



JRC MARS Bulletin - Global outlook 2021

Crop monitoring European neighbourhood

Ukraine

September 2021

Positive yield outlook for summer crops

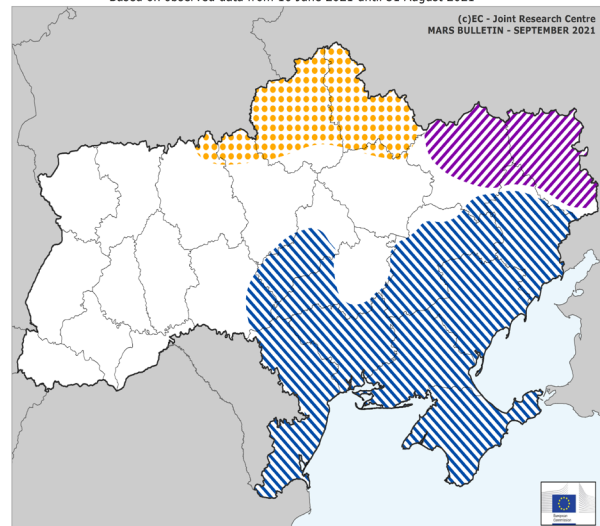
The crop year was characterised by a difficult start, due to dry and warm conditions during sowing in the autumn of 2020. However, the favourable conditions for the rest of the season allowed most winter crops to achieve new record yields, despite the adverse weather in June as highlighted in the previous Bulletin.

In the current analysis period (10 June – 10 September), the rain surplus in the southern and some of the central parts of Ukraine delayed the harvest of winter crops and is expected to have compromised grain quality.

The warmer-than-usual conditions during July were not harmful to the grain maize crop, but the heatwave that occurred in the north-eastern part reduced the yield potential for sunflowers. The yield outlook for summer crops remains positive overall: above-average yields are expected for sunflowers and soybean, while a high yield is forecast for grain maize.

AREAS OF CONCERN - EXTREME WEATHER EVENTS

Based on observed data from 10 June 2021 until 31 August 2021



Rain surplus
 Heat wave
 Temperature surplus

Yield forecasts for Ukraine - September 2021 Bulletin

Crop	Yield (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
Wheat	4.00	3.80	4.64	+ 16	+ 22
Barley	3.25	3.22	3.77	+ 16	+ 17
Winter barley	3.47	3.27	4.40	+ 27	+ 35
Spring barley	3.11	3.18	3.27	+ 5.3	+ 2.9
Grain maize	6.52	5.62	7.65	+ 17	+ 36
Sunflower	2.22	2.02	2.26	+ 1.7	+ 12
Soybean	2.25	2.05	2.32	+ 3.0	+ 13
Rapeseed	2.56	2.30	2.79	+ 9.1	+ 21

NB: Yields are forecast for crops with more than 10 000 ha per country.
2016-2020 data come from FAO and Ministry for Development of Economy, Trade and Agriculture of Ukraine.
2021 yields come from MARS Crop Yield Forecasting System (output up to 10.09.2021).
The column header '%21/5yrs' stands for the 2021 change with respect to the 5-year average (%). Similarly, '%21/20' stands for the 2021 change with respect to 2020 (%).

Meteorological Overview

The summer (June-July-August) was characterised by record high levels of precipitation in Ukraine. The presence of abundant rainfall was combined with a slightly positive thermal anomaly for most of the country.

June

- Abundant and frequent rainfall prevailed during the first two dekads, locally exceeding double the long-term average (LTA) in southern and eastern parts of the country.
- A rain deficit was observed in the west of the country (*Zhytomir's'ka*, *Rivnens'ka* and *Volyns'ka* oblasts), locally up to 80% below the LTA.
- Colder-than-usual conditions prevailed in the south, while slightly warmer-than-usual temperatures were registered in the north.
- A moderate heatwave occurred in late June, but the daily maxima rarely exceeded 35 °C.

July

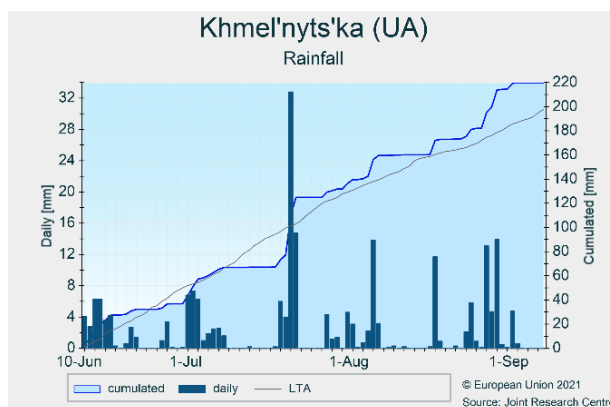
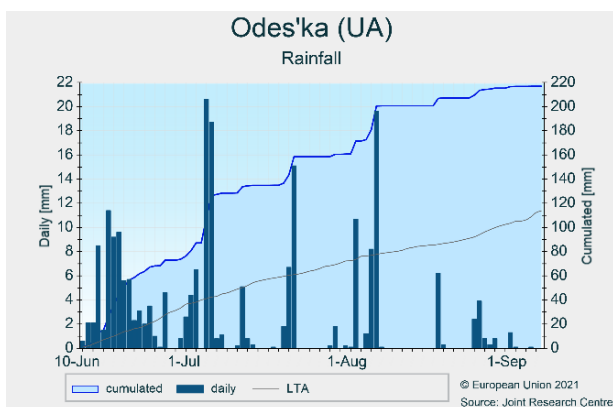
- For the first time since 2012, significantly (2-4 °C) warmer-than-usual temperatures prevailed during the entire month, especially in the northern half of the country.
- The highest temperatures recorded were between 35 °C and 38 °C in the east and in the north-west, while temperatures of 38-40 °C were recorded around 19 July in the easternmost part of the country. Nevertheless, daily minima were rarely above 20 °C.

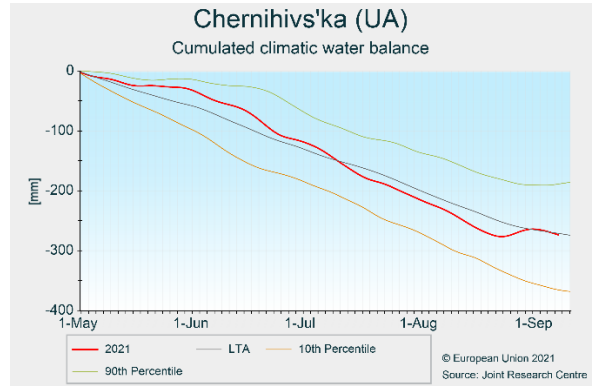
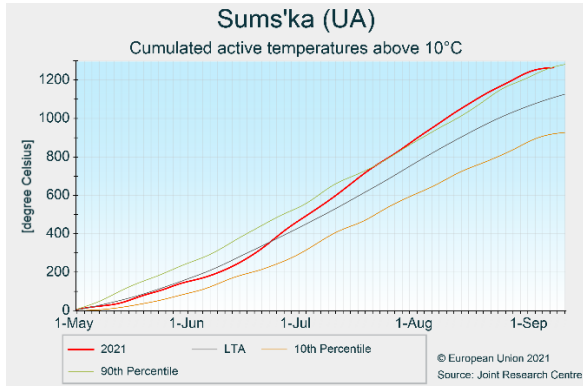
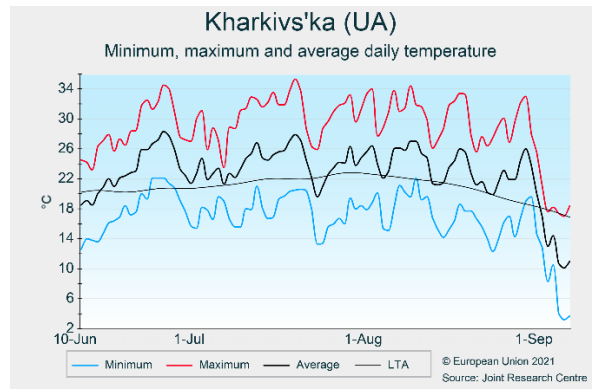
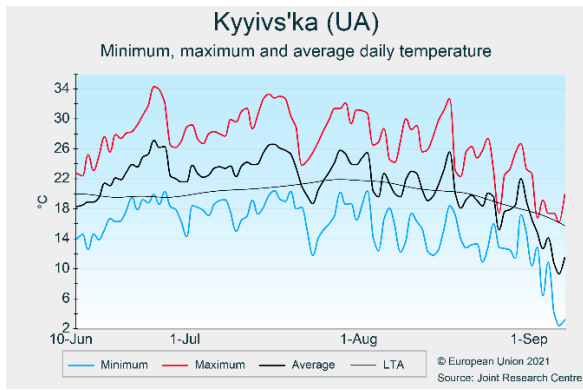
- The south continued to experience wetter-than-usual conditions, while most of the country registered average to slightly below-average rainfall, allowing sufficient soil moisture levels to be maintained for the growth of summer crops.
- A moderate to locally severe rain deficit was observed in the east, in the oblast of *Kharkivs'ka* and parts of *Sums'ka*.

August

- Abundant rainfall favoured the north-western and the south-eastern part of the country. In the rest of the country, precipitation levels were around to moderately below the LTA.
- A negative thermal anomaly (2 °C below the LTA) characterised the western half of Ukraine. Meanwhile, warmer-than-usual conditions prevailed in the eastern half, especially near the Russian border (*Luhans'ka* and *Kharkivs'ka* oblasts), where temperatures were locally up to 4 °C above the LTA.

Since **early September**, a significant drop in temperature has been observed, combined with drier-than-usual conditions.

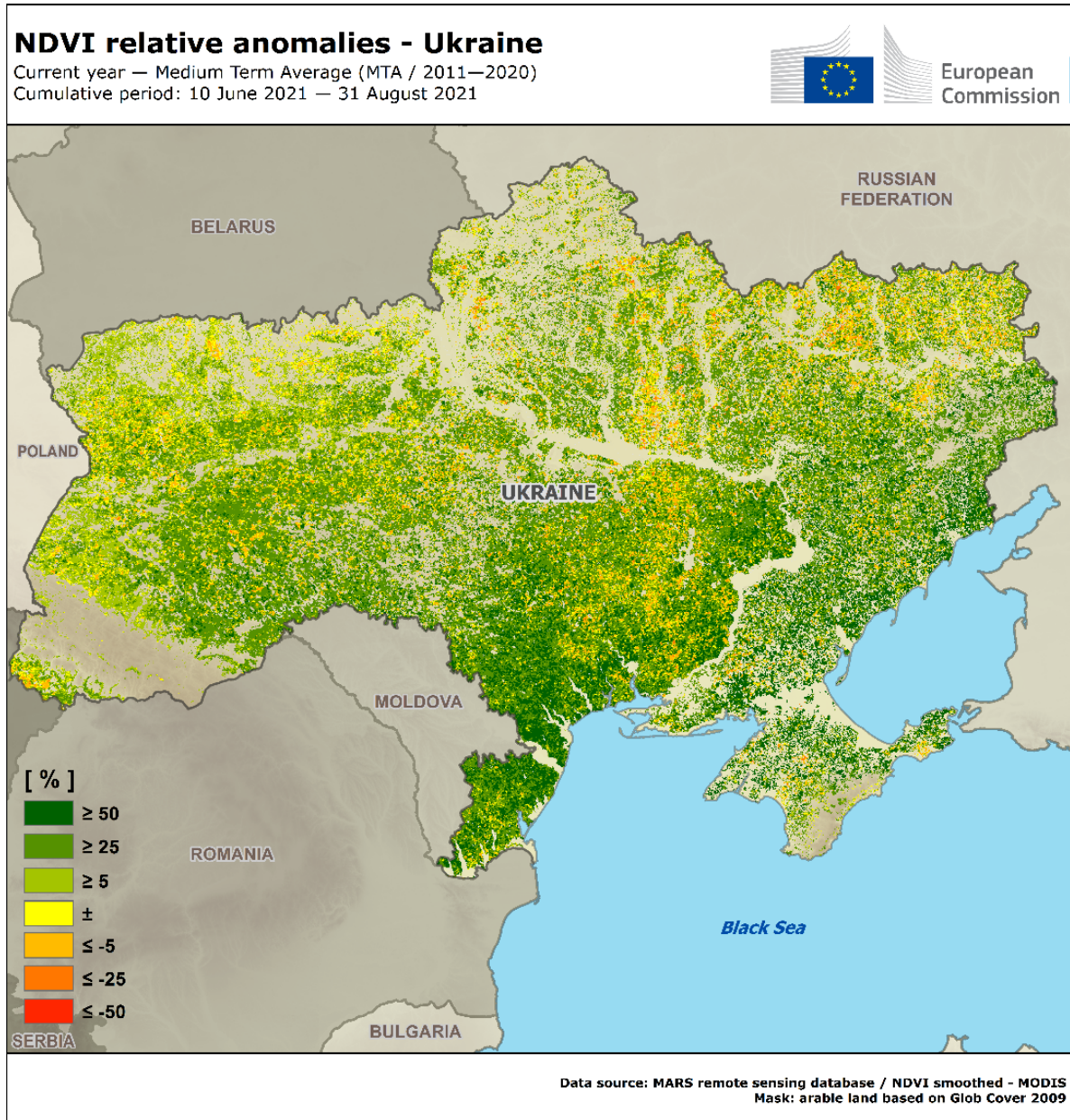




Crop canopy conditions

The map as a whole shows positive anomalies throughout the country, reflecting excellent outlooks for both winter and summer crops. Less positive conditions are only observed in the most north-eastern regions (yellow shades on the map), where crops suffered from warm weather during grain filling and maturing stages.

Southern oblasts, where there is a prevalence of winter crops, benefited from mild and wet weather throughout the season. In western oblasts, mainly producing summer crops, biomass accumulation recovered well after a delayed start to the season, reaching above-average to significantly above-average values.



The map displays the differences between the Normalized Difference Vegetation Index (NDVI) cumulated from 10 June to 31 August 2021 and the medium-term average (MTA, 2011-2020) for the same period. Positive anomalies (in green) reflect above-average canopy density or early crop development while negative anomalies (in red) reflect below-average biomass accumulation or late crop development.

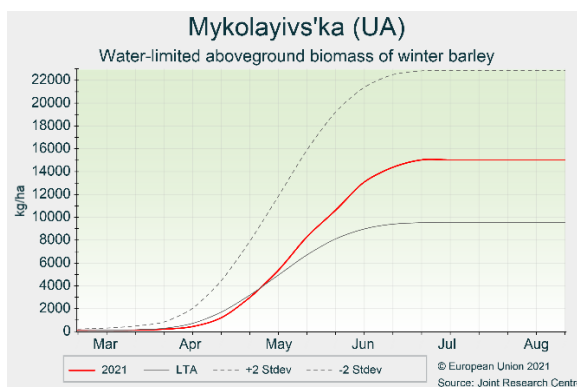
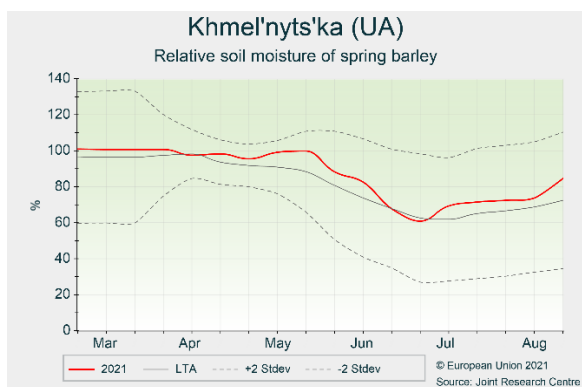
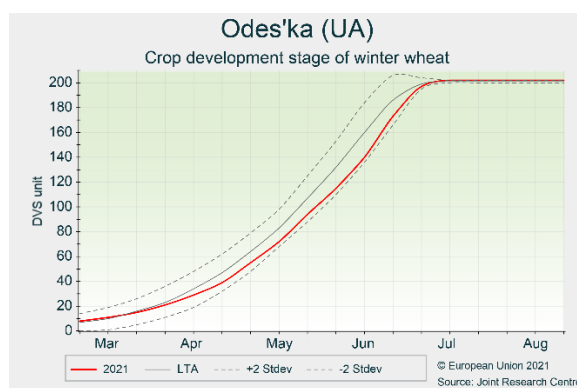
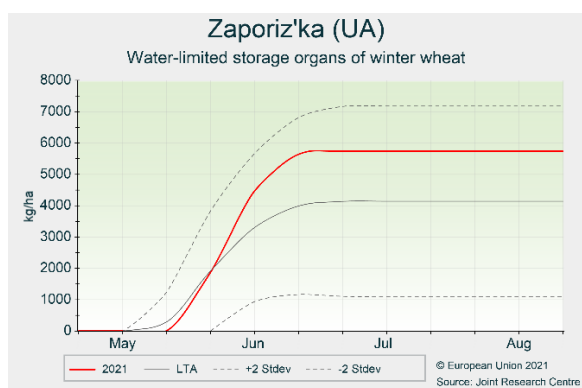
Crop growth conditions

Winter and spring crops

Wet weather during grain filling may have affected the grain quality of winter wheat, whereas winter barley benefited from cooler and more favourable conditions during grain filling. Adequate rainfall distribution sustained relatively good growth of spring barley. The yield outlook remains largely positive for rapeseed, and significantly above the trend for wheat and barley.

- o Agrometeorological conditions until May were favourable for biomass accumulation of winter cereals.
 - o The warm weather registered from mid-June until the end of July accelerated the development of winter and spring cereals, which had been slightly delayed until early June. Winter and spring cereals reached maturity close to the normal time. The impact of the hot July temperatures on yields was limited due to the advanced stage of grain filling.
- However, frequent precipitation and stormy weather observed in June and the beginning of July, in the southern areas where wheat is largely cultivated, are expected to locally have a negative impact on wheat grain quality.
- o For winter barley, in the main producing regions, conditions were generally favourable during grain filling.
- Spring barley, cultivated more in the north-east, benefited

- o from the less abundant rainfall pattern. The decreased soil moisture shown by our models in some areas in the north had a limited impact on growth and biomass, and yields are maintained above the trend.
- o The western regions were particularly affected in August by the rainy weather, which caused delays to the harvest of winter cereals; it was mainly completed by the end of August and high yields are confirmed. Hence, the national yield forecast for winter cereals remains practically unchanged and significantly above the trend. Rapeseed yields were revised upward compared with our forecast in June.
- o The conditions prevailing since early September have allowed a rapid start to the sowing of the new season winter crops, under good soil moisture supply, in the southern part of the country.



Summer crops

Sowings of summer crops were delayed compared with the previous season, due to the abundant rainfall observed in the spring. The lower-than-usual temperatures until mid-June delayed crop development. Nevertheless, the overall warmer-than-usual conditions of the summer allowed early development of maize and sunflowers, according to our crop model. Despite the temperature surplus, especially in July, high yields are expected thanks to the sufficient availability of water supply during the summer.

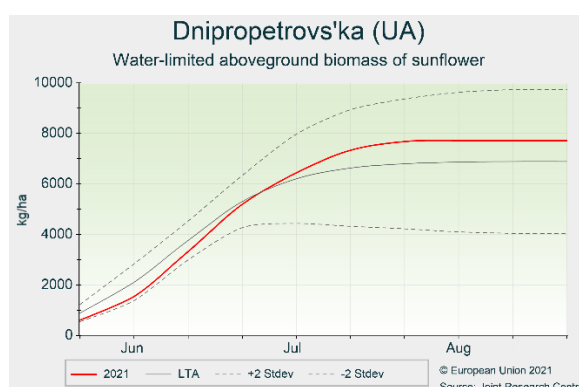
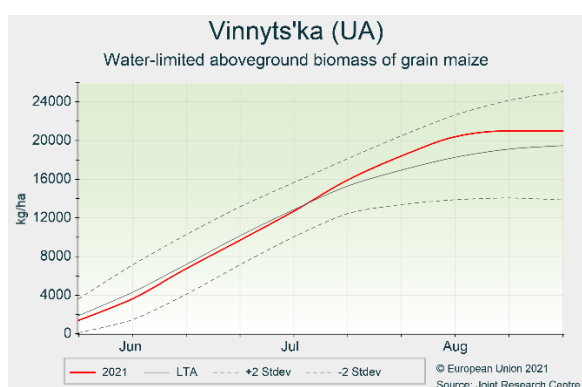
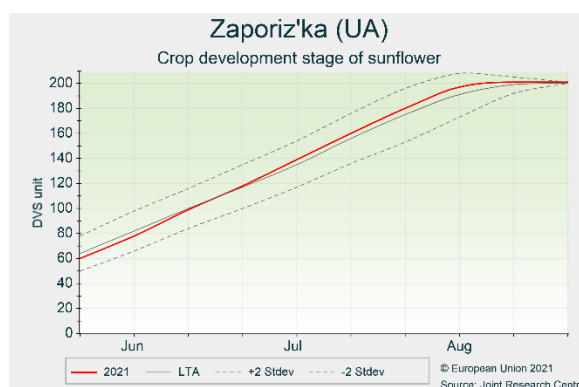
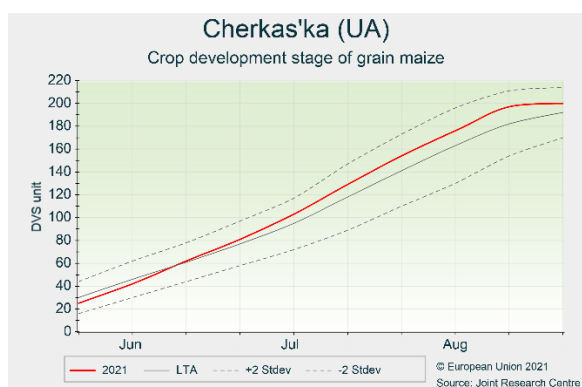
o Grain maize production is concentrated in the central and northernmost parts of Ukraine, which benefited from abundant rainfall from 1 May until 15 June. Average to slightly below-average precipitation was registered in July, especially in the oblasts of *Sums'ka* and *Poltavas'ka*, while August experienced wet conditions. As a result, grain maize was overall not exposed to any water stress throughout the entire crop season.

The positive thermal anomaly registered from mid-June until the end of July fully offset the delayed start to the season and enhanced biomass accumulation. According to our crop model, grain maize exhibits early development in most oblasts. The daily maxima rarely exceeded the critical threshold of 35 °C for summer crops, except in the oblast of *Kharkivs'ka*. Thus, the positive thermal anomaly is expected to have only a minor impact on flowering and grain filling. Consequently, the yield forecast was revised upward, significantly above the trend. The harvest has started slowly in the eastern part since early September,

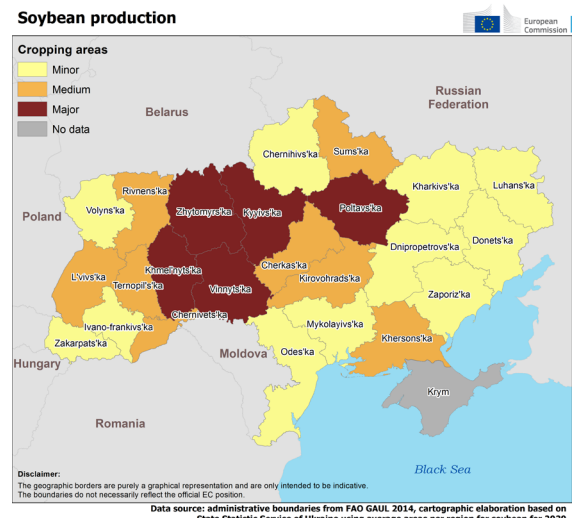
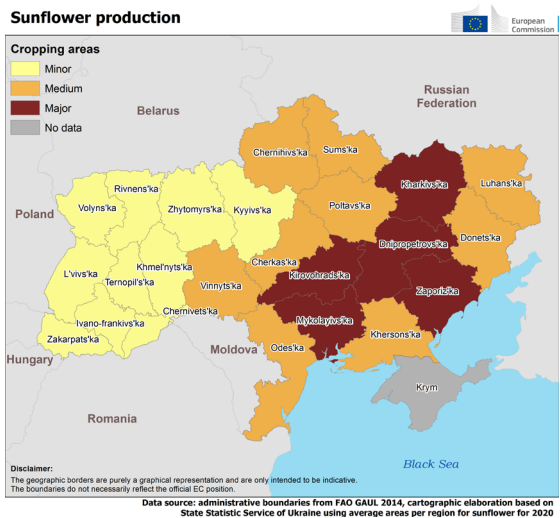
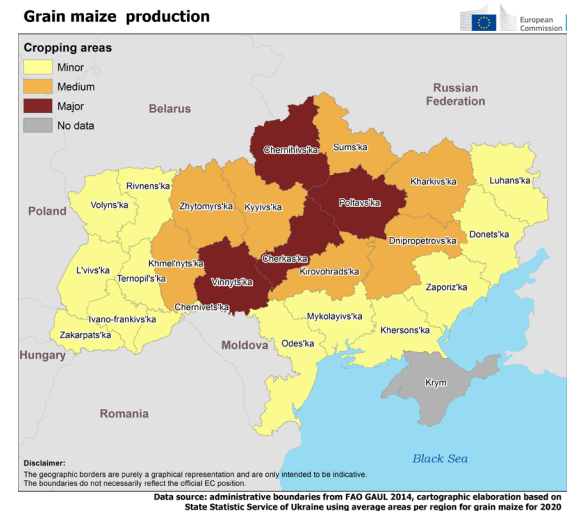
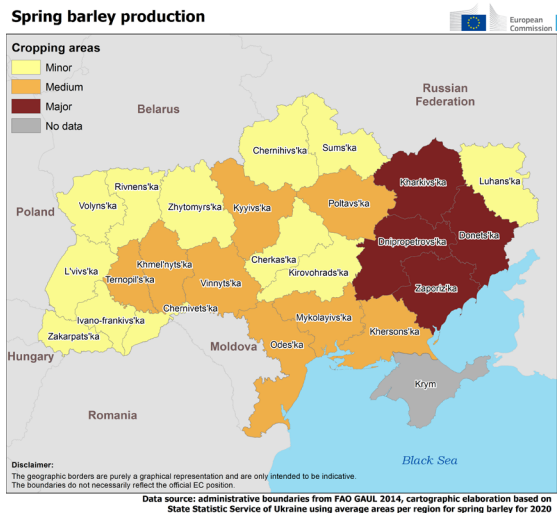
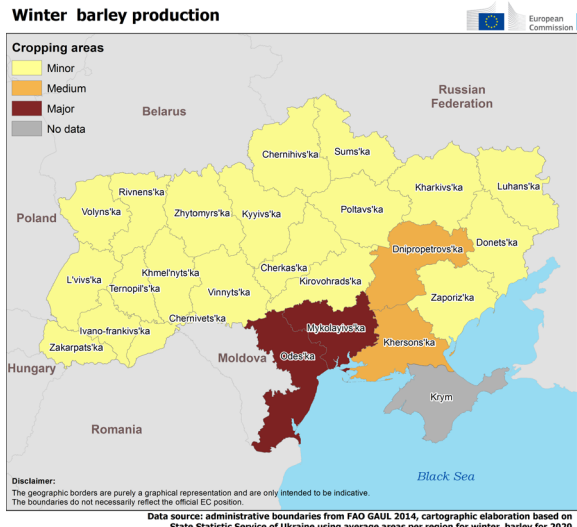
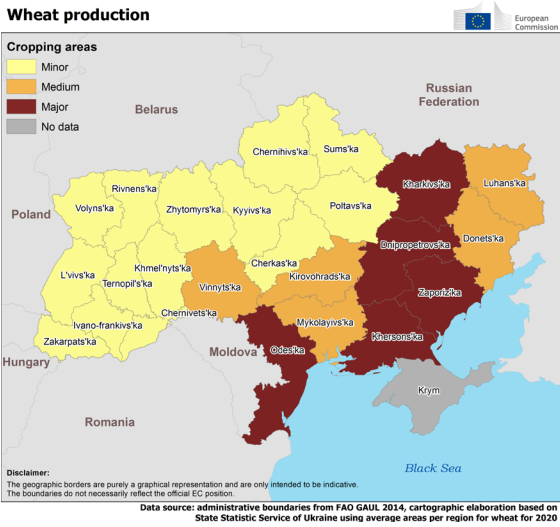
under good conditions. If conditions remain favourable, a new record high yield could be attained.

o Production of sunflower seeds is concentrated in the eastern and south-eastern parts of the country, where a heatwave was observed around mid-July. In parts of the oblasts of *Dnipropetrovs'ks*, *Luhans'ka* and *Kharkivs'ka*, the high temperature (up to 38-40 °C) is expected to have a negative impact on the yields. In the other producing areas, sunflowers have profited from the temperature surplus combined with the sufficient water availability. Overall, above-average yields are expected. However, the positive thermal anomaly may have negatively impacted the oil content.

o Soybean is mainly produced in the western half of Ukraine, where locally dry conditions prevailed in June and July. In August, wet conditions prevailed in the major producing areas, with slightly below-average temperatures. This allowed optimal grain-filling conditions and hence the forecast yield is above the average.



Main production areas



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The long-term average (LTA) used within this Bulletin as a reference is based on an archive of data covering 1991-2020.

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