European Commission

JRC MARS Bulletin global outlook

Crop monitoring European neighbourhood

Ukraine

September 2017

Positive yield outlook despite a difficult season

The yield outlook is positive in spite of the rain deficit observed this year. Winter wheat yield is forecast to be close to last year's record level, and total barley yield is at a level not seen since the high-yielding 1993 season. Grain maize yield is forecast to be slightly below the general trend because of the rain deficit. Only sunflower yield has been revised substantially downwards because of the high temperatures and the rain deficit observed in August in southern Ukraine.

While an exceptional rain deficit has been ongoing since the beginning of the year in central Ukraine and since May in southern and eastern Ukraine, the outlook for winter wheat, winter barley and spring barley is positive. The negative impact of the rain deficit on grain maize yield was limited, thanks to the chernozem soils and their high water retention capacity, which buffered the weather conditions and compensated for the lack of rain. The continuous hot temperatures observed in southern and eastern Ukraine had an adverse impact on sunflower yield. The yields of all major crops continue on an upward trend, despite the stable consumption of fertilisers since 2011, according to the International Fertilizer Association.

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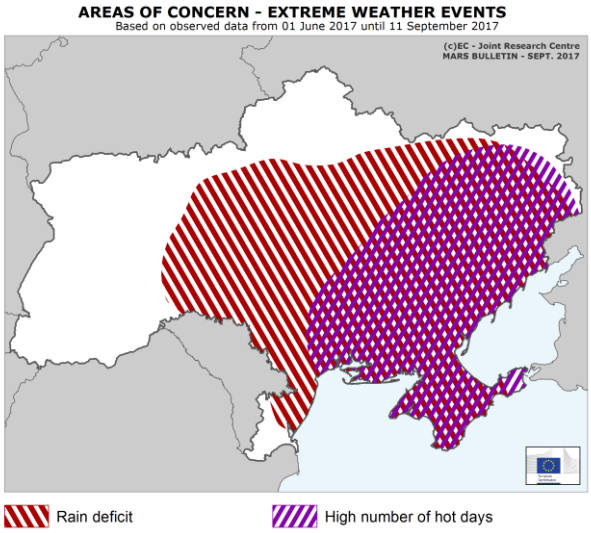
Covers the period from 1 June 2017 until 10 September 2017



Ukraine yield forecasts - September 2017 Bulletin

Country	Crop	Yield (t/ha)				
		Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Ukraine	wheat	3.69	4.21	**4.01**	+8.6	–4.8
	barley	2.73	3.30	**3.32**	+21	+0.5
	winter barley	3.00	3.61	**3.58**	+19	–0.9
	spring barley	2.61	3.13	**3.17**	+21	+1.2
	grain maize	5.84	6.60	**5.84**	+0.0	–11
	sunflower	2.04	2.24	**1.95**	–4.2	–13

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 10 kg

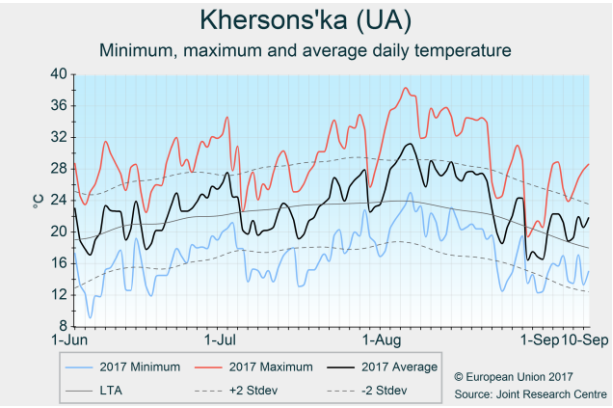
Sources: 2011-2015 data come from State Statistics Service of Ukraine, the Ministry of Agrarian Policy and USDA
2017 area copied from data of year 2016 published State Statistics Service of Ukraine
2017 yields come from the MARS Crop Yield Forecasting System (CGMS output up to 10/09/2017)

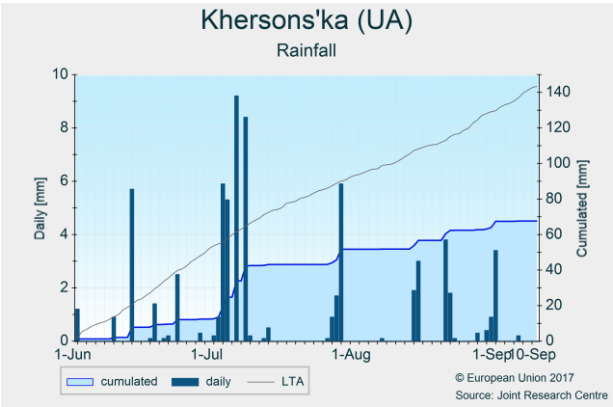
Joint Research Centre

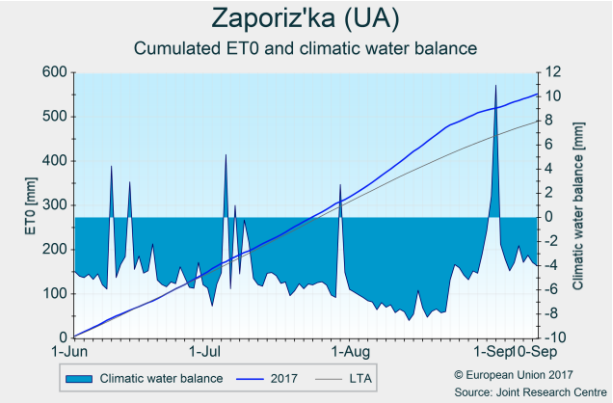
1. Meteorological overview

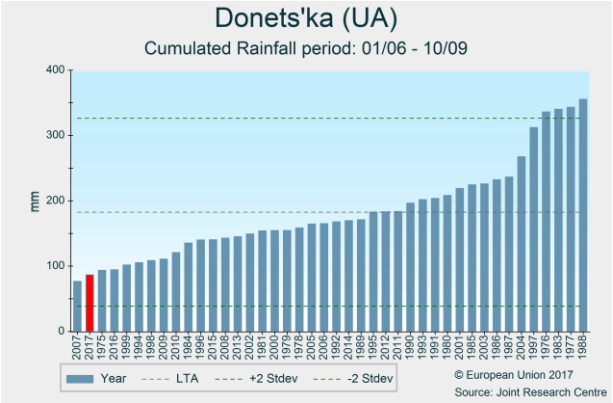
The weather conditions were particularly dry for the period under analysis, and, according to our database, the rain deficit is the largest recorded since 1976 in a majority of oblasts, thus prolonging the dry conditions observed this spring in central oblasts. Temperatures were close to average in June and July, but largely higher than average in August.

- Central and eastern oblasts received 40% to 50% less rainfall than the average from 1 June to 10 September, with the highest deficit being observed in eastern oblasts for the period under analysis: *Kehrsons'ka*, *Zaporiz'ka*, *Donets'ka* and *Kharkivs'ka*.
- Western-most and northern-most oblasts (*Chernihivs'ka* and *Sums'ka*) have received 25% less rainfall than the average since June.
- Only *Odes'ka* received a cumulative amount of rainfall close to average.
- While temperatures were close to average in June and July, August was particularly warm; a series of heatwaves was observed with maximum temperatures reaching 34 to 38°C during the first and second dekad of August.
- The climatic water balance has been continuously negative for the period under analysis, and evapotranspiration was largely above average in August as a consequence of the warm temperatures.









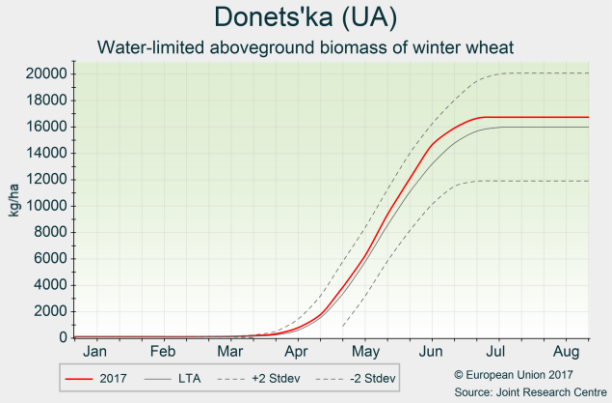
2. Crop growth conditions

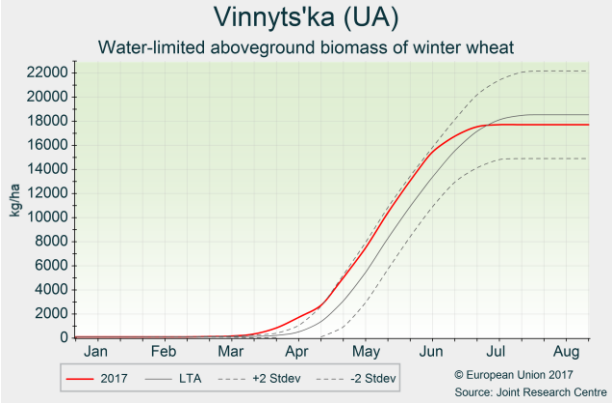
2.1 Winter crops

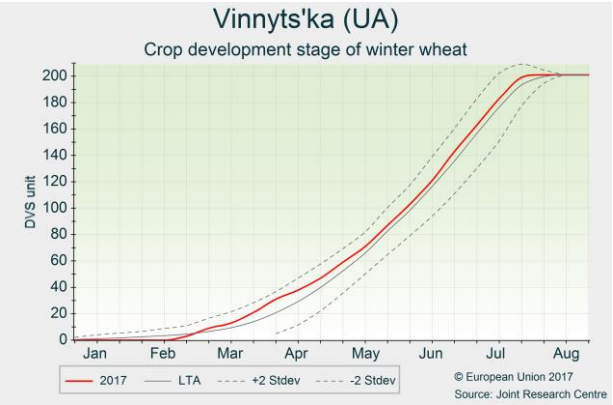
Weather conditions have been favourable for growing winter wheat and winter barley in the main producing regions of southern and eastern Ukraine. Only a small part of the cultivated area was exposed to the rain deficit observed during spring in central Ukraine. Therefore, yields are forecast to be only slightly below last year's record levels.

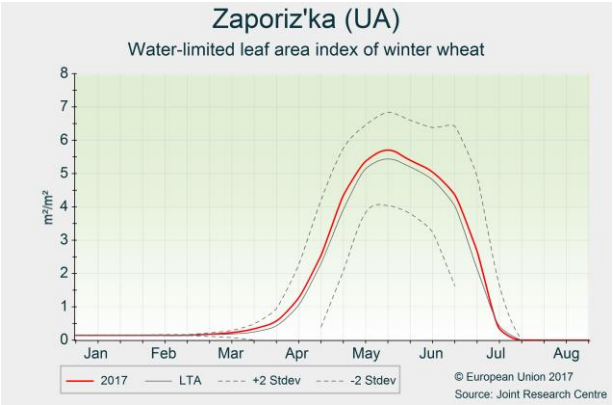
The rain deficit observed in the central oblasts since January impacted only a small part of the winter wheat and winter barley cultivated areas. These crops are mainly cultivated in southern and eastern oblasts where cumulative rainfall stayed close to average until end of April. The few rainfall events observed from May onwards, together with the close-to-average temperatures observed in June, have been favourable for the flowering and grain-filling phases of winter crops, leading to above-average simulated plant development as given by the LAI. As a consequence of the above-average temperatures observed in March and April, most of the winter crops were advanced and reached maturity earlier than they do in an average year (e.g. *Vinnyts'ka* oblast). Harvest conditions have been favourable and only a few rainfall events slightly delayed harvesting operations without having any consequences on the yields.

Winter wheat and winter barley yield forecasts are only slightly below last year's levels, as the rain deficit observed in central Ukraine has had a limited impact on winter cereal growth, thanks to the chernozem soils buffering the rain deficit.









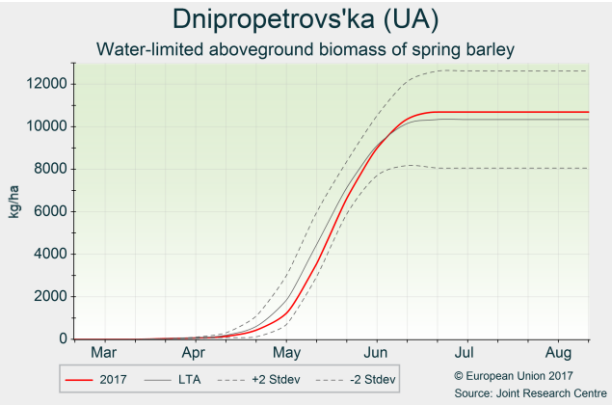
2.2 Spring and summer crops

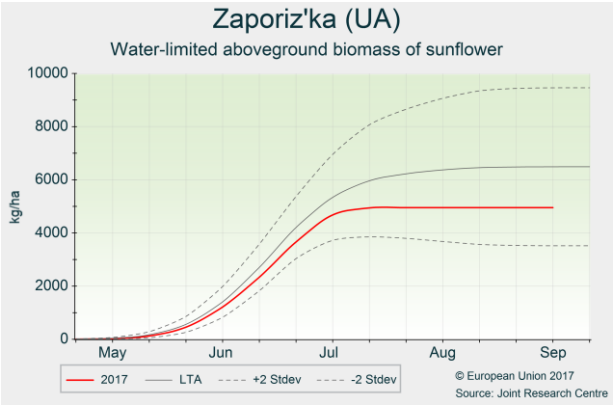
Weather conditions were favourable for growing spring barley so that the yield is forecast to be largely above average, whereas the main grain maize-producing regions have been exposed to an exceptional rain deficit. However, this seems to have had only a limited impact on yield expectations. Sunflower has been impacted by the exceptionally high temperatures observed in August, with a consequent yield forecast substantially lower than average.

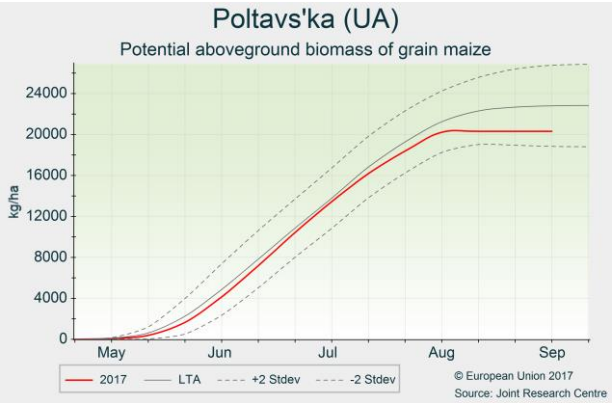
Spring barley benefited from good weather conditions: Sowing took place relatively early this year, and the above-average temperatures in March and April accelerated the vegetative development. The rain deficit observed in eastern and southern Ukraine occurred late in the barley season, from May onwards, and therefore did not impact yield. The close-to-average temperatures observed in May and June were favourable for the grain development. In consequence, yield is forecast to be largely above average, at a level not seen since 1993.

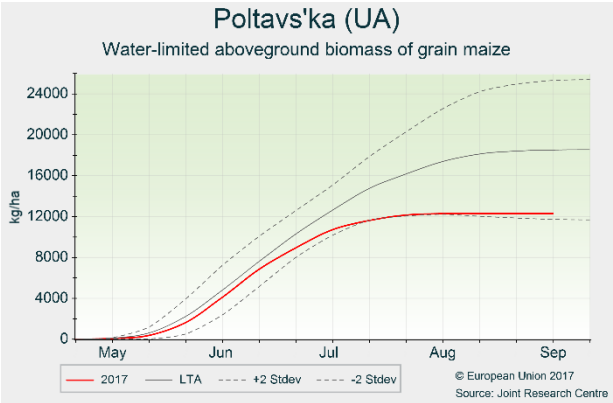
While a continuous rain deficit has been observed since the beginning of this year in the main grain maize-producing regions, remote sensing images show a slight positive anomaly in central Ukraine, contrasting with the negative pattern observed on crop model indicators. The discrepancy between the crop model and remote sensing information can be explained by the high water retention capacity of soils probably being underestimated by the crop model. The high summer temperatures and heat waves observed did not affect substantially maize, being as a C4 crop more tolerant to heat stress than sunflower. Considering the positive anomaly observed on remote sensing images, the yield forecast was maintained at the level of the five-year average, which, however, is substantially below last year's record yield and opposite to the general upward trend observed since 1997.

In August, sunflowers were exposed to several hot days with temperatures greater than 35°C. The negative anomaly observed on remote sensing images in southern and eastern Ukraine confirms the negative impact of the thermal conditions on sunflowers. Thus, considering also the rain deficit in central-south Ukraine, the yield forecast has been significantly revised downwards below the five-year average.

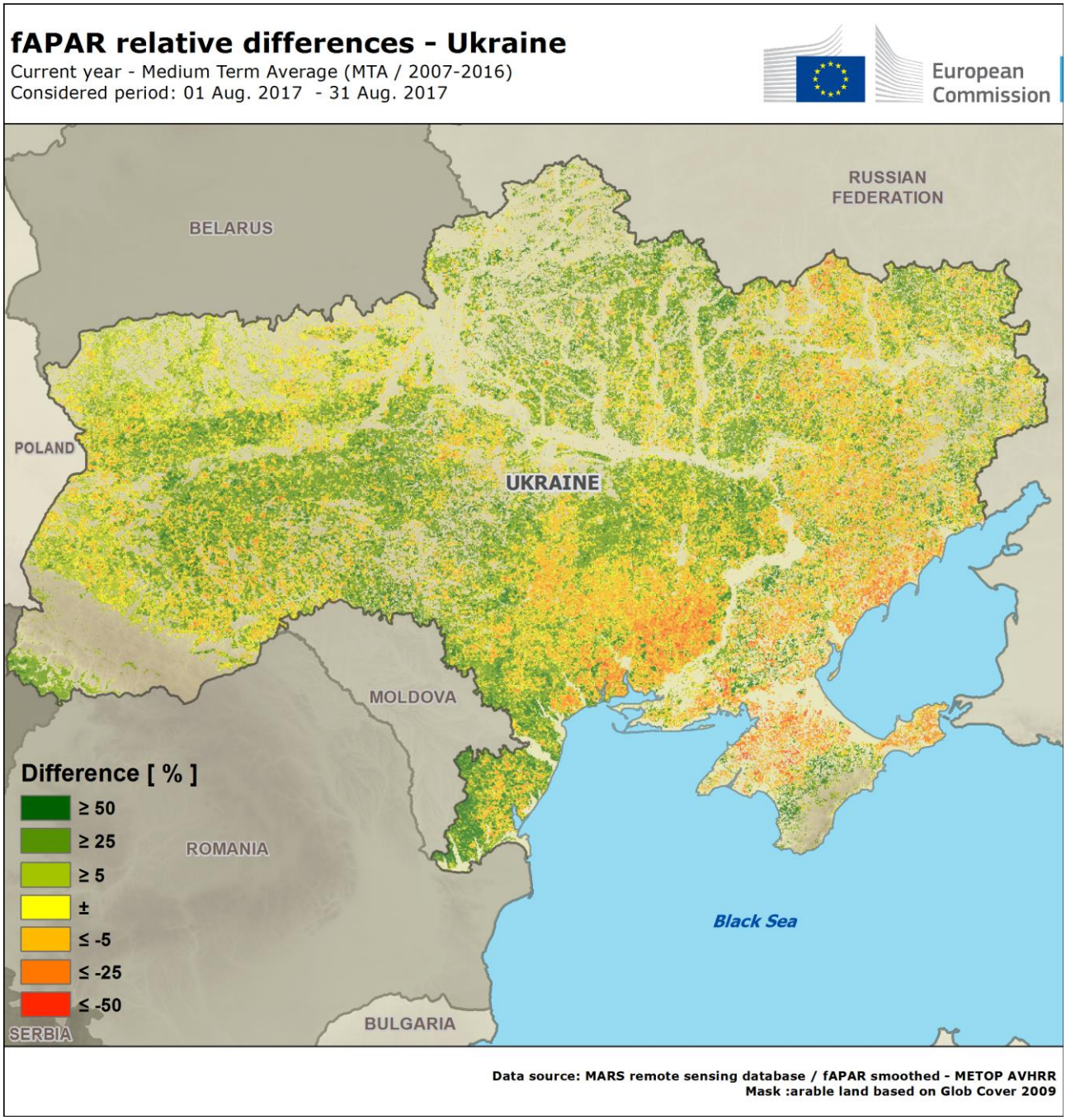






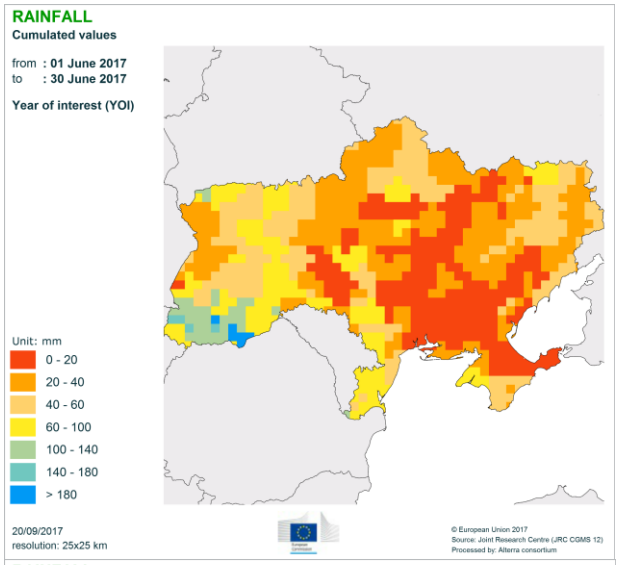


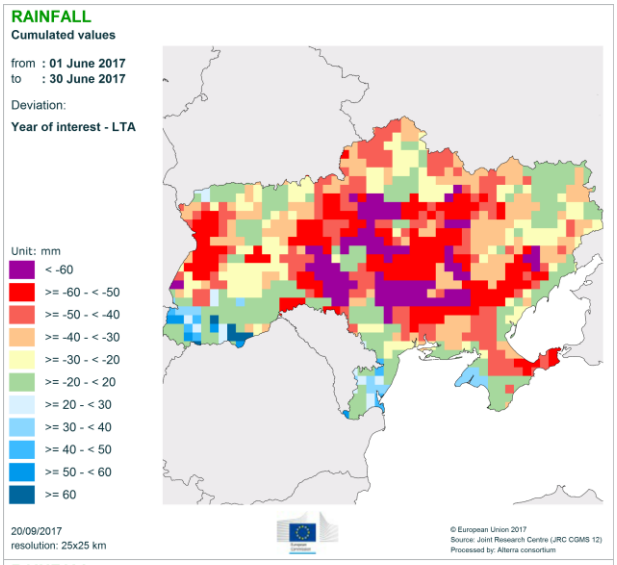
3. Remote sensing maps

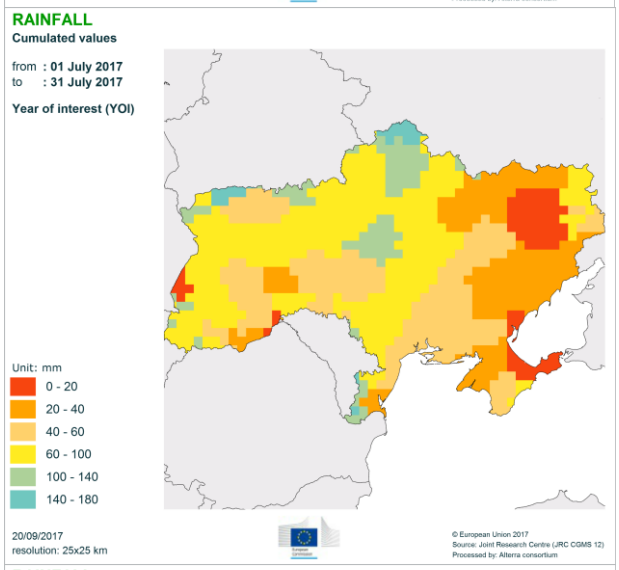


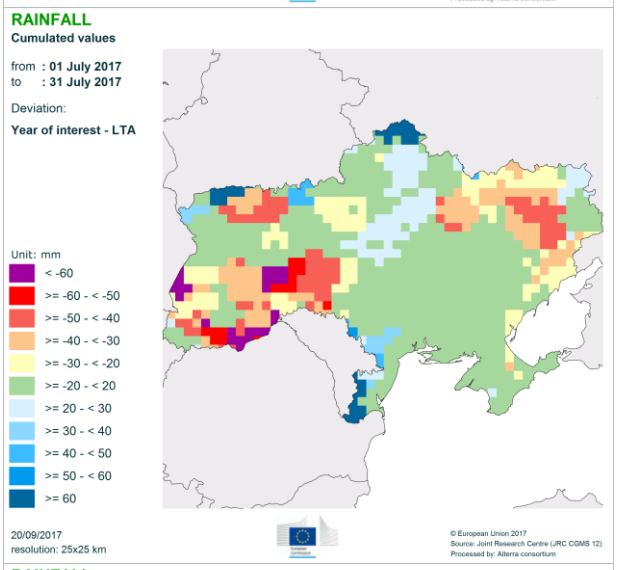
4. Atlas

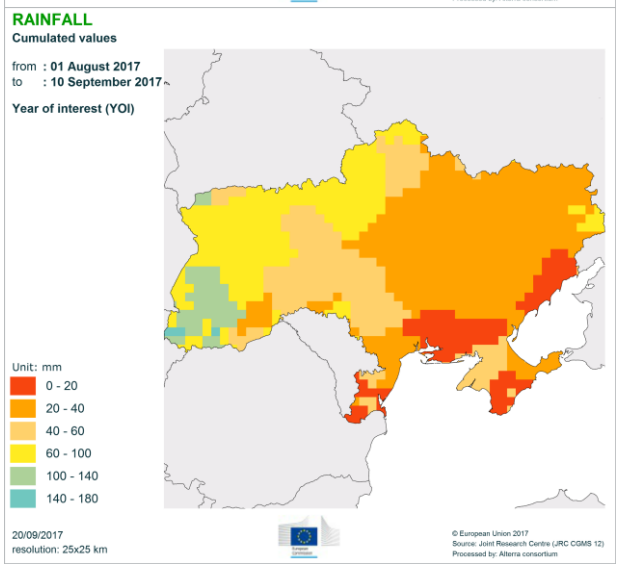
Precipitation

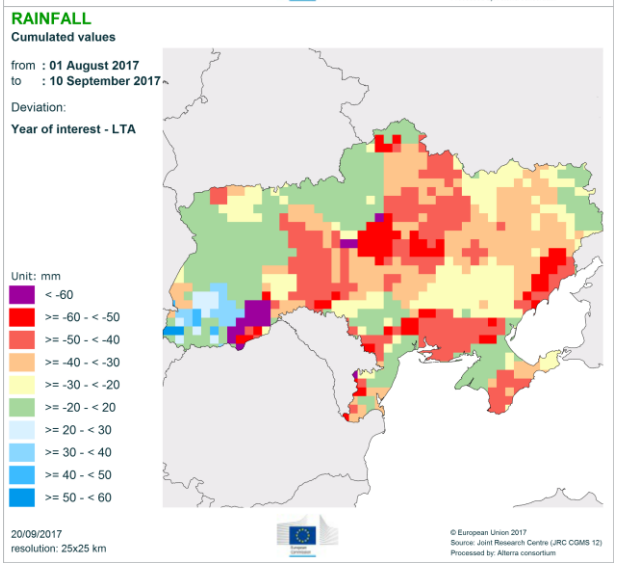




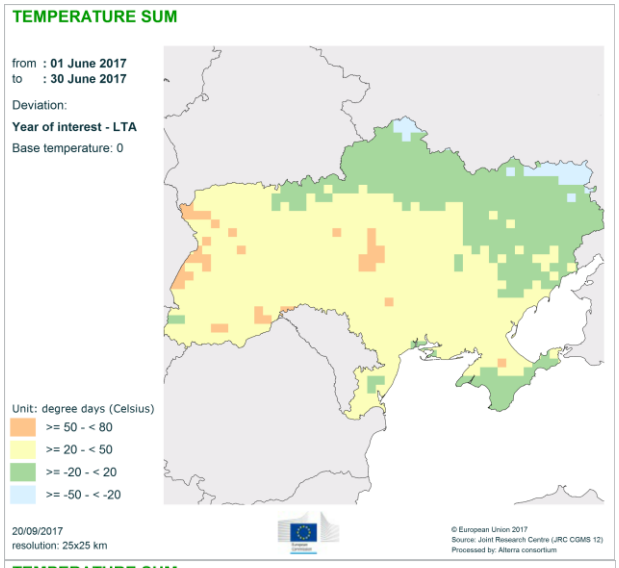


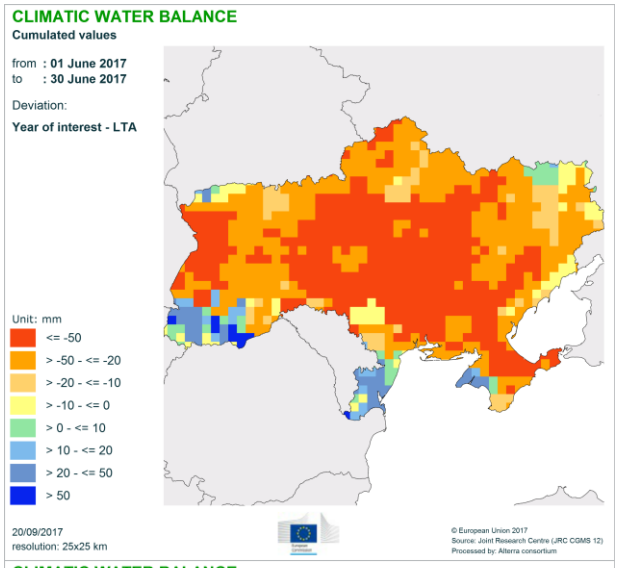


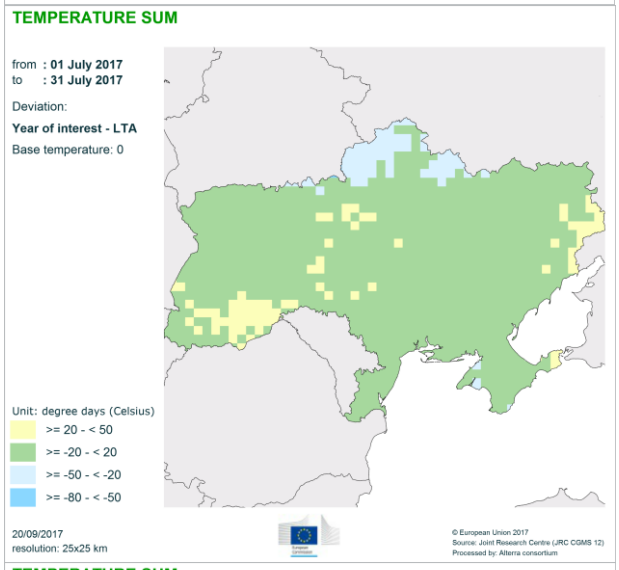


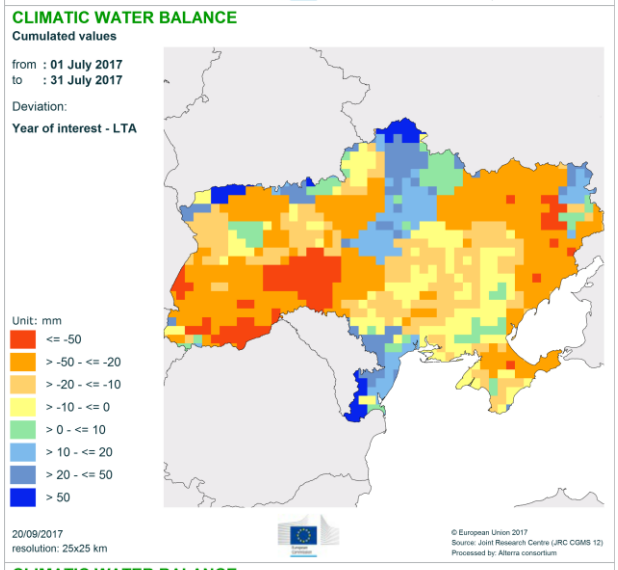


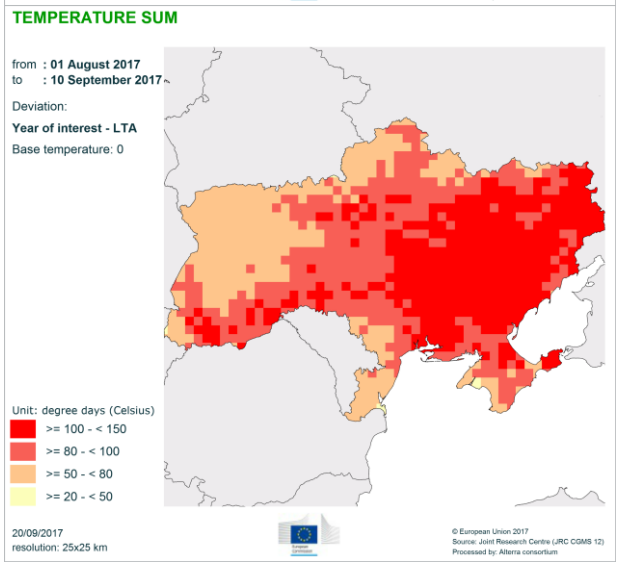
Temperature regime and climatic water balance

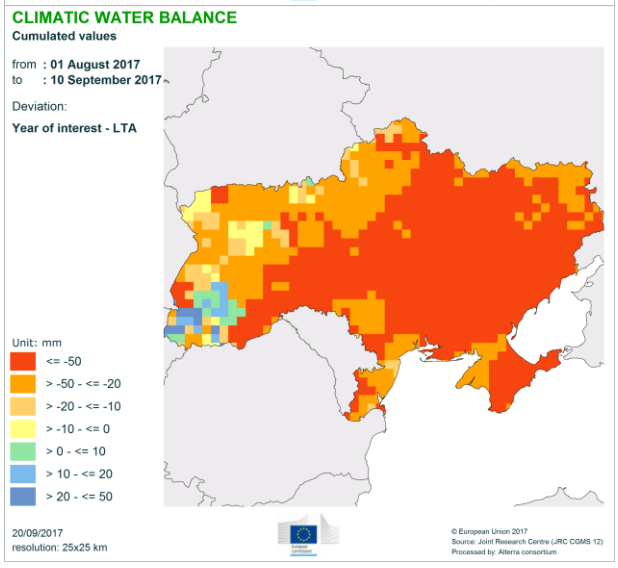




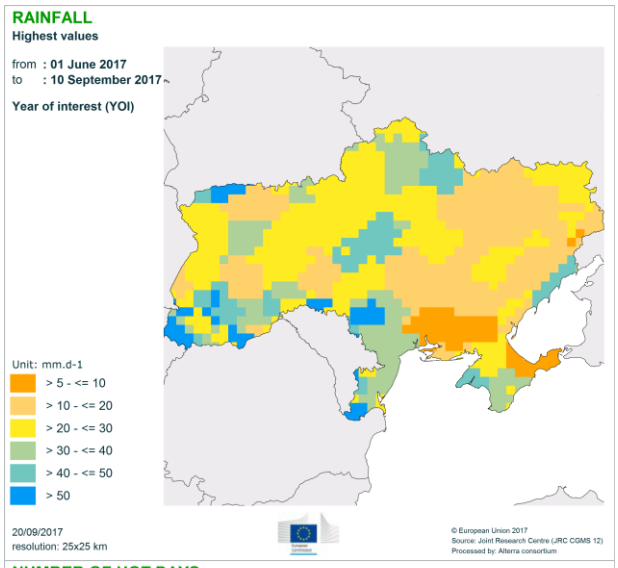


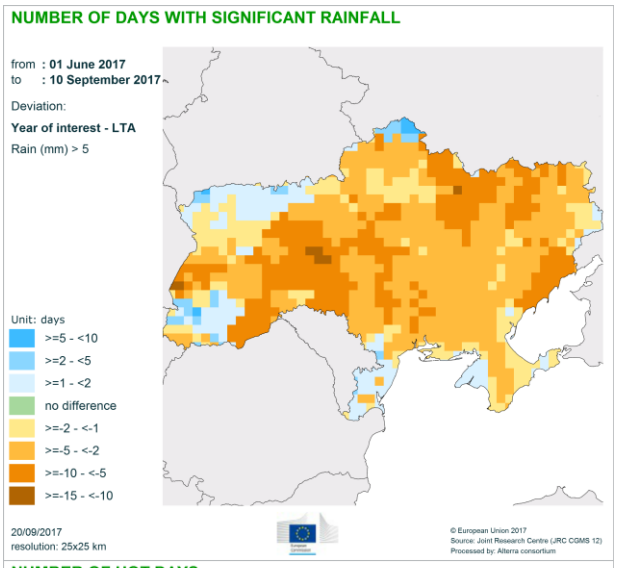


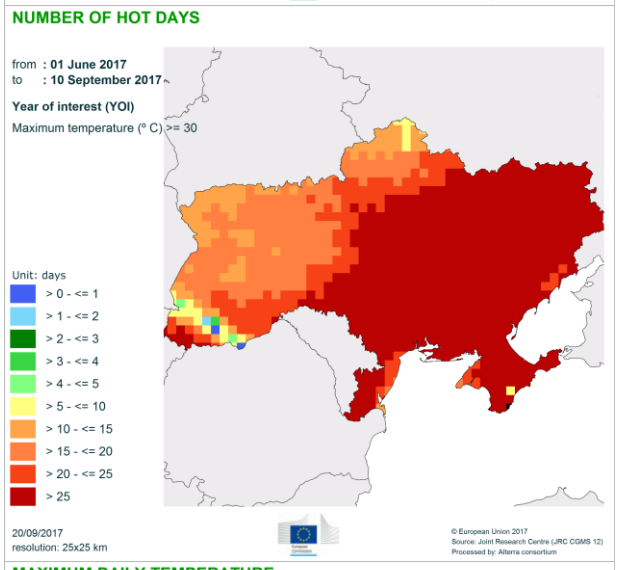


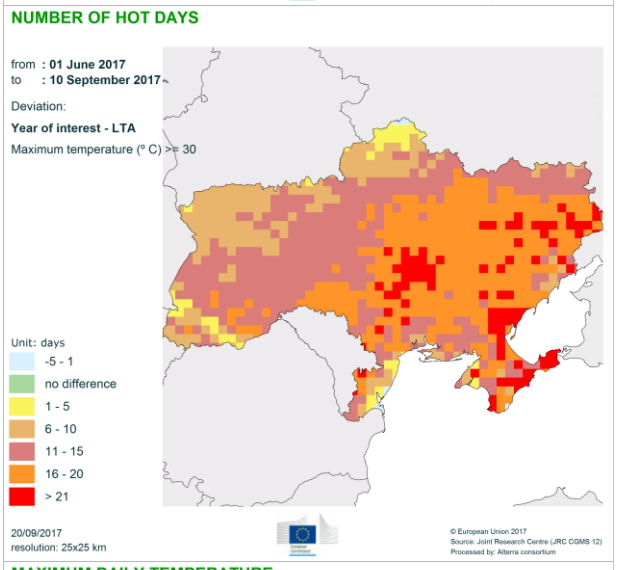


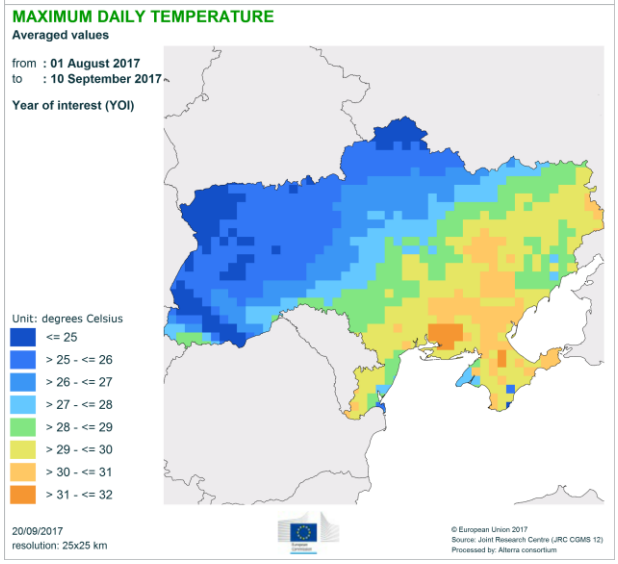
Weather events

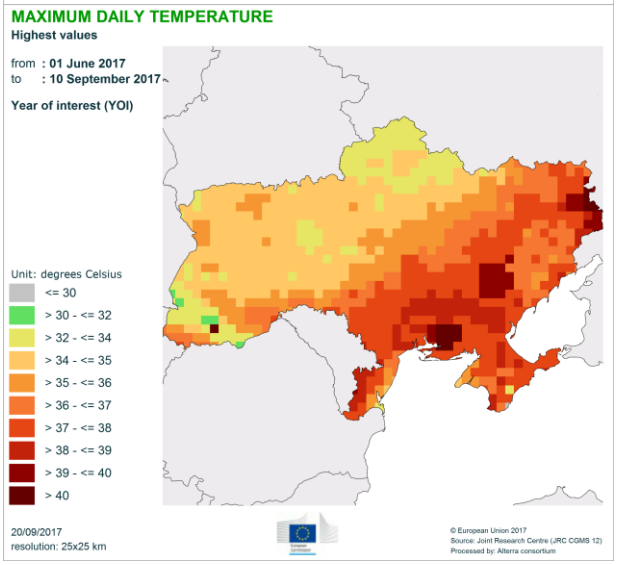












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MARS stands for Monitoring Agricultural Resources

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