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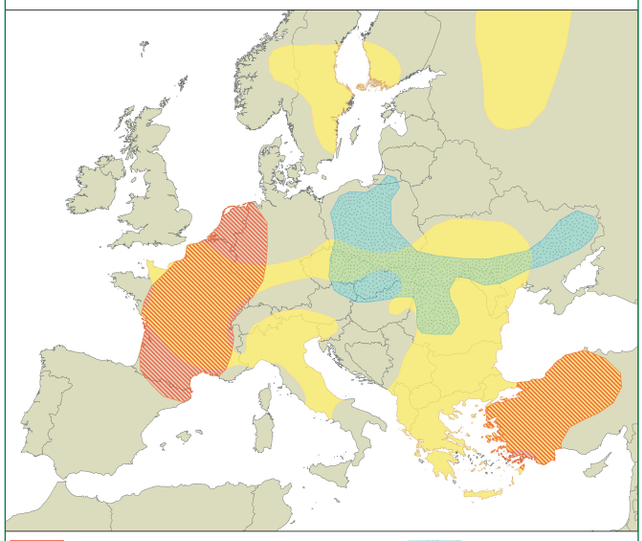
MARS AGROMETEOROLOGICAL Crop Monitoring in Europe

1st April 2007 to 10th May 2007

Vol. 15, No 3

Temperatures boosting crop growth

Areas of concern



High temperatures
Risk of Frost
Soil moisture deficit

MARS STAT yield forecasts: 10 MAY 2007

CROPS	European Union 27 Yield (t/ha)				
	2006	2007	Average 5 years	% 2007/06	% 2007/ Average
TOTAL CEREALS	4.7	**4.9**	*4.8*	+3.4	+2.0
Soft wheat	5.4	**5.5**	5.4	+2.4	+1.0
Durum wheat	3.0	**2.9**	2.7	-1.8	+9.7
Total wheat	5.1	**5.2**	*5.0*	+1.8	+2.7
Spring barley	3.4	**3.7**	*3.7*	+8.7	+1.1
Winter barley	5.1	**5.2**	*5.0*	+0.5	+4.0
Total barley	4.1	**4.3**	*4.2*	+4.9	+2.7
Grain maize	6.5	**6.6**	*6.5*	+1.6	+2.7
Other cereals (1)	2.9	**3.0**	*3.2*	+3.1	+2.4
Rape seed	3.0	**3.0**	3.0	+1.5	+0.7

Yield figures are rounded to 100 kg
(1) Sorghum, rye, maslin, oats, triticale, mixed grain other than maslin, millet, buckwheat
Sources: 2006 yields come from EUROSTAT CRONOS
2007 yields come from MARS CROP YIELD FORECASTING SYSTEM

1. Agrometeorological overview

Continuing unseasonable mild and dry conditions over most of the continent: the worst conditions were in the central and northern EU, whilst more favourable conditions occurred in the western and southern Mediterranean. Brief but threatening late frosts in May over north-east Europe.

Temperatures and evapotranspiration

Thermal anomalies continued in April. Warmer-than-seasonal temperatures occurred mainly in the central and northern EU, Italy and Norway.

As in winter, in most EU agricultural areas, spring started with very mild thermal conditions. As a whole, April was one of the mildest for the last 30 years: in many central and northern EU countries (France, Benelux, the UK, western Germany, Ireland, Denmark, Sweden), Italy and western Turkey, the current season was overall the warmest since 1975 (on average 2–3 °C, but in some cases as much as 4–4.5 °C, above the seasonal mean). In eastern Germany, Poland, the Czech Republic and Austria, thermal conditions such as these have occurred only in 1986, 1998 and 2000.

Contents

EUROPEAN COMMISSION
Joint Research Centre

EC publication from JRC/IPSC/Agrifish/MARS_STAT: mars-stat@jrc.it
MARS bulletin: http://agrifish.jrc.it/marsstat/bulletins/2007.htm
MARS agrometeorological database: http://www.marsop.info

These conditions persisted into early May. Thus, at the end of the first dekad of May, the cumulated active surplus recorded was above 140–150 GDD in France (except for Normandy and the south-west), Belgium, the Netherlands, western Germany (Baden-Württemberg, Rheinland-Pfalz), north and central Italy (Po valley, Marche, Abruzzo). In the other countries mentioned above, the surplus was around 80–100 GDD.

The biggest temperature anomalies (more than 10 °C as compared to the long-term average) occurred between 15 and 25 April, when the maximum daily values were close to or even exceeded the 30 °C threshold. This was the case in the Netherlands (Noord-Holland, Friesland, Zeeland), Belgium (Wallonia), France (Aquitaine, Centre, Bourgogne, Poitou-Charentes), Portugal (Norte, Alentejo), Spain (Murcia, Extremadura) and Italy (Po valley).

Temperatures were extremely high in May in Spain and Portugal (34 °C in Extremadura and Alentejo on 9 May) and Turkey (38 °C in Akdeniz, 37 °C in Guneydogu Anadolu on 7 and 8 May). These abundant thermal resources continued to force crop development, maintaining — and in many cases boosting even further — the advanced stages of development reached at the end of winter.

At the beginning of May, an arctic cold air erupted in the Baltics, the eastern EU and eastern countries: the minimum temperatures dropped suddenly to several degrees below 0 °C (– 6 °C in central Poland and Slovakia) but they quickly returned toward seasonal values. Locally, damage to crops was likely (especially for winter crops at the heading or flowering stages, and spring crops at the very early stages of the crop cycle).

Rainfall and climatic water balance

Persistent rain shortages over most of the continent. Alarming soil moisture levels in many EU countries. Very beneficial water supplies in the western Mediterranean, southern Italy and the Maghreb.

The anomalous rain distribution recorded during the winter continued at the beginning of spring. A virtual diagonal line connecting Normandy to Greece split the continent into two sectors: the north-east side received little precipitation, whereas the southern side received abundant beneficial rain (favourable conditions occurred mainly in central and eastern Spain, the Maghreb, Sardinia and southern Italy). Very little rain was recorded in Andalucia and Portugal.

In absolute terms, larger rain deficits (70–100 mm) were recorded in France, Benelux, the Po valley and the southern UK. In relative terms, the situation appears even worse: most of the continent presented significant rain shortages (< – 30 % as compared to the long-term average).

In the drier areas, the effect of the rain deficit was amplified even further by higher temperatures and thus by higher levels of evapotranspiration, both of which depleted the soil moisture. Over vast areas, at the end of April, the climatic water balance went into deep deficit (< – 100 %) as compared to the long-term average. Furthermore, this situation was aggravated in those areas with limited soil water retention (such as northern Germany, Denmark, the Netherlands and the UK) or where the rain scarcity was coupled with scarce winter snow cover and consequently scarce snowmelt runoff (the Po valley and Alpine regions).

In these areas, the soil moisture content was even lower than recorded in 2003. The level of impact on the active crops will be strictly dependent on the future water supply, but the crop potentialities were certainly also reduced considering the advanced crops' development.

The western Mediterranean areas also faced an anomalous season, with large water supplies, which refilled the soil water reservoirs (largely in surplus as compared to the long-term average: on average 30–50 mm, but in some case as much as 70–80 mm) and created very favourable conditions for the next important stages of development of the winter crops.

Publication issue

The third 2007 printed MARS analysis (Vol. 15, No 3) of the agricultural campaign covers the period 1 April 2007 to 10 May 2007.

It makes a synthesis of the major issues pertaining to:
— meteo and agrometeorological situation,
— winter crop sowings and development.

Previous related analysis available:
— Climatic updates, 16/04/2007 to 30/04/2007 (CU2007/05)
— Climatic updates, 20/03/2007 to 15/04/2007 (CU2007/04)
— Complete Bulletin, 01/04/2007 to 31/03/2007 (Vol. 15, No2)
— Climatic updates, 25/02/2007 to 14/03/2007 (CU2007/03)
— Climatic updates, 01/02/2007 to 25/02/2007 (CU2007/02)
— Complete Bulletin, 01/11/2006 to 31/01/2007 (Vol. 15, No1)
— Climatic updates, 10/12/2006 to 13/01/2007 (CU2007/01)

Next printed issue:

Vol. 15, No 4 : 11 May -10 July 2007 analysis and forecasts; available mid July 2007.

Contributions

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MARS Bulletin reports, press releases and climatic updates are available at:

http://agrifish.jrc.it/marsstat/bulletins/2007.htm

2. Campaign Analysis at country level

Europe 27

France: hot and dry conditions stressing more central and northern areas

The country experienced a dry April with less than half of the usual precipitation for most of the area. North-east France was particularly affected, with rainfall below 5 mm. Only the south-west border benefited from good precipitation. Early May was characterised by significant rain, particularly in the southern half. Some regions, such as central France, still have a rainfall deficit.

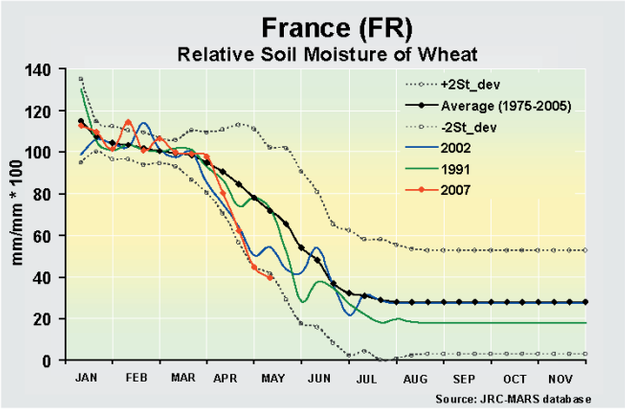
Temperatures continued to be exceptional, particularly from 10 April, with average temperatures higher by 5 °C and maximum temperature exceeding the seasonal level from 6 °C to 9 °C. The difference was reduced in May although values were still higher than normal in the northern part.

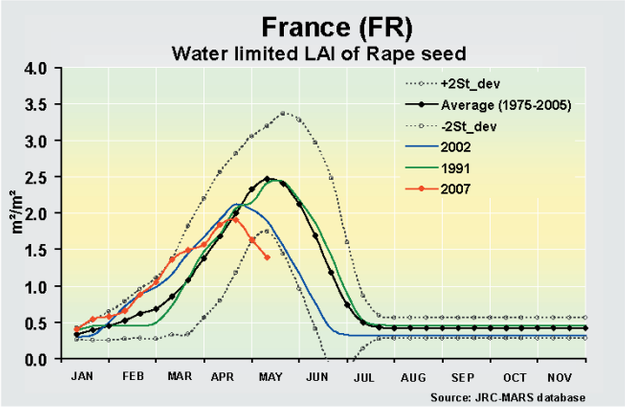
The winter wheat continued to be boosted by these temperatures and from heading in April reached flowering/grain-filling stages in May, three weeks earlier than normal. At a high demanding vegetative stage the crop probably suffered in April from the conjunction of high temperature with low soil moisture reducing the yield potential. Further rainfall will be determinant during the sensitive period of the yield elaboration after a suboptimal development.

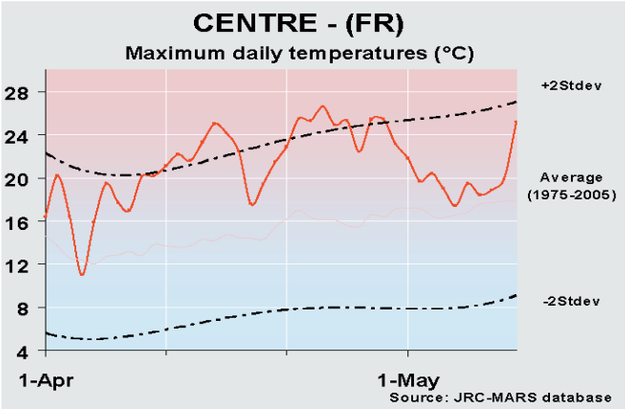
Durum wheat, mainly located in southern France, is already at the grain-filling stage and has probably suffered less from the dry spell than in central France. The potential should still be close to normal but, as for all the crops, further precipitation is needed to replenish the soil and allow a normal yield.

Rapeseed was also very advanced: from flowering in April it reached the grain-filling stage in May. The end of the vegetative phase was anticipated and hindered an optimal canopy development that could limit the grain-filling process. However, the deep roots of the rape plant — allowing a greater soil moisture exploration than does wheat — should have limited the impact of the dry spell. Nevertheless, further rainfall will be the determinant for keeping a normal yield potential.

The sowing and emergence of summer crops were made under dry, suboptimal conditions but the improvement of the soil moisture in May should still allow a normal growth.







MARS Agrometeorological web database is accessible at: 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 1975–2006.

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

A great deal of additional information on the European Union is available on the Internet. It can be accessed through the Europa server (http://europa.eu.int).

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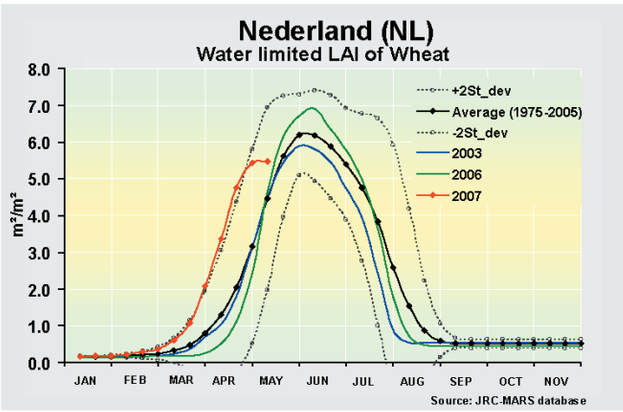
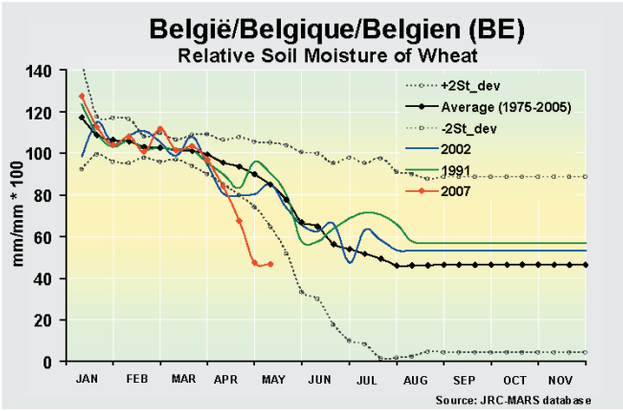
THE MISSION OF THE JRC IS TO PROVIDE CUSTOMER-DRIVEN SCIENTIFIC AND TECHNICAL SUPPORT FOR THE CONCEPTION, DEVELOPMENT, IMPLEMENTATION AND MONITORING OF EU POLICIES. AS A SERVICE OF THE EUROPEAN COMMISSION, THE JRC FUNCTIONS AS A REFERENCE CENTRE OF SCIENCE AND TECHNOLOGY FOR THE UNION. CLOSE TO THE POLICY-MAKING PROCESS, IT SERVES THE COMMON INTEREST OF THE MEMBER STATES, WHILE BEING INDEPENDENT OF SPECIAL INTERESTS, WHETHER PRIVATE OR NATIONAL.

Belgium, the Netherlands, Luxembourg: crops under water stress

The exceptionally mild spell of temperatures continued for the whole April in Belgium and the Netherlands with daily values more than 30 % higher than average. Maximum temperatures of over 26 °C were regularly recorded, which is 11–13 °C higher than the seasonal maximum temperature. Crops continued to be three weeks ahead of their normal development and increased their water needs. Winter wheat was at the flowering and rapeseed at the grain-filling stage in May.

The lack of rainfall throughout the month of April did not replenish the low soil moisture. The crops suffered from water stress, particularly in soil with low water-holding capacity in the Netherlands. This suboptimal vegetative phase in April is likely to have reduced the yield potential. The favourable rainfall in May should continue to replenish the soil moisture and allow a normal end to the crop cycle.





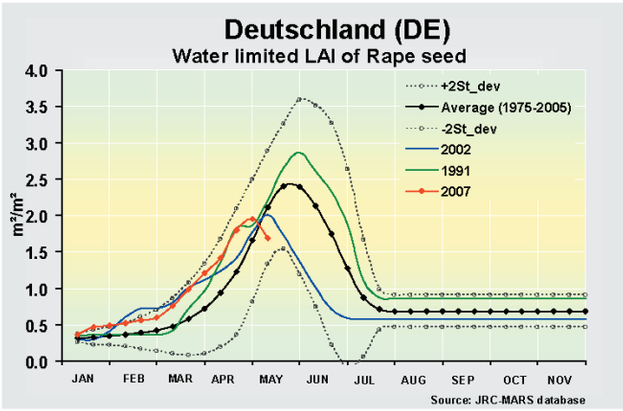
Germany: boosted crop development under water stress

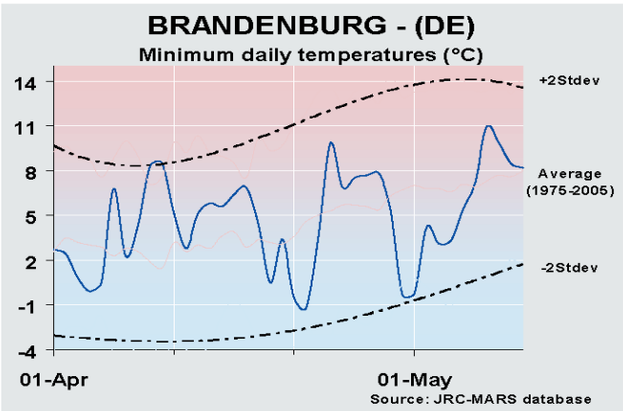
Germany experienced an exceptionally dry April, with less than 5 mm of precipitation for most of the country. The soil moisture was partially replenished with the abundant rainfall of May. The temperature was much higher than the seasonal norm up to the end of April, at 3–6 °C over the average and up to 10 °C above the maximum value.

The winter crops that were already much earlier than the normal stage were again boosted. From heading, the winter wheat reached flowering phase in the southern half of the country. But in eastern Germany, minimum temperatures dropped drastically from 8 °C to – 1 °C on two occasions at the end of April and the beginning of May, and this might have locally affected the winter wheat at a sensitive stage.

Rapeseed was at the flowering stage at the beginning of April and reached the grain-filling phase in May. Crops were three to four weeks more advanced than is usual. At a very demanding vegetative stage, the crops could not benefit from optimal soil moisture and probably suffered from water stress in the light soils, particularly in the northern and eastern areas, reducing the crop yield potential. Despite a better situation in May, which partially replenished the soil moisture, further precipitations will be necessary to ensure a normal grain filling and ripening.

Sowing and emergence of summer crops took place under dry conditions: however, the crop yield potential will probably not be reduced if the good conditions of May continue.



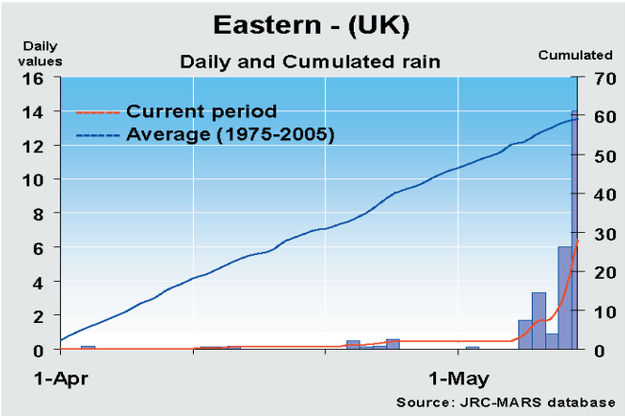


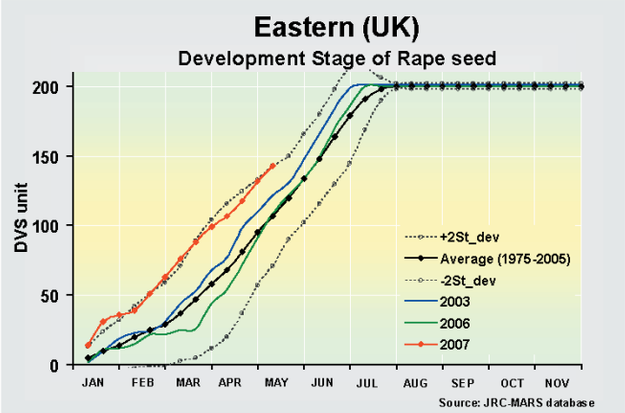
UK and Ireland: persisting mild, dry and alarming conditions

In April and in the first part of May, temperatures were again above the seasonal average. In general, for the whole period, the maximum daily values persisted above the long-term average. Minimum temperatures oscillated mostly around the seasonal averages. However, the current season was the warmest since 1975 (the mean temperatures were 2.5–3 °C above the seasonal values) and the cumulated active temperatures presented a very large surplus as compared to the long-term average: on average 80–100 GDD (equivalent to + 30/+ 35 % of the long-term average). The highest thermal anomalies occurred around mid-April and at the beginning of May, when the maximum values were also 10–12 °C above the average.

Another anomaly during this period was the very low level of rain. April was almost completely dry in all agricultural districts (except locally in Scotland and Wales): it was the driest April since 1975, with less than 5 % of the expected rainfall and the water deficit was estimated at 50–60 mm. In May, only a few millimetres of rain were recorded in Ireland, but rain did return to Great Britain (25–30 mm) although it was only able to alleviate the critical soil moisture levels reached.

The water shortage depleted potential production, particularly in the area with lighter soils and those crops in the more advanced reproductive stage (grain-filling) such as rapeseed or early barley. But the dry weather did reduce disease pressure and the risk of lodging.





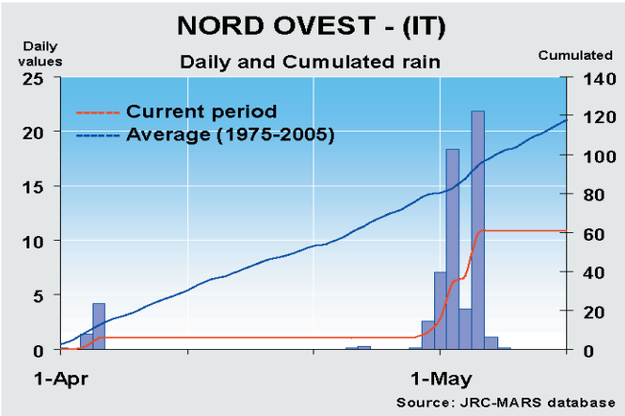
Italy: unseasonably warm; drier in the north, beneficial rain in southern areas

Temperatures were anomalously high once again in April and at the start of May. In absolute terms, this year was the warmest since 1975, with temperatures on average 2–3 °C higher than the seasonal averages. They were higher in the Po valley (by 3.5–4 °C, similar to those in 1999, 2000, 2003 and 2006) and lower in the south (by 1.5– 2 °C, similar to those in 2000, 2003 and 2006).

Temperatures increased progressively from the beginning of April and, from the middle of the month, there were significant thermal anomalies. Consequently, at the end of the period considered, the cumulated active temperatures presented a very large surplus as compared to the seasonal values: + 30 % (equivalent to 150 GDD) in the Po valley, and + 10–15 % (equivalent to 80 GDD) in the southern areas.

The quantity and distribution of rain again presented anomalies: negative in the central and northern areas and positive in the southern areas. The Po valley experienced a very dry April, and significant rainy events occurred only at the beginning of May, only partially refilling the soil reservoirs. In April, the soil moistures presented critical values, even lower than those in 2003. On the other hand, in the southern areas, not very numerous but abundant rainy events occurred at the beginning of April and again between April and May, balancing the maximum crop water requirement.

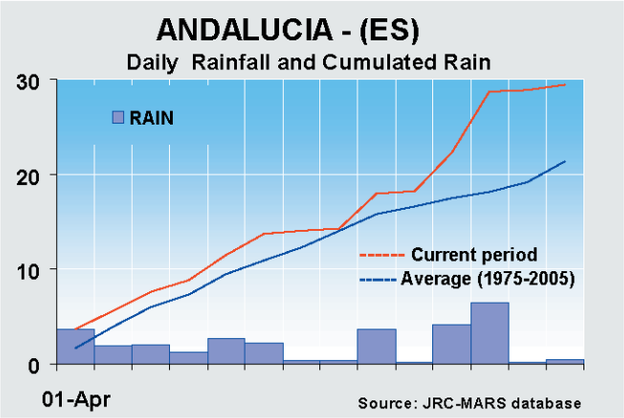
Due to the warmer thermal conditions, both winter and spring crops (sown early thanks to the warmer early spring) experienced an accelerated growth: around 15–25 days in advance of the long-term average is estimable for winter cereal. The main effects of that accelerated growth was to shorten the crop cycle (esp. the reproductive stages) and limit the expansion of LAI (reduced capacity to intercept solar radiation). Also, according to the simulations, the negative impact on final yields caused by the anomalous thermal conditions will probably be larger as compared to those due to the rain shortages in the Po valley. Therefore, only those farmers who adopted longer cycle varieties could profit from the agrometeorological conditions which occurred. On the other hand, in the southern areas, the favourable conditions permit positive expectations of a very good campaign.

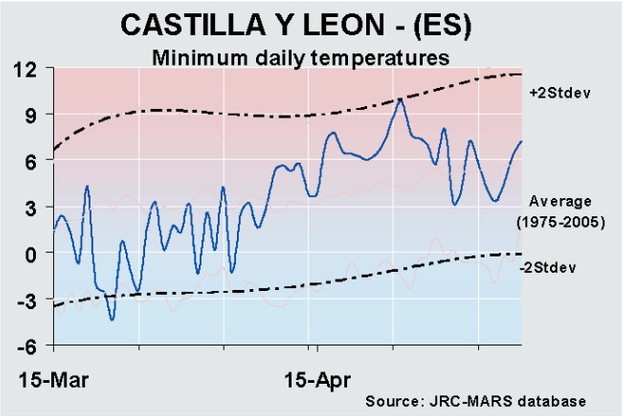


Spain: mild temperatures and sufficient rain create positive yield expectations

During spring 2007, Spanish agriculture finally experienced some favourable weather after two years of drought. Yield levels for both winter cereals and spring crops are expected to take advantage of these conditions. At the beginning of April, the rain (which had started in the central regions of the country during March) extended to the south and continued throughout the whole month, intensifying at the beginning of May. As for temperatures, averages remained in the norm, while minimum levels that had systematically remained on the high side until mid-March, dropped at the beginning of April. There was, however, a recovery during the second half of the month even exceeding average levels. These conditions were reported uniformly across the country.

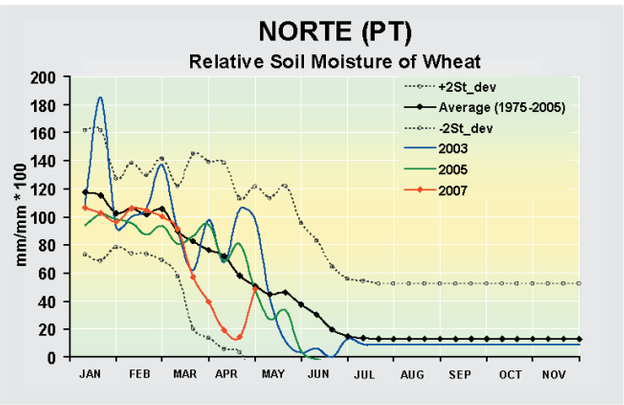
The combination of mild temperatures and good rain anticipated the development of winter cereals, both for durum wheat, prevalent in the south (mainly Andalucía) and for soft wheat in the central-north area (Castilla-y-Leon). The late rain affecting winter wheat in the final stages of its development (in southern areas) may, however, cause the insurgence of hazards such as diseases (mainly rust) or lodging problems. The development of spring crops should also be helped by the favourable weather. Spring barley in the north-east of the country which is in the tillering and heading phases should take particular advantage. The short dry period during the second half of April favoured access to the fields, soil preparation, planting and seeding. The following rain favoured germination and emergence both for other spring crops such as sunflower and grain maize. The expected yield for soft wheat is 3.4 t/ha, with a 13 % increase on both 2006 and the five-year average. The same levels of increase are expected for winter barley, with an estimate of almost 3 t/ha. Durum wheat is expected to yield around 2.5t/ha with a 5 % increase on 2006 but an even more significant + 23 % on the five-year average.





Portugal: late rains make up for the deficits, average season expected

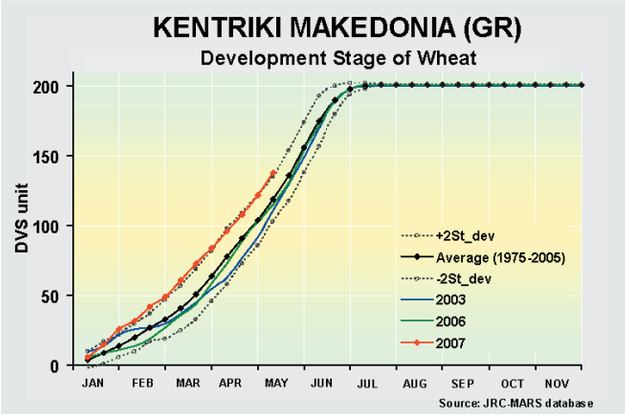
The spring season in Portugal was not as favourable for agriculture as in neighbouring Spain. Conditions until now can be described as average without any particular cause for concern, and this is reflected in the expected yield of winter crops. Following the dry spell in late March, precipitation remained scarce at the beginning of April, especially in the north-west of the country. Rain returned around mid-April partly making up for the cumulated deficit and, at the beginning of May, there was a further increase. Temperatures fluctuated around the average, though with significant maximum and minimum excursions. After a short period of relative cold at the beginning of April, minimum levels stabilised above the average until the first dekad of May, only to decrease again in coincidence with the May rains. This precipitation is supporting the development of winter wheat during the flowering stage and is a good sign for the grain filling. Winter barley, with a more delayed development than wheat, should also take advantage of these conditions. Climate can be considered positive too for spring crops as the dry and warm period in March and at the beginning of April favoured access to the fields, land preparation and seeding. Rains in late April and May supported germination and the emergence for sunflower in Alentejo and maize in Centro. The yield for winter soft wheat is estimated at 1.76 t/ha (+ 12 % on the five-year average) and the same level of outcome can be expected for winter barley (1.6 t/ha; + 8 %). The yield for durum wheat is not as favourable, but, on average, is around 1.4 t/ha.

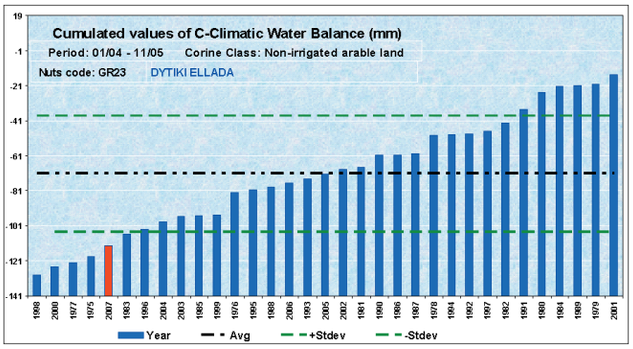


Greece: dry conditions continuing

The agricultural season in Greece is going through a dry spring following a dry winter. Expectations for the yield are not promising for both winter cereals and spring crops. The situation is particularly serious in the centre-north of the country, in the major cereal-producing provinces of Kentriki Makedonia for durum wheat and Dytiki Makedonia for soft wheat and barley. Precipitation continued to be scarce in April and in the first dekad of May, following on the drought that has afflicted the country since January and which worsened in March. Overall, the estimated climatic water balance is more than 30 % below the long-term average. Until now, this is one of the worst years since 1975, although not the absolute worst in recent years as the 2000 agricultural season was even drier. Temperatures remained in the norm and this condition, though not contributing to a worsening of the climatic conditions, kept the phenological development of winter cereals within the norm and even anticipated it in the south of the country. In most production areas, both in the north and in the centre of the country, wheat is flowering whilst barley is heading. The overall soil moisture deficit is not encouraging for the grain-filing phase to follow. The sowing of spring crops, such as grain maize, went ahead in March in the irrigated areas of central Greece (mostly Thessalia). Water requirements for the emergence and development of these crops are significant and irrigation is the norm. Considering the present climatic water balance, irrigation will probably be confronted with scarce water availability.

The expected yield for durum wheat is around 2.6 t/h and is reduced both on the 2006 season (– 11 %) and on the long-term average (– 8 %). Expectation for soft wheat is the same, with 1.8 t/ha reduced by 16 % on 2006 and 8 % on the long-term average. It is too early to give reliable figures on grain maize, although a reduction in yield can be expected.

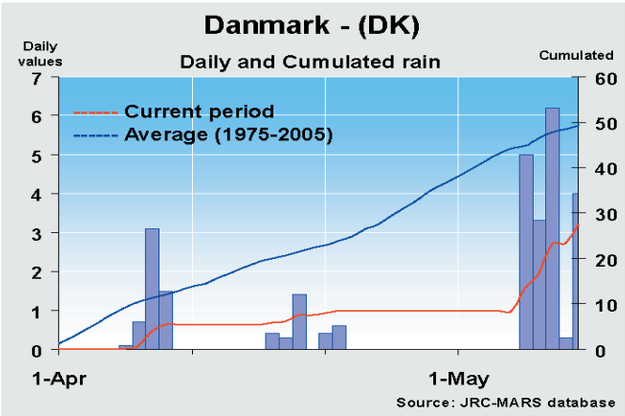




Denmark, Sweden and Finland: quite mild and dry in Denmark and Sweden

In April, Denmark and Sweden, especially during the second and third dekads, experienced higher-than-seasonal temperatures. Over several days, the maximum temperatures exceeded the normal range of variation and, over a couple of days, reached very unseasonable values: more than 10 °C above the long-term average. The minimum values were also generally above average, even if with larger daily fluctuations. Consequently, at the end of the period considered, the cumulated active temperatures were largely above the seasonal values: on average 80–100 GDD. The impact on the active crops was to accelerate growth and development. On average, at the end of the period considered, the winter crops are more than two weeks advanced as compared to the long-term average. Similar conditions occurred in 1989 and 1990. There was a shortage of rain in April and this was another impacting agrometeorological event: from the beginning of April up to 5 May, Denmark as well southern Sweden received only 10 % (5–10 mm) of the expected water supply. Due to the higher levels of crop water requirement, the climatic water balance was largely in deficit during the whole period. The crops mainly used the soil water reservoir and future rain supplies will significantly impact the final yields.

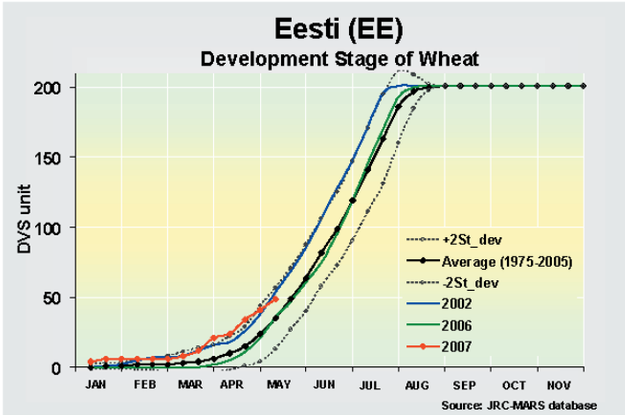
In Finland, more seasonal agrometeorological conditions were recorded: the minimum temperatures climbed steadily above 0 °C during the second half of April, interrupting the winter crop dormancy, but occasional frost events occurred again in May. The maximum temperature generally remained within the normal range of variation except during the second dekad of April (high above the long-term average). However, the cumulated active temperatures presented surplus as compared to the seasonal average. The rainfalls were normally distributed and quantitatively adequate to the season.

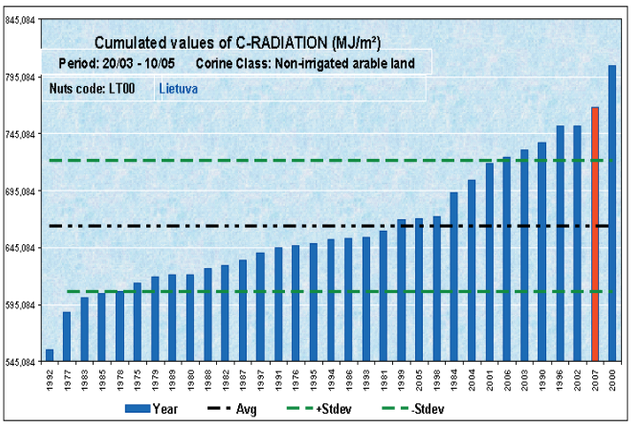


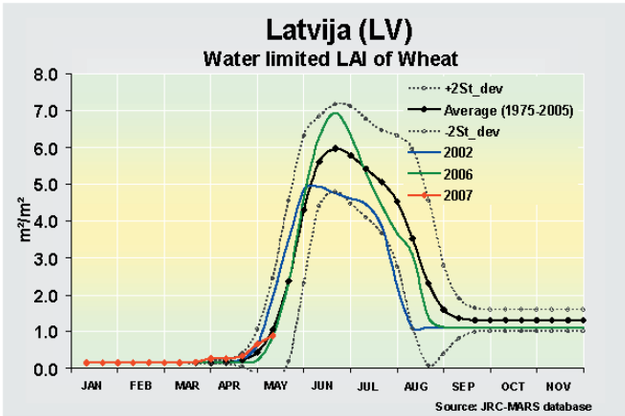
Estonia, Latvia, Lithuania: slight anticipation in development of winter wheat

Cumulated rain and climatic water balance were below the long-term average without falling below the lower 1 standard deviation level. The southern half of this area of interest was much drier than usual (<– 30 % of the long-term average).

The cumulated global radiation for this period was above the long-term average with more than 1 standard deviation in Estonia, second year (after 2000) in Lithuania and the third year in Latvia (after 2000 and 1996). The development of winter crops is in advance and the simulated biomass is at the normal level. The LAI and the simulated above-ground biomass are close to the long-term average. The NDVI is still above normal but the difference is small.

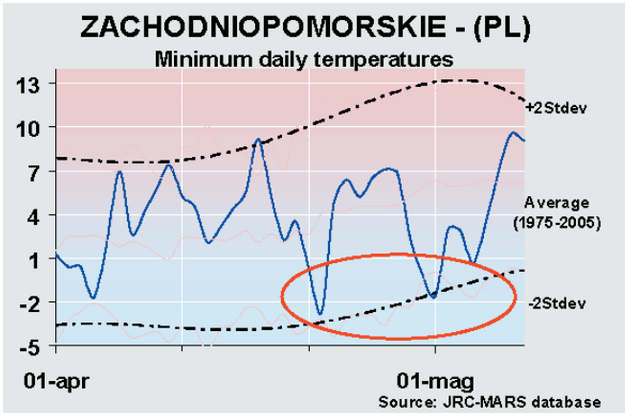




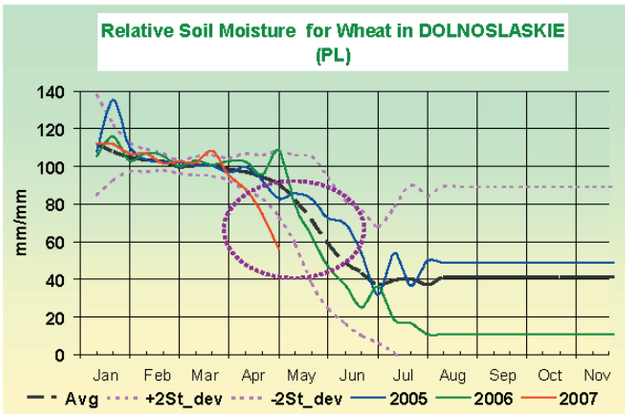


Poland: hardly any cloudy days lead to unusually high irradiance levels

Forecasted yields are 3.65 t/ha for soft wheat (– 2.6 % compared to the five-year average), 3.31 t/ha for winter barley (– 4.3 %), 2.86 t/ha for spring barley (– 5.0 %) and 2.44 t/ha for turnips (– 1.2 %).Cumulated rainfalls were definitely below average in April and characterised by a homogeneous distribution all over the country. Only in the north-western regions (e.g. Zachodniopomorskie) was an average rainfall situation recorded. In general, the extreme sparsity of cloudy days has favoured absolutely satisfactory irradiance conditions compared to the long-term average. Temperatures followed an increasing gradient from the east (e.g. Warminsko-Mazurskie, Lubelskie, Malopolskie experienced average thermal conditions) to the west (e.g. Dolnoslaskie, Zachodniopomorskie, where higher-than-average temperatures were recorded).



Winter wheat is at the head development stage (in the first part of this phenological stage in the north-eastern regions, in the second part in the south-western ones). The advance in development stage ranges between half a month and two dekads, according to the regions. Although not calamitous, the situation with respect to water availability is not encouraging. Winter rapeseed is concluding the flowering phase with a 15-day advance according to the average. The soil moisture values are strongly below the average although the situation is not as critical as in the countries bordering the south-west: no impacts are simulated both in biomass accumulation and in leaf area index. Spring barley is entering the tillering stage according to the norm where March precipitations have not delayed the sowings.



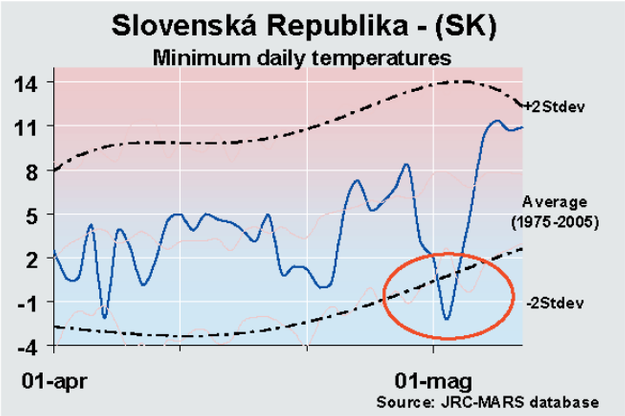
Czech Republic and Slovakia: suboptimal water availability for winter crops

Except for turnips (2.76 t/ha, – 8.4 %), the yields forecasted for the Czech Republic are higher than those for 2006: 4.57 t/ha for soft wheat (+ 1.9 %), 4.04 t/ha for winter barley (+7.6 %) and 3.78 t/ha for spring barley (+ 6.3 %).

Yields for Slovakia are: 3.73 t/ha for soft wheat (– 2.4 %), 3.12 t/ha for winter barley (+ 0.2 %), 4.00 t/ha for spring barley (+ 14.1 %) and 1.73 t/ha for turnips (– 17.6 %).

Meteorological conditions experienced in the Czech Republic and Slovakia are similar to those described for Austria, although the dry April might have had a deeper impact on the crops because precipitations in the first part of the year were not as abundant as in Austria. Although cumulated mean daily temperatures were higher than those characterising the long-term average, they are often the results of extreme fluctuations between the values recorded during the night and the day ones. In particular, Slovakia experienced a temperature fall (values below – 2 °C were measured) during the first days of May. This might have negatively impacted straw cereals at the heading stage. High temperatures were recorded around 14 and 28 April. The almost total absence of rainfall in April corresponded to high irradiance levels for the whole month.

Winter wheat is completing the head development stage with a two-dekad advance compared to the long-term average. Simulated relative soil moisture is less than 80 % lower than the long-term average value – 2 standard deviations. A decrease in the leaf area expansion rate is shown by simulations, lowering the yield expectations. This effect is simulated particularly for the Czech Republic. Rapeseed is completing the flowering stage with more than half a month advance compared to the average under suboptimal soil moisture conditions. In spite of the advance in the development stage, simulated values of leaf area index are rapidly returning to average values, after the high values simulated at the start of the season. This is mainly due to the insufficient water availability occurring in the second part of April and it is particularly evident for Slovak simulations. Spring barley has reached the mid-tillering stage with about a one-dekad advance with respect to the long-term average.

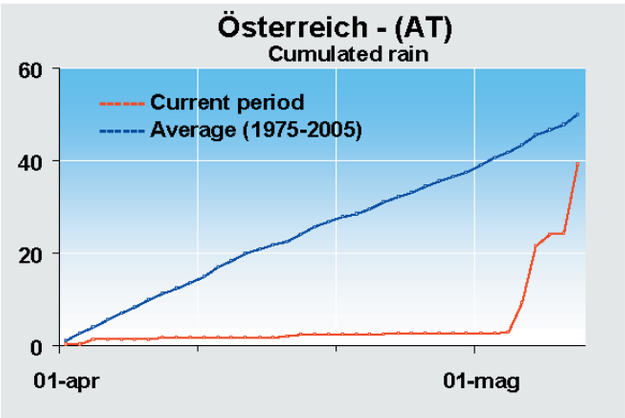


Austria: an extremely dry April

Yield forecasts are 5.24 t/ha for soft wheat (– 24.3 % compared to the five-year average), 2.58 t/ha for durum wheat (– 3.1 %), 4.98 t/ha for winter barley (– 3.4 %), 4.04 t/ha for spring barley (– 3.7 %) and 2.62 t/ha for rapeseed (– 4.2 %).

An extremely dry April characterised spring in the whole country, but the abundant precipitations which occurred in the first months of the year are maintaining the cumulated rainfall value above the long-term average. Problems due to insufficient water availability in the top-soil could have been avoided partly because of rainfall at the beginning of May. Higher-than-average temperatures were recorded in April, mainly due to high daily maxima. Of course, these conditions have been associated with irradiance levels consistently above the average. Where the soils have been able to retain the March rainfalls, and if they have not caused soil moisture excess problems when plants were restarting after the winter, a good season is expected.

A two-dekad advance is simulated for winter wheat, which will enter in the flowering stage in a few days. This advance could be even higher where water stress affected the crop, which could have been induced to anticipate the end of the vegetative stage. Where winter wheat suffered from water stress, a certain decrease in the rate of total leaf area expansion is expected, although the crop has already reached the close canopy stage and therefore no problems due to suboptimal light interception should verify. Rapeseed has completed the flowering stage with an advance of about 20 days. As already mentioned for winter wheat, problems due to insufficient water availability might have affected the crop, decreasing its potential, although current CNDVI values are encouraging. Spring barley will complete the tillering phase with a one-dekad advance compared to the average.

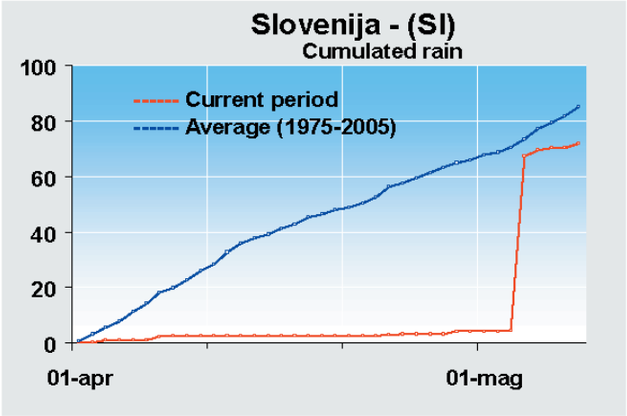


Slovenia: plants might have suffered from the absolute lack of rainfall during April

Forecasts are 4.56 t/ha for soft wheat (+ 8.9 % compared to 2006) and 3.77 t/ha for barley (+ 4.4 %).

An absolute lack of rainfall characterised this part of the season until a significant rainfall event (4 May, 63 mm) brought back the cumulated (from the beginning of the year to now) rainfall slightly above average. Higher-than-average temperatures have been recorded for the whole period of analysis.

Winter wheat has just completed the flowering stage with a two-dekad advance compared to the long-term average. The combined effect of the soil moisture deficit simulated after the first dekad of April and of the shortening of the vegetative phase because of the high temperature is leading to a suboptimal leaf area expansion. This will probably reduce the crop potential during the grain-filling period. Rapeseed has completed the flowering stage more than 15 days in advance compared to the average. The crop is experiencing the same conditions for the leaf area index as discussed for winter wheat. Spring barley is in the first half of the stem elongation phase with a more than one-dekad advance on the average.

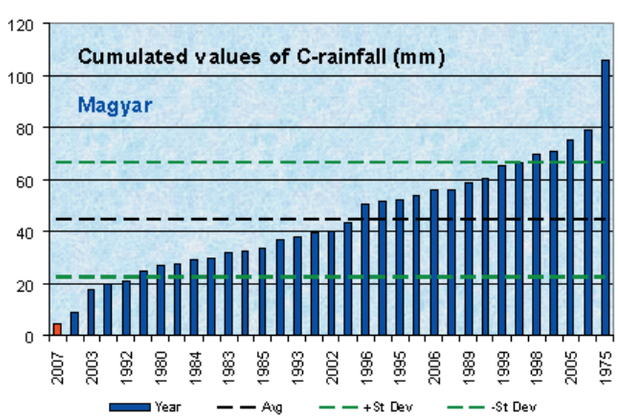


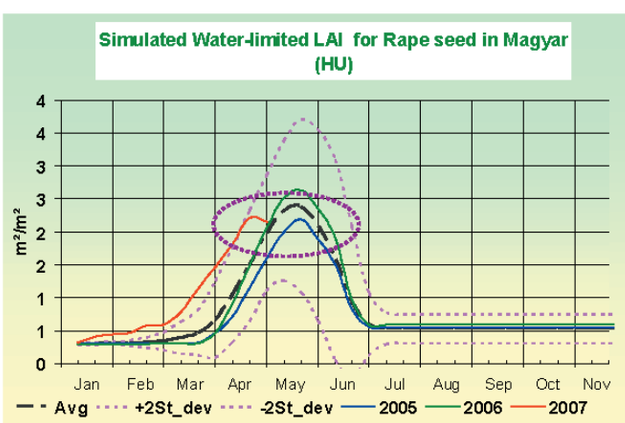
Hungary: crops have experienced the driest April since 1975

Apart from wheat (4.20 t/ha, + 3.3 % compared to 2006), forecasts are showing a negative trend since last year: 3.75 t/ha for winter barley (– 2.0 %), 2.62 t/ha for spring barley (– 24.7 %), 2.02 t/ha for turnips (– 13.8 %).

The tendency of temperatures being higher than the long-term average, discussed in the previous analysis, is still continuing, especially because of high daily maxima. This is leading to short crop cycles all over the country. Cumulated values of C-rainfall (Corine land cover class: 'Non-irrigated arable land') in April are the lowest since 1975, with less than 5 mm. This gives a clear idea of the scarcity of precipitations experienced by the crop. The related absence of clouds has positively influenced the irradiance levels: with the exception of a few days, daily radiation has always been decidedly above (double on most days) the average values.

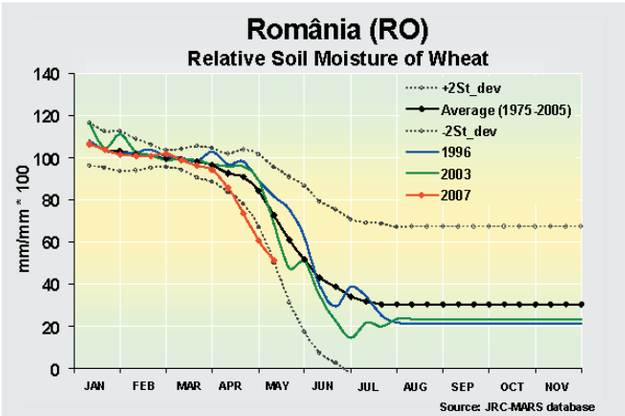
Winter wheat is anticipating the beginning of the flowering stage of about 20 days under insufficient conditions of water availability. The relative soil moisture simulated at the end of April is half of the average value and almost 40 % lower than the average value – 2 standard deviations. The main effects of the insufficient water supply are simulated on the rate of leaf area expansion, which starts decreasing in the second part of April. Rapeseed concluded flowering with more than half a month advance under scarce soil water content conditions. The simulated leaf area index has reached its maximum and is starting the decreasing part of its course with an approximately 25-day advance compared to the average. Spring barley is entering the head development stage with an advance of a few days compared to the average.

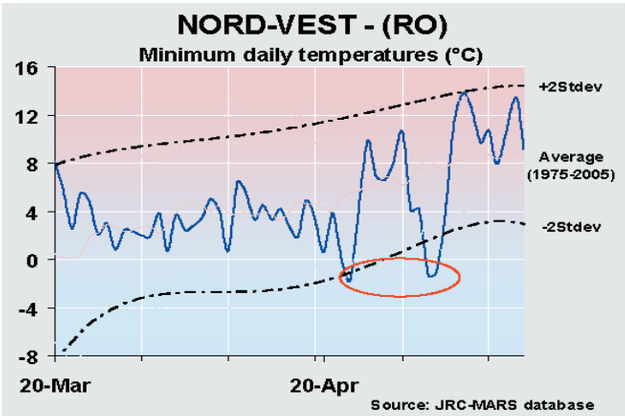


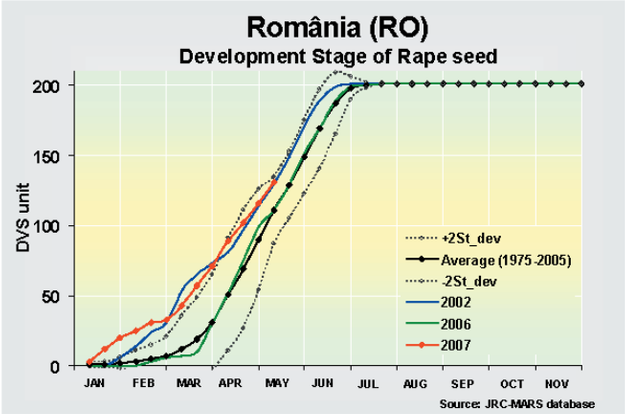


Romania: two cold days in the north-west, low level of soil moisture

The accumulation of thermal resources (Tbase 0 °C) was slightly above the normal level for the whole of the period considered and at 10 May the difference was about 50 GDD. In north-west Romania, two late freezing events (less than – 1 °C) affected the winter crops at the boosting stage. The level of global solar radiation was equal with that from 2003 (the highest since 1975). The climatic water balance was low (without reaching the 1 standard deviation limit). From mid-April, the simulated relative soil moisture for the winter crops remained with 2 standard deviations below the normal level. The winter crop development is anticipated. The sowing of the summer crops was performed under dry conditions.







Bulgaria: very low level of soil moisture

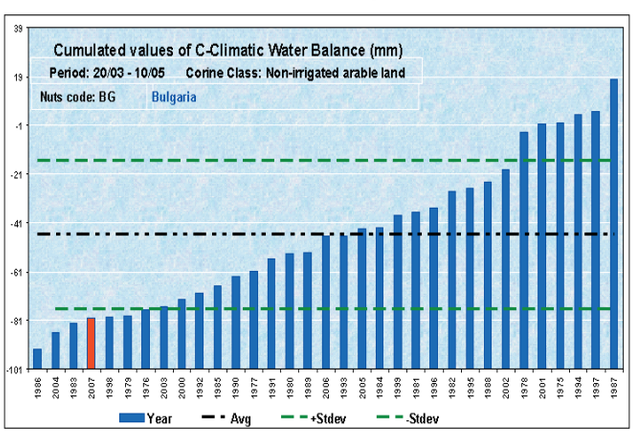
The sum of active degrees (Tbase = 0°C) was slightly above the long-term average (+ 75 GDD). This situation is a less intense continuation of the warmer-than-usual period.

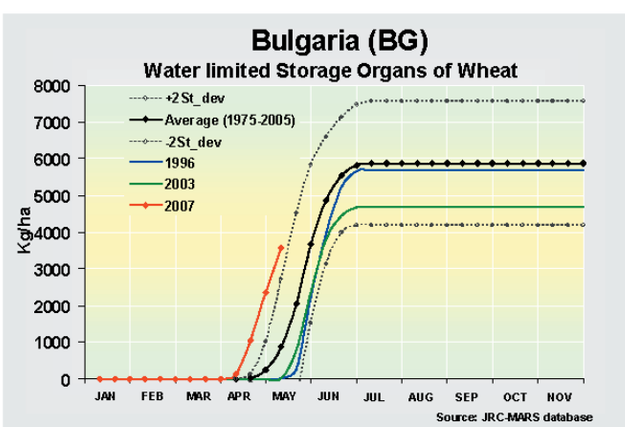
For the period considered, the cumulated precipitation was quite low (falling more than 1 standard deviation below the long-term average), but the high level of global radiation (the second after 2003) increased evapotranspiration and, as a result, the climatic water balance for the period was very low (the fourth driest year since 1975).

The development of winter crops is considerably anticipated as is the simulated total above-ground biomass and the weight of the storage organs, but, compared with the normal situation, the soil moisture level is extremely low (below 2 standard deviations).

In accordance with the simulated LAI for winter crops, the NDVI derived from SPOT Vegetation data for the non-irrigated agricultural areas in the northern part of Bulgaria is showing an anticipated decrease. A rather dry weather forecast is suggesting a very low yield scenario for the winter crops.

The sowing of the spring crops was performed under dry conditions.

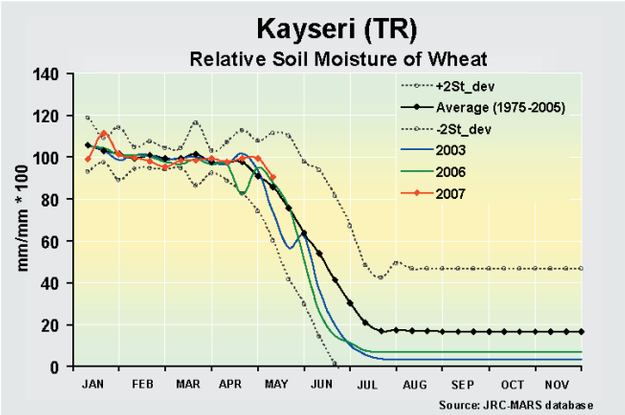


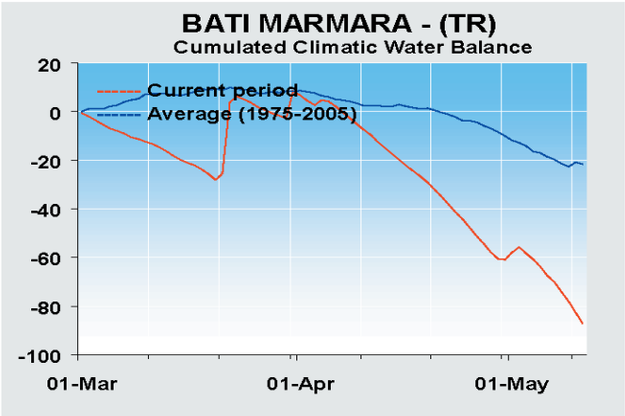


Black Sea Area

Turkey: climatic conditions are evolving negatively but no definite impact on crops

The spring agricultural season in Turkey, which had experienced alternating periods of dry weather and rain during the winter and early spring, appears to be evolving negatively in April and early May. A rainfall deficit is accumulating throughout the country, affecting different areas at different times. The areas of most concern are in the west, on the Aegean coast, but dry conditions are moving progressively eastward affecting the main winter wheat production areas of central Anatolia. Precipitation remained abundant, however, in the east continuing the trend that was established during the winter months and early spring. Temperatures were in the norm almost everywhere concerning the average and maximum levels, while minimums were slightly lower in the northern Black Sea regions. Regarding the influence on the main winter cereals, although at the beginning of April development was still such for the crop to tolerate dry weather, the present conditions find cereals in a delicate phase of development. Winter wheat is still heading in most of the production areas of central Turkey while in the west (mainly the Manisa region) the relatively milder temperatures are bringing it to flowering. Winter barley is more advanced in its development and is diffused in the west; for this reason it could be even more affected by the lack of rain. Spring crops are probably suffering too in their initial development stages. Durum wheat, until now, is still expected to yield 2.27 t/ha on the same levels of the five-year average and so is winter barley, stable on average values, with 2.5 t/ha.



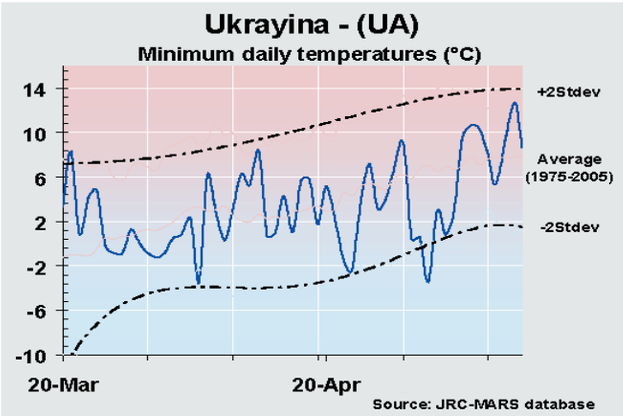


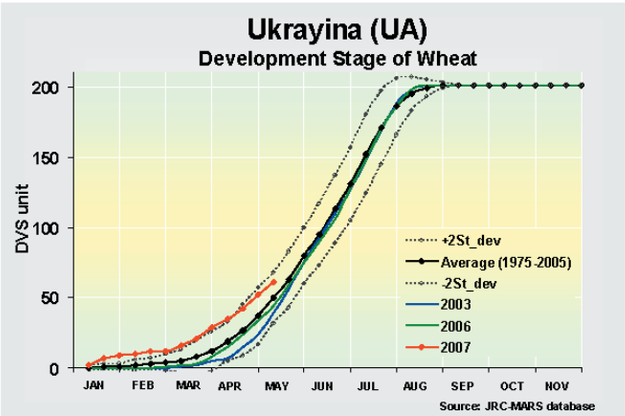
Ukraine: very low level of soil moisture

The thermal resources (Tbase = 0°C) were slightly above the long-term average (maintaining the advance of the developmental stage). Freezing minimum temperatures (< – 2 °C) were recorded in two waves, the last of them, 2 May, affecting the wheat crops from eastern and western Ukraine. Precipitation received in this period was at about 15 mm below the long-term average, but, in the central areas, the situation was more severe. The climatic water balance was at about 1 standard deviation below normal. The year 2007 was in the third position (after 2003 and 2000) in the top of the global radiation cumulated for the period considered.

Winter crops are still preserving the advance in development achieved in the warmer-than-usual previous months. The level of soil moisture for winter wheat is very low (about 2 standard deviations below the normal level). The expectances for an average yield are reduced even more due to dry weather being forecasted for the next 10 days.

Until the end of the period considered, the simulated LAI was following the long-term average curve.

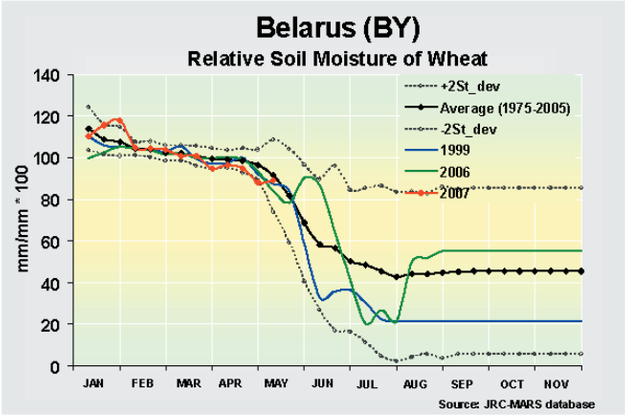




Eastern countries

Belarus: winter crops development is still in advance

The average temperature was at 1 standard deviation below the long-term average for this period. Cumulated rainfall from the beginning of the year is close to the long-term level and the considered period is slightly below normal. At the beginning of May, the relative soil water content was below the long-term average with more than 2 standard deviations, but, at the end of the period considered, it increased up to normal. Although the anticipated development of winter crops is quite close to those from 1999 (one of the lowest yield years) the other simulated indicators are rather different at the moment. This year, it is expected that the precipitation regime from the first half of June will make the difference between a bad year and a slightly better-than-average yield for winter crops. The sowing of spring barley was performed under normal conditions.



Russia: favourable conditions for spring crop sowing

The period under analysis is the end of the dormant period/re-start of winter crop growth after the winter, and the time for spring crop sowing.

Because of the warm weather in March, practically all agricultural fields in the European part of Russia were free of snow at the beginning of April, although around the Urals the snow cover disappeared in mid-April. In general, snow thawing in the current season is one to two weeks in advance compared to the long-term average dates.

April 2007 was slightly colder than normal. The minimal air temperature in some days was near – 3 to – 8 °C. The air temperature was not extreme for winter crops, although in some regions it might lead to a delay in spring crop sowing.

The amount of precipitation was higher during April than in previous years and higher than average in the Volga and Urals regions. In other regions, the amount of precipitation was close to normal. Extremely low levels of rain was observed only in southern Dagestan where cropping areas are scarce.

Agrometeorological conditions during the winter and spring have lead to optimal soil water content practically everywhere. The exception is in the central part of the European Russia, where soils contain slightly less water as compared with the long-term average values and with those of the previous year.

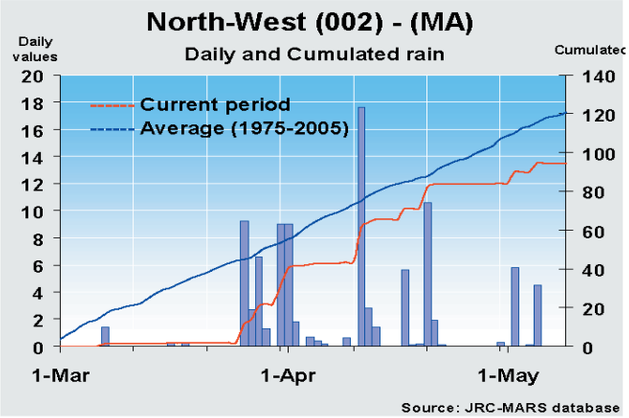
The CGMS simulation results of wheat growth demonstrate that the situation at the end of April 2007 is better than in the previous year in the north-western part of Russia, and worse in the southern regions and near the Urals. The main cause of these results is the delay in winter crop development in these regions due to the cold and rainy weather during the second dekad of April.

Based on analysis of all crop growth indicators, it seems possible to conclude that agrometeorological conditions in April 2007 were in general good for winter crops, apart from the delay in crop development in southern Russia and the Urals. The agrometeorological situation for spring crop sowing was favourable practically everywhere, and the sowing campaign is likely to be finished on time.

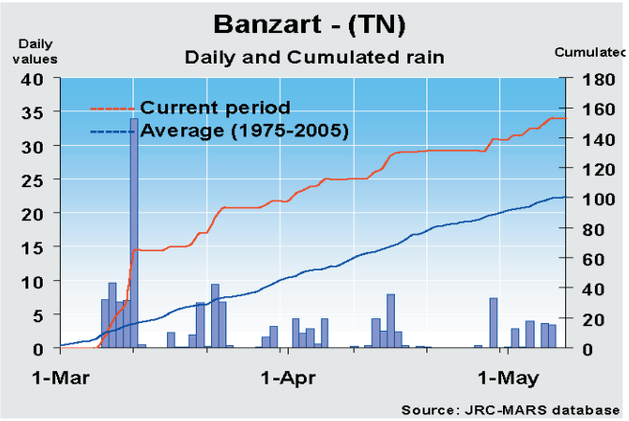
Maghreb countries

Maghreb: the positive trend for winter cereals continues, supported by abundant rain and mild temperatures

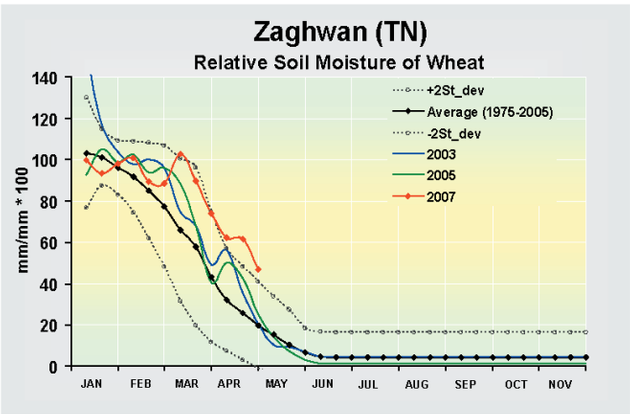
The evolution of the spring climate, both for rain and temperatures, is confirming the positive expectations of late March, supporting the prospect of a good yield and a significant recovery on 2006. Diffuse and abundant precipitations continued throughout April and early May with absolute peaks during the second dekad of the month. This situation is confirmed all along the Mediterranean coastline from north-eastern Morocco up to northern Tunisia. The weather was less favourable in the two extremes of the region; in north-western Morocco and on the east coast of Tunisia. Precipitation here only made up for the deficit cumulated in the previous months. Even in these areas, however, the climatic balance is positive. Temperatures fluctuated around the norm both for maximum and minimum levels without many exceptions. This trend continues to date.

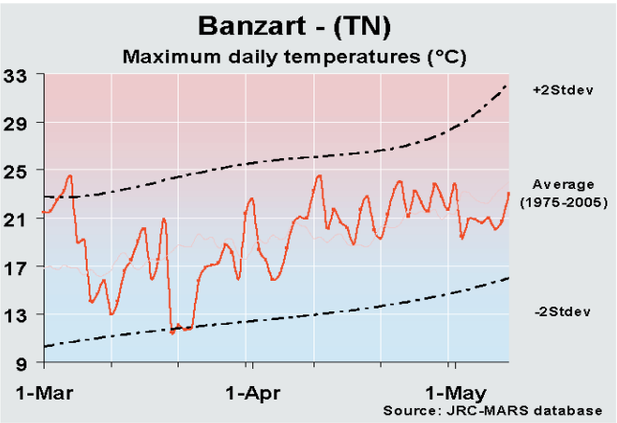


Winter cereals in the east of the Maghreb, in Algeria and Tunisia, whose development had been delayed by the low temperatures in early winter, took full advantage of the combined effect of temperature and available soil moisture during the grain-filling phases. If no major diseases or lodging problems occur, the expected outcome of the production season is positive. In western Morocco, conditions are more on average levels and this is also reflected in the expected yield of winter cereals.

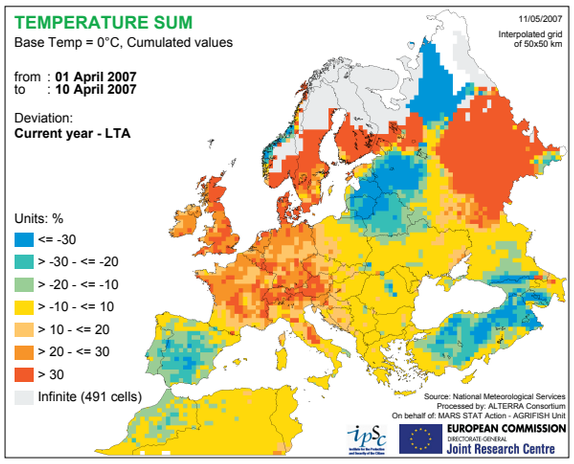


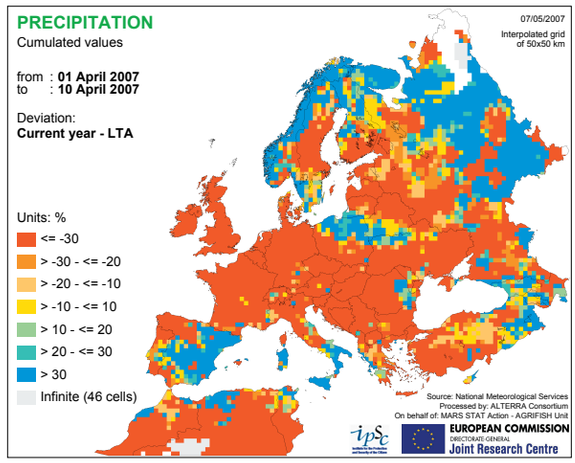
Wheat in Morocco is expected to yield 1.5 t/ha, + 7 % over the five years. In Algeria, the same crop should yield 1.27 t/ha and 1.72 t/ha in Tunisia; here too, the increment is around 5 % on the five-year average. Expectations are the same for barley. In the three countries, the recovery on the 2006 yield is significant and ranging from + 20 % in Tunisia to over + 40 % in Morocco and Algeria.

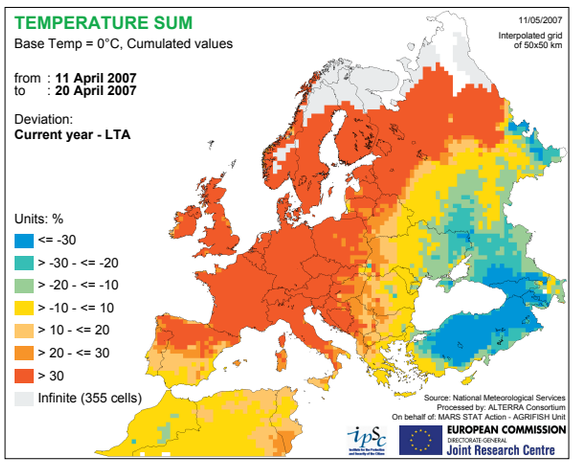


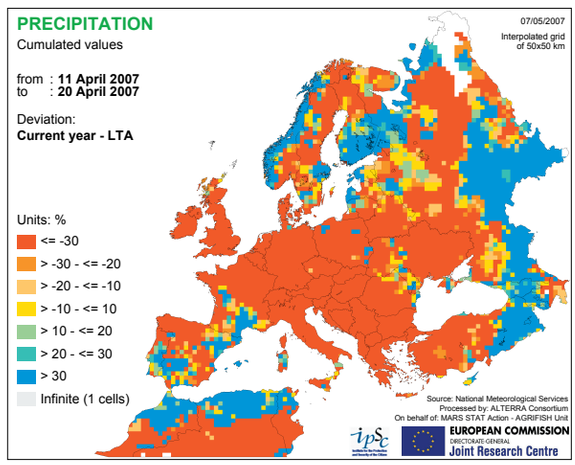


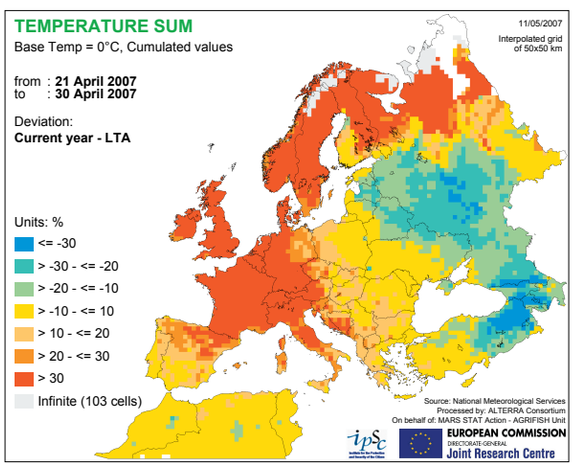
3. Temperature and precipitation in April-May 2007

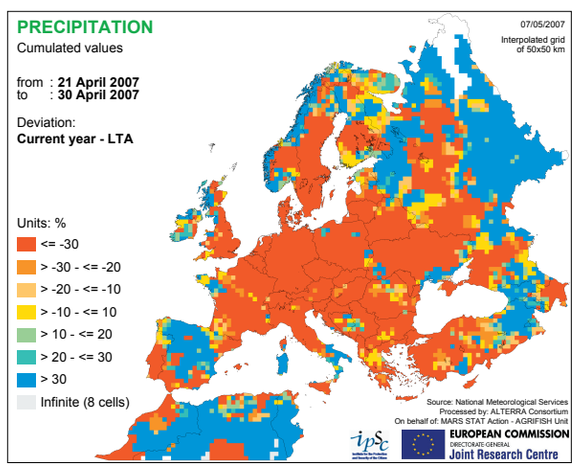


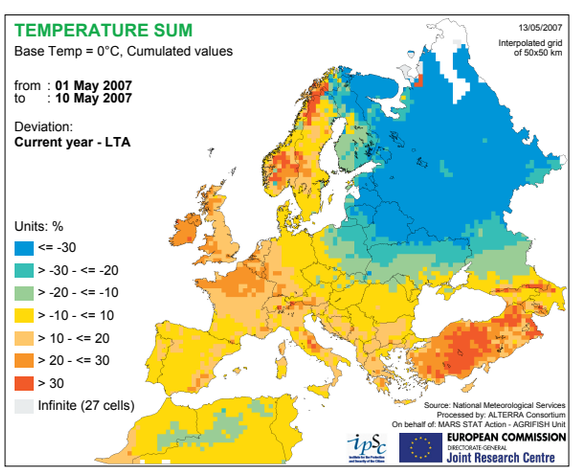


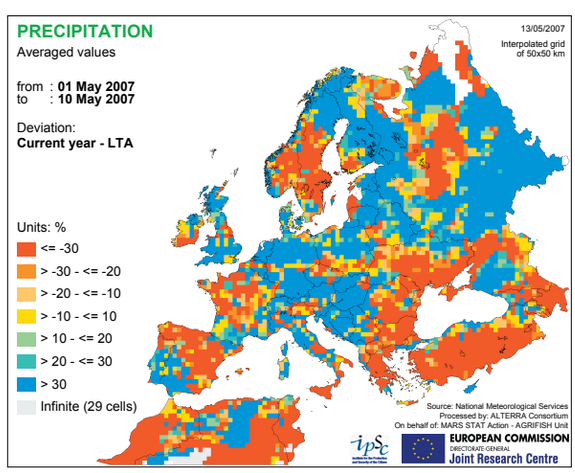




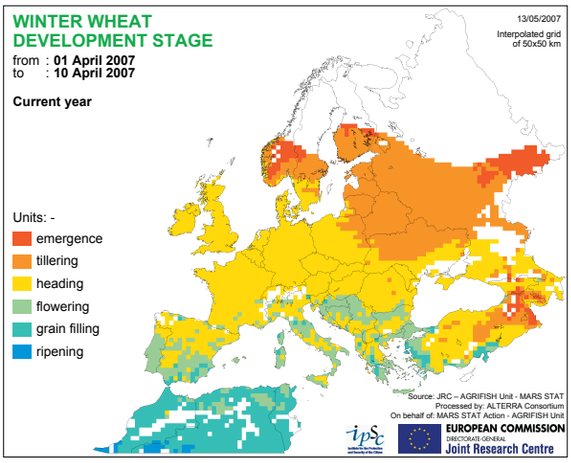


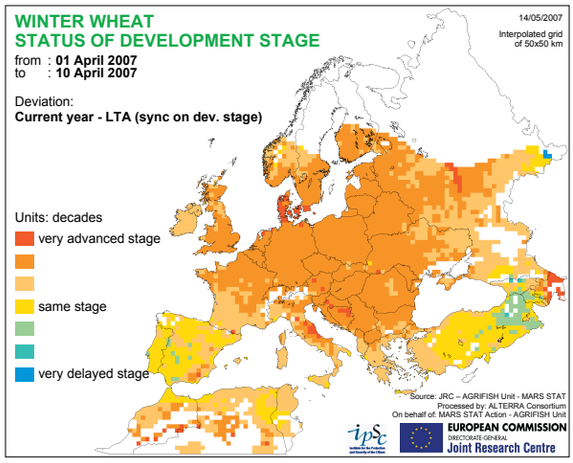


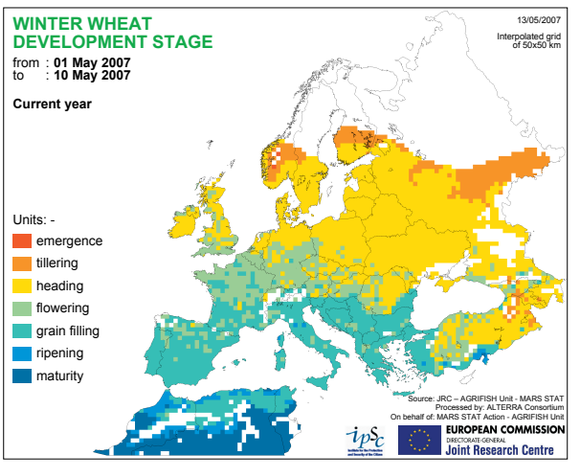


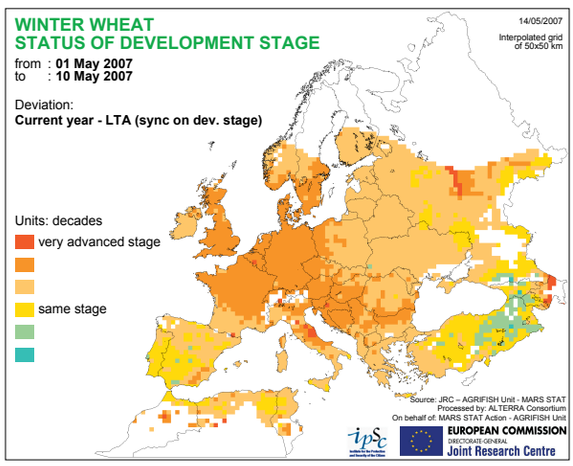


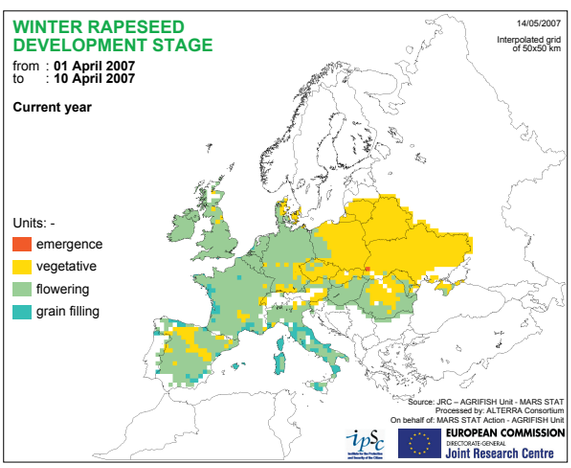
4. Crops - Development stage

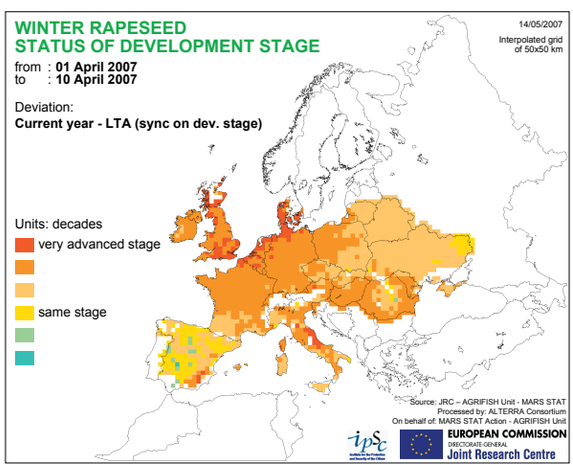


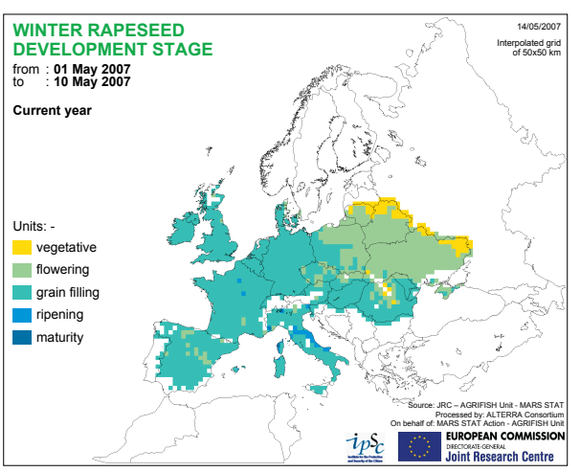


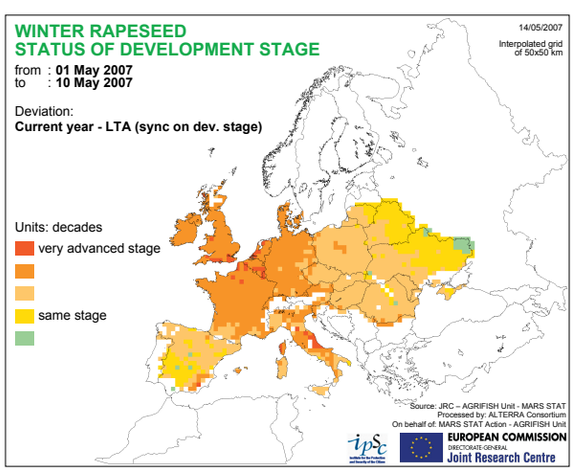




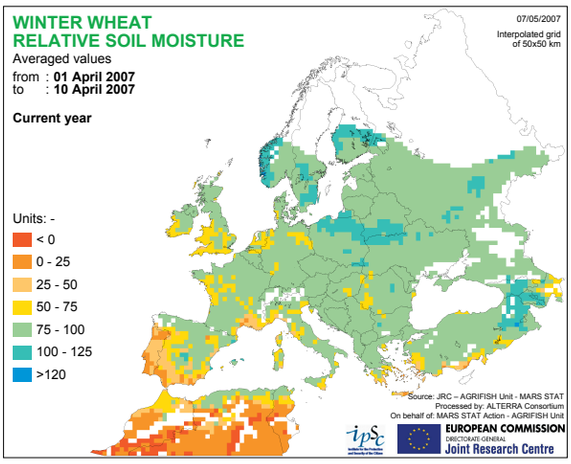


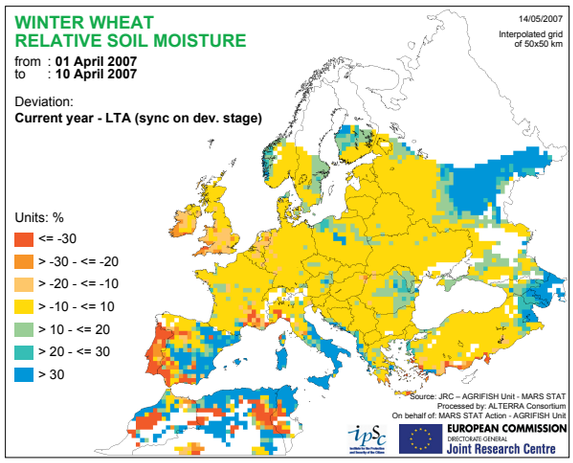


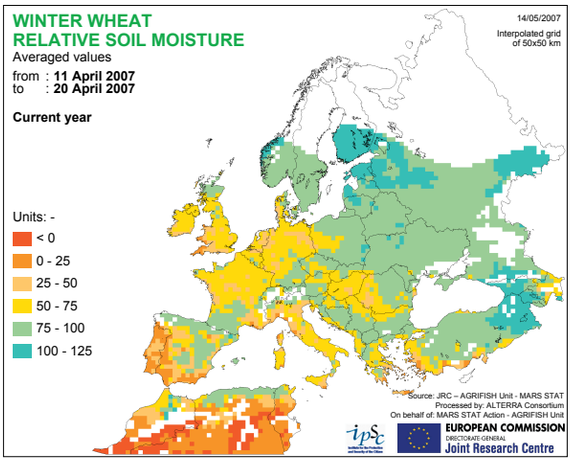


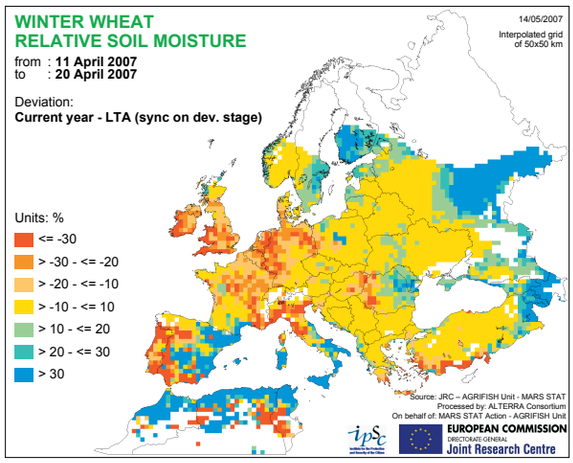


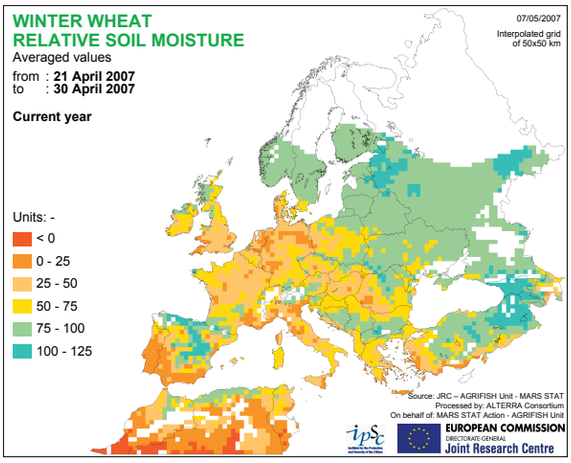
5. Winter Wheat - Relative soil moisture

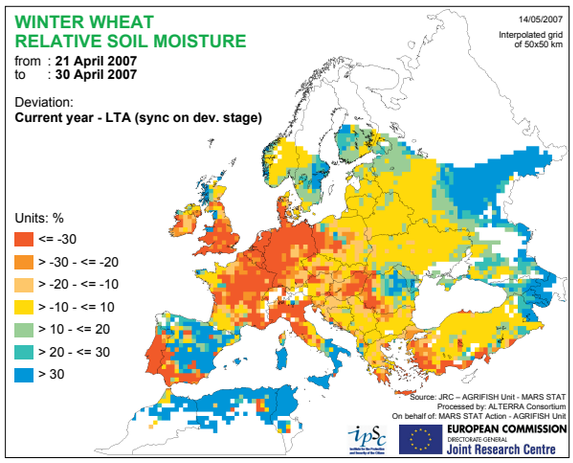


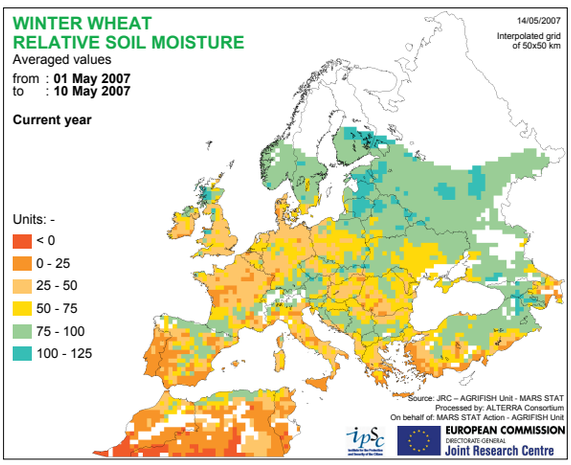


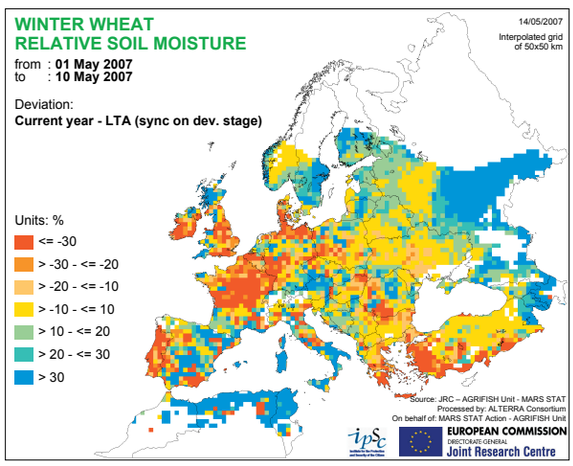




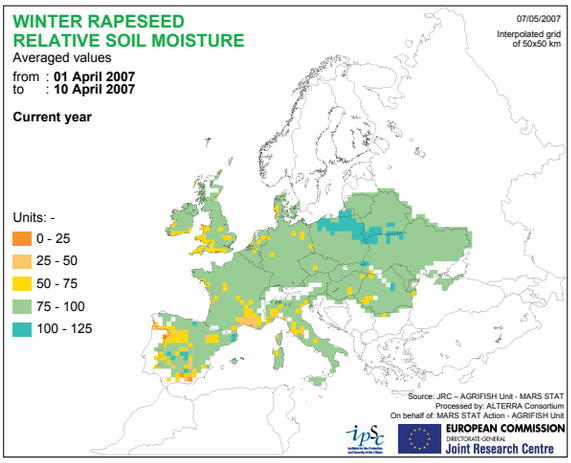


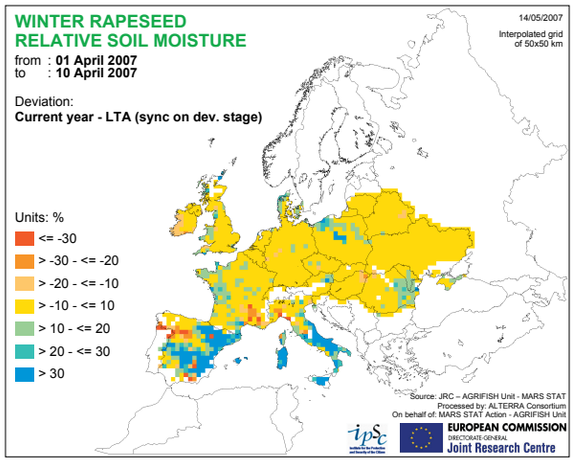


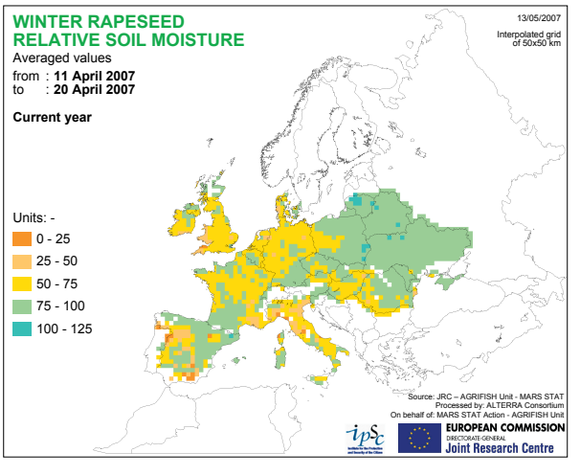


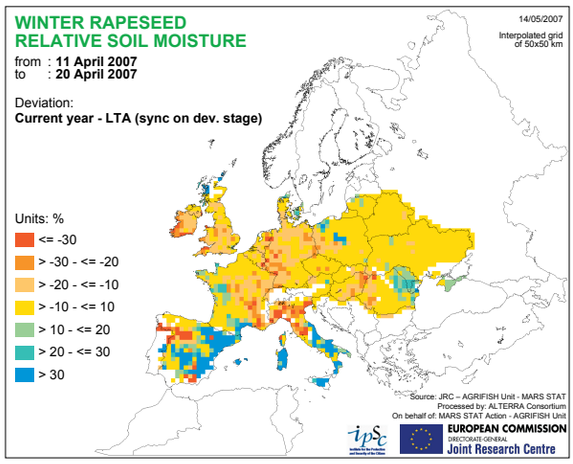


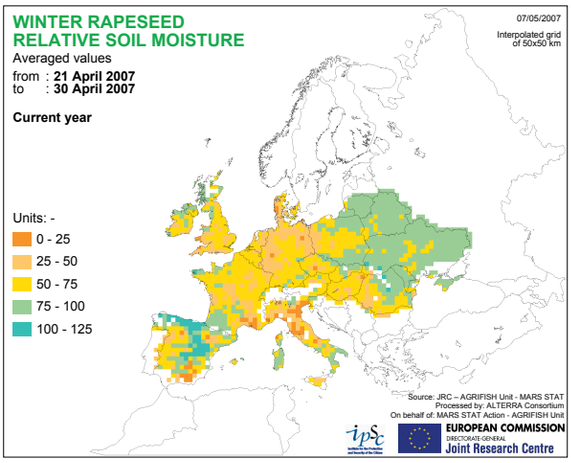
6 . Winter Rapeseed - Relative soil moisture

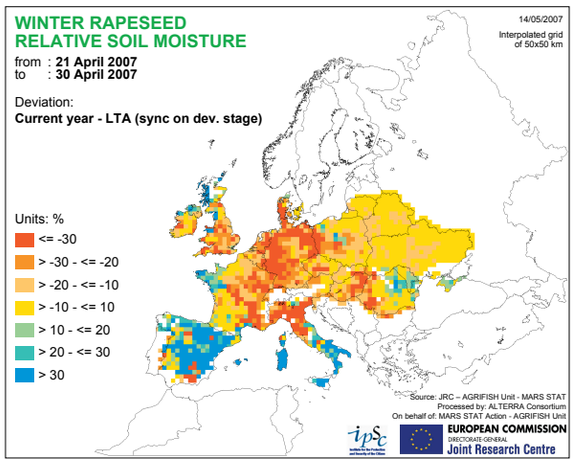


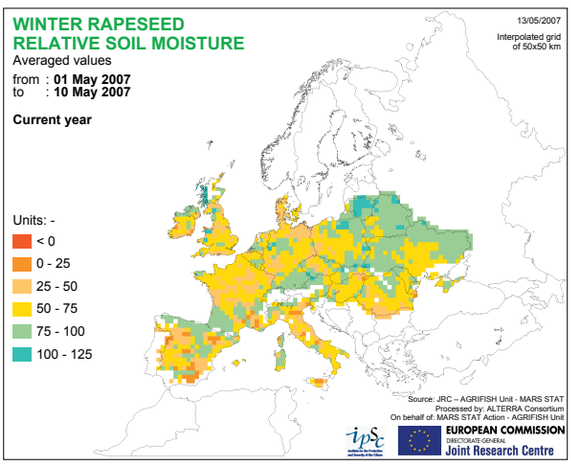


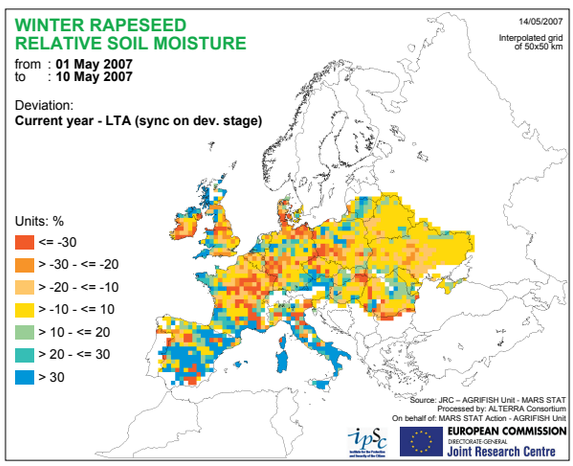




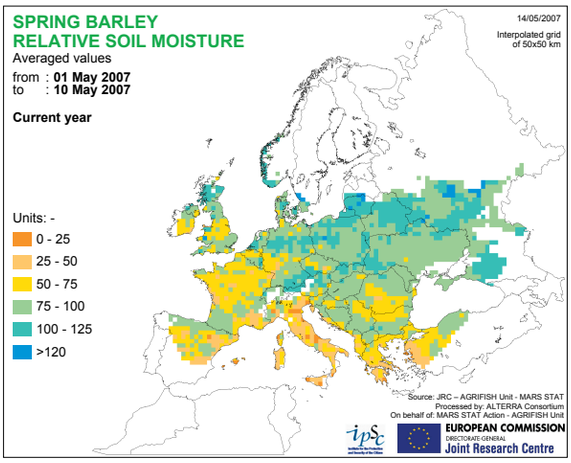


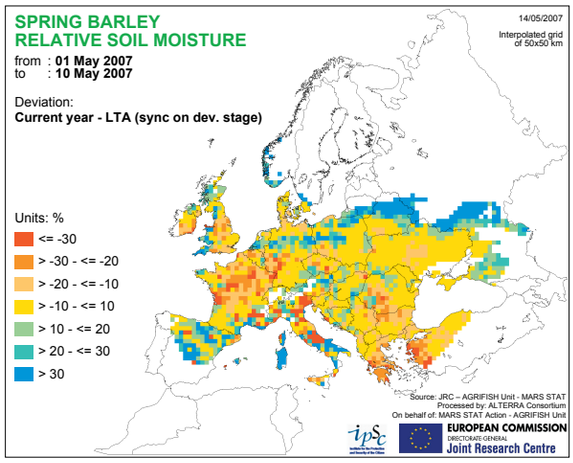


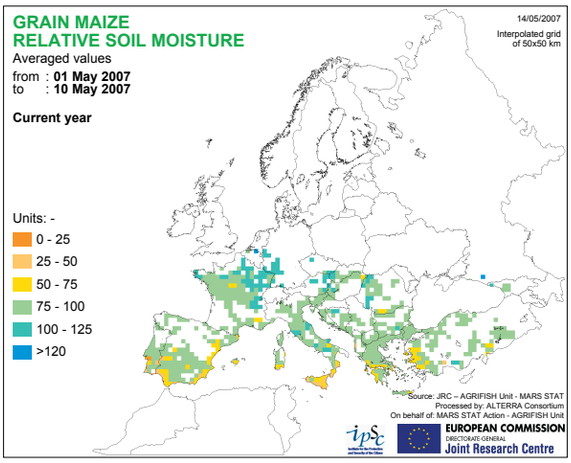


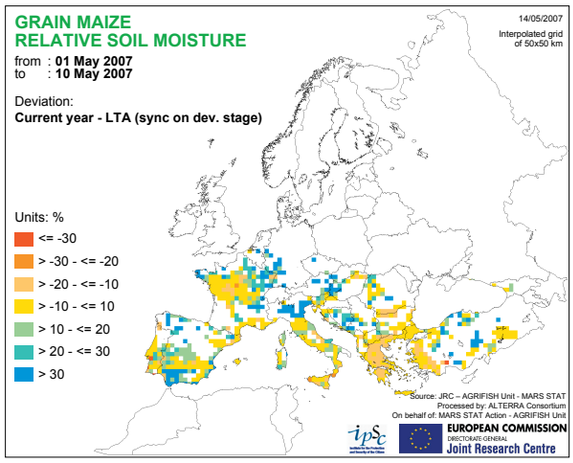


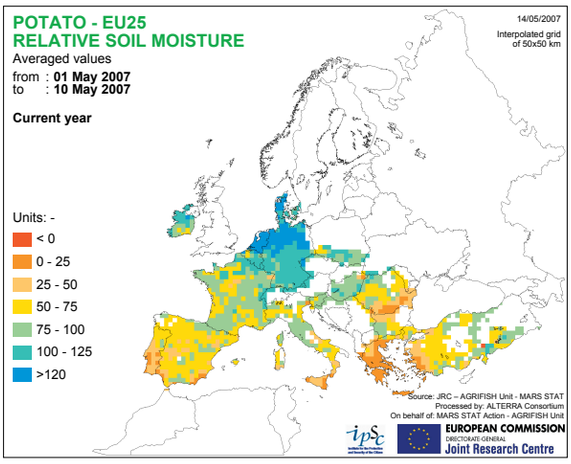
7. Crops - Relative soil moisture

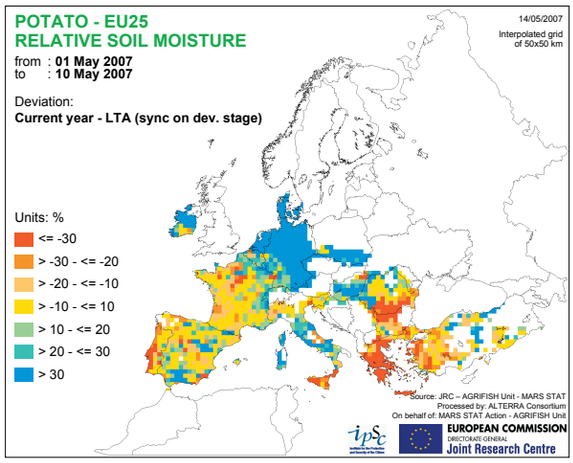


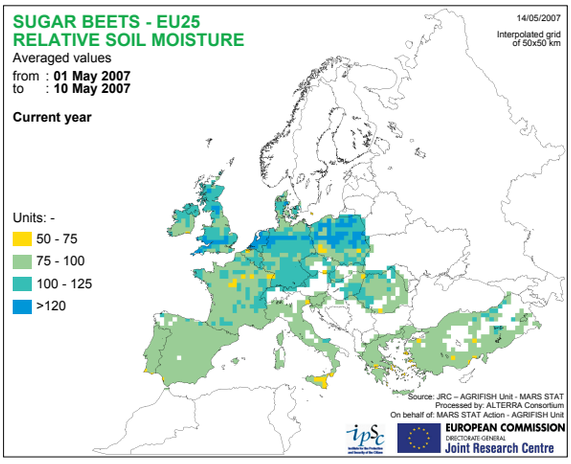


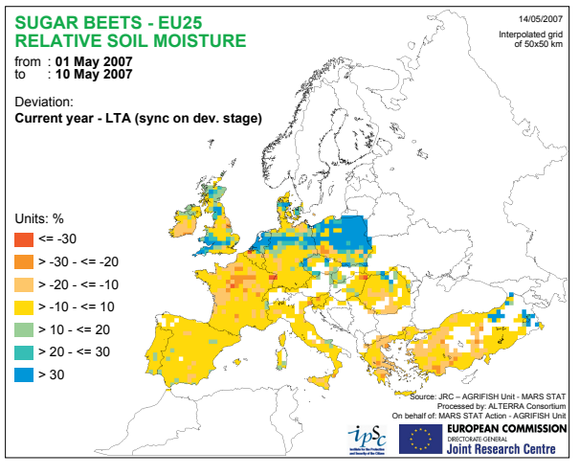






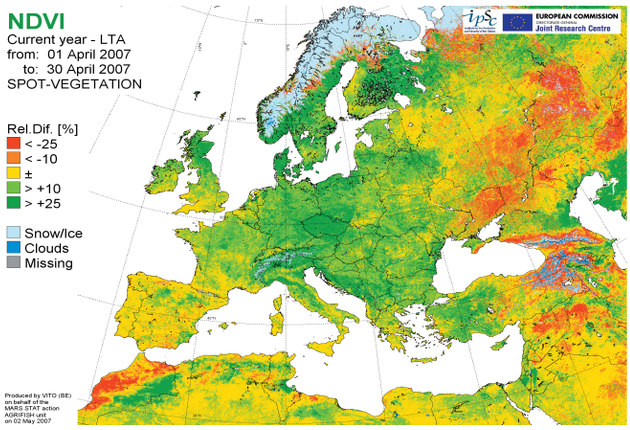


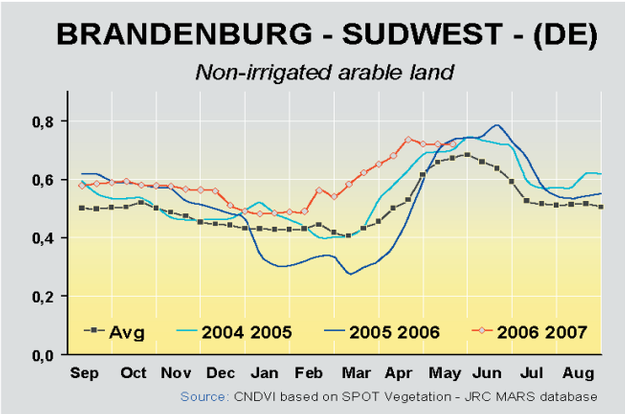




7. SPOT Vegetation satellite anaysis

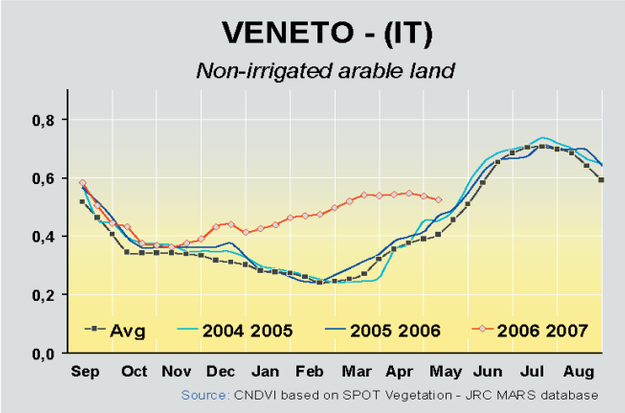
Biomass accumulation still high, but worrying profile development for central EU

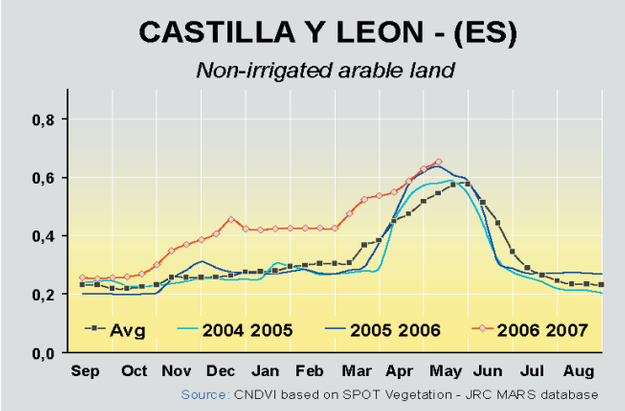


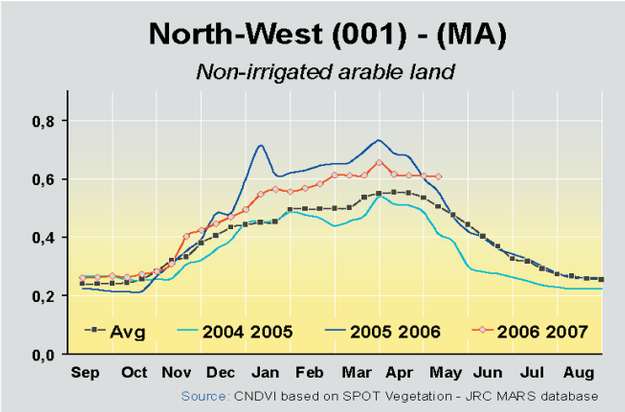


The NDVI map compares the current values of April with the long-term average values of the same month. Low values can be seen for inland Morocco, which experienced a less favourable season. Throughout Europe, NDVI values are well above the average due to the early and vivid start of the season because of the extremely mild temperatures.

The profiles, however, show a more diverse picture throughout Europe. Starting with a profile from Germany which experienced high temperatures and hardly any rain throughout April, a drop of NDVI values can be seen for the last dekad of April and the first dekad of May. The season for Brandenburg started in advance with a good biomass accumulation, but the lack of rain in combination with the light soils hampered the biomass accumulation within the last two dekads of April. The profile of Veneto in Italy also shows a hampered start of the vegetation boost, even if the values are high above the average, but throughout April the biomass accumulation almost stagnated. Very similar profiles can be found for Lombardia and Piemonte, whereas central and southern Italy show favourable NDVI profiles. For Castilla y Leon in Spain, biomass accumulation continued to be favourable indicating possible good yield expectations with NDVI values above the long-term average. This is fairly representative for the whole of Spain. Moving to Morocco, where the season is almost finished, two types of profile can be found. For the coastal regions (North-West) which experienced favourable conditions, the profile is well above average. A profile below average for the inland part of Tensift can be found. Here, conditions were less favourable throughout the season, which is reflected in the NDVI profile. The actual vegetation boost remained rudimentary.







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