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MARS Bulletin – November, December 2005, 10 January 2006

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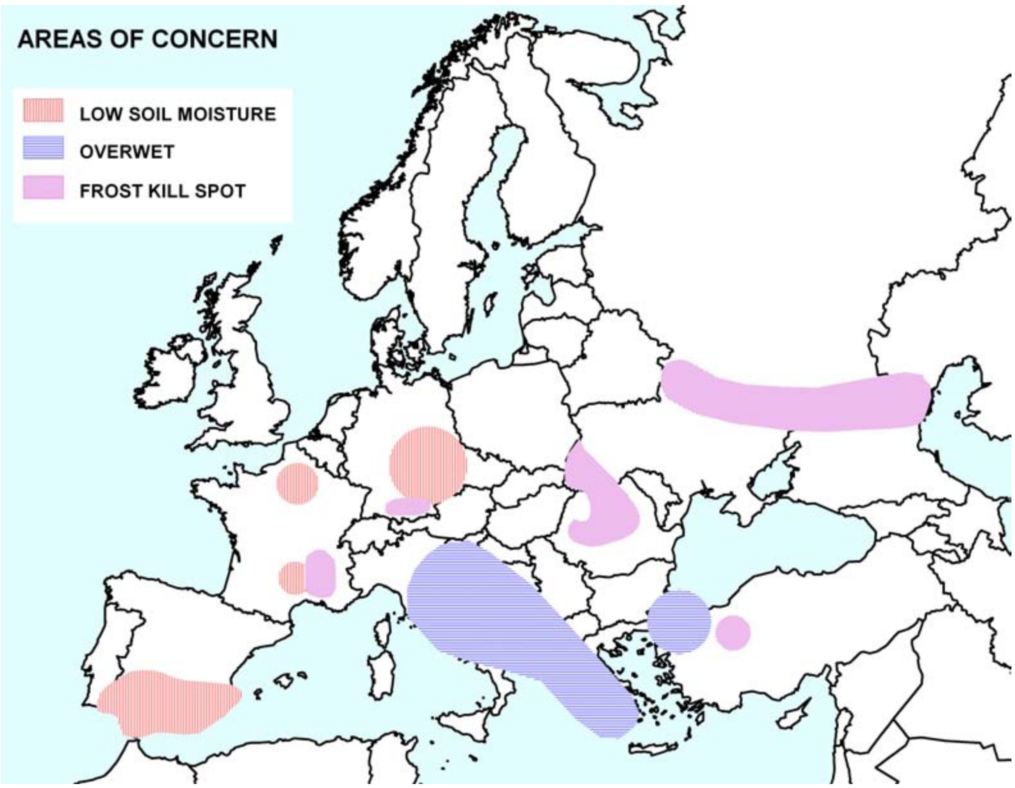
The Mid-January Bulletin makes a synthesis of the major issues pertaining to Winter crop sowing conditions, water reserves status and risks of frost impacts

NO IMPORTANT FROST KILL RISK
LOW SOIL MOISTURE IN CENTRAL EU and SPAIN
OVERWET IN ADRIATIC COUNTRIES



Contents

1. Agrometeorological overview

Relatively warmer in eastern EU, Eastern Countries (especially Black Sea areas) and Russia; whilst colder in France, southern England, Iberian peninsula and Maghreb. Limited frost risk conditions. Scarce rainfall in west EU while abundant in eastern EU. More severe drought in western Spain, southern France and north-western Italy.

1.1 TEMPERATURES

A quite mild first part of the sowing campaign, favoured a rapid germination of the new winter cereals but in the meanwhile exposed the new plants to a risk of frost damage (due to the lack of the "hardening" process). Fortunately in **November**, all over EU, the temperatures progressively decreased toward more normal values: in the second half of November in the majority of EU territories some frost events were recorded with even some intense events (-7°/-8°C) but always within the seasonal range of variation and in general with sufficient snow cover protection: only in some districts in Czech Republic, Slovakia and Hungary some frost impacts on winter crops were possible. In **December** a significant change in the general circulation occurred and colder than normal conditions were present mainly in eastern Spain, France and north-western Italy; while eastern EU experienced still relatively milder temperatures. In eastern Germany (Brandenburg), minimum temperatures 5-6°C above the average were also recorded. In the last part of the month, again a significant change happened with an Artic air intrusion and drastic temperature drops were recorded and frost damages probably occurred in northern and southern France (Picardie, Champagne-Ardenne, Midi-Pyrenees), in central Spain (Aragon, Castilla-la Mancha, Castilla y Leon) and central Germany (Mittelfranken).
In **January**, return to close to normal values, even if still slightly colder than seasonal conditions were recorded in Benelux, north-east France and Maghreb.

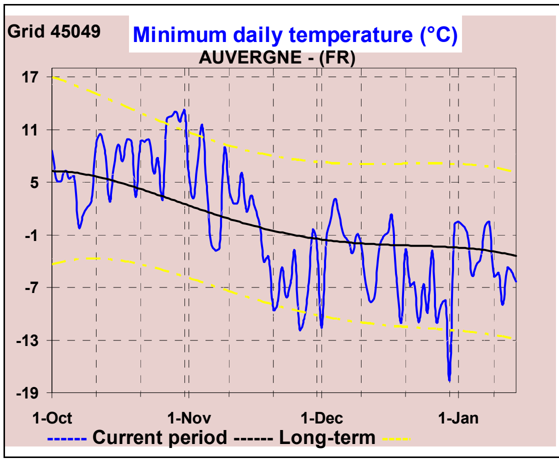
1.2 RAINFALL AND CLIMATIC WATER BALANCE: very low precipitation over central EU and Spain; over wet in Adriatic countries

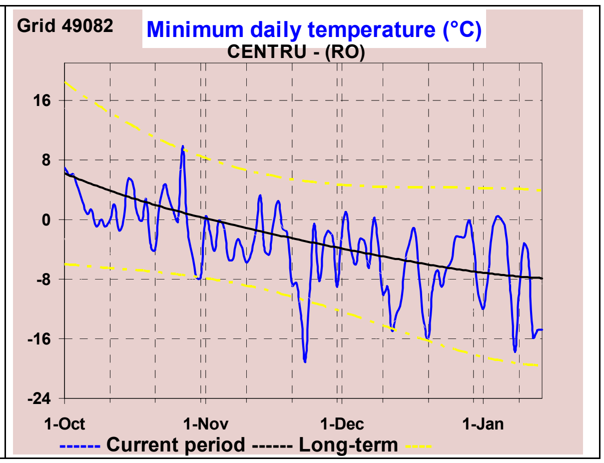
As a whole, the most relevant agrometeorological phenomenon was the reduced rainfall recorded in central EU (North-eastern and central-southern France, Benelux, western Germany, northern Italy, western Czech) in western and southern Spain and Portugal. In particular, in Portugal (Norte, Centro), Spain (Galicia, Andalucia, Extremadura), France (Lorraine), Belgium (Namur, Brabant Wallon, Vlaams Brabant) and Luxembourg deficit values around 80-100 mm were recorded. Also south-east England (Essex) experienced a significant lack of rain (around 43% reduction, equivalent to 60 mm). Anyway, all the areas received enough water to compensate the modest crop water requirements and everywhere the climatic water balance presented positive values: except in some areas in Italy (Lombardia, Emilia Romagna and Sicily) and in central and south Spain (Castilla La Mancha, Castilla y Leon, Andalucia, Murcia). Thus, due to the reduced soil water content, future rainfall will be necessary to keep the crop yields at a potential level.
Opposite conditions occurred in the band between Algeria and Poland, Balkans and in particular in central and southern Italy and Greece where persistent (more then 25 rainy-days) and abundant rainfall (350-450 mm, +80-110% compared to LTA) were recorded. Over these areas the rainfall was particularly concentrated between November and December and again between the two years. Soil over welling conditions probably occurred with significant losses of nitrogen due to leaching effects.
Also, some very intense rainy events (more than 80 mm/day) occurred in northern and central Italy (197 mm recorded the 2nd of December), Sicily, south-western France, Slovenia, Peloponnesus, south-western Turkey.

1.3 FROSTKILL RISK: NO MAJOR RISK DETECTED FOR WHEAT CROPS – LOCAL LEAF AREA DAMAGES

For the period **1st October 2005 -14th January 2006**, the analysis of the co-incidence of

lower temperatures with poor snow layer shows an increased frost risk as compared to the previous two years for **eastern Ukraine** and **limited areas in Romania, southern Germany, south-eastern France and northern Spain**.
Till now the simulated direct frost damages on plant populations of winter wheat are not significant for the whole European area. Critical temperatures (depending on hardening index) for crown level of wheat crops (based on hardening index from 08-Jan-2006) are generally good. Critical temperatures are at optimum level for Russia, Baltic States, Belarus and northern Ukraine. Crops from southern part of Ukraine were at a moderate degree of hardening and in Crimea the critical temperature of -13°C was not reached.
The level of hardening index for northern half of Europe varied from good to acceptable. In the southern half of Europe the value of hardening index was as usually lower and a certain degree of risk for future frost damages may be considered for Balkans.
The combinations of low temperatures, poor snow layers and low hardening index resulted in reduction of leaf area index in large regions of Russia and in a smaller extent in north-eastern Ukraine and isolated areas from Romania (the highest probability for frost damages for this area occurred in the second decade of December when the minimum temperature dropped below -15°C and the snow layer was quite thin).
Minor damages of foliar apparatus were foreseen for Turkey and limited areas of Poland, Austria, Germany and in a larger extent for south-eastern France (minimum temperature dropped bellow -16°C and the snow cover was insufficient to buffer the shock completely). These minor damages of leaves do not yet represent a factor for yield reduction of winter wheat but may increase the vulnerability to other winter or spring stress factors. For barley the leaf area reduction was expected to be higher but even for this crop no major damages were detected on large areas





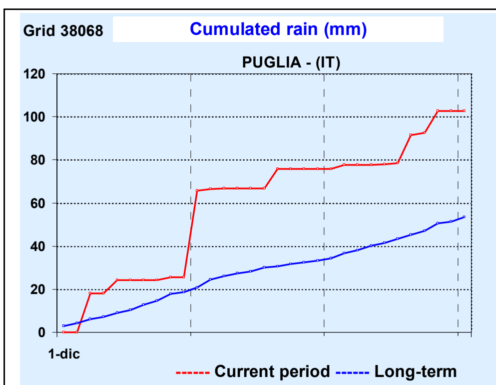
2. Synthesis of the 2005/06 sowing campaign

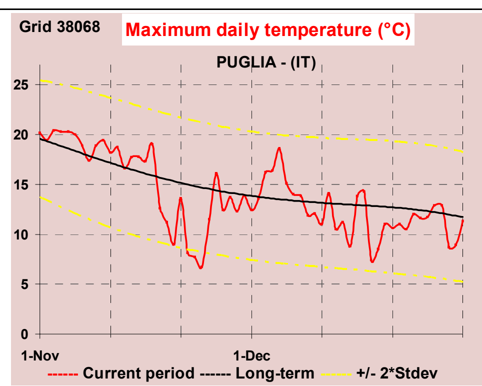
This text makes an update and recalls the previous text published in Bulletin n°6 Vol 13th

EU-25

Winter wheat: favourable conditions for sowings in most of the EU. Below average temperatures and rainfall in most of the areas did not affect emergence. Unfavourable conditions in the Mediterranean regions delayed sowings.

Early sowings were carried out under good conditions in the whole of Europe, except in northern – central Italy (above all in the Po valley), where machine accessibility or mobility have been possibly threatened by the wet soil.
During the canonical period of sowing, good conditions were experienced everywhere. Only Portugal, north – eastern Spain (Galicia, Castilla y Leon, Asturias, Cataluna) and southern coasts of France registered a series of consecutive rainy days (more than 100 mm reached in some cases) which have probably delayed the sowings. Wet conditions were also recorded in the Highlands (UK).
In some regions (south – eastern Sweden, Denmark, Austria, part of the Balkans), dry conditions characterized all the sowing periods, from the period where usually early sowings are carried out to that suitable for late ones. Conversely, abundant rains and low temperatures could have unfavourably affected sowing in the Mediterranean regions and especially in southern and central Italy. Rainfall remained intense throughout November, with increases ranging between 20% and 30% on the long term averages. There was however a brief dry spell in mid December which, most probably, allowed the completion of sowings in those areas where this practice had been hampered by exceptional rain in early autumn. In some cases persisting unfavourable conditions could have delayed the last sowings to January.
Favourable thermal conditions allowed good germination and emergence phases.
The situation worsened later into November and even more notably in December, reporting, at the same time, low temperatures and scarce rainfall levels. Cumulated rainfall values in this period, were over 30% below the long term average in the south-western portions of the EU, and in particular in France and Spain. Temperatures also reported below average values, but the combined effect of these conditions did not significantly affect crops in the early stages of development as already in vernalisation.
Temperatures remained in any case at fairly mild levels in the central Mediterranean regions and were, in most cases, not limiting emergence.





Winter barley: favourable conditions for sowing followed by normal emergence in the north and central EU. Problems for late sowings and emergence in some of southern Europe regions especially central Italy.

Favourable climatic conditions occurred for winter barley sowings in the main part of Europe. Dry sowings conditions verified in Spain, Portugal, and Poland. Late sowings were hampered in some cases in northern Italy and south – eastern France because of the high soil moisture. Early sowings were hindered by excess water in southern Italy and in the Balkans. The opposite situation (dry conditions) verified for the period usually dedicated to early sowings in northern Italy, Denmark, Belgium, northern Germany, and the Netherlands. In all cases, in these regions in October the possible delays where compensated by temperatures higher than the average leading to good germination and emergence phases.
An excess of rainfall persisted during November and December in southern Italy and these conditions may have hindered and further delayed sowings.
Dry conditions and low temperatures may also have affected emergence from late sowings in Spain, central France and northern Italy; it is however too early to quantify the effects of this climatic evolution on the overall conditions of the crops.

Rapeseed: partially affected by initial dry conditions
The dry conditions which characterized the canonical sowing period in the northern regions of Germany and Poland have possibly affected early sowings in some cases. In these Countries only in the second decade of September, some rainy days led to optimal soil moisture value suitable for optimal sowing/emergence. Similarly late sowings were penalized in Denmark and in the southern part of Sweden because of the dry conditions.

Black Sea Area

Optimal/favourable sowing spells, with some excess of dryness in Ukraine causing non-optimal emergence. The dryness was partly recovered in December.

The dekade before sowing of winter wheat in Ukraine was generally dry (only one to three days with significant rain in eastern and northern areas). The number of days with significant rain during winter wheat sowing dekade was practically zero. The dry period continued about two decades after sowing when the mid October rain ended the drought period which had started in mid August. So, the field preparation and sowing occurred under optimal dry conditions but the soil water available to crops was lower than usual causing a non-uniform emergence especially in southern Ukraine (where the water balance for October was within -30% below long term average).
A similar "dry scenario" occurred for winter barley sowing. Also the sowing of rape seed in Ukraine was performed under dry conditions except in central areas where before and during the sowing dekade some rainfall occurred that may have postponed the field activities a little bit but also increased the soil moisture.
As regards the other Black Sea areas, the decade before sowing of winter wheat was drier than usual (-30%) in northern Romania and western Turkey and wetter in southern Romania, Bulgaria and most of Turkey. A similar situation occurred during the pre-sowing dekade of winter barley except for the fact that the whole of Romania (including northern part) was wetter than usual.
The sowing periods of the winter wheat and barley were generally dry and favourable for this activity except the border area between Romania and Bulgaria close to the Black Sea (up to 50 mm cumulated rain) and north western Turkey (50 to 70 mm). During the decade after canonical sowing of winter cereals some rain events occurred in Turkey (with beneficial effects) and eastern Romania. For Romania and Bulgaria the soil moisture was higher than usual due to excessive rain received from the beginning of the year. During the dekade before sowing of rapeseed some rain occurred in northern Romania (about 40 mm) and the weather was rainy during sowing decade in southern Romania, and central areas of the country received more than 50mm of rain in the dekade after sowing.
In December, the situation recovered over most of Ukraine and western Romania, where rainfall was in excess of the long term average by over 30%. Dry conditions throughout Septem-

ber persisted in Moldova, eastern Romania and Bulgaria. Average temperatures remained on absolute high levels all across the Balkans, in Turkey and eastward to the Caucasian region, reaching, at times, an increase of almost 50% on the long term average.
These can be considered overall favourable conditions for emergence of winter crops, both wheat and barley. The coupling of a wet and warm December, should have favoured the recovery from possible non-uniform [unequal] emergence caused by soil moisture shortages in October and November.

Eastern Countries

RUSSIA: dry conditions for sowing, favourable conditions for emergence of winter crops

The air temperature during October/November was 2-3 degrees higher than in the previous year in all regions. while rain was lower than normal, especially in the central and northern regions of Russia. As a result, soil moisture content during the time of winter crops' sowing was lower than normal and lower than in the previous year. October rains in southern regions have created good conditions for winter crops emergence. Low amount of precipitation in some regions could have caused big delay in sowing campaign while northern most (central Russia), dry conditions could have lead to replacement of winter crops with spring crops.

Average daily temperatures remained significantly above average across Belarus and Russia, in November and December, in some cases exceeding the long term average by over 30%. Conversely, precipitation, which had remained below norm in November, recovered in December. These conditions can be considered overall favourable for winter cereals with early sowings (August-September).

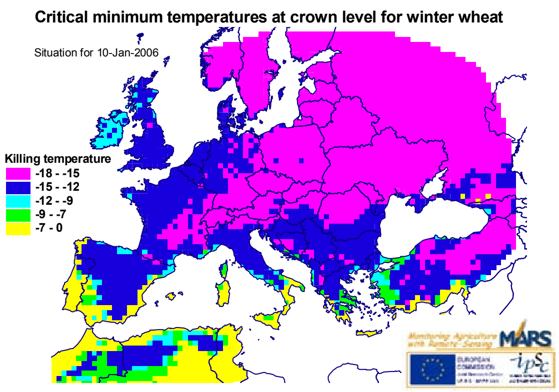
Maghreb

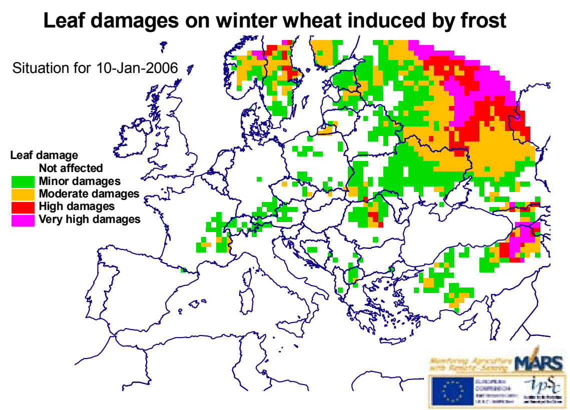
Favourable sowing and germination conditions.

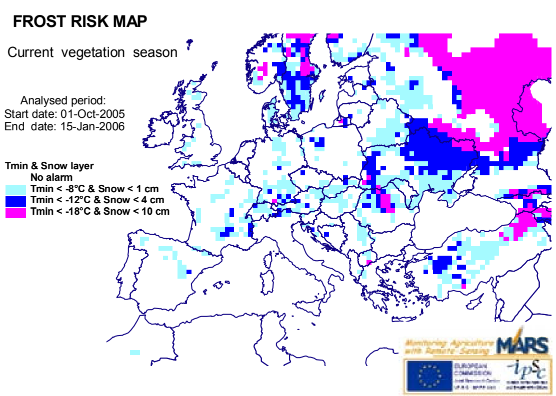
Higher than average rainfall in the Maghreb region, was coupled, in November and December, with mild temperatures. These conditions can be considered as optimal for the sowings which are customary in the area and also for the positive outcome of germination and emergence.

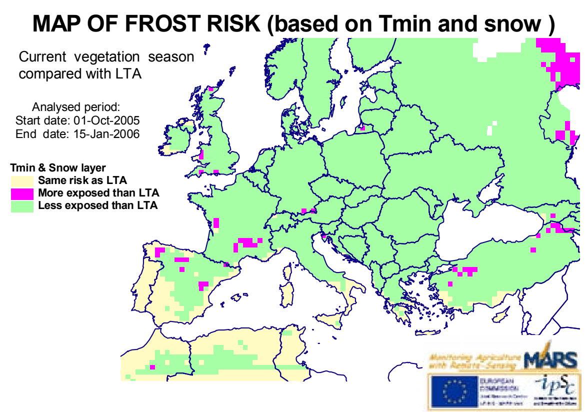
3. MAPS

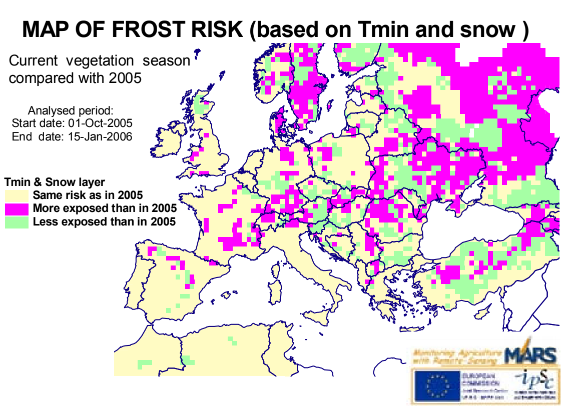
3.1-FROST RISK MAPS

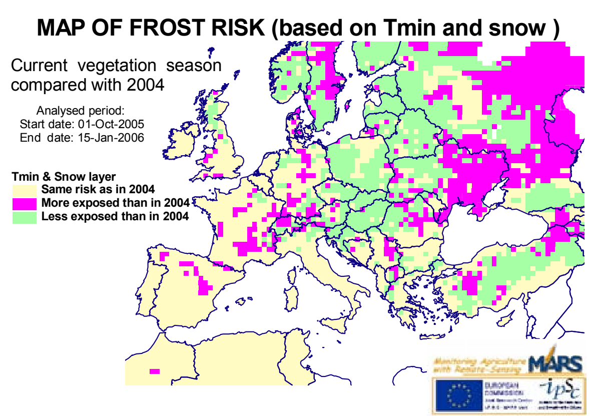






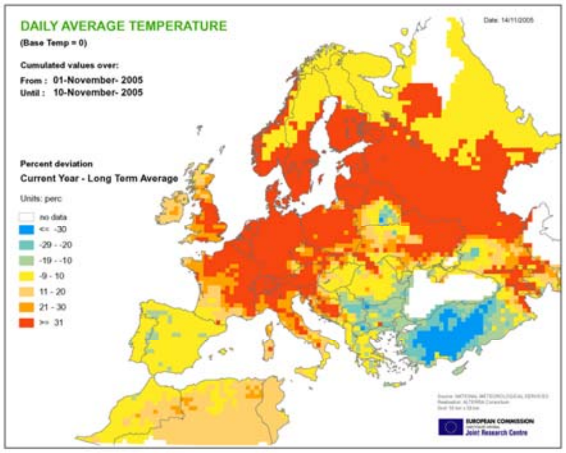


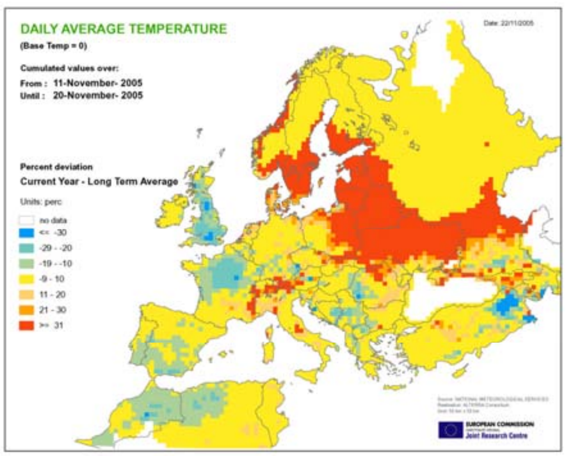


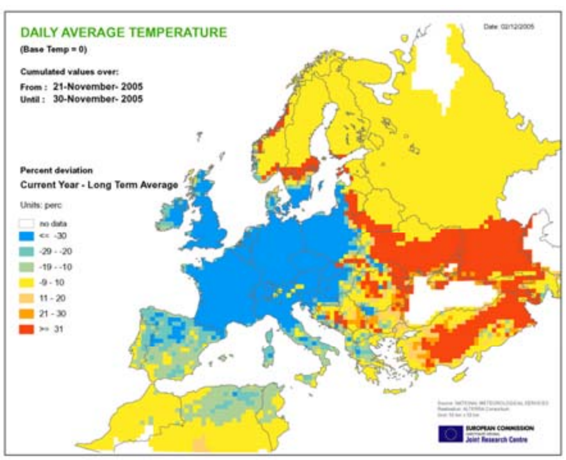


3.2-TEMPERATURE MAPS

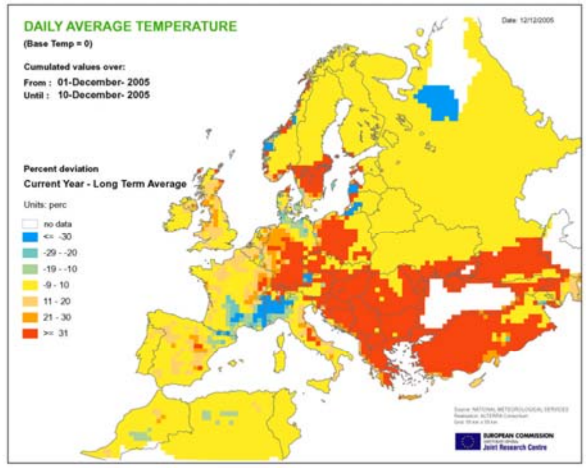
November 2005

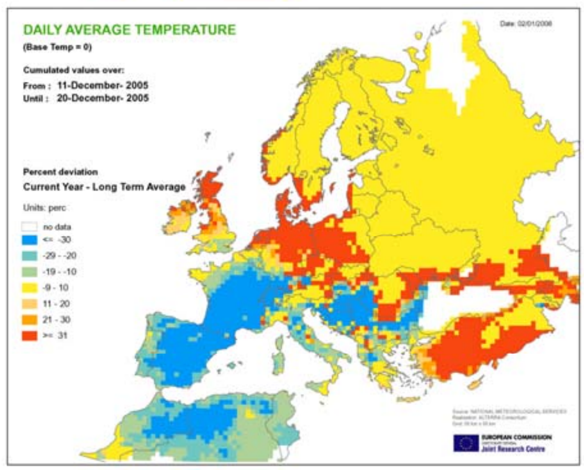


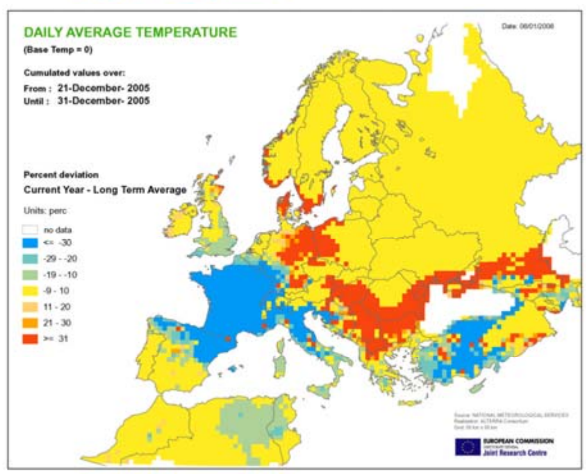




December 2005



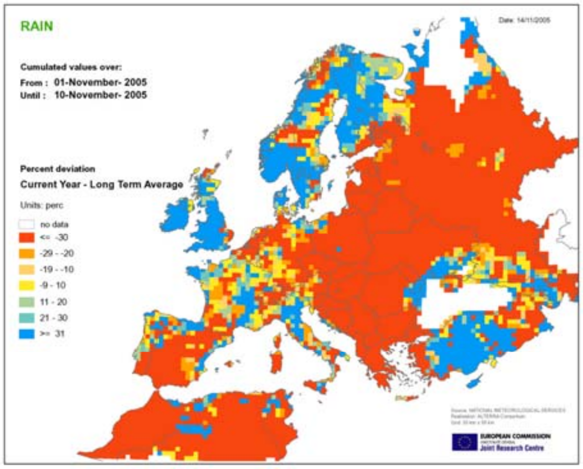


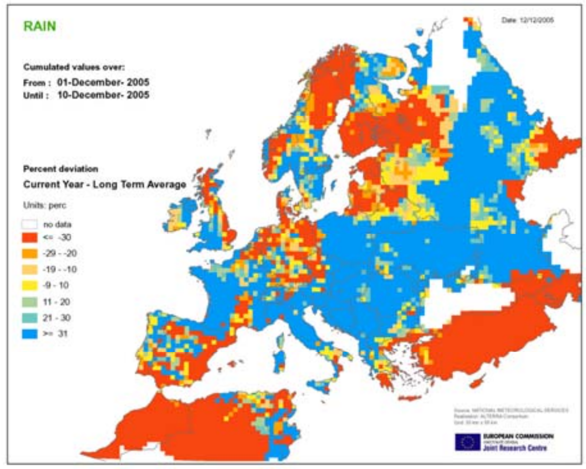


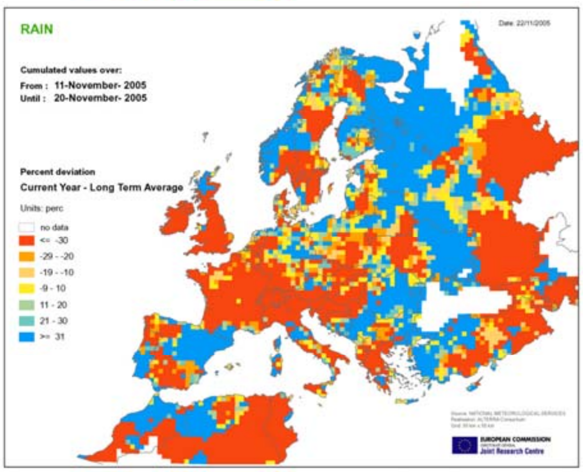
3.3-RAINFALL MAPS

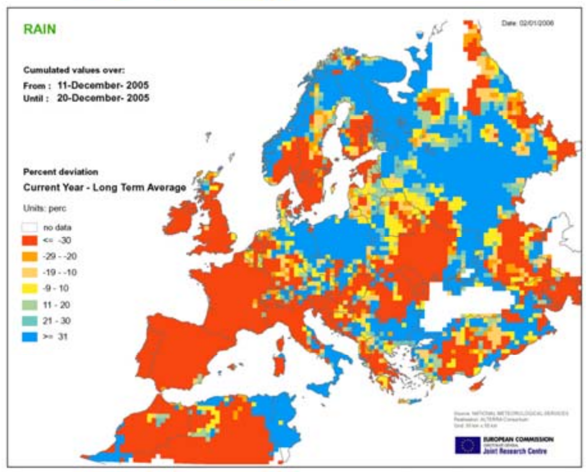
November 2005

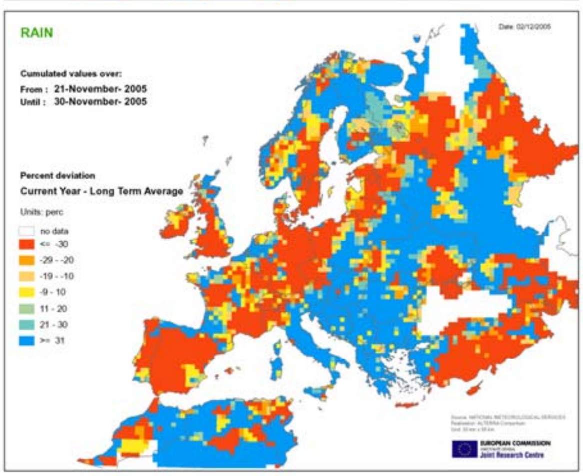
December 2005

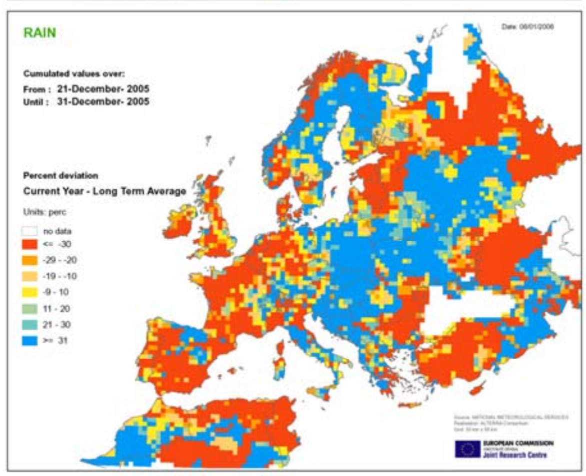






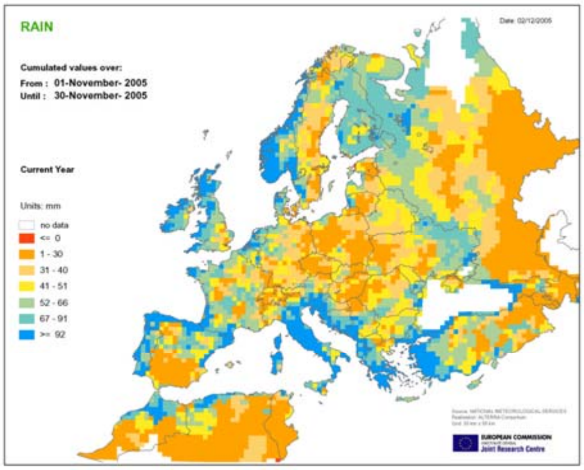


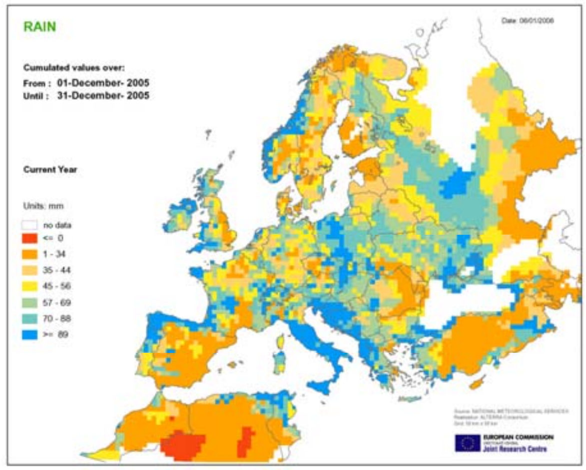


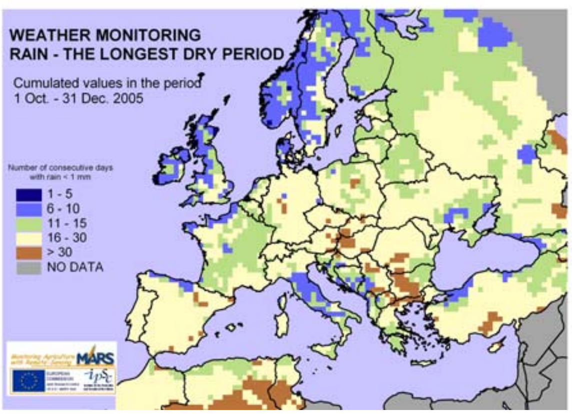


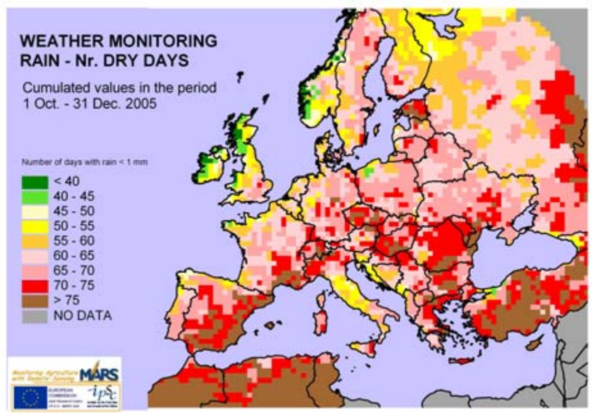
3.4-RAINFALL ANALYSIS MAPS

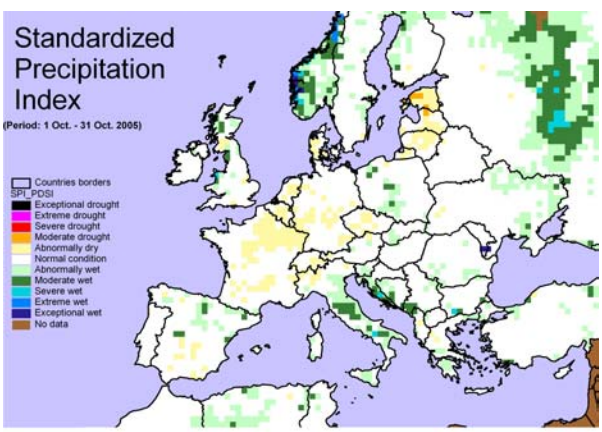
November 2005 **December 2005**

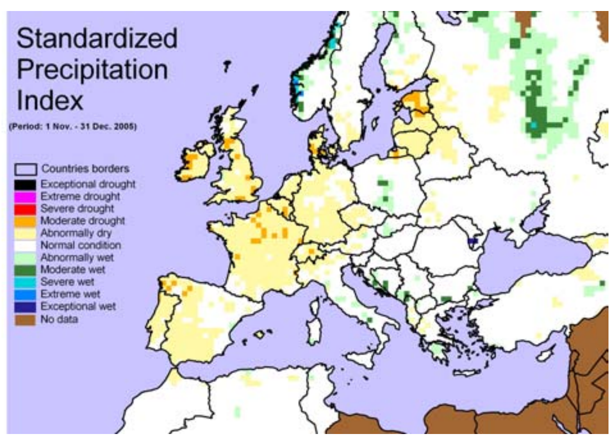




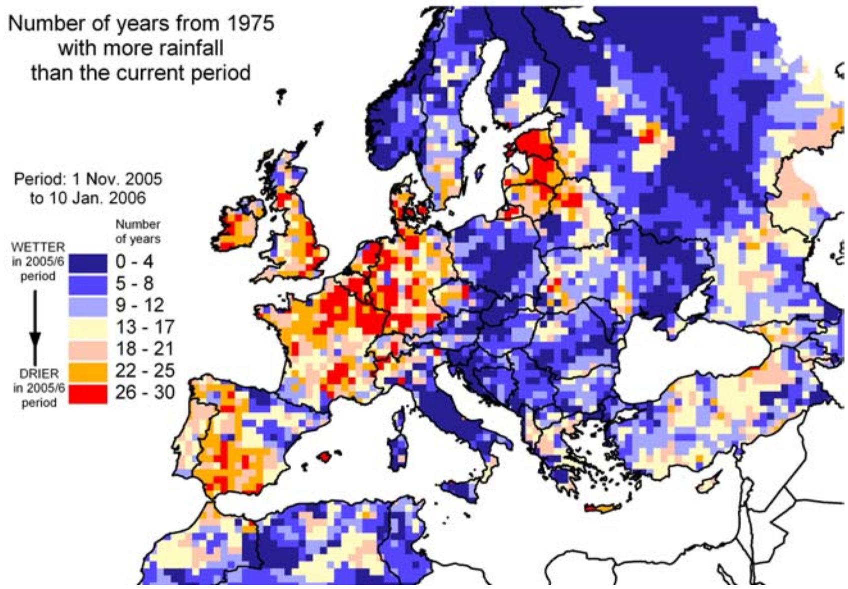






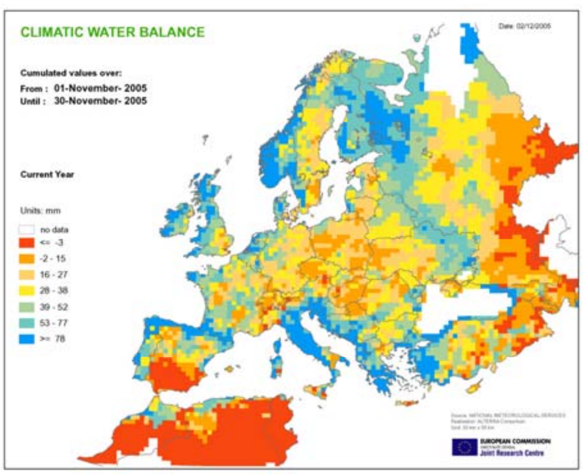


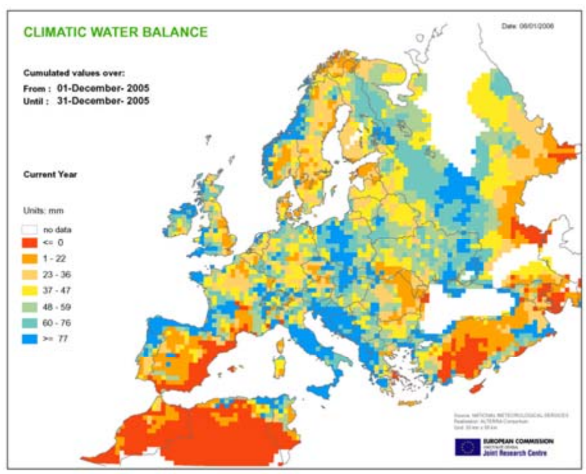
3.4 RAINFALL ANALYSIS MAPS

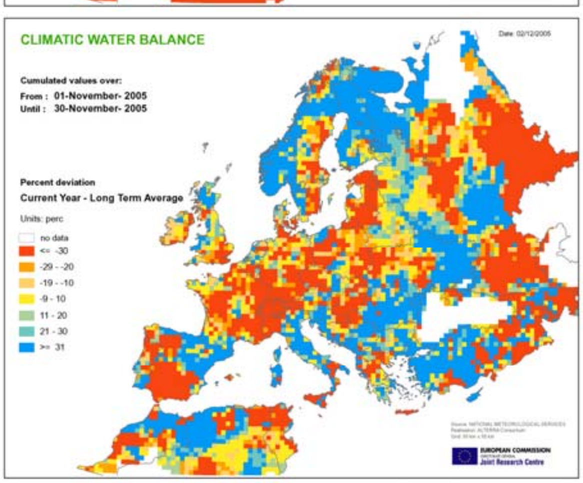


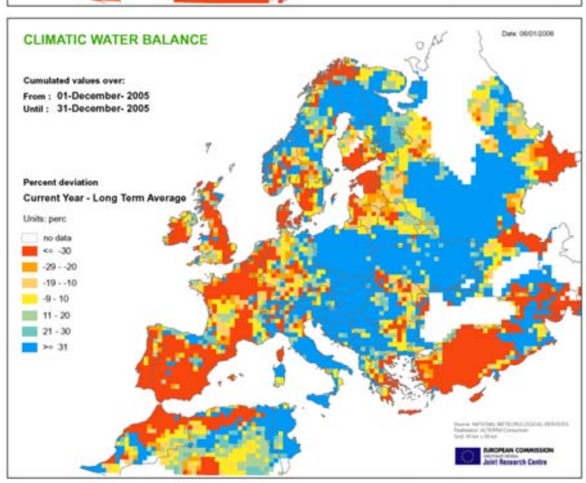
3.5 WATER BALANCE MAPS

November 2005 **December 2005**



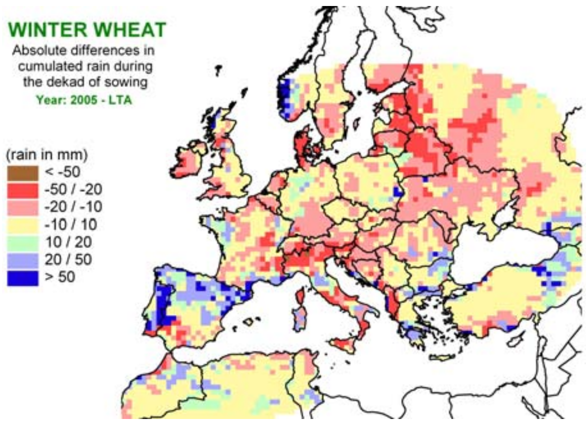


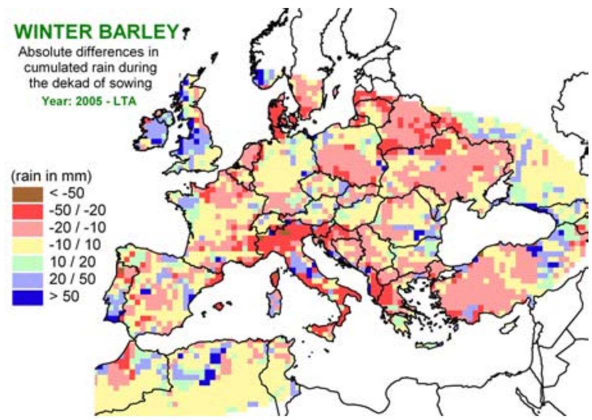


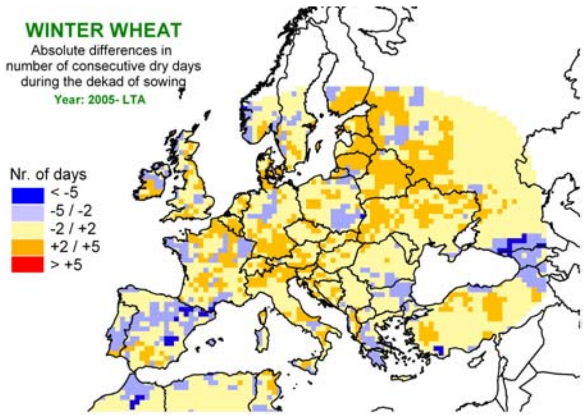


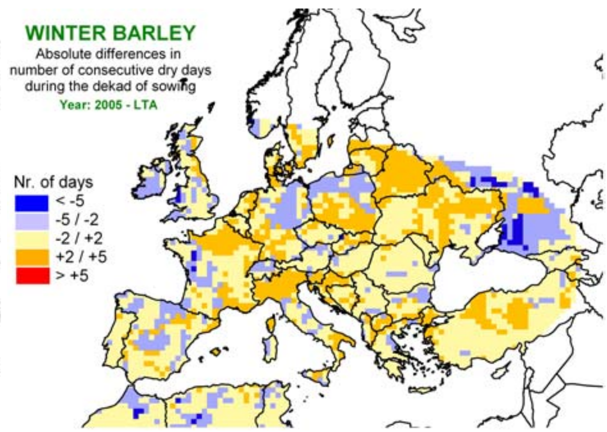
3.6 CROP MAPS

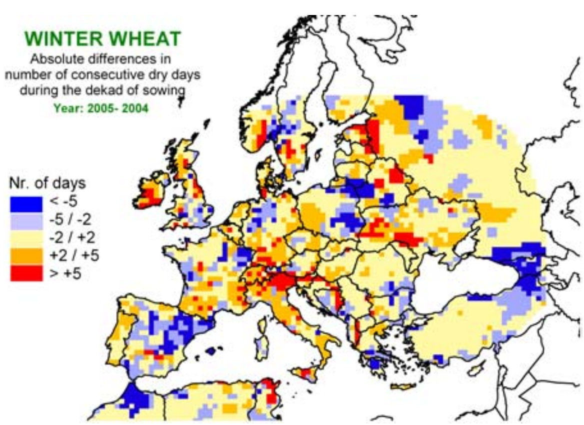
Winter wheat | **Winter barley**

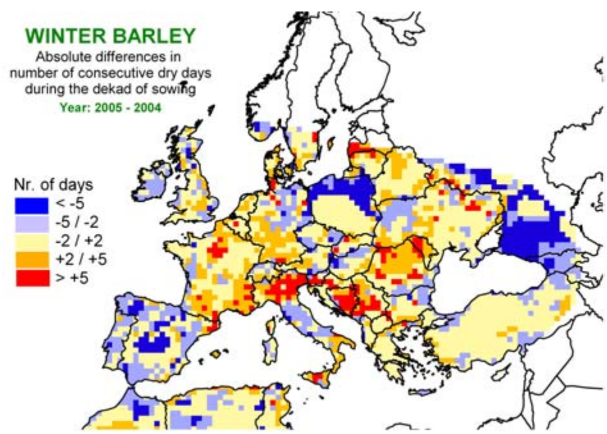












3.6-CROP MAPS

Winter wheat **Winter barley**