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MARS AGROMETEOROLOGICAL Bulletin

Monitoring Agriculture with Remote Sensing

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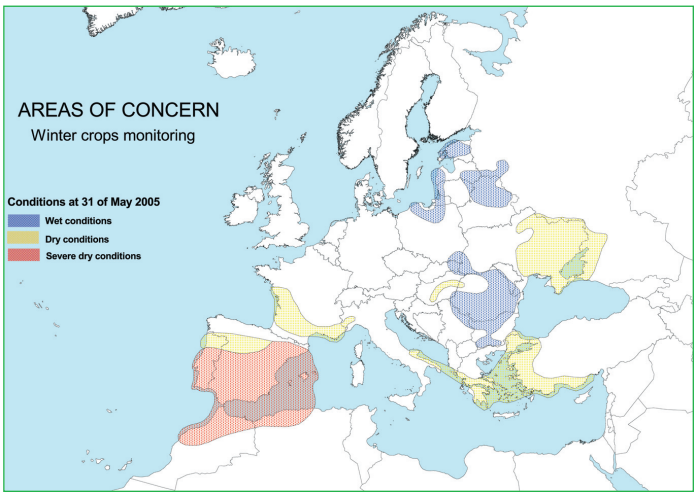
Situation: 21 April to 31 May 2005, Vol. 13, No 3

Persistent drought in the Iberian peninsula is strongly affecting crops
Extreme wetness in the Balkan areas might result in crop loss



MARS yield forecast at European level: 31 May 2005

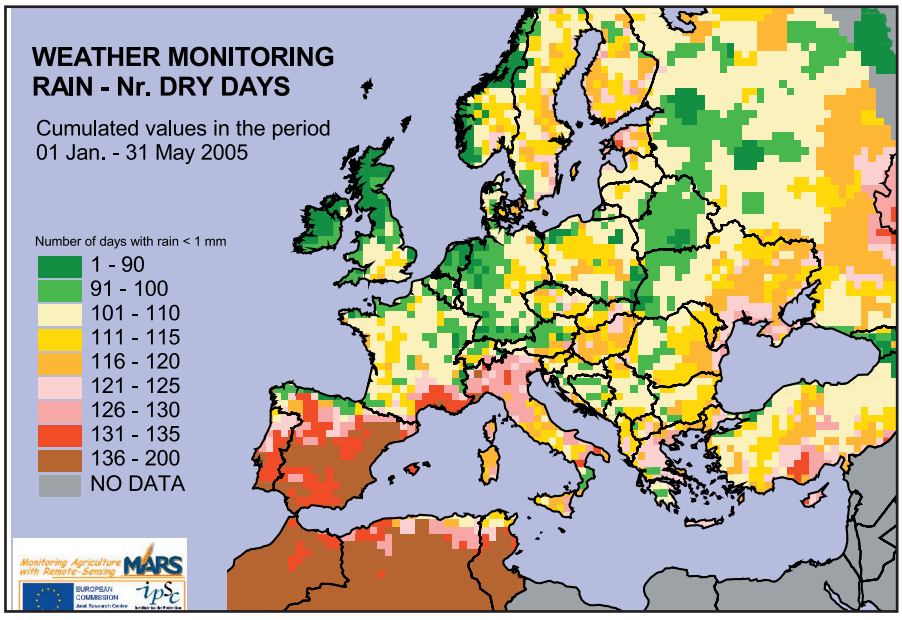
Crops	EU-25 yield (t/ha)				
	2004	**2005**	% 05/04	Avg 5 years	% 05/Avg
Total cereals	5.5	**5.2**	*4.9*	–4.7	*6.0*
Soft wheat	6.5	**6.1**	*5.8*	–5.5	*5.2*
Durum wheat	3.0	**2.6**	*2.5*	–13.2	*4.1*
Total wheat	5.9	**5.6**	*5.3*	–5.1	*6.0*
Spring barley	4.2	**4.0**	*3.8*	–5.9	*4.2*
Winter barley	5.8	**5.5**	*5.2*	–5.3	*4.7*
Total barley	4.8	**4.5**	*4.3*	–5.5	*4.4*
Grain maize	8.3	**8.2**	*7.8*	–1.8	*4.7*
Other cereals (1)	3.7	**3.5**	*3.3*	–5.6	*4.7*
Rapeseed	3.4	**3.3**	*2.9*	–3.9	*12.8*

(1) Sorghum, rye, maslin, oats, triticale, mixed grain other than maslin, millet, buckwheat.
Yield figures are rounded to 100 kg.
Sources:
2004 yields come from Eurostat Cronos.
2005 yields come from MARS crop yield forecasting system.

Contents

Agrometeorological overview (21 April to 31 May 2005)

The general synoptic air circulation was mainly characterised by the presence of a **cyclone over the Baltic** area and the **Azoreans' anticyclone** centred offshore from western Morocco. This synoptic system determined a cold air stream flux on the central and eastern part of Europe, coming from the north and, progressively, a flux from the south bringing warm and dry conditions in the western part. In the last dekad of May, the Azoreans' anticyclone progressively invaded the continent, causing maximum temperatures and solar radiation. During the last



dekad of May, the whole continent experienced temperatures significantly above average. A series of Atlantic rainy fronts crossed Europe, bringing abundant rain at the confluence of the two main fluxes: central and eastern countries.

Publication issue

The third printed *MARS Bulletin* for the 2004/05 agricultural campaign covers the period 21 April to the end of May agrometeorological conditions.

It makes a synthesis of the major issues pertaining to:

— growing conditions for winter and spring crops;
— water and drought stresses.

Previous related analyses available:
— Conditions at sowing — November 2004 (Vol. 12, No 6)
— Climatic updates December 2004 to May 2005 (Nos 1–7)
— Winter crops conditions in January and February 2005 (Vol. 13, No 1)
— Winter and Spring crops conditions in March and April 2005 (Vol. 13, No 2)

Contributions

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http://www.marsop.info

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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 1975–2004.
The CNDVI is an unmixed normalised vegetation index on the base of Corine land cover mainly for arable land or grassland.

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Vol. 13, No 4 — 2005: June analysis. Available early July

Temperatures and evapotranspiration

During the last dekad of April and the second of May, Baltic, Scandinavia and eastern countries were generally fresher than average; in contrast, Morocco, Algeria, Spain, Portugal, southern France and central Italy experienced above average temperatures.

The highest active temperature (base temperature 0 °C) deficits from the long-term average were recorded in Estonia, Lithuania, Latvia, Belarus, western Ukraine and Poland, where the negative differences of the cumulated active temperatures exceeded 80 to 90 °C. In these areas, the thermal deficits which occurred almost compensated for the surpluses accumulated in the previous period.

In a similar way, the warmer areas (mainly Spain, Morocco, Algeria and central Italy) received a surplus, estimated at around 100 to 120 °C, that balanced the deficit recorded in the previous months.

At the beginning of the considered period, some **frosts** occurred, mainly in Sweden (– 6.5 °C), the Baltic countries (– 3.3 to – 4.8 °C), Belarus (– 4.0 °C), Denmark (– 2.4 °C), eastern Germany (– 6.3 to – 6.6 °C), Poland (– 5.9 to – 6.5 °C), Czech Republic (– 4.9 to – 5.7 °C) and Slovakia (– 3.5 °C). In contrast, during the last part of the period, unseasonable **high temperatures** were recorded in Spain (36.6 °C in Andalusia, 36.3 °C in Extremadura), Portugal (32.0 °C in Alentejo), southern Italy (34.9 °C in Sicily) and also in northern and eastern Germany (34.9 °C in Dessau, 33.6 °C in Lüneburg and 31.9 °C in Brandenburg).

The different thermal conditions over the continent influenced the development of the active crops: in Spain the development was accelerated after a reduction during March and the first part of April; Poland, the Baltic States and Belarus experienced a significant reduction in development. In both cases, at the end of the period, crop development was very close to normal.

The cumulated **potential evapotranspiration** presented, all over the continent, values close to average in April (only in southern Spain/Portugal were values above the norm recorded). In May, the particular thermal conditions, recorded mainly during the first and last dekads, determined higher than average values in the Mediterranean areas (amplifying the agricultural drought) and lower than average values in the eastern and northern part of the continent.

Rain and climatic water balance

The geographical distributions of rainfall were strongly influenced by the synoptic circulation and were mainly concentrated on the **central and eastern countries**: Romania, Belarus, between Poland, Slovakia, Hungary and Ukraine, but also in Austria and central and eastern Germany, eastern France (Alsace) and north-west Spain (Galicia). In those areas, the cumulated values exceeded the norm quantitatively in many cases by + 50 to + 60 % (equivalent to 150 to 250 mm over the period) and the rains were distributed in 10 to 12 rainy days. Due to the abundant and persistent rain in those areas, temporarily and locally, excess of water or even floods were likely. In the central part of the continent the rain (more than 1 mm) was more frequent and probably represented an obstacle to the canonical spring/summer crop seeding.

The completely opposite situation was recorded in **Mediterranean areas** (central and southern Spain, Portugal, central and southern Italy, Maghreb, Greece and southern Turkey), **eastern Ukraine and western France**, where rain was scarce or absent. These areas, on average, received little rain (5 to 15 mm) with an estimable deficit of more than 150 mm. The worst conditions were experienced in central and southern Spain and southern Portugal, where the absence of rain persisted until the second dekad of May, when only sparse rainfall (15 to 30 mm) was recorded. In those areas, the deficit from the beginning of the year is estimated on average at around 200 to 250 mm (equivalent to – 40 to – 50 %) with extremes in Spain and Portugal, where the deficit is around 70 to 75 % (equivalent to 300 to 350 mm) compared with the long-term average.

The impact of the persistent drought on final yield will be very severe on the winter cereals (mainly durum wheat) in these areas. In fact, the possible beneficial effect of the rains recorded during the second half of May and even the future rain supplies (according to the weather forecast) will be very limited due to the advanced stage of crop development.

The geographical distribution of rainfall reflected in the **climatic water balance** separates the European continent into two parts: significant negative values compared with the average over Portugal, Spain, Maghreb, southern and western France, Italy, Greece and Turkey; water surplus over Austria, eastern Poland, the Balkans and mainly in central and eastern countries.

Highlights EU-25

The European total cereal potential production is still foreseen at higher than average values (about + 5 %), but well below last year (about – 6 %). The average cereal yield is now expected at 5.2 t/ha (about – 5 % as compared with 2004). Durum wheat is the most affected crop in terms of climatic impact; yield forecast is now 2.6 t/ha (reduction of 13.2 % compared with 3.0 t/ha last year). Barley average yield forecast is now 4.5 t/ha (4.8 last year), however this figure could further decrease depending on drought impact on late varieties in central and central-eastern Spain entering in grain filling in the next weeks and with higher than average pests' damage and diseases as a consequence of the excessive wetness in central-eastern EU countries.

Maize conditions and forecasts (8.2 t/ha, compared with 8.3 t/ha in 2004) are still pending and some other decreases are possible according to the summer water availability (especially in Spain.

Highlights by region of interest

EU-25

France: lower rainfalls than expected

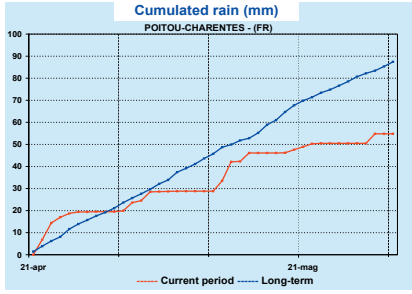
Compared with the situation for the last bulletin, the soft wheat forecast is slightly increasing at 7.7 t/ha (– 1.4 % compared with 2004), durum wheat at 5.0 t/ha (– 2.0 % compared with 2004 but + 4.7 % compared with the last five-year average); the barley forecast is reviewed at a lower value with 6.1 t/ha (– 3.0 % compared with 2004) and rapeseed yield is slightly improved with 3.6 t/ha.

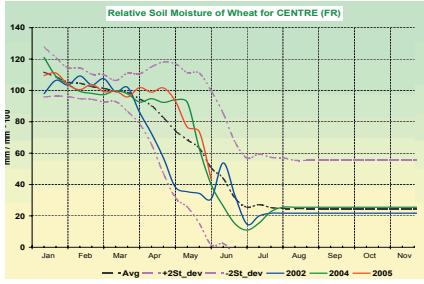
Most of the country experienced scattered precipitation alternated with dry periods. The rainfall was globally insufficient to compensate the evapotranspiration. The rainfall deficit was more pronounced in the southern area from Brittany to Provence, with – 25 to – 50 mm below the norm. Due to the crop water demand, the soil moisture continued to decrease, particularly in Charentes, Limousin, the South-West region, Auvergne and Rhône-Alpes: the soil water reservoir fell below the seasonal level.

The 10-day temperatures were higher than average during the last dekads of April and May; they reached normal values during the first dekads of May, except in the north-east. Most of the crops benefited from a higher cumulated temperature that boosted their development.

The country experienced exceptional peaks of temperature at the end of April and end of May. The daily temperatures reached up to 32 °C. This should not have affected the crops, as the high temperatures did not last long enough during a sensitive crop stage.

Wheat: The development stage was within the norm except in the northern area that, in May, caught up from its delay. From heading to stem elongation, the winter wheat reached flowering stage at the end of May. The soft wheat should not have suffered from the reduced rainfall. However, in Midi-Pyrénées, and even more so in Charentes and Limousin, further rainfall will be necessary to replenish the low soil moisture and keep the crop yield potential.





Rapeseed: From flowering in April it reached the ripening stage at the end of May in the whole country, slightly earlier in the north. Despite the decrease of the soil water reserves their levels are still higher than normal in the production regions, except for Poitou-Charentes, where moisture started to become lower than average. The conditions are still optimum. In Franche-Comté some spots experienced more than 70 mm of rainfall during the flowering stage: it could have hampered crop development.

Spring barley and wheat: The soil moisture is slightly below the norm but should not have affected the crops, due to the low crop water demand. However, further rainfall should be necessary to optimise spring crop development.

Maize and sunflower: The summer crops have not yet suffered from suboptimum soil moisture; however, further precipitations will be necessary to face the increasing water demand of the plants.

Sugar beet: The conditions remained optimal in the main production areas (northern).

Potato: In Brittany, the relatively drier than normal situation could have a negative impact on the yield if no further precipitations occur.

Germany: it looks like a record year

Forecast yields are generally higher with respect to the situation reported in the previous bulletin: 7.9 t/ha for soft wheat (+ 7.9 % on the last five-year average); 3.8 t/ha for rapeseed (+ 13 %); 7.2 t/ha for winter barley (+ 12.4 %); 5.2 t/ha for spring barley (+ 7.5 %); 9.2 t/ha for grain maize (+ 4.7 %).

Although these forecast yields are higher than the last five-year means and the current situation is similar or better than last year's, the yields are lower than the observations for 2004, with the exception of winter barley and grain maize. This is because the 2004 record productions were mainly forced by extraordinary conditions verified starting from the end of June and it is improbable that they will be verified again this year.

The dry conditions already experienced in the north-eastern regions since the end of March persisted until the beginning of May, threatening rapeseed which was entering the flowering phase. Almost daily, light rainfall is ensuring more than adequate water supply in the rest of the country. In the north-east, severe falls in night temperatures were experienced on 21 April, 10 to 12 and 18 May and record high temperatures (more than 30 °C in some regions) on 2 May.

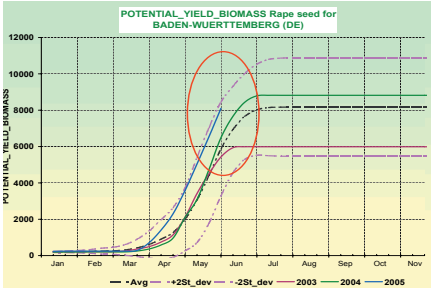
Winter wheat: Although record productions were obtained in 2004, current simulations show that winter wheat is giving higher yields than both the norm and last year, when production values exceeded the norm only in the last dekad of June. This encouraging situation is increasingly evident from north-eastern region (Mecklenburg-Vorpommern, Brandenburg, Schleswig-Holstein), where crop is regularly completing the stem elongation phase, to southern regions, where winter wheat is entering the heading stage, according to the norm.

Soil moisture values are above the average but not high enough to create problems.

The crop (from the stem elongation phase wheat decreases its resistance to low temperatures) could have suffered from cold shocks because of temperature falls during the first part of May.

Rapeseed: Development has come back to average values (currently at mid-flowering stage) after the advance observed during April. The soil moisture situation is similar to that simulated for winter wheat. The geographical trend (average production in the north-east, very high in southern regions) is as already described for winter wheat, and even more accentuated (record simulated productions in the southern regions). The temperature falls experienced in May (mid-flowering) could influence production.

Spring crops: Development is slightly advanced (after mid-stem elongation) in southern regions and regular (before mid-stem elongation) elsewhere. Production is above average, following the geographical trend already described for winter wheat. There is sufficient soil water content.



Austria: an excess of water could have threatened production

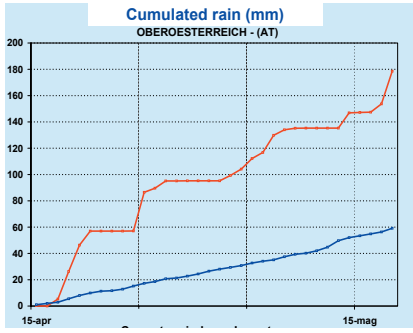
Except for grain maize (+ 2.1 % on last year's yield), forecast yields are still lower than 2004 values (– 8.3 % for soft wheat, – 17.3 % for rapeseed, – 8.6 % for winter barley, – 9.9 % for spring barley). Even so, all yields are higher than last year's average: + 8.5 % for soft wheat (5.5 t/ha), + 12.7 % for rapeseed (2.8 t/ha), 2.8 % for winter barley (5.2 t/ha), + 10.4 % for spring barley (4.5 t/ha), + 2.8 % for grain maize (9.4 t/ha).

Frequent and, in some cases, relatively intense rainfall is excessively increasing soil water content throughout the country. Cumulative rainfall since mid-April is in fact abundantly above the average. In the same period, extreme temperatures were observed: abrupt nightfalls on 22 April, 10 to 12 and 18 May and very high daily maximums on 16 April and 2 May.

Winter wheat: the crop has regularly started the heading phase but possible problems will be related to the combined effect of high soil water content and an abnormally warm beginning of May (parasite attacks).

Rapeseed: According to last year's average, the rapeseed development stage is simulated as mid-flowering. The two cold air eruptions of May could have caused problems because the crop was in the middle of flowering. As for winter wheat, soil moisture values are a bit worrying. CNDVI data confirm the high production simulated for the Oberösterreich region.

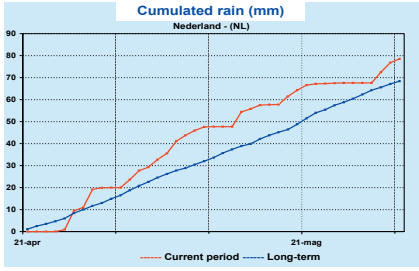
Spring crops: Spring crops are regularly completing the stem elongation phase. In this case (the plants are younger), the observed high soil water content could have caused problems related to hypoxia in the rhizosphere, particularly in the Oberösterreich region.



Belgium, the Netherlands and Luxembourg: normal conditions

Thanks to the favourable weather conditions the wheat was forecast at a higher yield than in the last bulletin, with 8.9 t/ha (– 1.4 %) for Belgium, 8.6 t/ha (– 3.1 %) for the Netherlands and 6.4 t/ha (– 6.6 %) for Luxembourg. For barley, the expected yields reached respectively 5.9 t/ha and 6.3 t/ha.

The three countries experienced two hot spells at the end of April and May (+ 20 to 30 % LTA) with a colder period (– 20 to – 30 % LTA) in between. Two peaks of temperature were recorded, at the end of April and at the end of May, reaching a daily maximum of 30 °C. The crop stage was boosted each time and reached a slightly earlier stage than normal.



The precipitations were abundant up to the first dekad of May then became below the seasonal values in Belgium and within the average for the Netherlands. In Luxembourg, the rainfall remained within the norm. The soil moisture decreased in May but was still at the normal level at the end of May. The conditions for winter and spring crop development are normal in the three countries.

The UK and the Republic of Ireland: slightly higher seasonal temperatures, normal rain

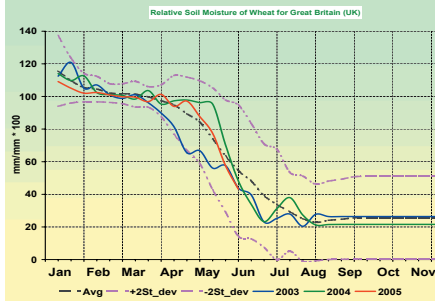
The UK and Ireland are expected to reach a good level of yields. The soft wheat yield is respectively foreseen at 7.9 t/ha (+ 1.1 % compared with 2004) and 9.5 t/ha (– 3.5 %). As regards barley, a higher yield than 2004 is expected for the UK (5.6 t/ha, 4.9 %) and, at the moment, a slight decrease in Ireland (6.5 t/ha, – 3.9 %). Rapeseed yield is expected at 3.2 t/ha (+ 11.8 %) in the UK.

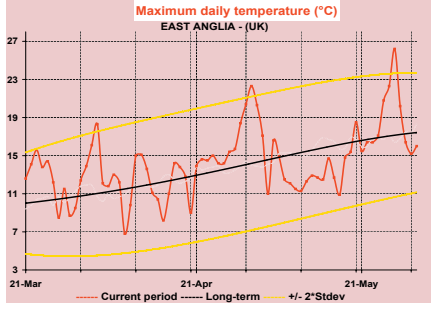
Similar to the 2002 and 2003 campaigns, thanks to the favourable thermal conditions mainly during the first part of May, at the end of period all the winter crops showed relatively advanced development compared with the average.

During the first part of May the active temperatures (Tbase = 0 °C) were 5 to 6 °C above the climatic average, and all the crops reacted, increasing the rate of development. These conditions were coupled with some dry days and higher levels of radiation. As a consequence, the plants capitalised on the favourable conditions with high potential yields (especially in the UK), even if the soil's water content was partially depressed (evapotranspiration also showed higher than average cumulated values).

In Ireland, the foreseen future water supplies allow for optimism on the possibility of maintaining the current good level of estimated yield. In contrast, in central and southern parts of the UK the limited rain foreseen could have a negative impact on final yields.

In general, the reported weather conditions were also favourable for the first stages of spring/summer crops.





Denmark, Sweden and Finland: seasonal temperatures over Denmark and Sweden; slightly colder and drier in Finland

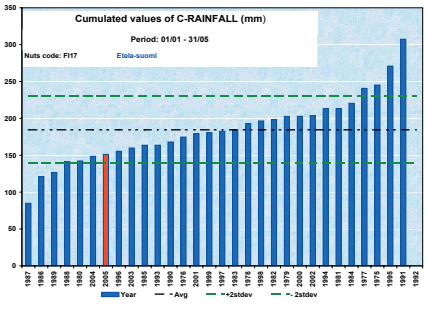
The favourable agrometeorological conditions allowed a good productive level and in Denmark the expected yields are at: soft wheat 7.3 t/ha (+ 2.7 % compared with 2004), barley 5.3 t/ha (+ 6.8 %) and rapeseed 3.2 t/ha (– 17.7 % compared with 2004, but + 2.6 % compared with the previous five-year average); in Sweden: soft wheat 6.1 t/ha (+ 2.2 % compared with 2004); in Finland: soft wheat 3.5 t/ha (– 0.2 % compared with 2004).

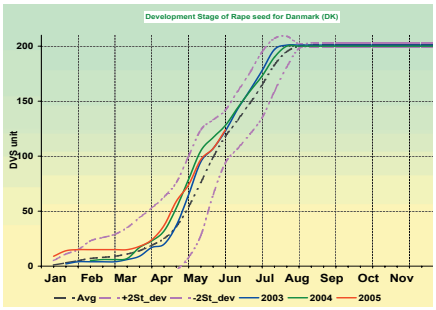
In Denmark and Sweden, following a mild April, in the second part of May (especially the last week) **temperatures** were slightly higher than average. (In Denmark the maximum values were 6 to 8 °C above normal for the period and the maximum climbed to 28 to 29 °C.) However, as a whole, the cumulated active temperatures at the end of May presented normal values. In Finland, colder or close to normal temperatures characterised the period and only during the last part of May were significant increases in maximum and minimum temperatures recorded.

All the active crops were positively influenced. In fact, until the last dekad of May the winter crops generally showed a normal stage of development (heading for cereals and end of flowering for rapeseed) compared with the average, while in the last dekad the more favourable conditions boosted their development.

The **rainfalls** were, in general, well distributed and quantitatively close to the seasonal cumulative values.

In contrast, in **Finland** the rains were scarce (especially during the last part of April), prolonging the dry conditions recorded in the previous period. From the beginning of the year, the cumulated deficit is estimated at 50 to 60 mm, equivalent to – 25 to – 30 %. However, the soil moisture content is still close to average, thanks also to the relatively early stage of development of active crops and the limited evapotranspiration rate. Moreover, considering the foreseen rain for the coming days no negative impact on winter crops yields is likely.





However, the dry conditions were favourable in Finland for spring sowing and in Denmark for the latest spring sowing and rapeseed flowering.

Italy: decreasing rain in southern and central Italy but strong recovery from winter drought in the north

The period 21 April to 31 May 2005 was characterised by a significant reduction of rainfall over southern and central Italy. In northern Italy, however, due to abundant rains in mid-April, the situation recovered from an ensuing drought that had proceeded throughout the winter.

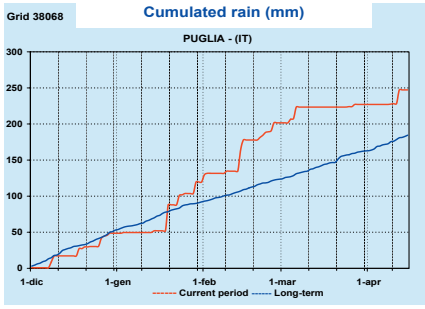
Expected **yields range between 2.5 and 2.9 t/ha, slightly reduced** with respect to the previous 2005 forecast and to the yield recorded in 2004 (– 7.1 %) but largely above the five-year average (+ 15.7 %). This **reduction** could be **more relevant in southern and central Italy** due to the reduced rain. In the **north**, and especially in the **north-west** of the country, **favourable rain should support higher yields**. In these parts of the country the April rains should also favour the emergence and early development stages of maize and other **spring crops**.

Rainfall in the analysed period was below average along the southern and central Adriatic coast. This reduction was more significant in the major production areas of northern Apulia and central and western Sicily, even though the extreme western parts of the island experienced heavy rainfall in the same period.

This climatic evolution commenced around mid-April and appears to be worsening, recorded by the measure of cumulated rainfall and confirmed by the relative soil moisture content. Preceded by a rather 'wet' winter, the reduction in rainfall finds soft and durum wheat, as well as the other winter cereals, in the critical development stages of flowering and grain filling. This is not favourable to a positive outcome for the season. Temperatures did not deviate much from the average for the season with the exception of some high peaks in the first half of the month of May when temperatures reached 30 °C. This was not a lasting phenomenon and the situation stabilised to normal levels soon after.

In Emilia-Romagna and the north-east, the cumulated rainfall returned to average levels between the end of April and mid-May. This followed a rather dry winter and brought back the average soil moisture content to a comfortable level. This favourable evolution found the development with winter cereals slightly delayed compared with normal by the winter drought; meaning that the crops will have enough available soil moisture for the most vulnerable stages of their development.

The dry winter also favoured early soil preparation for spring crops and late seeding/planting. Rain fell between mid- and late April, during early spring crop development stages, thus favouring a good start for the production season. Temperatures did not show relevant extremes for either minimum or maximum levels. There were exceptional highs in the north-west (> 25 °C) in late March which, though combined with water shortages, occurred rather early in the cycle and should not have affected development.

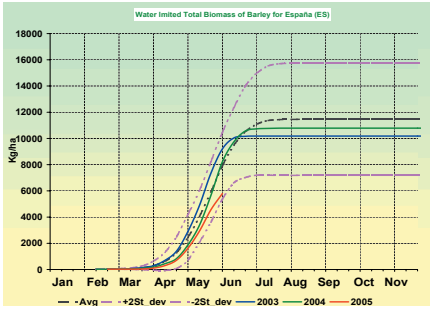


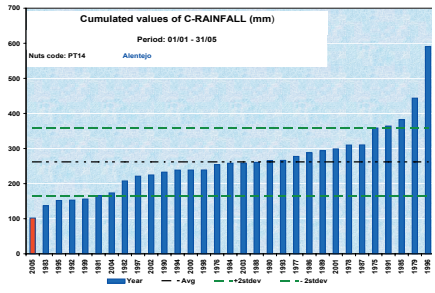
Spain and Portugal: severe drought compromises winter crops production in the south

The persistent dry conditions severely depressed the winter crop production and yields are estimated in Spain for soft wheat at 2.9 t/ha (– 19.6 % compared with 2004), durum wheat at 1.7 t/ha (– 42.0 %) and barley at 2.9 t/ha (– 14.3 %). In Portugal the durum wheat is estimated at 0.5 t/ha (– 56.5 % compared with 2004) and soft wheat at 0.9 t/ha (– 50.1 %).

Practically during the whole period the general air mass circulation divided the Iberian peninsula in two parts. The central and southern areas were affected by a high pressure system bringing higher than seasonal temperatures (in May temperatures in southern Spain were 2 to 3 °C above average and represent some of the highest values in the MARS database), persistent drought and a high level of evapotranspiration. In contrast, the extreme northern territories were affected by a cyclonic circulation, with more normal temperatures and cumulated rainfall.

As a whole, the active temperatures (Tbase = 0 °C) were significantly above average, except in the north-west. Also some **extremely high temperatures** were recorded, mainly during the last dekad of May: 36.6 °C in Andalusia, 36.3 °C in Extremadura, 34.3 °C in Alentejo, 34.1 °C in the Centre region. Some heat stress phenomena (Tmax > 30 °C) were also present during the flowering stage of winter wheat.





In central and southern areas of Spain, as well as in Portugal, **rain** was practically absent until the second dekad of May, when some (20 to 30 mm) was recorded. Anyway, the rain arrived too late to have a significant effect on the winter cereals and could be even harmful by promoting fungal diseases. In those areas, considering the rain deficit accumulated from the beginning of the year, it is evident that the current season is the driest for the last 30 years (70 to 80 mm compared with 240 to 250 mm expected).

In the north-western areas, the cumulated rain from the beginning of the year presented more normal values. During April and May the deficit was relatively limited. In April, anyway, the dry conditions have not been an obstacle for **spring/summer crops** and the warmer temperatures in May boosted crop development, even excessively in some cases (reduced LAI).

Greece: reduced rains in the whole country starting from April and decreasing soil moisture after a wet winter

The period 21 April to 31 May was characterised over most of the country by a dispersed reduction in rainfall after a rather wet winter. It is not a homogeneous situation but affects the overall expected yield of most winter crops.

The reduction in rainfall started in the north of the country at the end of March and extended south as the season proceeded. The **soil moisture content appears to be decreasing** considerably in the northern and central parts of the country (Thessaly), in spite of the rather wet winter. The main winter crop in this area, **durum wheat**, is now in the most vulnerable phase of its development. Due to this evolution, the **overall yield estimate** for durum wheat had to be cut to **1.9 t/ha** from the 2 t/ha of the previous forecast, but it is in line with the five-year average.

The drought appears to be serious in the central areas of the country (Continental Greece) as well. These areas are, however, characterised by irrigation of spring and summer crops (maize and cotton) and the dry winter followed by a dry spring could have delayed the seeding and planting practices. This is currently not verified by observations and simulations. Temperatures were normal all over the country, without any particular peaks in either maximum or minimum levels. The overall dry conditions greatly reduced the risk of insurgence of pests and diseases.

In the inland and mountainous areas of Macedonia in the north-east, the overall rainfall was higher. The expected yield of **soft wheat**, production of which is concentrated in this part of the country did not benefit from this and the estimated yield remained stable compared with the previous forecast (**2.71 t/ha**). This is a reduction from the 3.1 t/ha of 2004 but in line with the five-year average.

Estonia, Latvia and Lithuania: cooler than usual, lower soil moisture for spring barley crops in Estonia

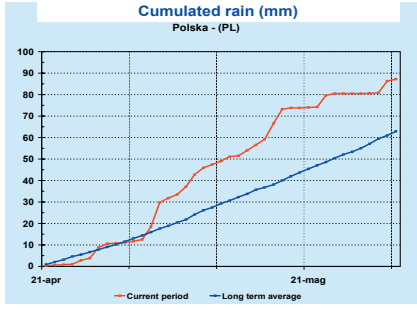
Forecast yields for soft wheat are 2.2 t/ha (– 8 % compared with the previous year) for Estonia, 3.0 t/ha (2 %) for Latvia and 3.7 t/ha (– 9 %) for Lithuania. The estimates for rapeseed are 1.5 t/ha (+ 7 %) for Estonia, 1.8 t/ha (– 3 %) for Latvia and 2.1 t/ha (+ 3 %) for Lithuania. Barley yield for Estonia is expected at 2.0 t/ha (– 11 %) and for Latvia and Lithuania the figures are 2.0 t/ha (– 10 %) and 3.0 t/ha (+ 4 %), respectively.

The weather was cooler than usual, the conditions from the last dekad of April contributing largely to the overall description of the period. Estonia and western parts of Latvia and Lithuania were drier than normal (especially during the first half of the considered period); meanwhile, the eastern areas of these two countries were wetter than usual (+ 25 % compared with the long-term average). Development of barley and wheat crops was normal but the relative soil moisture for barley was below the long-term average in Estonia and Latvia and higher than normal in Lithuania. In general, the sowing of spring crops was performed under dry conditions. Water limited biomass of wheat and rapeseed was close to normal levels. The simulated leaf area index was higher than the long-term average for rapeseed crops in Latvia and Lithuania.

Poland: wetter than usual

The early yield forecasts are 3.8 t/ha (– 10 % compared with the previous year) for soft wheat, 3.1 t/ha (– 13 %) for total barley, 2.6 t/ha (– 8 %) for sugar beet, 2.6 t/ha (– 16 %) for rapeseed and 6.0 t/ha for grain maize (+ 4.6 %).

Accumulation of active temperatures was close to normal except for eastern Poland, where it was cooler than normal (– 20 %). Other than the Baltic rim, the weather was wetter than usual (+ 25 % LTA), especially during May. Late spring sowing may be hampered by rainy conditions, but the emergence of the already sown crops was facilitated by increased soil moisture. Development biomass dynamics of winter crops were in the normal range. The relative soil moisture was above the norm.



Czech Republic: relatively high soil moisture for spring crops

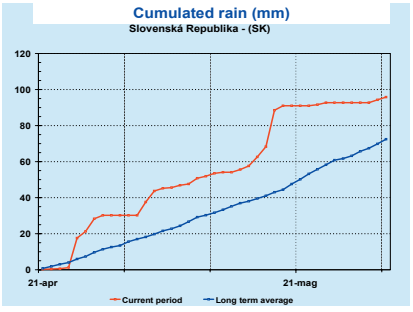
Yield forecasts are 5.2 t/ha (– 12 % compared with the previous year record) for soft wheat, 4.3 t/ha (– 15 %) for total barley, 3.0 t/ha (– 18 %) for rapeseed and 6.2 t/ha (– 2 %) for grain maize.

Accumulation of the active temperatures (Tbase = 0 °C) was close to the long-term average and the precipitation regime was slightly above the long-term average. The development and biomass of winter wheat were close to normal but the leaf area index exceeded the long-term average. Soil moisture during the emergence of barley was higher than normal. The soil moisture during the emergence stage of spring crops was restored by some good rains. Soil moisture for rapeseed was also above the long-term average.

Slovak Republic: recovering from previous dry conditions

Yield forecasts are 3.4 t/ha (– 28 % compared with the previous year record) for soft wheat, 2.7 t/ha (– 34 %) for total barley, 2.5 t/ha (– 13 %) for rapeseed and 5.0 t/ha (– 16 %) for grain maize.

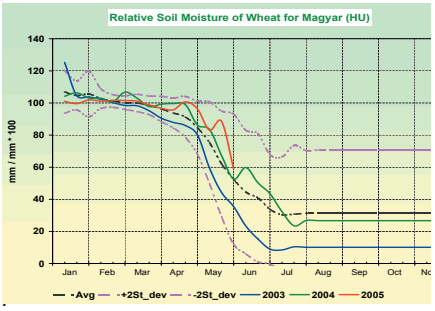
Accumulation of active temperatures (Tbase = 0 °C) was slightly below the long-term average until the end of the considered period, when the normal level was achieved mainly due to contribution of several days of maximum temperatures (above 30 °C). As shown in our previous bulletin, Slovakia experienced dry conditions (beginning of March to the second dekad of April) but, after 25 April 2005, the level of cumulated precipitation rose well above normal and in eastern Slovakia it became very high (>+ 25 % LTA) at the end of the second dekad of May. However, the level of global solar radiation remained close to normal. Towards the end of May, the rain was less abundant and the simulated relative soil moisture started to decrease again but it did not fall significantly below the long-term average. The leaf area index was higher than average for wheat, at normal level for barley and below this level for rapeseed. The development stages and above ground biomass of winter crops were close to normal. Although the number of days without rain during the sowing dekads of spring crops was reduced, one may suppose that this activity was probably not affected due to the fact that rain was well forecast and the farmers possibly took advantage of the dry days and the days with precipitations below 4 mm/day.



Hungary: dry in the central areas and wetter than usual in the north-east and north-west

Yield forecasts are 3.8 t/ha (– 26 % compared with the previous year record) for soft wheat, 3.6 t/ha (– 19 %) for durum wheat, 2.3 t/ha (+ 4 %) for rapeseed, 3.2 t/ha (– 25 %) for barley and 5.9 t/ha (– 10 %) for grain maize.

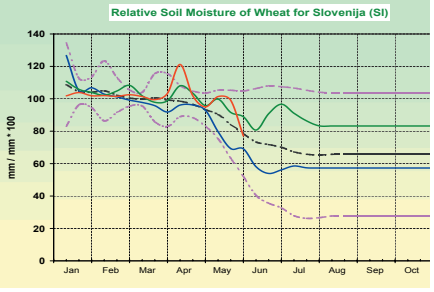
Thermal resources available for plant development were slightly below the normal range. The cumulated rainfall received by agricultural areas remained above the long-term average for most of the period. Rain was more abundant in north-western and north-eastern Hungary (>+ 25 % LTA), while the central areas were drier than usual (<– 25 % LTA). The last dekad of May was relatively dry. Development of all simulated crops was normal. Water limited above ground biomass was below the long-term average for wheat and rape and normal for barley. The leaf area index was below the long-term average for rapeseed and close to normal for wheat and barley. Soil moisture level presents the usual decrease for this period and it is above or close to the long-term average for winter crops and below this level for spring crops.



Slovenia: normal crop development; soil moisture is decreasing again after a wetter period

Yield forecasts are 4.6 t/ha (+ 0.1 % compared with the previous year) for soft wheat, 3.9 t/ha – 3 %) for total barley and 7.1 t/ha (– 9 %) for grain maize.

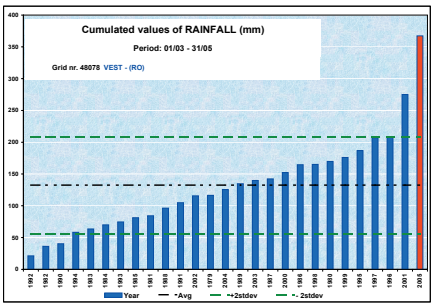
The thermal conditions were normal and the cumulated precipitation was below the long-term average until 5 May and, after that, remained above this level. The rainfalls were more abundant in western areas of the country (>+ 25 % LTA). Development of all crops was normal. The water limited above ground biomass was above the long-term average for winter wheat and rapeseed and slightly below the long-term average for barley. The relative soil moisture for spring crops has decreased rapidly; for winter crops this indicator reached this level but has not yet fallen below it. The leaf area index of the winter crops is above the long-term average.



Black Sea countries

Romania: the wettest spring since 1979

Winter wheat yield is forecast at 2.4 t/ha (– 30 % compared with the previous year record) and the yield forecast for barley is 2.4 t/ha (– 38 %).



The accumulation of active temperatures was slightly below the long-term average, but the cumulated rainfall was excessive (>+ 25 % LTA); in some western areas it was the wettest spring since 1979. Water-logging problems occurred in some areas. For all simulated crops, the development stage was normal. The leaf area index (LAI) of winter wheat crops simulated for non-irrigated conditions tends to reach up to the normal level for this period and, due to the absence of drought and thermal stress, the maximum value for LAI may still reach the normal level which usually occurs in the second dekad of May. The LAI of winter barley and spring crops is at the normal level but the foliar apparatuses of rapeseed crops remained poor. Due to high humidity and temperature fluctuations, additional foliar diseases are expected for winter crops. The weight of storage organs of winter wheat simulated for water limited conditions is already below normal.

Bulgaria: unusually wet period

Yield forecasts are 3.0 t/ha (– 15 % compared with the previous year record) for wheat and 3.0 t/ha (– 17 %) for barley.

Accumulation of active temperatures was in the normal range but the level of cumulated rainfall was very high (> 25 % LTA) for most agricultural areas and in some places it exceeded all the records existing in our database for this period. The development stage of winter wheat and rapeseed are normal; total biomass and leaf area index are below the long-term average but the simulated weights of storage organs of these crops are still at normal level. As a consequence of rainy weather, the relative soil moisture is above the long-term average. The simulated evolution of spring crops is good but the real effects of this unusually wet period may also include serious problems such as water-logging, nutrients leaching and disease.

Turkey: worsening drought conditions in the south-eastern parts of the country but improving conditions in the Aegean and Black Sea areas

For the period 21 April to 31 May, the winter cereal production areas of central and south-eastern Turkey were characterised by low rainfall coupled with higher than average temperatures.

Evolving from a winter drought, this situation is affecting the soil moisture content, which is developing towards low levels. The drought is more serious in the eastern Mediterranean coastal areas. The development of winter crops appears to be slightly advanced with respect to the average and these combined factors may result in reduced yields.

In the analysed period, the western parts of the country were characterised by fairly mild temperatures, moreover, coupled with reduced rainfall. The soil moisture levels are reduced but still above average. This area is of most relevance for spring and summer crops such as maize, legumes and sugar beet and these conditions should favour early planting and guarantee a positive start to the growing season.

In the Black Sea coastal regions, climatic and crop parameters such as rainfall and soil moisture content are in line with average levels. Temperatures recorded show strong fluctuations with peaks for both minimums and maximums, but these variations should not have affected production. A favourable outcome of the productive season is expected for winter cereal, as is a positive development start for spring and summer crops.

Ukraine: normal in the north-west, dry in the Black Sea and north-east

Temperatures were lower in the east and normal in the west up to the last dekad of May, when a hot spell was recorded. Extreme temperatures over 30 °C were recorded during more than six days in the eastern and Black Sea areas. The winter wheat, being at the heading stage, should not have suffered from these extremes.

The north-eastern and Black Sea areas were drier than normal during the whole period of interest (<– 30 % LTA). In contrast, up to the last dekad of May, the north-west was wetter, with 30 % extra rainfall than average. From the last dekad of May, the weather conditions were drier.

Crops on the eastern and Black Sea area will need further rainfalls to replenish the soil moisture and keep the crop potential. The yield potential appeared to be lower than average, particularly in the Black Sea area.

Crops on the eastern and Black Sea area will need further rainfall to replenish the soil moisture and keep the crop potential. According to the simulation, the yield potential appeared to be lower than average, particularly in the Black Sea area.

Eastern countries

Russia: normal conditions for winter crops

The period under analysis is the time for winter crop flowering and the first stages of summer crop development in all regions of European Russia.

The air temperature during May 2005 was close to normal, and it was not extreme for crop development. The amount of precipitation during the first half of May was high everywhere. Then, a low amount of precipitation was observed in the northern and southern parts of European Russia. As a result, the amount of precipitation during May was higher than normal and than in the previous year everywhere except the central Chernozemic region, where it was lower than normal and than in the previous year.

Relatively low air temperature and a high amount of precipitation led to the good accumulation of water in the soil in the main areas for winter crops. As a result, soil moisture content at the end of May was higher compared with the previous year, especially in the northern Caucasus. Thus, the meteorological conditions were optimal for winter crop development in practically all the main winter crop sowing regions of Russia. But, due to a too mild winter, the yield of winter crops seems to be slightly lower than in the previous year. Rainy weather in spring led to delays in summer crop sowing in practically all regions, but dry conditions during the second half of May allowed recuperation of the sowing campaign. Optimal soil water content creates optimal conditions for summer crop development, especially in southern regions of Russia.

Maghreb countries

Average conditions in Tunisia and eastern Algeria and ensuing drought in the western parts, especially in Morocco.

Morocco

The analysed time period in Morocco was characterised by a persisting drought. There was no rain in the western parts of the country from the beginning of March and temperatures remained at higher than average levels. The progressive depletion of soil moisture is bound to have negatively affected the yield of winter cereals. This evolution is also relevant in the east of the country and in the Atlas regions. Cumulated rainfall remained at average levels until the beginning of April, and then a progressive decline started, coupled with high temperatures. In these regions the adverse climatic conditions will also considerably reduce the yield.

Tunisia

The period 21 April to 31 May in Tunisia accounted for an irregular distribution of rainfall following a rather wet winter. This climatic development caused a decrease in the availability of soil moisture, although it remained at higher than average levels. This condition was coupled with temperatures fluctuating on higher than average levels. The development of winter crops was not significantly affected by these conditions and the overall outcome of the productive season is expected to be positive.

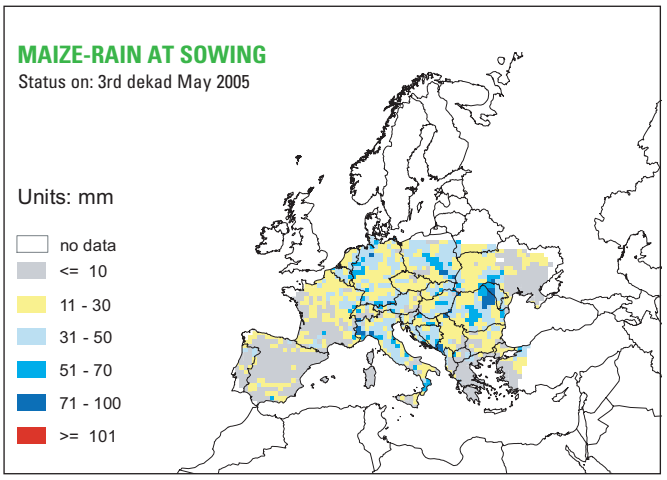
Algeria

Climatic conditions in Algeria in the analysed period can be considered as intermediate between what was reported for Morocco and Tunisia. Rainfall was sufficient in the eastern parts of the country but there was no precipitation in the west from the beginning of March. In central Algeria, rainfall started declining from the beginning of April. The same east–west pattern was recorded for temperatures. Yields are expected to be directly connected to these climatic conditions: good or average in the east and very reduced in the west.

Crop maps — 31 May 2005

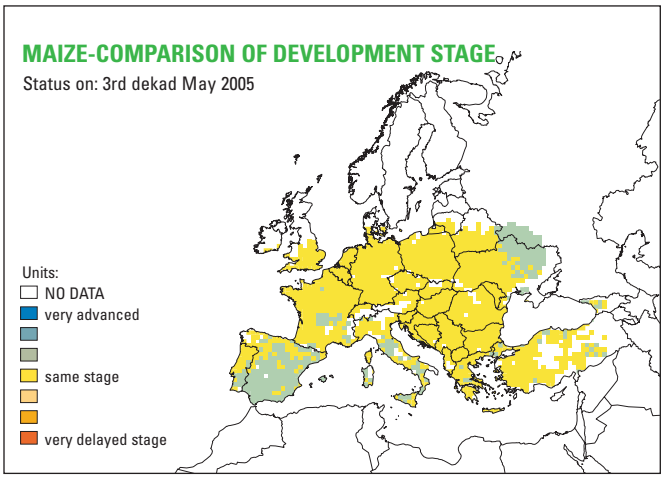
MAIZE-RAIN AT SOWING

Status on: 3rd dekad May 2005



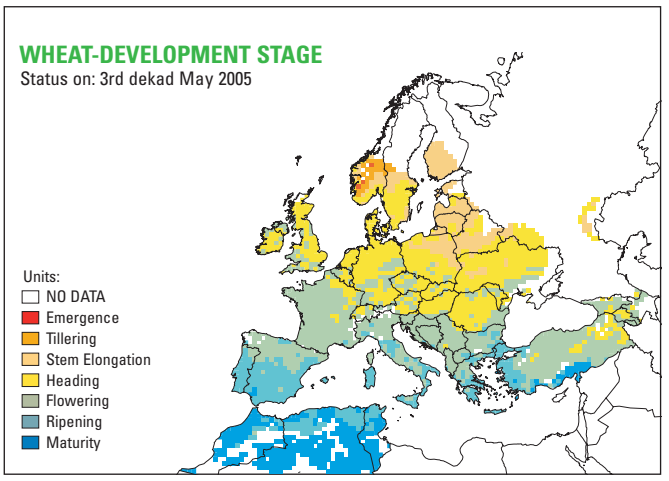
MAIZE-COMPARISON OF DEVELOPMENT STAGE

Status on: 3rd dekad May 2005



WHEAT-DEVELOPMENT STAGE

Status on: 3rd dekad May 2005



WHEAT-COMPARISON OF DEVELOPMENT STAGE

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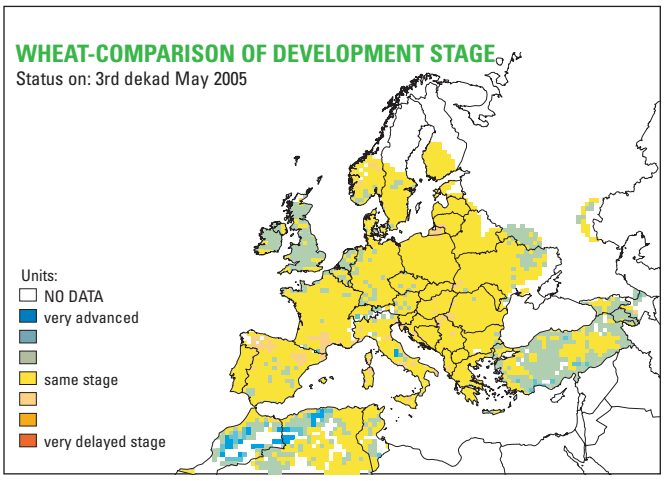

RAPESEED-RAIN AT FLOWERING

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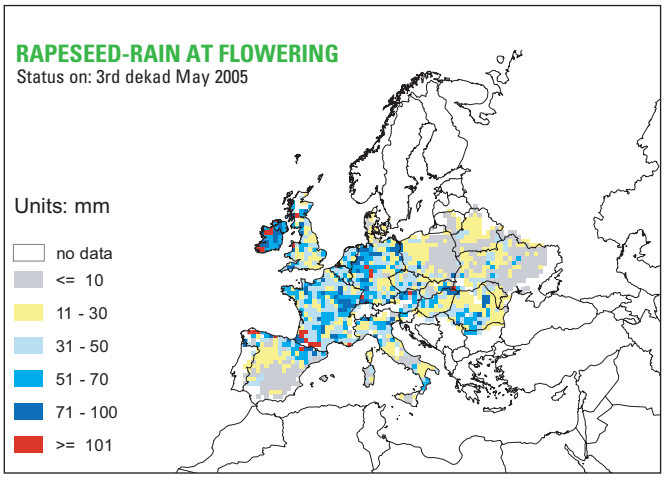
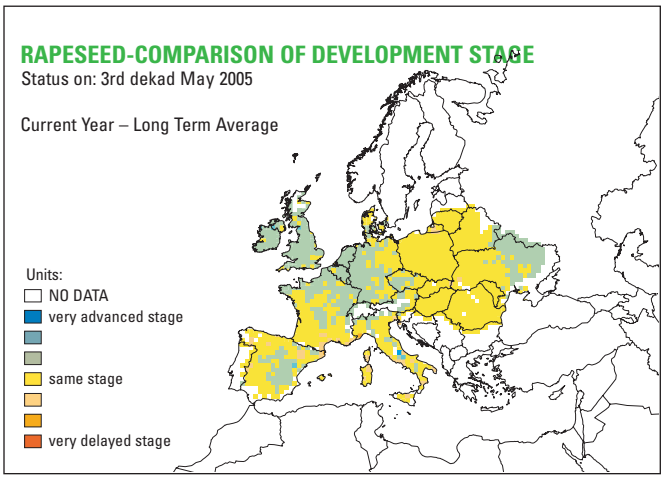


RAPESEED-COMPARISON OF DEVELOPMENT STAGE

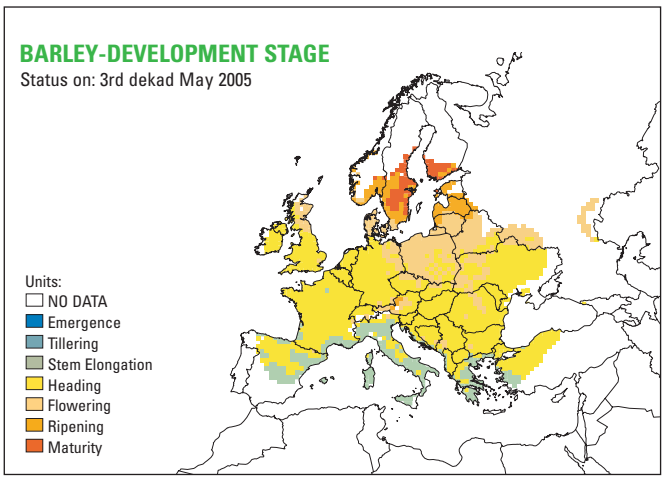
Status on: 3rd dekad May 2005

Current Year – Long Term Average



BARLEY-DEVELOPMENT STAGE

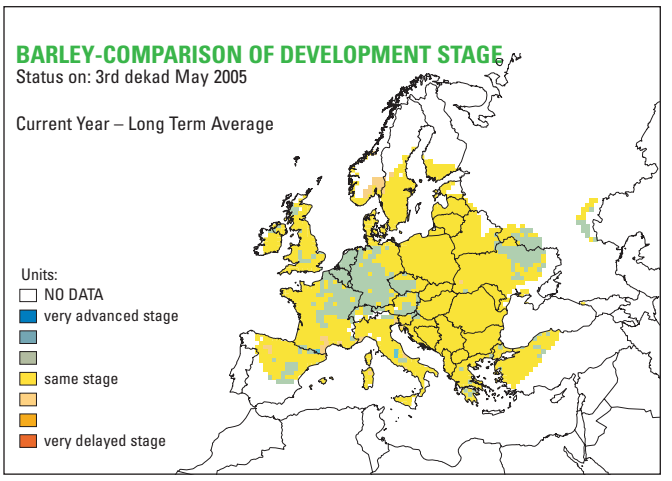
Status on: 3rd dekad May 2005



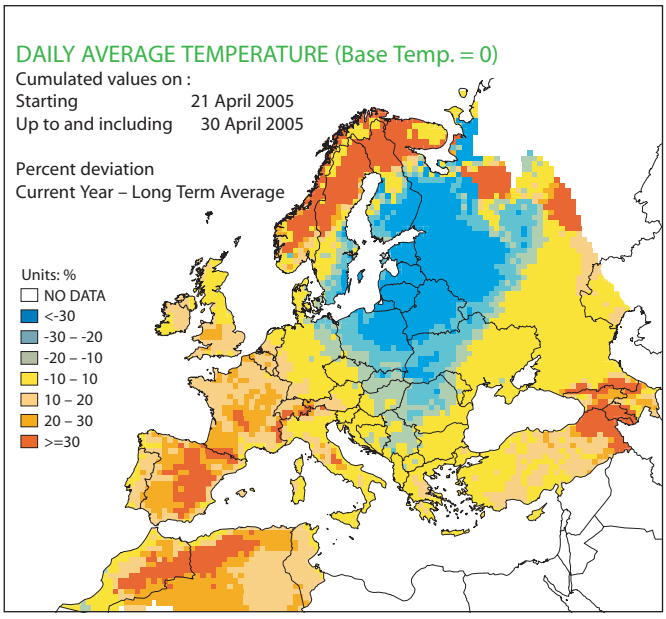
BARLEY-COMPARISON OF DEVELOPMENT STAGE

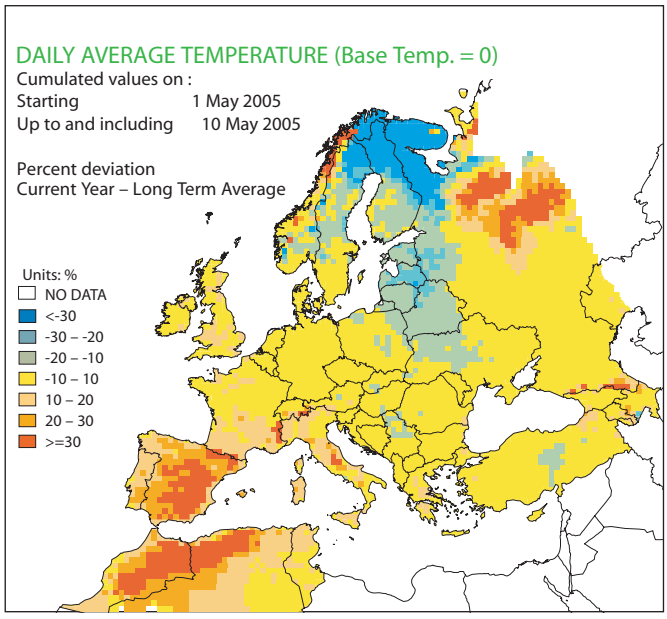
Status on: 3rd dekad May 2005

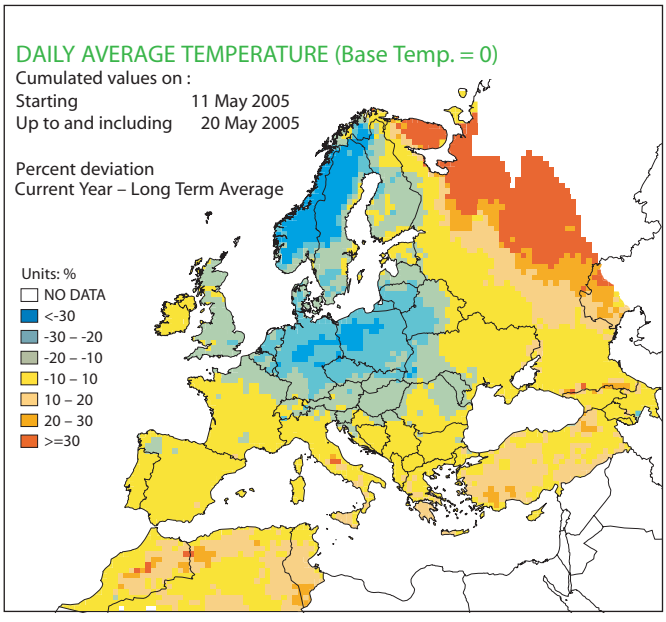
Current Year – Long Term Average

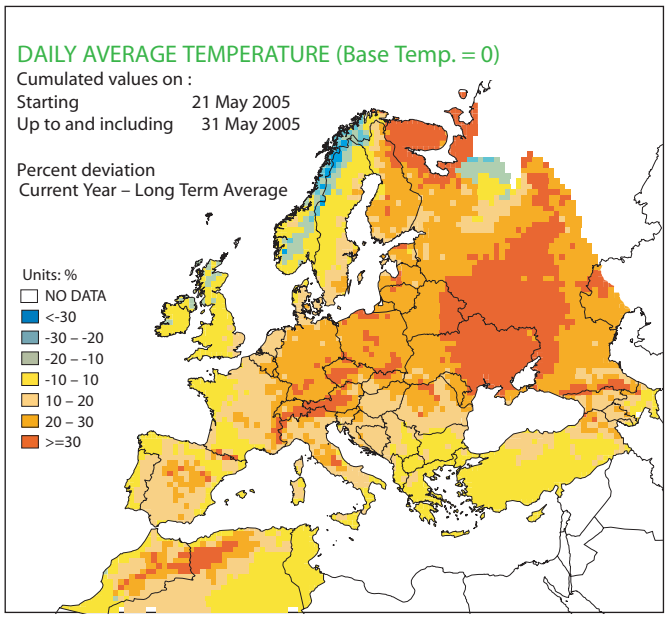


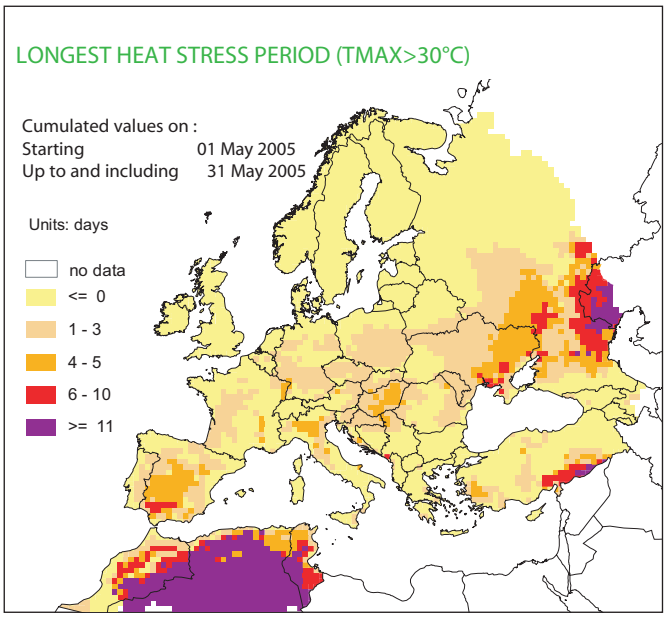
Ten-day rain maps — 21 April to 31 May 2005

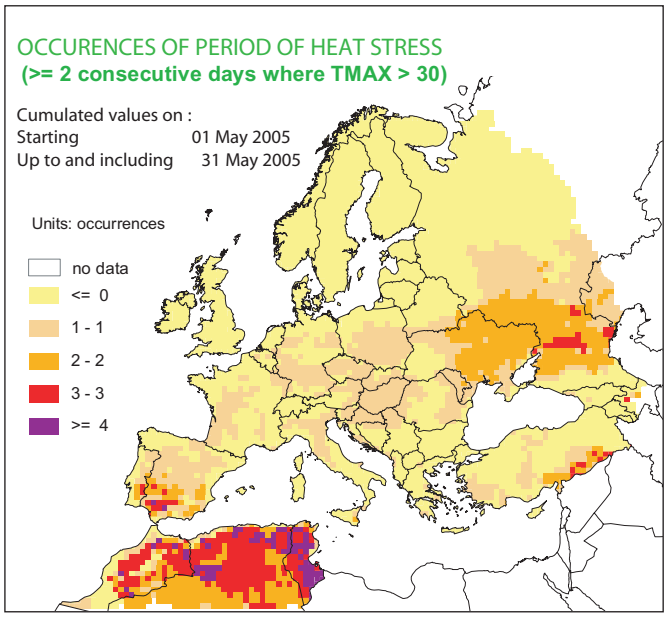




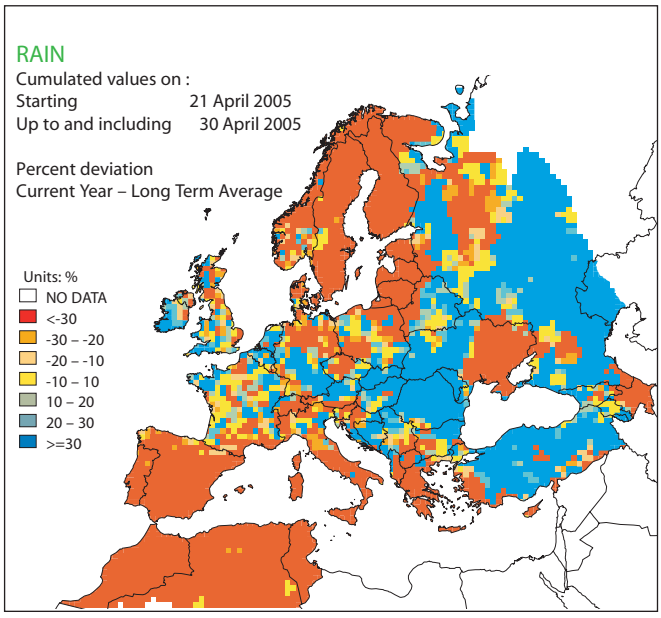


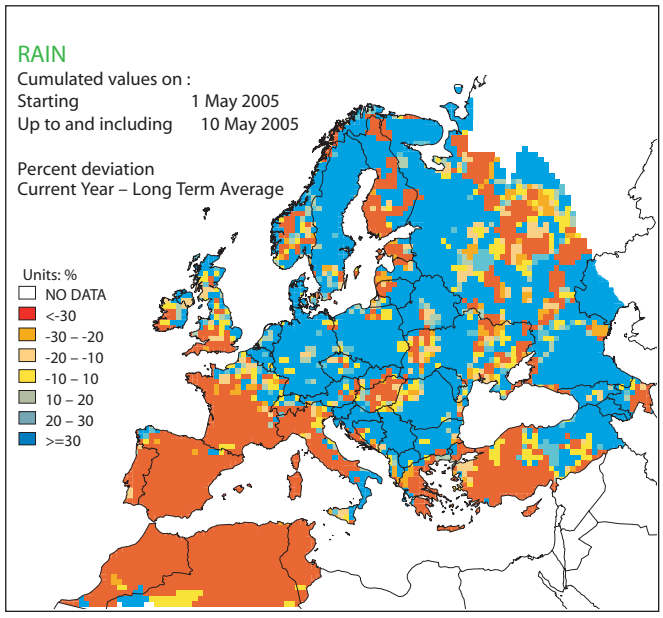


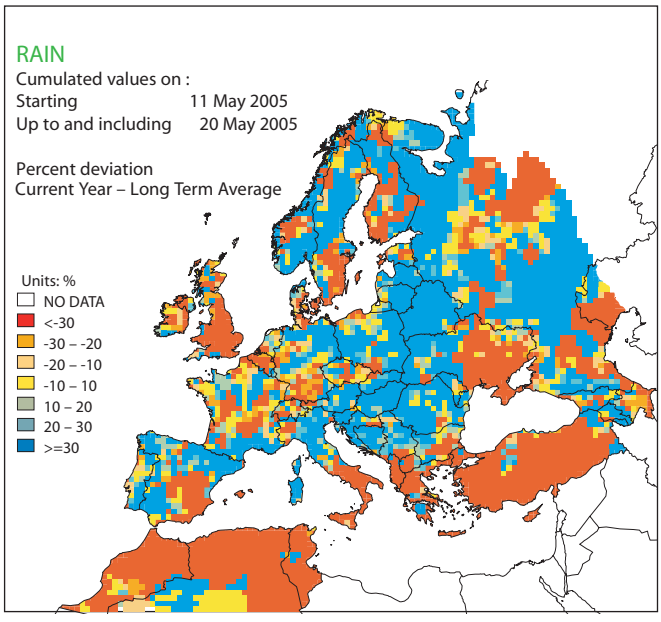


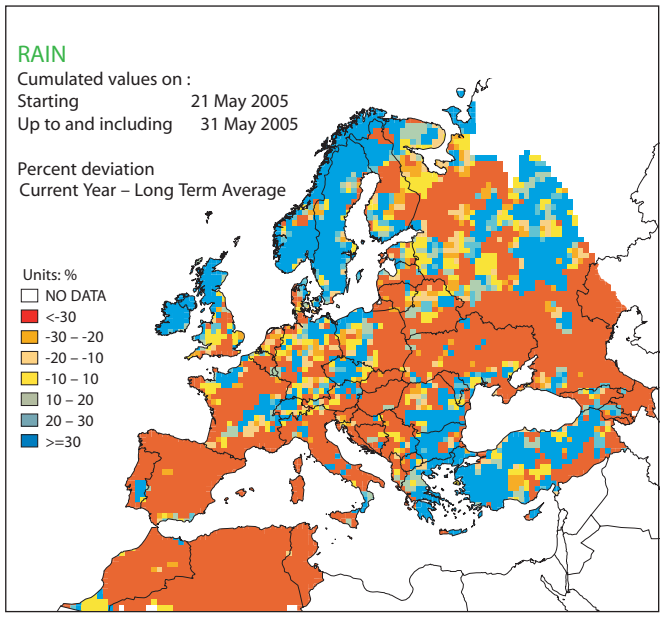


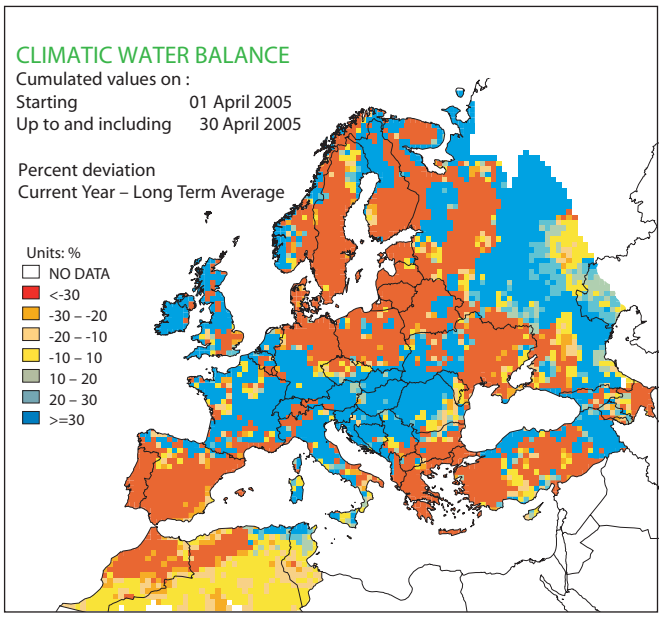
Ten-day temperature maps — 21 April to 31 May 2005

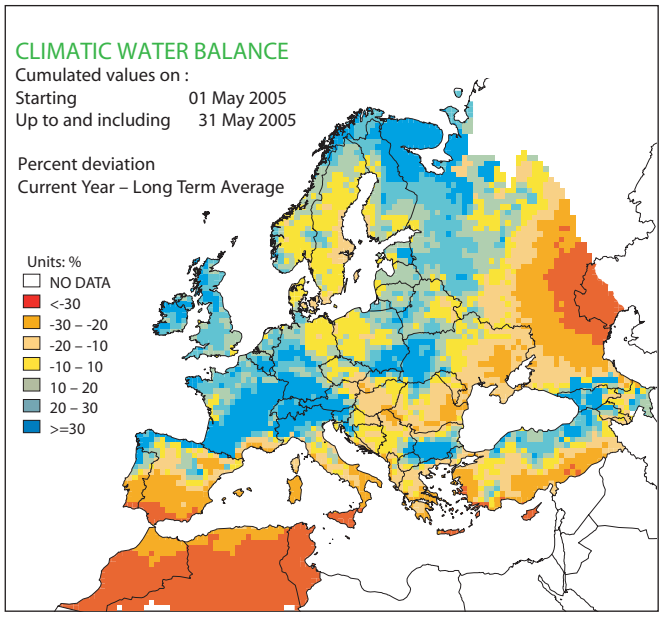










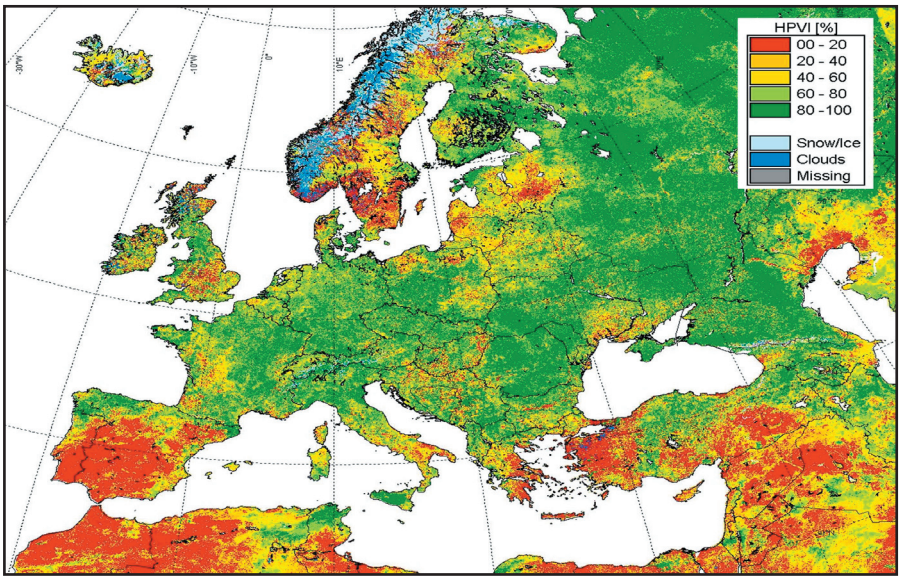


Spot-vegetation satellite analysis

Map highlights: Good vegetation conditions in central Europe but satellite analysis reveals strongly hampered vegetation development in Spain and Portugal

The NDVI map derived from the spot-vegetation instrument for the last dekad of May shows vivid vegetation development for central Europe, e.g. France and Germany and moderate values for the north of Europe, as the vegetation cycle here is less advanced.

The strong trend of hampered vegetation development at a low level due to the extremely dry conditions that had been shown in the last bulletins for Spain and Portugal has become clearly manifested and can also be observed in the second map showing the historical probability that this particular NDVI value actually occurs. Portugal and large parts of central Spain appear red, underlining the fact that the senescence phase has started here at a very low level. Moreover this map brings to our attention the western part of Greece and eastern Turkey where the dry conditions are also affecting the vegetation development, also visible with low actual NDVI values.



Historical propability of NDVI values, third dekad, May 2005

CNDVI profile highlights: Normal to good vegetation growth cycle for most of Europe, exceptional low vegetation development and short cycle for Spain, Portugal and parts of the Maghreb countries

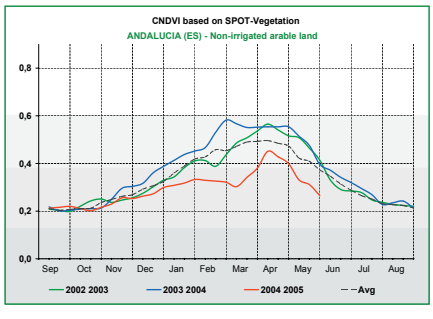
In **Andalucia (Spain)** the vegetation development is clearly below the average since the start of the season and instead of increasing values in February with the start of the most dynamic phase of the vegetation cycle even slight depressions can be observed. Mid-March a very short vegetation boost started unable to compensate the low performance in the preceding dekads and entering in a fast senescence phase at a very low level. For **Alentejo (Portugal)** an opposed development to the normal cycle can be observed with decreasing values since February and no considerable biomass accumulation, revealing a very low yield potential.

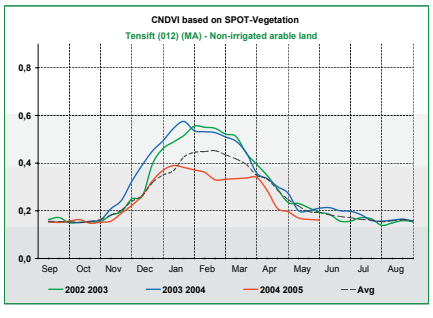
A comparable situation is displayed for the profile of **Tensift (Marocco)**. Here we see a truncated crop growth cycle with a low maximum vegetation development very early in the season followed by a long period of stagnancy without biomass accumulation before entering into the senescence phase and concluding the vegetation cycle.

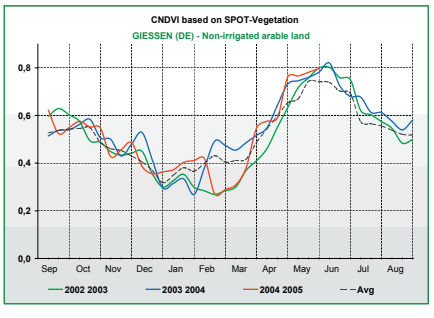
These observations are in contrast to the displayed vegetation profiles from Poland, Germany and France. A very good crop yield potential is shown for the profile of **Dolnoslaskie (Poland)** which experienced normal weather conditions, slightly wetter than usual with NDVI values well above the average and the maximum vegetation development not yet reached.

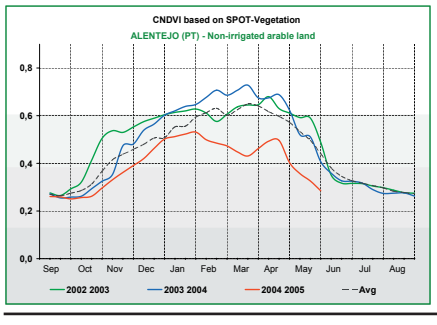
A similar situation is shown in the profile for **Giessen (Germany)** where maximum values of vegetation development have been reached accumulating a lot of biomass early in the season and remaining at a high level, even slightly increasing, since the end of April.

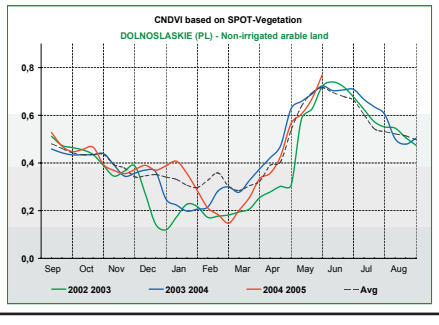
Despite the rainfall deficit for France within the last dekads the NDVI profile for **Poitou-Charentes (France)** shows a potential above the two last years but an earlier transition into the senescence phase can be observed.

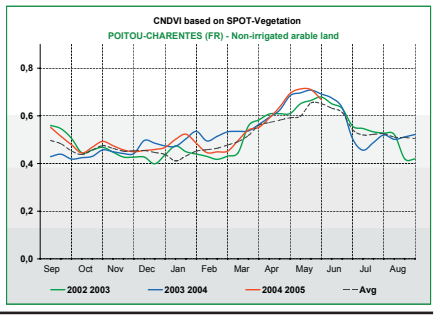












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