ISSN 1725-5813
EUR 23298 EN-2009

MARS AGROMETEOROLOGICAL

Crop Monitoring in Europe

21st November 2008 to 28th February 2009 Vol. 17, No 1

Mild to seasonal winter with positive outlook

Highlights

General mild to seasonal autumn and second part of the winter determined quite favourable conditions for winter crops. Only in western EU (Iberia, France, western Germany) cooler conditions were recorded. Extremely low temperatures in January were observed, with likely frost impacts in France and the Black Sea area. The autumn was worryingly dry in Iberia but all the Mediterranean received beneficial winter rain. For central EU, a persistent water shortage was noted.

At a glance, crop conditions are considered normal and no severe decrease in yield potential as a consequence of the winter is expected.

Among the winter crops, we have seen favourable conditions for **durum wheat** production areas (except in Spain), which received abundant water supplies that are very important for the next reproductive period. However, in terms of general production, the likely reduction in cultivated areas will compensate the expected high yield. Also for **soft wheat** general good yields are forecasted for the main producers. On the contrary, **rape seed** showed a lower level of yield even when compared with the 5-year average, mainly due to the delay in development simulated in Germany, Poland and UK.

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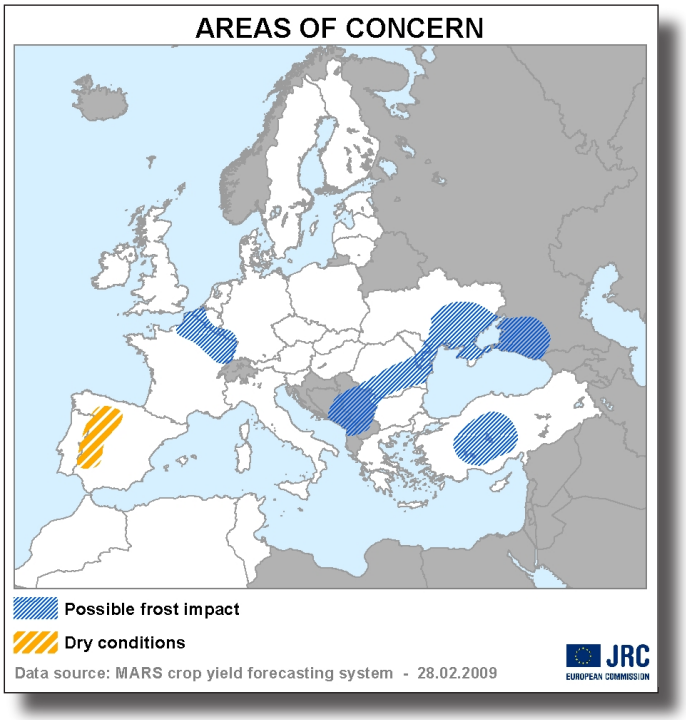

JRC EUROPEAN COMMISSION

EC publication from JRC/IPSC/MARS/AGRI4CAST (mars-stat@jrc.it)
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1. Agrometeorological overview

1.1. Temperature and evapotranspiration

Autumn was fairly mild in eastern Europe and slightly cooler than average in the western EU and Maghreb. Followed again by a temperate winter, at the beginning of January extremely low temperatures occurred. Sparse rain was recorded in autumn in the central EU, eastern Black Sea and western Iberia; it was abundant in Italy, southern France, former Yugoslavia and Morocco.

For the third consecutive year, in most of Europe (mainly the eastern side), autumn was again characterised by milder than seasonal temperatures, even milder than the past year. These conditions persisted both in November and December and particularly on the eastern side of the continent, whilst on the western side (France, Spain, Portugal) more seasonal or slightly cooler than seasonal temperatures were recorded. At the end of the year, a marked surplus of accumulated GDD (+ 100°/+ 150° GDD, equivalent to >+ 40 % as compared with the LTA), was present in eastern Germany and in particular in the eastern EU, Balkans, northern and eastern Italy and the northern Black Sea area. On the other hand, in the Iberian peninsula, Morocco and Algeria, a deficit was recorded: – 100°/– 150° GDD (– 20 % as compared with the LTA). Those surpluses were mainly due to the higher than seasonal both maximum and minimum daily values recorded during this period, mainly in November. The higher temperatures were favourable to a rapid germination and tilling of the new winter cereals but meanwhile exposed the new plants to a higher risk of frost damage. In the second half of December, however, a progressive but rapid drop of temperatures occurred mainly in eastern Europe favouring the 'hardening' process in winter cereals.

In central and eastern Europe, despite the very low temperatures recorded during the first half of January, higher GDD accumulations were recorded between January and February. At the end of the period under consideration, around the Black Sea areas and the Balkans, more than 100° GDD of surplus were counted. On the other hand, in France, Benelux and the southern UK, a deficit estimable at 60–80° GDD occurred.

However, as briefly mentioned above, it must be noted that during the first half of January, extremely low temperatures occurred (lower than – 20 °C) over most of the continent, with the exception of the Mediterranean areas, and in particular in the central and eastern EU (north-western France, Germany, Poland, the Czech Republic, Slovakia, Romania, Ukraine, Turkey). Locally, the insufficient snow cover depth did not completely protect the vegetation and plants, and injuries (leaf area reduction) were likely. A positive impact of these frost events was the increased mortality of pests (mainly insects) unable to survive under these extreme conditions.

In February, generally more seasonal temperatures were recorded, again with the exception of the Black Sea areas where, especially during the second dekad, decidedly milder than seasonal temperatures occurred: the maximum daily values were on average 6–8 °C above the LTA. Locally in Bulgaria, south-east Romania, southern Ukraine and northern Turkey, and between Russia and Georgia, the recorded daily values reached 18–20 °C. The minimum temperatures were even milder, with differences greater than 8–10 °C as compared with the LTA.

In relation to the relatively low temperatures and the modest level of solar radiation during the winter, the cumulated values of potential evapotranspiration were only marginally influenced and small differences appeared as compared with the LTA. Generally lower cumulated values were recorded in Great Britain.

Abstract

The 1st 2009 printed MARS Bulletin (Vol. 17, No 1) covers meteorological analysis and crop yield forecasts for the period 21 November 2008 to 28 February 2009.

Previous related analysis available:

—Climatic update, 01/01/2009 to 15/02/2009, (CU2009/1)

—Complete Bulletin, 01/09/2008 to 20/11/2008 (Vol. 16, No 6)

Next printed issue

Vol. 17, No 2: 1 March - 30 April 2009 analysis and forecasts.

Contributions

The ***MARS technical report*** is an EC publication from JRC/IPSC MARS Unit-AGRI4CAST Action

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MARS stands for Monitoring Agricultural Resources.

Technical note:

The long-term average used within this bulletin as a reference is based on an archive of data covering 1975–2008.

The CNDVI is an unmixed normalised vegetation index on the base of Corine land cover 2000 for arable land or grassland.

Disclaimer:

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

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JRC 50331 - EUR 23298 EN, EUR – Scientific and Technical Research series – ISSN 1725-5813

Luxembourg: Office for Official Publications of the European Communities,

2009 – 20 pp. – 21.0 x 29.7 cm, © European Communities, 2009

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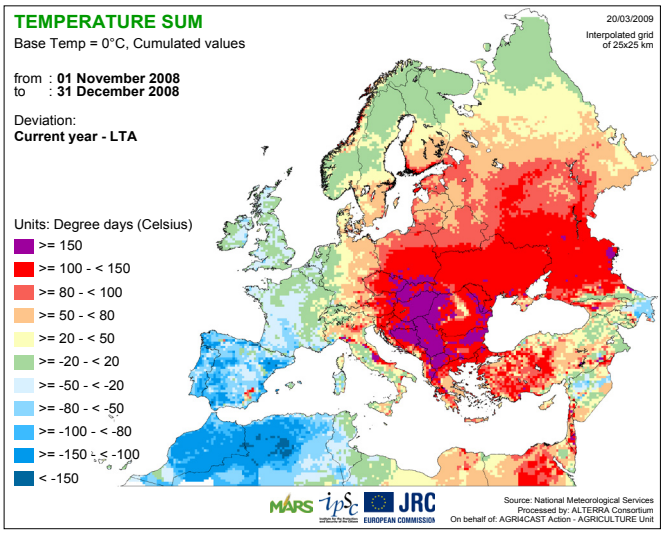
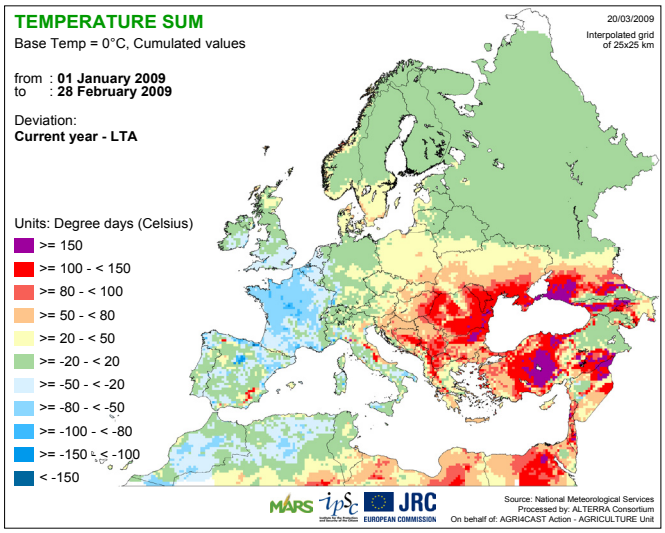




1.2. Rainfall and climatic water balance

Quite a wet and favourable autumn in the Mediterranean; decidedly dry in the central EU, Iberian peninsula, Bulgaria, eastern Black Sea and Tunisia. In winter, it was quite wet again in all the Mediterranean regions (especially in Italy and the eastern side) and still relatively dry in the central EU (mainly Germany, Poland, Denmark).

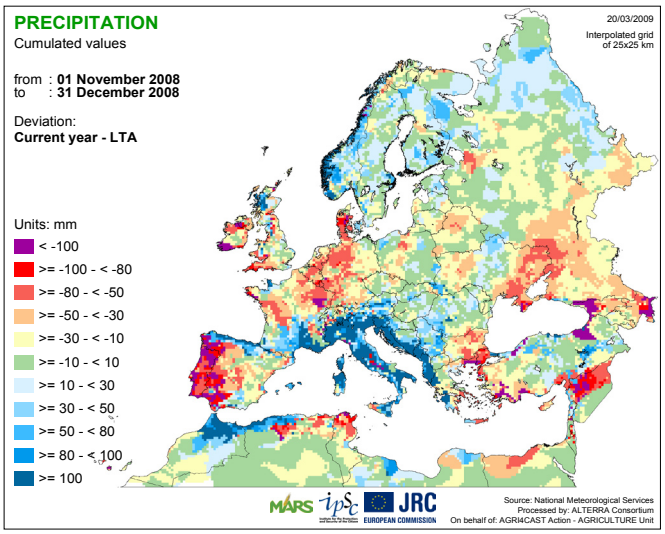
As a whole, quantitatively the rains were more abundant in the areas facing the Mediterranean basin (except the Iberian peninsula), whilst they were scarce in the central EU, particularly in Germany, eastern France, Denmark, central Poland, western Spain and southern Ukraine.

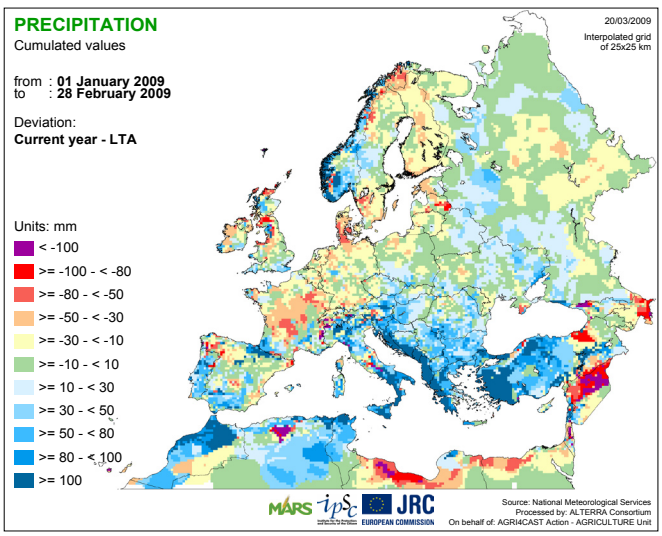
The rain which occurred in the Mediterranean areas, although probably disturbing field preparation and the timely sowing of winter cereals, was particularly favourable for refilling the soil water reservoirs and providing good future prospects.

During autumn, the rain was generally below the LTA in November with the exception of Italy, southern France, Morocco, Algeria and former Yugoslavia where it was largely above the average (>+ 50 %). In many other large areas (Portugal, western Spain, eastern France, Germany, Slovakia, Hungary, Bulgaria, Romania, north-east Greece, Moldova, Ukraine, Tunisia), the water supplies were decidedly scarce. Analogous conditions also occurred in December: there was quite scarce rain in the northern latitudes and Iberian peninsula (Portugal received only 15–20 mm, equivalent to 20 % of the expected amount of rain and representing the third consecutive month with a significant rain deficit) and abundant supplies in the Mediterranean and Balkans. Intense rainy events occurred locally in northern and central Italy, southern France and Slovenia.

January brought back more seasonal conditions, but again with relatively more rain in the central Mediterranean (southern Italy, Greece, Tunisia, southern Bulgaria, eastern Turkey) and fortunately with abundant rain too in Portugal (100–150 mm above the LTA). This was due to a particular and persistent synoptic circulation with high pressure centred on the Baltic Sea which pushed the Atlantic rainy fronts toward the southern latitudes through the Iberian peninsula into the Mediterranean. This also determined extremely intense thunderstorms (in southern Italy, Tunisia and along the eastern Adriatic coastlines) and very strong wind (in Spain and south-western France) with temporary flooding and damage (mainly on permanent crops).

In the central EU, reduced amounts of rain were recorded in January. The largest deficit occurred in eastern France (more than 100 mm below the LTA), western Germany, and locally in Denmark and southern Sweden.





The synoptic configuration characterising January also persisted during the first part of February and the rain was therefore again more abundant in the west (Portugal, north and southern Spain, Morocco) and the southern part of the continent (southern France, Italy, eastern Adriatic, Greece, eastern Turkey). As a whole, during the period under consideration, Italy received the highest amount of rain since 1975. All the central and eastern side of the EU and Europe remained virtually without rain. Opposite conditions occurred in the second dekad of February: it was dry over the entire western side of Europe, but significant water supplies were recorded solely in Romania, Bulgaria, Greece, western Turkey and Tunisia. Beneficial, although not very abundant, rain also occurred in western Germany affected by the relative water shortage in previous months.

2. Campaign analysis at country level

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France: generally seasonable conditions, except in January with severe frost; beneficial water supplies in southern regions

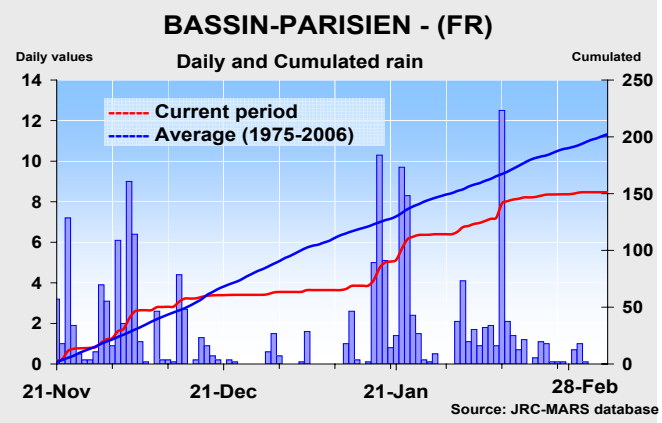
Generally seasonable conditions characterised both autumn and winter. In effect the cumulated active temperatures presented seasonal courses and generally the temperature fluctuations always remained within the normal ranges of variation.

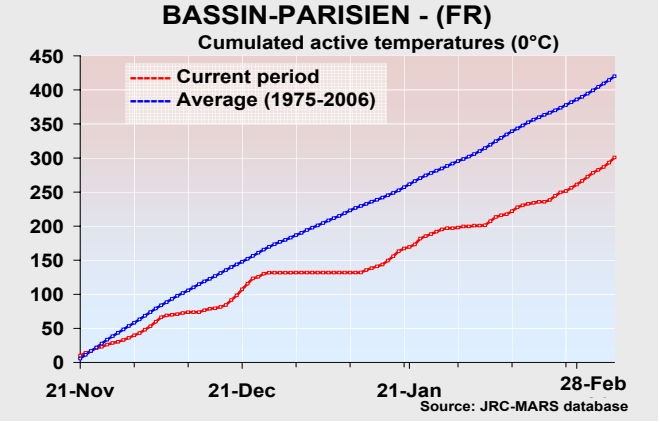
The only exception occurred during the first dekad of January when the temperatures, following a progressive reduction during the last part of December, dropped below the seasonal expected values. Between 5 and 7 January, over the whole eastern side, temperatures of around – 16 °C/– 18 °C were recorded. Despite this harsh frost and the reduced amount of snow, thanks to the good level of hardening reached at that time, damage to the active winter cereals should be limited or negligible. In the second half of January, more seasonal temperatures returned, repeated again in February. As a consequence of those thermal conditions, crop development was slowed down and, at the end of the period under consideration, one dekad of delay was estimated for winter cereal and more than two for rapeseed.

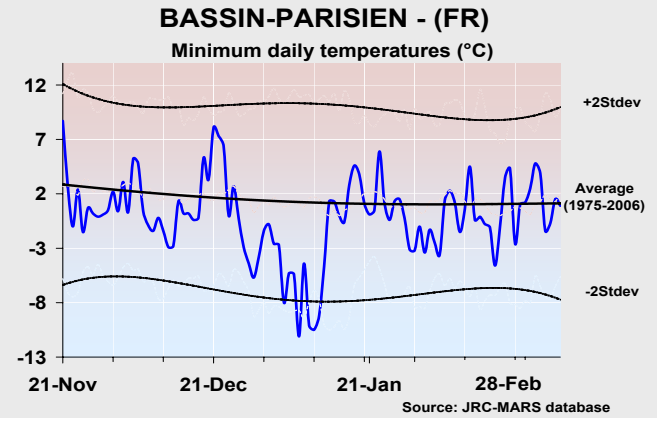
The cumulated rains also presented generally seasonal values. Positive and favourable differences were recorded in southern and south-western areas (Provence, Languedoc, Midi-Pyrenees) which received abundant rain particularly in November and between January and February. Moreover, the limited water consumption during the winter period allowed the creation of consistent soil water reservoirs. This water will be particularly favourable for durum wheat, which is mainly cultivated in these areas, as large quantities of water are required for the imminent future stages of development.

More seasonal amounts of rain were recorded on the northern side with a quite dry period (around 20 days) between December and mid-January. New rainy events occurred at the end of January and in February thus compensating the missing water supplies.

The yield forecast for durum wheat is 4.8 t/ha and for soft wheat 7.3 t/ha. Winter barley is expected at 6.5, – 5.5 % on last year's yield, and rapeseed at 3.3 t/ha.





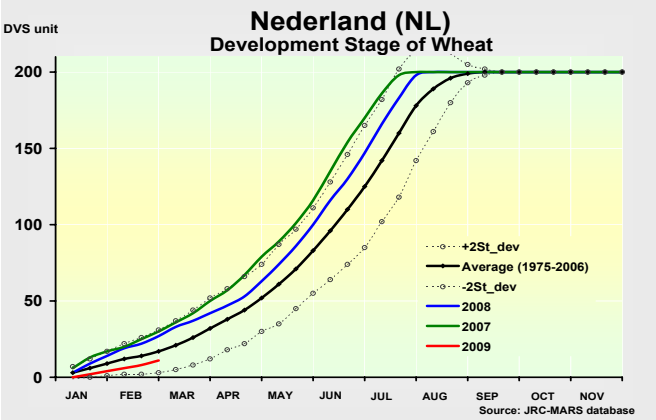


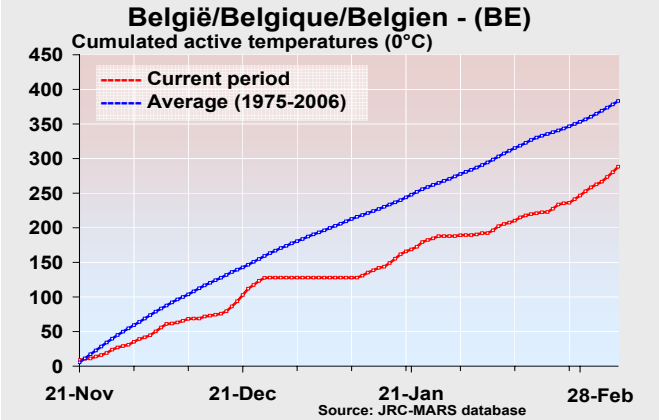
Belgium, the Netherlands, Luxembourg: cold air irruptions caused temperature drops; moderate overall conditions

The overall climatic conditions were not exceptional but allow moderate crop yield expectations.

In the three countries, colder temperatures compared with the LTA were recorded from the end of December onward with drops to around – 13 °C at the end of December in Belgium. The cumulated active temperature was much below the seasonal values, especially during February, related to frequent precipitations, while the cumulated solar radiation was equal to average values in almost all the cultivated areas. The sowing has been done with no major constraints as the rainfall events were well distributed with enough dry days along the sowing period. The cumulated rainfall from mid-November to mid-February has been recorded below the average. As a consequence, the soil moisture was at a normal level at the end of the period. The development stage of winter wheat is simulated slightly lower than average, maybe due to the scarce solar radiation after emergence.

Due to the non-optimal weather conditions, the yield on winter cereals is expected to be slightly lower than last year and only slightly higher than the five-year average. For soft wheat, 8.22 t/ha, – 1.7 % compared with 2008 in Belgium, 8.23 t/ha, + 5.8 % compared with 2008 in the Netherlands and 6.17 t/ha in Luxembourg is forecasted. For winter barley, a yield of 8.25 t/ha, + 3.29 % on 2008 and + 2.6 % on the average is forecasted in Belgium. The current climatic conditions are in the norm for the sowing of spring crops.

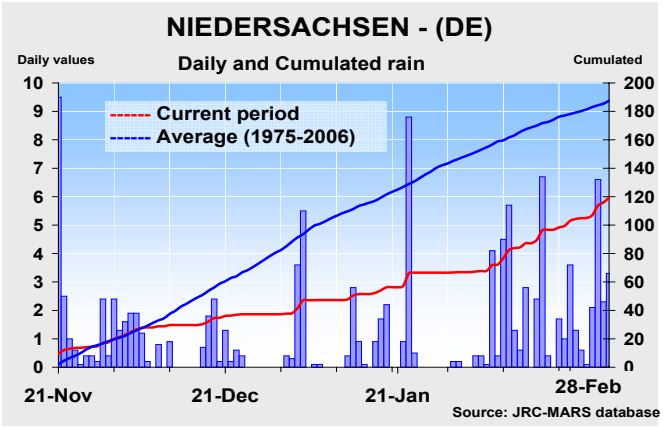


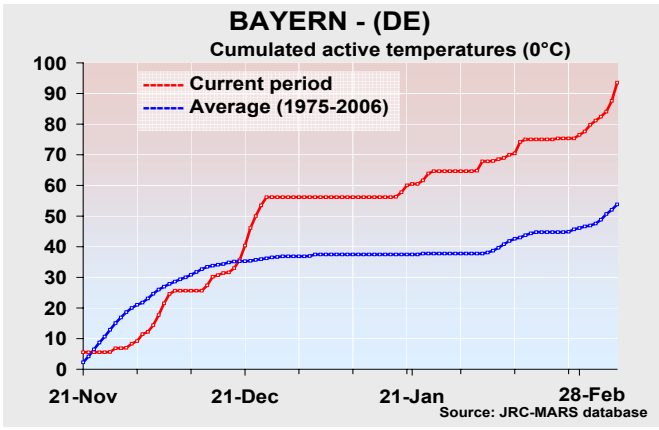


Germany: delayed development stages, but a good crop potential

Early development of winter cereals before the winter dormancy found near to optimal conditions during the autumn with a sufficient water supply and seasonal temperatures. Hardening of crops took place due to a progressive decrease of temperatures throughout November and December and thus a limited impact of the frost wave in early January is considered. In general, a mild to seasonal winter coupled with a modest rainfall deficit can be depicted.

Regarding average temperatures, Germany had a seasonal winter with slightly lower than normal temperatures (– 15 %) from December to February. Accumulated temperatures have been decidedly higher in the eastern and southern part of the country (> 30 % compared with the LTA) whereas north-western Germany (e.g. Niedersachsen) experienced seasonal values. The number of cold days (threshold 0 °C) was less for each of the winter months (December, January, February) as compared with the LTA for the whole of the country. Some big drops in temperatures were recorded in early January with temperatures locally below – 15 °C throughout the whole country. But as the temperature decreased from autumn onwards, continuously assuming a sufficient hardening of the plants, the impact in terms of frost kill on the crop biomass is considered limited. Moreover, the country was covered by snow (even if thin in some areas).

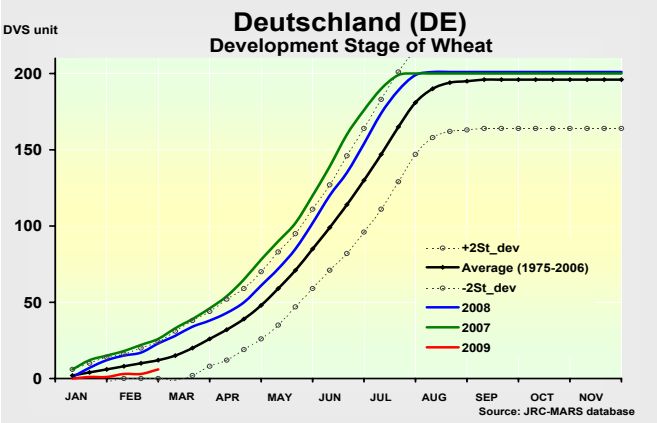


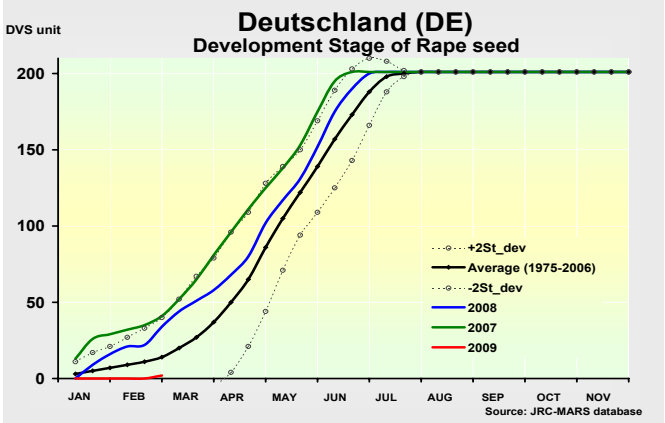


November, December (except the east), January and February (mainly southern Germany) were drier compared with the normal precipitation. The absolute deficit for the whole period averaged for the agricultural land is around 30 mm and thus a modest deficit. March has started with abundant rainfall replenishing the soil moisture.

The winter crops phenology driven by temperature sum shows a delayed stage of more than 10 days as temperature accumulation took place mainly in December before the start of the crop growth simulations.

As no major agrometeorological problems occurred through this winter, the wheat yield is forecasted at 7.56 t/ha, close to the average. The winter barley is also forecasted at a good level with 6.32 t/ha (– 2.4 % average). Due to the high yield amplitude, the rapeseed forecast is at this stage set close to the average (6.32 t/ha).





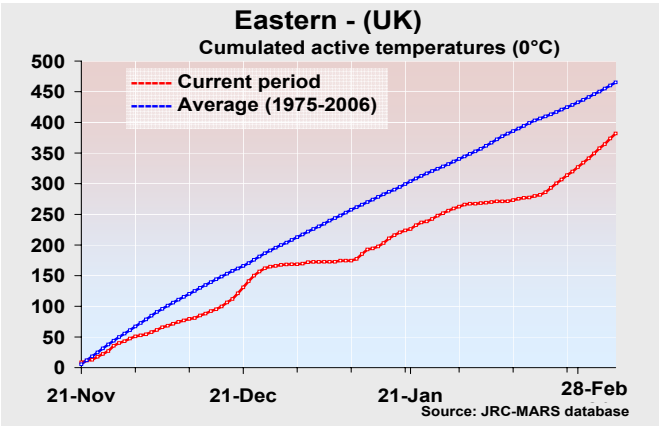
UK and Republic of Ireland: wet autumn, cooler and wetter than seasonal winter

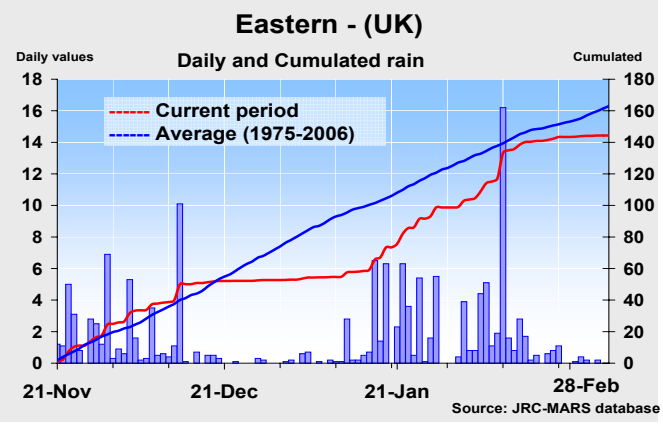
The campaign started under relatively good conditions although conditioned by often excessive rain.

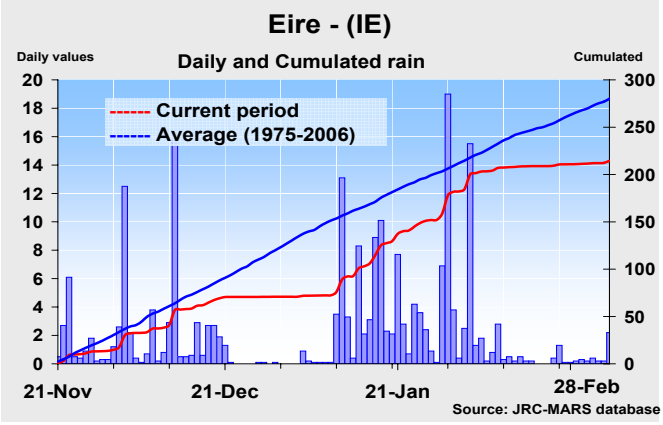
During the autumn, temperatures were generally within the normal ranges of variation and therefore permitted a good starting of all winter crops. However, the rain was quite persistent (particularly in the UK) creating overwells and temporary water saturation. At the end of the year, the cumulated active temperatures were in line with the expected values and also the cumulated water supplies remained close to the norm thanks to a relatively dry period which occurred in the second half of December.

The new year started with cooler but dry conditions. However, in the last part of January and in February, the weather changed and persistent rains characterised the period. Coupled with rain, low levels of solar radiation were also recorded. The areas with more 'heavy' soils suffered temporary water saturation and, due to the wet conditions, a high level of disease infections was likely (e.g. Fusarium g.). At the end of the period, a thermal deficit around 100° GDD is estimated. In Ireland, those agrometeorological conditions were relatively favourable for pasture.

The yield forecast for soft wheat is at 8.1 t/ha in the UK and 8.9 t/ha in Ireland. Winter barley is expected at 6.6 t/ha in the UK and at 7.9 t/ha in Ireland, almost 10 % lower than last year's but close to the five-year average. The forecast yield for rapeseed in the UK is also considerably lower than in 2008 (– 6.9 %), with a value of 3.1 t/ha.







Italy: abundant rainfall at sowing might have compromised the start of the campaign locally

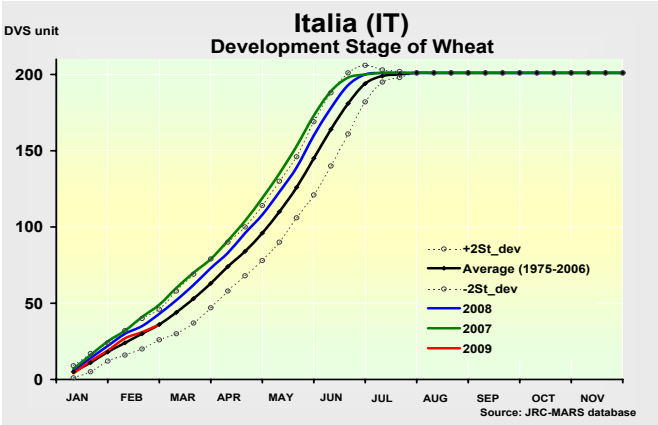
There are moderate expectations for productivity; the climatic evolution of the season, characterised by exceptionally and intense rainfall, might have caused trouble during the sowing period to the winter crops all over the country.

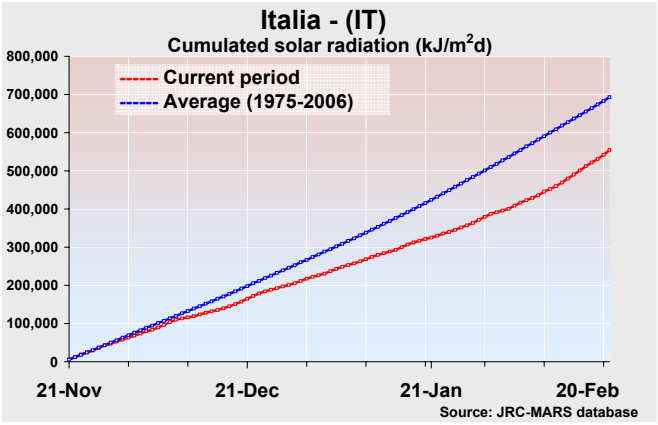
The first part of autumn was drier than average, while from November onwards, together with the winter season, it was extremely wet. In the north-eastern and western regions, the first rains started by the end of October, allowing the sowing to start after field preparation for a few days, as diffused precipitations were then almost constant from November until the end of December. This could have caused problems to the soft wheat and winter barley sowings. In the northern regions, minimum and maximum temperatures were below the average during mid-December until the beginning of February; a drop of minimum and maximum temperatures occurred again after mid-February.

In the southern regions, minimum and maximum temperatures were above or on average during December and January, but a drastic drop occurred in mid-February with snow events in the islands too. In January, the rain was abundant, persistent and partially coupled with intense events especially in Sicily, along the eastern Adriatic coastlines and in Sardinia. Daily values even above 100 mm/day were recorded (150 mm in Sicily on 20 January), therefore the sowing period for durum wheat in the southern regions might have been delayed; there were moderate yield expectations for the areas where the sowing was done earlier.

The cumulated solar radiation appeared lower than average during all the period observed, almost all over the country. The development stage of rapeseed is slightly advanced, maybe due to an early sowing. For barley and winter wheat, values are close to average.

Expectations for winter crop yields are close to the trend. Durum wheat is estimated at 2.98 t/ha (– 7.6 % compared with 2008 and – 0.44 % on the five-year average). Yield for soft wheat is simulated at 5.12 t/ha (– 3.5 % on the five-year average and 4.7 % lower than last year). The estimate for barley is 3.73 t/ha, similar to the average and slightly above last year's value). Turnips (rape) have been estimated at 2.32 t/ha (+ 1.3 % on 2008).





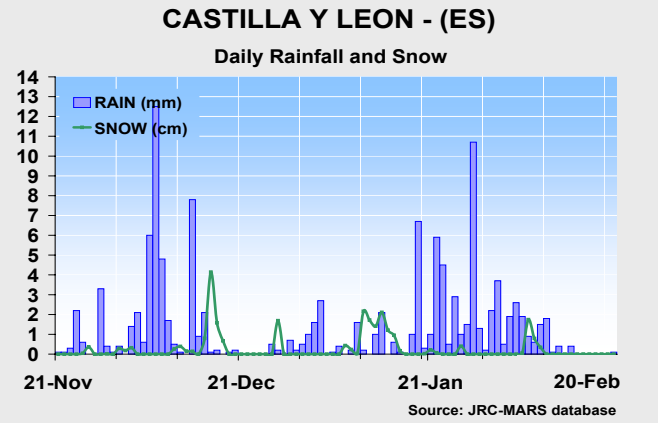
Spain: average conditions for winter crops

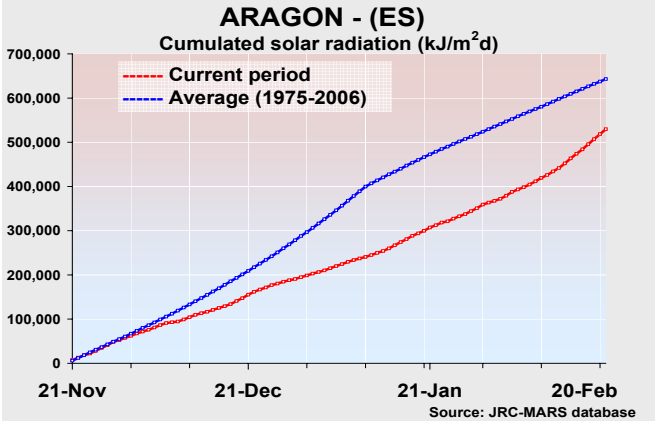
Meteorological conditions can be described by normal precipitation, cold temperatures and low solar radiation compared with the average. Given most crops are at an early stage, yield estimations are close to the trend.

The period between 21 November 2008 and 20 February 2009 was characterised by cold weather in the main crop-producing regions. The coldest days were in January, with minimum temperatures registered on 12 January. In the arable land of Castilla y Leon, the minimum registered was – 8 °C and the lowest maximum was 0 °C. There was also snow in the region this winter, up to 4 cm in December and 2 cm during the abovementioned coldest days. In Andalucia, minimums reached – 2 °C.

Cumulated rainfall was on the average or slightly above the average in most regions and cumulated active temperatures and solar radiation were much below the average. This may have some effect on the crop development stage — for example, cereals appear slightly delayed in Aragon due to low cumulated solar radiation — but, apart from this, as the crop was in the dormancy phase, it should not have important effects on final yields. Relative soil moisture values are in the norm, so at the moment expectations for winter crop yields are close to the trend.

The average yield of durum wheat is estimated at 2.22 t/ha (+ 5.3 % on the five-year average). The estimate for soft wheat is 3.51 t/ha (+ 8.3 % on the five-year average, but 3 % lower than last year). The estimate for winter barley is 2.71 t/ha, similar to 2008 and + 1.9 % on the five-year average). Finally, oil seed rape has been estimated at 1.66 t/ha (– 15.9 % on 2008, but + 2.6 % on the five-year average).





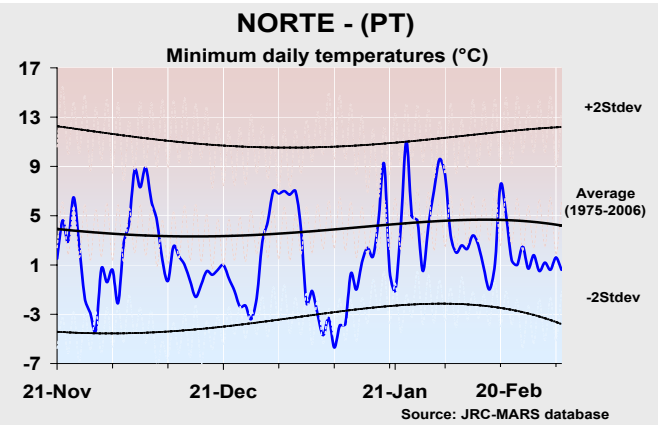
Portugal: moderate expectations after a fresh winter

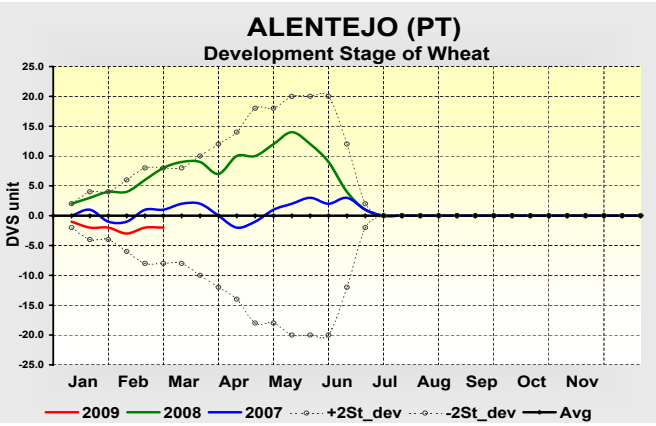
Weather conditions were characterised by colder than average temperatures and intense precipitations during January and early February, compensating for the water deficit from the previous months. There should not be much impact on winter crops given the period of the year in which it occurred.

The period was characterised by normal conditions except in January, which was affected by intense rainfall, especially in Alentejo, and by cold temperatures. The minimums reached – 1 °C in Alentejo and – 5 °C in the north on 9 January. Maximum temperatures were below average from the beginning of January until mid-February, with a minimum of 1 °C in the north. Due to cold temperatures, winter cereals are slightly delayed compared with the long-term average.

After relatively dry conditions in autumn and the beginning of winter, the January rainfall has brought the soil water balance back to average values. However, the maximum registered in the relative soil moisture indicates that the strong rains could have caused local problems of root asphyxia for winter cereals in some areas of not-well-draining and heavy soils.

Due to the non-optimal weather conditions, the yield of winter cereals is expected to be lower than last year and only slightly higher than the five-year average. For soft wheat, 1.78 t/ha, – 18.6 % compared with 2008 and + 1.7 % on the average, and for winter barley, 2.18 t/ha, – 10.9 % on 2008 and + 18 % on the average is expected. The conditions are in the norm and good for the sowing of spring crops.





Greece: a positive start of the season for winter cereals may have been affected by frost in January and February

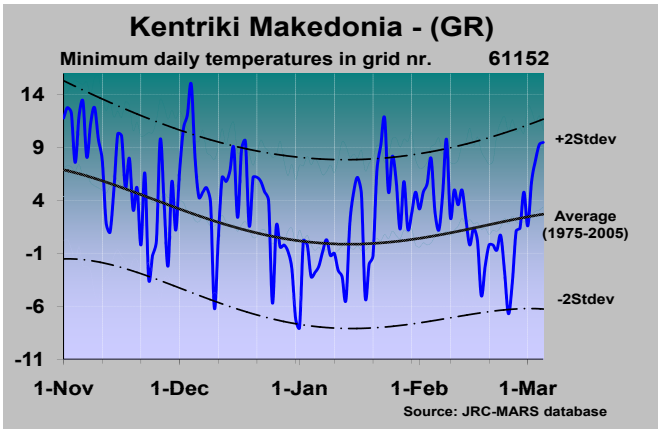
The early development stages of winter cereals, in October and November 2008, were characterised by warm temperature and abundant precipitation. A frost event occurred in mid-February in northern areas, with limited snow cover, and, following a mild period, could have locally affected the winter crops. Yield expectations at present are for a reduction with respect to 2008.

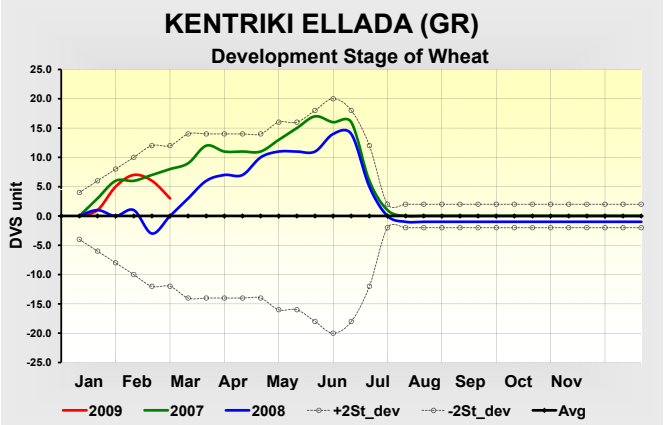
The 2008 autumn season was rather wet throughout the whole country and the daily maximum temperatures remained within the norm during October. This trend was conducive to early germination and tilling for both wheat and winter barley. In mid-November, and especially in the main barley-production areas of Dytiki Makedonia and Anatoliki Makedonia, maximum temperatures increased significantly and peaked at over 20 °C, more than 30 % above the average of the season. Fluctuations around absolute maximums continued throughout December.

In mid-February, a drop of temperatures occurred with the minimum largely below 0 °C and it might have found the crops at a more vulnerable stage. Locally, possible leaf damages might have occurred.

From mid-January onward, precipitation was abundant and well-distributed across the main cereal cultivation areas.

There were also abundant snowfalls in the north of Kentriki Makedonia as well as in central Greece (Thessalia) even though daily minimum temperatures remained within the norm of the period (~ 1 °C/2 °C). Currently, north-eastern and southern Greece are still experiencing significant rain, at times exceeding the seasonal averages by over 30 %. The crop yield forecast for durum wheat is set at 2.5 t/ha and for soft wheat at 2.9 t/ha, both above the five-year average and winter barley with 2.5 t/ha close to the average.





Denmark, Sweden and Finland: generally favourable conditions

Denmark, Sweden and Finland were characterised by a slightly wet autumn and a mild winter.

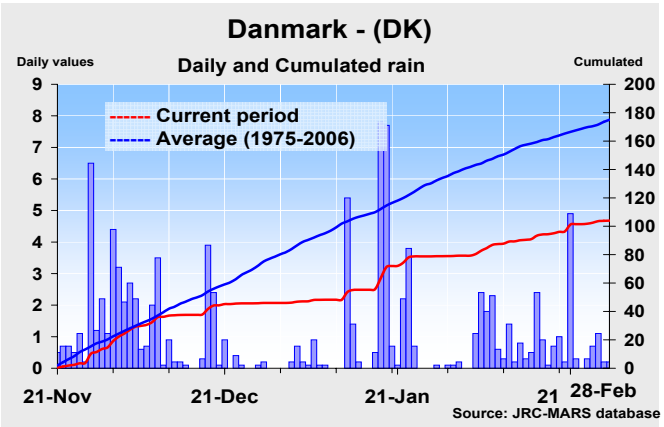
In the three countries, autumn had a mild course, even if with large temperatures fluctuations. During the first half of November and December, the maximums were slightly above the average, permitting a good starting of the winter corps, but sudden drops occurred at the end of November and December. However, at the end of the year, the cumulated GDD were significantly above the LTA (+ 70°/+ 80° GDD, equivalent to + 40 %). Also, the winter had a similar course, with large GDD surplus accumulation (+ 56 % at the end of February) and temperature fluctuations (drops at the beginning of January and in mid-February).

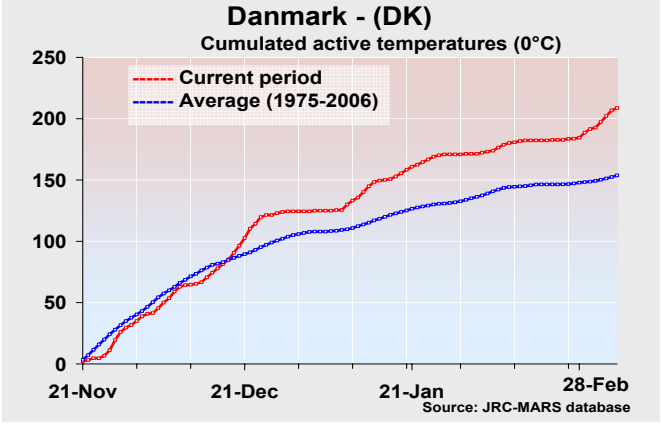
The rain distribution and amount was generally close to normal with slightly higher accumulation in Sweden and Finland during the autumn and slightly lower during the winter. The largest rain deficit was estimated in Denmark at around – 30 % as compared with the LTA. However, this deficit does not represent an immediate concern because of the current modest crop water consumptions and because of the normal presence of rain during spring.

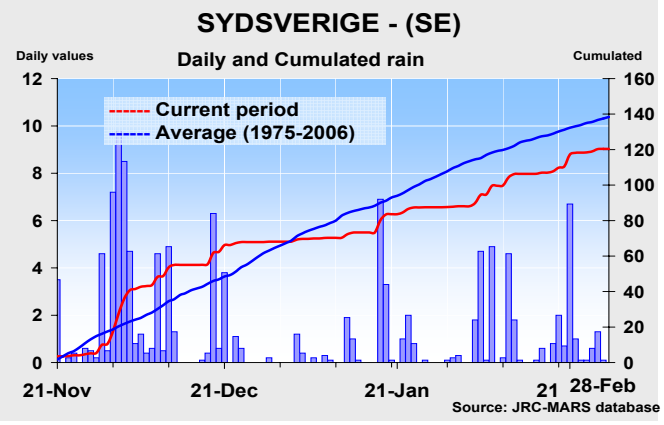
Despite the relatively favourable thermal conditions, the crops remained in the winter dormancy or developed closely to normal conditions.

In Finland, a positive accumulation of solar radiation was also measured during autumn and winter, even if at the end of February the difference with the LTA was not very big.

For Denmark, soft wheat is forecasted at 7.2 t/ha, winter barley at 5.7 t/ha and rapeseed at 3.4 t/ha. In Sweden, soft wheat is forecasted at 6.1 t/ha, winter barley at 5.5 t/ha and rapeseed at 2.6 t/ha. The figure for Finland for soft wheat is 3.7 t/ha.







Estonia, Latvia, Lithuania: mild conditions again

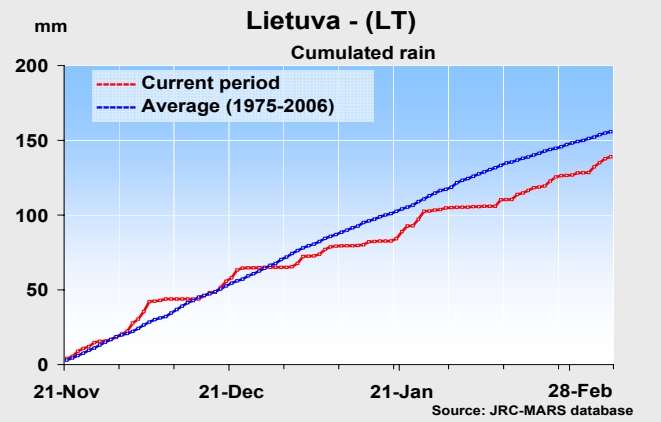
Average daily temperature and temperature sum for the period under consideration are again above the average.

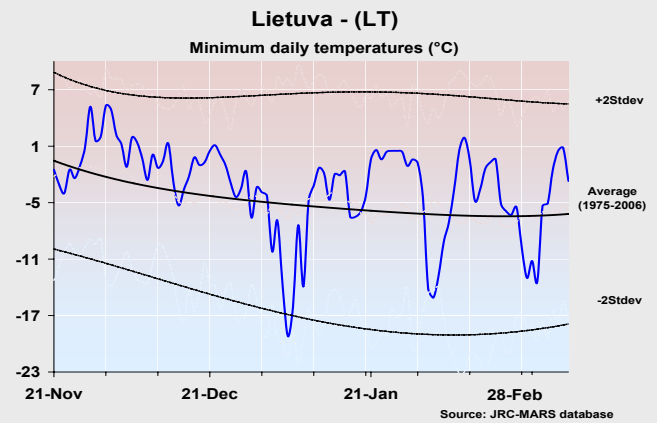
Nevertheless, the highest minimum temperature for Lithuania is 2 °C for one day in the period between November 2008 the 21st and February 2009 the 28th. Minimum temperatures dropped below – 15 °C in the three countries only for one or two days in early January (5 January) and in early February (1 February). Cumulated precipitation is below the average with a slight deficit. Snow cover has been present since the last third of December in all three countries. Solar radiation is in line with the average values for this period. Currently winter crops are still at dormancy.

For Estonia, the forecasted yields are 2.98 t/ha for soft wheat and 3.88 t/ha for winter barley.

The figures for Latvia are 3.38 t/ha for soft wheat and 2.91 t/ha for winter barley.

The figures for Lithuania are 3.85 t/ha for soft wheat and 3.38 t/ha for winter barley.





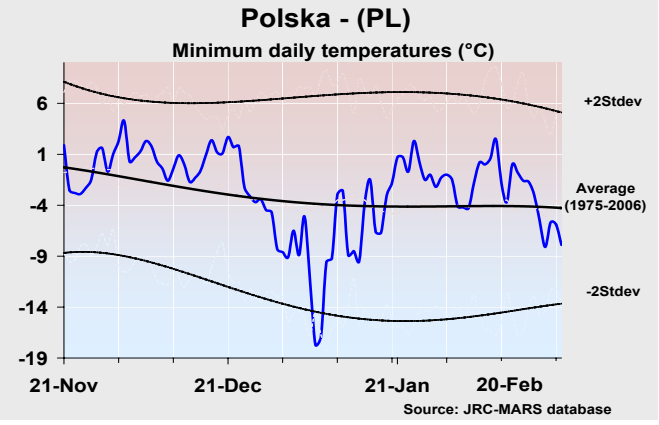
Poland: delay in development of winter crops but satisfactory yield perspectives

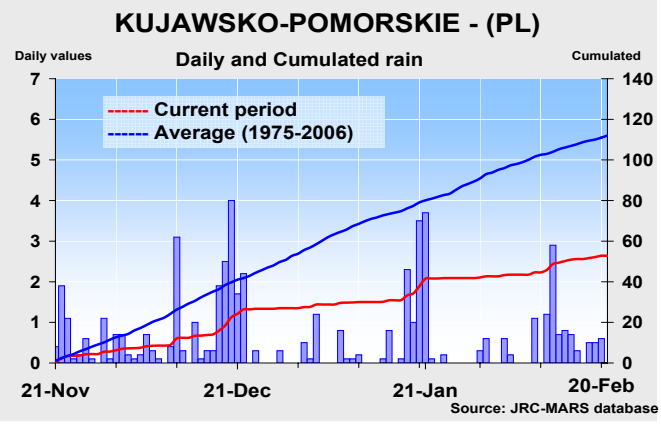
Poland experienced higher than usual cumulated active temperatures and scarcity of rainfall reducing soil water reserves.

In Poland, cumulated active temperatures (T base=0 °C) were higher than the long-term average, because of the high daily minimum temperatures recorded in November and December. During this mild winter, the most relevant phenomenon in the whole country was the brief but sudden drop in temperature at the beginning of January (on 6 January, the daily maximum temperature was lower than – 10 °C). Winter crops were in dormancy and this cold air irruption may have affected crops in areas with an absence of snow or thin snow cover.

Cumulated rainfall values were below the long-term average. The difference up to – 35 % was recorded in Kujawsko-Pomorskie and Wielkopolskie, the regions which already experienced drought problems last year. The lack of rainfall could have caused a deficit in water supply especially in the western regions of the country. Soil moisture was lower than the LTA and also than last year. The scarcity in rainfalls has probably delayed the development of winter crops which have just entered into the emergence phase in almost the whole country.

Despite the sub-optimal meteorological conditions recorded during the winter, the yield forecast for winter cereals crops are expected to be at a level comparable to the last five-year average. The winter soft wheat yield is estimated at 3.95 t/ha (+ 1.4 % on the five-year average), winter barley at 3.80 t/ha (close to the average) and oil seed expectation at 2.80 t/ha (– 2.3 % on the five-year average).





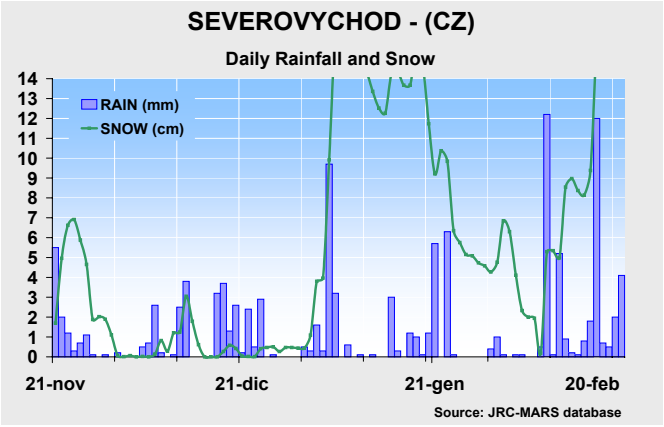
Czech Republic and Slovakia: reduced expectations with respect to last year

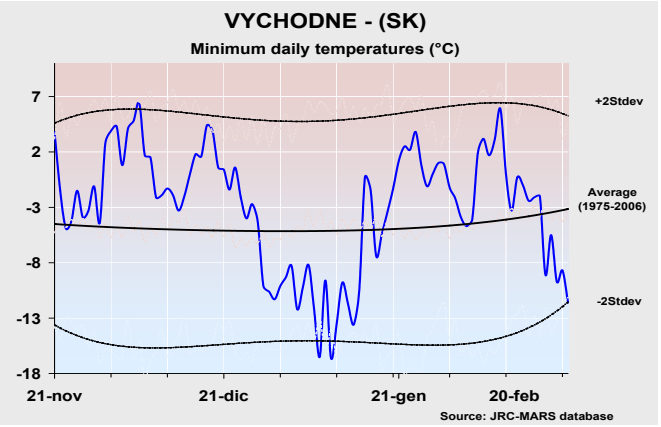
Mild winter conditions were recorded in Slovakia where daily temperatures stayed mainly above the average value. Sparse rainfall characterised the weather in the Czech Republic, especially in the north-west.

Cumulated active temperatures (T base=0 °C) are higher than average, especially because of the warm conditions in the last months of 2008 and in the last dekad of January. These favourable thermal conditions have been coupled in Slovakia with suitable irradiance levels, leading to a satisfactory development of winter crops even if lower than last year. On the other hand, in the Czech Republic, crops show a strong delay in restarting the vegetative phase. This is probably due to the snow depth (average values between 5 and 20 cm have been recorded since the beginning of 2009) which is covering most of the country. A cold air irruption (– 16.2 °C was reached in Slovakia and – 14.4 °C in the Czech Republic) which occurred on 9 January could have affected the crops which had already entered into the emergence phase. Precipitation presented a spatial gradient distribution from north-west to south-east and although cumulated values have been partly below the long-term average (in Severozapad cumulated rain values were more than 30 % lower than the LTA) relatively good soil moisture values are depicted.

In the Czech Republic, both winter crops, wheat and rapeseed, have entered into the emergence phase with respectively more than two and three dekads' delay compared with the LTA. For rapeseed, the depicted situation is similar in both countries, whilst winter wheat in Slovakia (especially in the north-eastern regions) is ending the emergence phase with a slight advance in development compared with the LTA.

With respect to last year, a reduction in yields is depicted for Slovakia. Forecasts for winter crops are: 3.44 t/ha (–14.8%) for winter barley, 4.30 t/ha for soft wheat (–11.9%) and 2.43 t/ha (– 10.2 %) for rapeseed. Forecasted yields for the Czech Republic are: 5.25 t/ha for soft wheat (– 10.3 %), 3.01 t/ha for rapeseed (1.7 %) and 4.65 t/ha for winter barley (– 2.0 %).





Austria: strong delay in development

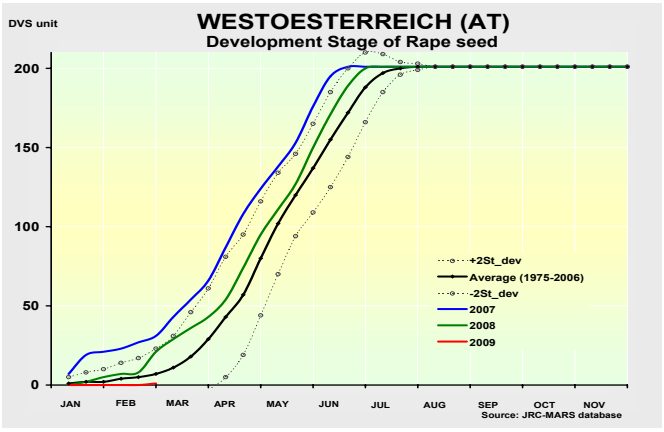
Snow coverage continued during all winter months and cloudy weather reduced irradiance levels significantly.

Despite an abrupt temperature fall in the first dekad of January (on 10 January, the minimum temperature reached almost 12.7 °C below zero), the thermal conditions have been generally milder than the long-term average during winter. However, Austria experienced abundant rainfalls, especially during December, and, since the beginning of the year, soils continue being covered by snow. This, in conjunction with low irradiance levels, has probably reduced the risk of frost but has at the same time stopped the vegetative restart. Moreover, the prolonged presence of snow could postpone the thaw significantly and consequently delay the field preparation.

With the exception of southern regions, both winter wheat and rapeseed have just entered into the emergence phase in almost the whole country, showing a delay in development of more than two dekads with respect to the long-term average. The expected increase in temperature in the next dekads might allow plants to recuperate from the described delay with any major consequences on crops.

Soil moisture conditions, at the moment only slightly higher than the average, could rise significantly when snow melts, causing problems of accessibility of machinery to the field.

Except for soft wheat (5.27 t/ha, – 0.7 % compared with the five-year average) and rapeseed (3.10 t/ha, – 1.1 %), a good potential is shown for cereals despite the delay in development: 4.63 t/ha for durum wheat (+ 3.1 %) and 5.59 t/ha for winter barley (+ 0.6 %).



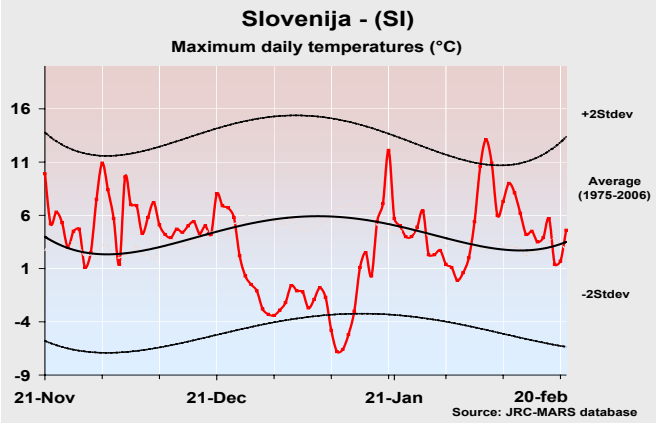
Slovenia: despite snow presence a good development for winter crop is depicted

Humid and warm conditions characterised almost all winter months. Irradiance levels were consistently below the average during January and February.

The analysed period was characterised by abundant precipitations and by relatively low irradiance levels due to the number of cloudy days. Despite the heavy snowfalls which occurred at the beginning of February which could have delayed the winter crops' restart, a development in accordance with the long-term average is depicted.

While in the northern part of the country winter wheat and rapeseed are still completing the last part of the emergence phase, in the south the crops have already entered the tilling phase. This is probably due to the high temperatures recorded in December and February, which have driven the cumulated values above the average although there was a longer frost period at the beginning of January. In fact, with the exception of this brief but sudden drop of temperatures which concerned the whole of central Europe, minimum daily values remained almost all the time above the seasonal values. Therefore, at the end of the period under consideration, the cumulated GDD showed a significant surplus: almost three times higher than the LTA. Soil water content is oscillating between average and maximum values, without causing problems though, due to soil moisture excess.

Forecasts are 4.41 t/ha for soft wheat (– 0.2 % compared with the five-year average) and 3.88 t/ha for barley (+ 1.0 %).



Hungary: mild conditions have led to a good start to the season

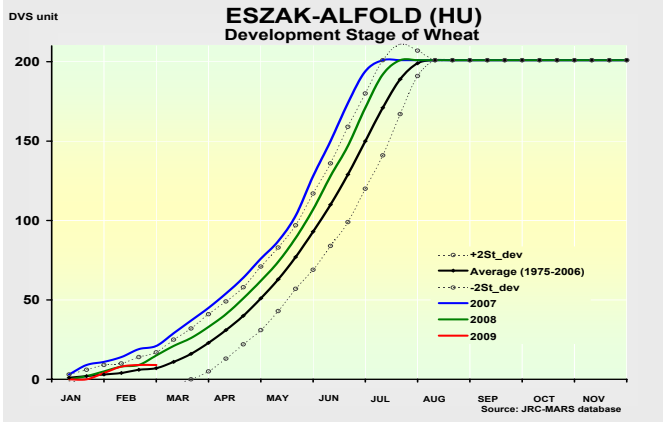
Cumulated GDD values over the period under consideration show a significant surplus with respect to the long-term average. The abrupt temperature drop which occurred at the beginning of January, in conjunction with an absence of snow, might have caused frost damage in some areas.

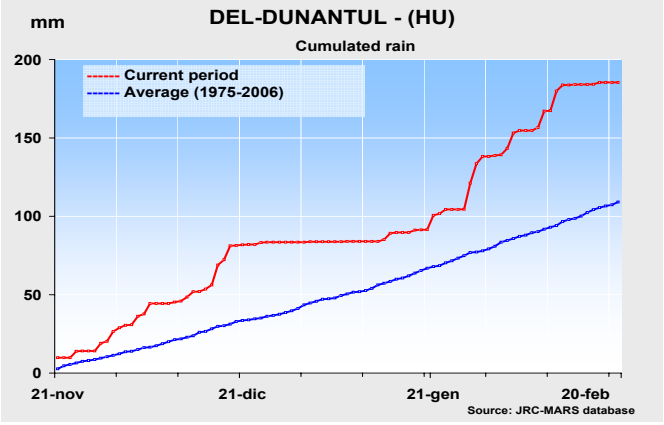
With the exception of a freezing period recorded during the first dekad of January, fairly warm and wet conditions have characterised the whole winter season. The scarcity of snow coverage might have exposed winter cereals to the risk of frost damage on the occasion of the cold air irruption which occurred between 4 and 9 January (minimum temperature reached – 14.5 °C in Del-Alfold).

Cumulated precipitations above the long-term average were recorded in the whole country (in most cases more than 30 %) especially in the south-western regions (Del-Dunantul and Nyugat-Dunantul). Humid conditions in conjunction with optimal irradiance values have pushed the potential evapotranspiration to above-average values since the beginning of February.

The establishment of crops was favoured by mild meteorological conditions. Winter wheat and rapeseed present a slight advance in development which exceeds 10 days in eastern regions (Eszak-Alfold and Del-Alfold). Simulated soil moisture values were slightly above the long-term average but are expected to decrease as a consequence of the sparse rainfall forecast for the next dekad. Winter wheat is almost ending the emergence phase, while in the southern regions the tilling phase has already started. Rapeseed is concluding the emergence phase all over the country. Leaf-area expansion values depict an average development of the canopy both for winter wheat and rapeseed.

A good potential is shown for soft and durum wheat which are forecasted to yield respectively 4.53 t/ha (+ 1.6 % with respect to the five-year average) and 4.23 t/ha (+ 1.3 %). The forecast for rapeseed and winter barley are respectively 2.45 t/ha (– 3.0 %) and 4.10 t/ha (– 0.9 %).





Romania: uncertain season with alternating weather and advanced crop development susceptible to late frost

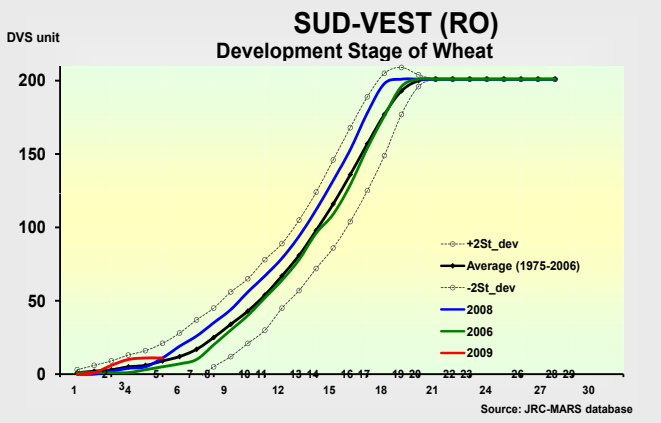
A positive start to the season was characterised by warm weather and sufficient precipitation. The trend continued until January, which saw the occurrence of a frost event, though mitigated by significant snow cover. The evolution of the season remains uncertain with warm weather and alternating precipitation. Considering the current trend, a higher-than-average yield is expected, though reduced with respect to 2008.

In Romania the season started favourably following a diffuse trend in the region, that is, with sufficient moisture supply for germination and mild temperatures. A warmer-than-usual after-sowing period allowed an anticipated germination but increased the risk of aphid attack. Cumulated active temperatures (T base=0 °C) were a boost to crop growth from October to December.

The beginning of January saw the occurrence of a frost event which was, however, associated to a sufficient snow cover which mitigated the possible damage to crops. Rainfall was reduced until the third dekad of January after which there were alternate periods of dry and wet weather, in a trend that continues up to the present in combination with unseasonably high temperatures.

Crop development was quite advanced with respect to the average of the period until the third dekad of February, but at present appears to be converging to average levels. The current evolution of the season combined with a possible early break of the dormancy result are cause for great uncertainty on future developments and there is a high risk for the possible effects of late frosts on the crops.

Yield for soft wheat is simulated at 3.2 t/ha (+ 13.3 % on the five-year average and – 7.9 % lower than last year). The estimate for barley is 3.3 t/ha and rapeseed is estimated at 1.8 t/ha.



Bulgaria: favourable conditions at the start of the season were followed by dry weather and frost events of limited impact

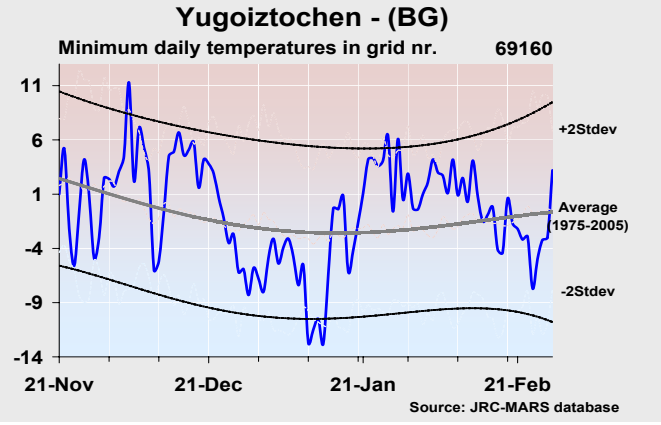
Germination and early development of winter cereals found near to optimal conditions during autumn with a sufficient soil moisture supply and warm weather. From November onward, a progressive cooling of temperatures combined to dry weather allowed hardening of the crops. This condition resulted in an enhanced resistance to the frost that occurred in early January. These events should not have affected significantly the outcome of the season with reduced winter kill, and the forecasted potential yields are expected to be higher than average although reduced with respect to 2008.

In Bulgaria, as in most of the Black Sea basin, sowing conditions for winter cereals have been favourable thanks to abundant precipitation during September which improved the soil moisture level. In October, precipitation dropped but temperatures remained mild, ranging between 5 °C and 10 °C until early November. Regardless of the scarce precipitation, conditions remained favourable for germination and tilling.

From November onward, the weather continued to be characterised by scarce precipitation with a deficit in cumulated rainfall of – 20 % to – 50 % on the LTA. Temperatures, however, dropped significantly starting from the third dekad of November but the decrease was not too abrupt and should have guaranteed a sufficient hardening of crops.

Around 15 January, the minimum daily temperature dropped below – 15 °C, but the negative impact on crops should have been reduced by the achieved hardening and by the presence of snow cover (~ 10 cm). The frost was followed again by rather mild weather until mid-February conducive to an early breaking of dormancy. After that and up to the present, temperatures again started to decrease but stabilising on average levels. This trend was combined with the return of precipitation in February, especially in the south-east regions of Yugoiztochen making up for the cumulated deficit. Overall, these conditions are setting a positive environment for the spring development of cereals.

Yield for soft wheat is simulated at 3.7 t/ha (+ 13.0 % on the five-year average and – 10 % lower than last year). The estimate for barley is 3.6 t/ha, similar to the average. The yield for rapeseed has been estimated at 2.1 t/ha.



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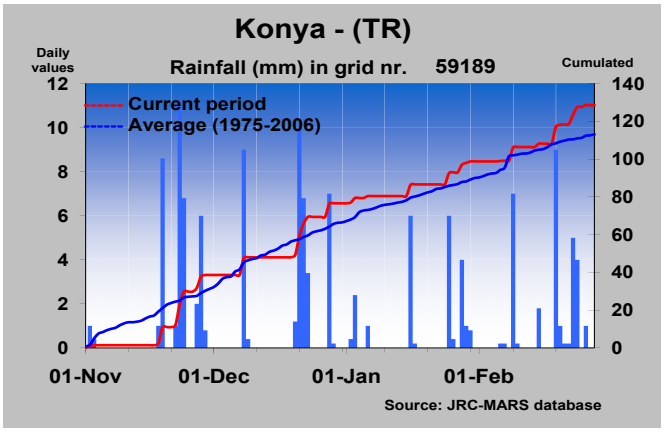
Turkey: dry and mild weather in the early development stages anticipated the growth cycle increasing susceptibility to frost

The beginning of the 2008/09 agricultural season in the eastern Mediterranean and Black Sea basin was characterised by mild and dry weather. These conditions worsened over most of the area while Turkey was somewhat less affected than other countries. Precipitation recovered starting from the second dekad of November in central Turkey (Ankara and Konya Provinces) and temperature levels remained mild with the exception of a sudden frost event at the beginning of January. The effects of this should, however, have been mitigated by the snow cover. At this stage, yield expectations for winter cereals are still fairly positive. A slight decrease on average yield forecasts may affect wheat due to the anticipated cycle even though this condition should be partly avoided for barley.

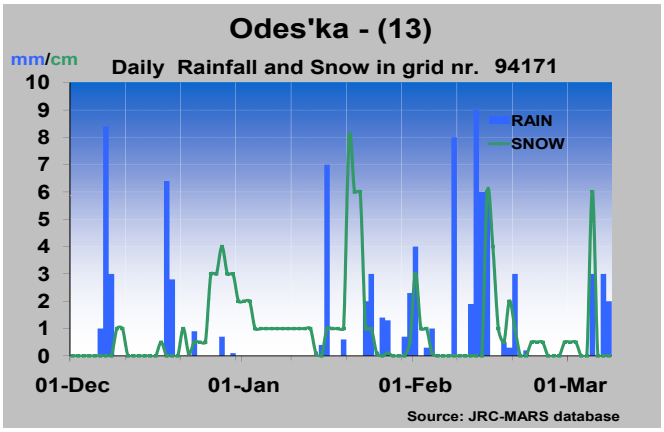
In Turkey, the sowing of winter cereals takes place between September and October, and, this year, this period was characterised by precipitation below the seasonal average in the main producing regions of central Anatolia (Ankara, Konya, Kirikkale, Kayseri). Precipitation started recovering from the second half of November while dry conditions persisted in the west. Rain continued regularly from January onward and currently the levels of cumulated rainfall are balanced with the values of the LTA. Temperatures remained on average levels from October to November 2008 after which unseasonably warm weather incepted. The increase in average temperatures was in the order of 4–6 °C with respect to the 2007/08 season and even more with respect to the LTA (+ 6–8 °C). In specific areas (such as the southern Konya Province), the cumulated active temperatures (T base=0 °C) were 20 % higher than the norm. For cereals planted in September and October, this meant a rapid germination, early development and tilling. These conditions at the beginning of winter generally expose the new plants to a higher risk of frost damage and a significant frost event actually affected most of central Anatolia in the first days of January. Daily minimum temperatures dropped below – 20 °C, especially in the southern parts of Kayseri Province. The negative impact on crops should have been reduced by the snow cover (> 10 cm) even though the overall conditions before the frost were probably not conducive to a sufficient hardening. In central Anatolia, temperatures returned to mild during the second half of January and for most of February, ranging between 0 °C and 5 °C (+ 30 % above the average). Given these conditions, yield expectations for both wheat and winter barley are fairly positive even though they could still be influenced by late frosts.



Ukraine: a positive seasonal trend but danger for late frosts persists

The 2008/09 agricultural season started with positive expectations. Mild temperatures and precipitation in September supported germination, while, from October onwards, dry and moderately cold weather favoured hardening. Frost events in January, in the east of the country, should not have caused significant winterkill. Milder weather in February, combined to increased precipitation, may be conducive to an early break of dormancy. At present, yield perspectives remain positive but the danger of late frost calls for a certain degree of caution.

The inception of the agricultural season in September was homogenously characterised by abundant precipitation followed by a protracted dry period. Temperatures were mild during the whole period and since sowing and germination are usually anticipated with respect to countries further south, this trend was no limit to germination and tilling. Minimum daily temperatures reported a progressive decrease in line with the seasonal trend and were conducive to dormancy and sufficient hardening. Precipitation picked up again in January starting with the eastern provinces and mainly in the form of intense snowfall combined with minimum daily temperatures that peaked to – 20 °C and even less. Given the context, no significant damage can be attributed to these events and winterkill is expected to be modest. The weather evolution in February was again characterised by mild temperatures and sufficient precipitation which may be conducive to an early break of dormancy, thus increasing susceptibility to late frost.



EASTERN COUNTRIES

Belarus: favourable conditions for winter crop

The period under analysis is the dormant period of winter crop development.

Air temperature during the 2008/09 winter period was close to normal, and was not extreme for winter crops. The amount of precipitation during November and December 2008 was lower than normal in the northern part of Belarus, and close to normal in other regions. In January and February 2009, the amount of precipitation was close to normal too, except for the eastern part of the country, where it was higher than normal.

The analysis of remote sensing data shows that snow cover was not melting at the end of February 2009, and active vegetation development after the winter dormant period has not yet started.

Based on the analysis of the meteorological situation, we can conclude that, in general, the winter period was favourable for winter crops. It is likely to be only in some northern regions that snow-cover thickness at the beginning of winter was not thick enough for winter crop protection against the frost.

Russia: good conditions for winter crops

Air temperature during November 2008 to January 2009 showed close to normal values in all regions of European Russia. Starting from the end of January 2009, the air temperature became higher than normal in southern regions where the main winter crop-sowing areas are situated. In February 2009, the air temperature was close to normal in other regions.

Snow-cover depth was close to normal in all regions except the Near Volga and southern regions. In the Near Volga region, a less than normal amount of precipitation in January and February has led to low snow-cover depth. The same situation can be observed in the southern region of Russia, where the amount of precipitation during November to January was lower than normal. The amount of precipitation in February 2009 was higher than normal practically everywhere, excluding the Near Volga region.

The analysis of remote sensing data shows that, at the end of February, snow cover was everywhere except for the southern region of Russia where it had melted at the end of January.

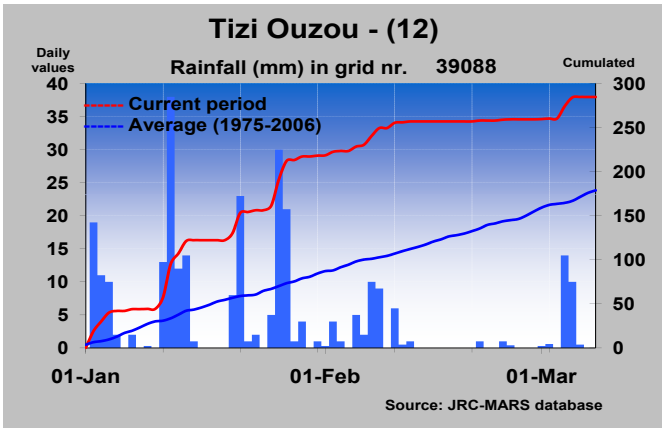
Thus, meteorological conditions during the winter period in general were favourable for winter crops. In the southern region, higher-than-normal air temperatures should provoke advanced development stages compared with the normal start of winter crop growth after the dormant period. This is confirmed by remote sensing data. Some areas of winter crop in the Near Volga region will probably be affected by frost due to insufficient snow depth.

MAGHREB

Maghreb: a positive season up to the present

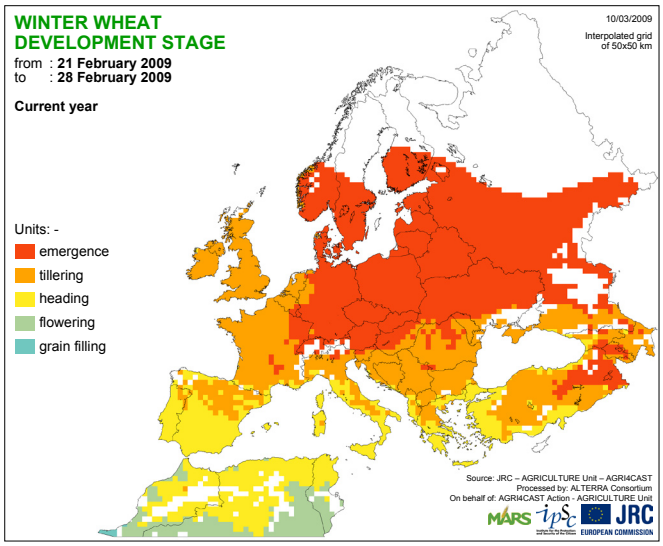
In most of the Maghreb, the season was exceptionally wet and mild until the beginning of February. These conditions greatly favoured germination and tilling. Since in this climatic area there is limited or no winter dormancy, the crop cycle found near to optimal conditions even in the current phases of early shooting. February, however, reported a drop in precipitation and even though there is availability for sufficient soil moisture, susceptibility of the crops to possible drought increased. Temperatures, however, remained within average levels and currently there are no reasons to be concerned even though it is still too early to make a final statement on the overall outcome of winter cereals.

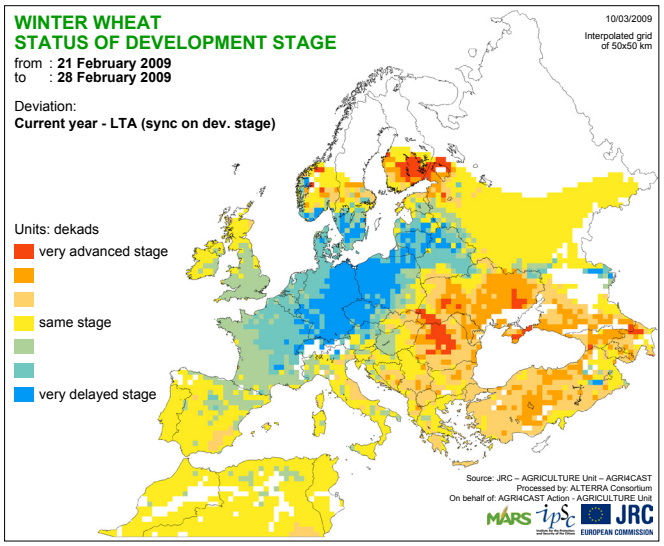
In Morocco, by the end of January, most provinces had exceeded the average levels of seasonal rainfall and significant areas were even flooded. During late January, winter cereals were at the end of the tilling stage in the cool northern parts of the country while they were already at shooting in southern parts. During February, elongation was expected to speed up due to the temperature rise. On average, the levels of the climatic water balance from November 2008 to February 2009 can be placed slightly above the average of the 35-year time series. So far, water has not been a limiting factor and, if the trend continues, the yield would depend mainly on the availability of nitrogen and crop management. A similar trend can be reported for the winter cereal production area of eastern Algeria and north-central Tunisia. In these areas, precipitation has been abundant for the whole season and, combined with mild temperatures, in line with the average trend.

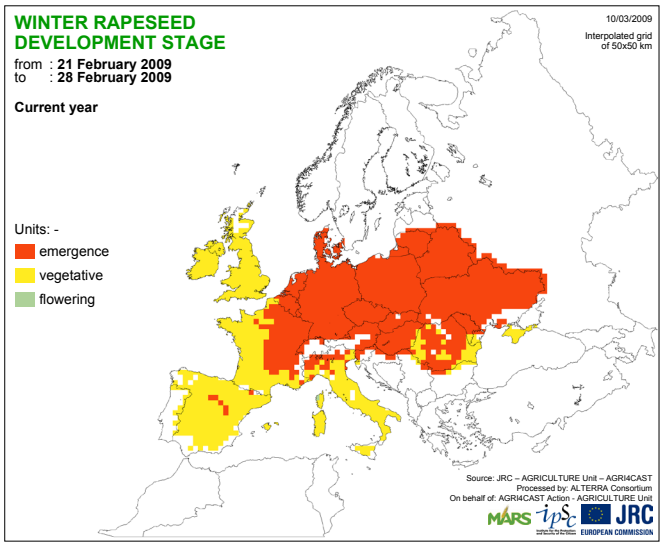


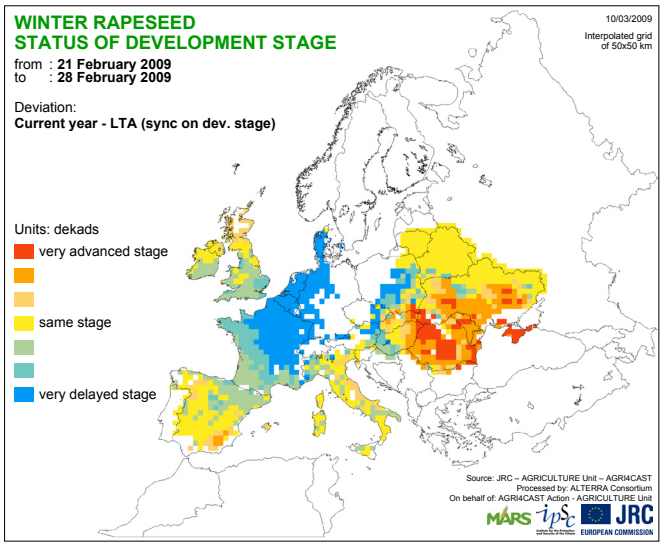
3. Map analysis

3.1. Crop development stage

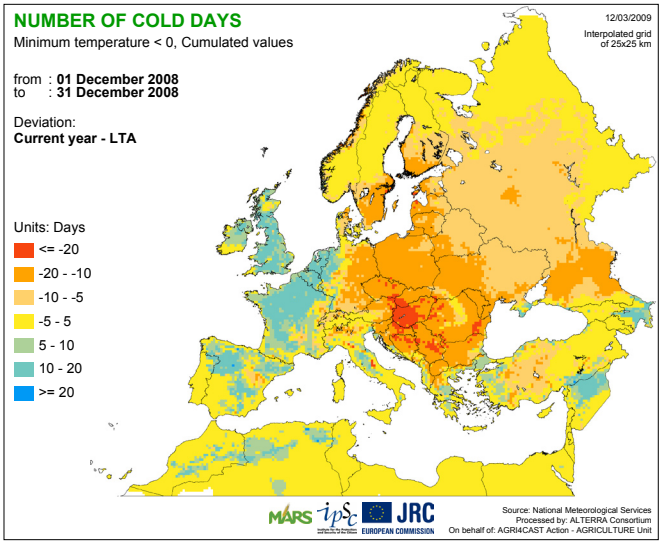


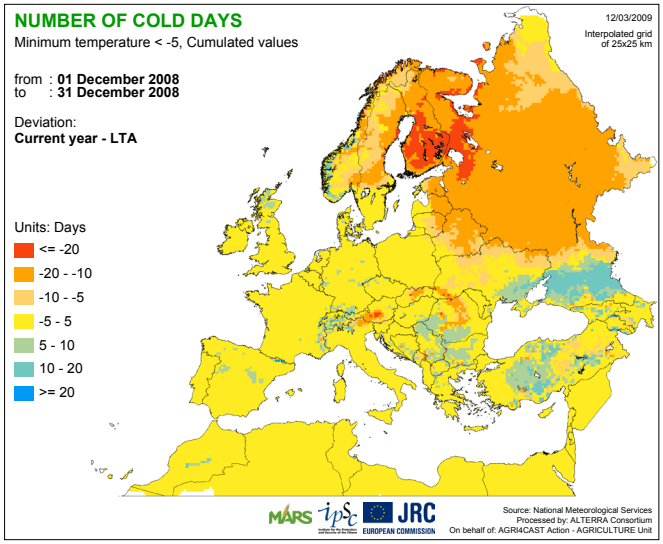


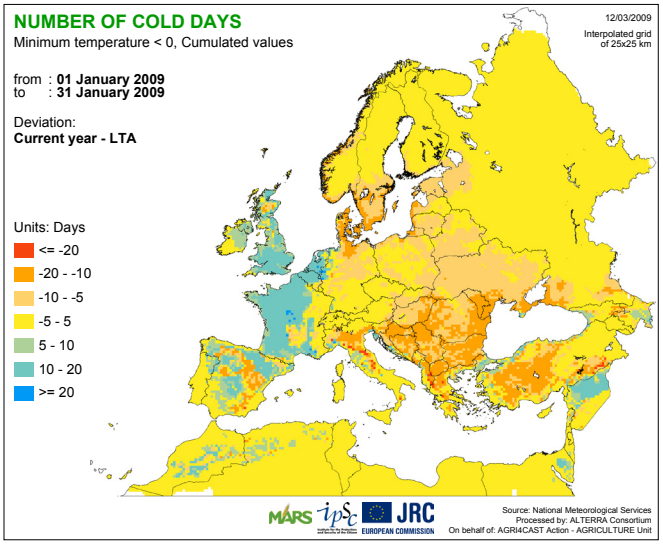


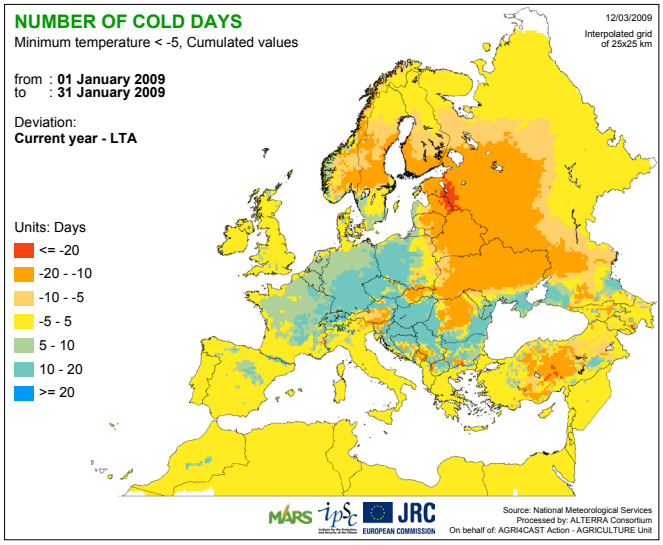


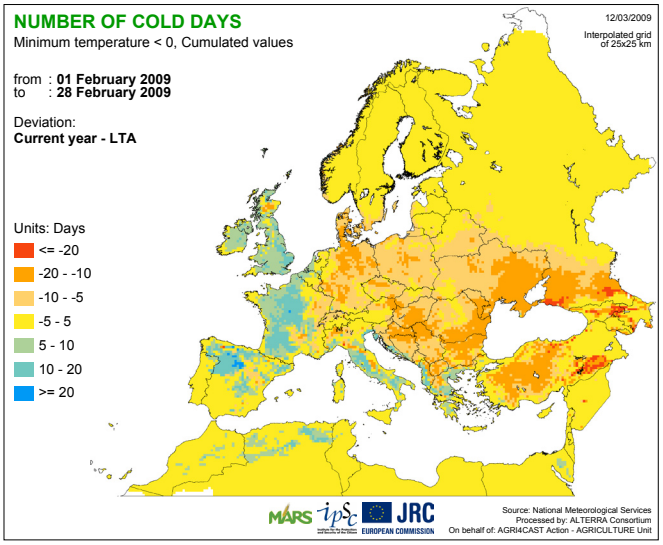
3.2. Number of cold days

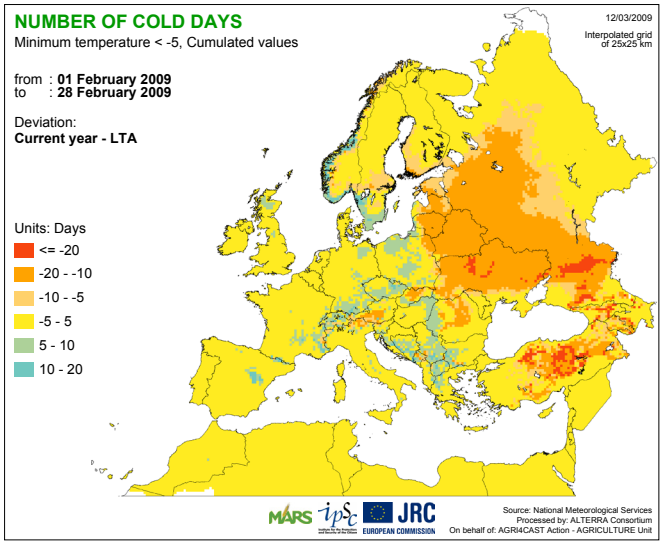




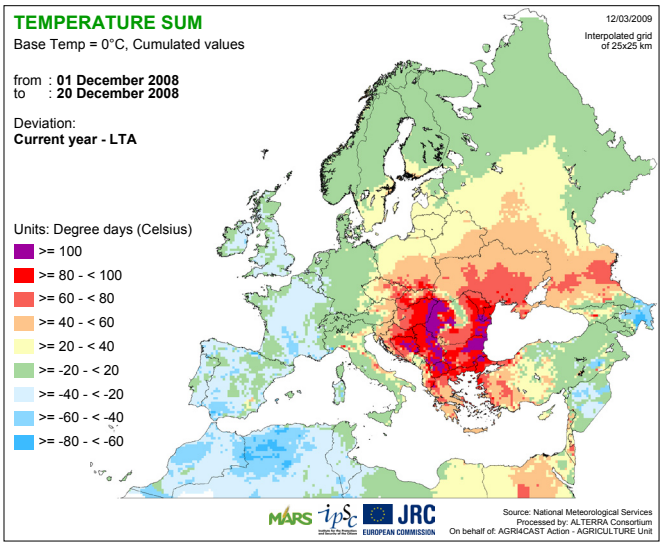


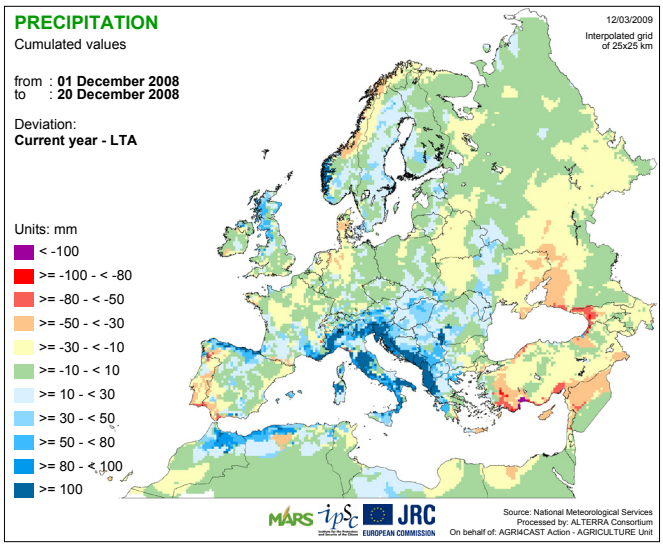


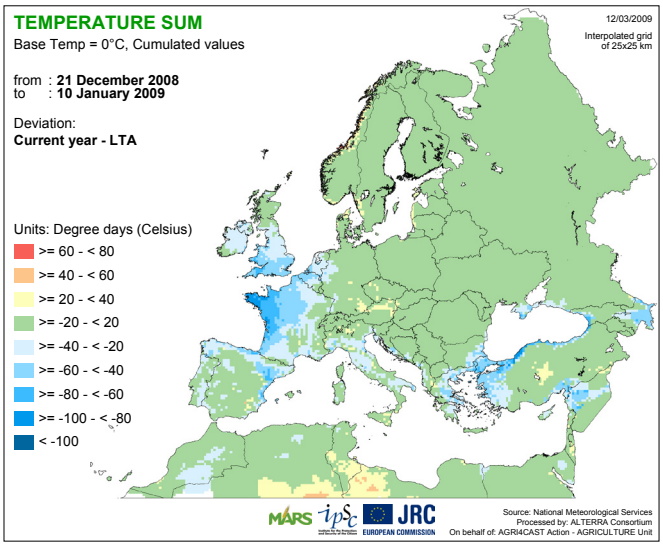


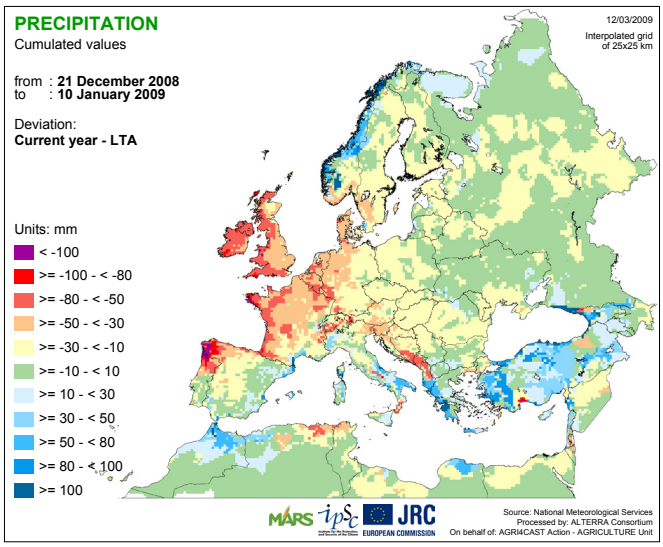


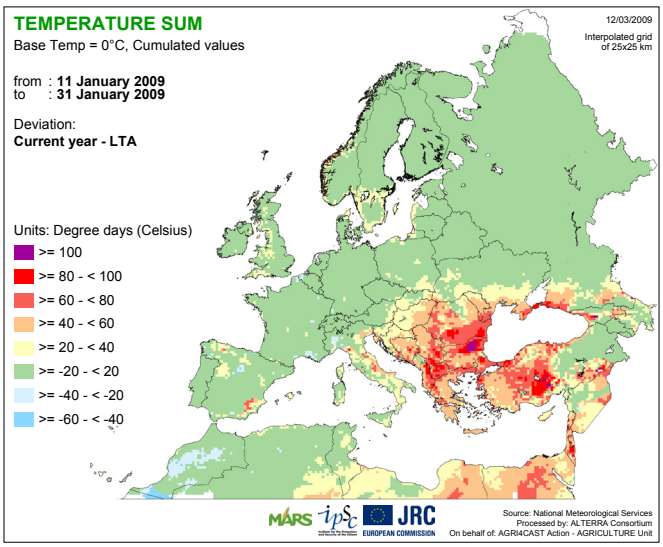
3.3. Temperature and Precipitation - 2009 compared with Long Term Average - (20 days)

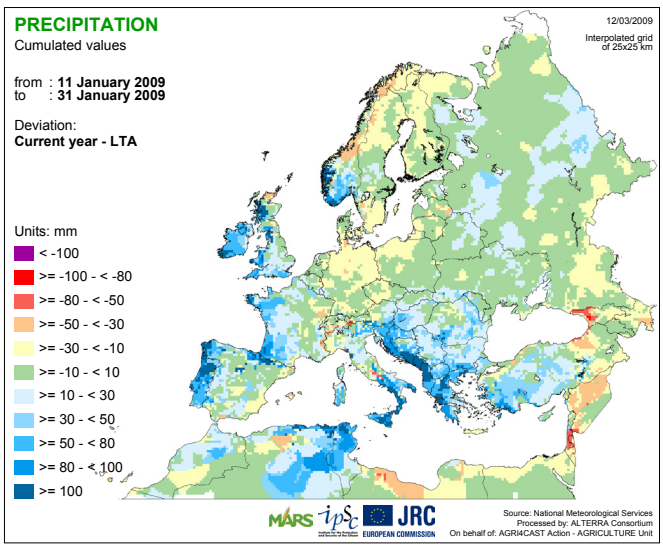




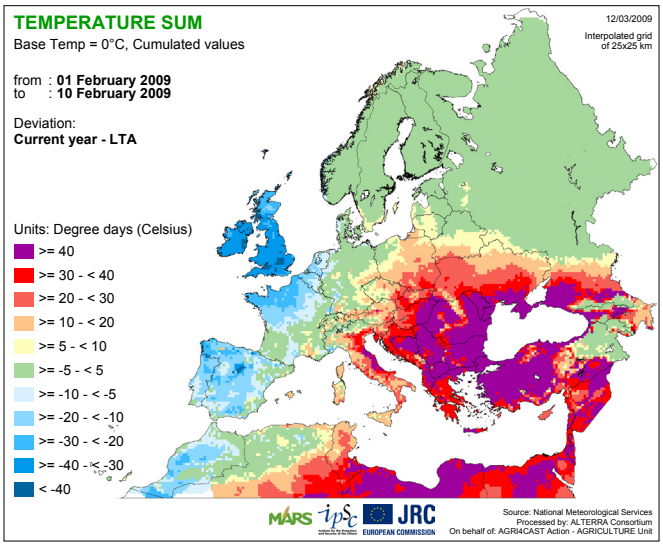


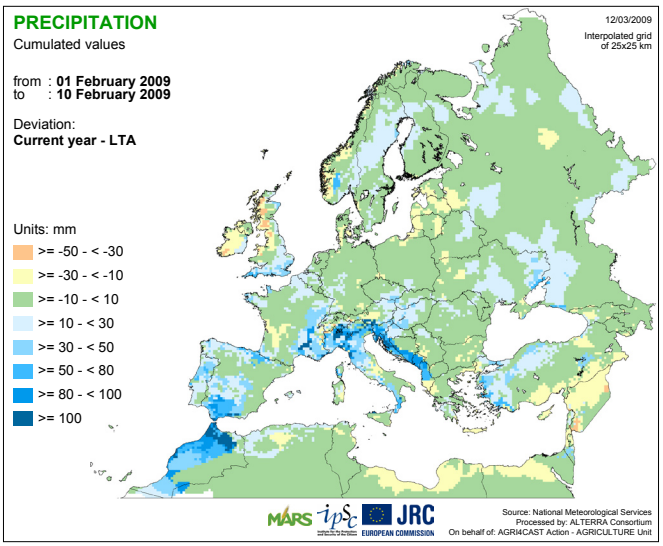


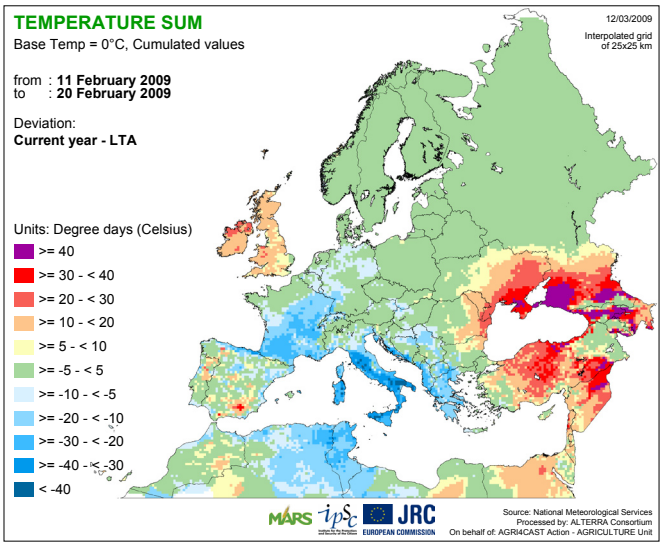


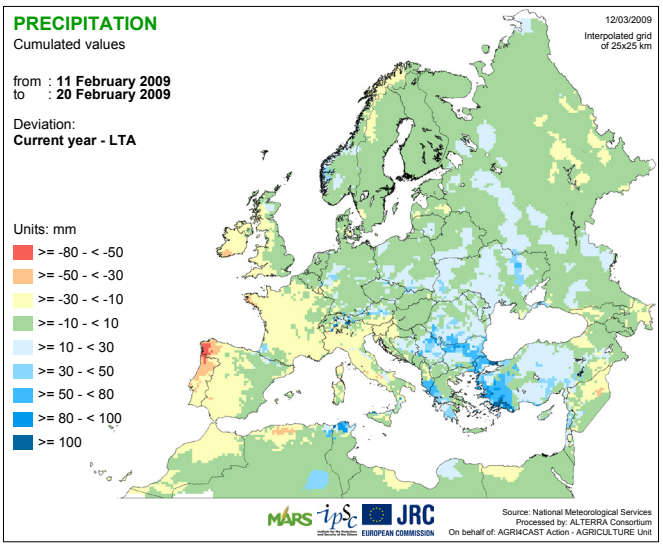


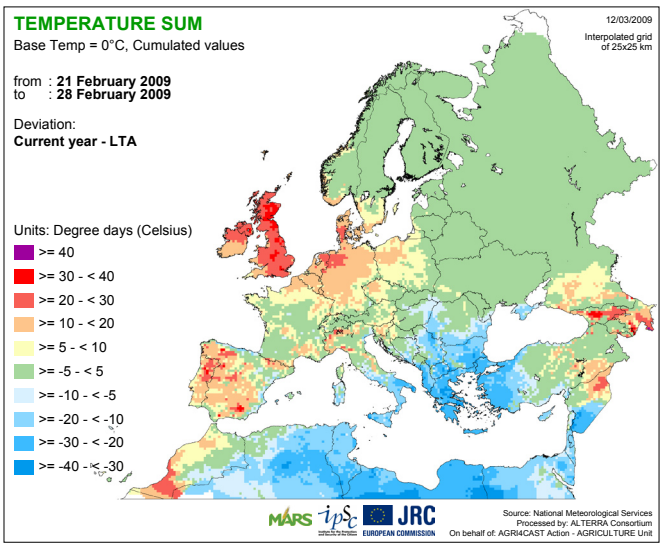
3.3. Temperature and Precipitation - 2009 compared with Long Term Average - (10 days)

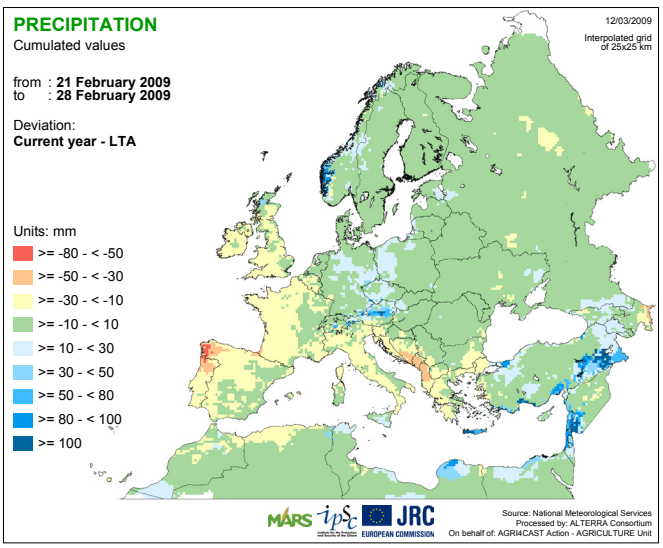






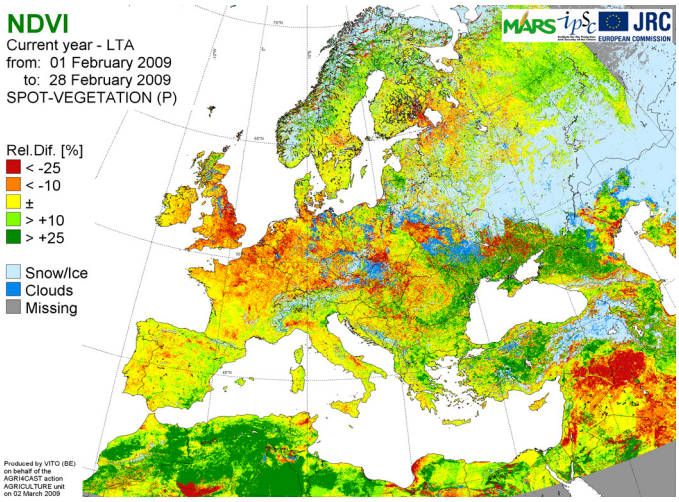






4. Satellite analysis: SPOT Vegetation

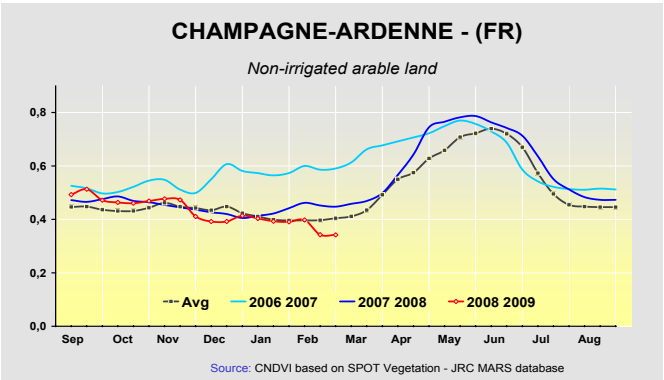
Slightly lower NDVI values for most of Europe, good development in the Black Sea area and Maghreb region

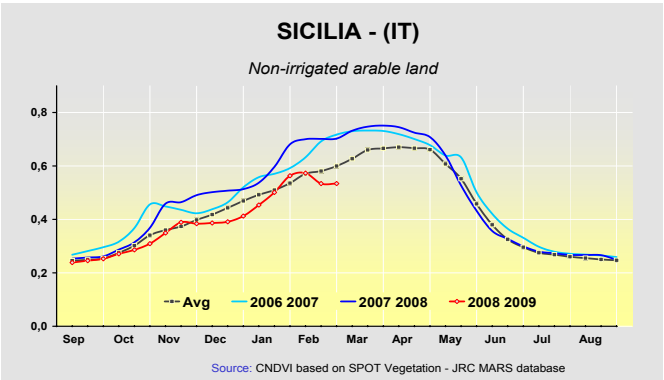


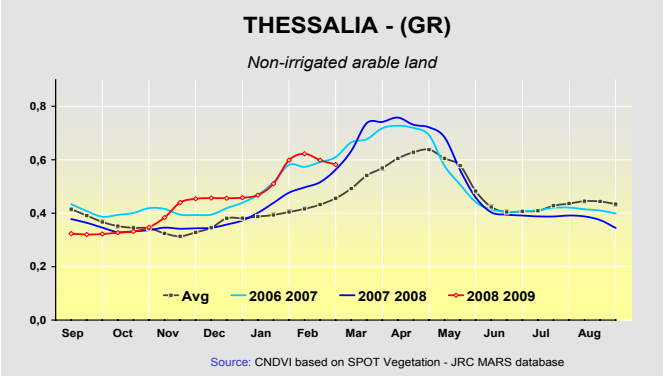
The NDVI map shows the relative differences between current NDVI and the long-term average (1998–2007) for February 2009. For western Europe, NDVI exhibits values lower than the long-term average, mainly in the eastern United Kingdom and around the Benelux area. A favourable situation is shown for countries bordering the Black Sea (e.g. Romania, Ukraine) probably due to warmer-than-usual temperatures during germination and tilling of the new winter cereals. In the Mediterranean basin, conditions are near to the average for Spain and Italy, while in central Greece and western Morocco, higher positive NDVI differences are visible.

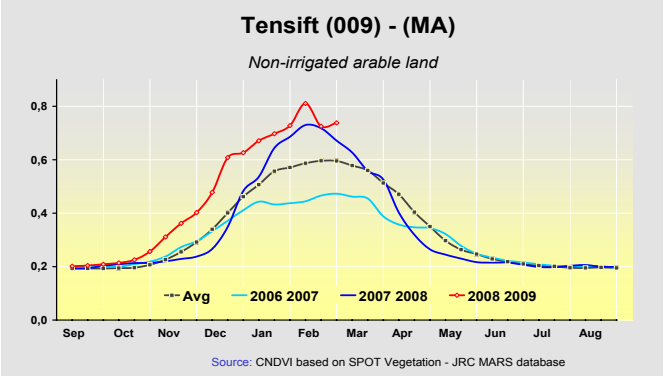
The situation is confirmed in the NDVI profiles of non-irrigated arable land. Western European countries have NDVI profiles around the average. In **France** (e.g. Champagne-Ardenne) and in southern **Italy** (e.g. Sicily), the NDVI values shifted slightly below the average in February. NDVI graphs in **Greece** (e.g. Thessalia) display high values caused by an advanced cycle, with a steep vegetation boost in January. Good starting conditions are highlighted in the west-coast countries of the Black Sea, but bad weather conditions could have affected the NDVI values in the second half of January. This becomes visible in the profiles for Romania.

The Maghreb region faces conditions from normal to very good. In Tunisia, NDVI profiles range around the average while extensive parts of arable land in western **Morocco** regions are characterised by anticipation early in the growing season. The Tensift profile even exhibits exceptional values above the average and the previous year.









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