Good yield outlook for summer crops despite rain deficit

The favourable cropping season for winter and spring cereals concluded with very high yields. Summer crop yields are also expected to be high and close to records. Grain maize yield has been impacted by late sowing and dry conditions in central Ukraine; nevertheless, yield forecasts are largely above average.

The grain filling of winter and spring cereals occurred within the optimal temperature window to ensure good yields, which is confirmed by first reports. The cropping season for winter wheat, winter barley and spring barley ended with very high yields. This summer was marked by a rain deficit which started in June in central Ukraine, where most of the grain maize is produced. In those regions, sunflowers benefited from very good conditions. Soybean yield is also expected to be close to last year’s record, sustained by good conditions in westernmost oblasts and by irrigated soybean in Kherson’ska.

**Ukraine yield forecasts - September 2019 Bulletin**

<table>
<thead>
<tr>
<th>Crop</th>
<th>Avg 5yrs</th>
<th>2018</th>
<th>MARS 2019 forecasts</th>
<th>%19/5yrs</th>
<th>%19/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>wheat</td>
<td>3.98</td>
<td>3.73</td>
<td>4.02</td>
<td>+0.9</td>
<td>+7.7</td>
</tr>
<tr>
<td>barley</td>
<td>3.10</td>
<td>2.96</td>
<td>3.22</td>
<td>+3.8</td>
<td>+8.9</td>
</tr>
<tr>
<td>winter barley</td>
<td>3.31</td>
<td>3.35</td>
<td>3.53</td>
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<td>+5.4</td>
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<td>7.84</td>
<td>7.26</td>
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<td>sunflower</td>
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Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 10 kg

Sources: 2014-2018 data come from State Statistics Service of Ukraine
2019 yields come from the MARS Crop Yield Forecasting System (CGMS output up to 31/08/2019)
Meteorological overview

The period of analysis was marked by a substantial rain deficit in central and northern Ukraine, the main producing oblasts for grain maize. The thermal regime was unusual, with warm temperatures in June, a relatively mild July and first half of August, then warm weather observed at the end of the analysis period.

The rain deficit observed in central and western Ukraine, with less than 70% of the usual amount of rain, led to an exceptionally negative climatic water balance for the period of analysis. This year is ranked as the third driest in Chemihiv’ska, second in Poltav’ska, and fourth in Kyyiv’ska, Vinnyts’ka and most western oblasts, since 1979.

Southern and eastern oblasts had a rain surplus, mostly due to heavy downpours at the beginning of August in Kherson’ska, Zaporiz’ka and Donets’ka, but since mid-August, a dry period has been observed in all oblasts.

Temperatures were 4°C above seasonal values in June throughout Ukraine, while from the beginning of July to mid-August temperatures have been somewhat mild, with a significant drop in temperatures at the beginning of August. From mid-August, more typical summer temperatures re-established. Cumulative global radiation was 2-7% above average, with the highest surplus observed in western oblasts.
Crop growth conditions

Winter and spring cereals

*Frost damage during winter has been limited and spring started early; however, the rainy weather in the west of the country in May and the warm temperatures observed in June have had a somewhat limiting effect on yield. Nevertheless, yield forecasts for wheat, winter barley and spring barley are close to record highs.*

At the start of the analysis period, conditions of winter and spring crops were particularly good, due to an early start to re-growth thanks to above-average temperatures observed in February and March, substantial spring rainfall, and cumulative radiation close to the average in most regions.

The warm weather observed in June happened during the grain-filling period for winter soft wheat. Consequently, the whole grain filling of wheat occurred while temperatures were 4°C above average. Nevertheless, those temperatures remained close to optimal, even in the warmer oblasts and main producing ones located in southern and eastern Ukraine. Thus, conditions during grain filling have been favourable. The main limiting conditions for winter and spring cereals, especially impacting winter soft wheat, have been disease pressure due to the substantial rainfall observed in April and May, as relatively mild and above-average temperatures increased humidity and thus disease pressure in central and western oblasts.

Winter barley was less exposed to diseases, as the main producing regions are Odes’ka and Mykolayivs’ka. In Odes’ka, a rain deficit was observed early spring which substantially impacted winter barley yields, but, was largely compensated by good conditions elsewhere.

The preliminary statistics for winter barley show a record high yield, while winter wheat is expected to be at the same level as the top record in 2016. Spring barley yield is also close to the top record.
Summer crops

The dry conditions observed this summer in central Ukraine had a slight negative impact on grain maize yield. Negative impacts on soybean occurred to a lesser extent, as part of the cultivated area is located in western oblasts, compensating for estimated losses in the central oblast. Sunflower yield is also expected to be close to the record high, as dry conditions in central Ukraine had little to no negative effect.

While sowing delays were observed at the beginning of the season due to heavy rainfall in western Ukraine and part of the central oblasts, warm temperatures and high soil moisture—thanks to the rainfall in May and June—have been favourable at the start of the season. The dry conditions due to the rain deficit observed since June in central Ukraine had a negative impact, mostly on grain maize and to a lower extent on soybean. The impact of the dry conditions was exacerbated by the delays observed in the sowing of grain maize. Grain maize yield is still forecast higher than average, but largely below the record high of last year.

Soybean is cultivated to a large extent in central Ukraine but also in western oblasts, and was thus less exposed to the dry conditions. The yield forecast is lower than last year’s top record but very close to it. At national scale, soybean yield is also sustained by irrigated soybean in Khersons’ka.

Sunflowers benefited from very good conditions, the main producing oblasts being located in the east and south (the steppe zone), where a rain surplus was observed rather than a deficit and sowing was not delayed. Dry conditions in central Ukraine had little to no negative effect, and very high yields are expected. The intense rainfall observed at the beginning of August in southern and eastern oblasts was not harmful to the plants, radiation was slightly above average, and a dry weather spell at the end of August and beginning of September favoured ripening, avoiding any losses.
Remote sensing map

Cumulated fAPAR anomalies from 1 June to 31 August show a slight positive anomaly throughout Ukraine, except in Odes’ka and Kharkivs’ka. Those negative anomalies relate to an exceptional rain deficit observed this spring, exacerbated by above-average temperatures in June.

The map displays the differences between the fraction of Absorbed Photosynthetically Active Radiation (fAPAR) cumulated from 1 June to 31 August 2019 and the short-term average (STA, 2014-2018) for the same period. Positive anomalies (in green) reflect above-average biomass accumulation or early crop development while negative anomalies (in red) reflect below-average biomass accumulation or late crop development.

Crop yield forecasts

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The current JRC MARS Bulletin – Crop monitoring European Neighbourhood is a JRC – EC publication from AGRI4CAST (JRC/DS unit – Directorate of Sustainable Resources)

MARS Bulletins are available under: https://ec.europa.eu/jrc/en/mars/bulletins

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MARS stands for Monitoring Agricultural Resources

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