No additional frost-kill damage

Hardening of winter cereals did not improve for large parts of Europe

In most regions of western and central Europe, the hardening status of winter cereals has not improved, and remains lower than usual due to the persistence of above-average thermal conditions.

Hardening is a bio-physiological process of winter cereals that occurs when cellular starch is transformed into glucose to increase the freezing point of cellular liquid, thereby developing low-temperature tolerance in the plant. Our assessment refers to model simulations based on weather data up to mid February. In the region between eastern Germany and central Ukraine, as well as in southern Russia, a slight increase in frost tolerance was simulated during the second half of January, whereas in central Europe and western Ukraine the process of dehardening started in early February due to well-above-average daily temperatures.
As a consequence, winter crops are practically not hardened in western and southern Europe, Germany, southern Poland, Romania and western Ukraine. Winter crops are in the partial or advanced hardening stages in the Baltic States, some regions of the Czech Republic and Hungary, northern Poland, Scandinavia, Slovakia and central Ukraine, whereas crops have reached full or almost full hardening in Belarus, Russia (except in the most southern areas) and eastern Ukraine. During this winter, the majority of frost-kill events occurred in late December and early January. South-western Belarus, Moldavia, some regions of southern Russia and western and southern Ukraine appear to have been moderately affected. Only slight/minor frost-kill damages are probable in the Baltic countries, eastern Bulgaria, western Poland and eastern Romania. No additional significant damage is expected to have occurred since mid January. Whereas the lack of hardening in most of Europe indicates that winter crops remain vulnerable on the basis of the medium-range weather forecast, no further frost-kill damage is expected until the end of February.

1. Agro-meteorological overview (1 January–16 February)

Warmer-than-usual weather was experienced in major parts of Europe and north-western Africa. Air temperatures in these regions were generally 2-4°C above the long-term average. The analysed period was among the warmest on our record in western Mediterranean regions.

Cold anomalies were recorded in Scandinavia, with air temperatures around 2°C below the long-term average. Polar air inflow from north-eastern Europe at the beginning of January caused a cold spell in eastern and south-eastern Europe and Turkey (see January Bulletin). Minimum daily temperatures during the cold spell dropped below -20°C in many areas of the abovementioned regions, leaving winter crops exposed to frost. Western Europe saw a series of cyclones forming in a westerly flow over the Atlantic, which resulted in abundant rainfall in the British Isles, western France, the north-western part of the Iberian Peninsula and the northern Alpine region. Above-average rainfall was also recorded in south-eastern Europe, central and eastern Turkey and large areas of eastern Europe. Exceptional rainfall events caused flooding in central and northern England and Ireland at the beginning of January.

Substantially drier-than-seasonal conditions with rainfall cumulates generally below 40 mm were observed in the western Mediterranean (with the exception of the western Balkans), northern Poland and large areas of northern Scandinavia. A less pronounced lack of precipitation was observed in eastern Germany, parts of the Czech Republic, the westernmost part of Ukraine and north-eastern Romania. Recent rainfall in February slightly alleviated soil moisture deficits in Italy.
**AVERAGE DAILY TEMPERATURE**

Averaged values

from: 01 January 2016  
to: 15 February 2016

Deviation:

Year of interest - LTA

Unit: degrees Celsius

-6 - -4 (cooler in YOI)  
-4 - -2 (cooler in YOI)  
-2 - -0.5 (cooler in YOI)  
no difference  
>0.5 - 2 (warmer in YOI)  
2 - 4 (warmer in YOI)  
4 - 6 (warmer in YOI)  
6 - 8 (warmer in YOI)  
> 8 (warmer in YOI)

17/02/2016  
resolution: 25x25 km

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**RAINFALL**

Cumulated values

from: 01 January 2016  
to: 15 February 2016

Year of interest (YOI)

Unit: mm

>= 0 - < 10  
>= 10 - < 20  
>= 20 - < 40  
>= 40 - < 60  
>= 60 - < 80  
>= 80 - < 100  
>= 100 - < 150  
>= 150 - < 200  
>= 200 - < 250  
>= 250 - < 300  
>= 300 - < 400  
>= 400

17/02/2016  
resolution: 25x25 km
2. Atlas

Temperature sum
Precipitation: absolute values and relative to the long-term average
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Analysis and reports
A. Bussay, A. Ceglar, L. Seguini

Reporting support
G. Mulhern

Editing
B. Baruth, M. Van den Berg, S. Niemeyer

Data production
MARS Unit AGRI4CAST/JRC, Alterra (NL), Meteogroup (NL), VITO (BE) and CMCC (IT)

Contact
JRC–IES-MARS / AGRI4CAST
info-agri4cast@jrc.ec.europa.eu

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Technical note:
The long-term average (LTA) used within this bulletin as a reference is based on an archive of data covering 1975-2015.