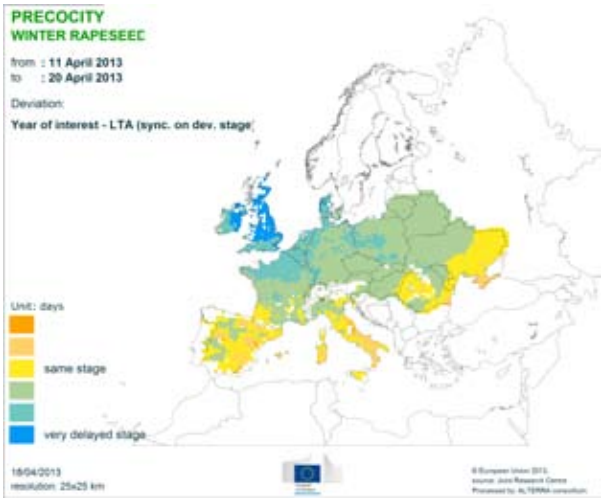


Crop development stage and precocity

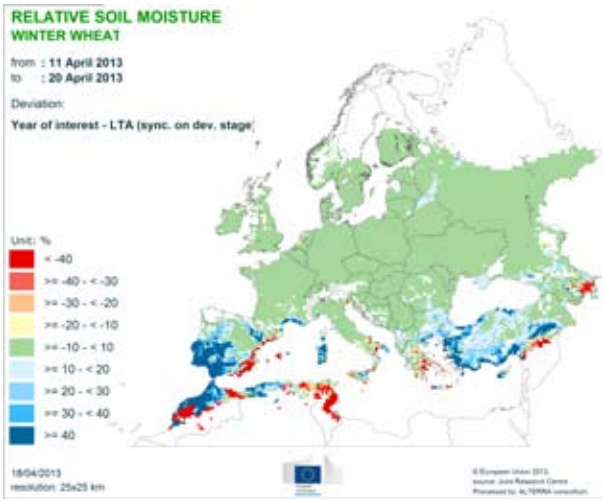


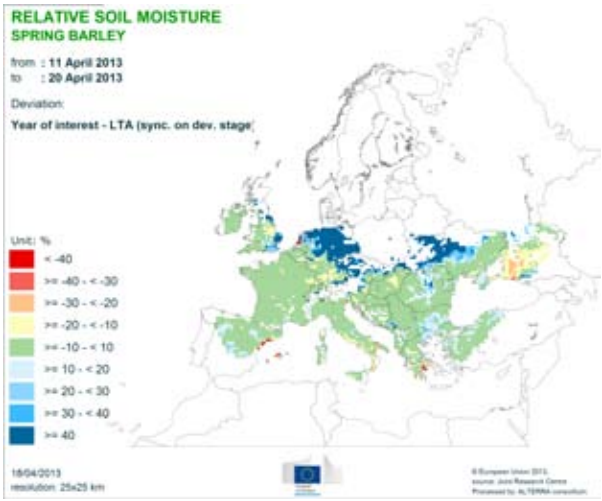






Relative soil moisture





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2013 MARS Bulletins

Date	Publication	Reference
21 Jan	Agromet. analysis	Vol. 21 No. 1
25 Feb	Agromet. analysis	Vol. 21 No. 2
25 Mar	Agromet. analysis and yield forecast	Vol. 21 No. 3
22 Apr	Agromet. analysis, remote sensing analysis, and yield forecast	Vol. 21 No. 4
21 May	Agromet. analysis, remote sensing analysis, and yield forecast, pasture analysis	Vol. 21 No. 5
17 Jun	Agromet. analysis, remote sensing analysis, and yield forecast, pasture update	Vol. 21 No. 6
22 Jul	Agromet. analysis, remote sensing analysis, and yield forecast, pasture update, rice analysis	Vol. 21 No. 7
26 Aug	Agromet. analysis and yield forecast, pasture update	Vol. 21 No. 8
16 Sep	Agromet. analysis, remote sensing analysis and yield forecast, pasture update	Vol. 21 No. 9
21 Oct	Agromet. analysis, remote sensing analysis and yield forecast, pasture analysis, rice analysis	Vol. 21 No. 10
25 Nov	Agromet. analysis, campaign review and yield forecast	Vol. 21 No. 11
16 Dec	Agromet. analysis	Vol. 21 No. 12

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