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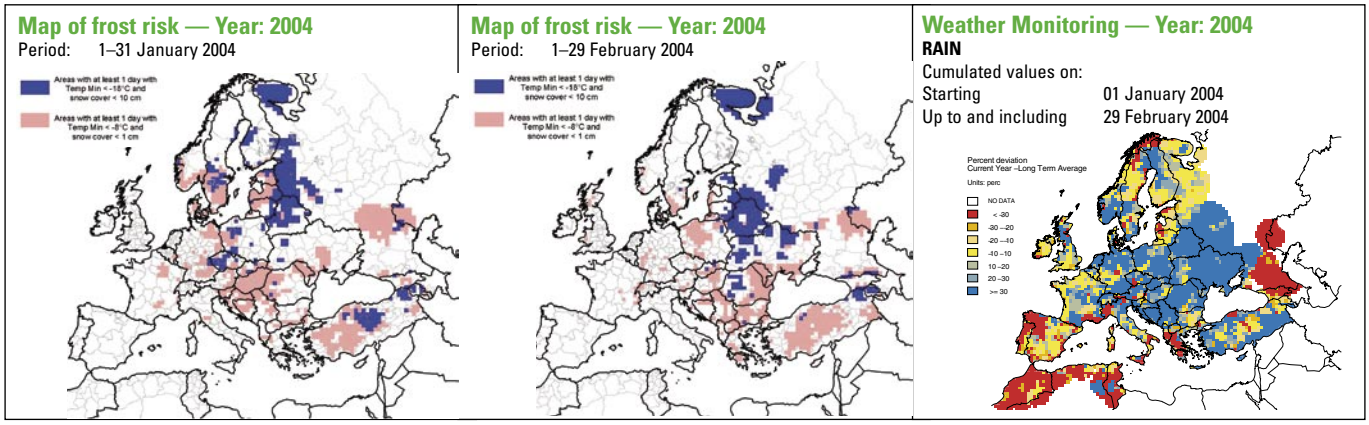
Situation at the end of **January-February 2004** Vol. **12** No **1**

Generally mild winter. Relatively dry conditions in the Mediterranean area and east European Russia



Agrometeorological overview

Generally higher seasonal temperatures. Low risk of frost damages due to extended and sufficient snow cover. Relatively dry in central and western Mediterranean countries, wet in eastern and central countries and changeable in Russia.

Temperature and evapotranspiration

Warmer than average conditions in the central and eastern areas and low risk of frost damage on winter cereals (except small and scattered areas in the Czech Republic, Poland, Ukraine, Belarus, Russia and Turkey). Temperatures closer to average and relatively dry conditions in Maghreb, Iberian peninsula and coastal areas in France, Italy and Greece.

Analysing the cumulated 'active temperatures' (with base temperature = 0 °C) in the whole period, it is evident that all the European territories experienced warmer than average temperatures, especially in central and eastern countries, Germany, Benelux, Austria, Denmark, Sweden, England and north-eastern France.

Studying in depth the **dekadal temperature values,** it appears that, in the period under consideration, the warmer conditions were interrupted by several cold waves: **in January,** during the first dekad, a cold wave crossed Greece, western Turkey, Hungary, southern Italy and France (in many areas in Germany, France and central-eastern countries, the minimum temperatures reached – 10/ – 15 °C, combined with consistent snowfalls); this was followed by a very warm period (with the exception of central-eastern Europe). In the last part of the month, a second cold wave crossed the continent from Denmark to Greece (with more severe minimum values and abundant snow). In small and scattered areas in western Czech Republic, western Poland, Ukraine, and parts of Belarus, Russia and Turkey where the snow cover was insufficient, there were low or moderate levels of frost risk. At the beginning of **February,** all over Europe warmer than average temperatures were recorded (in several areas in Germany, Benelux, Poland and the Czech Republic both minimum and maximum temperatures were also 8/10 °C above the average); in the second dekad a new very cold wave, coming from the north-east, crossed southern Italy, the Balkans, Turkey and Greece, where exceptional negative peaks (8/10 °C below the expected values and maximum daily values also below 0 °C) were recorded. In the last part of the month, another polar front, with intense snowfalls, invested western Europe, England, Ireland, Benelux, Germany and part of the central countries.

Due to the early stage of development of the active crops, the abovementioned thermal conditions marginally influenced the values of the **potential evapotranspiration,** the **crops' development** and **biomass production.** These were close to the norm in general all over Europe, with some localised exceptions in Great Britain, Germany, Benelux, Spain and southern Italy where values slightly above the average were recorded.

Contents

Rain and climatic water balance

Both in January and February, above average rains fell over the central-eastern countries, Ukraine, Belarus and Turkey. Drier than average conditions on the coastal Mediterranean countries (with the exclusion of Turkey), the Iberian peninsula, north Africa and Russia were recorded.

The **cumulated rains of the whole period** and their comparison with the long-term average show significant higher values over south-west and central France (Midi-Pyrénées, Centre), north-east Italy (Veneto, Friuli), east-central and south Germany (Niedersachsen, Sachsen-Anhalt, Bayern), the Netherlands, southern Sweden, central-eastern countries, Ukraine, Belarus, Turkey (except the northern coast), north Balkans and Austria. In general these rains were well distributed, except in the central and eastern countries where several consecutive rainy days were recorded.

On the contrary as a whole, Greece, north and western Spain (Castilla y Leon, Aragon, Cataluña, Comunidad Valenciana), southern Italy (Sicily, Puglia, Sardinia), Maghreb and southern Russia received a **reduced amount of rain** and consequently experienced a reduction of soil moisture. The possible impacts of these conditions on the active crops are not yet estimable, but are related to the future water supplies (rain and snow melt) and with the soil characteristics (soil water retention). The worst conditions seem to be present in southern Russia, where in previous months also (October–December 2003) the area received scarce rain supplies.

According to the rainfalls, the **climatic water balance** presents significant negative values compared to the average in Maghreb, Portugal, majority of Spain, southern Italy, southern France, Greece and southern Russia.

The areas most likely affected by **excessive rain** were the Netherlands, Ireland, south-west England, northern Germany (Schleswing-Holstein), central and north-west France (Bretagne), north Poland, Belarus, eastern Ukraine and southern Turkey, where not very intense but persistent rains caused possible local and temporary excessive moisture conditions. The following maps show the distribution of the number of the rainy days (daily rain above 5 mm).

Publication issue

The first printed MARS Bulletin for the 2003/04 agricultural campaign covers the January–February agrometeorological conditions.

It makes a synthesis of the major issues pertaining to:
— frost kill and soil moisture conditions;
— growing conditions for winter crops.

Previous related analyses available:
— Conditions at sowing — beginning of November 2003 (Vol. 11 No 6)
— November–December 2003 climatic update

Contributions

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MARS stands for Monitoring Agriculture with Remote Sensing

Technical note

The long-term average used within this bulletin as a reference is based on an archive of data covering 1975–2002.
The CNDVI is an unmixed normalised vegetation index on the base of CORINE Land Cover mainly 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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It can be accessed through the Europa server (http://europa.eu.int).

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Next issue

Vol. 12 No 2 – 2004: March–April analysis.

Highlights by region of interest

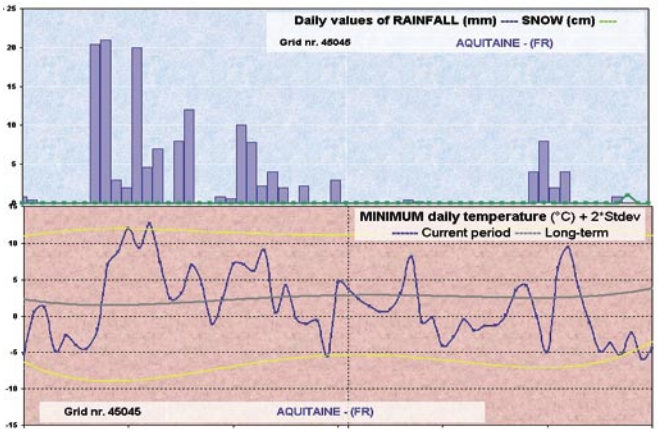
EU-15 countries

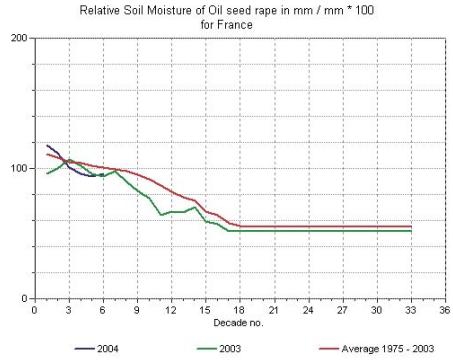
France: Mild winter

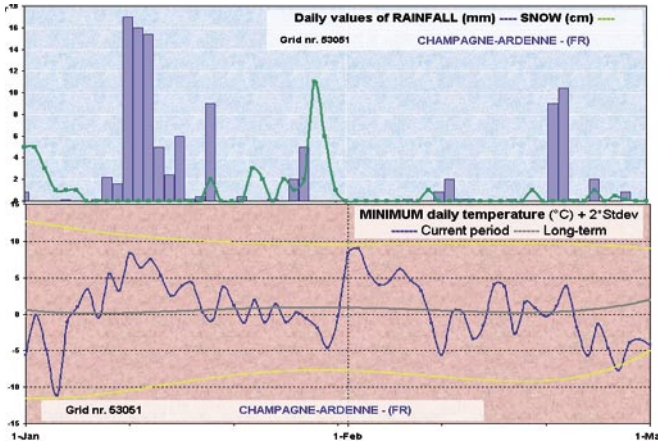
The period was characterised by milder temperatures than average that shortened the dormancy period and favoured an early restart of the vegetation activity. However, during the last dekad of February the temperature fell below seasonal value.

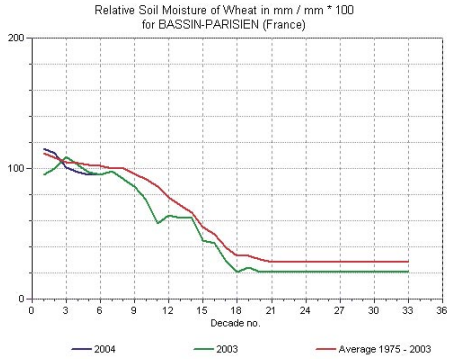
Only a few areas (mainly in Champagne Ardennes and Alsace) were exposed to possible frost kill conditions where temperatures below – 8 °C were recorded over two to five days. Except for these limited zones, most of the crops could start the regrowth period at their full potential.

After a wet January with around 100 mm, February recorded few precipitations (less than 30 mm for most of the arable area), far below the long-term average (< – 30 %). Auvergne was the drier region in France with less than 100 mm during the two-month period. Further precipitation will be important to replenish the soil moisture in order to meet the winter crops' needs during a new development phase.





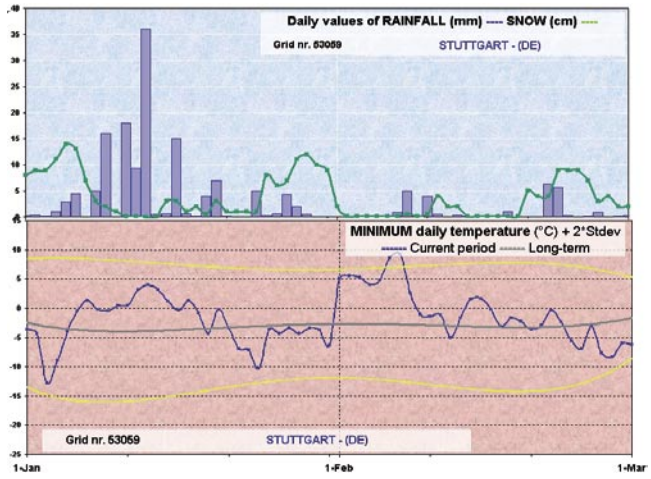


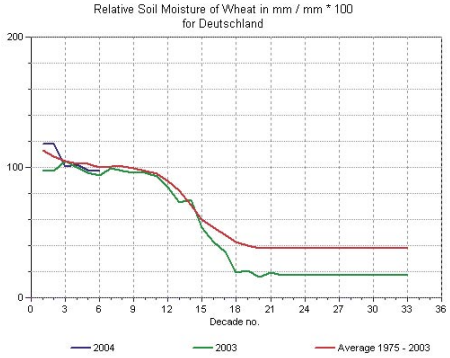


Germany and Austria: Higher temperatures than expected

Germany experienced temperatures above the average (more than 30 % higher) during most of the period. At the beginning of February, the minimum temperature increased up to 10 °C for the half western part of the country. At the end of January and February, the temperatures fell below the seasonal level. Up to 10 days with minimum temperatures below – 8 °C were recorded in the eastern part of the country but the sufficient snow cover should have prevented frost damage.

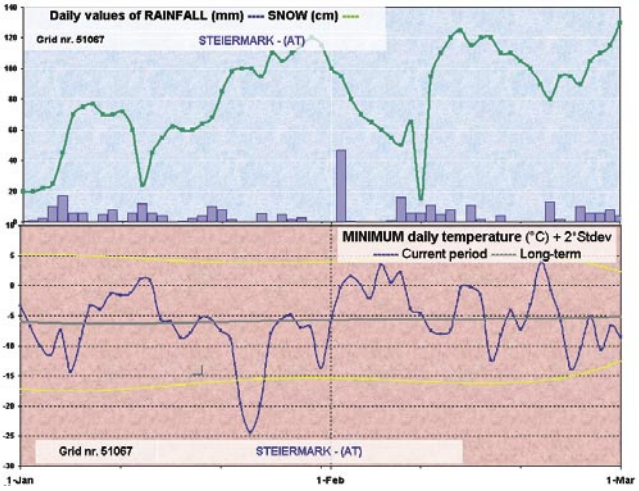
Germany received at least 30 % more rains than normal with 120 to 170 mm, except in the central part where less than 100 mm were recorded. After significant precipitations in January, February was drier than expected in the southern part.





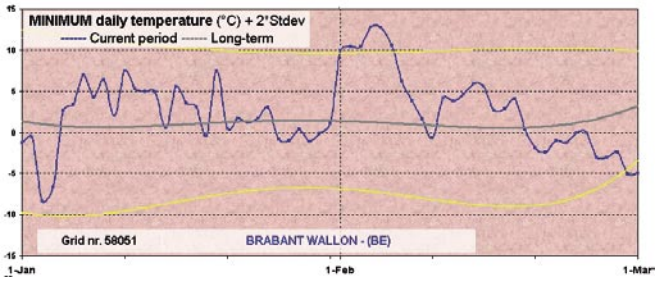
Despite a reduction of the soil moisture, particularly for the winter wheat and rape seed, the soil water reserve should retain all the crops' growth potential after the dormancy stage.

Austria received between 120 and 170 mm of rainfall in the central and western areas. The eastern part experienced relatively drier conditions with less than 100 mm. The temperature remained higher than the seasonal level during the two-month period. However, some extreme minimum temperatures (up to – 25 °C) were recorded and the snow cover was sufficient to protect crops from frost kill.

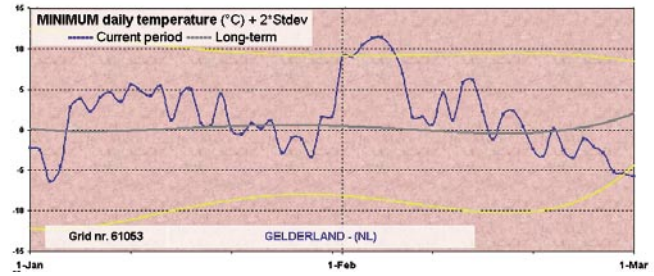


Belgium, the Netherlands, Luxembourg: Mild, mild, mild

These three countries recorded higher temperatures than average (> 30 %). Except at the beginning of January and the end of February, most of the daily minimum temperatures were above 0 °C. This mild condition should have shortened the crop dormancy period.



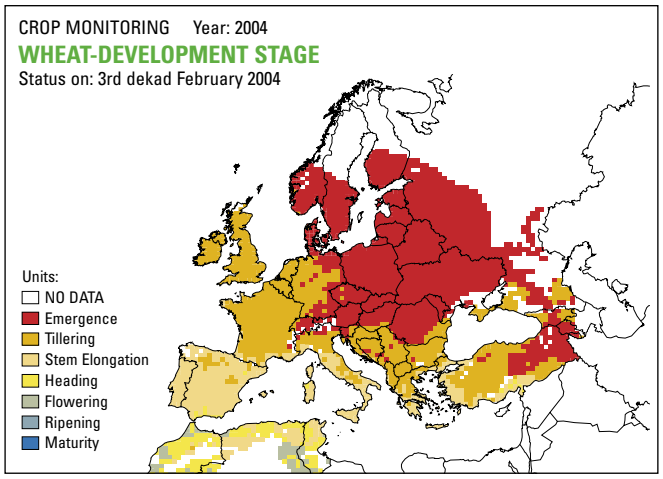
The Netherlands received abundant rainfall, with more than 165 mm; **Belgium** and **Luxembourg** recorded more than 120 mm mainly during the month of January. The crops that will start a new development phase will benefit from a normal soil moisture reserve.

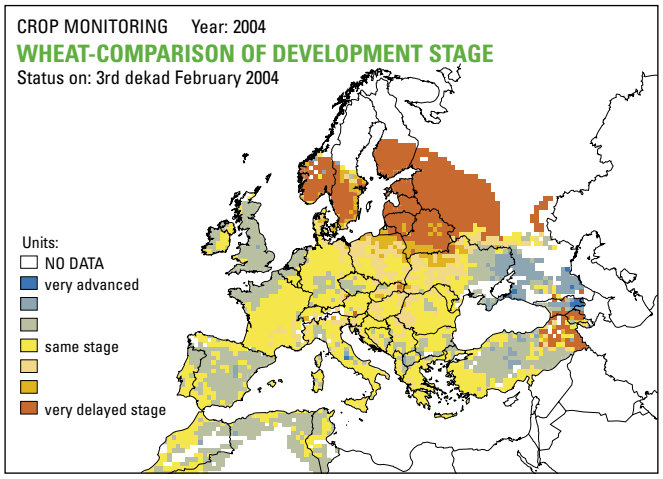


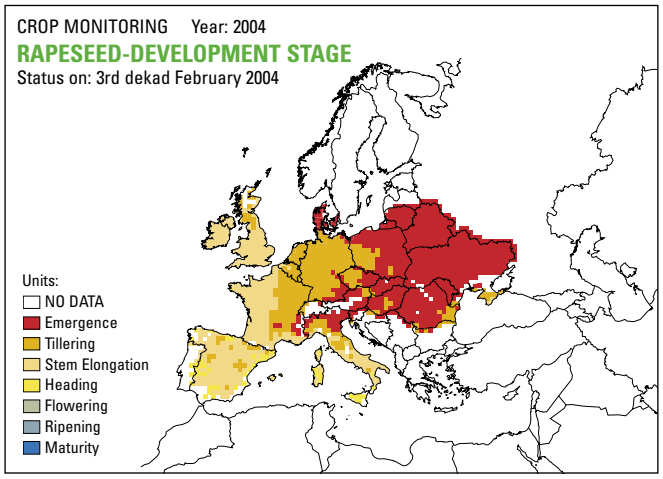
UK and Ireland: higher seasonal temperatures in the UK, normal in Ireland

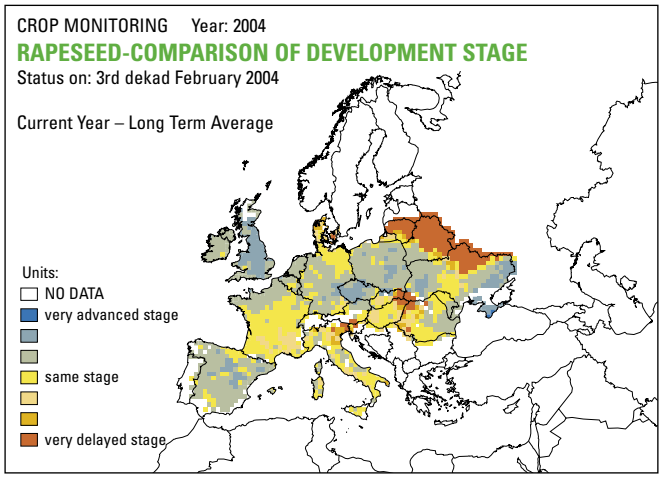
In the United Kingdom, both in January and February, the thermal conditions were higher than the average for the period. On the contrary, in Ireland the temperature values were very close to the normal.

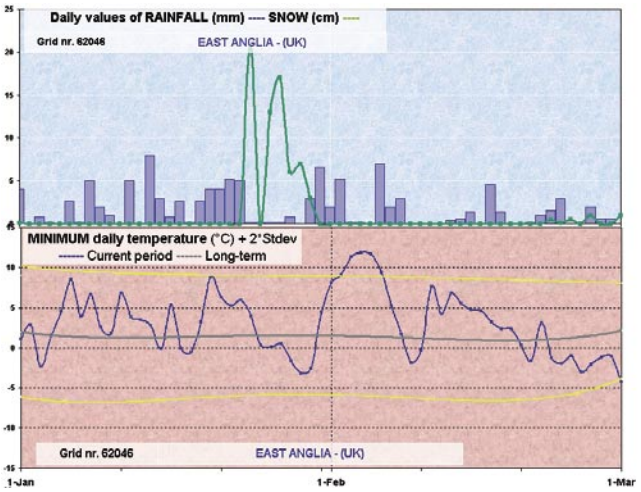
In the UK, excluding the last dekad of February, during the remaining part of the considered period the **temperatures** (in particular the minimum daily values) were, on average, constantly 1–2 °C above the normal values. The rate of crops' development positively responded to these conditions. In fact, at the end of the period, according to the MARS simulations, **the UK crops generally presented a slight advanced stage of development**. No frost risk conditions were











observed. In the second half of February, the temperatures dropped below the average, prolonging the winter dormancy.

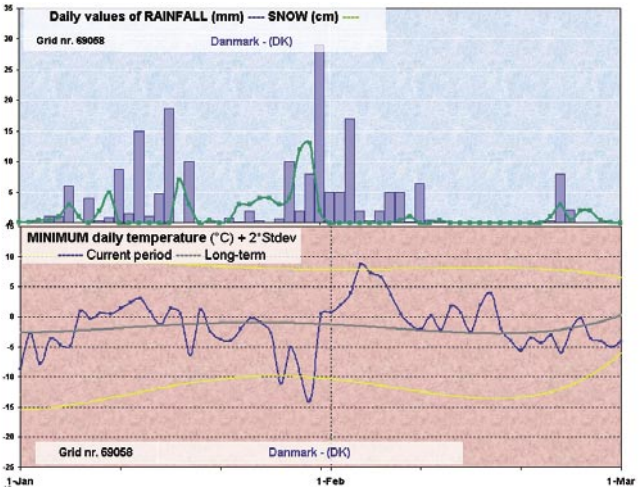
The cumulated values of **rainfalls** (between 100 and 250 mm, distributed over 25–30 days) were close to the normal; higher than average values were only recorded in Scotland (in some cases past 350 mm, equivalent to + 70 % compared to the long-term average). The rains were mainly concentrated between January and the first dekad of February. The last two dekads of February were practically dry. Overall, Ireland presented higher cumulated values compared to the UK but slightly lower compared to the average.

Denmark, Sweden and Finland: Normal January, higher seasonal temperatures in February

As a whole, in Denmark and Sweden the 'active temperatures' (base temperature = 0 °C) were above the average during the period. On the contrary, normal conditions were reported in Finland.

In Denmark and Sweden, during the considered period the **maximum daily temperatures** were relatively close to the norm; only during the first and second dekad of February were they significantly above the average. On the contrary, the **minimum daily temperatures** oscillated within a large digression, especially between the last dekad of January and the first of February, when temperatures passed from – 14/– 16 °C to 7/9 °C in a few days. The frost effect on the crops was minimised by the snow presence and frost damages seem unlikely.

The cumulated rain values were close to the norm and their distribution was such as not to determine problems.

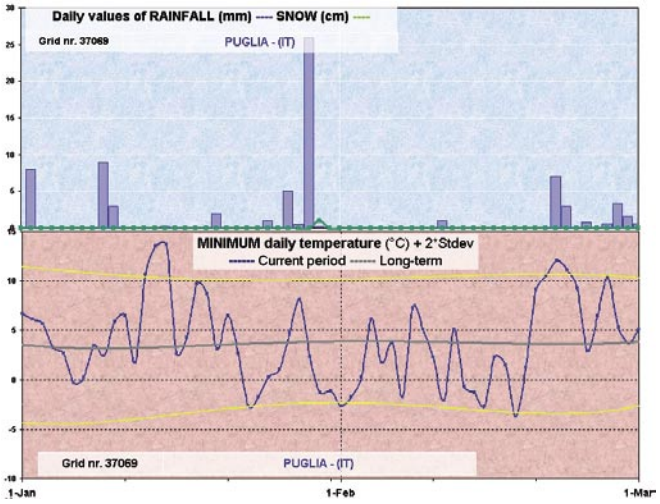


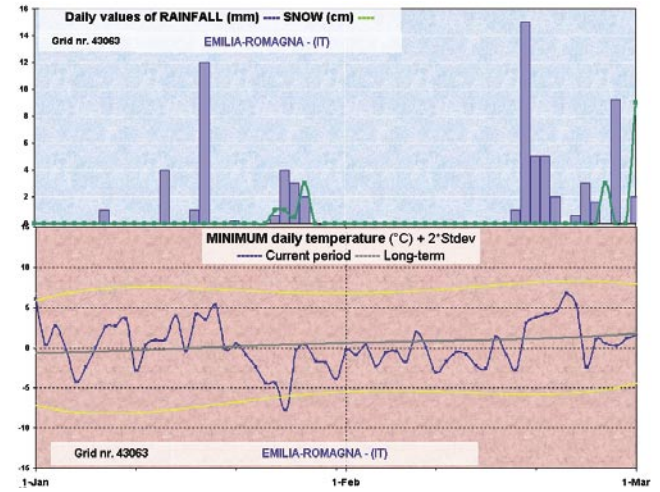
Italy: Temperatures close to the norm (except north-east), relatively dry north-west and southern areas, extended snow cover

During the period under consideration the **temperatures** oscillated according to the synoptic fluxes. In particular, the southern areas were affected by air masses coming from different quadrants (from south-west to north-east), with consequent rapid variations in temperatures. In **January** two cold waves (with extended snowfalls) were separated by a southern flux which rapidly and significantly increased the temperatures (especially the minimum values). **February** started with higher seasonal temperatures in northern areas but in the second part a new cold flux invested the south and in the last part it left these areas and moved towards the north. The snow cover protected the crops and frost damages are not likely.

As a whole, the rain was abundant in the north-east (+ 30/40 %), normal in the central areas and relatively scarce in the south and north-west (– 40/– 50 %). During the second dekad of February some intense showers (60–70 mm) or consecutive rainy days were reported in north-east and centre areas. In these areas, local and temporary excess of soil moisture was possible.

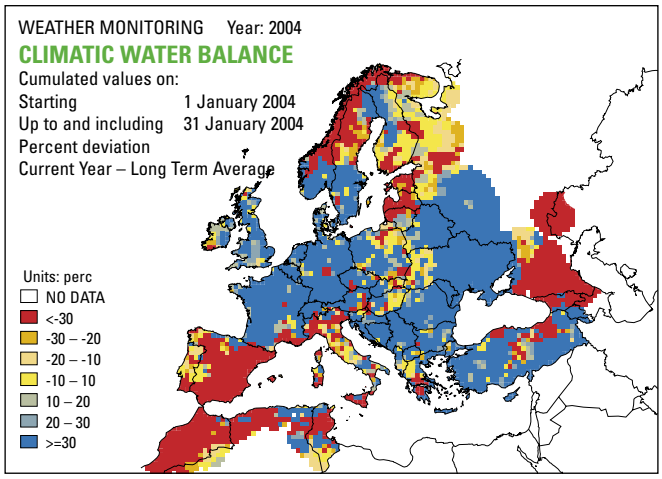
Due to the early stage of development and the snow cover presence, the winter crops should not be affected by frost kill.

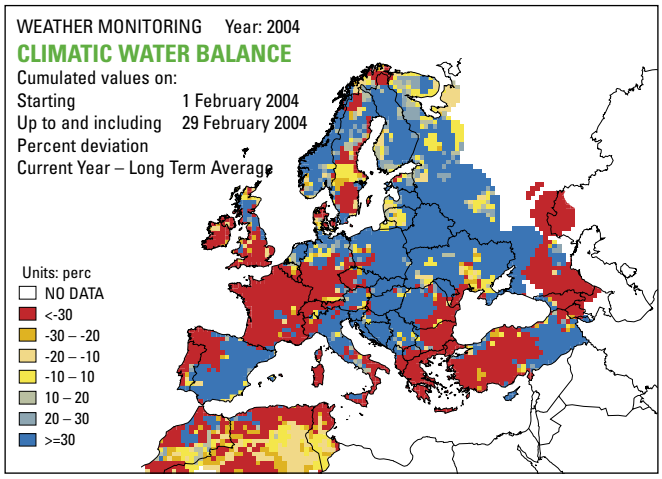


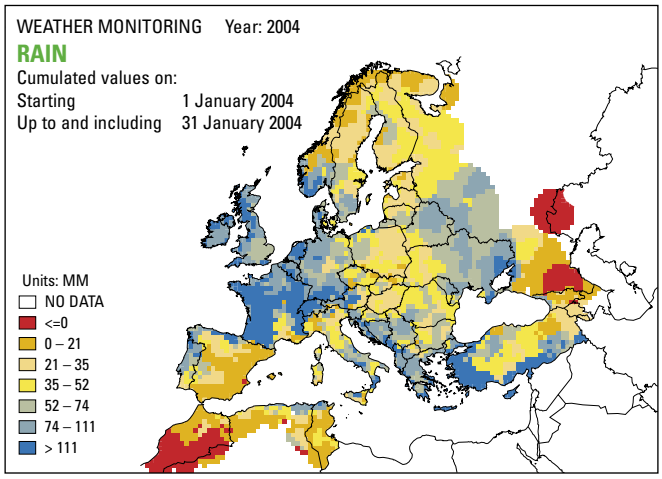


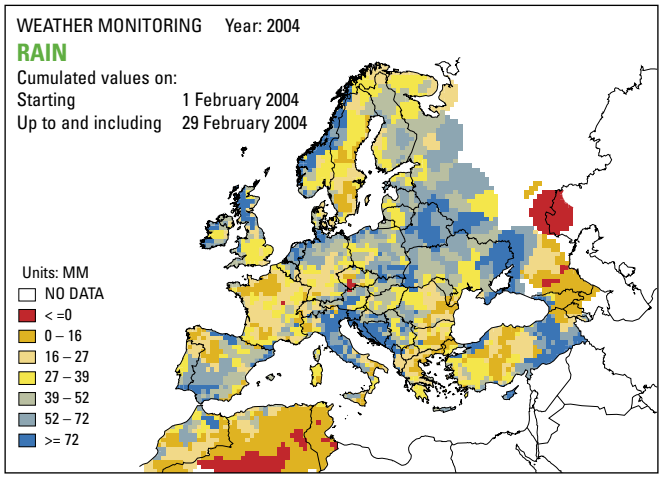
Spain and Portugal: Temperatures slightly above the average, normal rain supply (except north-west areas)

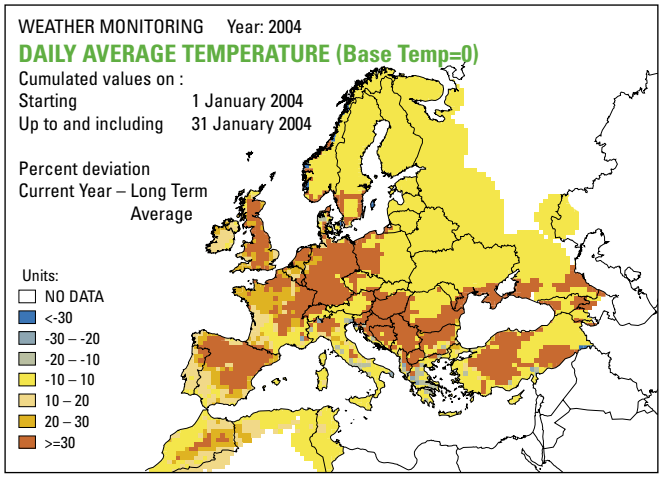
The new year started with four consecutive dekads warmer than average especially in central and northern areas. In the second half of **February,** the temperatures dropped (in particular the maximums) below the seasonal values and at the end of the month, in the central-northern areas, snowfalls were reported.

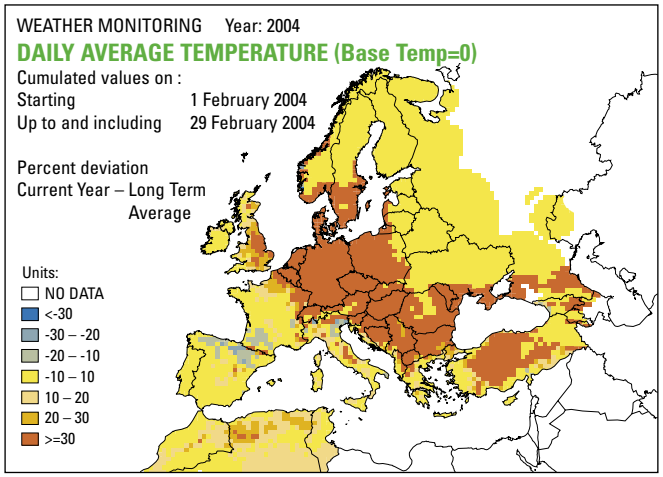


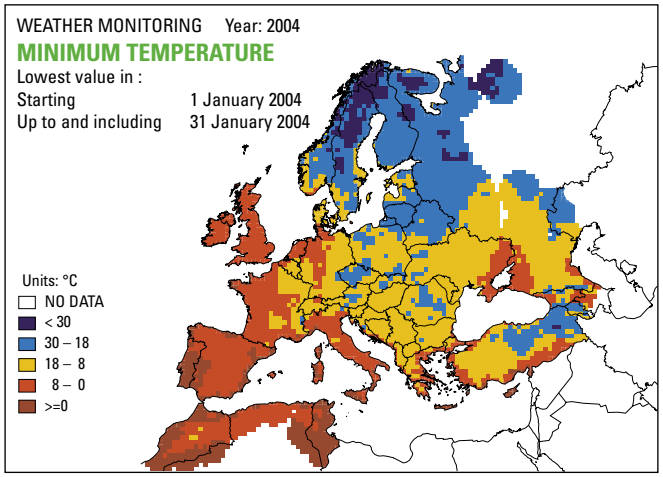


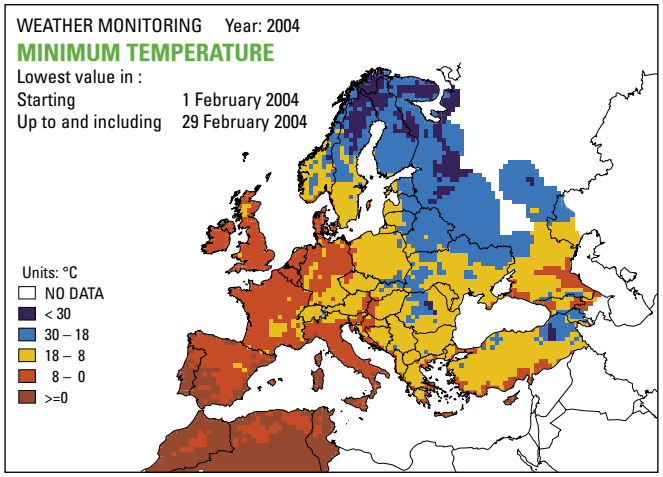






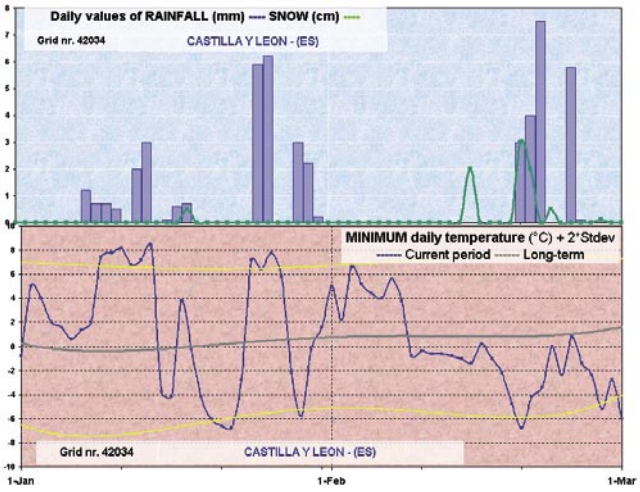






The rain was globally close to expected (only north-western Spain and northern Portugal received lower than average cumulated values) but varied in distribution in the north-west, south and east areas, respectively: scattered in January and in the last dekad of February; very dry in January and several consecutive rainy days in the second part of February.

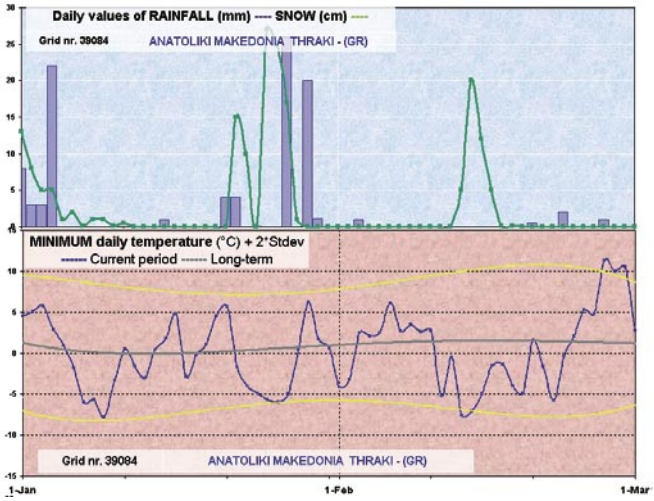
In January, the crops' development positively responded to the favourable thermal conditions, but at the end of February, due to the cooler conditions, more normal values are simulated.



Greece: Cold and wet conditions in January, warmer and drier than average in February

As a whole, the **active temperatures** (base temperature = 0 °C) during the considered period were close to the norm, but actually the temperatures oscillated according to the general air masses' circulation. **January** started and finished with temperatures lower than seasonal values associated to extensive and significant snowfalls, especially in Kentriki Makedonia and Anatoliki Makedonia. In the first half of **February** similar characteristics were present and the second snowfalls affected practically the whole country. In the last part the weather changed drastically and higher than normal temperatures were recorded.

The **rain** was mainly concentrated in January during the first and last dekads. On the contrary in February the only precipitation recorded was practically only due to the snow. According to the rain's course, at the end of January, the soil moisture reached higher than normal values, but rapidly compensated in February.



Central European countries and Turkey

Estonia, Latvia and Lithuania: Normal winter conditions

The temperature for the first two months of the year was close to normal, except for a warmer February for the seashore area of Lithuania and for parts of Latvia. The snowfall ensured a protective layer for the well-hardened winter crops so, although a serious reduction of the leaf index is expected, the plants will be able to recover in the spring but with some delay.

Poland: Frost risk present in limited areas

Although January and February were warmer than usual, in some limited areas winter crops were affected by some frosty days (below – 18 °C) in January when a reduction of initial plant population could occur and in larger areas unfolded leaves of winter crops were damaged in spite of the good cold hardening status due to the thin snow layer. The crops from these areas are expected to recover in the spring and larger zones from the centre and south-west of the country experienced less difficult conditions.

Czech Republic, Slovakia, Hungary and Slovenia: No serious frost problems identified

Low temperatures reduced the leaf area index of wheat crops from the Czech Republic and Slovakia but recovery is expected in the spring.

For Hungary and Slovenia no special frost problems are expected even if for some days temperatures decreased to below – 8 °C and the thickness of the snow layer was less than 1 cm because the winter wheat crops were supposed to be in good hardening conditions.

Romania: Possible frost-induced problems in the centre of the country, but better conditions expected for the rest of the country

Winter crops from the centre of Romania may be injured by the temperatures below – 18 °C in January. Above the ground biomass in southern and eastern parts of Romania should also be affected by the temperatures below – 8 °C which occurred when the snow cover was too thin to provide a good protection; however, the wintering conditions are much better than in the previous year.

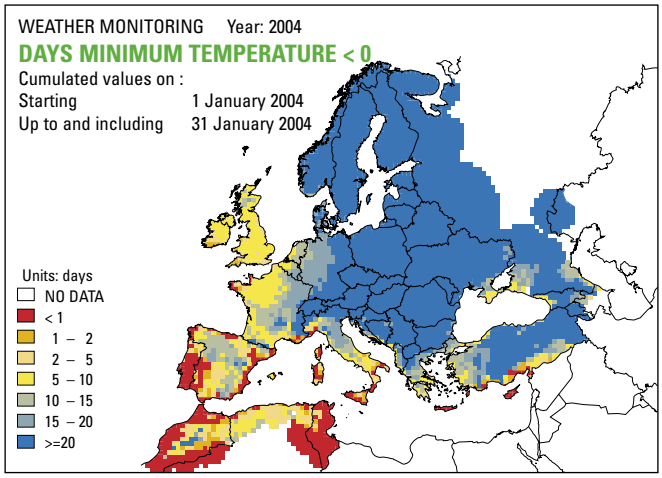
Bulgaria: Crops with no major damage but vulnerable to a late frost

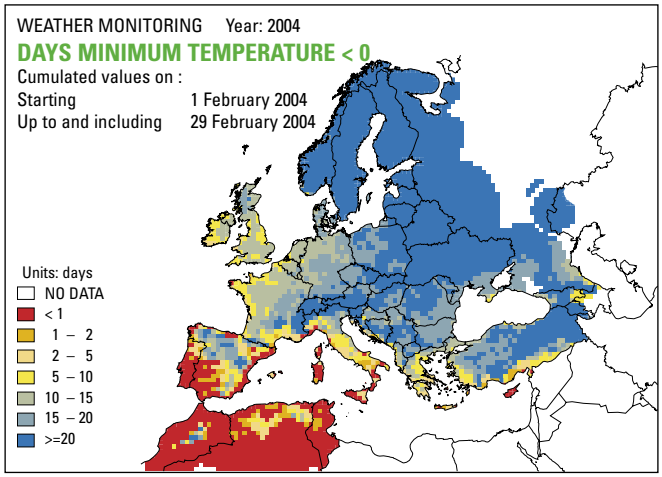
Most of the Bulgarian territory received fewer precipitations than in the previous year, except the eastern part of the centre of the country where the weather was warmer.

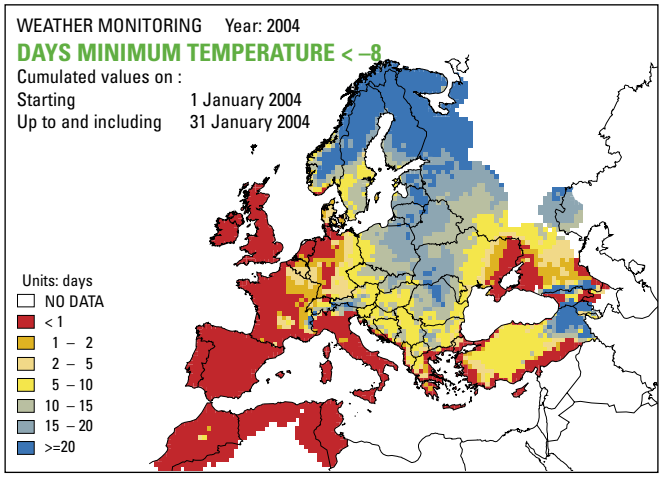
Even if the air temperature decreased on large surfaces below – 8 °C and the thickness of the snow layer was less than 1 cm, the above ground biomass was affected only in different zones along the western and southern borders of the country and also on the northern area of the country. The damages are not important for the winter wheat, which seems ready for a quick start in the spring, but as a counterpart the lowering hardening index (less than 60 % from maximum value) suggests that the crops may be vulnerable to an occasional late frost.

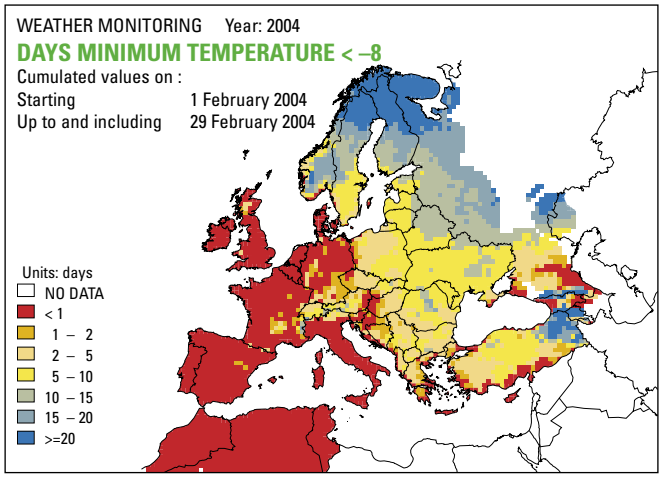
Turkey: Leaf area index reduced by frost especially in the central areas of the country

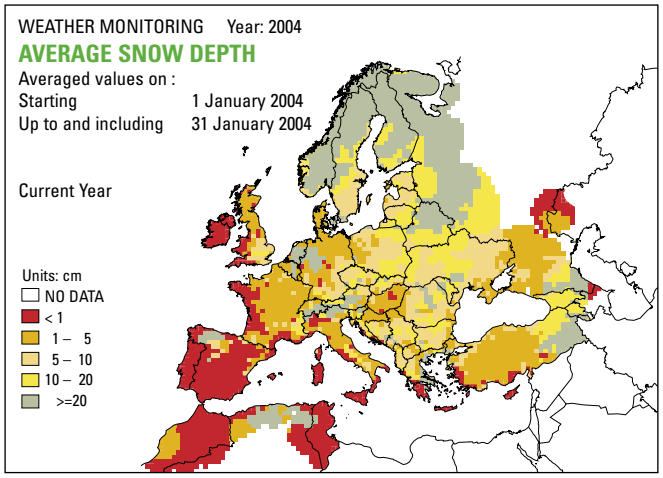
Large areas from the north-west to the centre of Turkey were affected by frost in January and partially in February, the leaf area index being decreased by frost. Above ground biomass is at a lower level than in the previous year, except some areas along the western and southern seashore. The relative soil moisture is at the long-term average level.

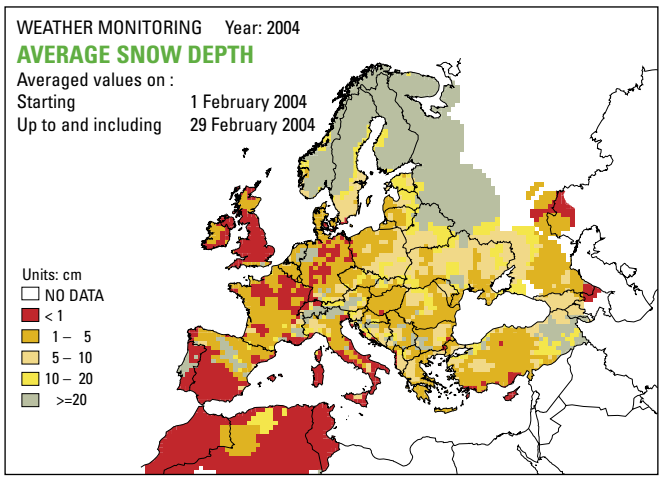


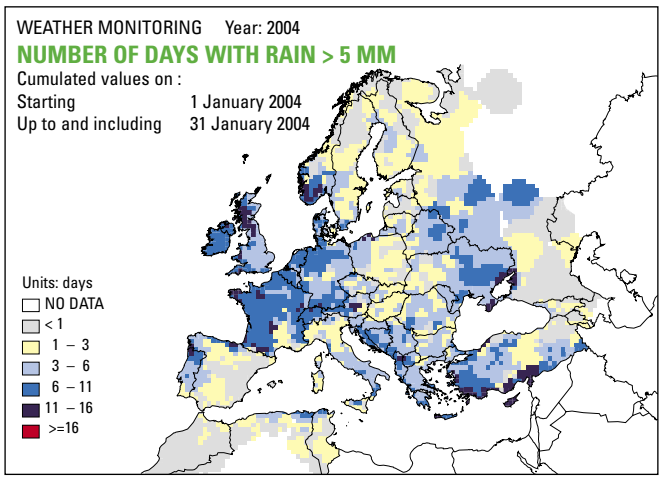


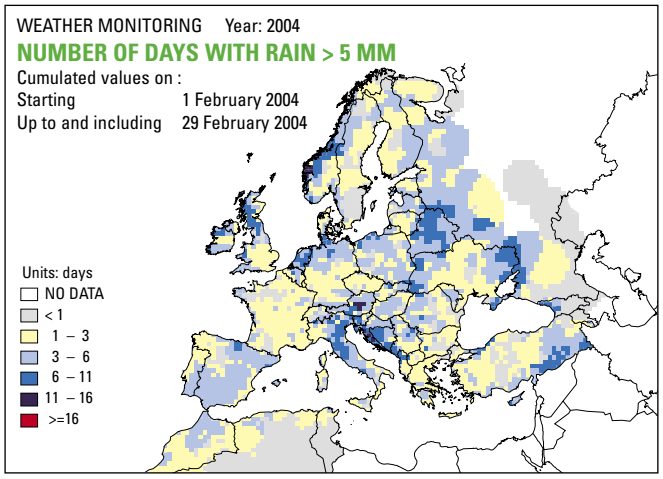












Eastern countries and Russia

Ukraine: A better situation than previous year

Repeated moderate frost risk (less than – 8 °C and less than 1 cm of snow) occurred in January and February for south-eastern Ukraine. Meanwhile, temperatures below – 18 °C were recorded for some areas in the north and north-west of the country. It may be supposed that strong winds induced local alterations of the depth of the snow layer and its thermal insulation capacity. The leaf area index of the crops from the west and north was decreased by frost but from this point of view the situation of the winter wheat seems better in comparison with the previous year.

Belarus: Wet and frost conditions

The precipitations received in January–February 2004 exceeded by 30 % the long-term average for the same period. The temperatures below – 18 °C combined with snow layers thinner than 10 cm reduced significantly the leaf area index of the crops especially in the north of the country.

Russia: Considerable frost risk in some areas

According to the available weather data, it may be suggested that the winter crops were damaged around the Ulianovsk zone (including parts of the administrative units *(oblast)* of Saratov, Nizhniy-Novgorod and Penza). Here it was the coincidence of low temperatures, thin snow cover and low values of the calculated hardening index, but the crop status at the end of February is somewhat better than in the previous year.

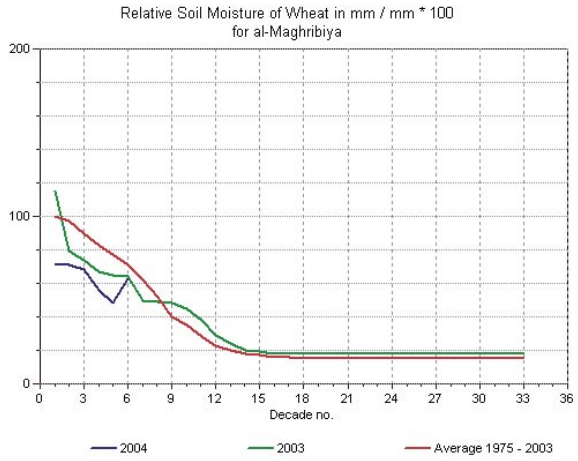
The leaf area index of the crops from other regions should also be decreased by frost. Soil water supply, which was already at a lower level at the time of sowing, decreased even more due to the lack of precipitations in the first 50 days of the year 2004, but at the end of February the long-term average level was reached.

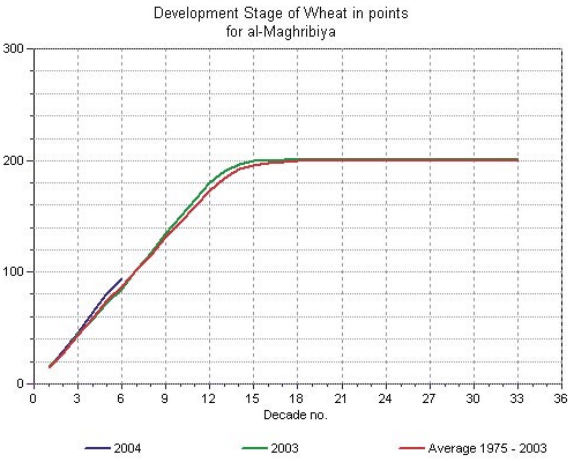
Maghreb

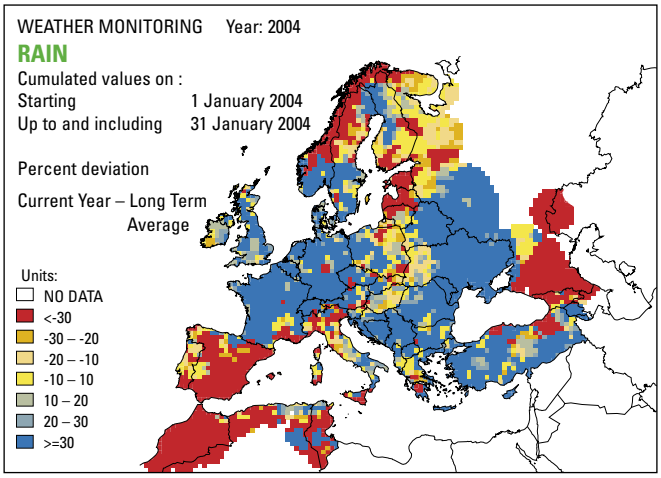
Maghreb: Much lower rainfall than average

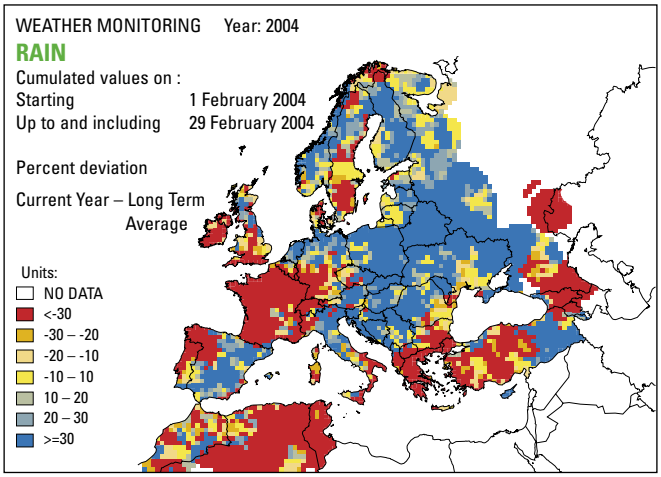
The temperature was slightly above the normal and favoured an early crop development.

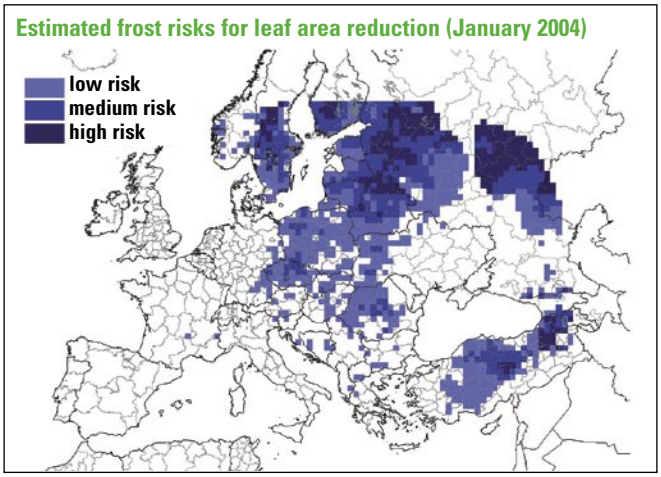
The precipitations received in January–February 2004 were far below the seasonal value with less than 70 mm when 120 mm were expected. The soil moisture was partially replenished during the last dekad of February. Further precipitations should be necessary to retain the yield potential of winter wheat.

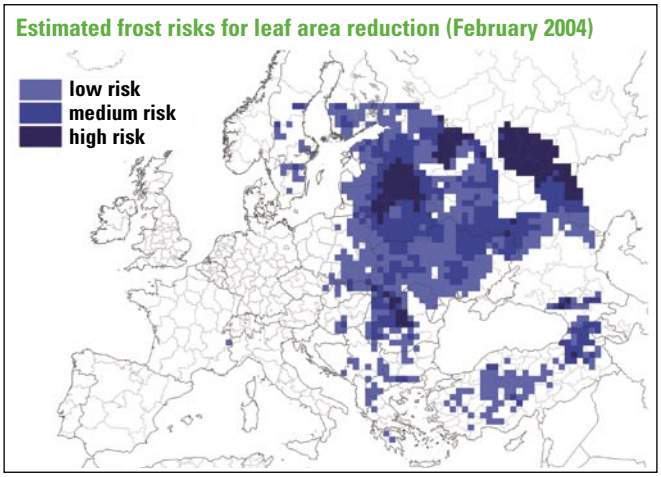




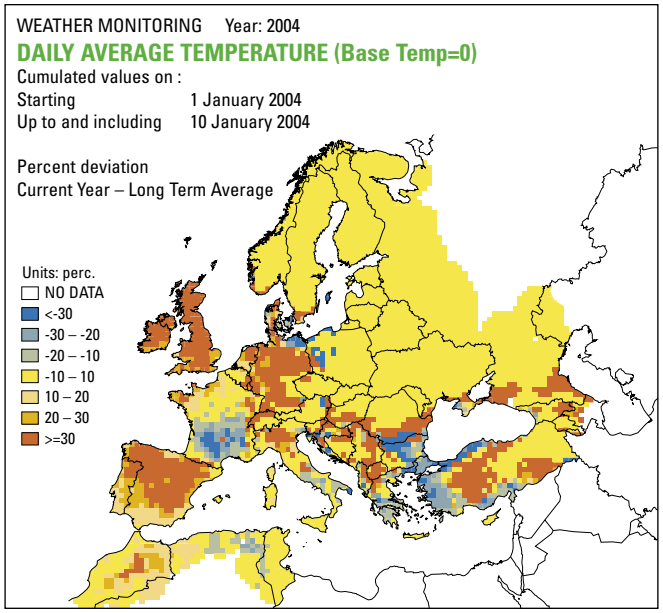


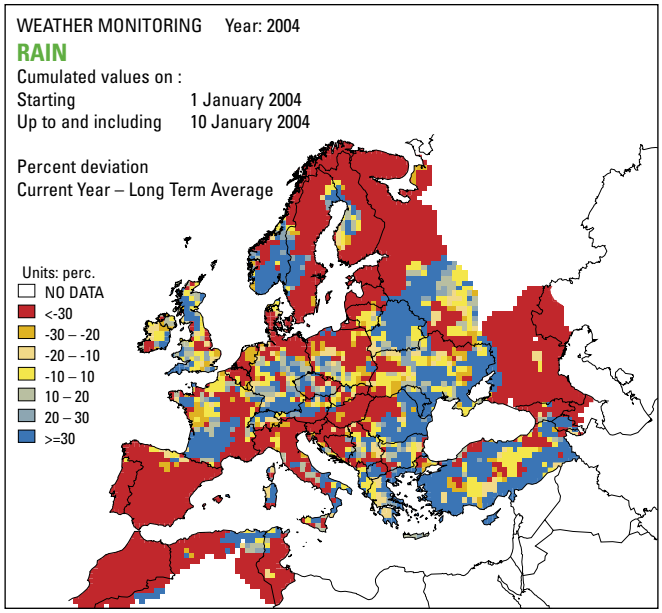


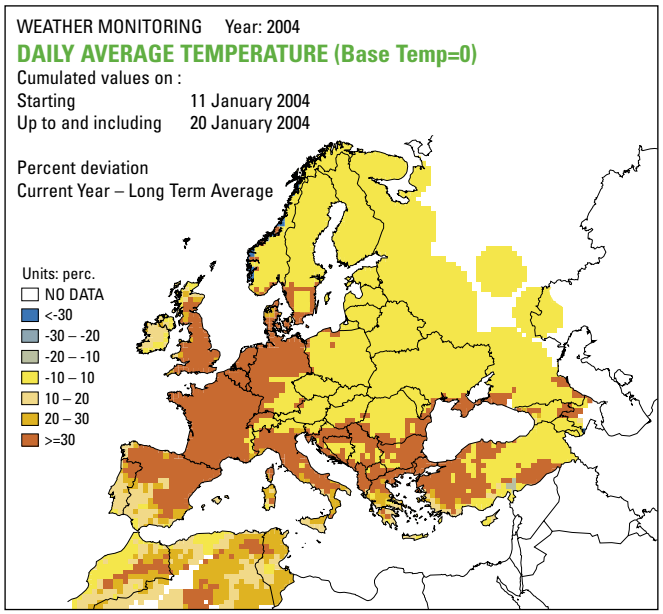


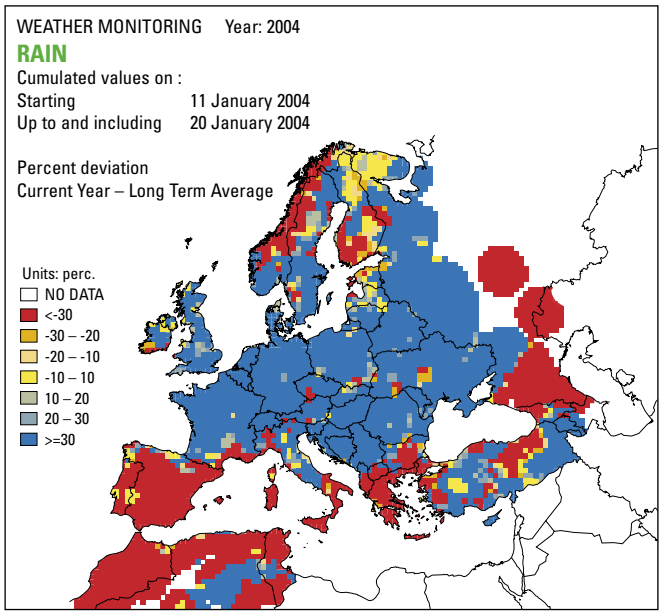


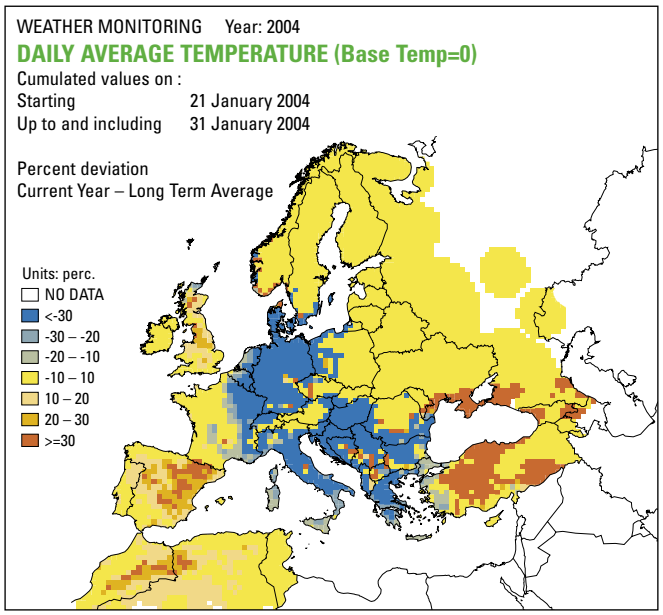
Ten-day rain and temperature maps — January 2004

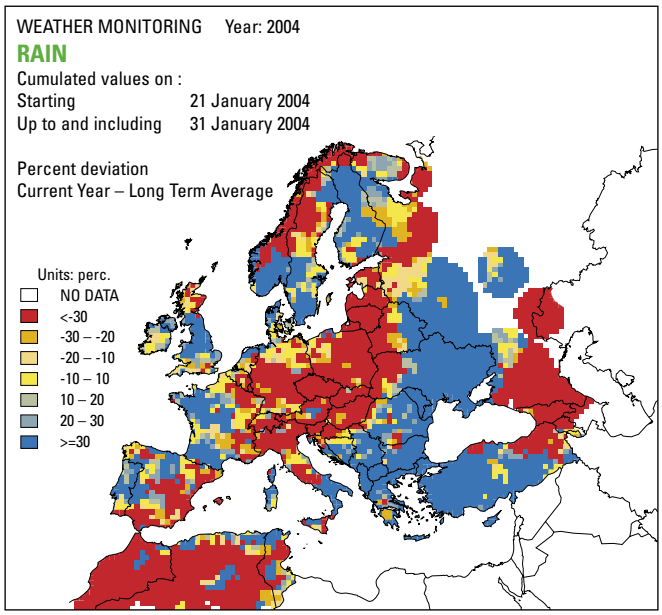




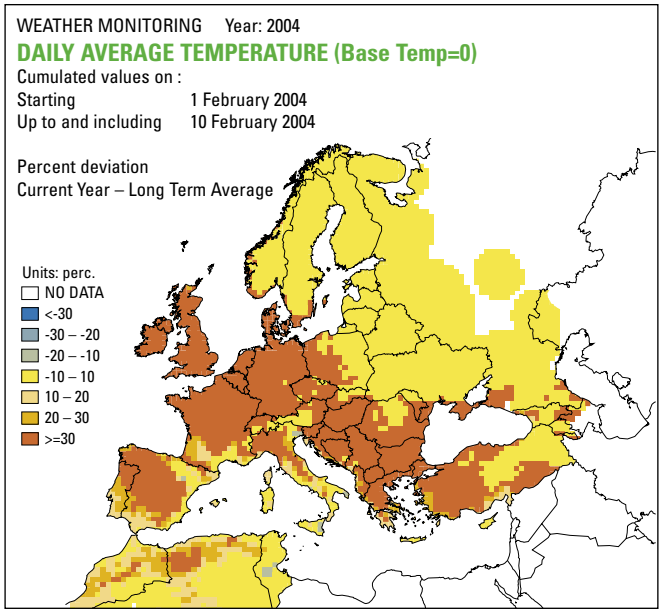


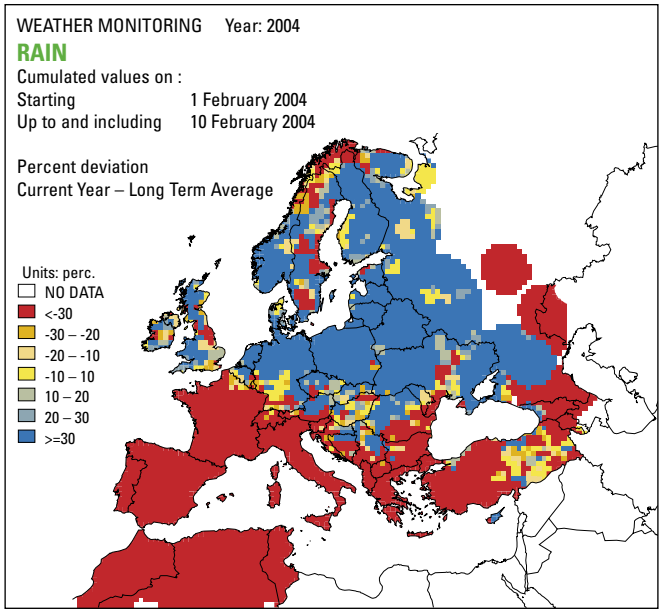


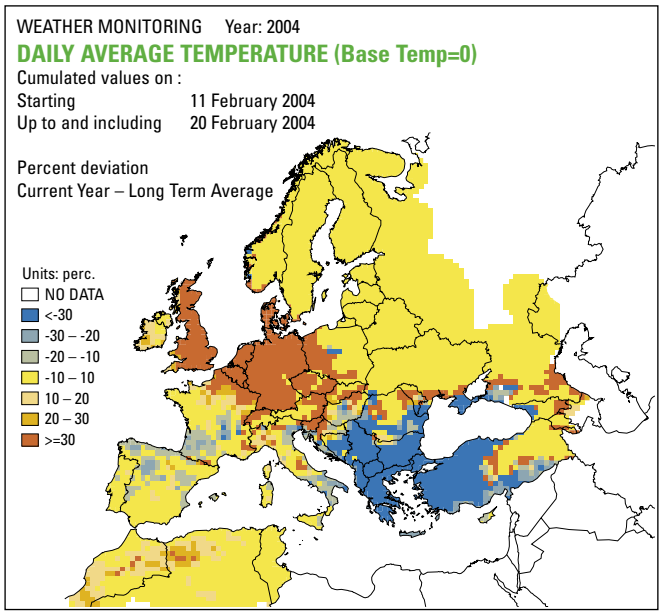


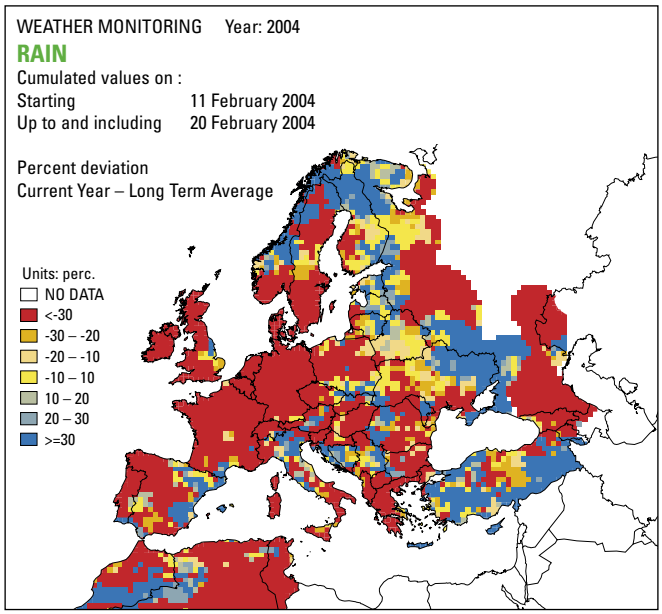


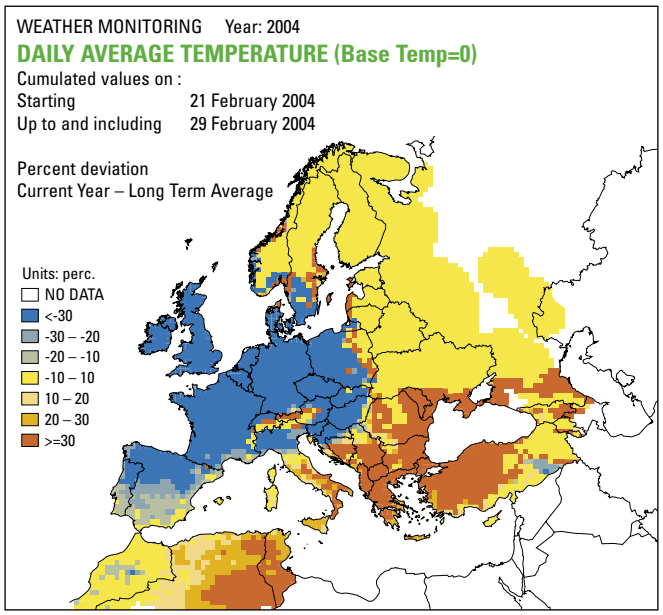
Ten-day rain and temperature maps — February 2004

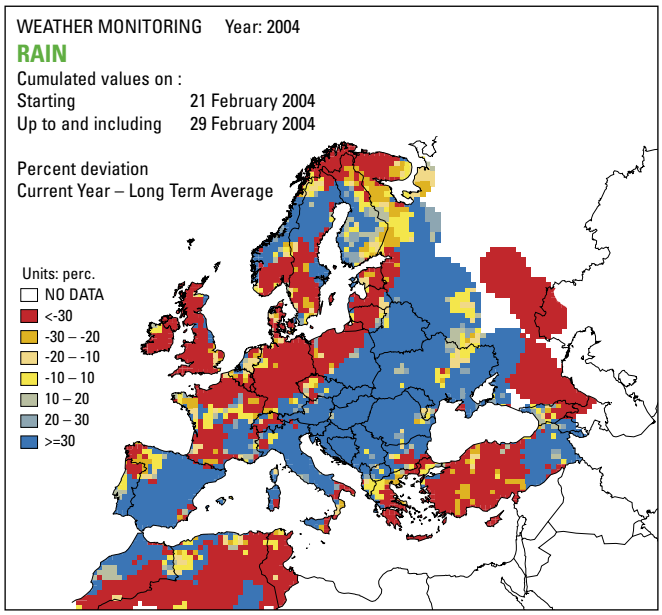












Spot/vegetation satellite analysis

Maps' highlights: Good start of vegetation development in the Mediterranean Basin and in central-northern Europe

The NDVI image of February 2004 shows a good start of the season in the Mediterranean Basin, in particular in the Maghreb region (Tunisia, north-west of Morocco's coast), as well as in southern Spain, central Italy, northern France and Germany. Conversely, low values of the index are registered in Italy, Greece and Turkey, probably due to very cold temperatures and the considerable presence of snow during January and the last dekad of February, as evident from the second map: the maximum value in third dekad.

These cold waves, alternated with warm temperatures, could have affected the early stage of development of crops as appears from the significant differences with the previous season, except for some regions where values are higher.

CNDVI profile highlights

In **Sicily (Italy)** the CNDVI curve for this start of the season shows a good profile and the biomass production seems to remain higher than in previous years, despite a visible decline in February, which is probably explained by the reduced amount of rain received in the last period.

The situation is different in **Puglia (Italy)** where the start of the growing season was quite good even if lower that last year. Some declines are evident after December, probably due to the snow cover.

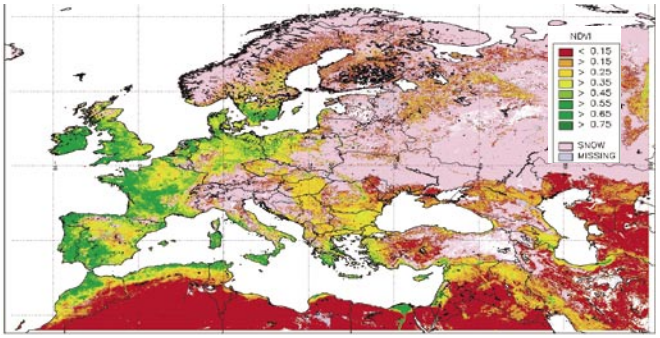
In **Castilla y Leon (Spain)** the vegetation development seems to be very good this year, reaching very high values in February, despite the oscillating weather conditions in the region.

For **Kentriki Makedonia (Greece)** the start of the season is characterised by a good start of biomass development followed by a flat profile. The effect of the cold waves and the snowfalls in January and February are still not too evident.

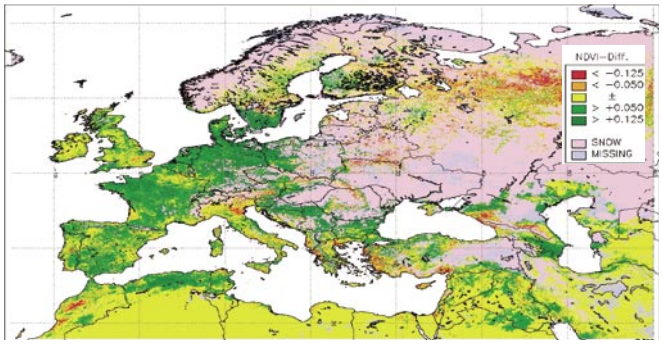
The biomass production in **Tensift (Morocco)** is very good, reaching in advance the same values as the previous season, which was already much higher than the past cycles. The effect of the low rain contribution in January and February is possibly starting to affect the vegetation development in the last dekads.

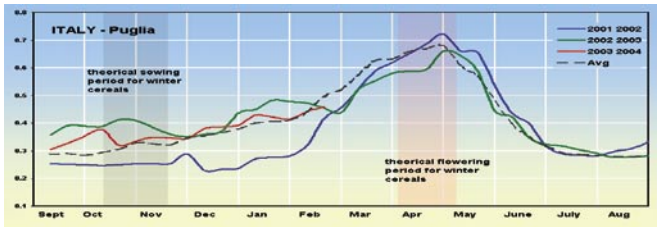
A similar trend for the start of season is presented by the index in Zaghwan (Tunisia). The green biomass is developing very early, maybe due to the good temperatures at the beginning of the season, and the effect of low precipitation is not yet visible.

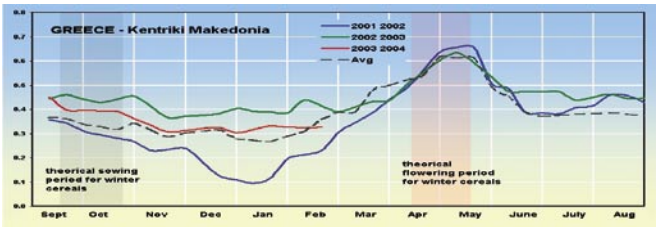
Vegetation index (February 2004)

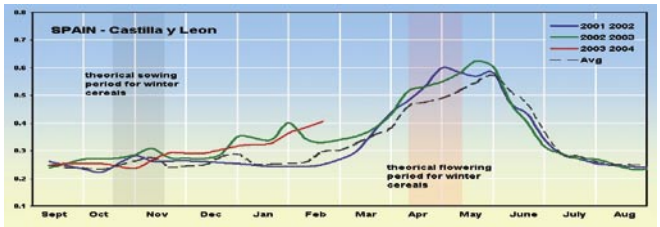


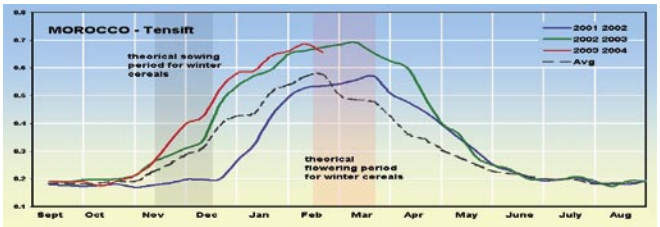
Vegetation index, absolute difference (February 2004–February 2003)

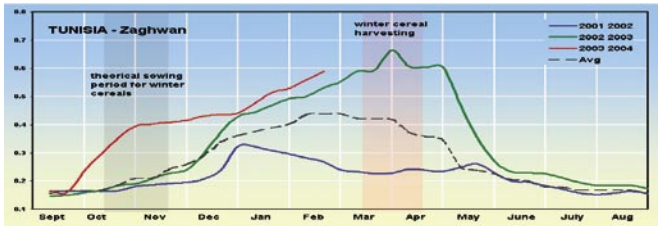












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