

# Crop Monitoring in Europe

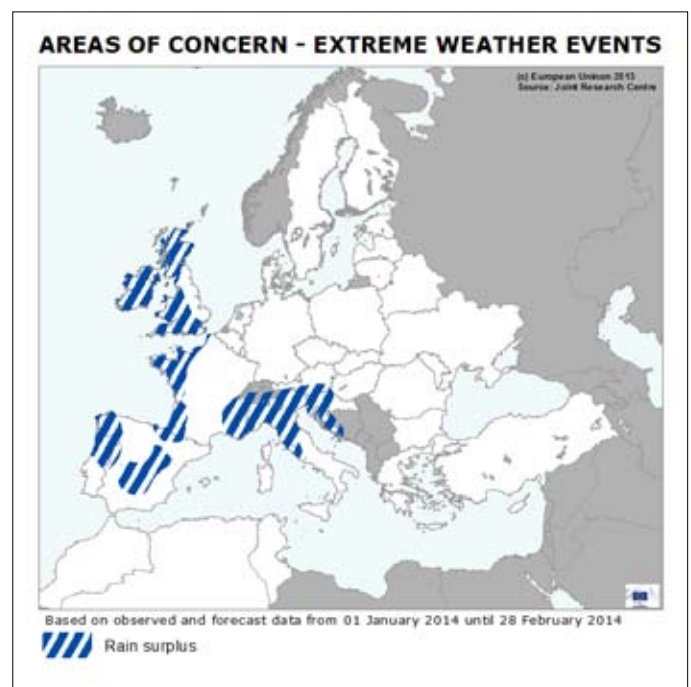
## MARS BULLETIN Vol.22 No. 2 (2014)

### Exceptional mild winter and very wet in western Europe

*Between January and February, persistent and heavy rains occurred in several regions of western Europe. In northern Italy and major parts of the British Isles, the period under review (1 January - 17 February) was the wettest on our records (since 1975), with repeated periods of continuous rainfall. Some agricultural areas were flooded and many others were waterlogged. Similar conditions occurred - to a lesser extent - in some regions in southern and western France. The Iberian Peninsula was also subjected to high rainfall, especially the first half of February.*

The impacts of the flooding and waterlogged conditions on crop and pasture production are difficult to judge at this time. Normally, during winter time, pastures and crops can withstand prolonged periods of waterlogged or ponded conditions, but this year's rains are exceptional and temperature conditions are unusually mild in many of the affected areas. This implies that soil oxygen is relatively rapidly consumed by roots and microbial activity leading to root asphyxia. Depending on local conditions, the effects can vary from a slight impact on growth which can be compensated once conditions improve, to total crop loss and areas that have to be completely re-sown. Moreover, excessive rain implies nutrient losses, and affected areas could be more susceptible to disease outbreaks. The situation appears to be more serious in several areas of northern and central Italy, for which a relatively large share of arable land has been subject to prolonged rains combined with very mild temperatures.

In the UK and Ireland, grassland areas are relatively more affected than croplands, and temperature conditions have been somewhat colder (albeit still unusually mild for these regions). At the national level the impacts on production are expected to be limited. In France, the negative impact of the rains is expected to be more localised. In the Iberian Peninsula, the excessive rains in the north-western areas



may have hampered pasture development, whereas the effects on crops and restored water reservoirs are predominantly beneficial in the southern regions.

# 1. Agro-meteorological overview (1 January – 17 February)

*Italy and the British Isles experienced an exceptionally wet period which led to floods and waterlogged soils. Above-average precipitation was also observed in France and Spain. Drier conditions are needed in these regions in the coming weeks to allow field activities. Warmer-than-usual weather conditions continue to characterise the winter season in most of Europe.*

## Observed temperatures

In January, positive thermal anomalies in the range of 2 to 4°C prevailed in western and central Europe. Warmer-than-usual conditions were also recorded in southern Italy, the Balkan Peninsula, Hungary, western Romania, Bulgaria and Turkey. Around 15 January, cold air flooded the northern and north-eastern part of Europe up to Ukraine, Poland and eastern Germany, with average daily temperatures up to 10°C below the long-term-average. During this period, which lasted until the beginning of February, minimum temperatures below -20°C occurred in the Baltic countries, northern Ukraine, Belarus, Russia, Finland and Sweden. By contrast, milder-than-usual thermal conditions continued over the main agricultural production areas in western Europe. After this period, average daily temperatures rose across Europe. Positive thermal anomalies in the range of 2 to 4°C were recorded in the central and south-eastern part of Europe, and temperatures in central Russia and the Scandinavian Peninsula were up to 6 to 8°C above average. Near- to slightly below-average temperatures were observed in the northern part of the Black Sea region,

eastern Russia and the western part of the Iberian Peninsula. The cumulated active temperatures (Tbase=0°C) since 1 January were well above average (>100 GDD) in France, the Benelux countries, Italy, the Balkan Peninsula, western Romania, Hungary, Bulgaria and the western part of Turkey. These prolonged warmer conditions, which are forecast to continue across Europe, are advancing the development of winter cereals and prevented crops to harden, which make the crops more vulnerable to frost in early spring. Above-average winter temperatures are also associated with increased pest and disease pressures.

## Observed rainfall

During the period of review, northern Italy and the southern and western parts of the British Isles experienced an exceptionally wet period (the wettest on our climatological records since 1975), which led to floods and widespread waterlogging, increasing the risk of pests and constraining plant development. Unusually wet conditions were also observed in western and southern France, central and southern Italy, the Iberian Peninsula and Croatia.

January was characterised by wetter-than-usual conditions in south-eastern France and Bretagne, northern and central Italy, the southern and western parts of the British Isles and the north-western part of the Iberian Peninsula, with cumulated rainfall locally above 200 mm. Above-average rainfall was also recorded in western France, the southern part of the Scandinavian Peninsula and along the Adriatic coast of the Balkan Peninsula. Below-average rainfall, in the range of -30 to -50%, was observed in Germany, the Czech Republic, Austria, Hungary, southern Ukraine and the northern part of the Scandinavian Peninsula. From 1 to 17 February, persistent and heavy rains continued in France, Italy, the British Isles, the Iberian Peninsula, the northern part of the Balkan Peninsula and the southern part of the Scandinavian Peninsula. Cumulated rainfall exceeded the long-term average by more than 100 mm in northern Italy, western France, the Iberian Peninsula, the British Isles, Slovenia and Croatia. The abundant

rainfall recorded in southern Spain and southern Italy led to a favourable increase in the soil moisture content. By contrast, drier-than-usual conditions were recorded in Poland, eastern Germany, the Czech Republic, Ukraine, Greece, and around the Black Sea regions. During the first week of February, snow covered northern and eastern Europe. In central-eastern Europe the snow cover was thinner. After this first week, the snow cover started to melt and disappear in several areas due to the warmer conditions recorded until 17 February.

## 2. Frost kill analysis

*Frost kill in Europe has been very limited so far, thanks to continued warmer-than-usual weather conditions in most regions during most of the winter period, whereas areas with winter cereals that did experience cold were mostly fully hardened and protected by snow.*

However, as a consequence of a cold spell (minimum temperature below  $-20^{\circ}\text{C}$ ) in southern Russia in late January and early February, during which no protective snow cover was present, moderate frost-kill events have been simulated in the surroundings of the Volga River Delta north of the Caspian Sea. The same is true for central Ukraine (*Poltava Okrug*).

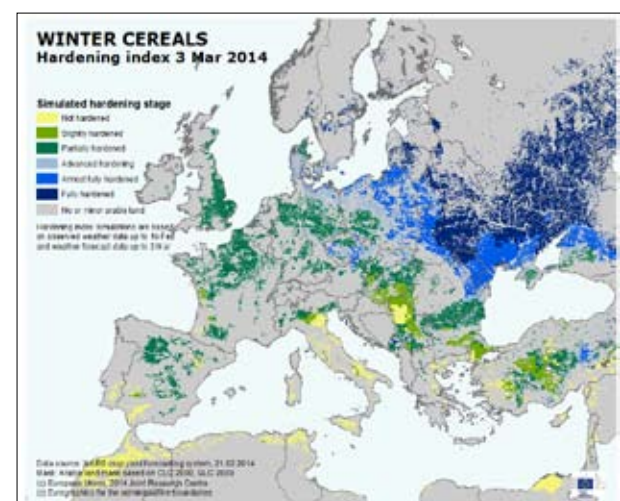
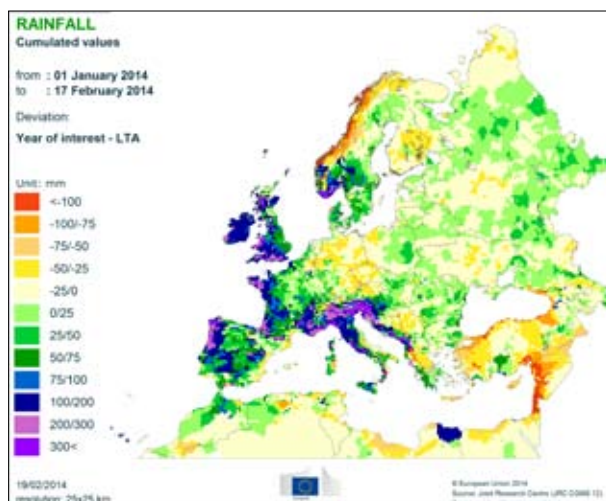
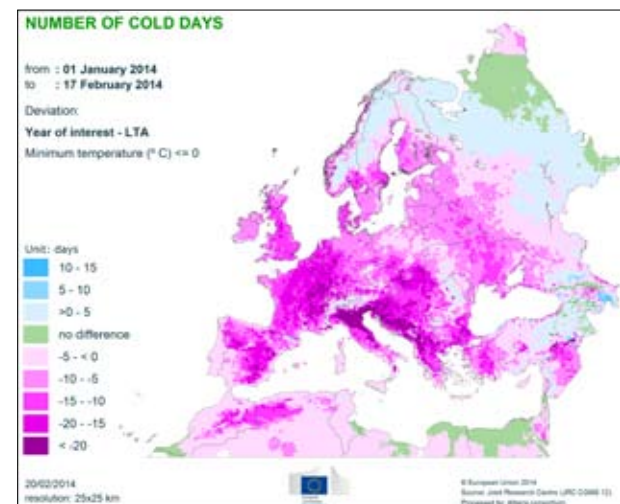
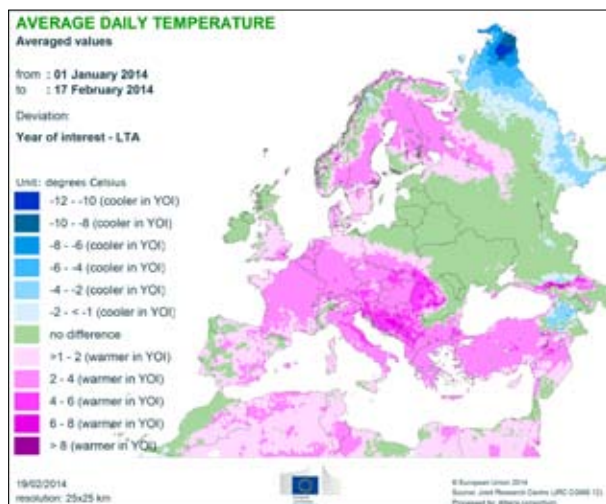
Frost kill and the build-up of low-temperature tolerance (i.e. hardening) are assessed with the MARS frost kill model, based on weather parameters such as temperature and the presence and thickness of snow cover.

At the time of analysis (mid-February), little or no low-temperature tolerance was observed in the Mediterranean regions (Portugal, coastal regions of Spain, southern and central Italy, Greece, southern part of Hungary, Serbia and most of Bulgaria and western Turkey). Winter cereals are in

a stage of partial or advanced hardening in the UK, France, inland Spain, northern Italy, western Germany, Denmark, the Benelux States and most of the Carpathian Basin. Full or almost full hardening has been reached (and is still maintained) in Poland, the Czech Republic, Romania, the Baltic countries, Belarus, Ukraine, Russia and eastern Turkey.

With spring approaching, the de-hardening process will soon get underway in Europe. Given the weather forecast for the next two weeks, a decrease in hardening levels is forecast for Italy, the Balkan Peninsula, Romania, Austria, Hungary, Czech Republic, Poland and southern Ukraine. In Eastern Europe, the plant protection level will remain high and probably satisfactory, in spite of the decrease in frost tolerance.

Considering the latest weather forecast, no significant frost damages are expected for the period between mid-February and the beginning of March.



## 2014 MARS Bulletins

Date	Publication	Reference
27 Jan	Agromet. analysis	Vol. 22 No. 1
24 Feb	Agromet analysis	Vol. 22 No. 2
24 Mar	Agromet analysis and yield forecast	Vol. 22 No. 3
14 Apr	Agromet analysis, remote sensing and yield forecast	Vol. 22 No. 4
12 May	Agromet analysis, remote sensing, yield forecast and pasture analysis	Vol. 22 No. 5
23 Jun	Agromet analysis, remote sensing, yield forecast and pasture update	Vol. 22 No. 6
21 Jul	Agromet analysis, remote sensing, yield forecast, pasture update and rice analysis	Vol. 22 No. 7
25 Aug	Agromet analysis, yield forecast and pasture update	Vol. 22 No. 8
22 Sep	Agromet analysis, remote sensing, yield forecast and pasture update	Vol. 22 No. 9
27 Oct	Agromet analysis, remote sensing, yield forecast, pasture analysis and rice analysis	Vol. 22 No. 10
24 Nov	Agromet analysis and yield forecast, sowing conditions	Vol. 22 No. 11
15 Dec	Agromet analysis	Vol. 22 No. 12

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