Yield forecasts for winter crops and spring barley are currently close to the average and depend largely on the weather conditions of the coming weeks. A heatwave could greatly reduce yield expectations. Summer crops are currently exposed to water stress and some rain is needed to sustain their vegetative growth.

The period of analysis was characterised by a mild and humid winter, which lasted until the beginning of April when the persisting snow cover melted. Since then, exceptionally dry and warm weather has prevailed and only a few downpours were observed at the end of May when temperatures returned to seasonal values. The impact of the dry conditions on winter crop and spring barley growth was limited but the long dry period reduced the crops’ access to nitrogen. Consequently, the yields of winter cereals and spring barley are forecast to be lower than last year, and relatively close to the last five-year average. Following the dry conditions observed in April and May, a heatwave in June would reduce crop yields because of high crop canopy temperatures and a shortening of the grain-filling stage. If temperatures are above the long-term average, the yield forecast will be lowered. The growth of grain maize, sunflower and soybean also depend on the weather in the coming weeks, as the upper soil horizons are particularly dry.
1. Meteorological overview

This cropping season has been characterised by a mild but prolonged winter, with snow cover persisting until the beginning of April across large areas. April and May have been exceptionally warm and dry.

This winter was characterised by mild and humid weather. Temperatures and precipitation remained largely above the average and the snow cover melted relatively late, in the first days of April, because of two cold spells observed at the beginning and end of March, which brought more snow. March was particularly rainy and snowy, so cumulative rainfall since December was largely above the average in all regions, replenishing soil water reserves before spring started.

In April and May, weather conditions contrasted with those observed this winter. Rainfall was largely below the average and a long period without rain was observed in April. Temperatures remained well above the average: according to our meteorological database, April and May have been among the driest and warmest months observed since 1976. Temperatures went back to seasonal values in mid-May and thunderstorms brought a few significant rainfall events.
2. Crop growth conditions

2.1 Winter crops

Winter wheat and winter barley conditions are currently good despite a long period without significant rainfall. Dry conditions have had a limited impact on crop growth so far, an eventual heatwave in June would reduce yields.

Winter wheat and winter barley, while emerging from dormancy relatively late because of the prolonged winter, had one of their highest survival rates observed in Ukraine as a result of the mild temperatures and the thick snow cover. While early April crop development was delayed because of the snow cover observed in March, the above-average temperatures observed in April and May accelerated crop development. Winter wheat and winter barley are therefore currently advanced compared with an average year. Winter wheat is at the flowering stage in southern oblasts and is starting flowering in northern oblasts. Winter barley has already entered the grain-filling stage, which is notably earlier compared with an average year.

Water stress impacted the biomass formation mostly in southern oblasts, particularly Khersons’ka, where the soil water holding capacity is also lower. In general, the long period without rain did not severely affect winter crops, as the roots were well developed, which allowed the crop to take up water from deeper in the soil. The precipitation observed in March has been beneficial, providing enough water for winter crops. By contrast, the efficiency of fertilizers was limited by the prolonged dry weather observed in April, a critical period corresponding to the vegetative growth where crops needs most of their nitrogen. Yields are projected to be below those of the record year (2016) and slightly below last year’s, based on the late start of spring. The reduced nitrogen efficiency, as well as a few areas being impacted by the dry conditions. Nevertheless, the weather conditions in June will be crucial for the final yield, particularly considering that the soils are dry, which might increase crop canopy temperatures and, in the event of a heatwave, will reduce yields because of a shortening of the grain-filling period.
2.2 Spring and summer crops

The late start of spring delayed the early sowing of spring barley. The warm and dry conditions observed in April and May allowed the timely sowing of grain maize, sunflower and soybean. Spring barley growth was slightly affected by dry conditions in May, while rainfall will be needed in the coming weeks to sustain sunflower, grain maize and soybean growth.

The late start of spring delayed the early sowing of spring barley — which usually commences in mid-March — by about 20 days. The warm and dry conditions observed in April allowed farmers to complete the spring barley sowing at a fast pace. The precipitation observed in March, plus the snow that melted at the beginning of April, replenished the soil, providing enough water to the crops during the early vegetative growth stage. Nevertheless, dry conditions in April and May have affected growth in that month, as reflected by the simulated Leaf Area Index. The exceptionally warm temperatures in April and May accelerated crop development, which is considerably advanced compared with a normal year. The unevenly distributed rainfall observed at the end of May allowed spring barley to recover locally. However, conditions are expected to be highly heterogeneous; fields that did not receive adequate rainfall will be in poor conditions.

The prolonged warm and dry conditions observed in April and May were favourable for sowing grain maize, sunflower and soybean. Most of the sowing was accomplished on time, which is slightly earlier than last year. The little rainfall observed towards the end of May in the southern oblasts, for example in Zaporiz'ka, allowed crops to emerge. However, conditions in central and northern Ukraine are of concern, as soil moisture is very low for the start of the season. The upper part of the soil is dry and more rain will be needed for the summer crops to continue their growth in good conditions.
3. Remote sensing maps

Data source: MARS remote sensing database / fAPAR smoothed - METOP AVHRR
Mask: arable land based on Glob Cover 2009
4. Crop yield forecasts

<table>
<thead>
<tr>
<th>Country</th>
<th>Crop</th>
<th>Yield (t/ha)</th>
<th>Avg 5yrs</th>
<th>2017</th>
<th>MARS 2018 forecasts</th>
<th>%18/5yrs</th>
<th>%18/17</th>
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</table>

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 10 kg.
2018 yields come from the MARS Crop Yield Forecasting System (CGMS output up to 10/06/2018).
5. Atlas
The current JRC MARS Bulletin – Crop monitoring European Neighbourhood is a JRC – EC publication from AGRi4CAST (JRC/DS unit – Directorate of Sustainable Resources).

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MARS stands for Monitoring Agricultural Resources

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