European Commission

Period covered: 11 February - 20 March
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Crop Monitoring in Europe

MARS BULLETIN Vol.20 No. 3 (2012)

Drought in Spain and Portugal, difficult start of the season with unfavourable biomass development in eastern France, Germany, Poland, Romania, Bulgaria and Greece

AREAS OF CONCERN

Dry conditions Unfavorable biomass development

Data source: MARS crop yield forecasting system 23.03.2012

Crops	Yield t/ha				
	2011	MARS 2012 forecasts	Avg 5yrs	%12/11	%12/5yrs
TOTAL CEREALS	5,12	**5,10**	4,99	-0,3	+2,3
Total Wheat	5,36	**5,41**	5,31	+0,9	+1,9
soft wheat	5,58	**5,67**	5,57	+1,7	+1,8
durum wheat	3,41	**3,16**	3,18	-7,2	-0,7
Total Barley	4,30	**4,41**	4,36	+2,6	+1,3
spring barley	3,81	**3,88**	3,82	+1,7	+1,4
winter barley	5,06	**5,24**	5,16	+3,6	+1,6
Grain maize	7,50	**7,03**	6,92	-6,3	+1,6
Rye	3,03	**3,28**	3,18	+8,5	+3,4
Triticale	3,90	**3,94**	3,98	+1,0	-1,1
Other cereals	3,00	**3,02**	3,25	+0,4	-7,2
					+0,6
Potato	31,49	**30,52**	29,73	-3,1	+2,7
Sugar beets	70,88	**68,65**	67,64	-3,1	+1,5
Sunflower	1,99	**1,84**	1,79	-7,6	+2,5

Generally milder-than-seasonal conditions prevailed from the beginning of December until the last days of January in most of Europe, followed by an extremely cold period until mid-February, especially in central and eastern Europe. Due to insufficient snow cover and severe frosts, significant winter kill occurred in eastern France, Germany, Poland, the Czech Republic, some areas in Romania, Bulgaria and Ukraine, as simulated by our frost kill model and confirmed by remote sensing observations showing unfavourable biomass development.

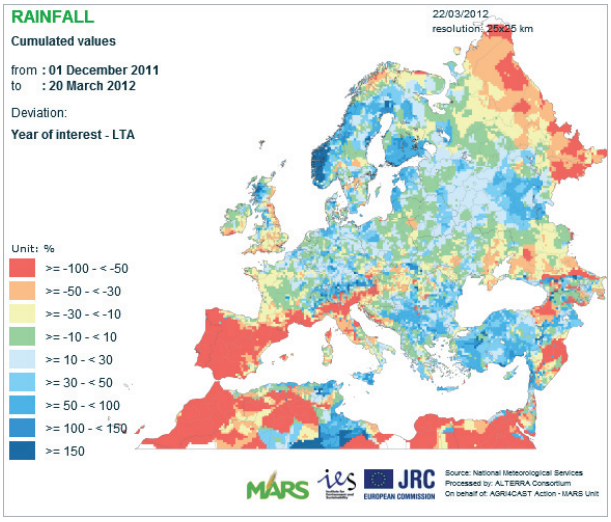
A severe rain shortage has been observed since December in Spain, Portugal and Morocco, with the driest period in our climatological record for southern Spain. Below-average winter precipitation is recorded also in southern France, northern Italy and some areas of England, Austria, Slovenia and Hungary as well as in southern and eastern parts of European Russia.

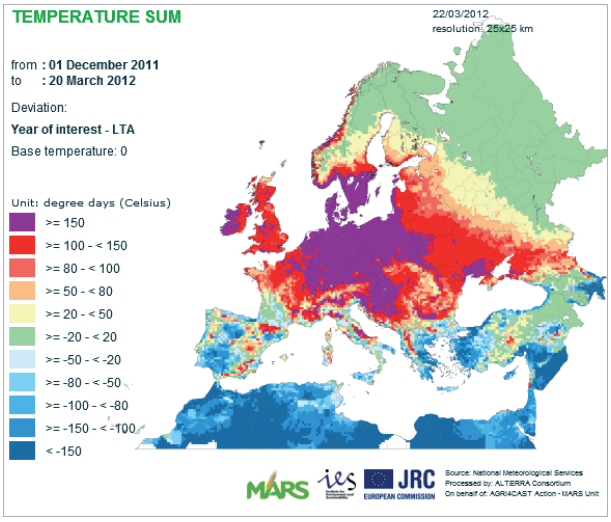
As it is early in the season our forecasts are mainly based on trend and average values, apart from the durum wheat forecasts for Spain, Portugal and Italy where the crop is close to anthesis and crop growth model outputs have been used to produce the forecast. Due to the drought in the main durum wheat-producing regions in Spain the forecasts are clearly below the average as the full yield potential can no longer be reached even if the remaining weeks of the growing season are beneficial.

Joint Research Centre

1. AGRO-METEOROLOGICAL OVERVIEW

The following agro-meteorological overview provides a summary of the winter months of December, January and February as well as the recent meteorological conditions in March. Relevant additional maps can be found in the atlas maps section. Generally milder-than-seasonal conditions prevailed from the beginning of December until the last dekad of January in most of Europe, followed by an extremely cold period until mid-February, especially in central and eastern Europe. This period was one of the coldest in our climatological record for several regions. Due to insufficient snow cover and severe frosts significant winter kill occurred in eastern France, Germany, Poland, the Czech Republic, some areas in Romania, Bulgaria and Ukraine, as simulated by our frost kill model and confirmed by remote sensing observations showing unfavourable biomass development. Spring started earlier in western Europe, whereas in eastern Europe spring is starting only slowly. A severe rain shortage has been observed since December in Spain, Portugal and Morocco, with the driest period in our climatological record for southern Spain. Below-average winter precipitation is recorded also in southern France, northern Italy and some areas of England, Austria, Slovenia and Hungary as well as in southern and eastern parts of European Russia.

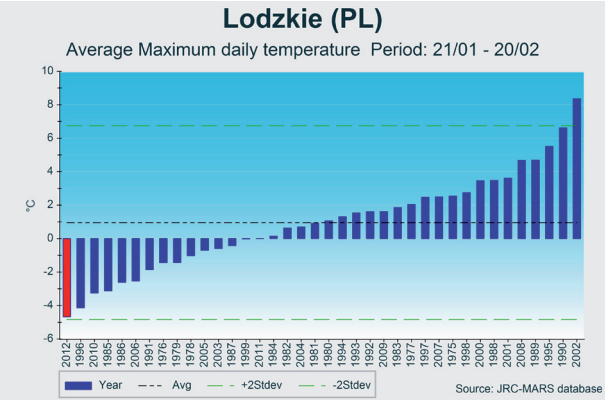


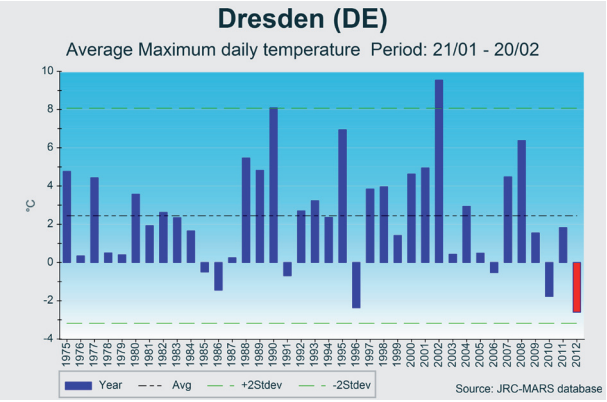


Observed temperature

In **December**, a warm anomaly was significant for most of the continent. The cumulated active temperatures indicated a +60 to +120 GDD surplus in a large triangle between the Pyrenees, southern Finland and the Caucasus. The mean temperature exceeded the long-term average by +2 to +4°C in a wide strip from France to southern Russia. In the Baltic countries, Belarus and Ukraine the December was on average +4 to +6°C milder than usual. The most prominent thermal anomalies >+8°C occurred in Finland and areas around the White Sea. The conditions were near-normal in the British Isles and in the Mediterranean Sea basin. Only eastern Turkey and Georgia proved to be colder than the average, by -2 and -5°C respectively. In the New Year, the mild weather continued throughout Europe and lasted until 25 **January**, with positive anomalies from Ireland to the Ural Mountains. More seasonal conditions were observed in the Iberian and Apennine Peninsulas and the Maghreb countries, but the eastern region of the Mediterranean and the southern coastline of the Black Sea proved to be -1 to -3°C colder than usual. The higher-than-seasonal temperatures in the first half of the winter favoured the germination and tillering of winter cereals but delayed or hindered the hardening process, exposing the new plants to a higher risk of frost damage. Due to a strong Nordic cold air intrusion, the temperature decreased dramatically throughout Europe after 25 January and frost kill became a real danger. The first dekad of **February** was extremely cold, with temperatures more than -10°C (or even -15°C in some places) lower than average in large parts of Europe. This period could be characterised by daily minimum temperature values between -10 and -20°C on average, decreasing gradually from eastern France to the eastern border of the EU. The coldest temperatures reached -20°C in wide areas between eastern Germany and Bulgaria, and along the eastern border of Poland, Slovakia and Romania temperatures even dropped below -25°C. What is more, the daily maximum temperatures did not rise above 0°C between 28 January and 12 February in Germany and all countries eastwards towards Russia. In several places the period 21 January–20 February is the coldest in our archive (the last 37 years) considering both daily maximum and minimum temperatures. The number

of cold days (Tmin<0°C) reached 10 in almost all of Europe and exceeded 21 in most of eastern Europe and wide areas across southern Europe. Warming started from 16 February as the prevailing anticyclone above Europe collapsed in the last dekad of February, with daily mean temperatures often exceeding the long-term average. The average temperature map for February depicts also an extremely cold month in spite of the mild days towards the end of the month. The low cumulated temperature sums of February led to delayed phenological development in the Mediterranean region. Early spring arrived in **March** in western Europe with mean temperatures +2 to +4°C higher than average in the British Isles and in a wide strip between Scandinavia and Italy. The frosts disappeared or became scarce in the Mediterranean and in the western part of Europe. Some very mild days in the second dekad reached daily maximum temperatures of over +20°C in the areas south of the North and Baltic Seas. In the first dekad of March eastern Europe was still ruled by winter. The warmth gradually tended to move eastward, melting the snow cover, but in the second dekad of March Turkey, southern Russia and the areas between the White and Caspian Seas were significantly colder, by -2 to -7°C, than usual.

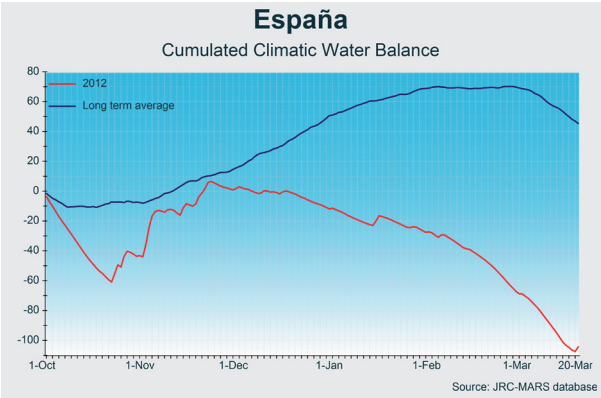


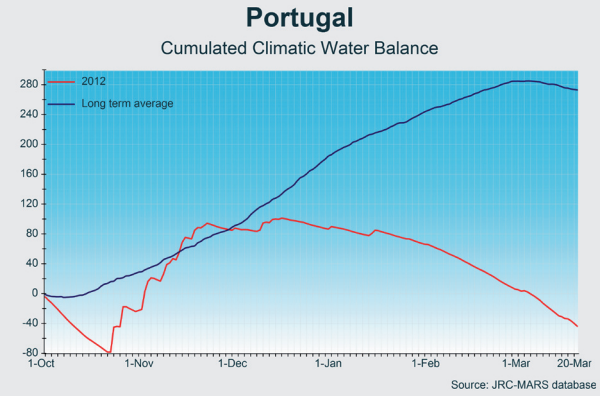


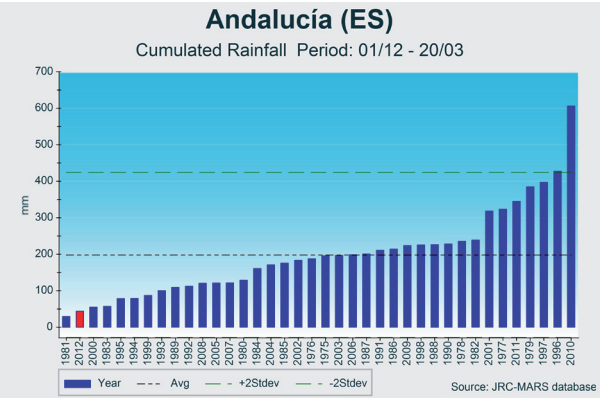
Observed precipitation

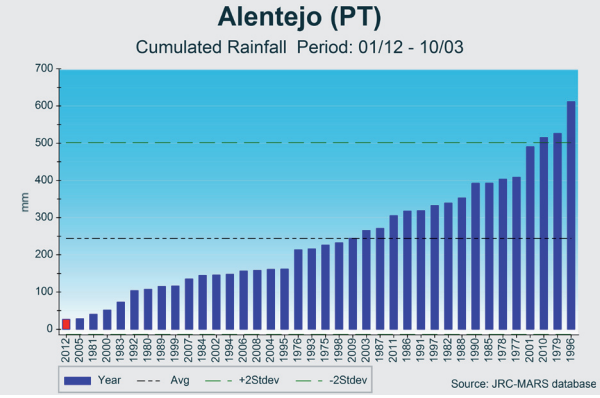
In **December** precipitation was frequent and ample in Scandinavia, the British Isles, France, the Benelux countries, Germany and areas along the western coastline of the Adriatic and the Aegean Sea, where in several places more than 200 mm of precipitation was recorded. These regions experienced characteristically +50 to +100 % more precipitation than usual. Scarce or no rainfall was measured in the Iberian Peninsula, northern Italy, southern France, Morocco and in areas east of the Black Sea. Romania and Moldova also had below-average precipitations. The dry weather conditions continued through **January** in Spain and Portugal as well as in northern Italy and southern France, accumulating a significant water deficit since last autumn. Abundant precipitation was recorded from 1 to 25 January in Scotland, the Baltic States, the Benelux countries, Germany, most of the Balkan Peninsula, eastern Turkey and some areas in Ukraine and Russia. Due to warm thermal conditions, hardly any snow covered western Europe before the beginning of the cold spell (25 January). The thin snow blanket in Poland, the Czech Republic and around the Black Sea was unable to protect crops efficiently over the first few days of the frost wave. Some slight snowfall eased the situation in western Europe until the end of the month. Precipitation did not reach the long-term average in western Europe in February. Primarily the Iberian Peninsula, the British Isles, France, the Benelux countries and Morocco experienced little precipitation. Snowfall was plentiful in a wide strip between the Black Sea and Scandinavia. Abundant precipitation was observed in the eastern basin of the Mediterranean Sea, as well as along the western coastline of Scotland and Norway. In harmony with the rising temperatures in the last dekad of February, the snow cover started to melt in western and southern areas and the extent of the European snow cover decreased significantly. In the early days of March the lowlands were covered only in Scandinavia and the east of Poland and Hungary. Gradual melting of the snow cover plays an important role in replenishing the soil moisture in Romania, Ukraine and eastern Europe. Most of Europe experienced little or no precipitation until 20 March, although the cumulated rainfall exceeded the average in Norway, Finland, Belarus, western Russia, Georgia, Greece, Turkey, southern Italy and Tunisia for the first two dekads of March. Especially Spain and Portugal are facing severe water supply problems. Characteristically precipitation remained as little as 10 mm in the Iberian Peninsula in March and the dry period continued. The cumulated country-wide average precipitation deficit since 1 October reaches 300 mm for Portugal and 155 mm for Spain, thereby approaching the most extreme years. Analysis of the

most similar years indicates that this situation is exceptional. The water deficit affects principally most of Portugal and the regions of Andalucía, Extremadura and Castilla y León in Spain. The low winter temperatures slightly mitigated the current crop situation. The low level of water reservoirs and weak snowpack in the mountains holds out the threat of irrigation water deficiency later. The drought penalises the rangelands, pastures and grasslands. Although there are visible signs of water scarcity in southern France, the central and northern parts of Italy and some areas of England, Austria, Slovenia and Hungary, this situation seems less serious compared to the Iberian region, although the arrival of spring rainfall is highly desired for these regions.



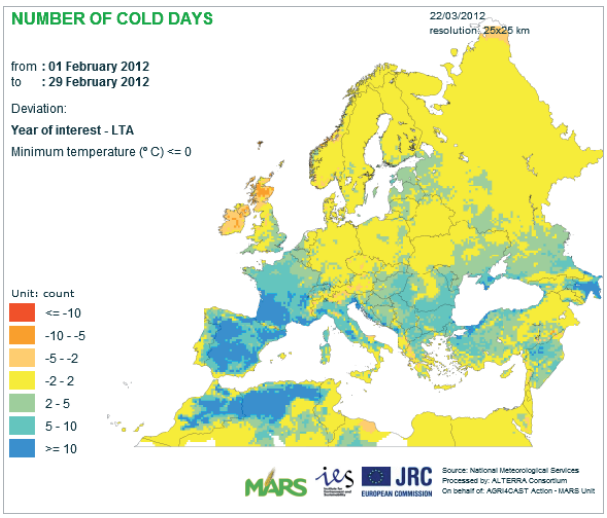


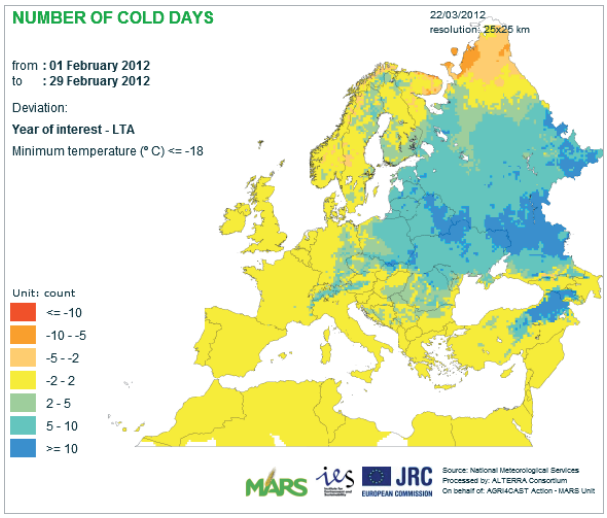




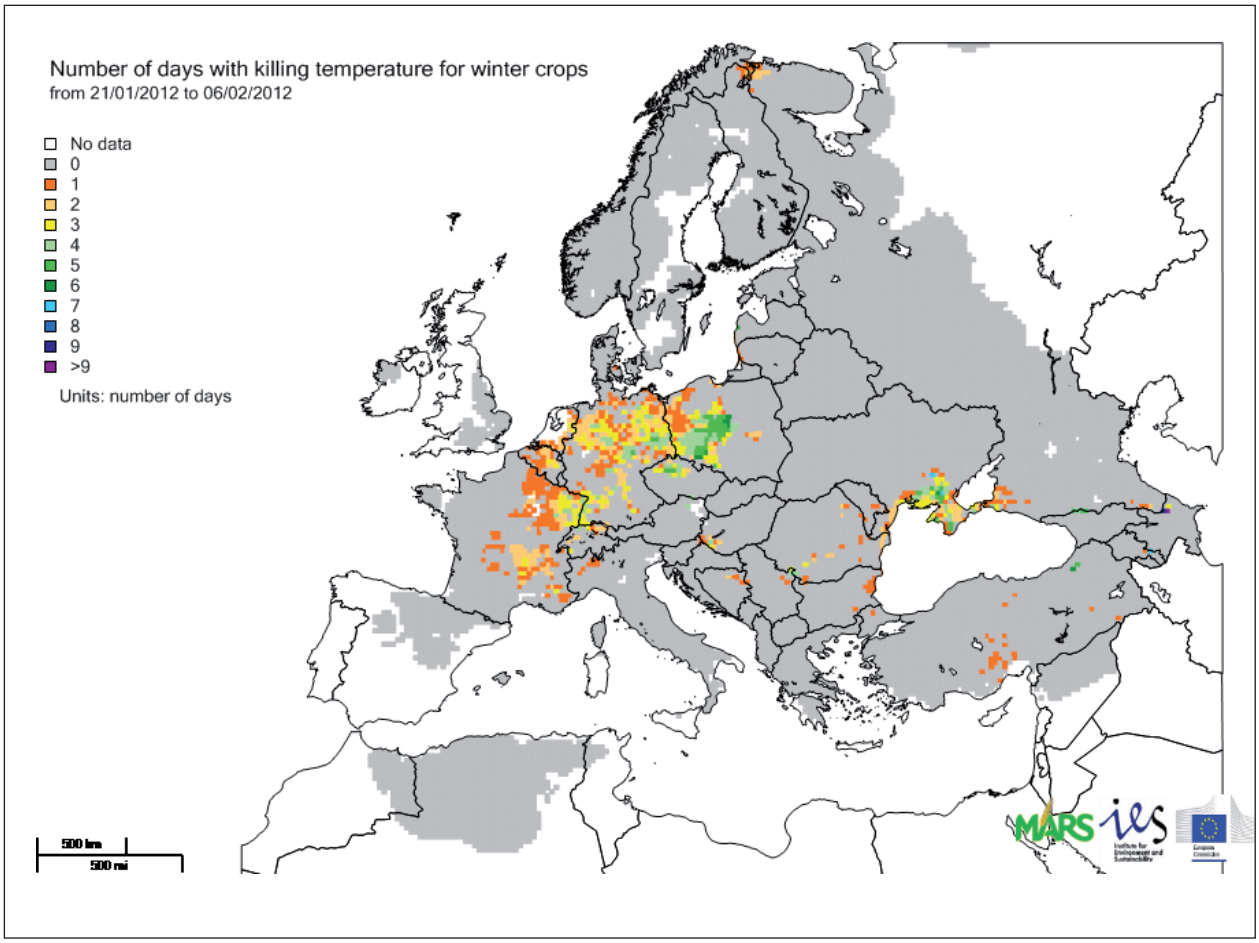
Winter kill analysis

Since the February Bulletin no significant additional winter kill has occurred. The frost kill events of this winter causing more extensive damage took place in the last days of January and the first half of February. The long-lasting mild weather before 25 January, when the cold spell started, prevented winter crops from achieving the desirable degree of hardening.



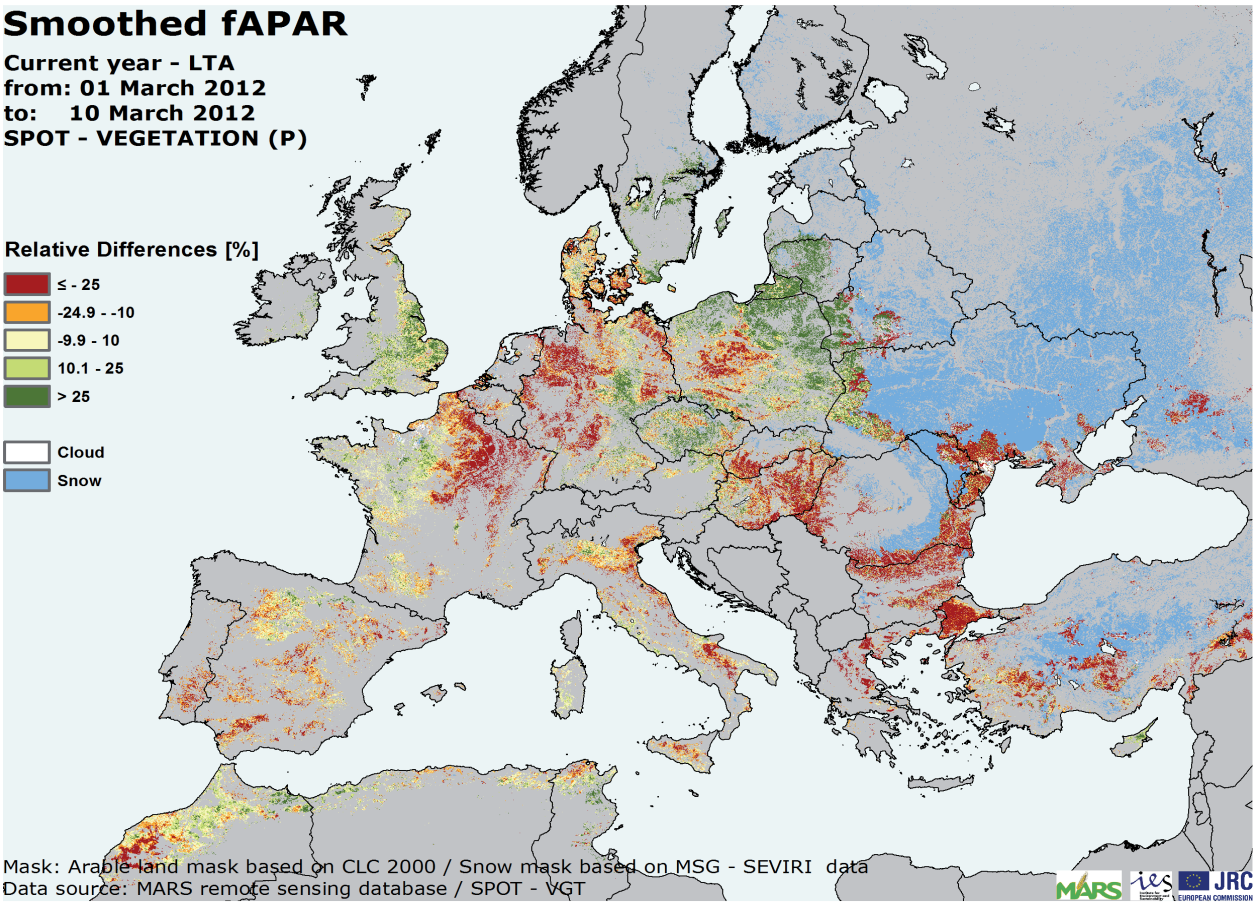


In western Europe the crops have not at all been prepared to withstand the freezing temperatures. In some central European areas as well as in western Poland and around the Black Sea crops could be considered to have been only slightly hardened. At the beginning of the cold period the snow cover was absent or too thin in western Europe and Poland and also around the Black Sea as well as in some additional regions of Ukraine. At the beginning of February the situation improved with the arrival of snowfalls in Hungary, Romania, Bulgaria and the Balkan Peninsula. Our model simulations indicated likely frost kill events in eastern France, the Benelux countries, Germany, Poland, the Czech Republic, some spots in Romania and also in Ukraine (primarily around the Crimean Peninsula). The number of days with killing temperatures was characteristically between 4 and 9 in these areas, where significant losses are probable. This is now confirmed to a large extent by the unfavourable biomass development observed by remote sensing in these regions.

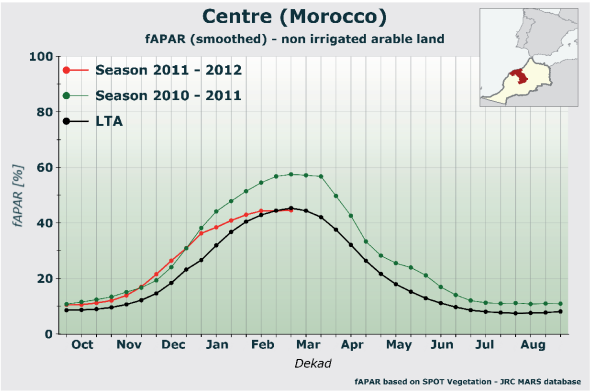


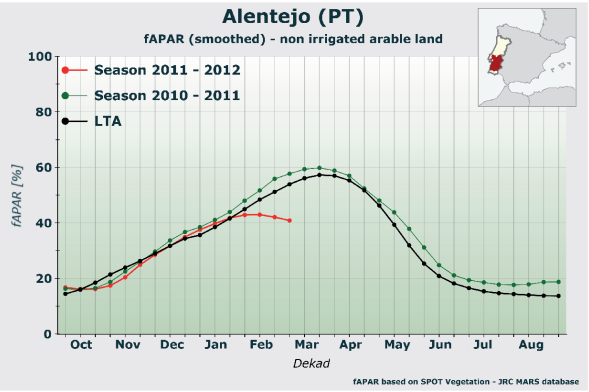
2. REMOTE SENSING – OBSERVED CANOPY CONDITIONS

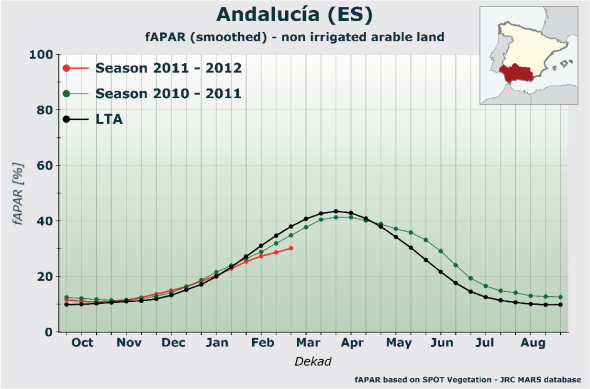
Bad canopy condition for southern Iberia peninsula due to persistent dry conditions. Negative biomass trend in central Europe. Delayed development stages in Eastern Europe.

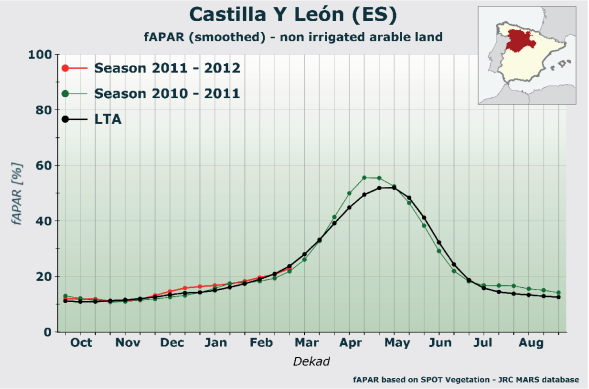


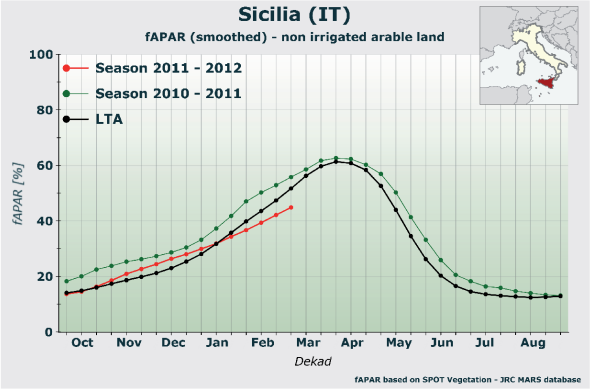
The map displays the differences between fAPAR during the period 1 March-10 March 2012 and the long-term average (LTA, 1998-2010) for the same period. Arable lands with a bad season so far or a delayed start of the season are shown in red; the opposite applies for the regions in green. In the **Iberian Peninsula** an increasing negative season is visible with a North–South trend. In the northern agricultural regions the growing season is at the very early stages and is not suffering from the winter dry period (see *Castilla y León* fAPAR profile), whereas the southern crop areas are suffering from the prolonged lack of rain. The situation has worsened since the beginning of February and is affecting durum wheat development especially in **Portugal**. The fAPAR profiles of *Andalucía* (ES) and *Alentejo* (PT) display the situation described in all respects. Southern **Italy** faced wetter and colder conditions than usual. Development of durum wheat and the start of the season for the other winter crops are delayed after better-than-average winter development (e.g. *Sicilia* fAPAR profile). The **United Kingdom** and **western France** benefit from the mild winter temperatures with a good and early start of the season for winter crops (e.g. *Poitou-Charentes* profile). In **eastern France** and **western Germany** the cold spell in February slowed down the advanced canopy development and, mainly in eastern France, caused winter kill. These effects are visible in the fAPAR profile of the *Lorraine* (FR) regions: the negative impact of the cold wave is well described by the current year curve but the magnitude of the biomass reduction is exaggerated because of the cloud cover present since late January. The main durum wheat regions in **eastern Germany** show re-growth with slightly advanced stages in spite of the February cold temperature (e.g. *Sachsen–Anhalt* fAPAR profile). Different conditions are present among the regions on the border between Germany and Poland, where winter crops showed advanced stages before winter dormancy but are now exhibiting a delay. In **central-eastern** and **eastern European countries** late germination due to the dry autumn and the lengthy delay due to the late winter cold spell make for a bad start to the season for winter crops. The fAPAR profile of *Sud Muntenia* (RO) is given as an example. In **Greece** the durum wheat and winter cereals development stages are strongly delayed because of the unusually low temperatures in January and February. In Turkey, Ukraine and Russia the snow cover is still persistent. In **Morocco** the fAPAR profiles display slightly advanced vegetation development with average behaviour (e.g. *Centre* region profile); the lack of rain in the southern regions could affect the final yield for those agricultural areas.

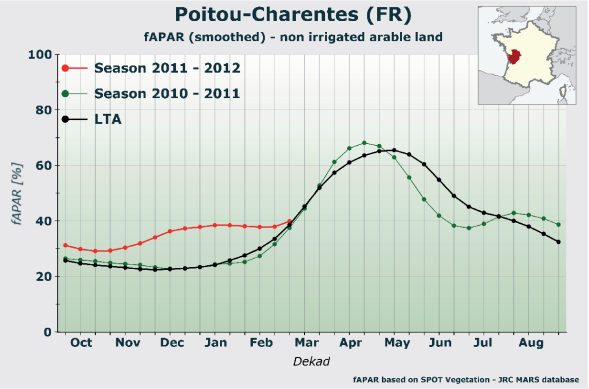

Centre (Morocco)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

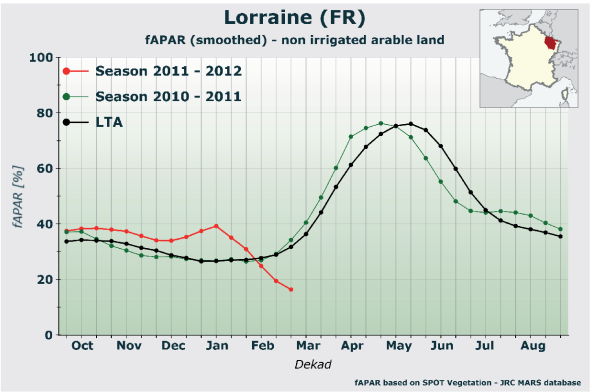

Alentejo (PT)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

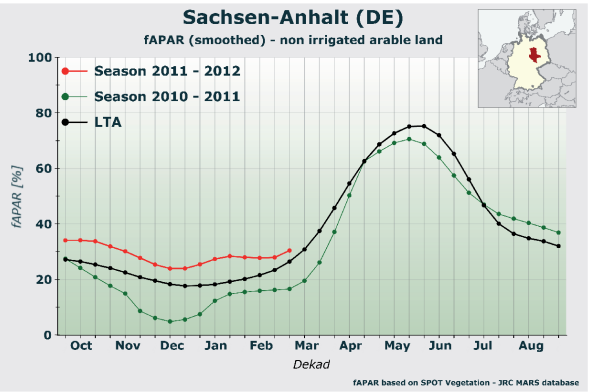

Andalucía (ES)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database


Castilla Y León (ES)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database


Sicilia (IT)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

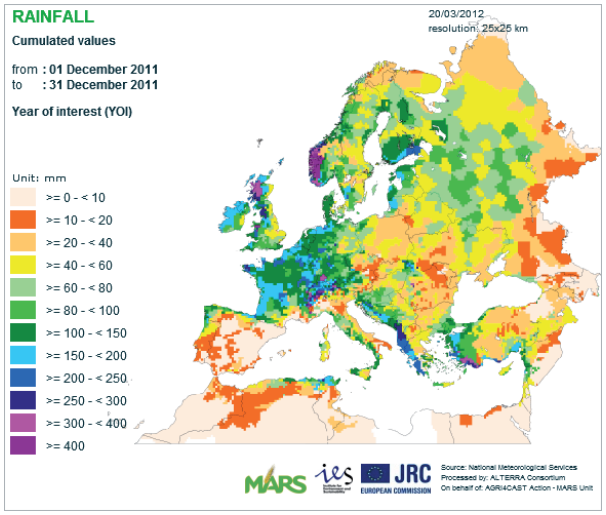

Poitou-Charentes (FR)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

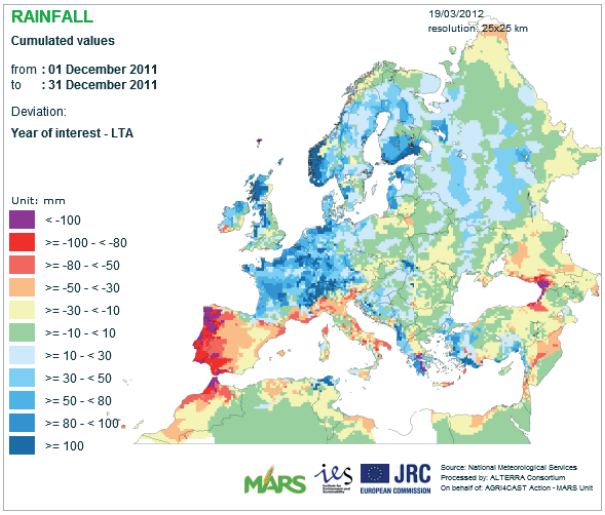

Lorraine (FR)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

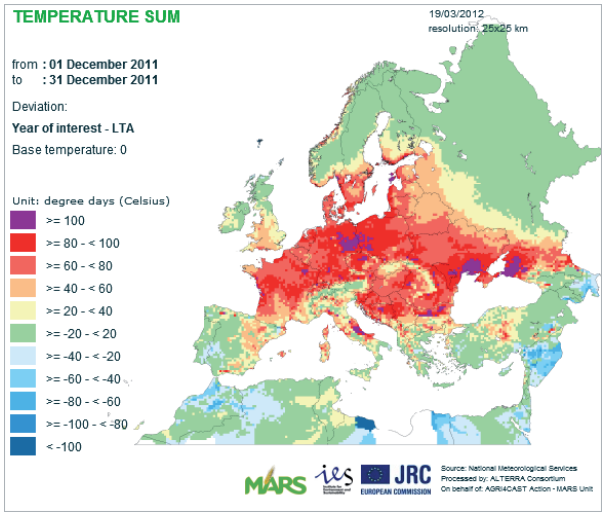

Sachsen-Anhalt (DE)
fAPAR (smoothed) - non irrigated arable land
Season 2011 - 2012
Season 2010 - 2011
LTA
fAPAR [%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Dekad
fAPAR based on SPOT Vegetation - JRC MARS database

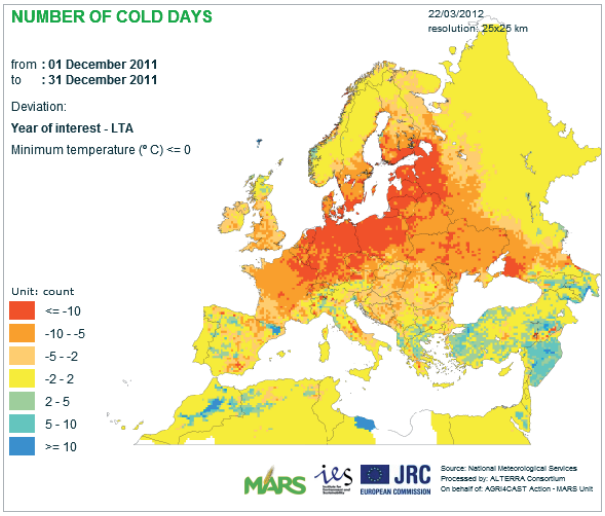
3. ATLAS MAPS

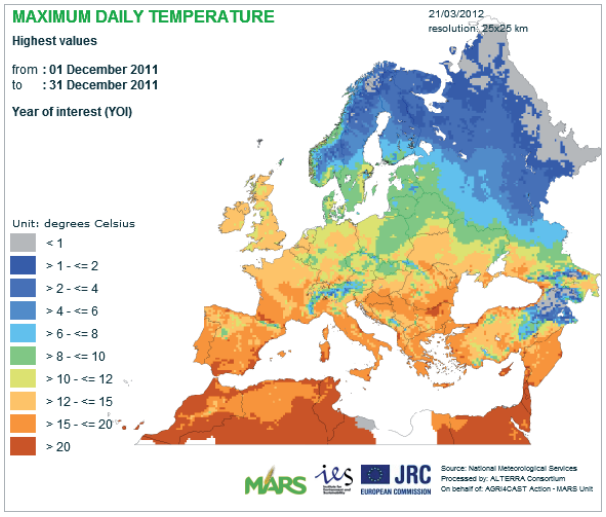
Meteorological conditions in December

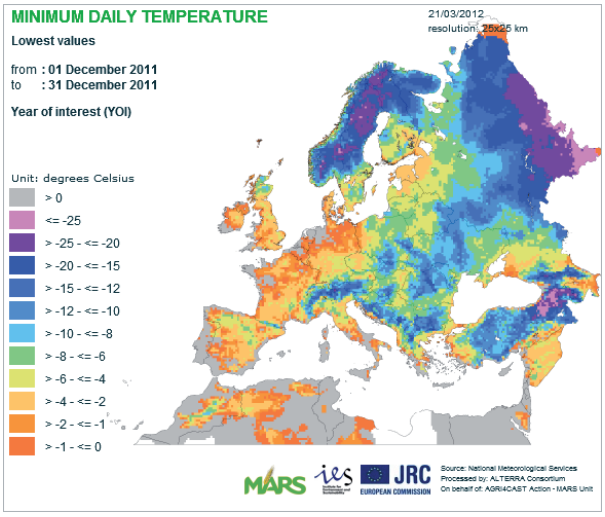




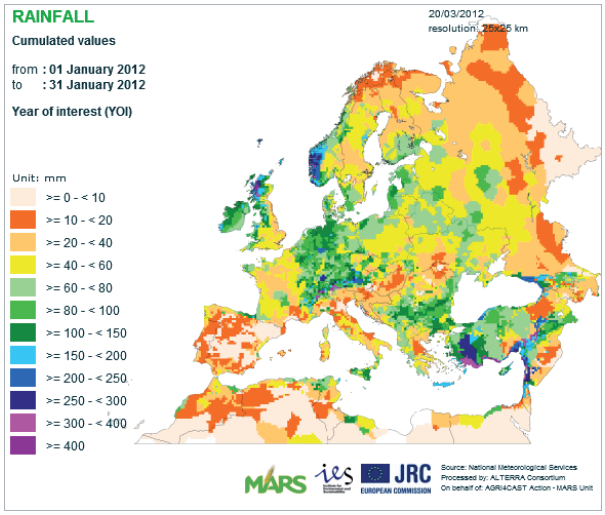


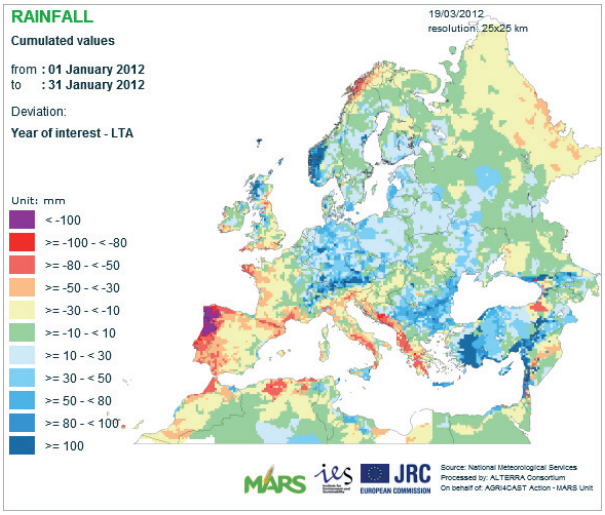


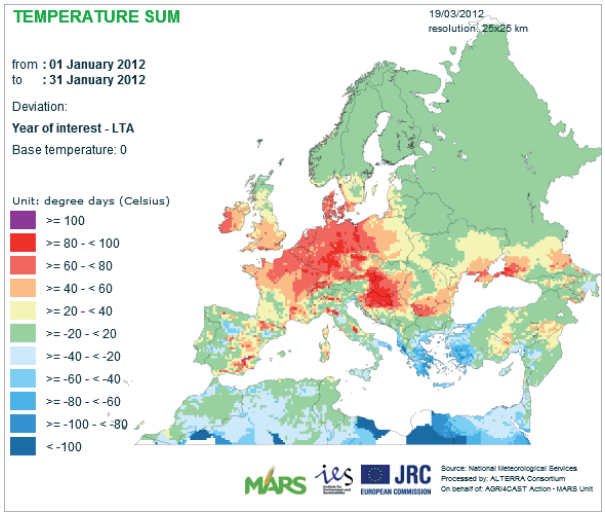


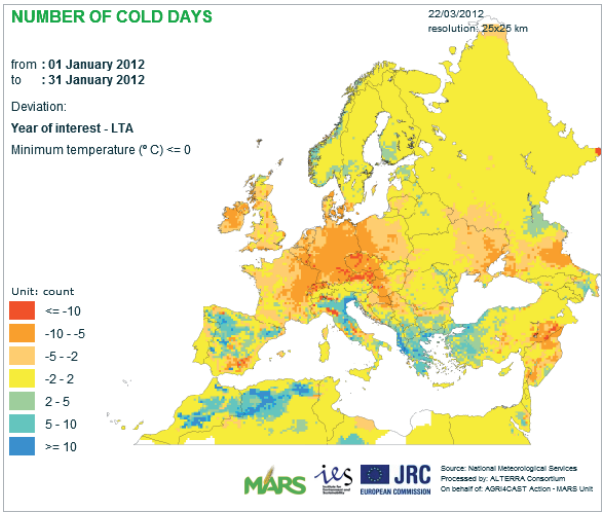


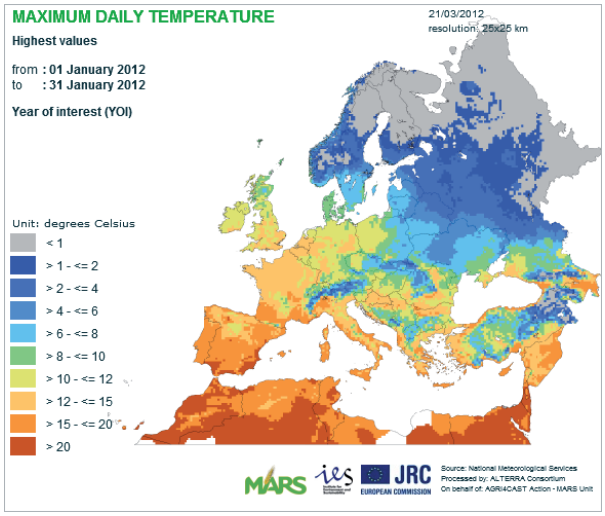
Meteorological conditions in January

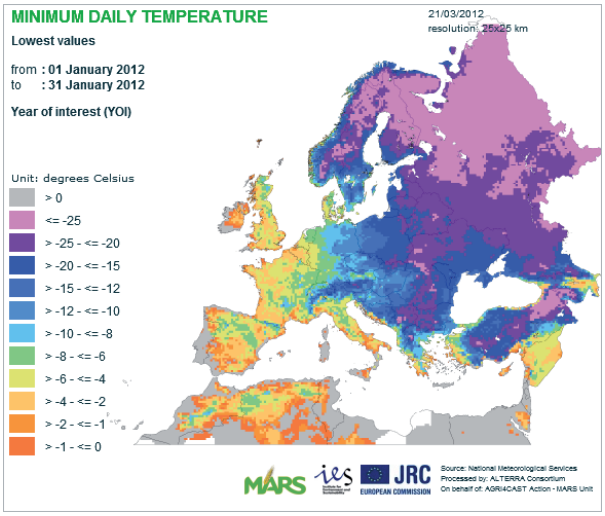




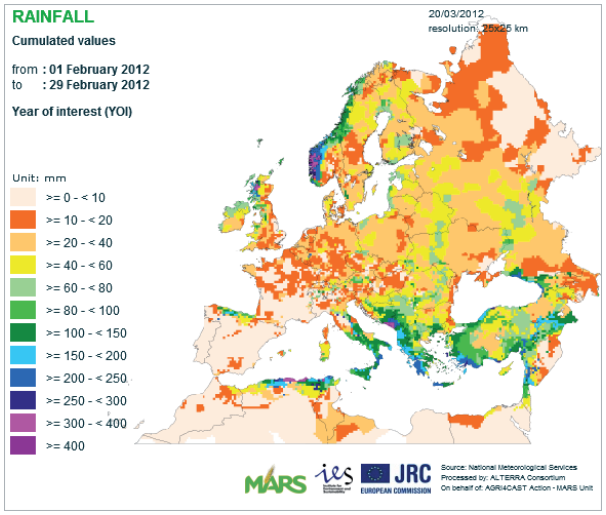


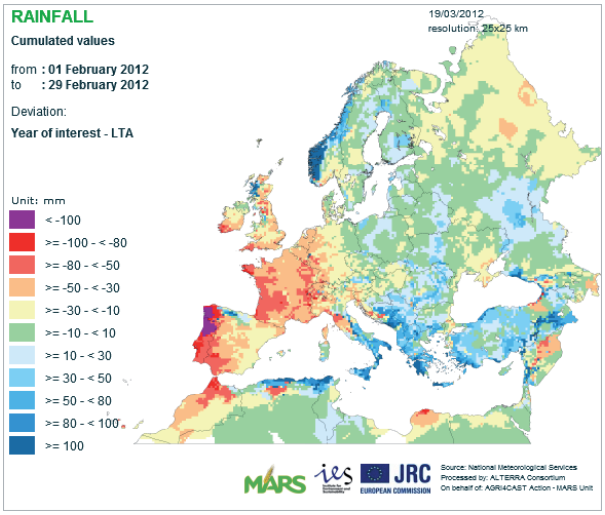


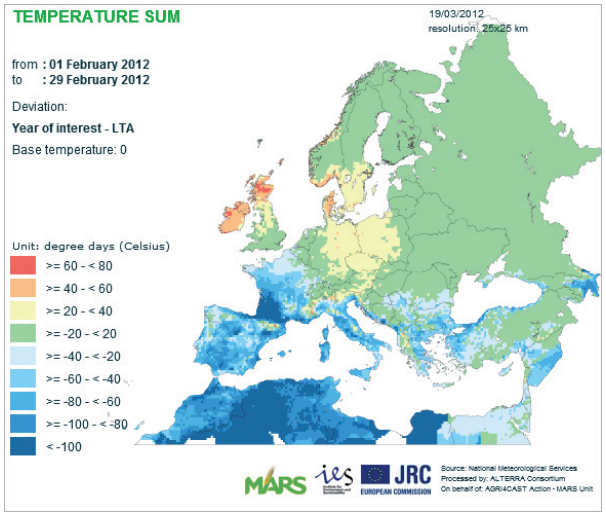


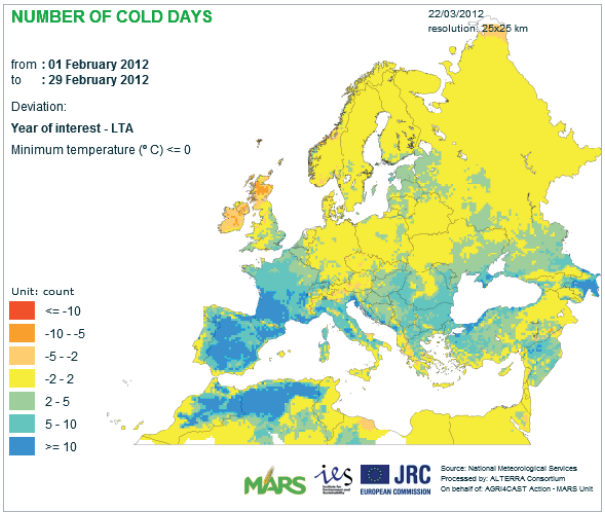


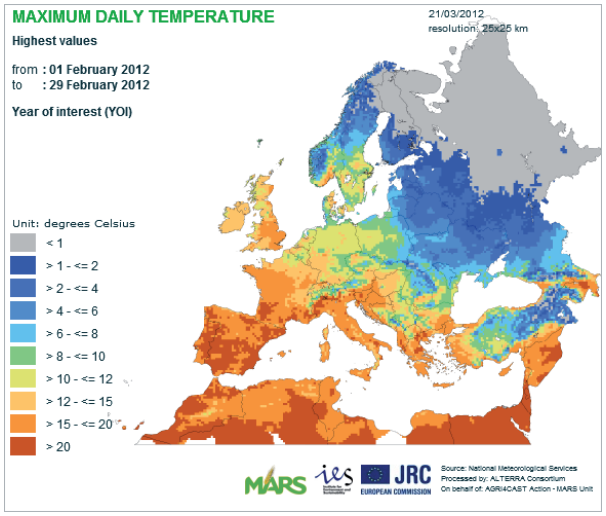
Meteorological conditions in February

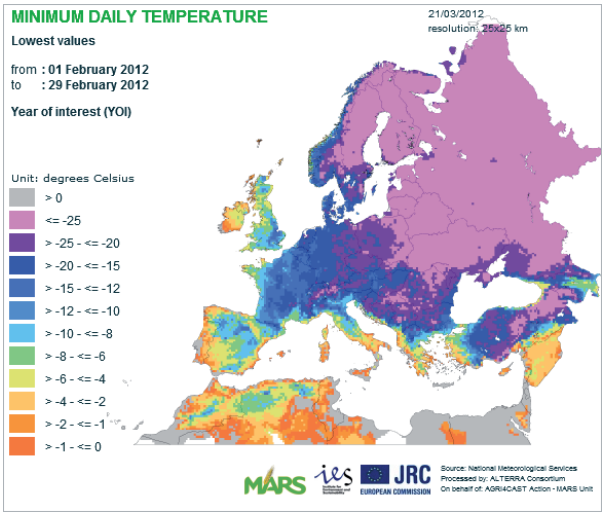




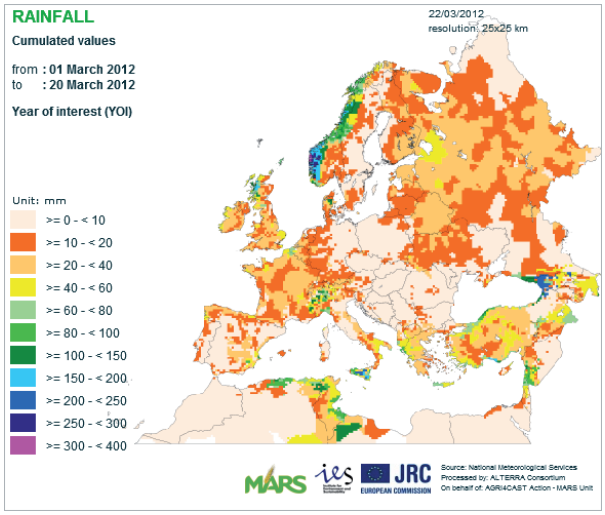


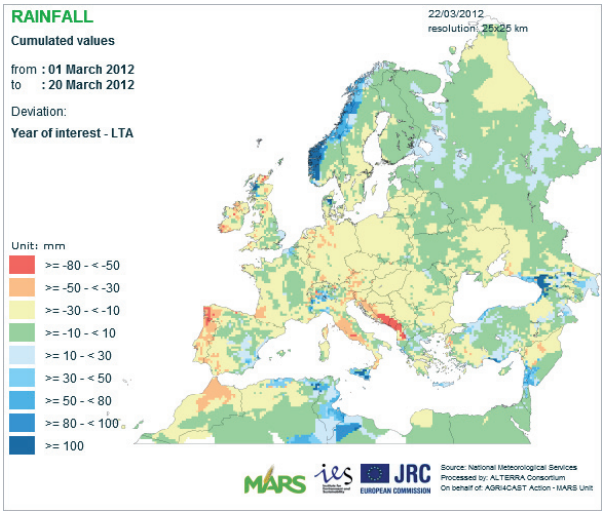


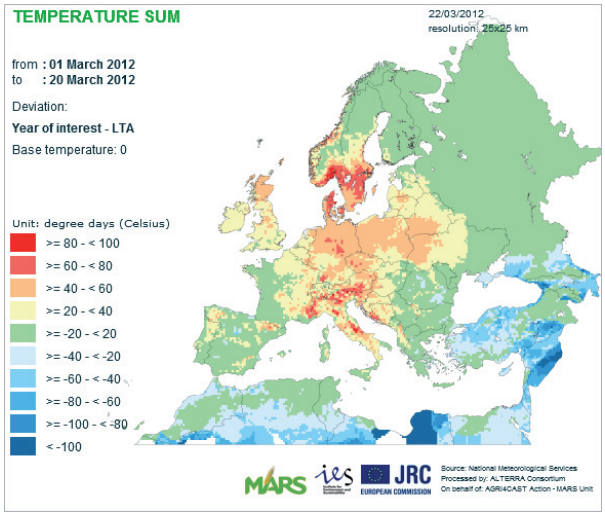


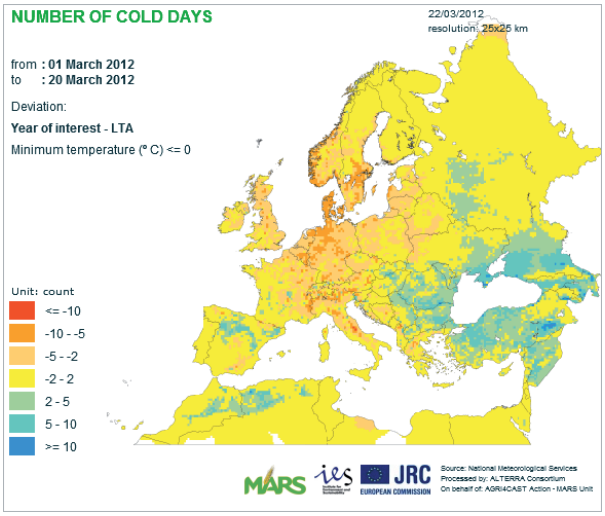


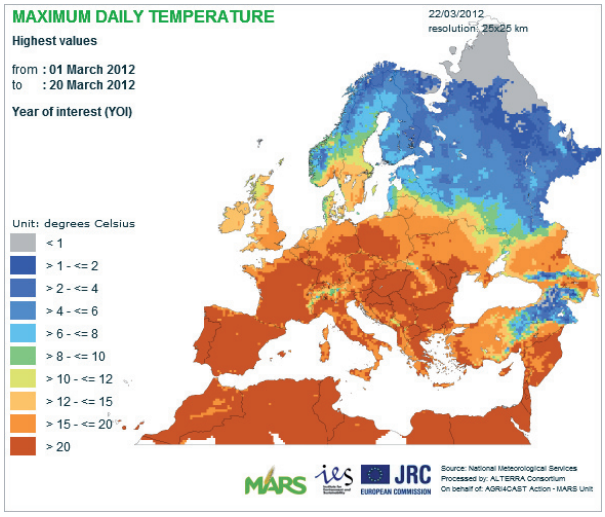
Meteorological conditions in March (until 20th)

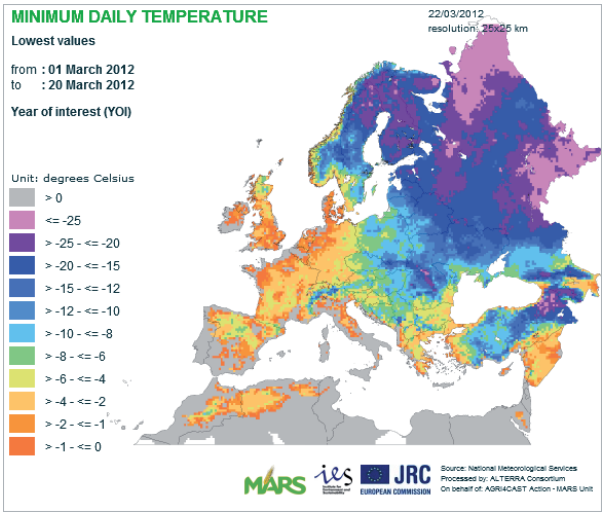












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13 Jan	Agromet. analysis	Vol. 20 No. 1
10 Feb	Agromet. analysis	Vol. 20 No. 2
26 Mar	Agromet. analysis and yield forecast	Vol. 20 No. 3
23 Apr	Agromet. analysis, remote sensing analysis, and yield forecast	Vol. 20 No.4
29 May	Agromet. analysis, remote sensing analysis, and yield forecast, pasture analysis	Vol. 20 No. 5
25 Jun	Agromet. analysis, remote sensing analysis, and yield forecast, pasture update	Vol. 20 No. 6
23 Jul	Agromet. analysis, remote sensing analysis, and yield forecast, pasture update, rice analysis	Vol. 20 No. 7
27 Aug	Agromet. analysis and yield forecast, pasture update	Vol. 20 No. 8
24 Sep	Agromet. analysis, remote sensing analysis and yield forecast, pasture update	Vol. 20 No. 9
22 Oct	Agromet. analysis, remote sensing analysis and yield forecast, pasture analysis, rice analysis	Vol. 20 No. 10
26 Nov	Agromet. analysis, campaign review and yield forecast	Vol. 20 No. 11
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