

JRC MARS Bulletin

Crop monitoring in Europe

October 2018

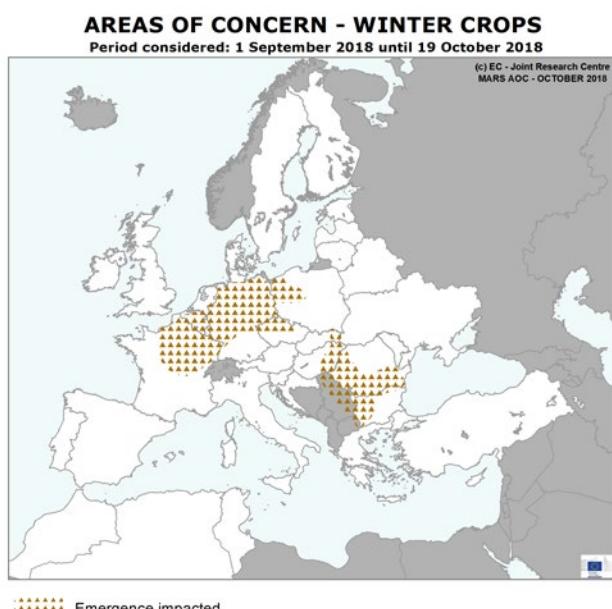
Dry weather favourable for harvesting

Rapeseed sowing and emergence seriously impacted

Warmer- and substantially drier-than-usual weather conditions in large parts of Europe provided favourable conditions for the ripening and harvesting of summer crops. However, the same conditions hampered the sowing and emergence of winter crops.

Sowing and emergence are most affected in central and eastern Germany, western Poland, and northern parts of the Czech Republic, where drought conditions persist. The situation is also delicate in many other parts of western, central, and south-eastern Europe, which have a significant precipitation deficit. Rapeseed, for which the sowing window is closed, is most affected. The sowing of winter cereals is ongoing; in dry areas farmers can still wait for sufficient rain to finish sowing or — if

need be — re-sow the fields. A more detailed analysis of sowing conditions is given in section 2.1 on page 5 of this Bulletin. Pasture conditions have further recovered in the UK, Ireland, Denmark, and Sweden but remain poor in most of Germany, France, the Czech Republic, Belgium, and Luxembourg. Rice crops, in southern Europe, have performed well this season, thanks to favourable weather conditions and adequate water supply. An overview is given in section 2.3 (page 13).

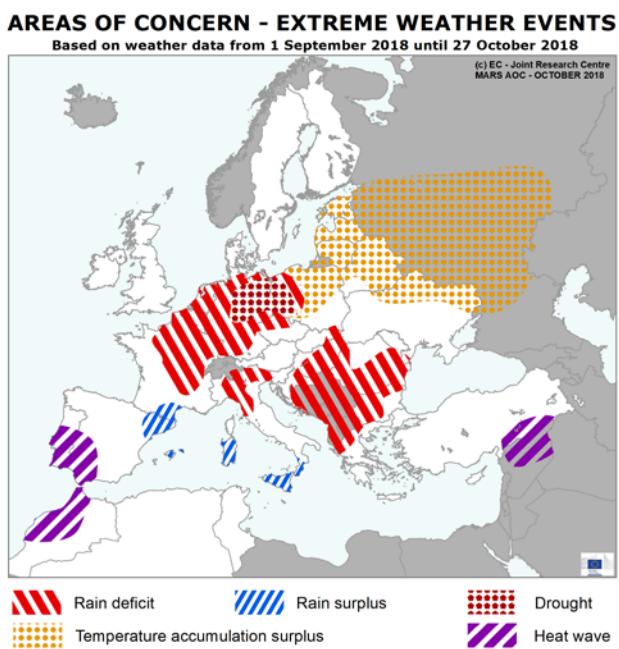


Crop	Yield (t/ha)				
	Avg Syrs	Sep-tember Bulletin	MARS 2018 forecasts	% Diff 18/Syrs	% Diff Sep-tember
TOTAL CEREALS	5,56	5,27	5,27	-5,2	+0,0
Total Wheat	5,73	5,48	5,48	-4,3	+0,0
soft wheat	5,97	5,70	5,69	-4,7	-0,2
durum wheat	3,39	3,48	3,51	+3,5	+0,9
Total Barley	4,91	4,69	4,68	-4,8	-0,2
spring barley	4,25	4,05	4,05	-4,8	+0,0
winter barley	5,79	5,61	5,60	-3,3	-0,2
Grain maize	7,29	7,49	7,63	+4,6	+1,9
Rye	3,93	3,37	3,36	-15	-0,3
Triticale	4,22	4,02	4,02	-4,9	+0,0
Rape and turnip rape	3,29	2,88	2,87	-13	-0,3
Potato	33,6	30,9	30,9	-7,8	+0,0
Sugar beet	74,9	73,3	72,7	-2,8	-0,8
Sunflower	2,12	2,41	2,50	+18	+3,7

Issued: 19 October 2018

1. Agrometeorological overview

1.1. Agro-meteorological review (1 September-15 October)



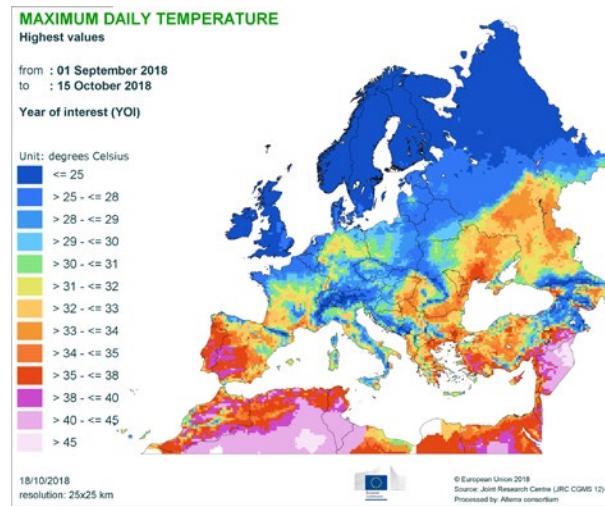
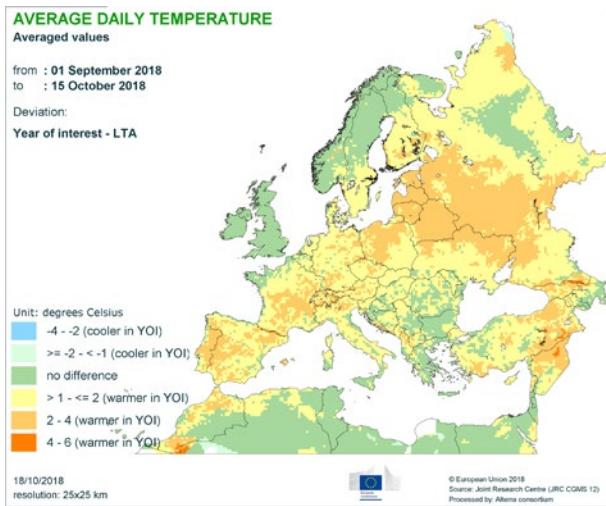
Warmer-than-usual conditions prevailed over most of Europe, with temperature anomalies of up to 4 °C compared with the long-term average (LTA). The most pronounced warm anomaly occurred in eastern Europe, where active

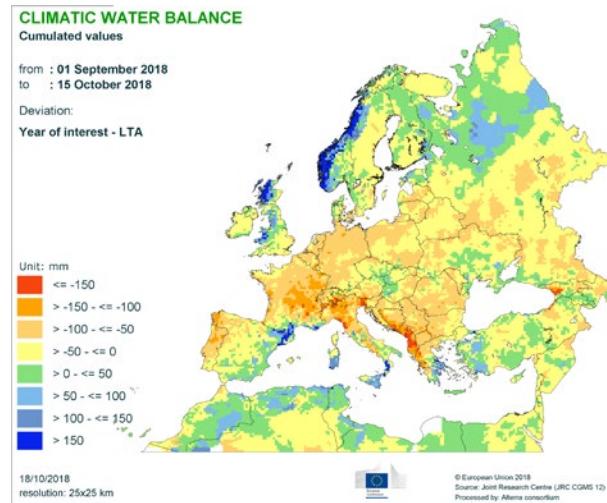
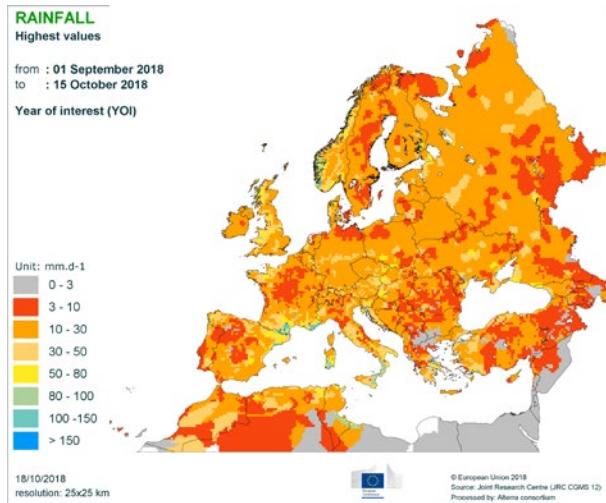
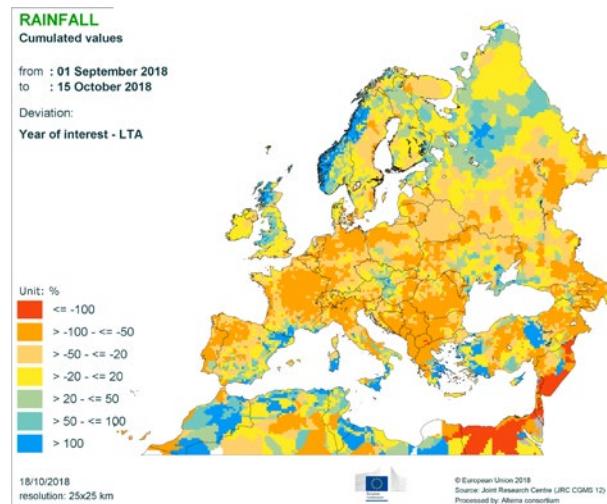
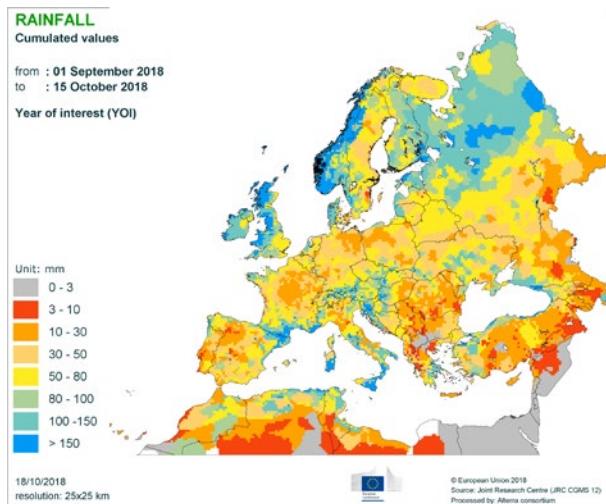
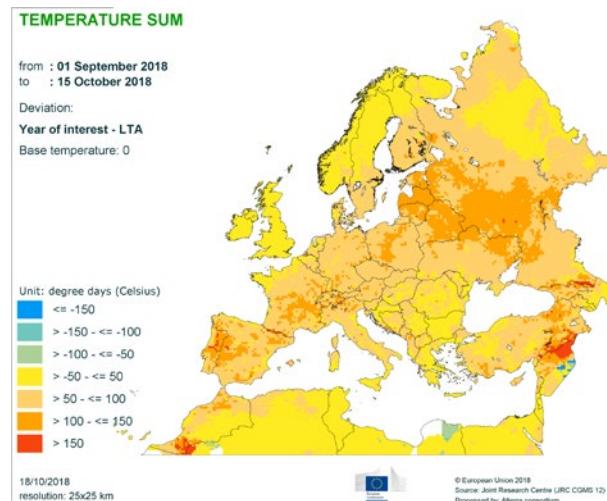
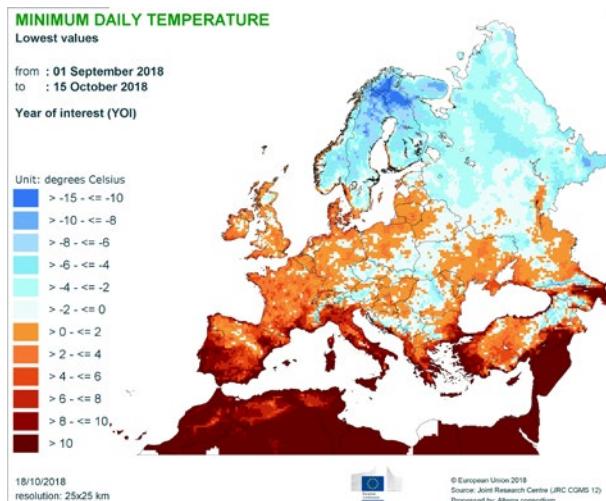
temperature sums reached up to 150 °C above the LTA. Maximum temperatures reached well above 30 °C at the beginning of September in south-eastern and eastern Europe, whereas central Europe experienced hot weather in the middle of September. As usual, maximum temperatures reached well above 30 °C in Mediterranean areas. An unseasonal heatwave occurred at the end of September in the southern Iberian Peninsula, western Morocco and south eastern Turkey.

Minimum temperatures dropped **below 0 °C** towards the end of September in a large portion of eastern and south-eastern Europe. Up to two cold days were reported over major agricultural areas in these parts of Europe, which is fewer than the long-term average for this period.

Drier-than-usual weather prevailed in most parts of Europe. Cumulative rainfall in western, south-eastern and central Europe was more than 50 % below the LTA. The southern Balkan region remained practically dry. Up to 30 mm of cumulative rainfall was recorded in the central and western part of the Iberian Peninsula, in northern France, in north-eastern Germany, in western Poland, in northern Italy and in south-eastern Europe.

Above-average rainfall was confined to north-eastern Europe, western Scandinavia, the northern British Isles, eastern Hungary, western Slovakia, the southern part of the Czech Republic, the majority of Austria, the northern Balkans and several parts of the European and North African Mediterranean regions. Intensive rainfall events with daily rainfall exceeding 80 mm occurred in southern France, southern *Sardegna*, southern Italy and south-western Norway.





2. Country analysis

2.1. Sowing conditions

Winter cereals (soft wheat, winter barley, rye)

Timely start of winter sowing across Europe, but mostly in dry conditions

The sowing campaign started in dry conditions in large parts of Europe, particularly in the central and eastern regions.

Sowing started into good seedbeds after the first rainfall of September in many areas of the UK and Ireland and is well under way. In Scandinavia and the Baltic countries, sowing was concluded mainly in September under favourable conditions and within the optimal time window.

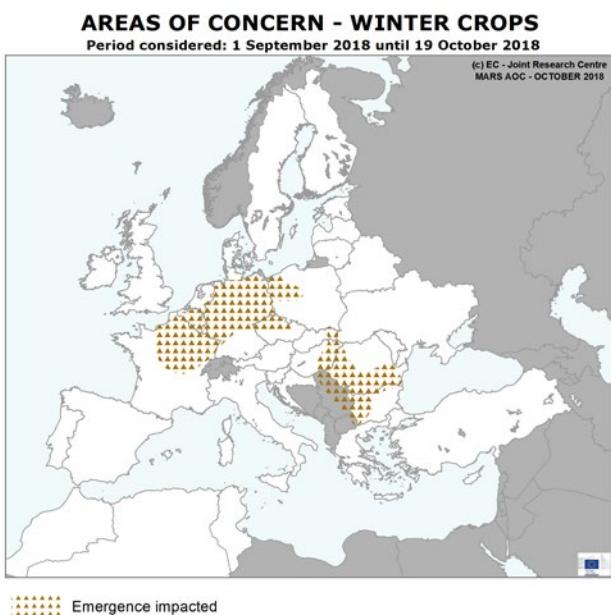
In France, Germany and the Benelux countries, sowing started at the end of September or the beginning of October and is currently ongoing. To a certain extent in these western European countries, but particularly in east and central Europe (Poland, Austria, Czech Republic, Slovakia, Hungary, Romania, Bulgaria), sowing was affected by dry soil conditions, which complicated field preparation and limited the emergence of the already-sown winter crops. In particular, in western Poland emergence is very heterogeneous and rain is needed

immediately to increase the number of germinating seeds. Alternatively, farmers will have to decide if they are to partially re-sow the fields. In Romania and Hungary, attention is needed but the dry conditions are not a matter of concern if some rain arrives in the coming week. Also in the other abovementioned countries (except in Scandinavia and the Baltic countries) there is still time to finish sowing or to re-sow, if needed.

In Ukraine, the sowing of winter wheat and barley is well advanced, as rainfall since the beginning of September has created favourable soil moisture conditions for farmers to sow and for the germination and emergence of winter cereals. In Spain and Portugal, sowing has usually started by mid-October. Following the rains registered at the end of the review period, soil conditions are favourable for seedbed preparation. In Italy and Greece, the optimal sowing window for cereals will begin in November.

Winter rapeseed

Mostly too dry for rapeseed — acreage reduced



Large parts of Europe's main rapeseed areas have suffered from dry conditions, compromising the acreage sown and hampering emergence in areas that have already been sown. Only a minority of areas are in good condition. This is likely to be reflected in rapeseed production in 2019.

Good autumn development of rapeseed stands is crucial for good yields in the coming year and is necessary to build up well-established plants that will survive harsh winter conditions and promptly restart growth in the spring. In most parts of Europe, this can be achieved only if sowing is accomplished in August or the first half of September. Where sufficient rain has fallen, rapeseed has indeed been sown within the optimal

window. In drier areas, some farmers have sown into the dry soil, while others have either waited for sufficient rain or opted to sow other crops. During the current period of review, rainfall in most rapeseed production areas was below average and was not always sufficient to trigger rapeseed germination and/or to allow adequate stand establishment.

Northern French and northern German areas, as well as areas close to the Alps, benefited from rain in August and September, whereas regions in central France, in central Germany and in western Poland faced difficult germination conditions. Plants did not emerge everywhere; where they did emerge, plants often did so weakly and were then hit by pests, resulting in heterogeneous stands. A significant portion of areas that had already been sown has been reallocated to other crops. In Germany and western Poland, rain in the third dekad of September was often too late or locally too weak to establish good stands. In contrast, in eastern Poland, the young stands are well established and even advanced on account of favourable weather conditions and this year's early sowing date. A similar favourable situation applies in the Baltic region, where warm temperatures have prevailed so far. The UK's stands were sown on time but were mainly developing slowly because of low soil moisture. They are fine for now but have high pest pressure. In France, the area sown is estimated to be 5-10 % less than usual. Germany's acreage is also expected to be considerably lower than in previous years (< 1 M ha), especially in the east and central regions (*Hessen*) as a result of contingency planning after this year's drought and owing to the portion of non-emerged stands.

More to the south, a long dry period is compromising germination and emergence in the south and east of Romania, and in western Bulgaria. A dry September left Italy's rapeseed stands in reasonable but suboptimal conditions. Problems due to dryness have also been experienced in the north-east of the Czech Republic, as well as in eastern Hungary, Slovakia and eastern Croatia.

2.2. European Union

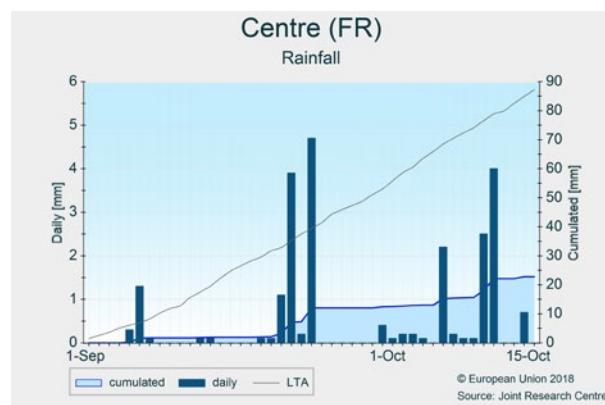
France

Exceptionally warm and dry weather conditions affect crops in multiple ways

The weather conditions in September followed the conditions already observed this summer: temperatures were well above the average and rainfall was well below the average. Only *Basse-Normandie*, the north of *Brittany*, the Mediterranean coast and part of the *Hauts-de-France* received their usual amounts of rain. The greatest rainfall deficit since the beginning of September was observed in the Massif Central and in eastern regions (mainly impacting grasslands). Moreover, sugar beet and potato crops are currently exposed to a high disease pressure as a result of the warm temperatures and high air humidity. Harvesting of both crops is still ongoing with some difficulties due to the dry soils.

The grain maize harvest started 2 weeks earlier than in an average year. The east and north-east are expected to be the areas most impacted by the rain deficit observed this summer, whereas the yield in south-western regions is expected to be closer to the average as a result of irrigation. Sunflower is partly harvested and the weather observed in September was finally beneficial for the late-sown sunflower.

Rapeseed was sown on dry soils and only a little rainfall has been observed since then, causing poor emergence. The high temperatures have been favourable to the development of pests. Winter barley and soft wheat sowings are currently ongoing. The yield forecasts have been updated considering indicators up to 10 October, without major changes compared to last month's forecasts.

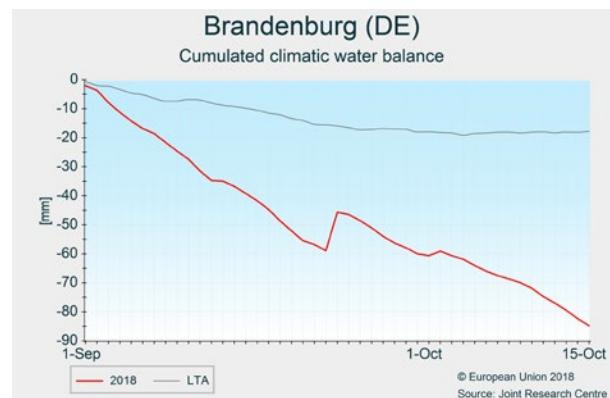


Germany

Dry soils hamper potato and sugar beet harvesting and affect winter rapeseed area

In most regions, temperatures exceeded the LTA by 1 to 2 °C (by 2 to 4 °C in the south-west and locally in the east) during the review period. Rainfall was below the LTA, except in areas close to the Alps. Abundant rainfall only occurred around 23 September. The cumulative climatic water balance for the review period is more than 50 mm below the LTA in all regions except Bayern.

The maize and potato harvests are largely finished, with reported yields below average for both crops. Potato harvesting was hampered in dry fields and harvested potatoes have often presented quality problems. The ongoing harvest of sugar beet has experienced similar difficulties. Moreover, leaves and roots are often hit by pests and diseases, leading to yield losses. The yield forecast for sugar beet has been revised further downwards. However, the sugar content of sugar beet is reportedly above average. The grain maize acreage has significantly reduced compared with previous years because of re-allocation of the land to green maize. However, this reduction is not yet quantified and the yield forecast for grain maize in our tables refers to the originally estimated area. The area of newly sown winter rapeseed is lower than was originally envisaged, partly because of contingency planning considering the drought and partly because of missing or poor emergence as a consequence of the prevailing dry conditions. The condition of rapeseed stands is highly heterogeneous; moderate stands need optimal conditions until December to produce good yields. Winter cereals are being sown under good conditions, but in many regions more rain is needed for good autumn development.

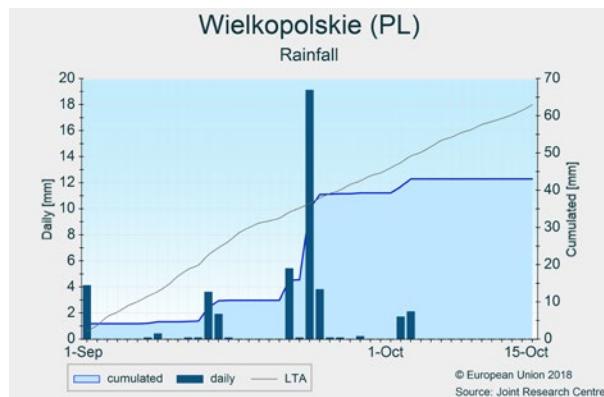


Poland

Sowing and emergence of winter crops regionally impaired by dry soil conditions

Temperatures were exceptionally warm during the first 2 dekads of September and fluctuated around the LTA for the rest of the period under review. Precipitation was below average and was mainly concentrated in the last dekad of September, with the exception of south-eastern and southern regions where abundant precipitation was recorded at the beginning of September, which resulted in above- or around-LTA precipitation for the period as a whole. Despite the improved soil water conditions since the last dekad of September, drought conditions are still observed in western regions of *Wielkopolskie*, *Zachodniopomorskie* and *Lubuskie*. The sugar beet harvesting campaign started at the end of August with very variable results for different regions, yet with overall close-to-average yield expectations. The potato harvest is ongoing, with widely different yields reported for irrigated and rainfed areas, and there are overall below-average yield expectations because of the prolonged drought. Sowing operations of winter crops and plant emergence were negatively impacted by the lack of soil water in drought-affected regions.

The harvest operations of grain maize and green maize have been completed a few weeks earlier than usual as a consequence of the dry and hot conditions and low plant water contents. The yield forecast has been slightly increased for sugar beet as a result of improved soil water conditions. However, the margin of uncertainty remains considerable, due to the exceptionality and high heterogeneity of conditions across regions. For potatoes, the forecast remains below the 5-year average.

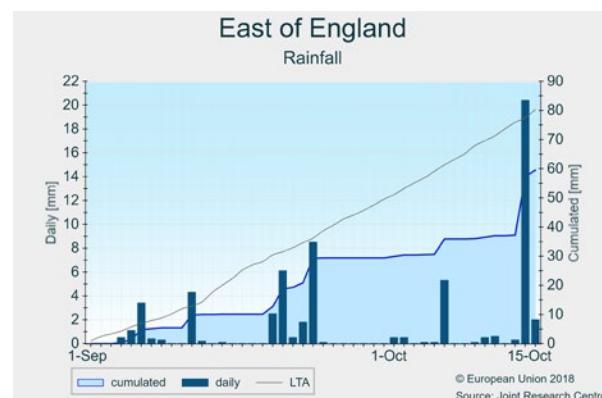


United Kingdom and Ireland

Favourable weather conditions for harvesting and winter crop sowing

Temperatures tended to fluctuate around the LTA, except for the cold anomaly that occurred during the last dekad of September and for a couple of days during the first week of October, when minimum temperatures reached close to 0 °C in most of the agricultural areas and some snow events were locally recorded in the northern regions of the UK. Rainfall was below average in both the UK and Ireland with the exception of the central-western coastal regions of Great Britain (*North West, Wales, West Midlands*). Rainfall was particularly abundant between 19 and 23 September and during the end of the review period.

These conditions were favourable for field activities. In many areas, winter sowings started in September into good seedbeds and are well under way. The sugar beet harvesting campaign started at the end of September in dry conditions with very variable results from field to field depending on the soil type and water availability. The potato harvest is going to get under way fully in mid-October. In Ireland, the green maize harvest started at the end of September. An exceptional storm hit the crop on 19 September causing crop lodging and significant harvest losses. The yield forecast for green maize was revised downwards based on re-analysis of the dry summer conditions and on the impact of this event before harvesting. The forecasts for sugar beet and potato remain practically unaltered compared with the report in the September issue of the Bulletin and are both below the 5-year average.



Spain and Portugal

Maize harvests under way with average yield expectations

Unusually high temperatures were observed in the Iberian Peninsula in September and the first half of October. Overall, drier-than-usual conditions prevailed from the second half of September until mid-October, when heavy rains and winds were registered in the west and north-east. Sunflower has been harvested and yields are expected to be higher than the average of the last 5 years. The irrigation campaign for summer crops is concluding and water storage has been sufficient to satisfy the needs of summer crops during the summer. Maize harvests are under way — with possible local delays as a result of the latest rainfall — and yield expectations are in line with the 5-year average. Average yields are also expected for potato and late varieties of sugar beet.



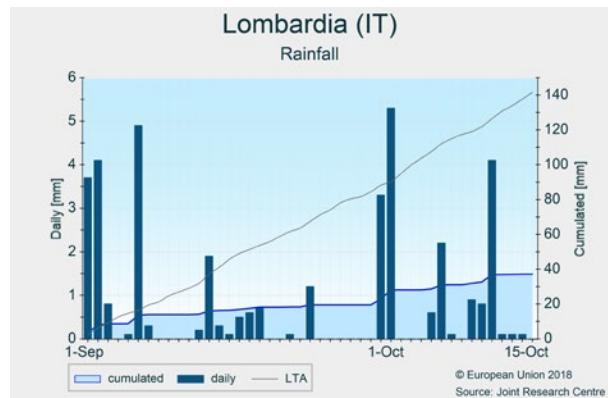
Italy

Summer crop harvesting ongoing under favourable

In northern Italy, September temperatures were constantly above the average by some 2 °C, and there was a peak of high temperatures in the second dekad of the month. Average temperatures have prevailed since the end of September. In northern regions, precipitation was below the average with few rainy days, which led to a precipitation deficit of between – 50 % and – 70 %. In southern regions, rainfall was predominantly above the average (+ 50 % to + 80 %), mostly thanks to the intense rainfall at the beginning of October in *Calabria, Sicilia and Sardegna*.

From mid-September, grain maize matured and harvest activities started under favourable conditions. Harvest of soybean started in the second week of October.

Rapeseed sowing took place in September under dry conditions. The optimal sowing window for winter cereals will start in late October.

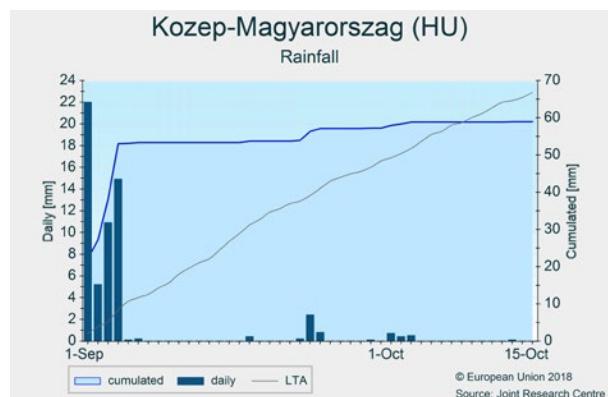


Hungary

Good harvest progressing well

In Hungary, most of the period under review was significantly warmer than usual. However, during a 10-day period in late September and early October, temperatures remained well below the LTA and even some local frost events occurred. Cumulative rainfall reached 60–150 mm in western Hungary, while in the eastern half of the country only 20–50 mm precipitation was measured. Rain was concentrated in the first days of September and the remaining part of the review period was practically dry. Dry topsoil conditions hampered seed-bed preparation. The sowing of winter crops went well, but the sprouting of rapeseed was very problematic in the eastern half of the country. In several places, no emergence was observed at all. The lack of rain allowed the harvesting of summer crops with no losses and reduced the need for grain drying.

The yield forecast for sunflower and grain maize was revised upwards, following a detailed re-analysis of the effects of the summer drought and also considering the exceptionally favourable harvesting conditions.



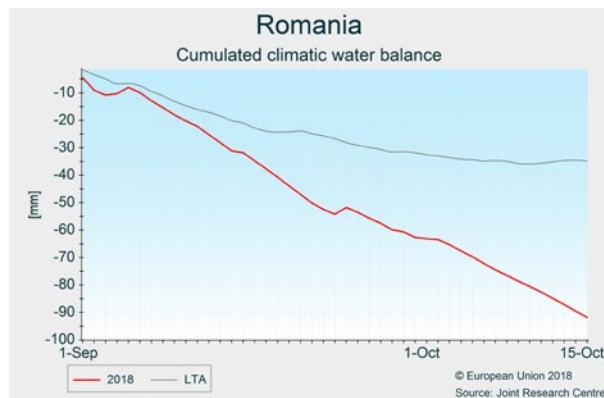
Romania

Favourable harvesting, but hard times for emergence of rapeseed

In the first 2 dekads of September, daily mean temperatures exceeded the LTA by 2-4 °C on average. In the eastern and southern regions, between three and eight hot days ($T_{\max} > 30$ °C) were experienced. Around 25 September, temperatures dropped sharply, in the range of 10 °C, and in several places minimum temperatures were observed to occasionally drop below 0 °C. After 6 October, temperatures rose again to slightly above-average levels. Precipitation was below average, and particularly sparse in the southern and eastern regions of Romania, where only 5-25 mm rainfall was recorded.

These weather conditions allowed good progress of harvesting and winter sowing. However, the germination and emergence of rapeseed have been hampered because of the dry soils. Even if there is rain in the coming days, there will be limited time for rapeseed growth to gain strength before entering winter dormancy. Re-sowing of the most affected fields with other crops is therefore likely to occur.

The grain maize and sunflower yield forecasts were further revised slightly upwards, considering the favourable harvesting conditions.



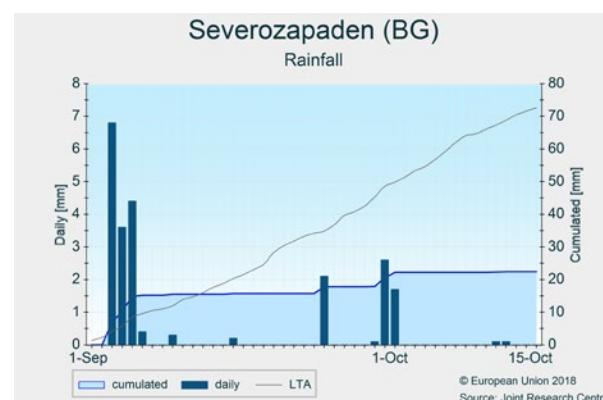
Bulgaria

Record high yield outlook for maize and sunflowers

Until 24 September, daily mean temperatures persistently exceeded the LTA by 1-3 °C. In late September, temperatures dropped abruptly to below- or near-average levels. In the last days of September, minimum temperatures dropped close to the freezing point; in western regions, moderate frost events (between –1 and –4 °C) occurred. Rainfall was sparse and was mostly concentrated in the first days of September and October. Precipitation totals during the review period were below 25 mm in the western regions and reached 30-60 mm mostly in the eastern regions.

These weather conditions allowed good progress of harvesting. The yield forecasts of grain maize and sunflower were

maintained at record high levels, but the forecast for green maize was revised downwards considering the severe rainfall deficit since early August. Conditions were also favourable for the timely sowing of winter crops, but the dry topsoil conditions could delay the emergence and compromise the early development of rapeseed stands, mainly in the western regions.

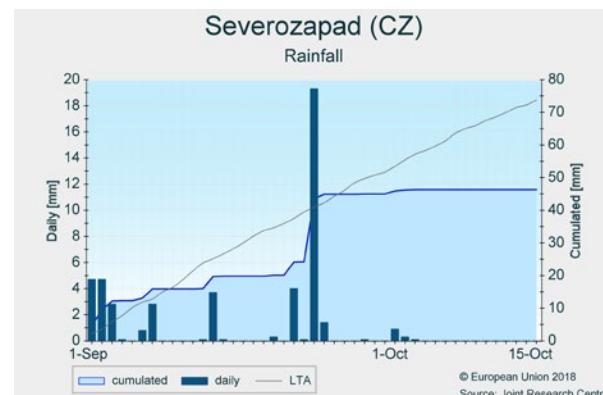


Austria, Czech Republic, Slovakia

Drought affects sowing campaign for winter crops in the Czech Republic

Temperatures were generally confined to between 1 and 2 °C above the long-term-average. The review period as a whole was wetter than usual in south-eastern parts of the Czech Republic, north-eastern Austria and western Slovakia. In these regions, cumulative rainfall above 80 mm was recorded, much of which occurred during one or a few events at the beginning of September; however, this provided no or very limited benefits to summer crops (grain maize had already reached maturity). Eastern Slovakia, western Austria and the north-western part of the Czech Republic experienced a (continued) rainfall deficit.

Summer crops have mainly been harvested. Drought conditions persist in central and northern parts of the Czech Republic and eastern Slovakia, causing difficulties to field preparation for sowing, and hampering the emergence and stand establishment of already sown winter crops.



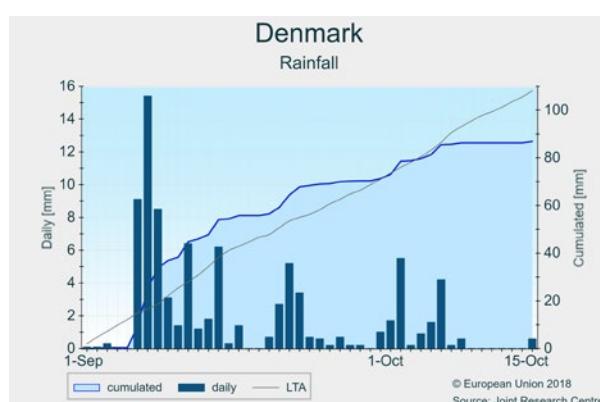
Denmark and Sweden

Winter sowing mostly completed

Temperatures in Denmark and Sweden were above average during most of the review period, except for the third dekad of September and the first week of October, when minimum temperatures reached -1.3°C ($7^{\circ}\text{C} < \text{LTA}$) in Östra Sverige. In Denmark, rainfall was slightly below average for the period as a whole, and was mainly concentrated during the second week of September, with smaller rain events in the following weeks. In Sweden, rainfall was below average throughout the review period, but was more uniformly distributed in general. Mainly in Denmark, the rainy weather in September created discontinuous harvest conditions for potatoes and sugar beet. Sugar beet harvesting is still ongoing.

The sowing of winter barley, winter rye and winter wheat was mostly completed at the beginning of October. The beginning of the sowing campaign in Denmark was difficult because of the many days of rainfall experienced in September.

The yield forecasts for sugar beet and potatoes remain below the 5-year average. The forecast for sugar beet in Sweden was slightly revised further downwards because of the persistent dry conditions.



Finland, Lithuania, Latvia and Estonia

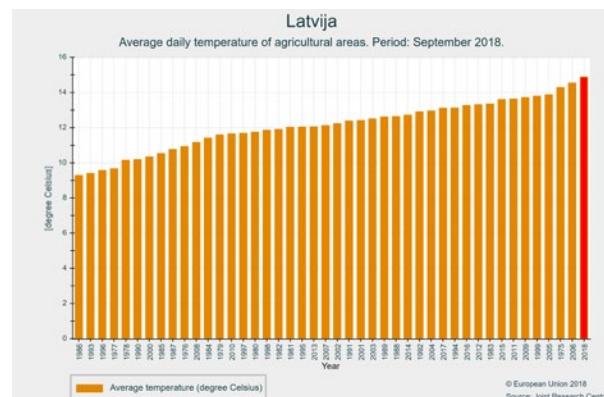
Favourable conditions for sowing

Temperatures were well above average during the first 3 weeks of September and in the second week of October, whereas, between, seasonal temperatures prevailed in the Baltic countries and below-average temperatures were experienced in Finland. September was either the warmest or one of the warmest on our records since 1975.

Rainfall was below average in Lithuania and Latvia. In Estonia and Finland, rainfall was above average, mainly as a result of the higher precipitations at the end of September in Estonia and in mid-September in Finland.

Weather conditions in September were favourable to terminate the sowing of both winter rapeseed and winter wheat into good seedbeds and within the optimal time window. At the end of September, sugar beet and potato harvests were concluded in most of the agricultural areas of the Baltic countries and Finland.

The yield forecasts for sugar beet and potatoes remain similar to those reported in the September issue of the Bulletin.



Belgium, the Netherlands and Luxembourg

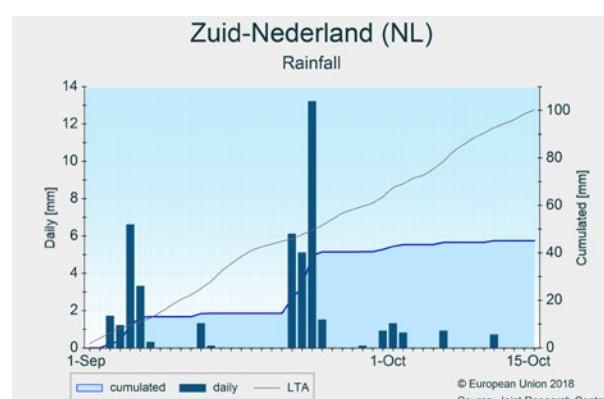
Warm and dry weather further reduces yield outlook and affects field activities

Warmer- and substantially drier-than-usual conditions prevailed in most regions in the Benelux, with the exception of the central coastal areas of the Netherlands. Temperature anomalies were $1-2^{\circ}\text{C}$ for the period as a whole; rainfall 40 to 60 % below LTA in most areas.

In non-irrigated sugarbeet crops, the continued negative climatic water balance has led to a further widening of the gap between yield biomass development during this season and in an average year. Irrigated stands are performing exceptionally well, however.

The warm and dry conditions generally favoured good progress of harvesting; despite the difficulties in some sugar beet and potato areas due to hard and dry soil conditions. Winter sowing has also progressed well. The warm weather conditions have favoured rapid emergence but rain is needed to allow the formation of adequate stands, especially in Luxembourg, southern and eastern Belgium and the southern parts of the Netherlands.

The yield forecast for sugar beet has been slightly revised downwards but remains close to the 5-year average. The forecasts for potatoes, grain maize and green maize were maintained, well below the 5-year average, or slightly revised further downwards.



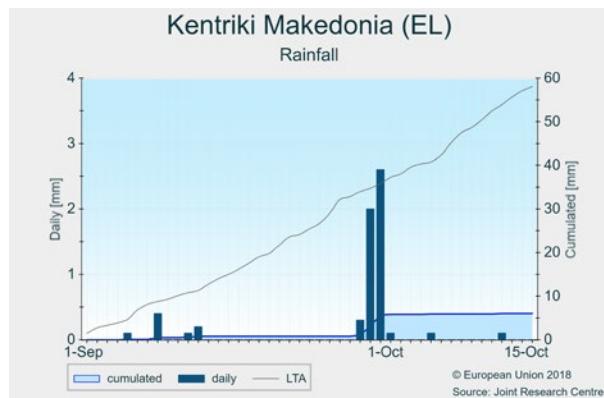
Greece and Cyprus

Rain needed for the winter sowing campaign

Until the last dekad of September, temperatures were constantly 1-3 °C above the LTA in most of Greece. Around 24 September, temperatures dropped sharply to below-average values (- 2 to - 5 °C compared with the LTA) but have since recovered and have remained around seasonal values since 1 October. Rainfall events, which occurred during the first days of October, were confined to southern Greece. In central and northern Greece (e.g. *Kentriki, Dytiki*), this year's period from 1 September to 15 October was one of the driest on our records (since 1975), with cumulative rainfall less than 10 mm.

The harvest of summer crops was completed by the end of September and the positive yield forecasts remain practically unaltered compared with the previous bulletin. The sowing window for winter crops is opening, but rain is needed before sowing activities can take place.

In Cyprus, hot conditions ($T_{\max} > 32^{\circ}\text{C}$) were coupled with above-average rainfall. It is still early for the sowing of winter crops.



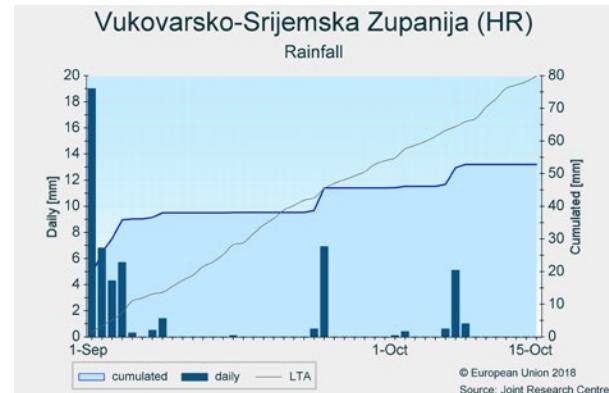
Slovenia and Croatia

Positive end of season for summer crops; sowing of winter crops regionally affected by dry conditions

Near-average temperatures were recorded in central Croatia, while warmer-than-usual conditions (1-2 °C above LTA) prevailed elsewhere. Rainfall was below average in most regions. The largest rainfall deficit was recorded in western Slovenia and in eastern Croatia, where cumulative rainfall for the period as a whole was between 30 and 80 mm. Most of the rainfall in eastern Croatia occurred at the beginning of September. In contrast, cumulative rainfall exceeded 150 mm (close to the long-term average) in central Slovenia and along the Dinaric Alps in Croatia.

The dry period after the beginning of September enabled the harvest of grain maize to commence. The grain maize yield outlook in Slovenia has been revised upwards following a re-analysis of the summer period and considering the favourable conditions during the end of the grain-filling phase and the harvesting period.

The sowing campaign for winter crops is ongoing. Good sowing conditions prevail, except regionally in eastern Croatia and in eastern Slovenia, where dry soil conditions are delaying the sowing campaign.



2.3. European Union — rice producing countries

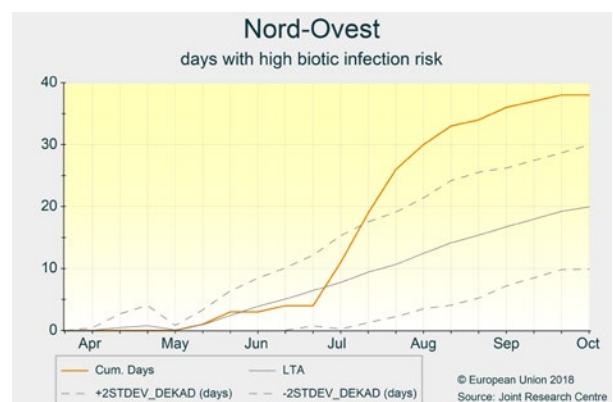
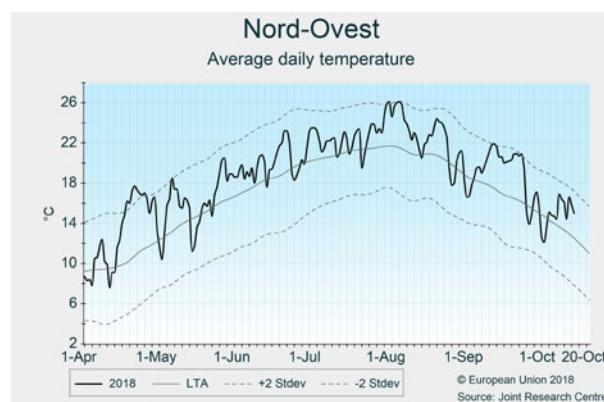
Above-average yield forecasts in most of the producing countries

Temperatures in the European rice districts almost constantly fluctuated above the long-term average and in some cases led to record seasonal cumulative growing degree-days. Temperature anomalies were not sufficient to induce spikelet sterility during flowering but, as shown in model simulations and depicted in remote sensing indicators, led to an acceleration of the ripening stage. Model simulations indicated biotic stress occurring in several countries (Italy, Romania, Hungary and Bulgaria) that also experienced frequent rain events in late July to mid-August. Nevertheless, yield values above the 5-year average are forecast for most of the rice-producing countries.

Italy

Rice flowering occurred at the end of July and in the first 10 days of August, with around average or slightly delayed timing. In the western rice district of *Lombardia*, the delay was caused by late sowing but development caught up following the high temperatures recorded in August. In all the rice districts, temperatures in August exceeded the long-term average. Temperature anomalies were insufficient to induce spikelet sterility but favoured increased pressure from pests and diseases. Our crop model highlighted a significantly higher-

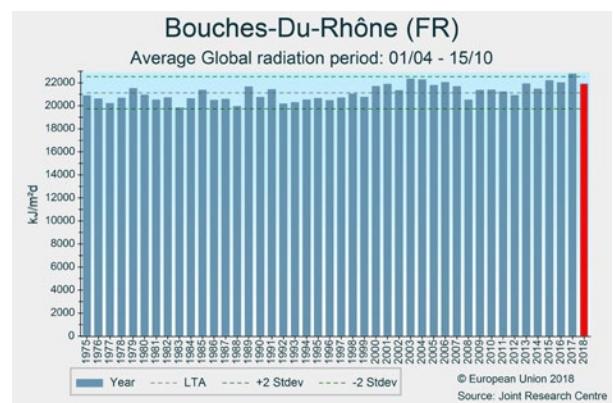
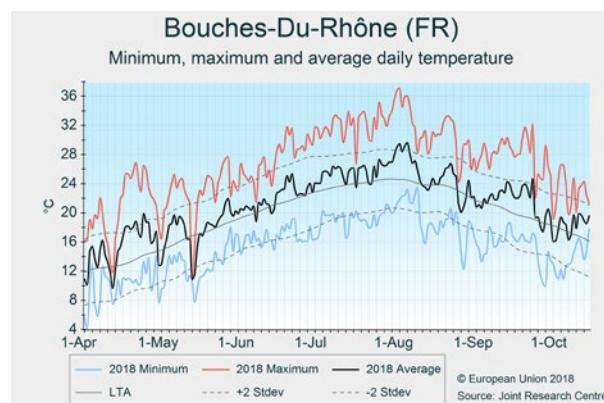
than-average number of days with high infection risk, and specialised news media (¹) reported a widespread presence of weeds and blast. Even though farmers can manage such problems, some damage is inevitable and yield expectations were reduced from very favourable to favourable, but still above the 5-year average. Harvest started at the beginning of September and was concluded by the beginning of October in most of the fields, in line with average timing.



France

Apart from the second dekad of May, when a cold snap was observed, temperatures during the whole crop cycle stayed above the long-term average. Cumulative global radiation was also above the average, mostly to the benefit of rice growth. At the beginning of August, a heatwave was observed with a maximum temperature of 37 °C on 2 August. Part of the rice

crop was at the flowering stage during the heatwave but no impacts on fertility are expected as night temperatures went down to 23 °C and maximum temperatures were still 3 °C below the critical value for heat sterility. Since then, conditions have been favourable until maturity. Harvest has started and should finish in the next few days.

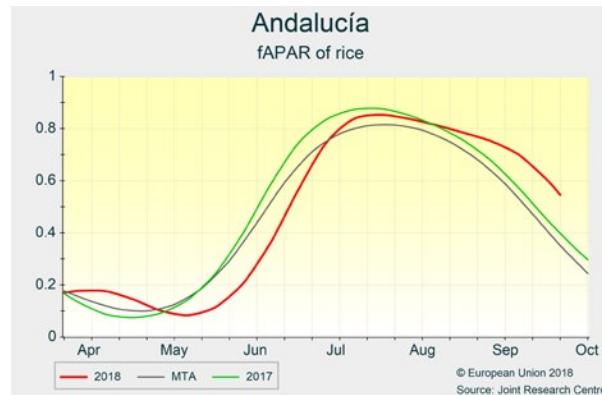


¹ Il Risicoltore (Year 61, n°8 — September 2018, EnteRisi).

Spain and Portugal

Rice harvests started in October in the main producing regions in the east of Spain (*Comunidad Valenciana, Cataluña*). Overall, the growing season in those regions has been slightly warmer than usual with exceptionally hot periods in mid-July and in the first half of August. Nevertheless, satellite imagery indicates no significant damage from abiotic stress, and water supply for flooding fields has been sufficient throughout the season. In south-western Spain and southern Portugal, most rice harvesting will start in the second half of October, more than 2 weeks later than usual. In these regions, the growing season

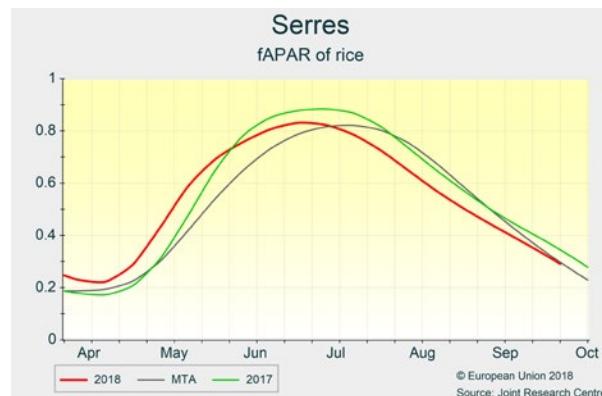
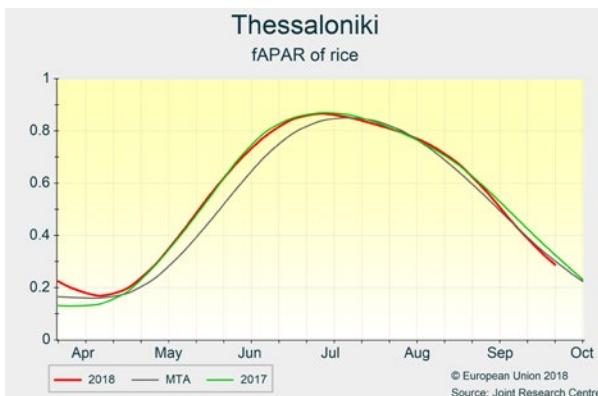
incurred a significant delay this year, caused by late sowing due to an exceptionally humid spring, and lower-than-usual summer temperatures. This delay is especially appreciable in *Andalucía*, where daily temperatures were, persistently, 2–3 °C below the long-term average during June and July. This delay has not affected crop growth, which, according to satellite imagery, has been above average since the end of July. Thanks to the absence of major water stress events in the main producing areas, yield expectations for both countries are in line with the average of the five previous years.



Greece

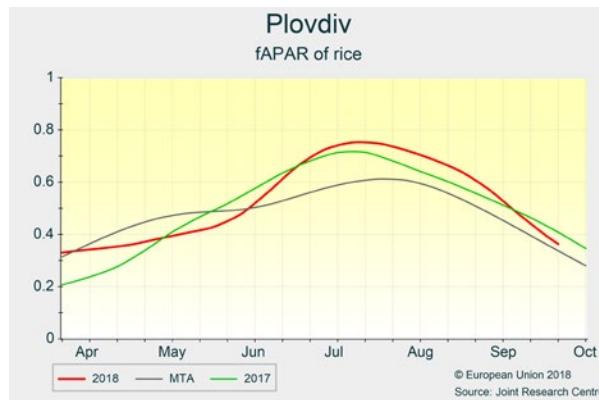
In Greece, hot conditions during May and June favoured rapid vegetative development in the main rice-producing regions (*Thessaloniki* and *Serres*). Flowering started by the end of June, almost 2 weeks early. July was unusually wet, especially in *Serres*, where cumulative rainfall was among the highest

since 1975 (according to our records). However, according to the remote sensing signal, the temperature surplus had no negative impact on final yields. Despite the wet conditions, windy weather and airborne salinity in coastal areas are unfavourable for the development of diseases.

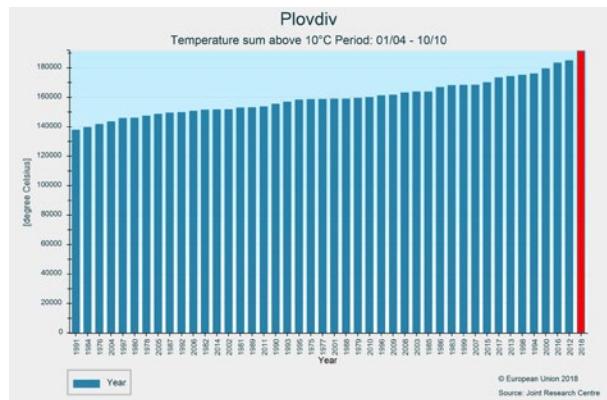


Bulgaria

Favourable rice-growing conditions have been observed in Bulgarian rice districts (*Plovdiv, Pazardzhik* and *Stara Zagora*), considering the above-the-average temperature profiles registered already since March (which set a new record of temperature cumulates since 1975). Water availability was optimal throughout the season. A higher-than-usual concentration of rain events occurred in July



and led to increase the probability of crop biotic stress. This was depicted by our model as an increase in the number of days with high potential infection. Remote sensing indicators registered above-average and above-last-year's levels of biomass accumulation throughout the flowering, grain-filling and harvesting periods. The rice yield forecast of the country is above the 5-year average.

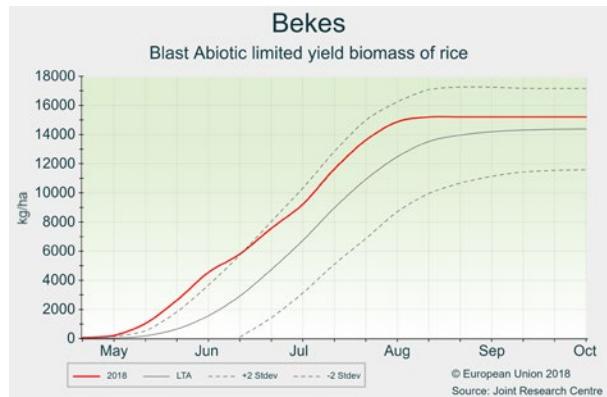
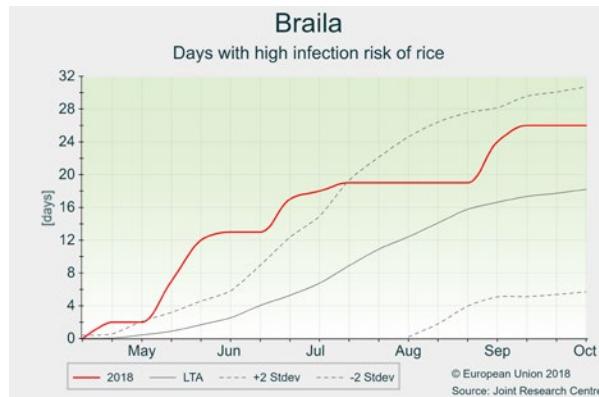


Romania and Hungary

This year, thermal conditions were much warmer than usual during the growing season of rice in both Romania and Hungary, leading to highly accelerated phenological development. In several places the rice crop reached the ripening stage in late August to early September, almost 2 to 3 weeks early compared with an average season.

Above-average temperatures accelerated crop canopy expansion in May and June. In both countries, the leaf area reached its maxima 15–20 days early, although the leaf area index remained at a near-average level. The above-average temperatures also caused premature senescence of the leaves, which took place from mid-July, thus unfavourably shortening the grain-filling period, allowing less time for biomass accumulation.

Abundant rainfall events in July increased the probability of both fungal infection and yield losses caused by rice blast. The number of days with high infection risk were slightly below or close to the average in eastern Hungary, as well as in southern and western Romania, but were extremely high in eastern Romania. The above-average temperatures also increased the probability of spikelet sterility in both countries. In Romania, according to our model simulations, the biomass accumulation remained at an average level considering the reduction effect of blast infection and spikelet sterility. In contrast, the potential biomass is expected to be above average in Hungary, even when accounting for the reducing factors. The dry weather conditions of late summer and early autumn were favourable for harvesting with minimal losses. Our yield forecast is above the 5-year average for both countries.



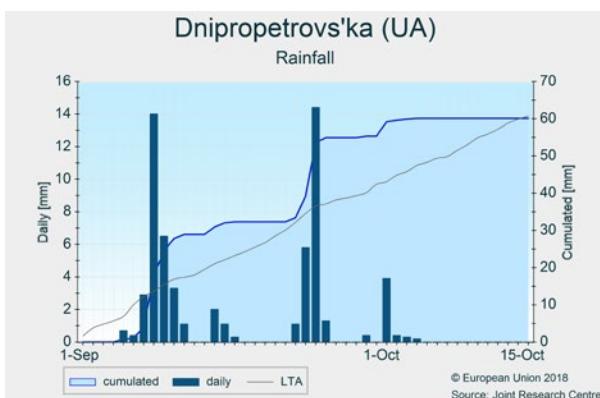
2.4. Black Sea Area

Ukraine

Positive end of summer crops season and start for winter crops

Cumulative rainfall was close to average for the current period of analysis thanks to two rainfall events, one in the first and one in the last dekad of September. Only the westernmost oblasts received below-average rainfall. Temperatures were warmer than usual, with a substantial positive anomaly in the north-eastern oblast (+ 2 °C) and a more modest anomaly close to the Black Sea (+ 1 °C). So far, October has been mostly dry, and farmers have benefited from good conditions for the harvest of summer crops. Grain maize harvest is still ongoing, whereas sunflower is close to being completely harvested. Yield forecasts have been maintained slightly above the average.

The concern expressed in the September bulletin, regarding the unfavourably dry topsoil conditions around rapeseed sowing, is now over, as rainfall has been sufficient for emergence and early crop establishment. The sowing of winter soft wheat is nearly completed.



Turkey

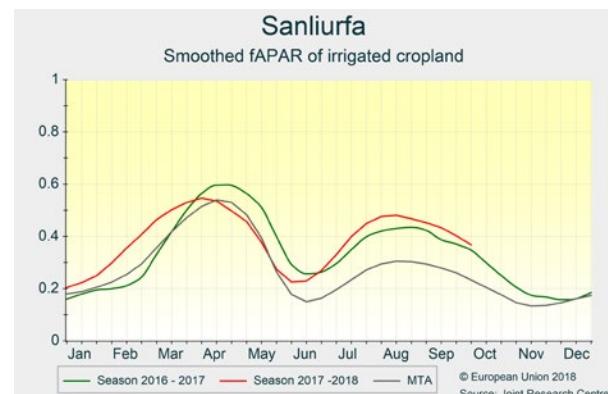
Harvest of grain maize still ongoing

In central regions (*Konya*), the end of the summer crops cycle was characterised by positive thermal anomalies at both the beginning and the end of September ($T_{\max} < 30^{\circ}\text{C}$). These anomalies were interrupted by a period of 10 to 15 days with average temperatures. In September, no relevant precipitation occurred and the harvest of maize proceeded without concerns.

In the Aegean regions of *Adana*, the temperature pattern was similar. Crops reached maturity after 15 September and harvest started in late September, but was interrupted in October by some rainy events.

In south-eastern regions (e.g. *Sanliurfa*), the maize phenological cycle has shifted by almost 1 month later compared with the rest of the country. In these regions, rainfall at the beginning of September and around 10 October favoured grain filling and harvest is expected to start around 20 October.

The sowing window for winter crops will start in November.



2.5. European Russia and Belarus

European Russia

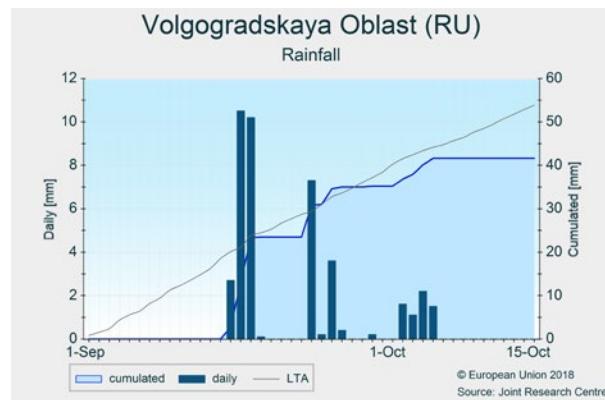
Adequate progress of the winter sowing campaign

Temperatures were predominantly warmer than usual, most markedly in the western and southern regions, which presented a positive thermal anomaly of 2-3 °C (for the period as a whole). The first 2 dekads of September were extremely warm (up to 6°C > LTA) for this period of the year.

Precipitation was near or above average in northern Russia and was well distributed over the review period. In the southern half of the country, rain was mainly sparse and was concentrated in the second half of September.

The sowing campaign of winter cereals progressed well. Abundant rainfall caused delays in the second half of September, but favourable conditions in early October allowed sowing to catch up. The sowing of winter wheat is practically finished in the colder northern, central and eastern regions and it is still ongoing in the warmer areas between the Black Sea and the Caspian Sea. Water supply has mostly been adequate for emergence and early crop development, except in the North Caucasian okrug and in some southern regions of the Volga okrug, where low soil moisture content of the topsoil can be a limiting factor.

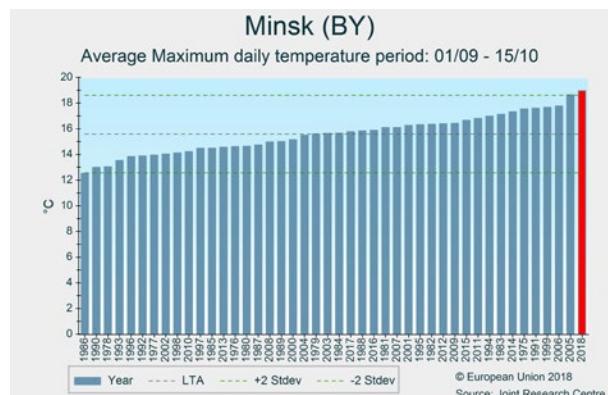
An overview on crop growth, harvesting conditions and associated yield forecasts of the season that is coming to an end is given in the Russia, October 2018 issue of the JRC MARS Bulletin global outlook series.



Belarus

Grain maize harvesting campaign progressing well, with average yield expectations

The temperatures for the period under review were the highest on our records. The first 2 dekads of September were particularly hot, with temperature anomalies between + 4 °C and + 6 °C across the country. Temperatures oscillated around the LTA for the rest of the period of analysis. Rainfall was generally below the LTA during the first 2 dekads of September, especially in the east of the country. Significant precipitation occurred during the third dekad of September and in the first dekad of October. The weather conditions were generally favourable for the grain maize harvesting campaign, which is still ongoing. The grain maize yield expectations have increased slightly, compared with the previous bulletin, as a result of favourable conditions during the end of the grain-filling period and during harvesting.

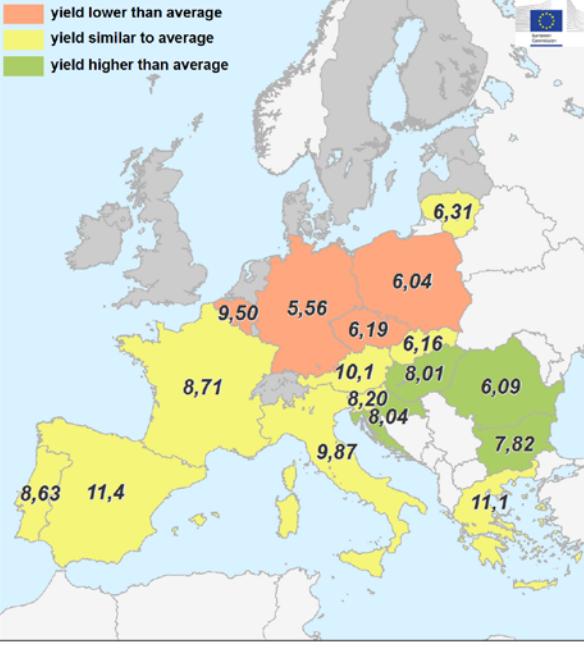


3. Crop yield forecasts

Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	7,29	7,85	7,63	+4,6	-2,9
AT	9,76	10,0	10,1	+3,6	+1,6
BE	11,0	12,3	9,50	-14	-22
BG	6,24	6,44	7,82	+25	+22
CY	-	-	-	-	-
CZ	7,56	6,84	6,19	-18	-9,5
DE	9,74	10,5	5,56	-43	-47
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	11,2	11,2	11,4	+2,0	+1,9
FI	-	-	-	-	-
FR	9,00	10,1	8,71	-3,2	-14
GR	10,8	9,92	11,1	+2,6	+11
HR	7,16	6,33	8,04	+12	+27
HU	6,84	6,89	8,01	+17	+16
IE	-	-	-	-	-
IT	9,71	9,30	9,87	+1,7	+6,1
LT	6,29	5,74	6,31	+0,3	+10
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	6,43	7,15	6,04	-6,1	-16
PT	8,45	9,24	8,63	+2,2	-6,6
RO	4,55	5,95	6,09	+34	+2,4
SE	-	-	-	-	-
SI	8,00	7,11	8,20	+2,5	+15
SK	6,36	5,68	6,16	-3,2	+8,4
UK	-	-	-	-	-

Grain maize - yield forecast 2018

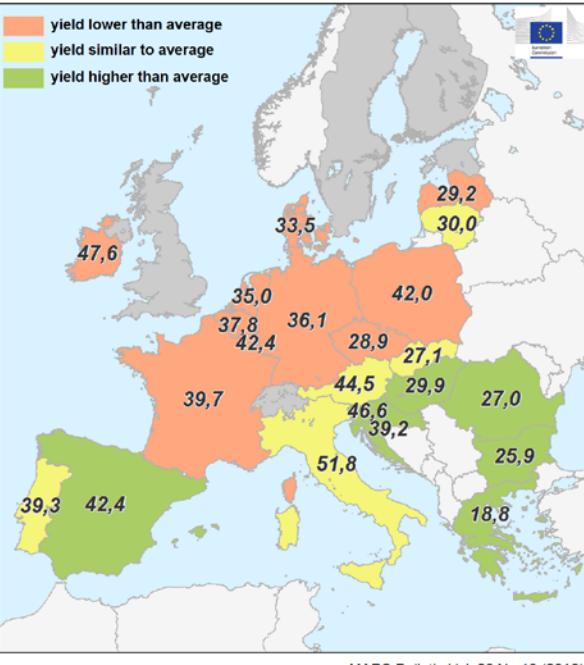
MARS forecast versus average yield (t/ha) 2013 - 2017



Country	GREEN MAIZE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU*	41,8	NA	37,8	-9,7	NA
AT	44,0	45,0	44,5	+1,0	-1,1
BE	43,4	44,6	37,8	-13	-15
BG	21,1	21,3	25,9	+23	+22
CY	-	-	-	-	-
CZ	35,5	34,8	28,9	-19	-17
DE	43,7	47,5	36,1	-17	-24
DK	37,1	38,7	33,5	-9,7	-14
EE	-	-	-	-	-
ES	40,4	38,9	42,4	+4,8	+8,9
FI	-	-	-	-	-
FR	41,9	45,3	39,7	-5,2	-12
GR	17,1	20,9	18,8	+9,7	-10
HR	36,1	32,4	39,2	+8,5	+21
HU	27,7	30,4	29,9	+8,0	-1,6
IE	51,4	55,7	47,6	-7,4	-15
IT	51,0	NA	51,8	+1,7	NA
LT	30,1	26,5	30,0	-0,3	+13
LU	47,5	55,8	42,4	-11	-24
LV	30,8	31,1	29,2	-5,1	-6,1
MT	-	-	-	-	-
NL	42,7	48,9	35,0	-18	-28
PL	44,1	NA	42,0	-4,7	NA
PT	39,2	35,5	39,3	+0,2	+11
RO	25,5	27,7	27,0	+5,6	-2,7
SE	-	-	-	-	-
SI	43,0	39,8	46,6	+8,4	+17
SK	27,9	25,3	27,1	-2,7	+7,0
UK	-	-	-	-	-

Green maize - yield forecast 2018

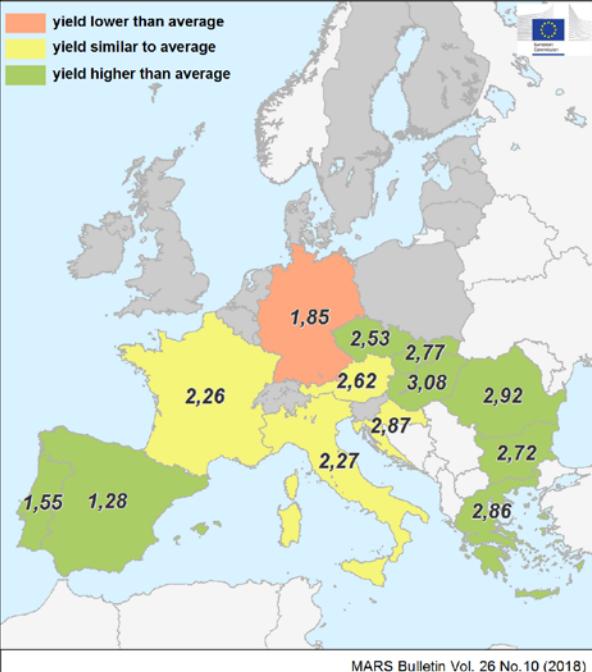
MARS forecast versus average yield (t/ha) 2013 - 2017



Country	SUNFLOWER (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	2,12	2,45	2,50	+18	+1,9
AT	2,54	2,33	2,62	+3,2	+13
BE	-	-	-	-	-
BG	2,26	2,29	2,72	+20	+19
CY	-	-	-	-	-
CZ	2,36	2,46	2,53	+7,3	+2,9
DE	2,13	2,20	1,85	-13	-16
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	1,13	1,24	1,28	+13	+3,4
FI	-	-	-	-	-
FR	2,27	2,76	2,26	-0,4	-18
GR	2,69	2,85	2,86	+6,1	+0,2
HR	2,93	3,12	2,87	-2,1	-8,0
HU	2,74	2,95	3,08	+12	+4,3
IE	-	-	-	-	-
IT	2,22	2,13	2,27	+2,2	+6,4
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	1,17	1,55	1,55	+32	+0,2
RO	2,17	2,97	2,92	+35	-1,6
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	2,54	2,51	2,77	+9,1	+11
UK	-	-	-	-	-

Sunflower - yield forecast 2018

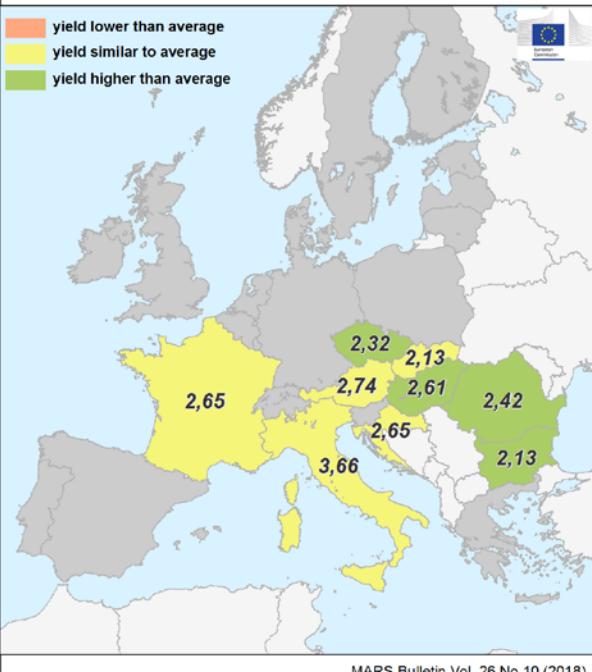
MARS forecast versus average yield (t/ha) 2013 - 2017



Country	SOYBEAN (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	2,90	2,92	2,93	+1,1	+0,5
AT	2,66	3,00	2,74	+3,0	-8,8
BE	-	-	-	-	-
BG	1,32	1,74	2,13	+62	+22
CY	-	-	-	-	-
CZ	2,21	2,41	2,32	+4,7	-3,9
DE	-	-	-	-	-
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	-	-	-	-	-
FI	-	-	-	-	-
FR	2,71	2,92	2,65	-2,3	-9,1
GR	-	-	-	-	-
HR	2,56	2,40	2,65	+3,2	+10
HU	2,33	2,10	2,61	+12	+24
IE	-	-	-	-	-
IT	3,72	3,66	3,66	-1,7	-0,1
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	-	-	-	-	-
RO	2,24	2,38	2,42	+8,0	+1,6
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	2,12	2,33	2,13	+0,5	-8,7
UK	-	-	-	-	-

Soybean - yield forecast 2018

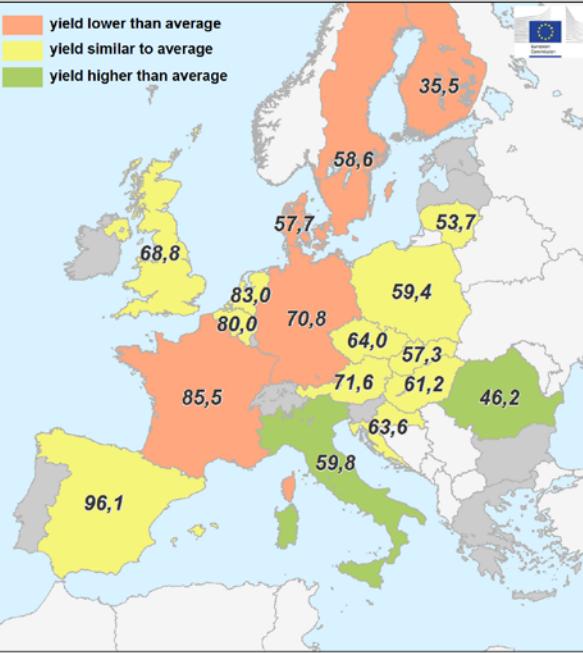
MARS forecast versus average yield (t/ha) 2013 - 2017



Country	SUGAR BEETS (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	74,9	NA	72,7	-2,8	NA
AT	73,3	70,1	71,6	-2,4	+2,0
BE	81,5	93,7	80,0	-1,8	-15
BG	-	-	-	-	-
CY	-	-	-	-	-
CZ	64,9	66,6	64,0	-1,5	-3,9
DE	75,5	83,8	70,8	-6,3	-16
DK	65,6	71,4	57,7	-12	-19
EE	-	-	-	-	-
ES	93,0	95,0	96,1	+3,3	+1,2
FI	38,7	36,6	35,5	-8,2	-2,8
FR	89,6	95,1	85,5	-4,6	-10
GR	-	-	-	-	-
HR	61,1	NA	63,6	+4,0	NA
HU	61,4	NA	61,2	-0,5	NA
IE	-	-	-	-	-
IT	57,3	NA	59,8	+4,3	NA
LT	55,3	55,8	53,7	-2,9	-3,9
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	84,0	93,3	83,0	-1,1	-11
PL	59,2	67,9	59,4	+0,4	-13
PT	-	-	-	-	-
RO	40,6	41,6	46,2	+14	+11
SE	65,8	63,2	58,6	-11	-7,3
SI	-	-	-	-	-
SK	58,5	55,0	57,3	-2,1	+4,1
UK	71,4	NA	68,8	-3,5	NA

Sugar beet - yield forecast 2018

MARS forecast versus average yield (t/ha) 2013 - 2017

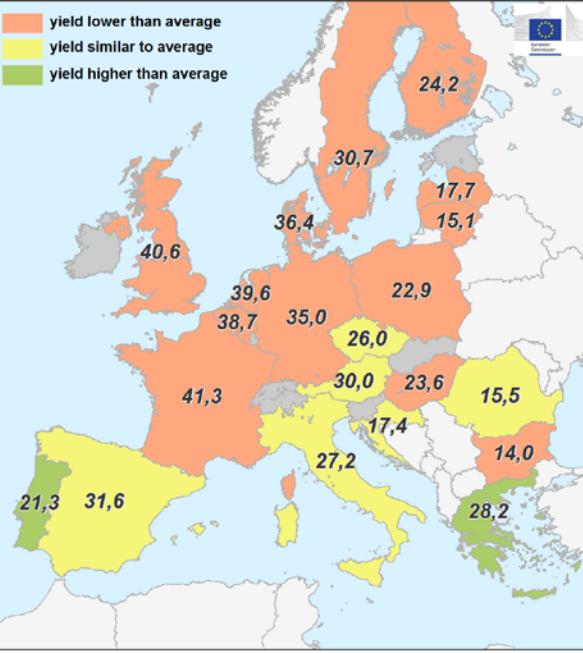


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Country	POTATO (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	33,6	NA	30,9	-7,8	NA
AT	30,9	28,4	30,0	-2,9	+5,6
BE	46,3	47,6	38,7	-17	-19
BG	15,5	17,8	14,0	-9,4	-21
CY	-	-	-	-	-
CZ	26,8	29,4	26,0	-3,0	-12
DE	44,5	46,8	35,0	-21	-25
DK	42,3	43,7	36,4	-14	-17
EE	-	-	-	-	-
ES	31,5	31,9	31,6	+0,3	-1,2
FI	27,1	28,9	24,2	-11	-16
FR	43,4	44,4	41,3	-4,8	-6,9
GR	26,8	28,3	28,2	+5,5	-0,1
HR	17,0	NA	17,4	+2,2	NA
HU	24,7	NA	23,6	-4,4	NA
IE	-	-	-	-	-
IT	26,9	NA	27,2	+1,1	NA
LT	15,8	12,3	15,1	-4,5	+23
LU	-	-	-	-	-
LV	18,8	NA	17,7	-5,6	NA
MT	-	-	-	-	-
NL	43,6	46,0	39,6	-9,3	-14
PL	24,5	27,9	22,9	-6,6	-18
PT	19,7	21,7	21,3	+7,9	-1,8
RO	15,9	18,2	15,5	-2,8	-15
SE	34,7	34,7	30,7	-12	-12
SI	-	-	-	-	-
SK	-	-	-	-	-
UK	42,5	42,9	40,6	-4,4	-5,3

Potato - yield forecast 2018

MARS forecast versus average yield (t/ha) 2013 - 2017

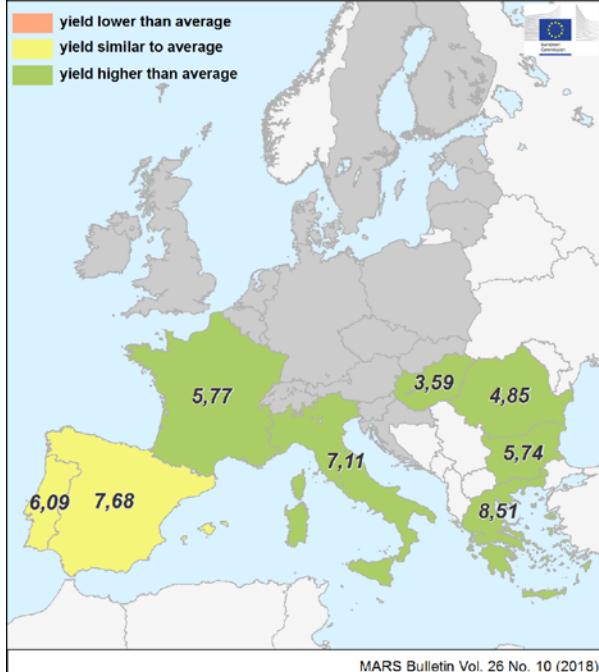


MARS Bulletin Vol. 26 No.10 (2018)

Country	RICE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
EU	6,9	6,9	7,1	+3,8	+3,8
AT	-	-	-	-	-
BE	-	-	-	-	-
BG	5,4	5,7	5,7	+6,5	+0,5
CY	-	-	-	-	-
CZ	-	-	-	-	-
DE	-	-	-	-	-
DK	-	-	-	-	-
EE	-	-	-	-	-
ES	7,6	7,5	7,7	+0,5	+3,0
FI	-	-	-	-	-
FR	5,2	5,9	5,8	+10	-1,7
GR	8,3	9,0	8,5	+2,6	-5,5
HR	-	-	-	-	-
HU	3,4	3,5	3,6	+4,9	+4,0
IE	-	-	-	-	-
IT	6,8	6,6	7,1	+5,1	+8,0
LT	-	-	-	-	-
LU	-	-	-	-	-
LV	-	-	-	-	-
MT	-	-	-	-	-
NL	-	-	-	-	-
PL	-	-	-	-	-
PT	6,0	6,2	6,1	+0,9	-2,0
RO	4,4	4,8	4,9	+11	+2,2
SE	-	-	-	-	-
SI	-	-	-	-	-
SK	-	-	-	-	-
UK	-	-	-	-	-

Rice - yield forecast 2018

MARS forecast versus average yield (t/ha) 2013 - 2017



Country	GRAIN MAIZE (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
BY	5,39	5,00	5,63	+4,5	+13
TR	9,17	9,23	9,47	+3,2	+2,6
UA	6,07	5,44	6,26	+3,1	+15

Country	SOYBEAN (t/ha)				
	Avg 5yrs	2017	MARS 2018 forecasts	%18/5yrs	%18/17
BY	-	-	-	-	-
TR	4,34	4,42	4,55	+4,9	+3,0
UA	2,08	1,97	2,24	+8,0	+14

Note: Yields are forecast for crops with more than 10000 ha per country (for rice more than 1000 ha per country).

Sources: MARS 2018 yield forecasts come from MARS CROP YIELD FORECASTING SYSTEM (based on model output up to 10/10/2018)

Other EU 2013-2018 data come from DG AGRICULTURE short term Outlook data (dated September 2018, received on 10/10/2018), EUROSTAT Eurobase (last update: 09/10/2018) and EES (last update: 15/11/2017)

* The EU figures do not include green maize forecasts for Sweden and the United Kingdom since recent data on yields were not consistent.

Non-EU. 2013-2017 data come from USDA, Turkish Statistical Institute (TurkStat), EUROSTAT Eurobase (last update: 09/10/2018), State Statistics Service of Ukraine, FAO and PSD-online

NA = Data not available.

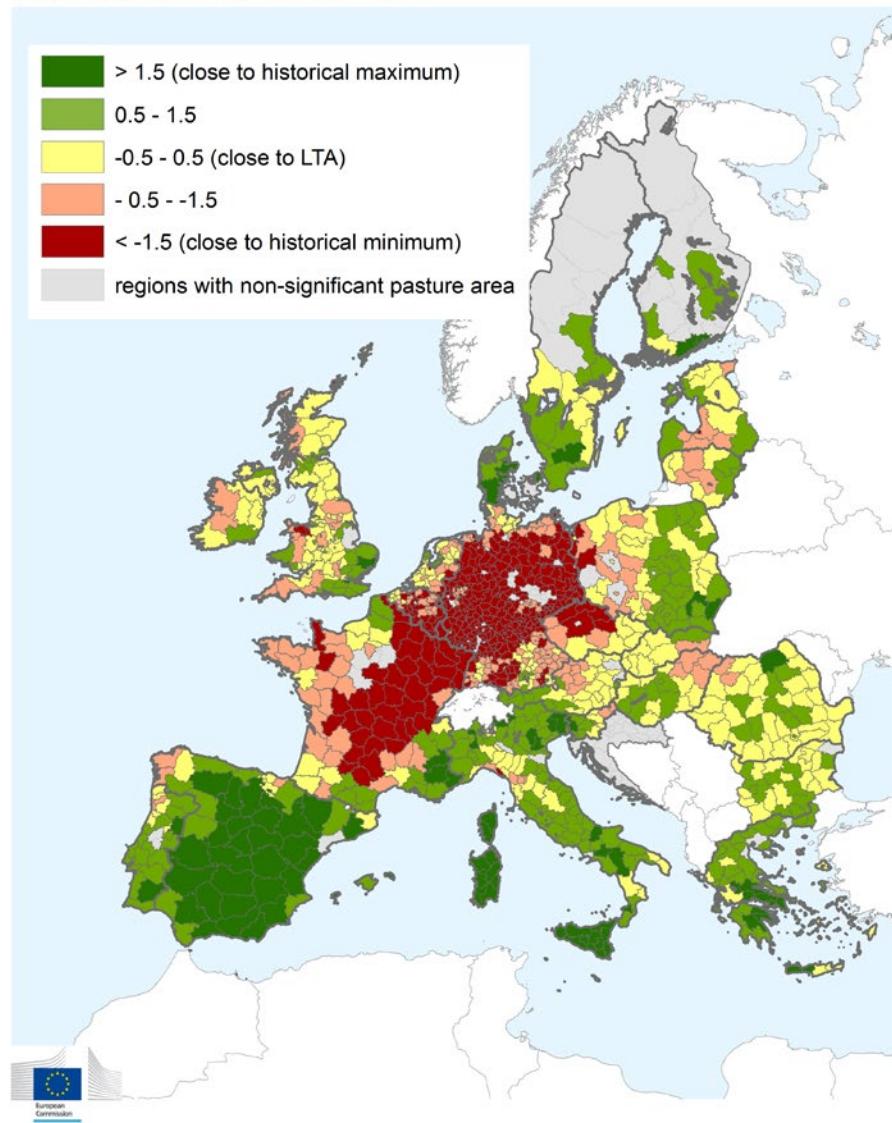
4. Pastures in Europe — Regional monitoring

Relative index of pasture productivity

Period of analysis: 1 September - 10 October 2018

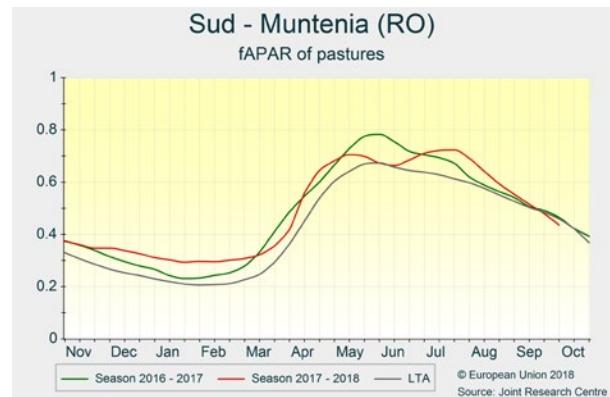
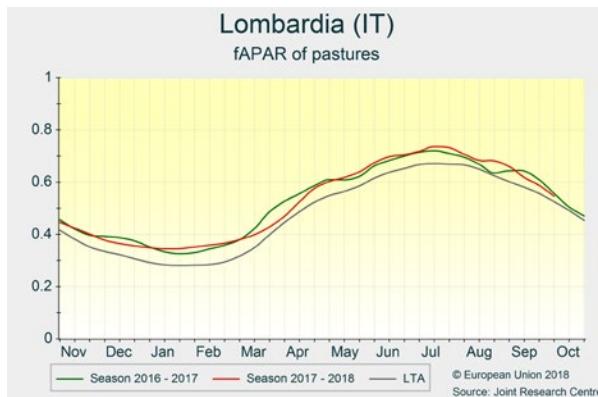
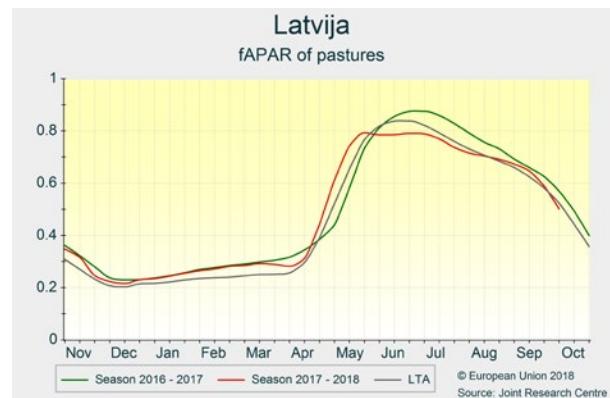
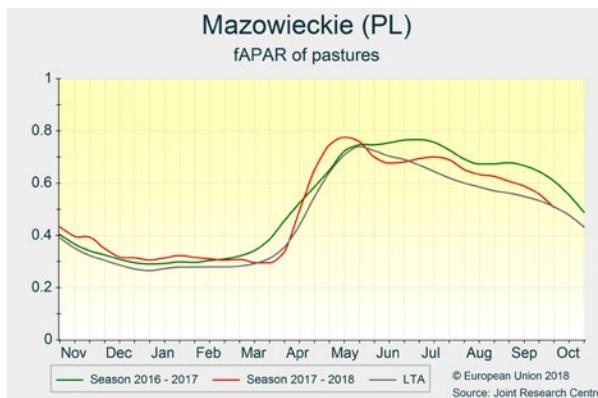
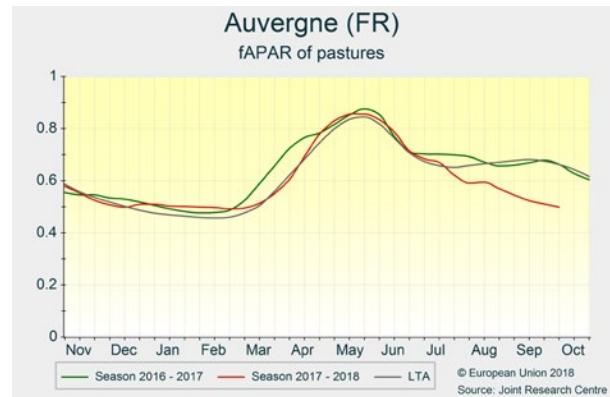
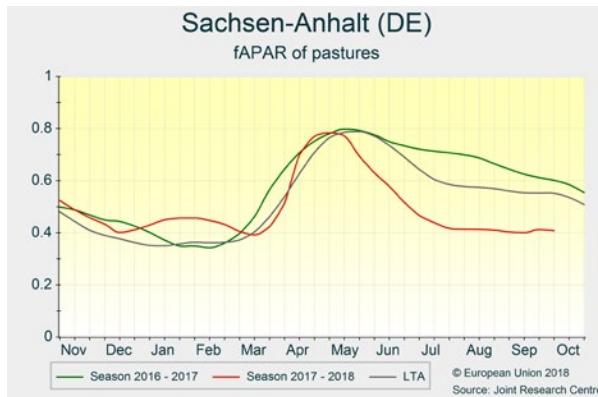
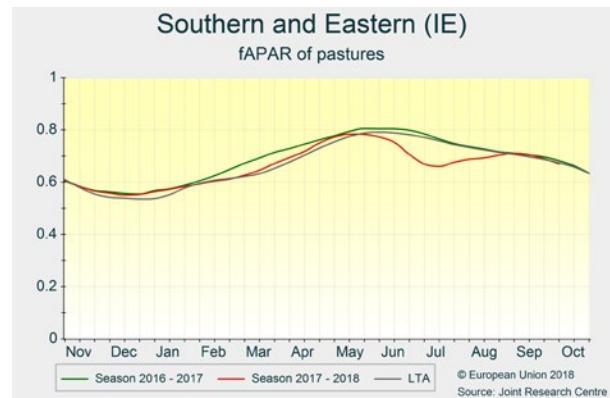
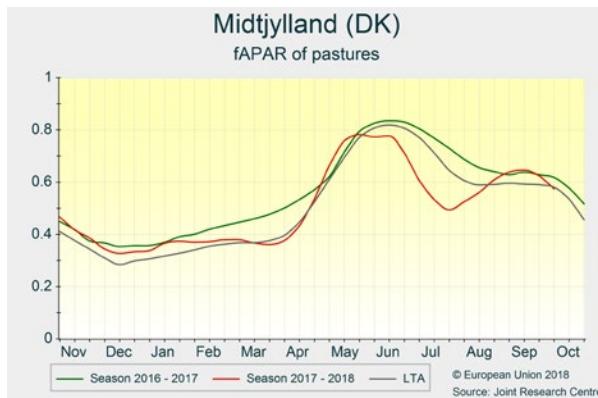
Index based on Copernicus GEOV2 fAPAR 10-day product.

Historical archive (LTA) from 1999 to 2017



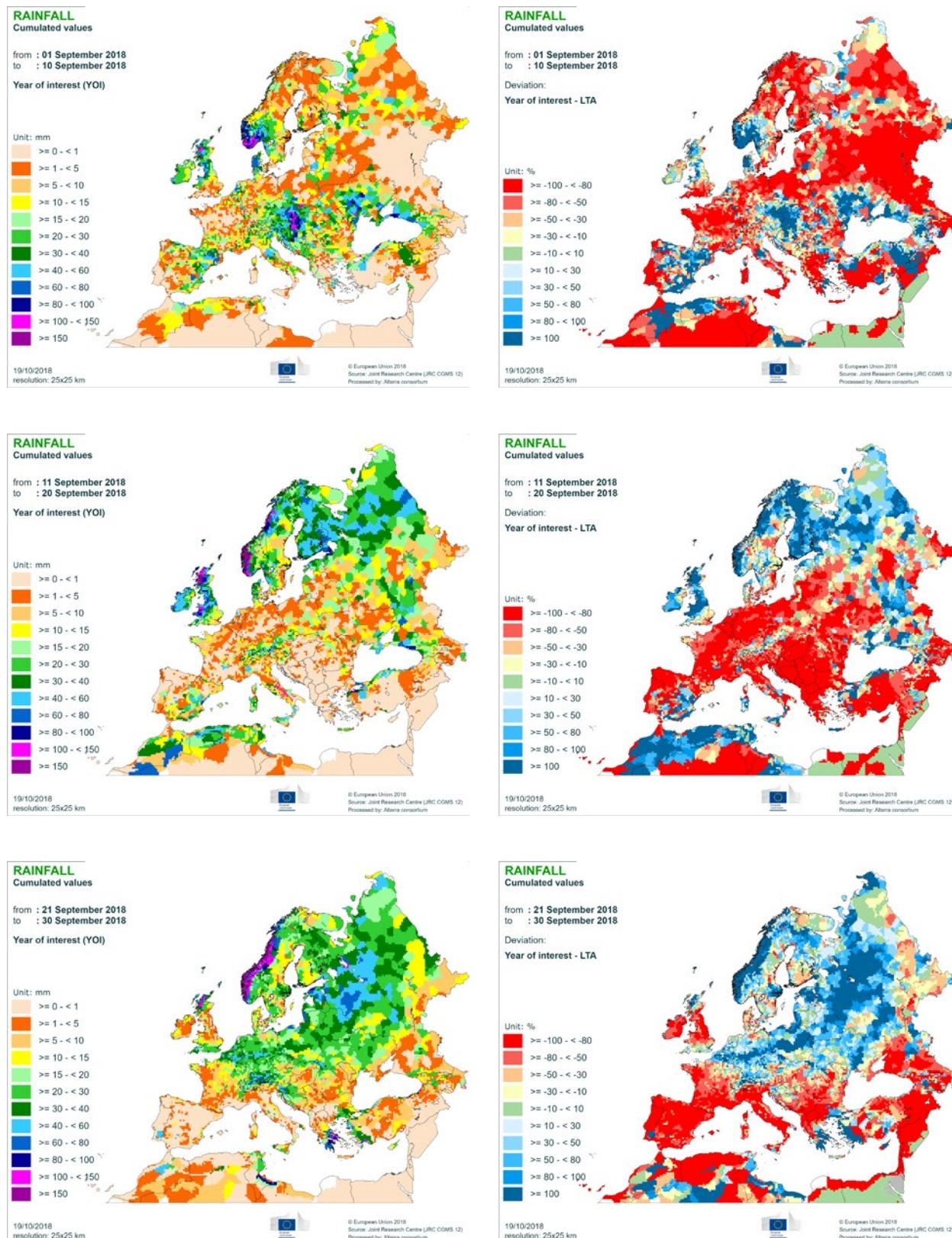
Weather conditions in September and the first half of October have been favourable for pasture growth in northern European countries, including the **UK, Ireland, Denmark** and **Sweden**. Temperatures were close to seasonal values and precipitation was sufficient to recover biomass production to average or above-average levels from the exceptionally low values observed at the end of August. A partial recovery of pasture productivity has also been observed in the **Netherlands**. By contrast, in most of **Germany, France, Czech Republic, Belgium** and **Luxembourg**, the unusually dry and warm conditions observed during the summer have persisted. Biomass formation levels remain exceptionally low in those pasture areas that have been heavily affected by drought during the growing season (e.g. *Sachsen-Anhalt, Lorraine*). Moreover, in the grassland areas in the centre of France (*Auvergne, Limousin*) dry conditions since August have led to a sharp decrease in pasture productivity since September.

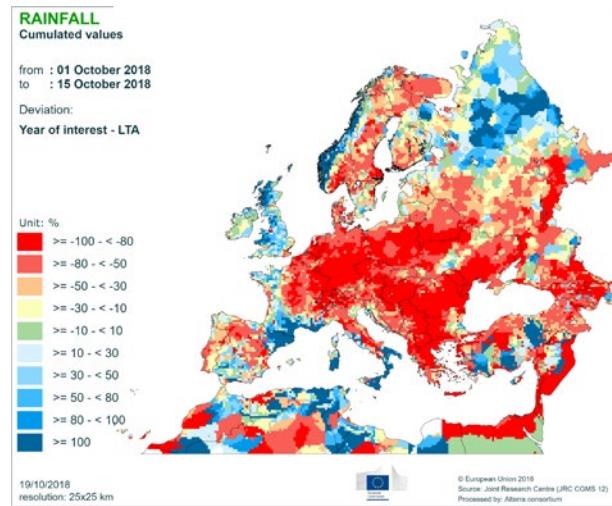
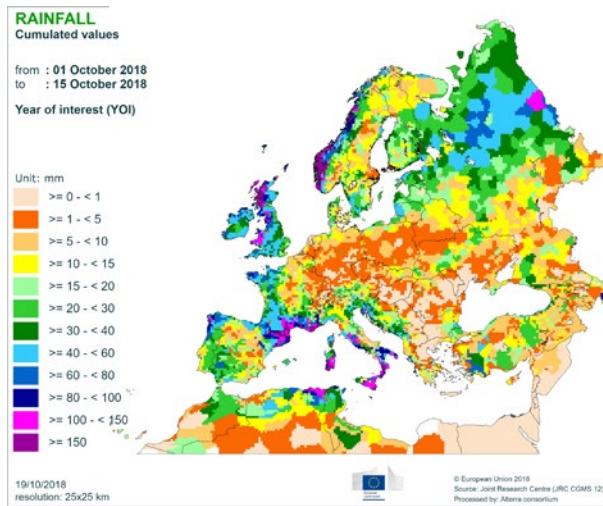
In the main producing areas in the east of **Poland** (*Mazowieckie, Warmińsko-Mazurskie*), pastures present favourable conditions. There, some substantial rainfall events in August and September have enabled pasture productivity to remain above the LTA. In **Lithuania, Latvia, Estonia** and **Finland**, the pasture growing season is coming to an end. Temperatures have drastically decreased in the first half of October and senescence in grasslands has started. Pasture productivity in September has been close to the average as a result of sufficient precipitation in August. In **Romania** and **Hungary**, weather conditions since September have been unusually dry. Moreover, since the last week of September, temperatures have dropped by more than 6 °C. As a consequence, grasslands and fodder crops are reaching senescence and pasture productivity has decreased from the exceptionally high values observed during most of summer and is currently close to the LTA. In **Spain, Italy** and western **Austria**, pasture productivity is above the average thanks to the favourable weather conditions experienced during the summer.



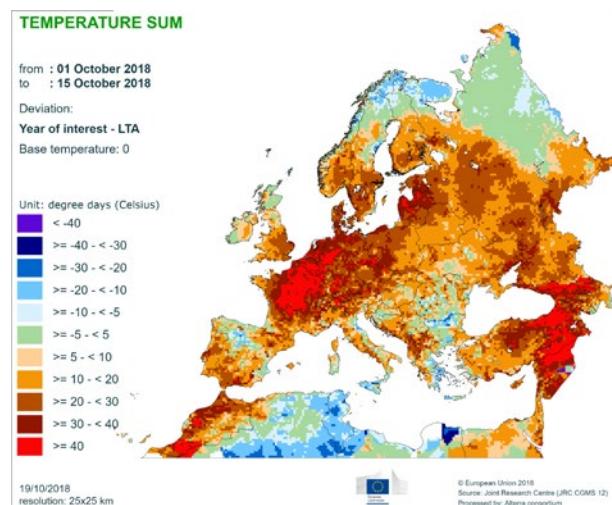
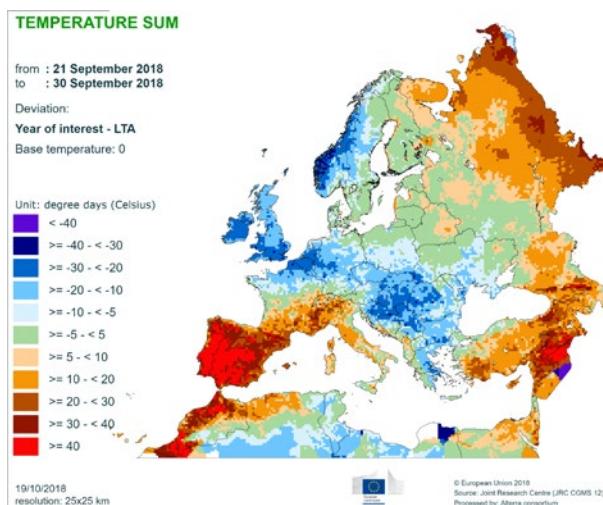
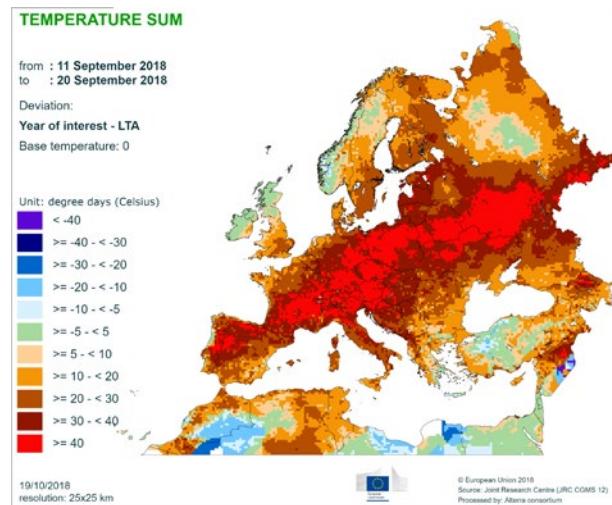
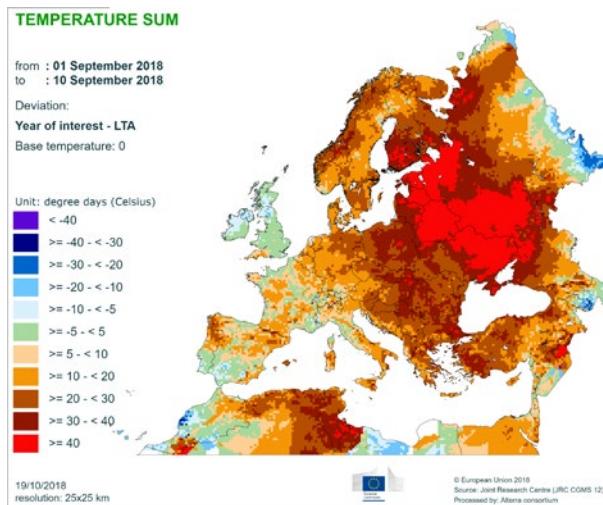
5. Atlas

Precipitation

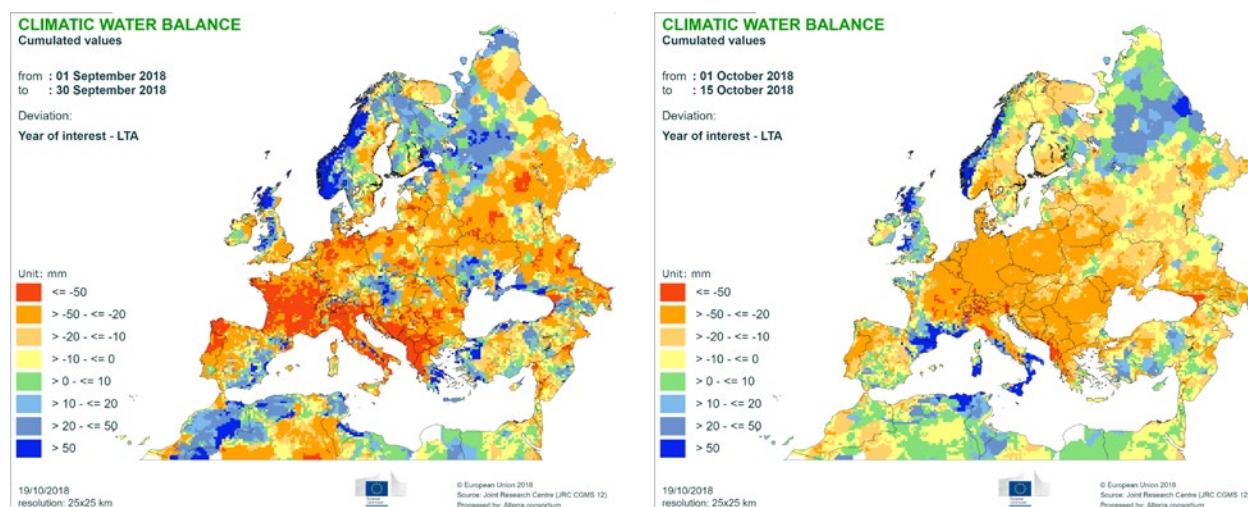




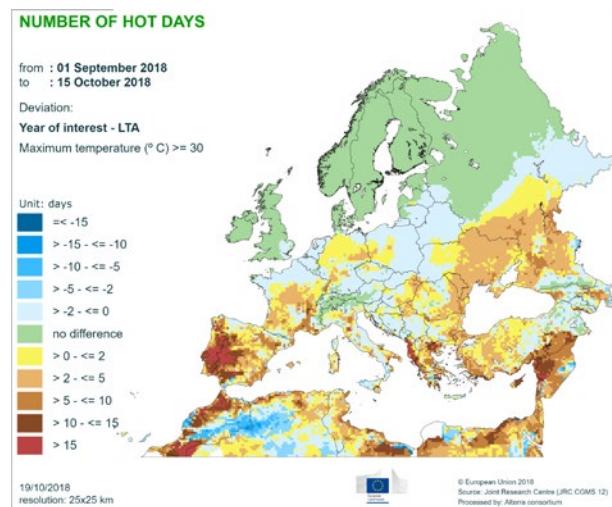
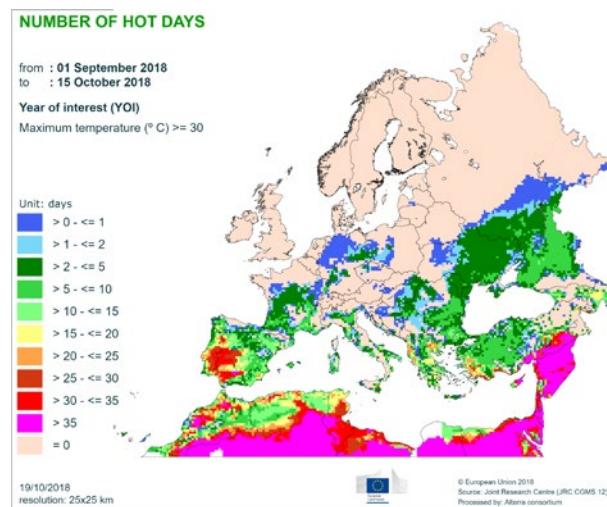
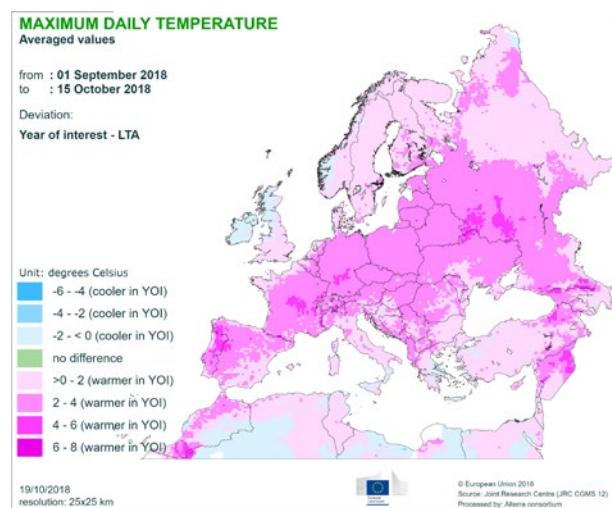
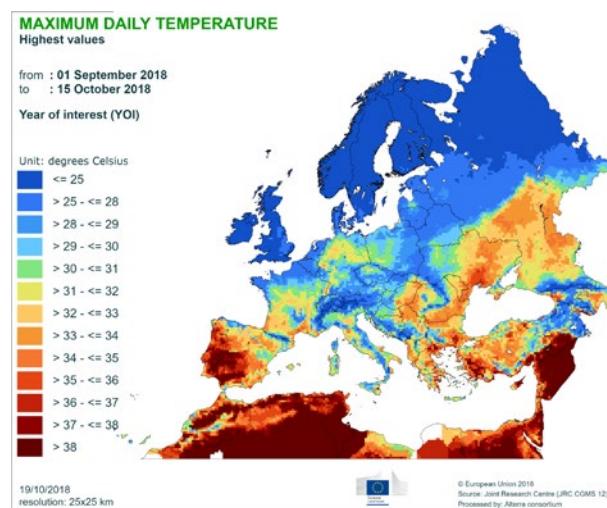
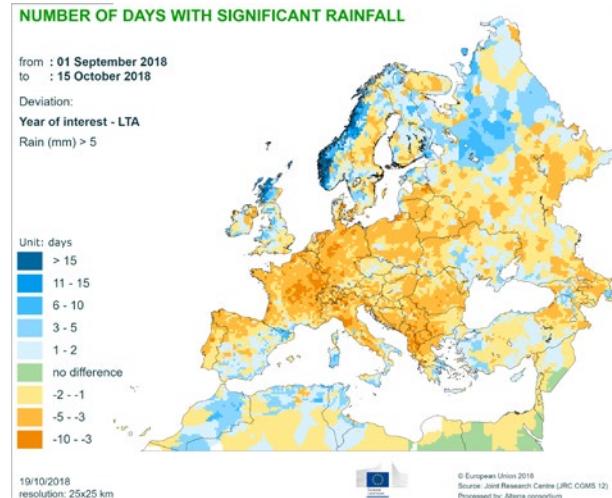
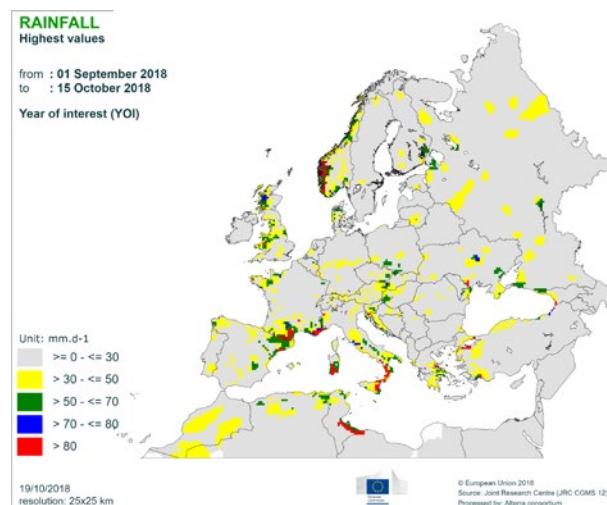
Temperature regime



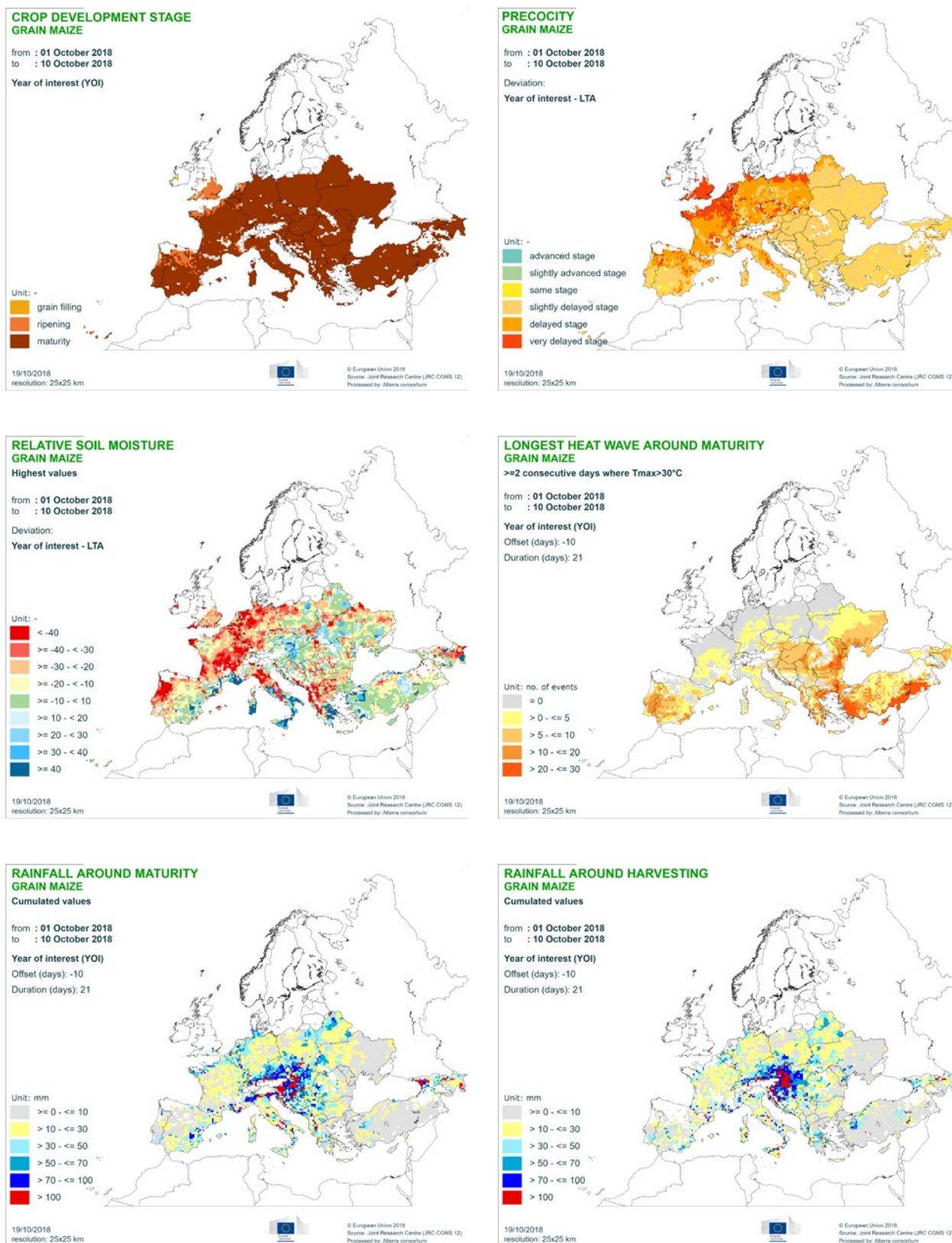
Climatic water balance



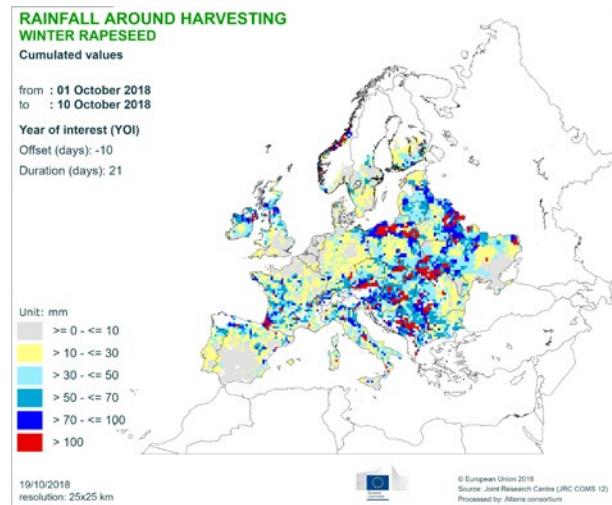
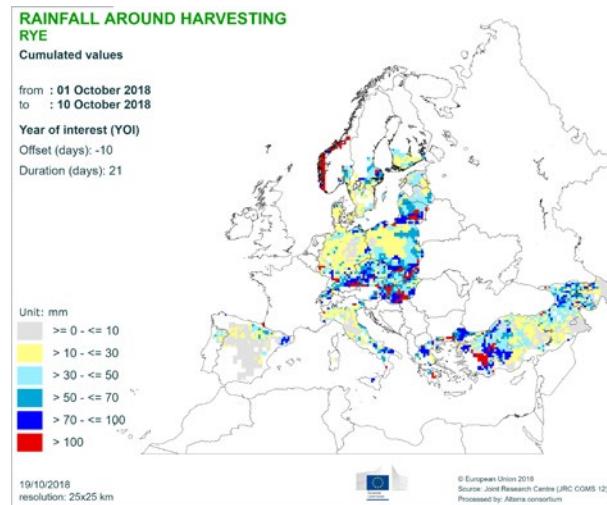
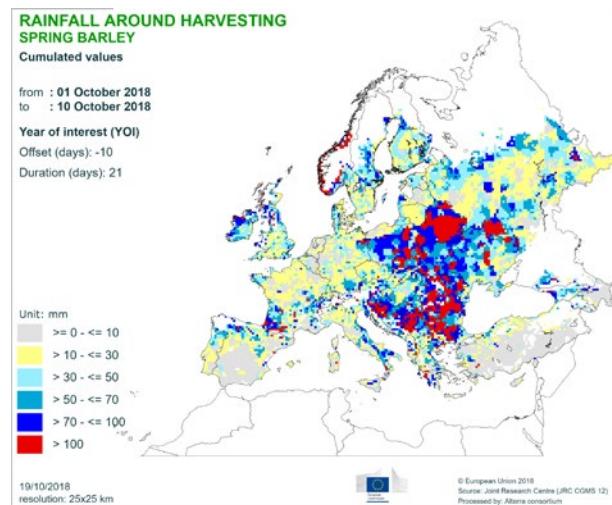
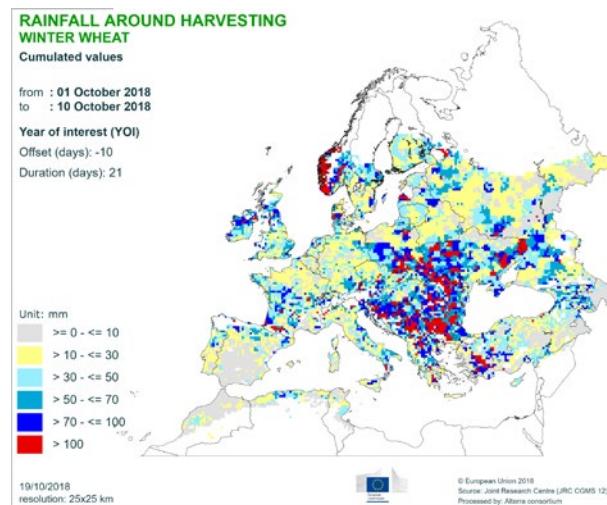
Weather events



Maize



Rainfall around harvesting



JRC MARS Bulletins 2018

Date	Publication	Reference
22 Jan	Agromet analysis	Vol. 26 No 1
19 Feb	Agromet analysis, durum wheat update and yield forecast	Vol. 26 No 2
19 Mar	Agromet analysis, yield forecast, pasture analysis	Vol. 26 No 3
16 Apr	Agromet analysis, remote sensing, yield forecast, sowing conditions, pasture analysis	Vol. 26 No 4
22 May	Agromet analysis, remote sensing, yield forecast, sowing update, pasture analysis	Vol. 26 No 5
18 Jun	Agromet analysis, remote sensing, yield forecast, pasture update, rice analysis	Vol. 26 No 6
23 Jul	Agromet analysis, remote sensing, yield forecast, harvesting conditions, pasture update	Vol. 26 No 7
27 Aug	Agromet analysis, remote sensing, yield forecast, pasture update, harvesting update	Vol. 26 No 8
17 Sep	Agromet analysis, remote sensing, yield forecast, harvesting update	Vol. 26 No 9
22 Oct	Agromet analysis, remote sensing, yield forecast, rice analysis, harvesting update, sowing conditions	Vol. 26 No 10
26 Nov	Agromet analysis and yield forecast, harvesting update, sowing updates	Vol. 26 No 11
17 Dec	Agromet analysis	Vol. 26 No 12

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Analysis and reports

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*MARS stands for Monitoring Agricultural Resources

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The long-term average (LTA) used within this bulletin as a reference is based on an archive of data covering 1975–2017.

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