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European Commission

JRC MARS Bulletin
Crop monitoring in Europe
May 2021

Cautiously positive yield outlook for winter crops

At EU level, the yield forecasts for winter crops have been revised slightly upwards, mainly because the improved outlook for France, Romania, Bulgaria, Hungary and several other southern-central European countries outweighed the slight downward revisions for several more northerly countries, as well as for Greece.

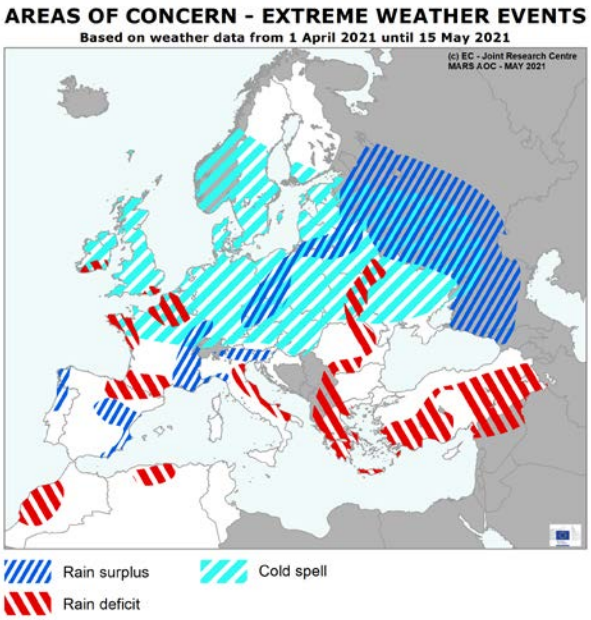
During the period of review, large parts of Europe were affected by severe cold spells. The most distinct events that occurred after the reporting period of the April Bulletin (20 April) mostly affected north-western, central, eastern and northern Europe. The main impact of the cold events on winter crops has been a delay in growth and phenological development, and some reversible damage to flowering rapeseed stands, with no major impacts on yield potential. In the case of spring cereals and summer crops, emergence and canopy development are delayed in the regions affected.

Rain deficits that occurred in several EU regions had little or no negative impact on yield potential, as, in most regions, soil water contents remained at adequate levels and evaporative demand was relatively low. Rain surpluses in other parts of Europe mostly benefited crops by restoring soil water levels.

Contents:

1. Agrometeorological overview
2. Remote sensing – observed canopy conditions
3. Pastures in Europe – regional monitoring
4. Sowing conditions
5. Country analysis
6. Crop yield forecasts
7. Atlas

Covers the period from 1 April until 15 May



Crop	Yield t/ha				
	Avg 5yrs	April Bulletin	MARS 2021 forecasts	%21/5yrs	% Diff April
Total cereals	5.33	5.52	**5.56**	+ 4.2	+ 0.7
Total wheat	5.47	5.64	**5.70**	+ 4.1	+ 1.1
Soft wheat	5.69	5.86	**5.91**	+ 3.9	+ 0.9
Durum wheat	3.49	3.47	**3.56**	+ 1.8	+ 2.6
Total barley	4.77	4.86	**4.89**	+ 2.4	+ 0.6
Spring barley	4.12	4.16	**4.17**	+ 1.4	+ 0.2
Winter barley	5.62	5.83	**5.89**	+ 4.8	+ 1.0
Grain maize	7.75	7.81	**7.81**	+ 0.8	+ 0.0
Rye	3.83	3.98	**4.05**	+ 5.9	+ 1.8
Triticale	4.07	4.20	**4.17**	+ 2.5	– 0.7
Rape and turnip rape	3.06	3.19	**3.21**	+ 5.2	+ 0.6
Potato	32.8	33.9	**34.0**	+ 3.7	+ 0.3
Sugar beet	74.2	75.6	**75.5**	+ 1.8	– 0.0
Sunflower	2.27	2.21	**2.21**	– 2.9	+ 0.0
Soybean	2.93	3.01	**2.99**	+ 2.1	– 0.7

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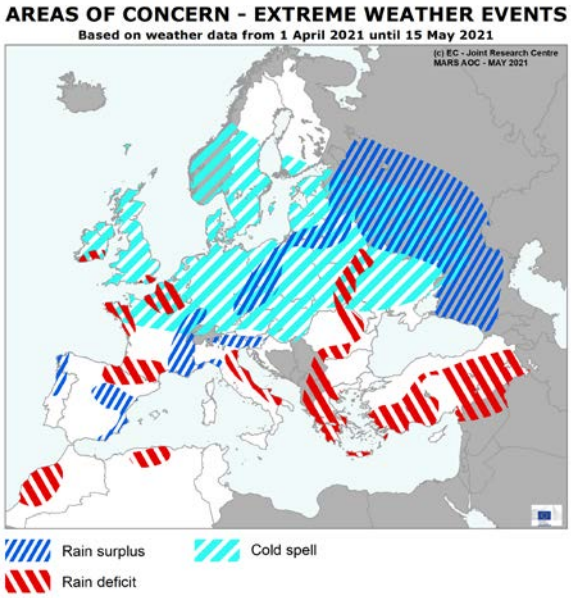
Joint Research Centre

1. Agrometeorological overview

1.1. Areas of concern



Large parts of Europe were affected by severe cold spells during the period of review. The map above only reflects the most distinct events (in terms of duration and/or severity) that occurred after the reporting period of the April Bulletin (20 April), which mostly affected north-western, central, eastern and northern Europe. Temperature anomalies reached -8°C (compared with the long-term average, LTA) in several parts of Germany and Denmark during this period. However, in most cropland regions, minimum temperatures did not drop below -5°C in the last dekad of April, nor below -3°C in the first dekad of May.

Similar to what was reported in the April Bulletin, the main impact of the cold events on winter crops has been a delay in growth and phenological development, and some reversible damage to flowering rapeseed stands, with no major impacts on yield potential. In the case of spring cereals and summer crops, emergence and canopy development are delayed in the regions affected. Such delays imply an increased risk of the crops being exposed to possible heatwaves during sensitive stages in summer, but fair to good yields are still possible if adequate conditions prevail during the remainder of the season.

A positive aspect of the colder-than-usual conditions, is that crop-water demand has also been lower than usual. As a consequence, the impacts on crops of rain deficits in these regions, as shown on the map, were very limited; this is also the case for Italy, southern France, and Romania, where temperatures were slightly below average. In some areas, spring sowing was delayed due to dry top soils, thus adding to the delay caused by the cold weather.

Recent lack of rainfall in Greece and Cyprus raises some concern. In Turkey, the pronounced rain deficit has led to increased use of irrigation to sustain winter crops. There are concerns for the summer crop season throughout the country, due to the low levels of irrigation reservoirs. Dry and warm conditions in the Maghreb region further deteriorated the yield outlook for cereal crops in Algeria but had no negative impact on the end of the very positive growing season in Morocco.

Intense rainfall in Poland, at the beginning of May, caused some damage to crops, and some sugar beet stands required re-sowing. In eastern France, rainy weather at the beginning of May is expected to have had some negative impact on flowering winter barley and durum wheat. The rain surplus observed in Czechia, northern Italy, Lithuania, the Iberian Peninsula, Lithuania, western Russia and eastern Ukraine benefited crops by restoring soil water levels.

1.2. Meteorological review (1 April until 15 May 2021)

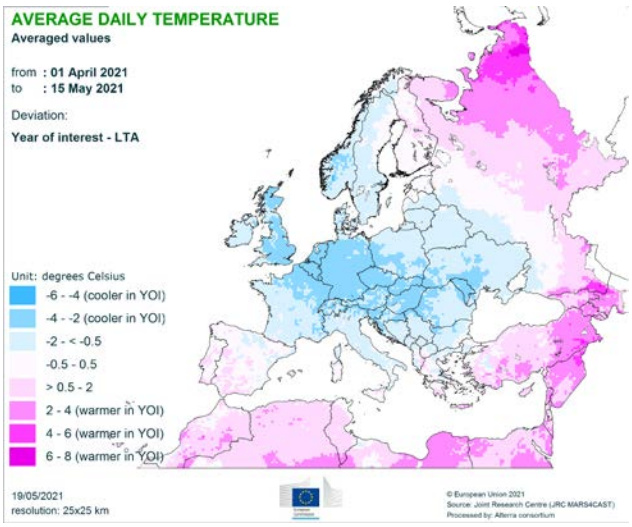
Colder-than-usual conditions were observed in a wide north-west/south-east belt extending from the United Kingdom to Romania, with daily mean temperature anomalies (with respect to the LTA) from -4°C to -2°C. **Slightly colder-than-usual conditions** (with daily mean temperature anomalies ranging from -2°C to -0.5°C) were recorded in the rest of Europe, except for the Iberian Peninsula, Finland, Greece and European Russia. In most of the above-mentioned areas, an exceptionally high number (above 100% of the LTA) of cold days (i.e. days with daily minimum temperature less or equal to 0°C) was observed.

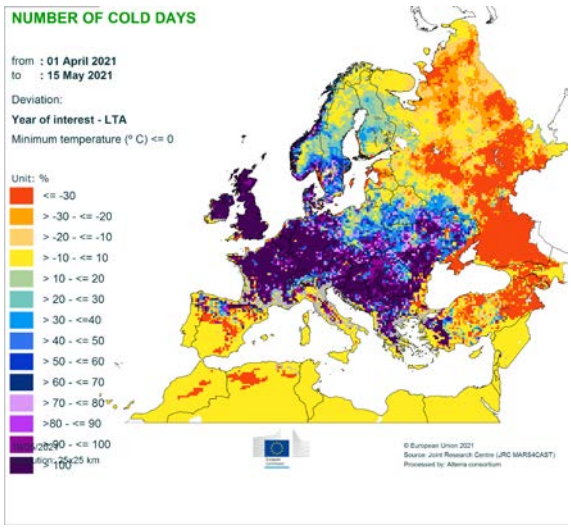
These unusual weather conditions were caused by a sequence of three **severe cold spells** that hit Europe, respectively, at the beginning, mid and at the end of April. The first cold spell mostly affected central and south-eastern Europe; the second one hit western, central and south-eastern Europe. While the third one mostly affected central, eastern and northern Europe. As a consequence, in large parts of central Europe **April 2021 was among the three coldest** (by looking at our historical archive, since 1979) in terms of mean daily temperature. While, in many areas of France, central Mediterranean and Scotland **record-breaking minimum temperatures** (among the first three) were reached.

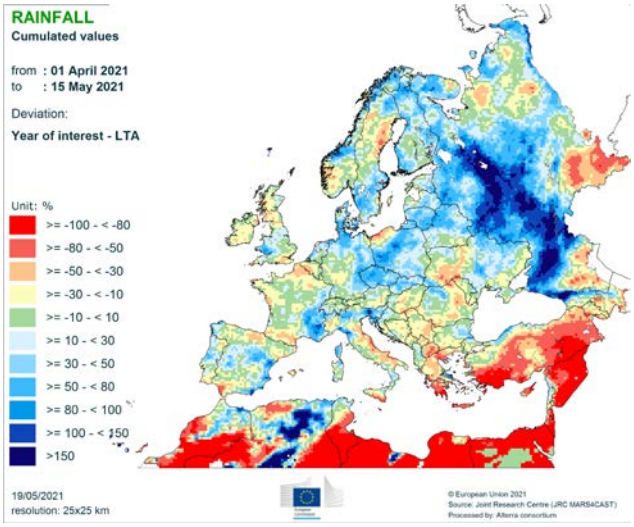
Slightly warmer- and warmer-than-usual conditions were observed in Turkey and European Russia. Daily mean temperature anomalies were less than 2°C in most of Turkey, except for its eastern part where higher values (up to 4°C) were recorded. The same holds for European Russia, which presents an eastward gradient of increasing anomalies, up to 6°C.

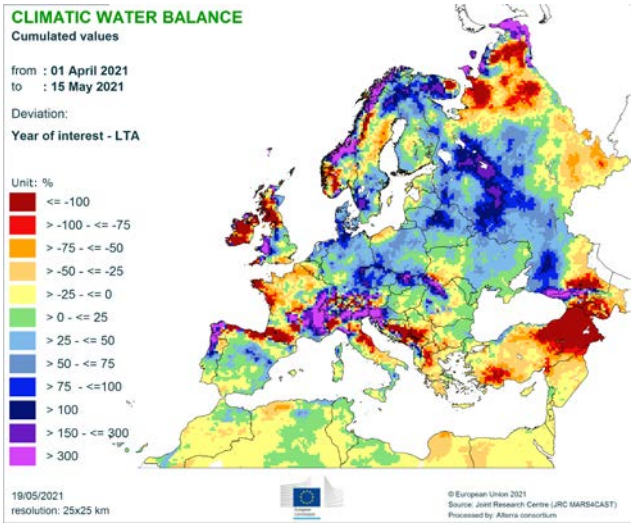
Wetter-than-usual conditions were observed in large areas of central-eastern Europe, south-eastern France, Sweden, Finland and European Russia. Anomalies of total precipitation were mainly from 50% to 80%, although higher values (up to 150%) were recorded in a meridional belt extending over European Russia.

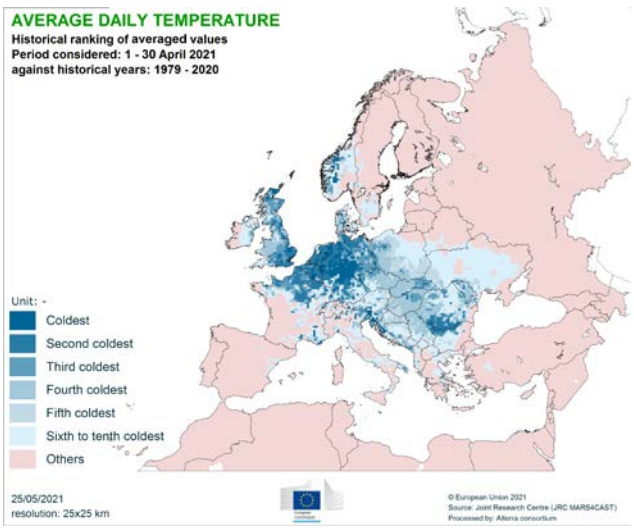
Drier-than-usual conditions were mainly observed in large regions of eastern Italy, south-eastern Europe and Turkey. While in most of these areas the anomalies of total precipitation were mostly from -50% to -30%, in large areas of Turkey and Greece values reaching -80% (and also -100%) were observed.

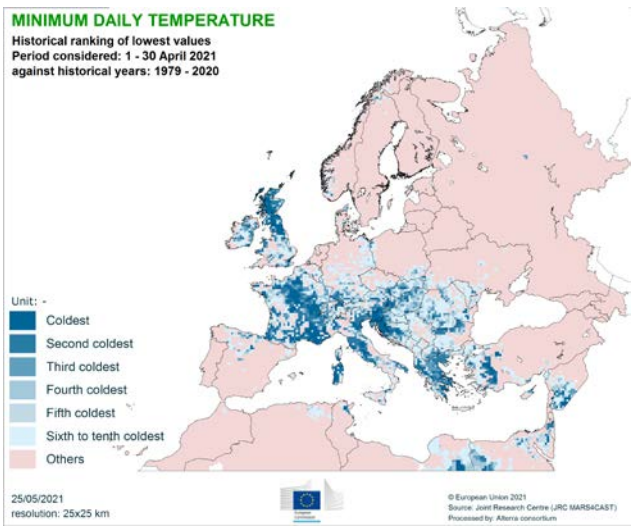





RAINFALL
Cumulated values
from : 01 April 2021
to : 15 May 2021
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100 - < 150
>150
19/05/2021
resolution: 25x25 km
© European Union 2021
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

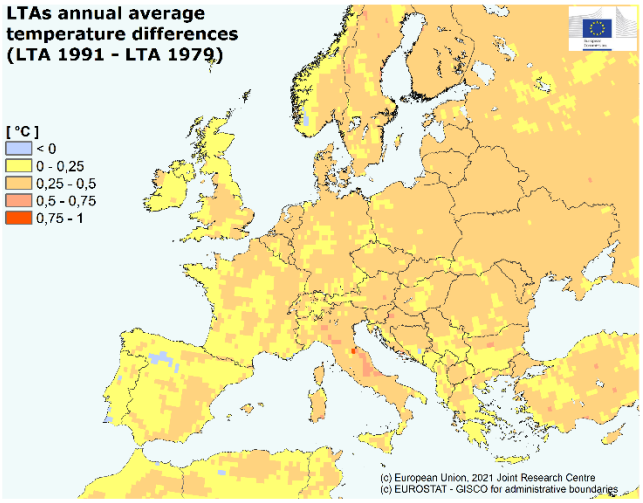

CLIMATIC WATER BALANCE
Cumulated values
from : 01 April 2021
to : 15 May 2021
Deviation:
Year of interest - LTA
Unit: %
<= -100
> -100 - <= -75
> -75 - <= -50
> -50 - <= -25
> -25 - <= 0
> 0 - <= 25
> 25 - <= 50
> 50 - <= 75
> 75 - <=100
> 100
> 150 - <= 300
> 300
19/05/2021
resolution: 25x25 km
© European Union 2021
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


AVERAGE DAILY TEMPERATURE
Historical ranking of averaged values
Period considered: 1 - 30 April 2021
against historical years: 1979 - 2020
Unit: -
Coldest
Second coldest
Third coldest
Fourth coldest
Fifth coldest
Sixth to tenth coldest
Others
25/05/2021
resolution: 25x25 km
© European Union 2021
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


MINIMUM DAILY TEMPERATURE
Historical ranking of lowest values
Period considered: 1 - 30 April 2021
against historical years: 1979 - 2020
Unit: -
Coldest
Second coldest
Third coldest
Fourth coldest
Fifth coldest
Sixth to tenth coldest
Others
25/05/2021
resolution: 25x25 km
© European Union 2021
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

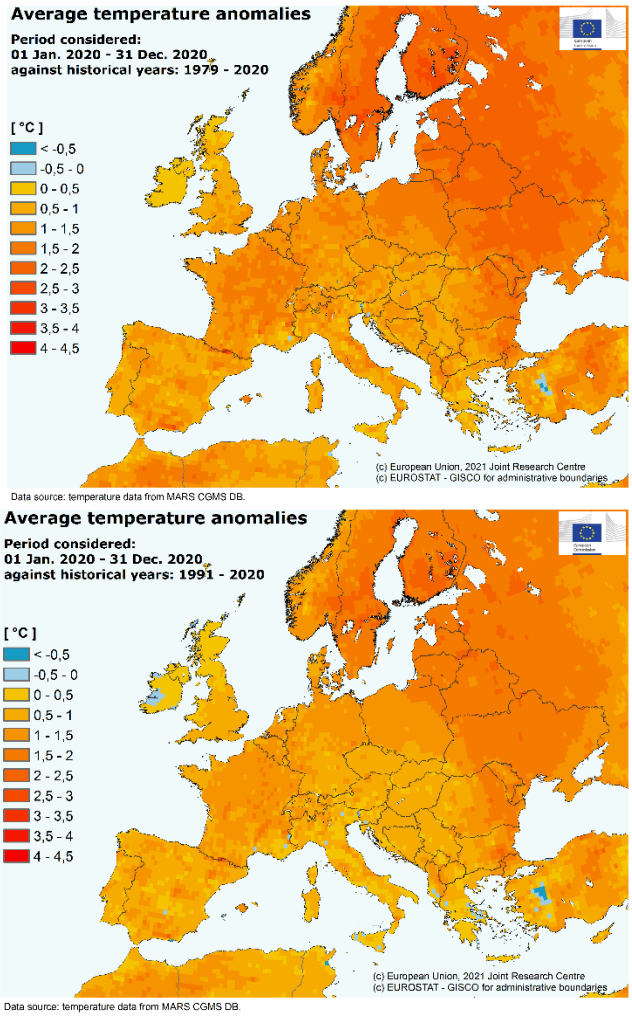
New Long-Term-Average (LTA)

All Long-Term-Averages (LTAs) used to define anomalies in the analyses have been updated. Following the recommendation of the World Meteorological Organization, considering the higher availability and quality of stations in the last decades, and to have LTA values closer to what people perceive as being "normal" conditions, the new reference period is 1991-2020. As shown in the map below, differences are not too pronounced and mostly point to a new warmer LTA.



Differences between the new and the previous annual mean temperature LTA.

Although this change does not modify trend and ranking, it affects the anomalies used and described in the Bulletins. As an example of such differences, the maps on the right show the anomalies of 2020 annual mean temperature derived by using the previous LTA and the new 1991-2020 LTA.



2020 annual mean temperature anomalies w.r.t. the previous (upper panel) and the new (lower panel) LTA.

1.3. Weather forecast (22-28 May)

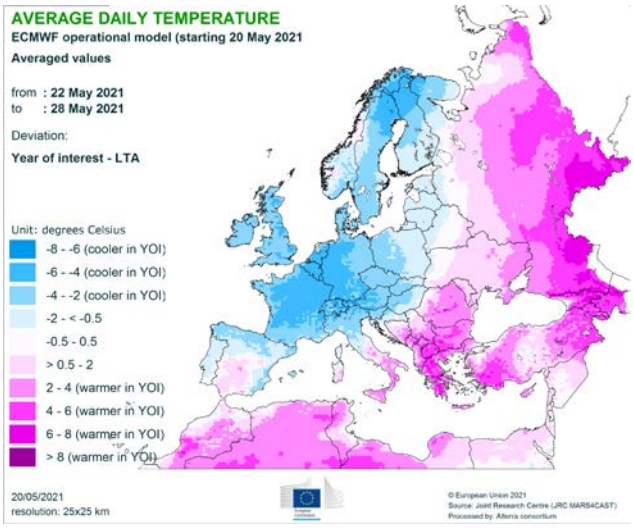
Weather conditions will be mainly determined by a trough evolving over the North Sea, a cyclonic system over the eastern Mediterranean, and small scale disturbances affecting the western Euro-Mediterranean region. This atmospheric pattern will trigger atmospheric instabilities, rainfall and colder flow in the affected regions.

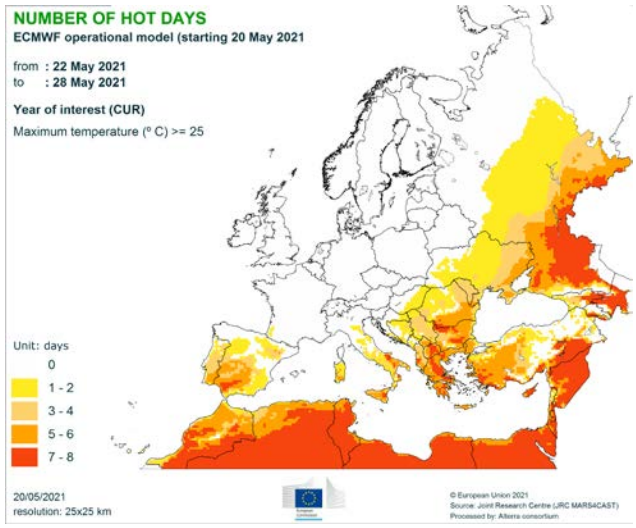
Colder-than-usual conditions are forecast in most of north-western, central, eastern, and northern Europe with daily mean temperature anomalies (with respect to the LTA) mainly from -6 °C to -2 °C.

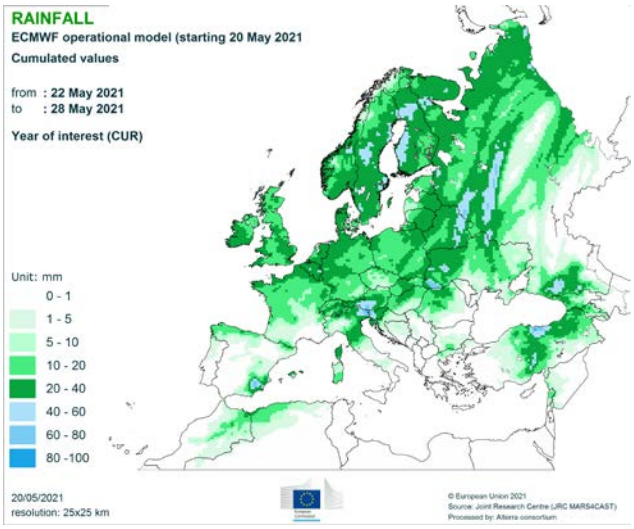
Warmer-than-usual conditions are expected in south-eastern Europe, southern Italy, Turkey, eastern Ukraine, and European Russia. Daily mean temperature anomalies in these regions will mainly range from 2 °C to 6 °C. **Slightly warmer-than-usual conditions** are forecast in large parts of Spain and Ukraine.

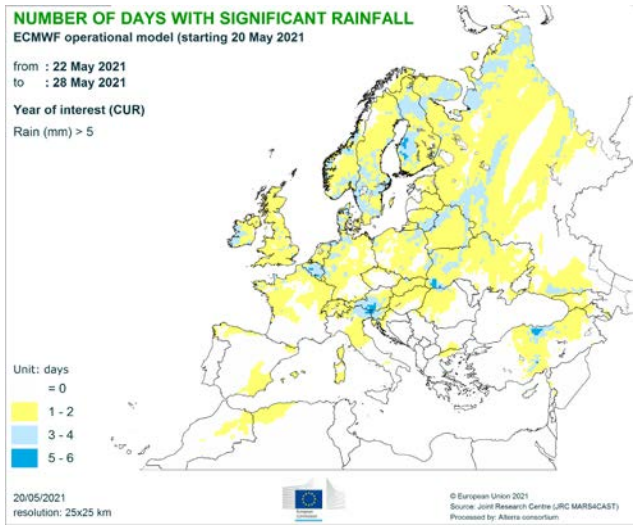
Wet conditions (with accumulated precipitation mainly between 10 mm and 40 mm; locally up to 80 mm) are expected in most of Europe, except in south-eastern regions, large areas of the Iberian Peninsula, Italy, and Turkey, where **dry conditions** are forecast.

Long-range weather forecast for June, July, August points to likely to occur warmer-than-usual conditions in the Euro-Mediterranean region (extremely likely over Turkey). Likely to occur drier-than-usual conditions are forecast in large parts of eastern Europe, Turkey, and the central Mediterranean region.



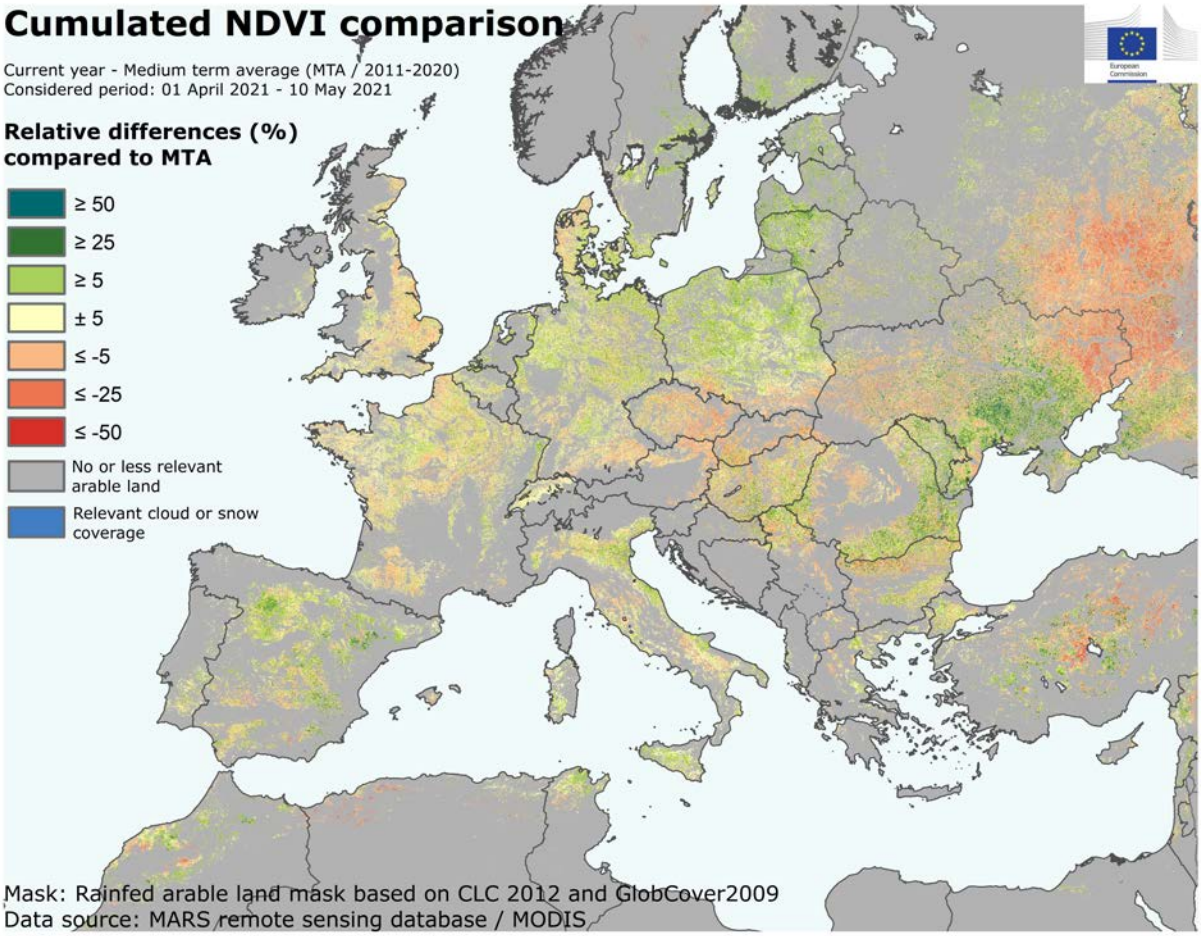






2. Remote sensing – observed canopy conditions

Fresh spring temperatures slowed biomass accumulation

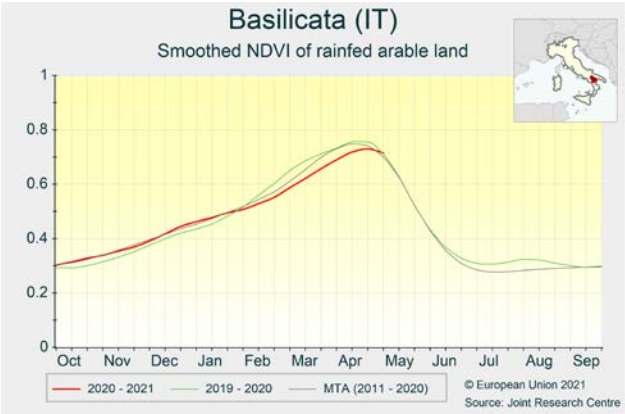


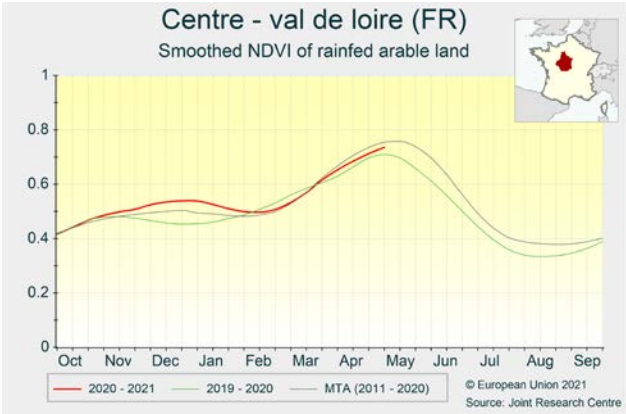
The map displays the differences between the Normalized Difference Vegetation Index (NDVI) cumulated from 1 April to 10 May 2021 and the medium-term average (MTA, 2011-2020) for the same period. Positive anomalies (in green) reflect above-average canopy density and/or early crop development, while negative anomalies (in red) reflect below-average biomass accumulation and/or late crop development.

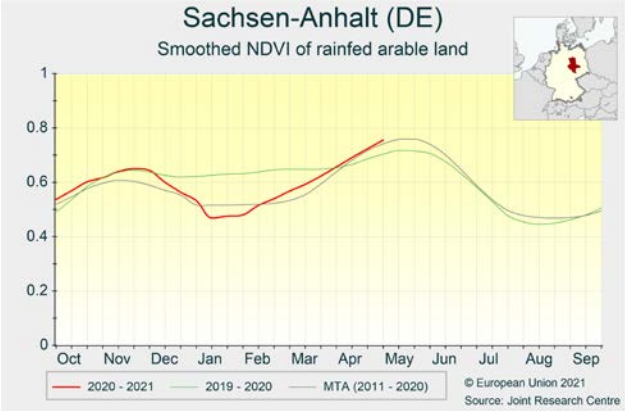
The map above displays predominately winter crop conditions, as the summer crop season has just started and contributes little to NDVI values. Average to slightly delayed crop stages are predominantly observed in southern and western regions, with the exception of the Iberian Peninsula, where early and favourable crop development still prevails. Cold spring temperatures have further increased the negative anomalies in central Europe. Conversely, a favourable biomass accumulation is observed in Romania and southern Ukraine, thanks to the overall mild spring temperatures and sufficient precipitation.

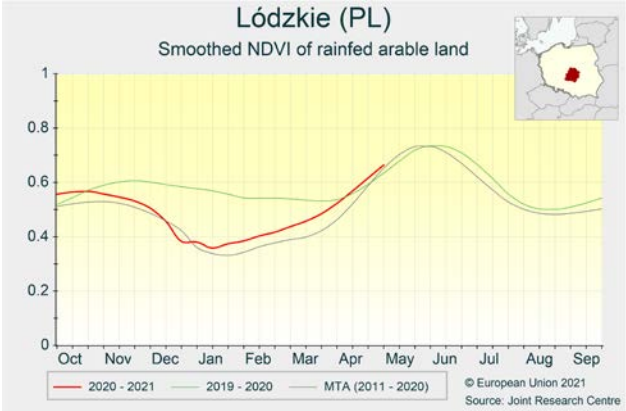
Spain shows a slowdown in crop development due to cold temperatures, slightly lower than the average. Crops in southern regions are in early flowering, while in northern regions green biomass accumulation is still ongoing, supported by the rainfall that arrived in April. In **southern Italy**, colder-than-usual weather slowed down crop development. Crop conditions are fair to slightly weak and winter cereals have reached flowering with around 10 days of delay with respect to the average, (e.g. *Basilicata*). In northern regions, favourable biomass accumulation was sustained by abundant precipitation that occurred from the second half of April onwards. In **France**, despite the dry conditions observed in April, biomass accumulation is proceeding in line with the average (e.g. *Centre*). The impact of the dry conditions on biomass accumulation was mitigated by cold temperatures that reduced water demand and evaporation. In northern **Germany** and **Poland**, the low temperatures registered in April have caused a slight slowdown in crop growth, but crop development as observed by the NDVI remains slightly anticipated and biomass accumulation is still sustained by the well-distributed precipitation in early spring (e.g.

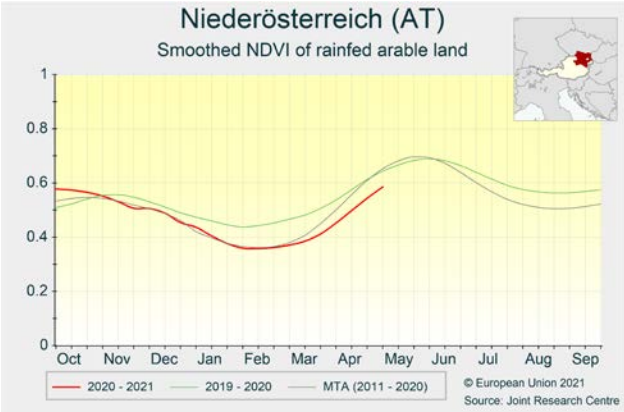
Sachsen-Anhalt, Lódzkie)**.** The map displays a large area with negative anomalies (red colours) covering central Europe (including **Slovakia**, **the Czech Republic**, **Austria**, **Hungary** and southern regions of Germany and Poland). In these regions, a crop development delay of more than 10 days is registered with respect to the average (e.g. *Niederösterreich*). This signifies an increased risk of heat stress later in the season, as yield formation stages might now coincide with the hotter periods during summer. In the **Baltic** countries, the positive anomaly highlighted on the map reflects a strong advancement of the season due to mild spring temperatures. In **Romania** and **Bulgaria,** crops continue to benefit from favourable weather conditions characterised by slightly below average temperatures and persistent rainfall. These regions also faced a drop in temperatures in April, which slowed down crop development in Bulgaria, while it had almost no impact on crops in Romania (e.g. *Macroregiunea Patru*). In **Greece**, crop biomass accumulation is average to fair while crop development, already delayed since early spring, was further hampered by a cold spell recorded in April (e.g. *Central Macedonia*). Mixed conditions are observed in **Ukraine.** Southern regions, with a prevalence of winter crops, are experiencing a positive and advanced start of the season, while eastern regions (including European **Russia**), are characterised by a delayed season. However, in these regions, good crop biomass accumulation is expected thanks to abundant precipitation and temperatures close or just slightly higher than the average (e.g. *Rostovskaya Oblast*). In **the United Kingdom**, conditions similar to those described for France occurred. The biomass accumulation shows values in line with or slightly below the average, but more rain is needed to restore soil moisture and sustain crop growth.

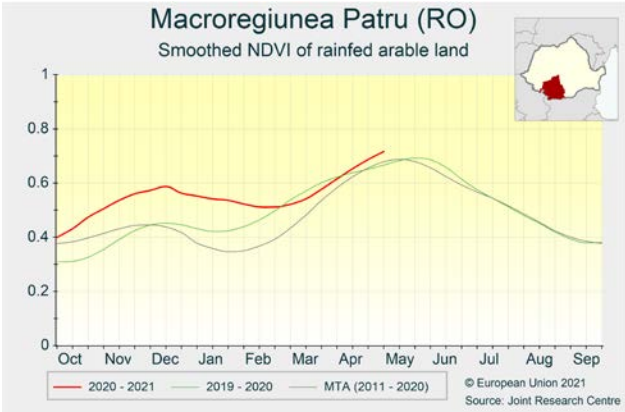


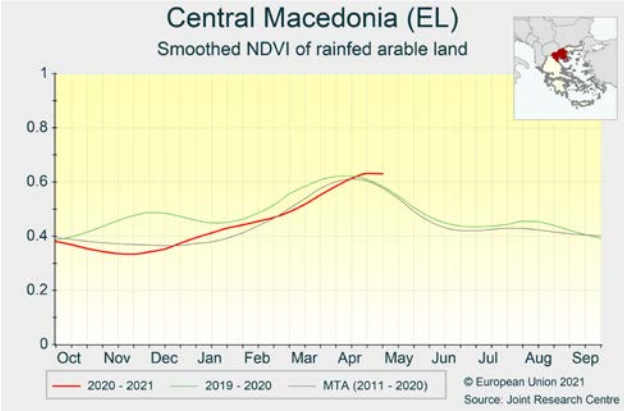


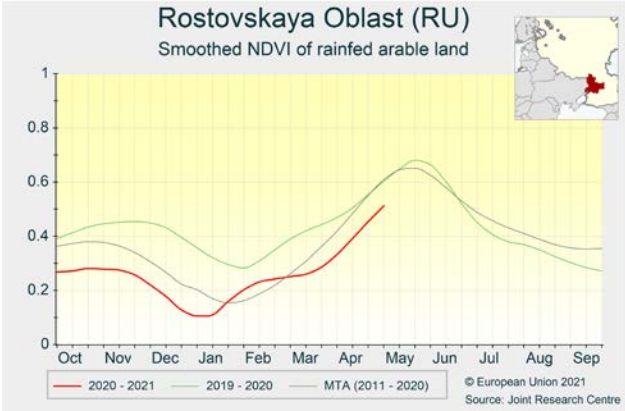





Niederösterreich (AT)
Smoothed NDVI of rainfed arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2020 - 2021
2019 - 2020
MTA (2011 - 2020)
© European Union 2021
Source: Joint Research Centre


Macroregiunea Patru (RO)
Smoothed NDVI of rainfed arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2020 - 2021
2019 - 2020
MTA (2011 - 2020)
© European Union 2021
Source: Joint Research Centre

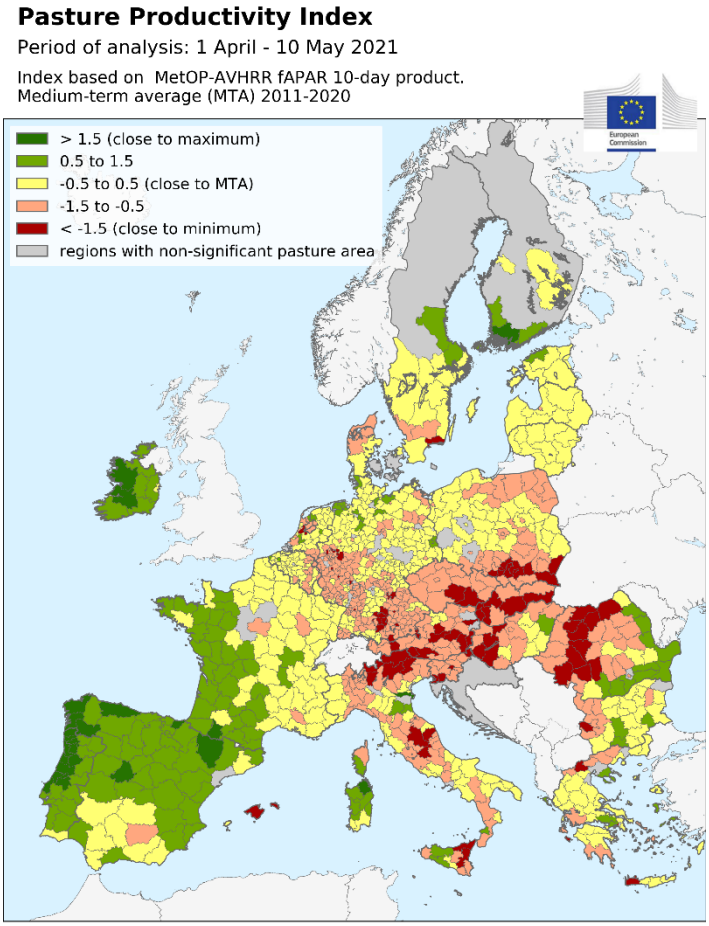

Central Macedonia (EL)
Smoothed NDVI of rainfed arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2020 - 2021
2019 - 2020
MTA (2011 - 2020)
© European Union 2021
Source: Joint Research Centre


Rostovskaya Oblast (RU)
Smoothed NDVI of rainfed arable land
1
0.8
0.6
0.4
0.2
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
2020 - 2021
2019 - 2020
MTA (2011 - 2020)
© European Union 2021
Source: Joint Research Centre

3. Pastures in Europe – regional monitoring

Cold weather conditions limited pasture productivity

Observations are mixed, as canopy conditions have been under cold stress in the northern, central and eastern regions, but also under water stress in several places. The return of rain has alleviated the water stress, but the cold has had a delaying effect on biomass growth.



Austria, **Germany**, **Poland**, **Czechia**, **Slovakia**, **Slovenia**, **Croatia**, **Hungary**, **Bulgaria**, **Romania**, **Italy**, the **Benelux** countries, **Ireland**, **Finland**, **Denmark, Sweden** and the **Baltic** countries had much colder-than-usual weather conditions throughout April and the first week of May. This generated a slow growth of pastures. Even though rainfall in several of these regions – especially in April – was substantially less than usual (e.g. southern Ireland, Austria, Hungary, central Romania), water supply was mostly adequate because of the reduced evaporative demand. Some pasture areas in western **Poland** were negatively impacted by inundation due to intense rainfall events at the beginning of May.

In **France** (as well as in south-western parts of the **Benelux**), a substantial rain deficit was observed in April in all regions except Rhone-Alpes and PACA. Radiation was well above the LTA but temperatures were exceptionally low. While a substantial rain deficit, 50% below the LTA, was observed, the water demand was relatively low thanks to the cold temperatures, thus limiting the impact of water stress. Substantial rainfall has been observed since the beginning of May. The pasture productivity, considering the meteorological conditions, is expected to be below average, with some areas impacted locally by water stress. Similarly, the colder-than-usual conditions in southern **Italy** could be regarded as beneficial to pastures, which were receiving less rainfall. Even though growth was reduced, no water stress is observed thanks to the reduced evapotranspiration demand.

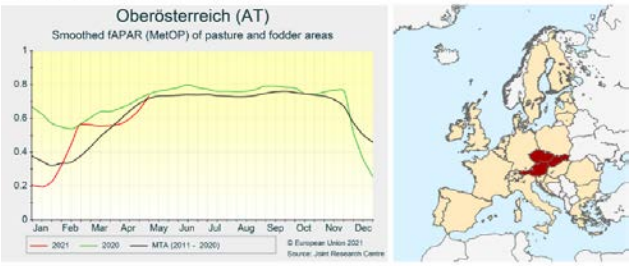
In a large part of southern **Greece** and the South Aegean islands, Crete in particular, pastures are under moderate stress due to slightly warmer-than-usual temperatures, mostly at the end of April and the beginning of May, and dry spells since the end of April. In northern parts of

Greece (Northern Aegean islands, Epirus and Eastern Macedonia) pasture productivity is either in line with or slightly below the seasonal average.

Spain and **Portugal** experienced well-distributed close-to-average precipitation since the beginning of April.

Austria, Czech Republic and Slovakia

Reference period: 01 Apr to 10 May 2021

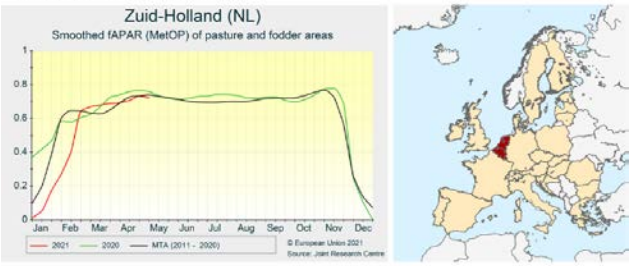


BULLETIN ISSUE

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
RAINFALL	N/A							
TEMPERATURE	N/A							
RADIATION	N/A							

Benelux

Reference period: 01 Apr to 10 May 2021



BULLETIN ISSUE

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TEMPERATURE	N/A							
RADIATION	N/A							

France - East

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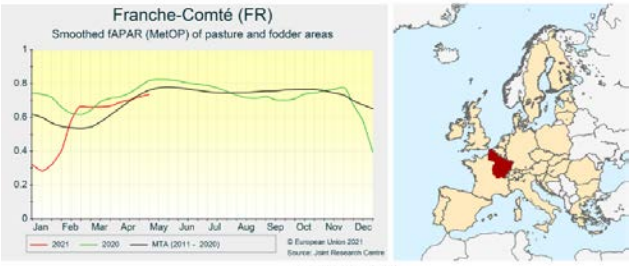

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Italy - North and central

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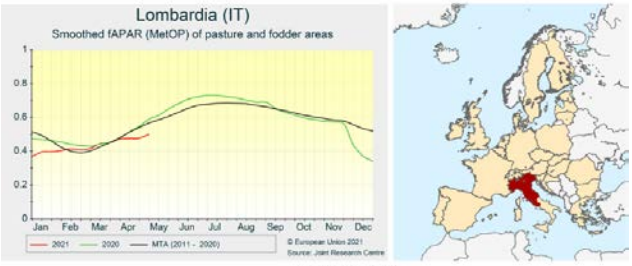

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Slovenia and Croatia

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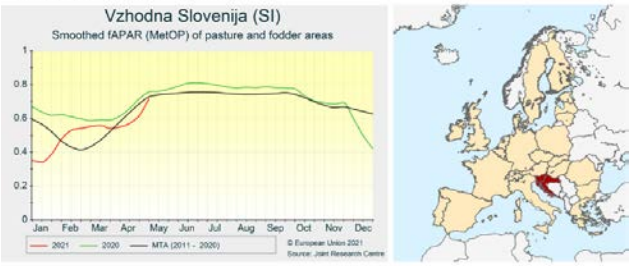

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RADIATION	N/A							

Greece

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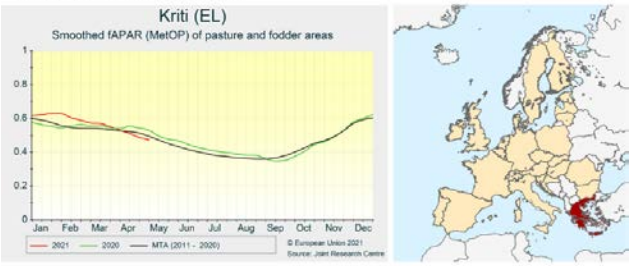

BULLETIN ISSUE

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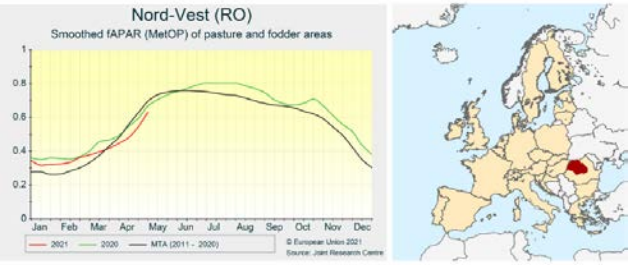
TEMPERATURE	N/A							
RADIATION	N/A							

Romania - Central

Reference period: 01 Apr to 10 May 2021



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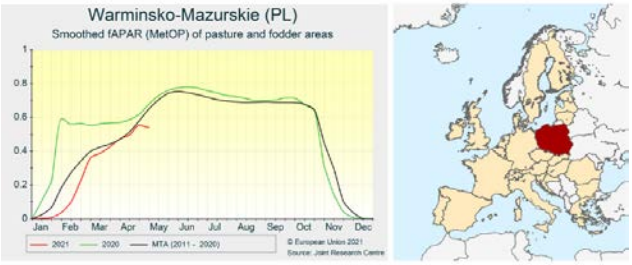
RADIATION	N/A							

Poland

Reference period: 01 Apr to 10 May 2021



BULLETIN ISSUE

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
RAINFALL	N/A							
TEMPERATURE	N/A							
RADIATION	N/A							

4. Sowing conditions

Spring barley

Cold weather delays emergence in most European countries

Sowing progressed well in northern and eastern Europe, but lower than usual temperatures delayed germination and early growth in most of these countries.

In most European countries (e.g. France, Benelux, Denmark, Germany, Poland, Ireland, UK), sowing was mainly concluded in April. Emergence and early growth has generally been slow due to continued cold weather that, combined with dry conditions, resulted in uneven crop establishment in some regions (e.g. southern Ireland, south-eastern United Kingdom, south-western Benelux). However, weather conditions improved at the beginning of May and are likely to promote growth in the coming weeks. In Hungary, Czechia, Slovakia and Croatia, the sowing campaign started with a delay due to cold and dry conditions, but improved soil moisture conditions since the end of April ensured good progress, and higher temperatures at the beginning of May favoured adequate germination and uniform establishment. In Romania, where the sowing campaign progressed well in April, cold temperatures delayed germination and crop emergence.

In the Baltic countries and Sweden, spring sowings are progressing well within the normal window, although the cold weather slowed seed germination. In southern Finland, the sowing of spring cereals started at the end of April despite the cold and rainy weather, whereas in the rest of the country sowing is expected to be in full swing in mid-May, which is a normal time for this country.

Sugar beet and potatoes

Slow start to the season

Colder-than-usual weather conditions slowed down germination and early development of sugar beet across western and central Europe.

Despite some delays with the onset of sugar beet sowing due to low temperatures and a slower pace of field operations at the beginning of April (as described in the previous bulletin), the sugar beet sowing campaign was finalised within a normal time window, i.e. by the end of April in Germany, Poland and Benelux. The beginning of the season was generally not favourable for sugar beet in the main producing regions of western and central Europe due to colder-than-usual weather conditions. Below-average daily temperatures and frost events delayed the emergence and early development of seedlings. Notwithstanding frequent cold snaps in many regions, frost damages were generally minor, with the notable exception of France where approximately 10% of the sown area required re-sowing after a cold spell at the beginning of April. The conditions for the re-sown plants were not favourable throughout April due to cold and dry topsoils, but improved in May. Additionally, in Poland, damage to sugar beet stands was reported due to torrential rains at the beginning of May.

Potatoes, of which the main production regions coincide with those of sugar beet, faced similar challenges. Most plantings of the main crop started in the second half of April and were finalised mid-May, but emergence and early development (if emergence already occurred) have been very slow.

Maize

Cold weather delaying maize germination

Favourable weather conditions have generally been observed to complete the maize sowing campaign, which is currently coming to an end in the main producing regions. Nonetheless, substantially colder-than-usual temperatures since April have been slowing down crop emergence.

In France, the sowing campaign completed 10 days in advance compared to an average year, as the soil was dry and allowed farmers to proceed quickly with the field work. In Germany, the sowing campaign is completed and conditions have been generally favourable. No unfavourable weather conditions have been hampering the sowing campaign in Italy, Serbia, Romania, Greece, Bulgaria where the sowing is completed, while it is currently coming to an end in Austria and Hungary. Some delays have been observed in Poland, Czechia and Slovakia where, in addition to the colder-than-usual temperatures observed since the beginning of April, substantial rainfall occurred during the usual sowing window.

While sowings are almost completed, weather conditions have not been particularly beneficial for crop emergence considering the colder-than-usual temperatures observed in all the previously cited countries. April 2021 is the coldest April recorded in large parts of Europe since 1979. Soil temperatures were sub-optimal to ensure quick germination. In France, adding to the cold temperatures, a substantial rainfall deficit (<50% than the LTA in April) further contributed to an unfavourable start to the season. Since the beginning of May, substantial rainfall has been observed, alleviating the concern of a possible prolonged water stress for grain maize while the season is only just starting.

Only Spain was not exposed to the colder-than-usual weather: Temperatures have been warmer than usual and rainfall close to the LTA since the beginning of April, ensuring a good start to the season.

Sunflowers

Cold temperatures delay the sowing campaign

The sowing of sunflower progressed well after the low temperatures of April that delayed the beginning of the campaign. Emergence has been generally slow, but the increasing temperatures at the end of the period should promote initial growth and ensure a good crop establishment.

In Hungary and Croatia, the sowing campaign started delayed due to cold and dry conditions, but improved soil moisture since the end of April has ensured good progress, an adequate germination and uniform establishment.

In Romania and Bulgaria, the sowing campaign progressed well in April, but emergence was delayed by cold conditions. Similar delays in emergence have been reported in Slovakia, Czechia, Austria and Germany.

In Greece, the sowing of sunflower progressed well after a slight delay in April. Cold conditions slowed down emergence, but the improved weather at the end of April with some rainfall and warmer temperatures helped crops to recover and ensure a good establishment.

In France, the sowing campaign is slightly delayed and still ongoing, but the rainfall at the beginning of May created beneficial conditions for emergence.

In Spain and Portugal, a favourable rainfall distribution resulted in good conditions for sunflower sowing, which has now been mostly concluded. In these countries, after a slight delay in emergence, crops are currently in good condition.

In Italy, while the first sowings were delayed, later in April soil and weather conditions have been favourable for sunflower sowing and germination.

In Ukraine, sowings started slightly delayed in April, but are now progressing well, being about halfway through planting. Temperatures and soil moisture since the beginning of May have been adequate for sowing completion and crop emergence.

5. Country analysis

5.1. European Union

France

Unusually cold and dry weather had limited impacts on the main arable crops

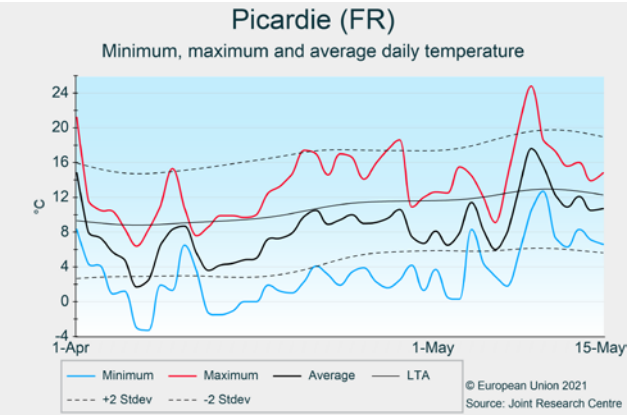
A rain deficit was observed in April, with limited impacts on crops, because of the exceptionally cold weather observed during the period under review which limited water demand. The rain has returned since the beginning of May. Winter crop conditions are generally favourable, but summer crops are facing a very slow start to the season in the northern half.

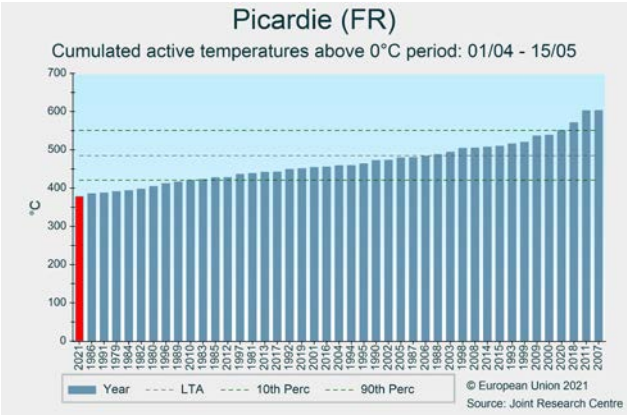
The period under review has been one of the coldest recorded since 1979, with the exception of south-western regions. A rain deficit was observed in April, with cumulative rainfall 50% below the LTA in most of the country (except the south-east); it was particularly pronounced in *Poitou-Charentes* and *Pays-de-la-Loire*, where April rainfall was locally less than 20% of the LTA. Since the beginning of May, rainy weather has prevailed.

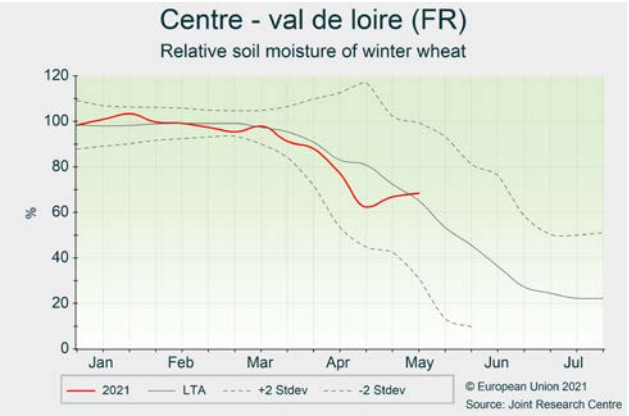
While winter cereals were exposed to the cold spell in the beginning of April, the impacts on soft wheat are expected to be very limited. Winter barley and durum wheat yield potentials are expected to have been negatively affected due to some frost damage on the ears, and the rainy weather during the flowering period, beginning of May. Rapeseed was also impacted by the cold spell, in early April, but the radiation surplus during the period under review was favourable to flowering. While the forecasts for soft wheat and rapeseed yields have been revised upward, the forecast for durum wheat has been maintained below the 5-year average and winter barley revised downward.

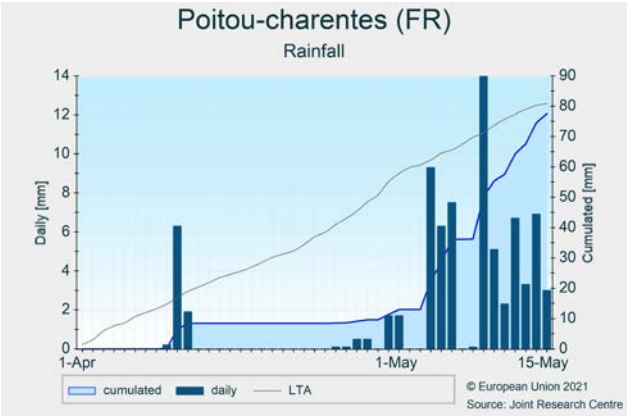
Sugar beet and spring barley had a difficult start, impacted by the frost and exposed to the rain deficit. The rainy weather observed since the beginning of May has been beneficial and improved the crop conditions.

While the dry weather was beneficial for the sowing of summer crops, the cold temperatures slowed emergence and early development, with the exception of the south-western regions. The delays observed in early development are exposing the newly sown crops to birds, and insect pests. The yield forecast remains on trend as this is only the start of the season.









Germany

Good yield potential for winter cereals is kept

The unsteady weather with lower-than-average temperatures and sufficient precipitation amounts – as described in the April Bulletin- continues for Germany and results in a general slowdown of crop growth but overall good conditions. Forecasts are now mostly based on model results for winter cereals and rapeseed and are generally well above the 5-year average.

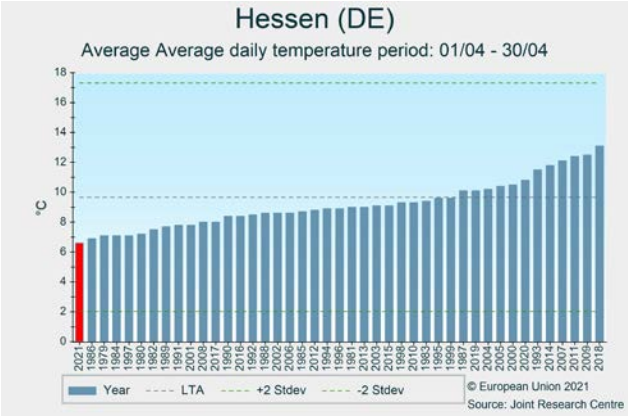
April as a whole presents itself with a lower than usual temperature regime. For some of the regions (e.g. *Hessen*), the average April temperatures are the lowest we have on record and the first half of May is clearly marked as colder than average too. Numerous frost events contributed to these low average temperatures. The last night frosts occurred around 7 or 8 May and were followed by a steep increase in temperatures, nearly reaching 30 degrees on 9 or 10 May. These are stressful conditions for crops, especially for the flowering rapeseed, but no severe damage is expected, although yield potential might be diminished slightly.

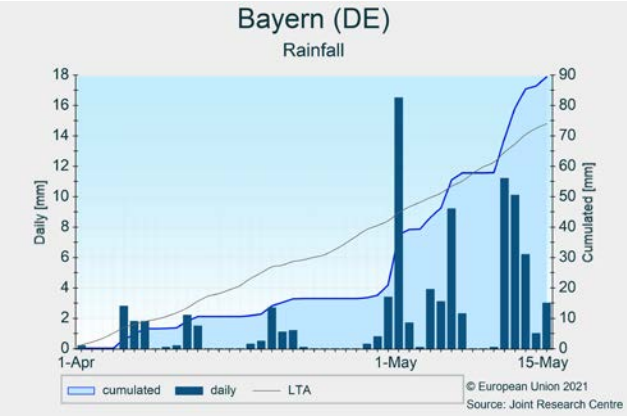
Rainfall cumulates during the period of review vary mostly between 50 and 100 mm with the higher amounts close to the Nordic Sea and the Alps. These cumulates mean a clear rainfall surplus for most of northern and eastern Germany and eastern *Bayern*. The previously identified dry spots in *Ober-* and *Niederbayern* as well as in *Schwaben* received sufficient rainfall to further sustain crop and pasture growth. Soil moisture conditions are good throughout the country providing some buffer for the weeks to come as more rain is forecast.

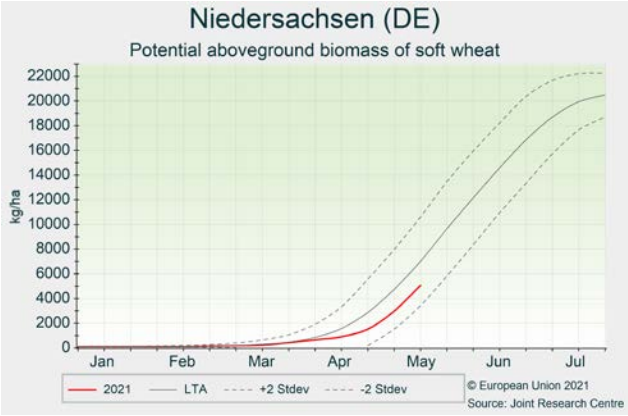
Winter cereals are at heading stage with the model indicating a delay of around 10 days. Biomass gains have slowed down now considerably in *Baden-Wuerttemberg* and *Bayern*, whereas we see steady growth, albeit delayed, in *Niedersachsen* and *Nordrhein-Westfalen*. The soft wheat yield forecast is slightly lower than last year and on the conservative side for the moment, but there is certainly room for a higher yield to materialize in the coming week. Winter barley is already set clearly above the yield of last year.

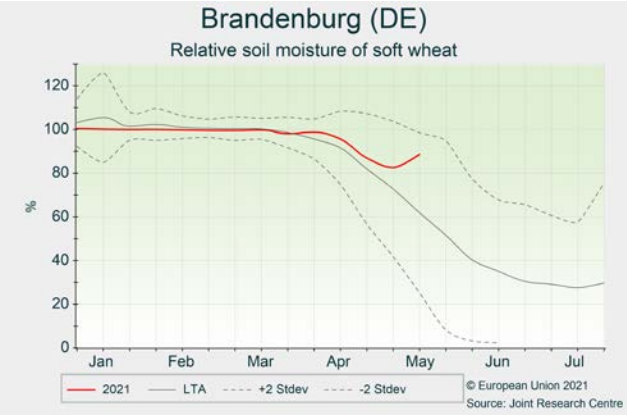
Maize and potato sowings were delayed but are completed by now, sugar beet sowing is still ongoing.

Yield forecasts are either using our crop model results or are based on historical trends, the latter specifically when it concerns summer crops.









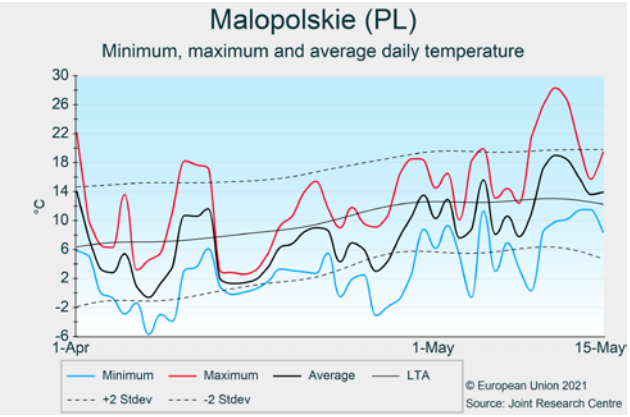
Poland

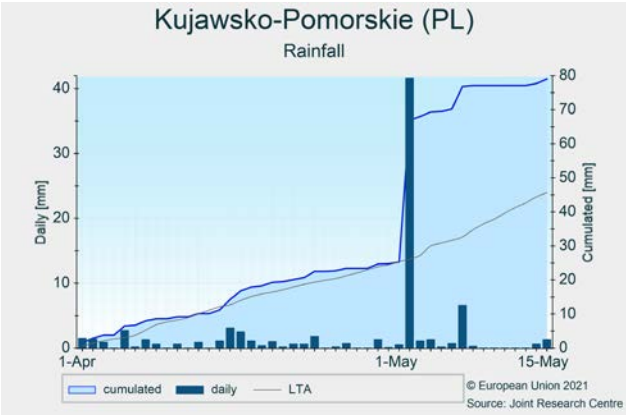
Cold and wet conditions delayed crop development and hampered spring field operations

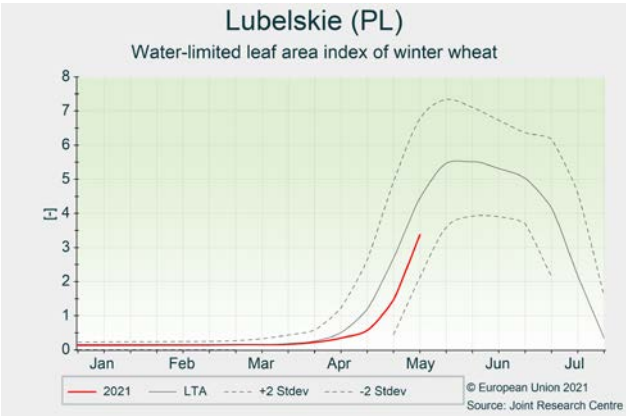
Temperatures in April and the beginning of May were substantially below the average, which slowed the development of winter and spring crops. Cold and wet conditions delayed the sowing of maize and spring-time field operations. The start of the season was not favourable for sugar beet due to the low temperatures and intense rains in May.

Substantially colder-than-usual temperatures were recorded in April and in the beginning of May. Frequent frost events occurred, with temperature minima below -6°C at the end of April. Cumulative precipitation was considerably above the average, except for the NW regions that remained drier than usual. The beginning of May brought intense precipitation events, exceeding 40mm/day in some regions. Cumulative global radiation was below average.

As a consequence of the predominantly low temperatures in April, the phenological development of winter and spring crops became noticeably delayed as compared to an average year. Nonetheless, winter crops are generally in good condition. Rapeseed generally did not suffer serious damage due to late April cold spells, as flowering was delayed with respect to previous years (and is about to begin). Sowing of maize started late (2-3 weeks later compared to last year) due to the cold and wet conditions and is still ongoing in some regions. The sugar beet sowing campaign was finalised at the end of April. Low temperatures delayed the emergence and early development of seedlings, but no serious frost damage was noted. However, some sugar beet stands required re-sowing after the torrential May rains. Currently crops are mostly forecast around average historical trends. However, adequate thermal conditions are needed in the following weeks to sustain these average forecasts for summer and spring crops.







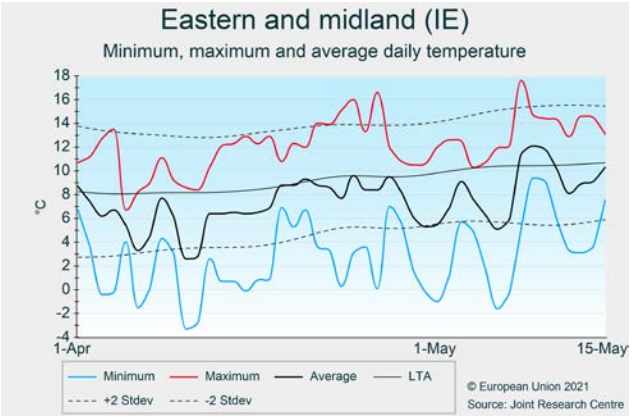
Ireland

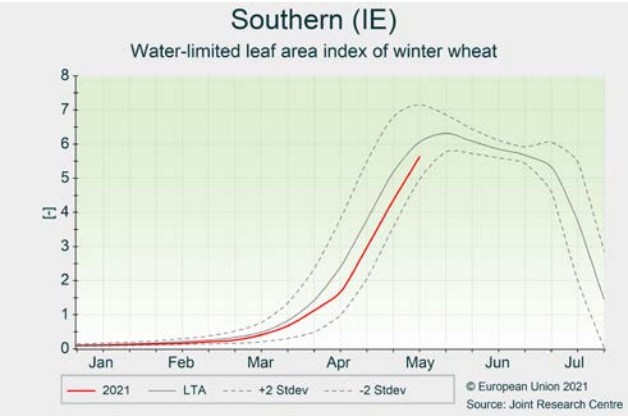
Positive yield outlook despite exceptionally cold conditions

Cold weather slowed down crop development. The rainfall at the beginning of May mitigated the soil moisture deficit in the south. Winter crops are in good condition and with low disease pressure. The yield outlook remains positive for winter and spring crops.

Cold temperatures prevailed during the period of review. Since the end of the first dekad of May, temperatures returned to close to seasonal values. Rainfall remained below average, but rain at the beginning of May improved topsoil water conditions for spring crops. Cumulative radiation was above average.

Cold conditions slowed crop development. According to our models, crop development of winter cereals is currently slightly delayed compared to an average season. Winter barley reached the flag leaf stage. Winter rapeseed is at flowering. The condition of crops improved after the rainfall at the beginning of May. Simulated leaf area is close to the LTA for winter barley and rapeseed, and following the LTA with some delay for winter wheat and spring barley. The dry weather of April allowed the completion of spring sowing in mid-April but the continued cold and dry weather created uneven establishment for later sown crops. However, winter and spring crops can still recover and the return of favourable weather conditions in terms of warmer temperatures and soil moisture conditions is likely to boost growth in the coming weeks. Yield forecasts remain positive for winter and spring crops and above the 5-year average.





Spain and Portugal

Winter cereals and spring barley still at risk despite substantial rain

Conditions for the emergence of summer crops were favourable as well-distributed rainfall provided optimal soil moisture conditions. Rainfall was sufficient to sustain adequate growth and development of winter crops and spring barley, but soil water contents remain very close to critical levels. The yield outlook remains well below last year's level and close to the 5-year average.

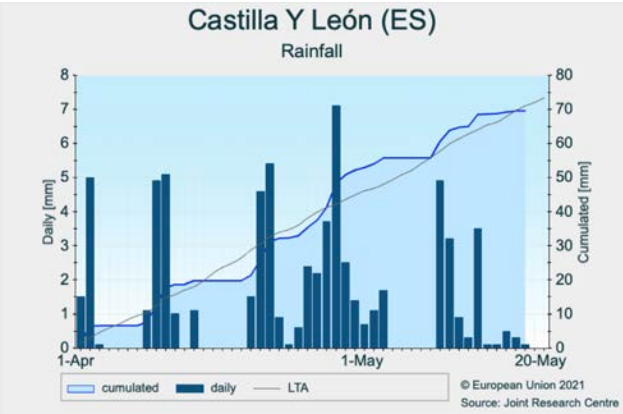
During the period under review, rainfall was close to the LTA and evenly distributed over numerous small events. Temperatures are following the LTA with some variations, leading to some warmer days in the northern regions and some colder days in south-western regions, such as *Alentejo* in Portugal.

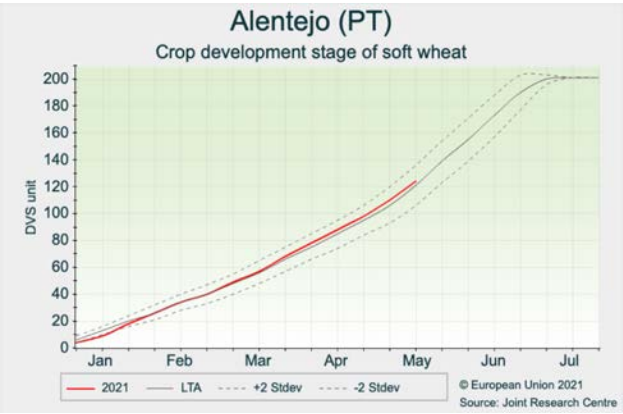
The favourable temperatures and well-distributed rainfall allowed the growth of winter crops and spring barley to continue at average or above-average levels, while phenological development is slightly advanced in both Portugal and Spain. However, while rainfall was sufficient to avoid stress conditions, it was insufficient to raise soil water contents to above the near-critical levels mentioned in the April Bulletin. Substantial rainfall in the coming weeks will still be necessary to avoid serious water constraints which would lead to early senescence with a considerable yield penalty.

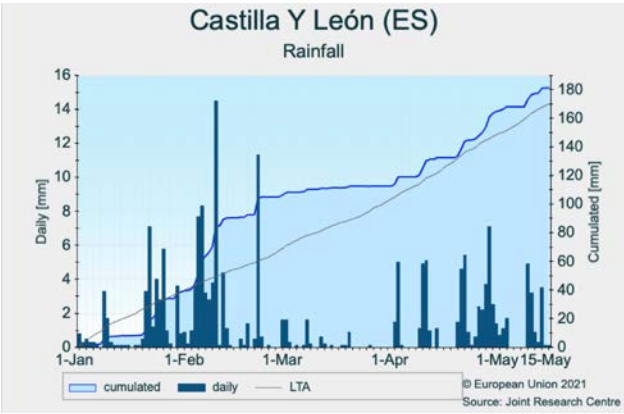
Consequently, the yield forecasts for winter crops and spring barley have remained unchanged at conservative levels: somewhat above the 5-year average for winter cereals and below the 5-year average for spring barley; whereas the forecast for rapeseed remains close to the 5-year average.

Sunflower had a delayed start of emergence alongside slightly weaker stem development, due to a dry period after emergence, but with actual overall favourable conditions. Maize experienced favourable conditions for emergence.

Water reservoirs in Spain are estimated at 61% of their full capacity (www.embalses.net), close to the 2019 lower levels and well below the 69% 10-year average.







Italy

Steady crop growth but delayed

Winter cereals are notably delayed but predominantly in favourable conditions. Crop yield forecasts increased and now are above the 5-year average. Summer crop forecasts are still based on the historical trend.

In northern Italy, a dry spell that started in late February ended around 10 April, but since then well distributed precipitation occurred in most of the regions. The overall accumulated rainfall remains below the average, notably in *Piemonte* and *Emilia Romagna* (-30%). Vegetation growth slowed down due to a cold spell in April, while temperatures in May so far have been average.

Along the Adriatic coast (*Marche*, *Abruzzo*, *Molise* and *Puglia*) April and May were drier than usual resulting in a precipitation deficit between 25mm and 50mm (-30% to -50%). A significant temperature variability was observed in the first half of April, before leaving the pace to a generally colder-than-usual period (15 April – 1 May). A similar weather pattern was observed in the inland regions of eastern *Toscana, Umbria* and *Basilicata*.

Along the Tirrenic coast (*Toscana, Lazio, Campania*) and *Sicilia* the weather was slightly wetter and colder than usual.

While on one side a cold spring delayed winter crop development, on the other side it reduced evapotranspiration and prevented a significant soil moisture depletion. In addition, well-distributed precipitation maintained crops in good shape. In southern regions (*Puglia*, *Basilicata*) winter crops are flowering with average to slightly below the average crop biomass accumulation.

Summer crop sowings were generally delayed due to the cold and dry periods. The early sown maize (mid to late March) emerged up to one month later and could present locally uneven growth, mostly in *Piemonte* and *Veneto*. Some delays occurred for the sowings of soybean, sunflower and sugar beet.

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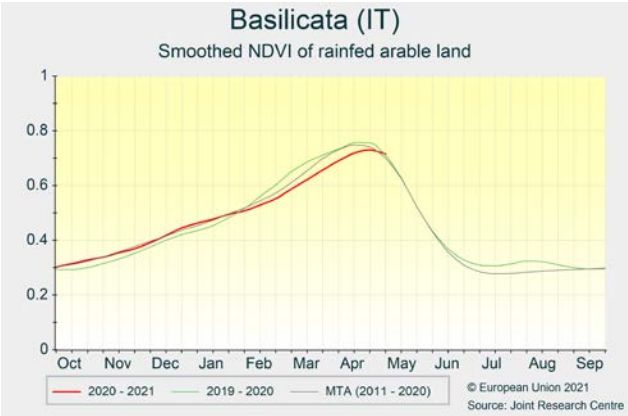
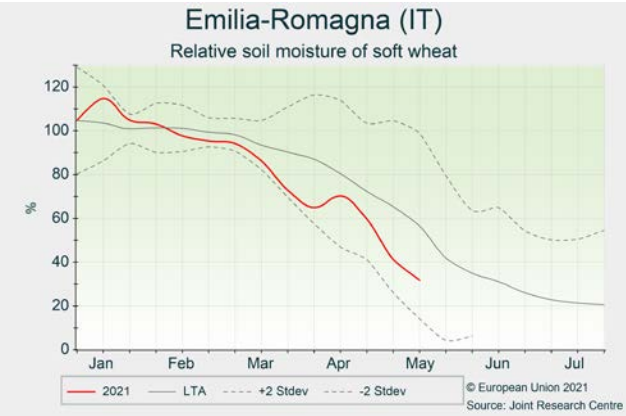
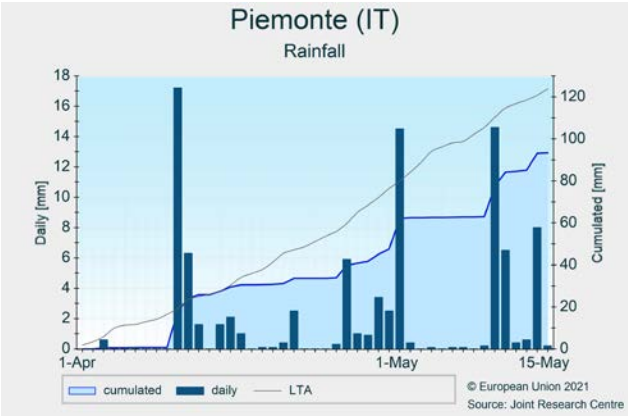
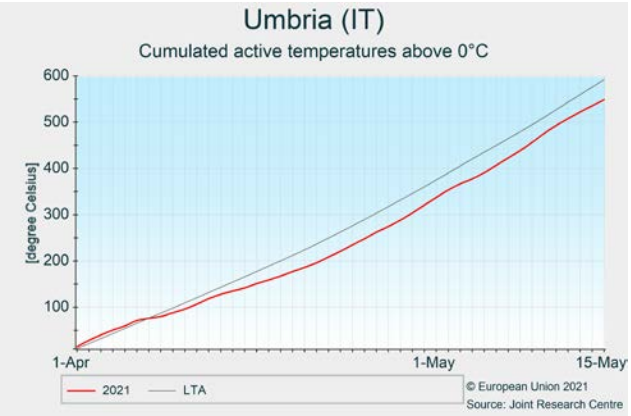








Hungary

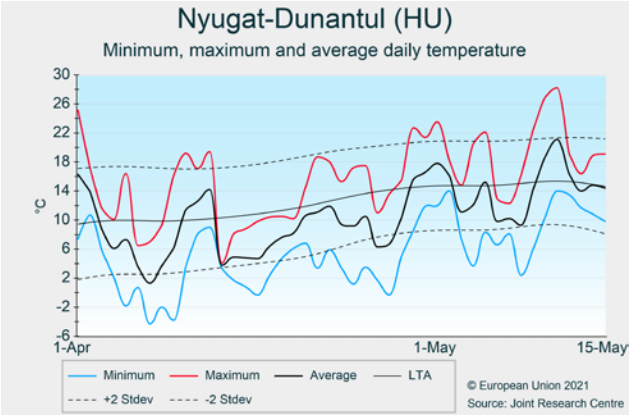
Delayed crop development

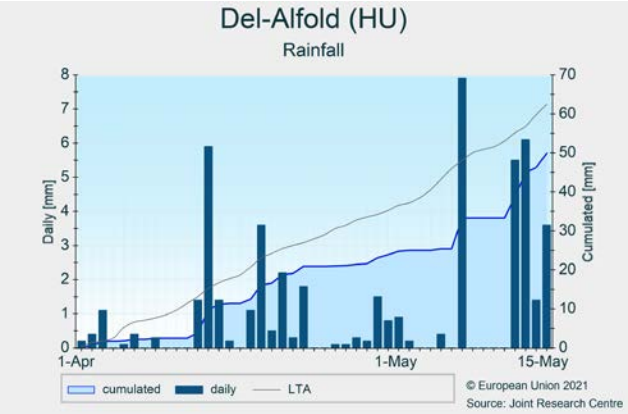
The development of winter crops was delayed due to cold temperatures in the first half of spring. Several rainfall events during this reporting period prevented water stress, but the still suboptimal soil moisture levels are concerning. Special attention will have to be paid to end-of-May rainfall.

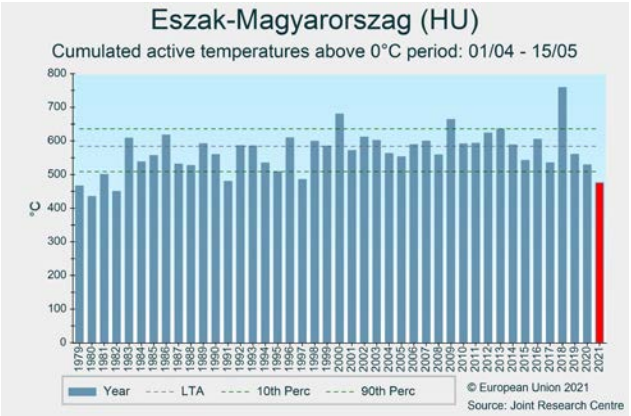
Average temperatures of the reporting period were among the lowest of our entire record. April temperatures were the lowest recorded for the last 20 years. In the beginning of April, dry conditions were a source of concern for winter crop development. The cumulative precipitation since April (40 to 100 mm) was sufficient to recover a favourable topsoil layer water content.

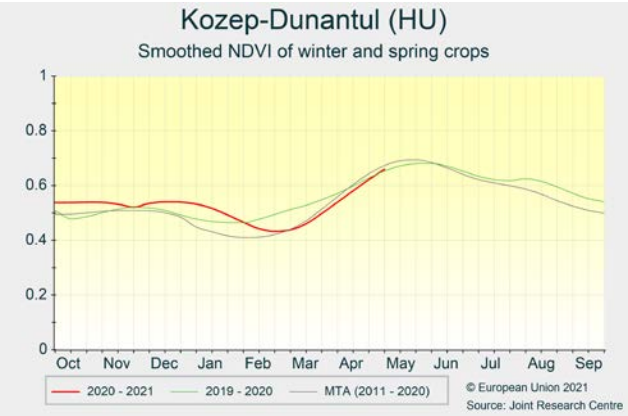
The low temperatures of the past weeks, leading to a limited growing degree days accumulation, slowed down the plant development of winter crops. The analysis of satellite imagery confirmed a 1-week delay compared to the MTA. The negative impact of the dry conditions was reduced thanks to this delay. Despite cold temperatures, no frost-kill events occurred after mid-April. We maintain forecasts close to the trends for winter cereals, as rain in May plays a major role in supporting heading/flowering. For rapeseed, the impacts of the frost event in the beginning of April are not yet established. To maintain a normal yield level, favourable weather (warm and wet) would be needed at the end of spring. Following this uncertainty, the yield forecast for rapeseed was revised downward.

Due to the cold and dry conditions in early April, the sowing of summer and spring crops has been slightly delayed. As of mid-May, the sowing campaign is mostly over since the conditions at the end of April were favourable. The crop weather has been also favourable for good emergence.









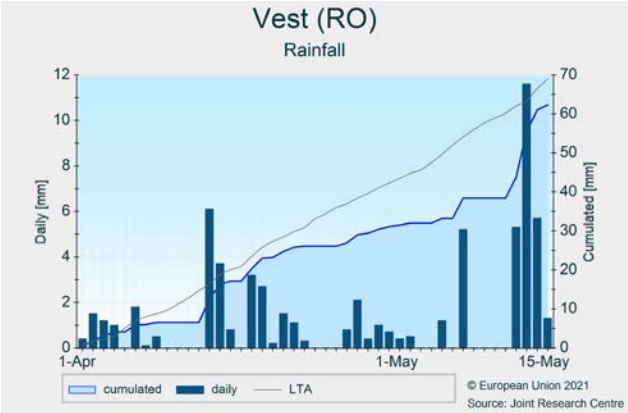
Romania

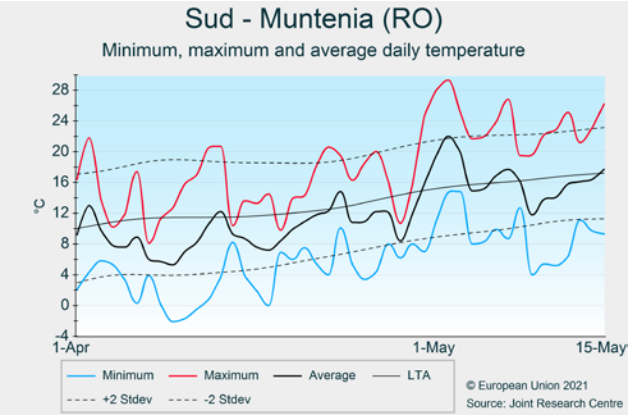
Good crop yield outlook for winter cereals

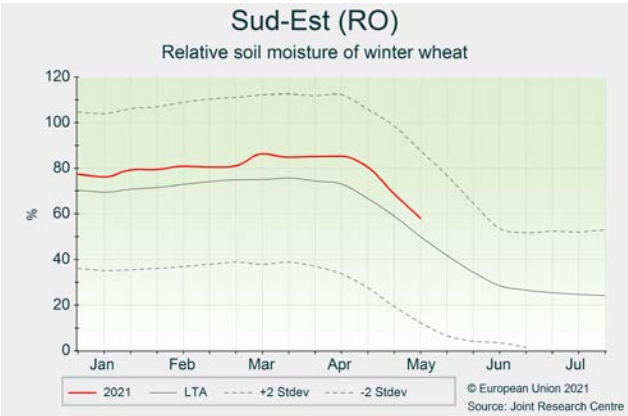
April has been among the three coldest months on our records in Romania, slowing down the phenological development of winter crops. Large parts of the country recorded a rainfall deficit; however, the soil moisture remains at satisfactory levels. The crop yield outlook has been revised upwards for winter cereals.

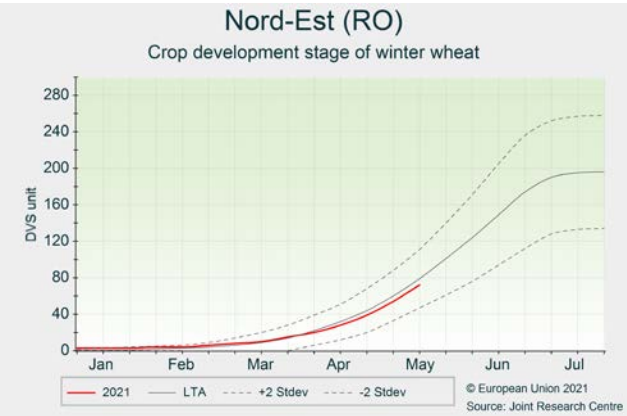
After a substantially colder-than-usual April with average air temperatures between 2°C and 4°C below the LTA, the beginning of May was characterised by warmer weather conditions. Rainfall cumulates were mainly between 10%and 50% below the LTA, except in *Nord-Vest* region where abundant rainfall (>100 mm) was recorded exceeding the LTA by more than 50%. Even though the rainfall deficit prevailed during the period of review in major parts of the country, the soil moisture generally remains at an adequate level for winter cereals and spring-sown crops. The cold weather anomaly slowed down the phenological development of winter crops, which was advanced due to the mild winter and early spring. Winter soft wheat is currently in heading stage. The sowing of spring crops was mainly finished in April; however, emergence was delayed by cold conditions.

Even though colder weather slowed the phenological development, winter cereals are progressing well. The crop yield potential of soft wheat will be defined in the following weeks when the flowering stage will occur. Due to overall favourable conditions, we have revised our crop yield outlook for winter cereals upwards. The crop yield outlook for spring crops currently remains at the long-term average.









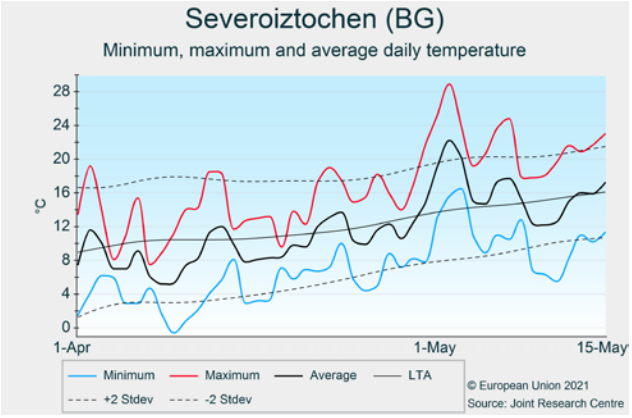
Bulgaria

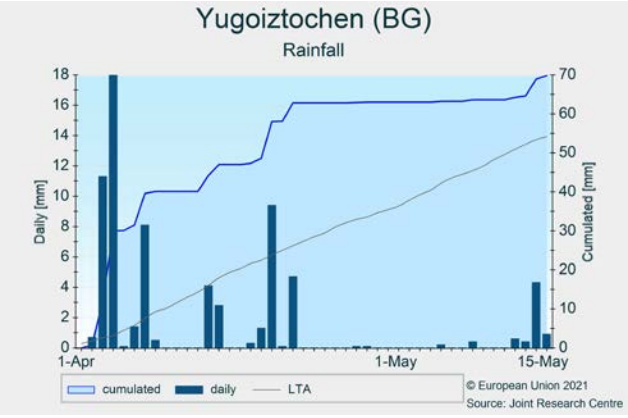
Positive crop yield outlook for winter cereals

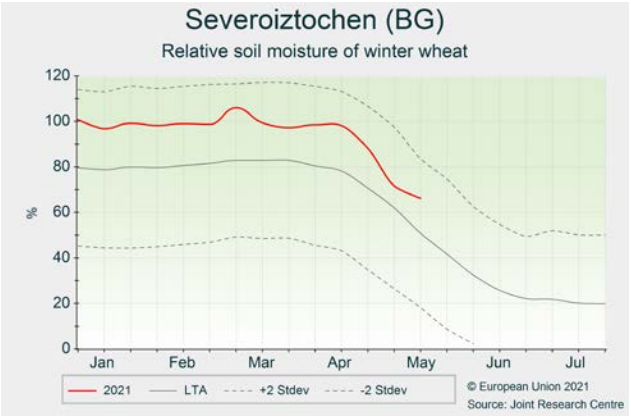
A cold start to April was followed by warmer conditions during the last dekad of April and first half of May. The recent rainfall deficit in southern Bulgaria has started to deplete the upper layer soil moisture with, however, limited impact on crops so far. The crop yield outlook has been revised upwards for winter cereals.

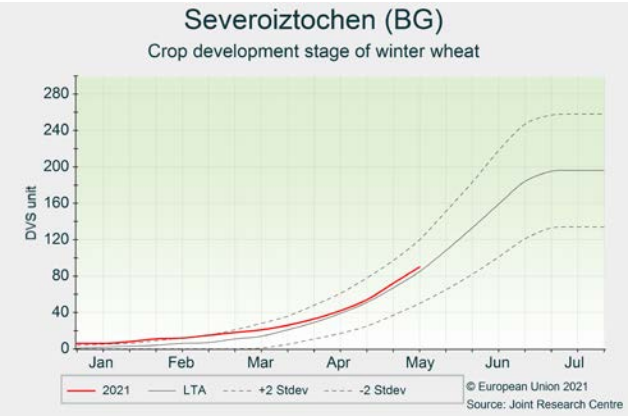
The colder-than-usual first half of April, during which an intensive cold spell event caused some local frost damage, was followed by warm weather during the second half of April and the beginning of May. A rainfall deficit was recorded especially in the south-western part of the country, while a rainfall surplus was recorded in the eastern part of Bulgaria. Overall, the rainfall events were unevenly distributed, with a majority of rainfall recorded during the first two dekads of April, while the subsequent period was characterised by drier conditions, especially in southern Bulgaria. Consequently, the soil moisture levels for winter cereals remain at satisfactory level in northern Bulgaria, while they are decreasing – especially in the upper soil layer – in southern Bulgaria. The cold weather anomaly in April slightly slowed down the phenological development of winter crops, which was advanced due to mild winter conditions. The sowing of spring crops was mainly finished in April.

In general, winter cereals are currently progressing well despite the mild soil moisture deficit in southern Bulgaria; our crop yield outlook has therefore been revised upwards. The crop yield outlook for spring crops currently remains at the long-term average.









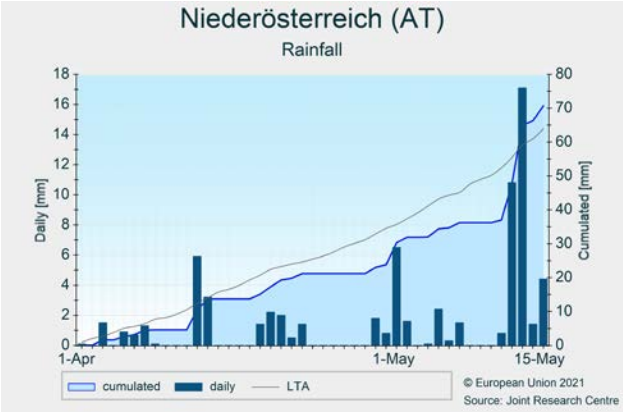
Austria, Czechia, and Slovakia

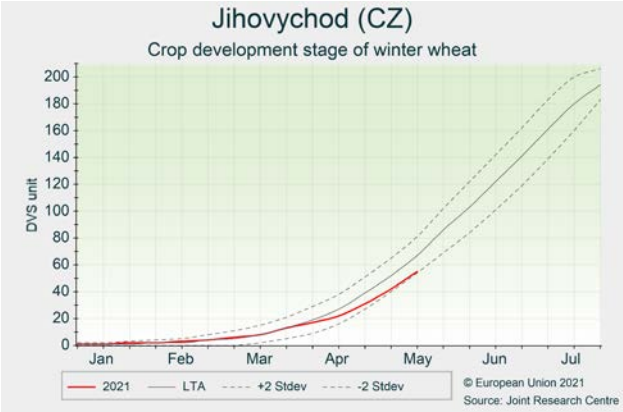
Average crop outlook despite very cold and dry spring

Below-average temperatures in April and begin May slowed the development of winter and spring crops, and caused delay to the sowing and emergence of summer crops. May rains finally improved soil moisture conditions.

The cold weather anomaly in April and the first dekad of May (with mean daily temperatures between 2°C and 3°C below the LTA) was followed by a brief warming during the second dekad of May, when temperature maxima exceeded 28°C. Frequent frost events occurred in April, with minimum temperatures dropping below -5°C during the first dekad of April. In most of Czechia, Austria, as well as in Western Slovakia, April was substantially drier than usual, causing soil moisture deficits to become even more pronounced after the very dry March. Precipitation events in May replenished soil moisture levels in most of the regions. Global radiation was close to average.

As a consequence of the predominantly below-average temperatures in April, the phenological development of winter crops became noticeably delayed as compared to an average year. Our model indicates that winter wheat is delayed in development by approximately 10 days (which is currently in stem elongation stage), and that biomass accumulation is significantly below the LTA. In addition, dry and cold conditions were not favourable for early development of spring crops, as well as for timely sowing of summer crops. Nevertheless, we maintain our previous forecast for winter crops (close to the 5-year average). More precipitation and adequate thermal conditions are needed in the weeks to come to allow for fair yield formation of winter cereals and to sustain the forecast. Our outlook for spring and summer crops follows historical trends, under similar assumptions.





Denmark and Sweden

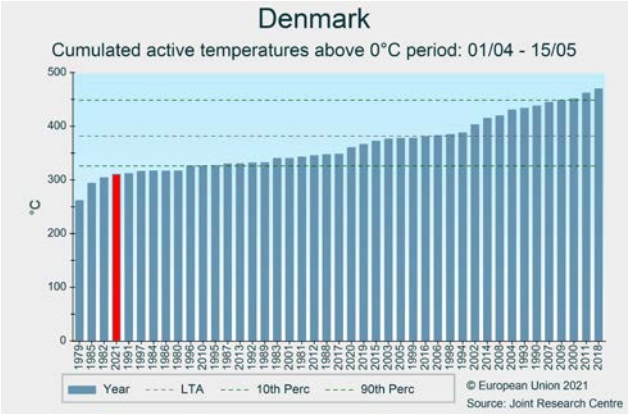
Exceptionally cold period delays crop growth

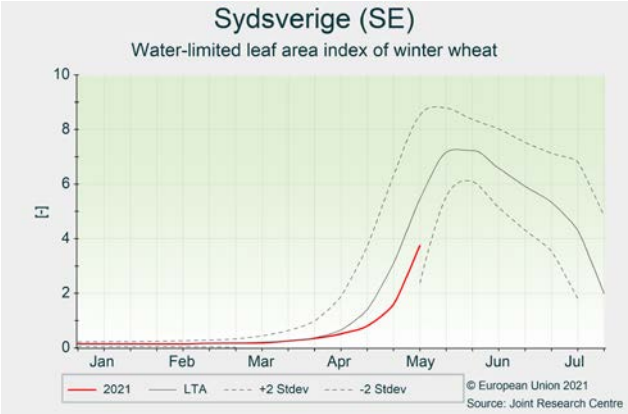
Colder than usual conditions slowed down growth and development of winter crops. Spring sowing is still progressing within the expected window. The outlook is positive despite the cold temperatures.

The period was among the coldest of the last 30 years. Temperatures dropped below average and were lower than usual until the end of the first dekad of May. Frost conditions were frequent during the night. Due to the low temperatures, development of winter cereals, which was advanced or close to the average by mid-April, slowed down and currently is slightly below average expectations. Rapeseed flowering is delayed by about two weeks. Similarly, biomass accumulation of winter crops decreased below average values. However, crops are in good condition. Rainfall was particularly scarce during the last two dekads of April but increased above the average totals at the beginning of May.

According to our models, soil moisture levels are adequate for winter crops and spring cereals benefitted from the rainfall at the beginning of May.

In Denmark, the vast majority of spring barley and sugar beets have been sown before mid-April and in good seedbeds, but the emergence has been slow due to the cold weather. Maize sowing started in May with variable progress across the country. In Sweden sowing is expected to be finished by the end of May, which is the usual time window for this country. The yield forecast remains unchanged with respect to the April Bulletin despite the reduced crop growth that characterised the period.





Finland, Lithuania, Latvia and Estonia

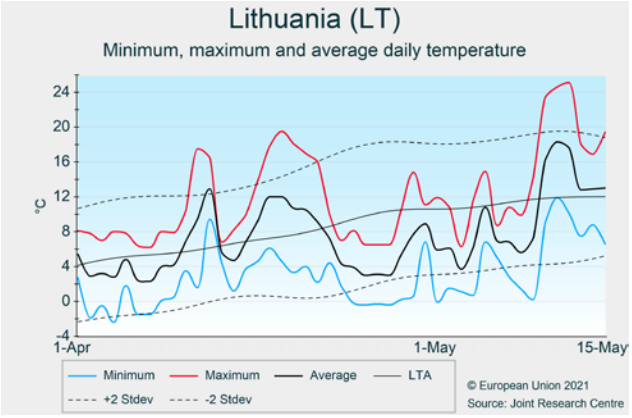
Sowings progress as usual despite cold weather

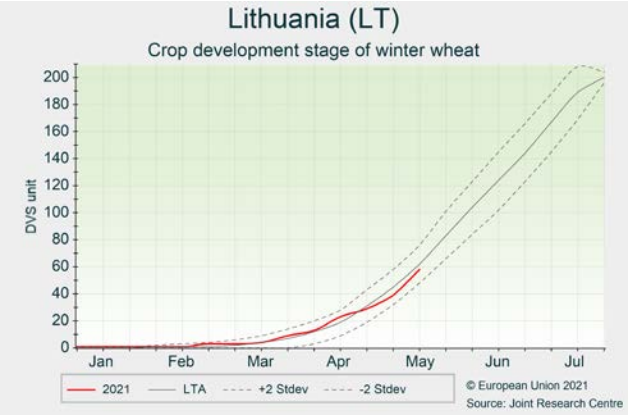
Colder than usual temperatures slowed crop development, but crops are in good conditions. Spring sowing activities progress well within a normal window despite the cold weather.

Cold temperatures with frequent night frosts characterised the period, although unusually warm weather occurred in April during the second dekad in the Baltic countries, and during the first two dekads in Finland. Since 10 May warmer than usual temperatures have characterised all countries. Rainfall was slightly lower than the average in April and increased above average in May in the Baltic countries; while it was higher than usual in Finland.

In southern Finland, the sowing of spring cereals and sugar beets started at the end of April, despite the cold and rainy weather. In the rest of the country sowing is expected to be in full swing in mid-May, which is a normal time for this country. In the Baltic countries sowings progress well, with limited interruptions in April, whereas the cold weather slowed seed germination. Winter crops are in good condition. According to our models, crop development of winter cereals is currently slightly delayed despite being advanced earlier. Winter rapeseed is delayed by around 2 weeks. Crop growth indicators are in line with average values. Soil moisture levels are adequate for winter crops, and spring crops benefitted from the rain that fell at the beginning of May.

Crop yield forecasts remain unchanged from last month and remain higher or close to the 5-year average.





Belgium, Luxembourg and the Netherlands

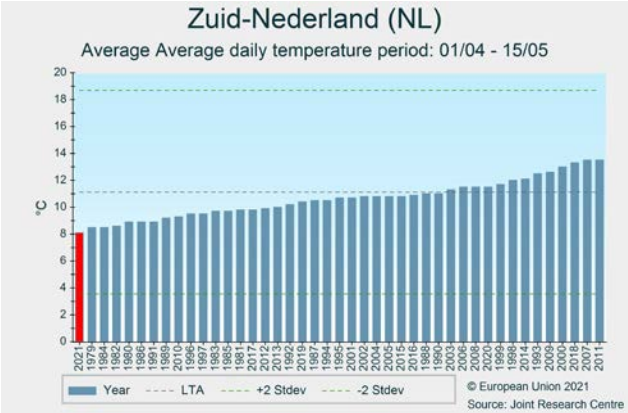
Crops in fair condition despite continued cold weather

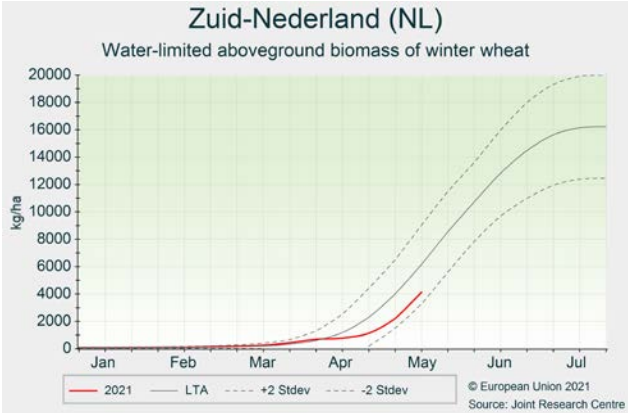
Colder-than-usual weather conditions continued throughout the period of review, causing crop growth and development to further lag behind. Spring sowing was completed within a suitable window but canopy formation has been slow. Soil-water conditions are adequate despite rain deficit in Belgium. Yield forecasts have been essentially maintained.

Below-average temperatures continued to prevail throughout the review period, making this the coldest 1 April to 15 May period in our records (since 1979) in most regions (in northern areas, the coldest since 1982). Only two days – 1 April and 9 May – were markedly warmer than usual. Frost events were common in the first half of April, but scarce and very mild since then. Rainfall was below average in April; the second half of April was practically dry. However, above average rainfall in May resulted in rainfall totals that were close to the LTA for the period as a whole in most parts of the Netherlands, but with a deficit (compared with the LTA) of up to 25 mm (locally 40 mm) in Luxembourg, Belgium and the southernmost parts of the Netherlands. Radiation was close to the LTA.

Winter crops are generally in fair condition, but growth and development lagged further behind, due to the below average temperatures. Phenological development for winter cereals is about one week delayed and biomass accumulation is even further behind. On the positive side, as rainfall in early spring was high and crop water demands have been low, soil water contents are currently above average in all regions (even in the south); and current mild temperature conditions are favourable for crop growth. Spring sowing was completed within a suitable window, but emergence and early development have been slow, which could result in a yield penalty for sugar beet. .Pest and disease pressure – which was very low - has started to increase due to the current mild temperatures and frequent rain events since the beginning of May. More settled weather will be welcomed by farmers to conduct phytosanitary measures.

Our yield forecasts have been maintained at or close to the historical trend.





Greece and Cyprus

Yield forecasts for winter crops revised downwards

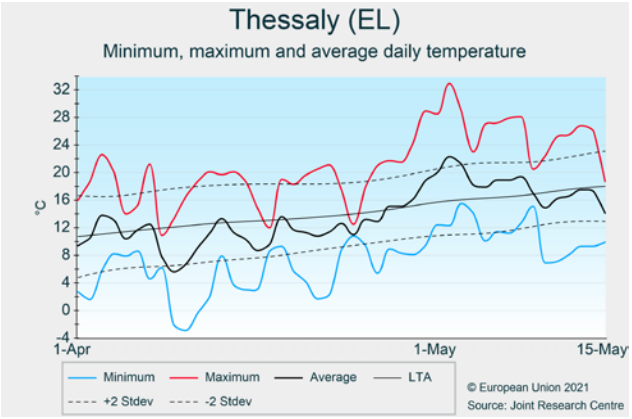
April's rainfall in Greece favoured a gradual recovery of summer crops, but the positive effects on winter crops were insufficient to compensate for the negative effects of earlier cold spells. Lack of rain in Cyprus hampered the yield expectations for barley.

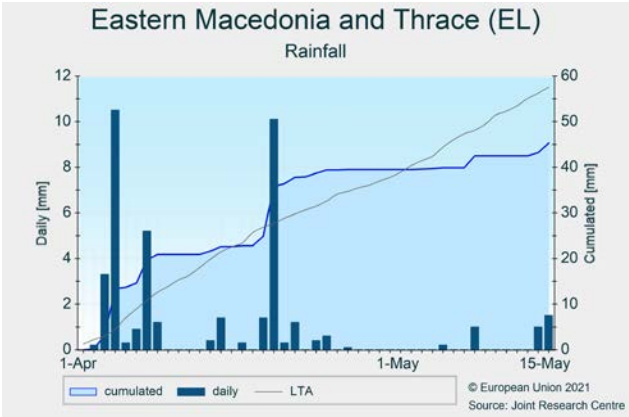
Predominantly colder-than-usual conditions over the major agricultural areas in northern Greece were observed in April. In the first ten days of May, daily temperatures sharply increased with peaks above 32°C in Thessaly, above 30°C in Macedonian regions on 2 May, and above 32°C in Cyprus on 4 May.

Precipitation totals during the period under review, from 1 April to 15 May, were below the LTA in both countries. In Cyprus, beneficial and well-distributed rain ceased after 10 April. In Greece, specifically in Thessaly and the Macedonian regions, abundant rainfall fell in the second half of April, while well distributed episodes of rainfall, though scarce, characterised the first half of May.

The fairly favourable weather conditions in Greece during the current review period have been insufficient to compensate for the damage caused to winter crops by the earlier cold wave episodes, which – on the basis of recent remote sensing observations and field reports from secondary information sources - appears to have been more serious than anticipated in the April Bulletin. Summer crops are gradually recovering. In Cyprus, remote sensing observations suggest an early senescence in barley, attributed to the lack of rain.

Therefore, our forecasts for winter crops have been lowered for both countries, while our forecasts for summer crops (in Greece) still follow the five-year average.





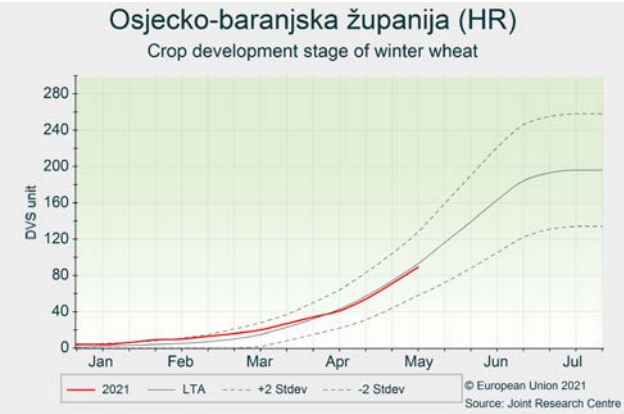
Slovenia and Croatia

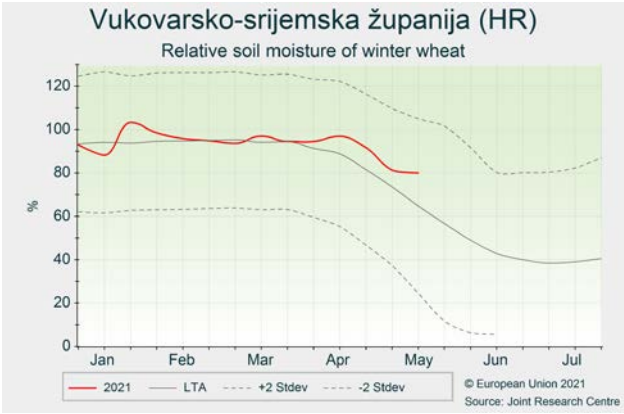
Improved yield potential for winter cereals

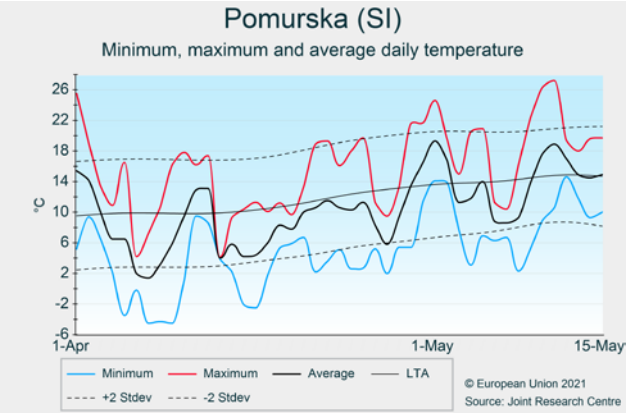
The intensive cold spell at the beginning of April caused substantial damage to flowering fruit trees and vineyards, but had only limited and localized impacts on winter crops. Sufficient soil moisture levels are supporting good progress of winter cereals, allowing an upwards revision of their crop yield outlook.

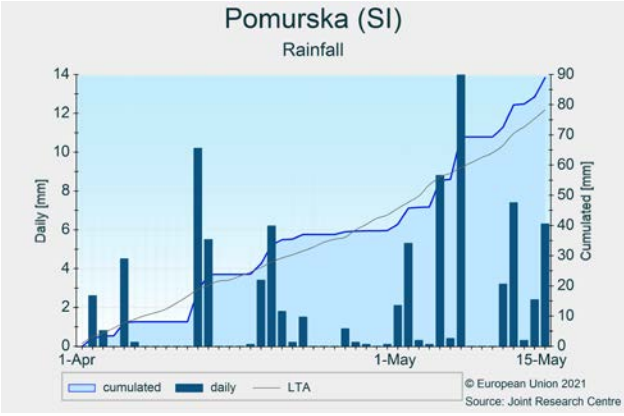
The intensive cold spell bringing record-low temperatures during the first half of April caused considerable damage to flowering fruit trees and vineyards, as already reported in the April Bulletin. The frost damage to winter cereals was likely limited only to local fields, depending on microclimatic conditions. Temperatures returned to normal towards the end of April. Colder weather during April slowed down the phenological development of winter crops, which is, after a favourably warm winter, currently close to the long-term average. Above-average rainfall occurred in Slovenia and Croatia in the central *Kontinentalna Hrvatska* and northern *Jadranska Hrvatska* regions. Sufficient soil moisture levels are supporting good progress of winter cereals. The spring crop sowing campaign started delayed due to the cold conditions in the first half of April. Nevertheless, improved soil moisture since the end of April ensured good progress of spring crops, an adequate germination and uniform establishment.

In conclusion, our crop yield outlook for winter cereals has been revised slightly upwards. The crop yield outlook for spring crops currently remains at the long-term average.









5.2. United Kingdom

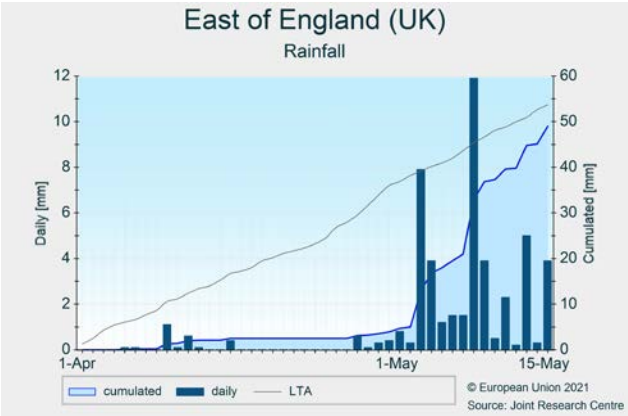
United Kingdom

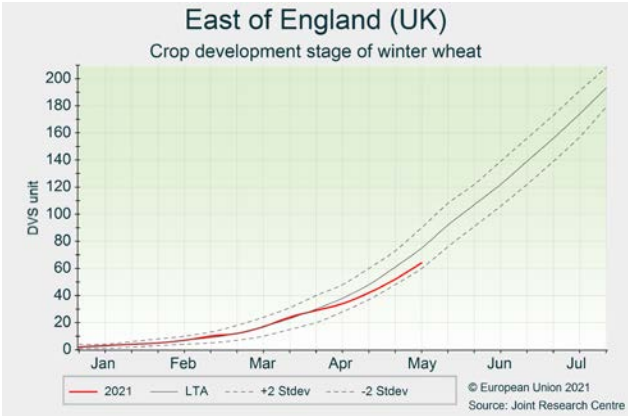
Exceptionally cold, dry, and wet

Colder-than-usual weather conditions continued throughout the period of review, whereas the exceptionally dry April was followed by an extraordinarily wet first half of May. Crop growth and development have further lagged behind. In our assessment, recovery is still possible and the yield forecasts for winter cereals and spring barley have been maintained.

Below-average temperatures continued to prevail throughout the review period, making this the coldest 1 April to 15 May period in our records (since 1979). Only a few days - most markedly 9 May – were warmer than usual. Frost events were common but mild, and mostly confined to April. April was exceptionally dry, but the first half of May was exceptionally wet, resulting in rainfall totals that were close to the LTA for the period as a whole in most regions. Radiation was well-above the LTA in April and close to average in May.

Winter crops are generally in fair condition, but growth and development lagged further behind, due to the continued below-average temperatures. Phenological development for winter cereals is about one week delayed and biomass accumulation is even further behind. On the positive side, the April rain deficit did not impact winter crops; thanks to the rain in May, soil water contents are currently above average in most regions, and current mild temperature conditions are favourable for crop growth. The growth of spring cereals has only just started to kick off. Some stands were negatively affected due to the frequent frost and dry top soils in April and may not fully recover. Pest and disease pressure – which was very low - has started to increase due to the mild temperatures and frequent rain events since the beginning of May. More settled weather will be welcomed by farmers to allow them to conduct phytosanitary measures.





5.3. Black Sea Area

Ukraine

Cold weather not favourable for winter cereals

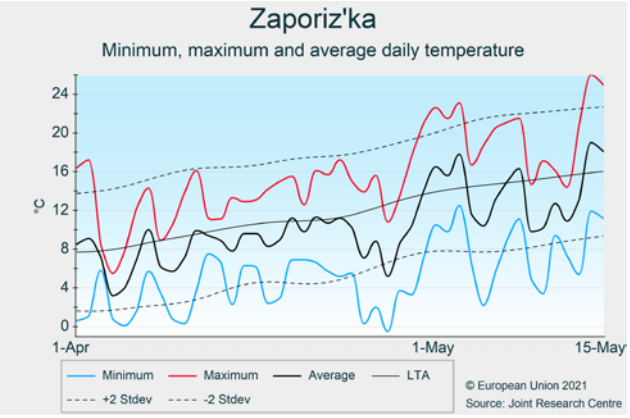
The cold weather observed during the period under review was not particularly favourable for winter wheat and spring barley. However, since the beginning of May, conditions have been favourable for summer crops, despite a slow start due to the cold temperatures.

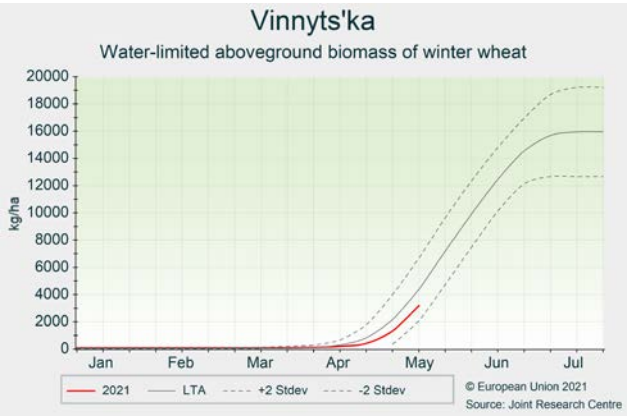
Cold weather prevailed during the period under review, with temperatures between -1°C and -2°C below the LTA in most oblasts. While April was much colder than the LTA, temperatures returned to seasonal values in the beginning of May. Meanwhile rainfall was close to the LTA for the period under review, with a slight rain deficit in eastern and western oblasts, while the centre received slightly more rainfall than the LTA.

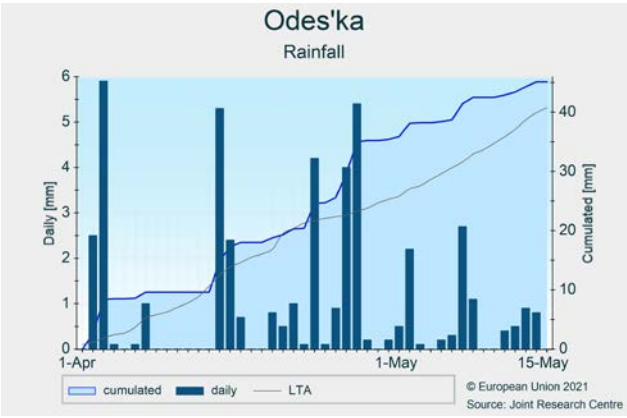
Winter wheat is in good condition in eastern Oblasts and Odes'ka, while conditions are somewhat below average in other Oblasts, and particularly Vinnyts'ka, where emerging stands were negatively impacted by the heavy rainfall observed last October. The yield forecast is slightly below the historical trend considering the heterogeneous crop conditions, particularly outside of the main producing regions. The cold weather observed in March and April is not favouring a good yield either, considering the average temperatures were below the optimal temperatures for winter wheat.

Winter barley is in good condition and the yield is expected to be close to the record-high level of 2019. Spring barley was sown relatively late and the cold temperatures since sowing have not been favourable to biomass formation.

Grain maize sowing is coming to an end, as well as the sowing of other summer crops; considering that temperatures have been back at close to average levels since the beginning of May, the start to the season is beneficial.







Turkey

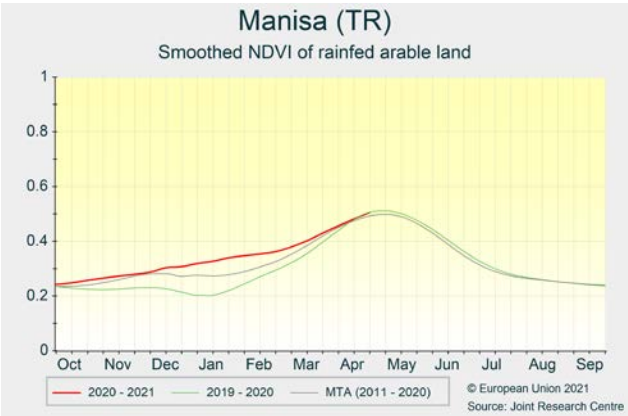
Crop growth delayed

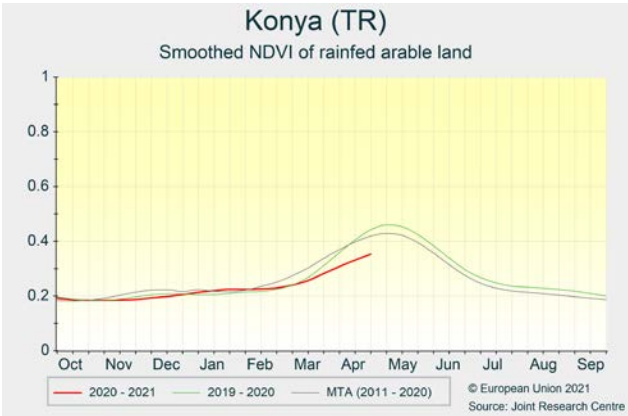
Winter crops forecast remains slightly above the last 5-year average, especially for soft wheat (+4%) and durum wheat (+3%) due to a favourable season in south-eastern and western-most regions. Summer crops season just started.

Since the beginning of April Anatolian agricultural regions have received 10 mm to 30 mm of rain, which is between 50% and 80% below the usual precipitation amounts. Temperatures increased during the analysis period and moved from slightly colder-than-usual conditions at the beginning of April to above-average temperatures with anomalies of around +4°C, and locally up to +6°C, compared to the average. *Ankara* and *Konya* regions were among the driest and warmest, increasing irrigation demands.

In south-eastern regions weather conditions were similar to in Anatolia, even though it was hotter with an average temperature anomaly of +6°C between 20 April and 15 May. From the beginning of May maximum temperatures were constantly above 30°C, while precipitation was negligible (<10 mm). Irrigation is sustaining winter crop growth, but water reservoirs needed for the summer season are already depleting.

In central and western regions winter crops are in contrasting conditions: weak and strongly delayed in *Ankara* and *Konya,* while favourable in *Manisa* and *Kiriklareli*. In eastern Anatolian regions crops are developing well, but with delayed stages. In the whole Anatolia region flowering is likely to occur later than usual in June, increasing the risk of heat stress at reproductive stages. In south-eastern regions irrigation is compensating for the rain deficit while the high temperatures could have a minor negative effect on reproductive stages. Concerns for the summer crop season are present throughout the whole country, due to the low level of irrigation reservoirs.





5.4. European Russia and Belarus

European Russia

Improved conditions in south-western regions

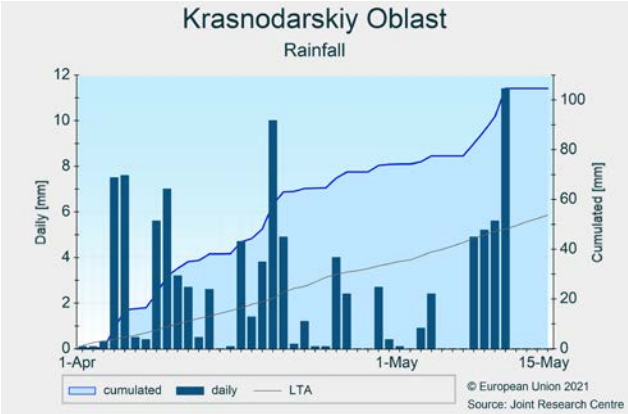
Recent abundant precipitation improved the condition of crops in south-western parts of the country, but did not bring any visible benefits to the crops grown in Central and Volga okrugs. The spring sowing campaign is progressing slowly.

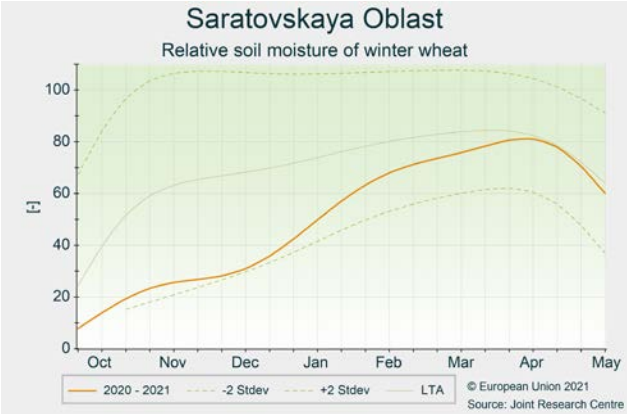
Most areas of European Russia received above-average precipitation in April, especially in the Southern and North Caucasian okrugs, which received more than 80 mm (exceeding the LTA by 25-40 mm). This allowed soil moisture levels to restore from the record dry start to the season.

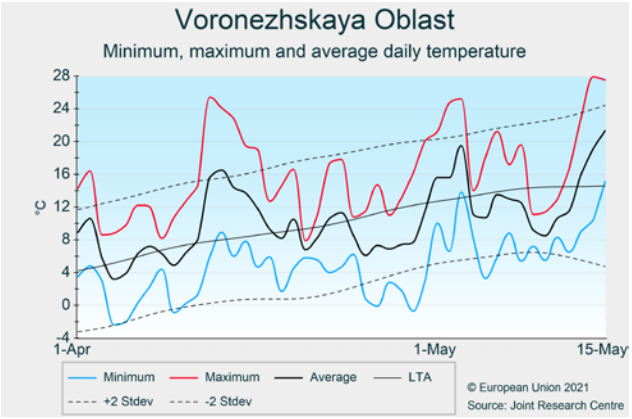
Throughout the winter wheat belt, temperatures were close to the LTA during the period of review (1 April to 15 May). Frost events were rare and mild.

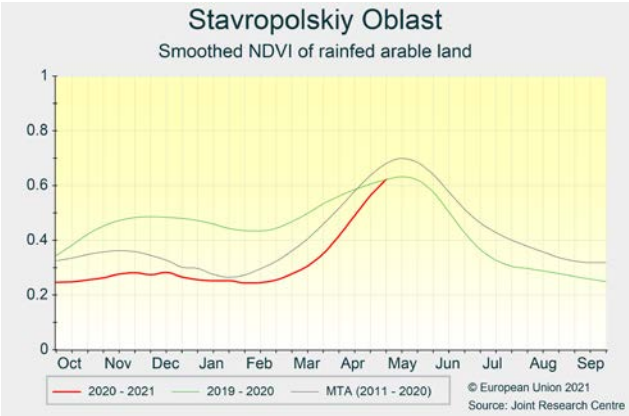
In the oblasts from the Southern and Northern Caucasian okrugs (*Krasnodar, Rostov, Stavropol*), remote sensing images indicate a significant improvement of the biomass accumulation in response to the overall positive conditions of April, which allowed winter cereals to get back on track for achieving good yields if weather conditions remain supportive. However, the images from the Central and the Volga okrugs did not show any visible improvement, which confirms the possible irreversible damage because of the bad wintering and the cold spell that occurred in mid-March.

The April rains also benefited the emergence of spring crops that had already been sown. Dry and warm weather conditions during the first week of May allowed spring sowing to accelerate. Nevertheless, it is still delayed compared to last year because of the wet soils.









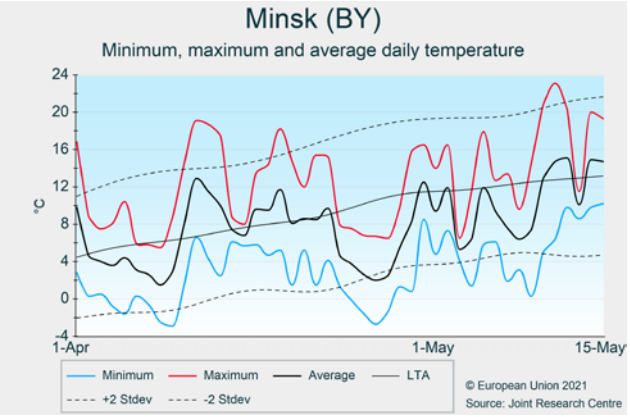
Belarus

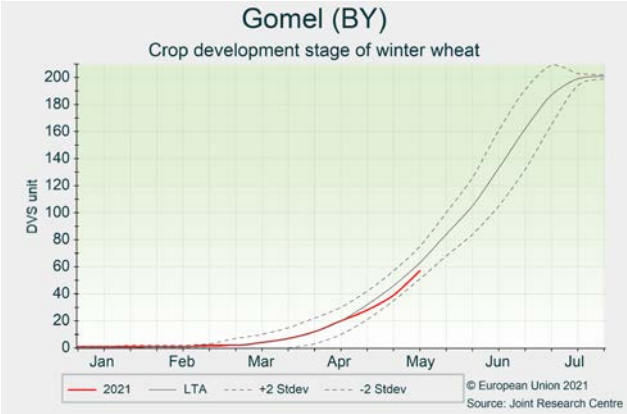
Good yield potential for winter cereals

Below-average temperatures caused a slowdown of winter crops' development. Agro-meteorological conditions were generally favourable for sowing spring cereals and maize. We maintain our positive yield expectations.

Temperatures oscillated around the average during the first two dekads of April, while significantly colder than usual conditions dominated at the end of April, and the first dekad of May. Frost events were frequent during the last dekad of April, but temperature minima rarely dropped below -3°C. Total precipitation remained around the average in most of the country, allowing for adequate soil moisture levels, while cumulative global radiation was slightly below the average.

Our model indicates some delays in the development and biomass accumulation of winter wheat due to colder-than-usual conditions during the third dekad of April and the first dekad of May. Nevertheless, currently there are no concerns for winter cereals. While sowing of spring cereals is close to being finalised, the sowing campaign of maize started during the third decade of April, under generally favourable agro-meteorological conditions. We maintain our positive yield outlook, based on historical trends.





5.5. Maghreb

Morocco, Algeria and Tunisia

Negative outlook for cereals in central Maghreb, positive expectations in Morocco

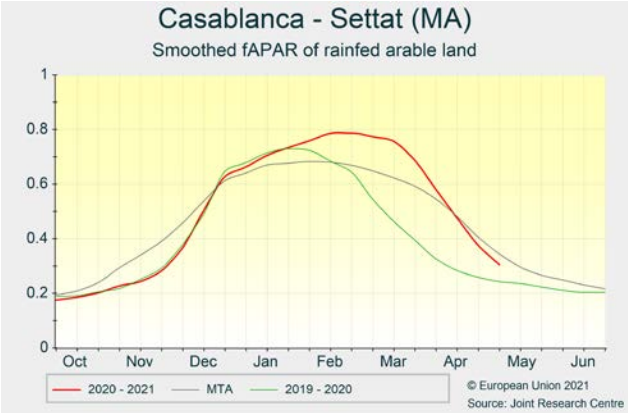
Favourable precipitation and warm temperatures sustained cereal growth in Morocco, yield expectations for this country are very positive. Dry and hot conditions accelerated grain filling in the central-eastern regions of Algeria, deteriorating an already unfavourable campaign. Barley expectations continue to be negatively affected by the earlier drought for two inland regions of Tunisia.

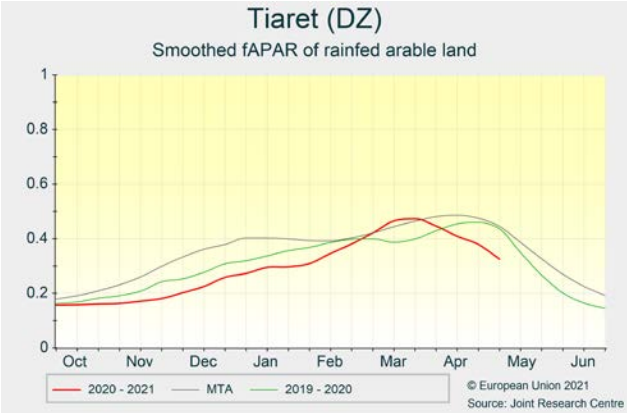
Winter cereals in **Morocco** are at the end of a very positive growing season. The current campaign started similarly to the previous (unfavourable) season: with delays in the autumn rains and postponed crop sowings and establishments. But unlike the previous season, January was rainier, with 90 mm of cumulated rain versus only 20 mm last season (average for the cultivated areas at national scale) and the successive February-May period was warm and characterised by frequent and evenly distributed rainfall events. Weather conditions supported crop growth and development along the vegetative, reproductive and grain filling phases.

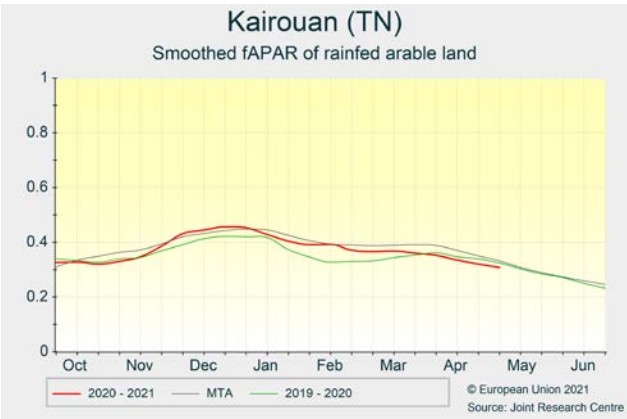
Crop conditions in **Algeria** further deteriorated during the period under review. Temperature sums (T_{base} 10°C) remained 20%-40% above the LTA in the most important agricultural areas and in addition, a rain deficit of 25 mm-50 mm was observed in north-western and central regions, particularly in *Relizane*, *Tissemsilt*, *Ain-Defla* and *Medea*. Analysis of remote sensing data indicates an acceleration of grain filling (e.g. *Sidi Bel Abbes*, *Tiaret*, *Medea*) in the April-May period. This occurred at the expense of the harvestable biomass.

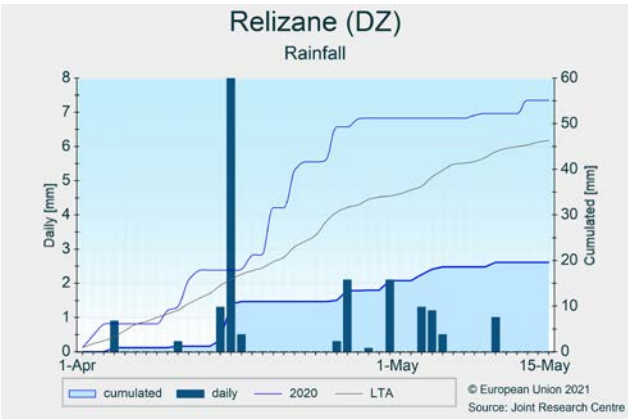
Winter crop conditions in **Tunisia** remained unchanged with respect to the previous outlook. Above-average rainfall accumulation and daily temperatures 1°C -2°C above the LTA prevailed in the period under review. Crop biomass accumulation was in line with an average season in all the coastal and central regions, with the exception for *Kasserine* and *Kairouan* (20% of the national production of barley) where below-average biomass accumulation has been observed since the drought in January and February.

Our forecasts are well above the 5-year average for Morocco, are revised downward in Algeria, and are around the last 5-year average for Tunisia



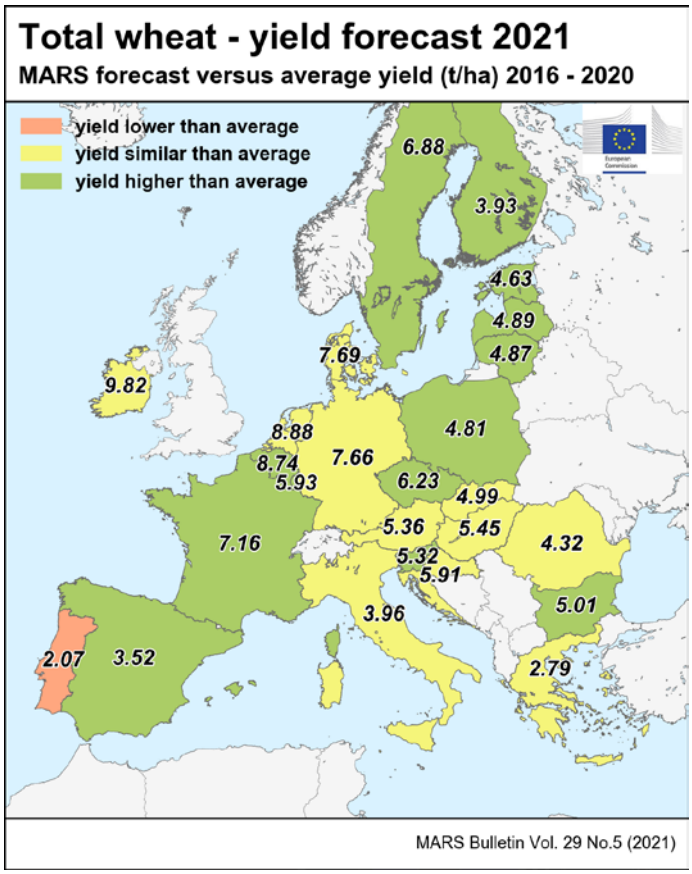




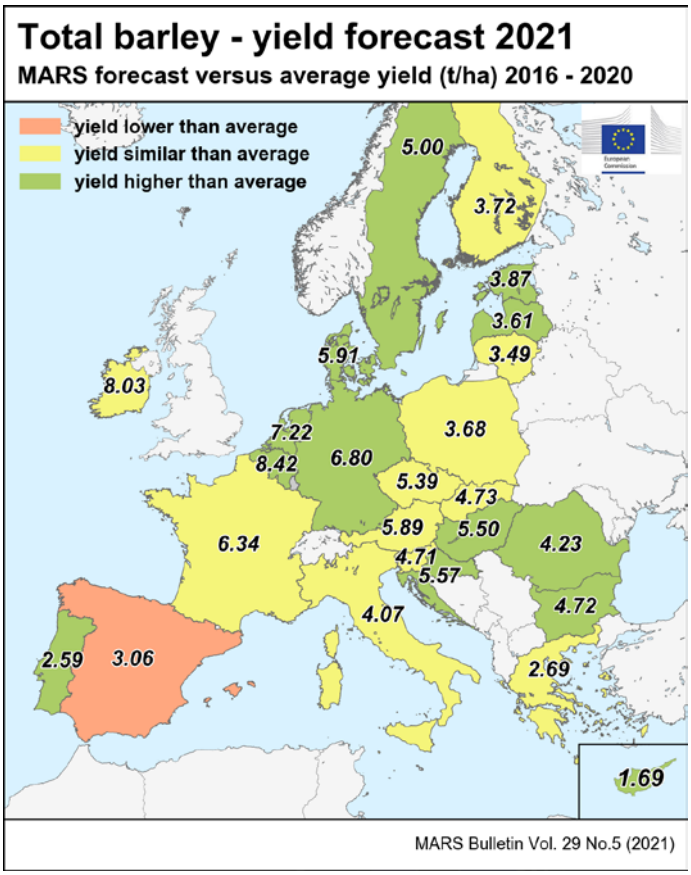


6. Crop yield forecast

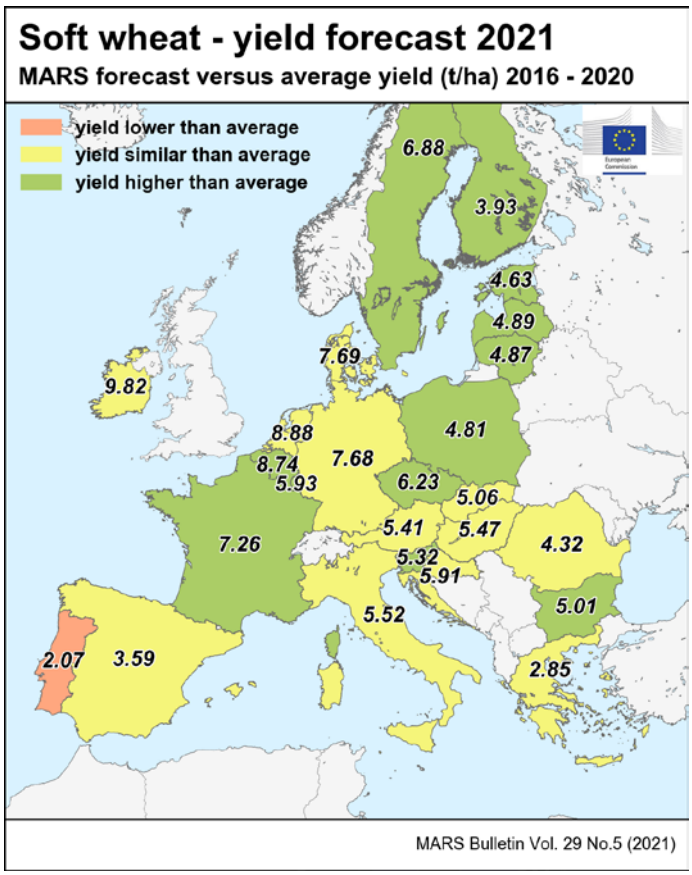
Country	Total wheat (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	5.47	5.50	**5.70**	+ 4.1	+ 3.6
AT	5.50	5.96	**5.36**	– 2.5	– 10
BE	8.39	9.00	**8.74**	+ 4.1	– 3.0
BG	4.80	3.93	**5.01**	+ 4.4	+ 28
CY	—	—	**—**	—	—
CZ	5.89	6.14	**6.23**	+ 5.8	+ 1.5
DE	7.43	7.82	**7.66**	+ 3.0	– 2.1
DK	7.68	8.19	**7.69**	+ 0.2	– 6.1
EE	4.01	5.00	**4.63**	+ 15	– 7.5
EL	2.70	2.54	**2.79**	+ 3.2	+ 10
ES	3.37	4.16	**3.52**	+ 4.5	– 15
FI	3.76	3.41	**3.93**	+ 4.4	+ 15
FR	6.78	6.73	**7.16**	+ 5.7	+ 6.5
HR	5.68	6.00	**5.91**	+ 4.0	– 1.5
HU	5.31	5.37	**5.45**	+ 2.5	+ 1.5
IE	9.45	8.35	**9.82**	+ 3.9	+ 18
IT	3.92	3.83	**3.96**	+ 1.0	+ 3.3
LT	4.53	5.39	**4.87**	+ 7.6	– 9.7
LU	5.70	5.97	**5.93**	+ 4.1	– 0.6
LV	4.57	5.34	**4.89**	+ 7.0	– 8.4
MT	—	—	**—**	—	—
NL	8.81	8.62	**8.88**	+ 0.8	+ 3.1
PL	4.55	4.90	**4.81**	+ 5.6	– 1.8
PT	2.21	2.03	**2.07**	– 6.7	+ 1.9
RO	4.27	2.99	**4.32**	+ 1.1	+ 45
SE	6.53	7.15	**6.88**	+ 5.2	– 3.9
SI	4.98	5.04	**5.32**	+ 6.8	+ 5.5
SK	5.15	5.51	**4.99**	– 3.2	– 10



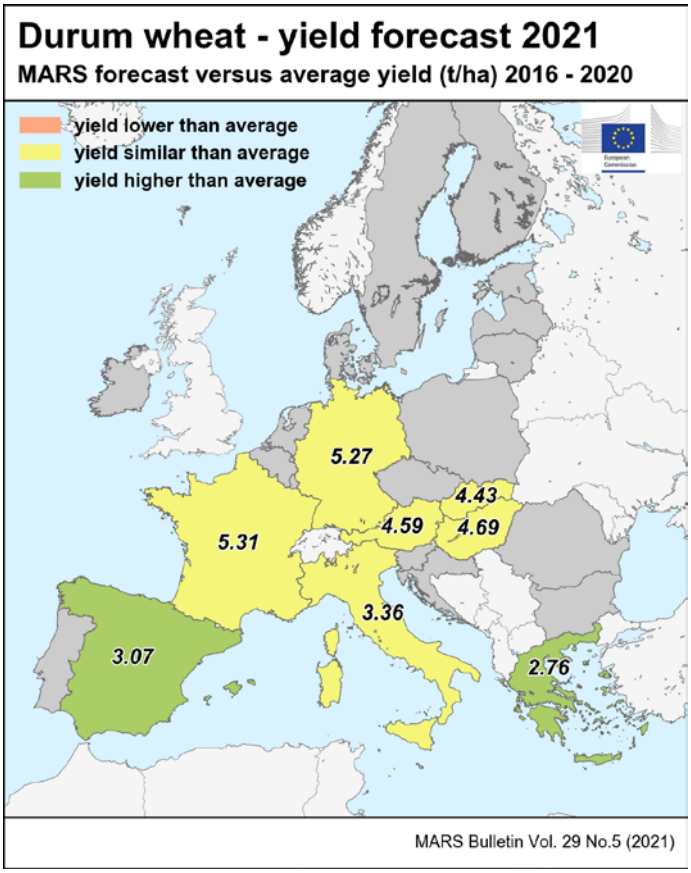
Country	Total barley (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	4.77	4.87	**4.89**	+ 2.4	+ 0.3
AT	5.85	6.45	**5.89**	+ 0.6	– 8.8
BE	7.76	7.65	**8.42**	+ 8.4	+ 10
BG	4.47	4.23	**4.72**	+ 5.8	+ 12
CY	1.44	2.16	**1.69**	+ 17	– 22
CZ	5.34	5.47	**5.39**	+ 0.9	– 1.5
DE	6.52	6.47	**6.80**	+ 4.3	+ 5.2
DK	5.67	6.44	**5.91**	+ 4.3	– 8.1
EE	3.39	4.04	**3.87**	+ 14	– 4.4
EL	2.68	2.54	**2.69**	+ 0.6	+ 6.1
ES	3.22	3.97	**3.06**	– 5.0	– 23
FI	3.74	3.52	**3.72**	– 0.6	+ 5.5
FR	6.09	5.32	**6.34**	+ 4.0	+ 19
HR	4.90	5.08	**5.57**	+ 14	+ 9.8
HU	5.23	5.52	**5.50**	+ 5.0	– 0.4
IE	7.77	7.42	**8.03**	+ 3.3	+ 8.1
IT	4.05	4.14	**4.07**	+ 0.6	– 1.7
LT	3.39	4.29	**3.49**	+ 3.1	– 19
LU	—	—	**—**	—	—
LV	3.18	3.66	**3.61**	+ 13	– 1.4
MT	—	—	**—**	—	—
NL	6.83	6.44	**7.22**	+ 5.7	+ 12
PL	3.64	3.92	**3.68**	+ 1.3	– 6.0
PT	2.49	2.65	**2.59**	+ 4.2	– 2.3
RO	3.83	2.56	**4.23**	+ 11	+ 65
SE	4.66	5.19	**5.00**	+ 7.3	– 3.6
SI	4.63	4.51	**4.71**	+ 1.8	+ 4.4
SK	4.74	5.19	**4.73**	– 0.3	– 9.0



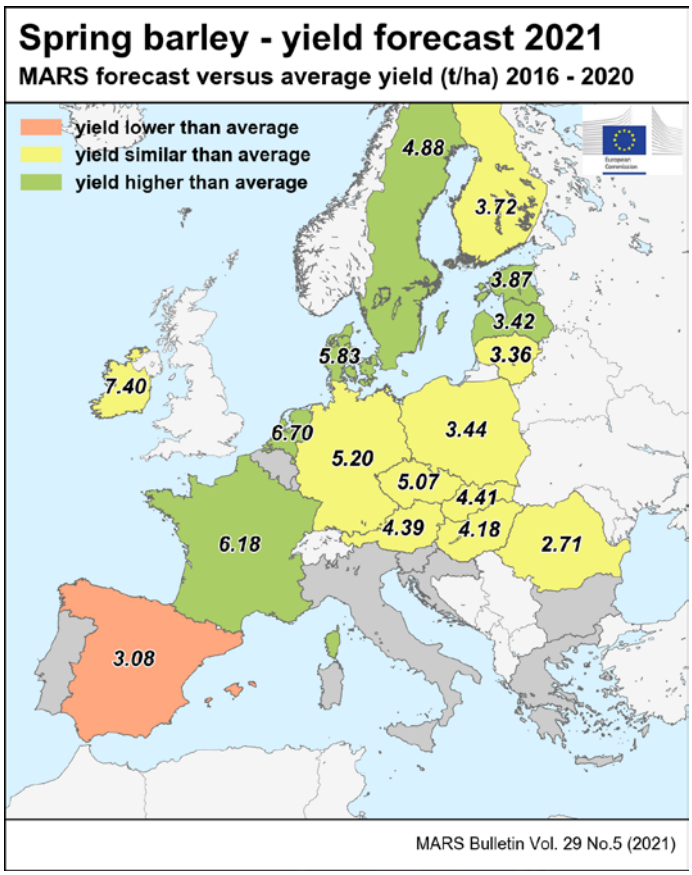
Country	Soft wheat (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	5.69	5.71	**5.91**	+ 3.9	+ 3.6
AT	5.56	6.03	**5.41**	– 2.8	– 10
BE	8.39	9.00	**8.74**	+ 4.1	– 3.0
BG	4.80	3.93	**5.01**	+ 4.4	+ 28
CY	—	—	**—**	—	—
CZ	5.89	6.14	**6.23**	+ 5.8	+ 1.5
DE	7.46	7.86	**7.68**	+ 3.0	– 2.2
DK	7.68	8.19	**7.69**	+ 0.2	– 6.1
EE	4.01	5.00	**4.63**	+ 15	– 7.5
EL	2.85	2.61	**2.85**	+ 0.3	+ 9.4
ES	3.49	4.29	**3.59**	+ 2.9	– 16
FI	3.76	3.41	**3.93**	+ 4.4	+ 15
FR	6.88	6.82	**7.26**	+ 5.4	+ 6.4
HR	5.68	6.00	**5.91**	+ 4.0	– 1.5
HU	5.34	5.40	**5.47**	+ 2.4	+ 1.3
IE	9.45	8.35	**9.82**	+ 3.9	+ 18
IT	5.37	5.33	**5.52**	+ 2.6	+ 3.5
LT	4.53	5.39	**4.87**	+ 7.6	– 9.7
LU	5.70	5.97	**5.93**	+ 4.1	– 0.6
LV	4.57	5.34	**4.89**	+ 7.0	– 8.4
MT	—	—	**—**	—	—
NL	8.81	8.62	**8.88**	+ 0.8	+ 3.1
PL	4.55	4.90	**4.81**	+ 5.6	– 1.8
PT	2.21	2.03	**2.07**	– 6.7	+ 1.9
RO	4.27	2.99	**4.32**	+ 1.1	+ 45
SE	6.53	7.15	**6.88**	+ 5.2	– 3.9
SI	4.98	5.04	**5.32**	+ 6.8	+ 5.5
SK	5.22	5.55	**5.06**	– 3.2	– 8.9



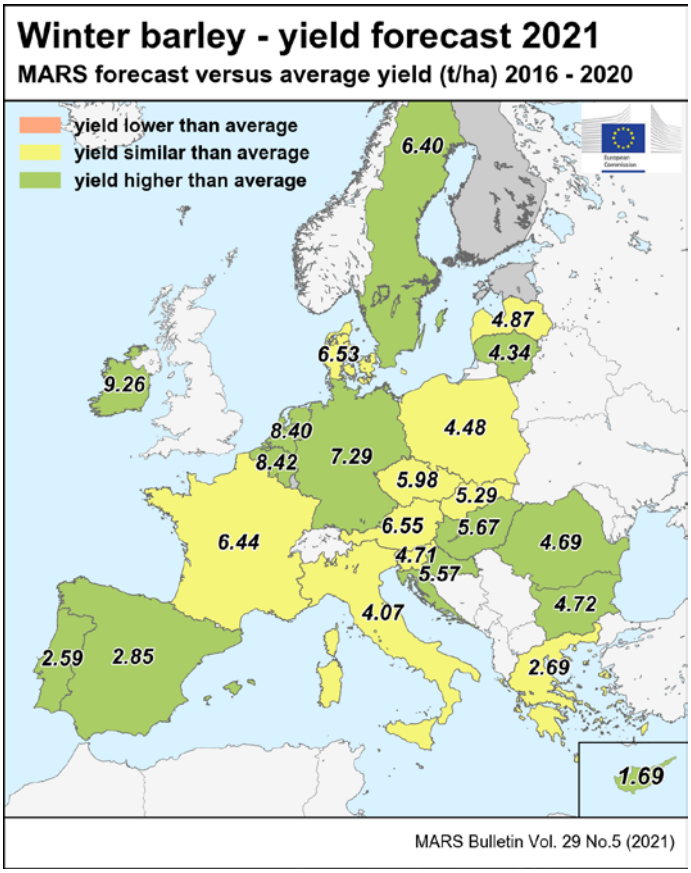
Country	Durum wheat (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	3.49	3.46	**3.56**	+ 1.8	+ 2.9
AT	4.61	4.80	**4.59**	– 0.4	– 4.4
BE	—	—	**—**	—	—
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	—	—	**—**	—	—
DE	5.17	5.29	**5.27**	+ 2.1	– 0.3
DK	—	—	**—**	—	—
EE	—	—	**—**	—	—
EL	2.65	2.51	**2.76**	+ 4.4	+ 10
ES	2.80	3.26	**3.07**	+ 9.5	– 5.9
FI	—	—	**—**	—	—
FR	5.19	5.11	**5.31**	+ 2.3	+ 3.9
HR	—	—	**—**	—	—
HU	4.66	4.41	**4.69**	+ 0.7	+ 6.4
IE	—	—	**—**	—	—
IT	3.33	3.21	**3.36**	+ 0.8	+ 4.6
LT	—	—	**—**	—	—
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	—	—	**—**	—	—
PT	—	—	**—**	—	—
RO	—	—	**—**	—	—
SE	—	—	**—**	—	—
SI	—	—	**—**	—	—
SK	4.56	5.11	**4.43**	– 3.0	– 13



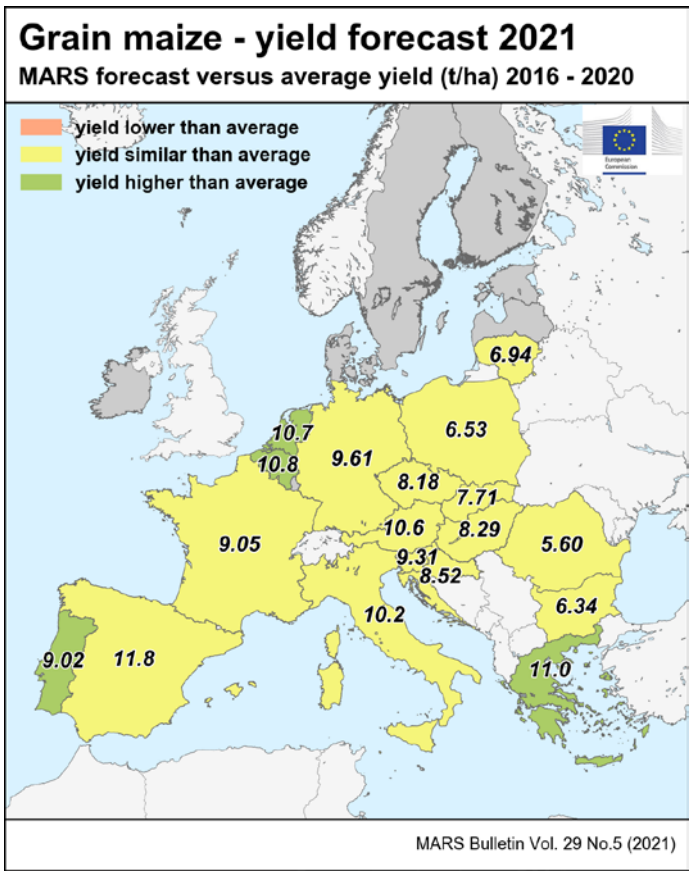
Country	Spring barley (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	4.12	4.50	**4.17**	+ 1.4	– 7.2
AT	4.36	4.90	**4.39**	+ 0.7	– 10
BE	—	—	—	—	—
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	5.11	5.15	**5.07**	– 0.7	– 1.4
DE	5.22	5.47	**5.20**	– 0.5	– 5.0
DK	5.53	6.34	**5.83**	+ 5.5	– 8.0
EE	3.39	4.04	**3.87**	+ 14	– 4.4
EL	—	—	—	—	—
ES	3.30	4.02	**3.08**	– 6.6	– 23
FI	3.74	3.52	**3.72**	– 0.6	+ 5.5
FR	5.83	4.95	**6.18**	+ 6.1	+ 25
HR	—	—	—	—	—
HU	4.06	4.32	**4.18**	+ 2.8	– 3.3
IE	7.14	7.11	**7.40**	+ 3.7	+ 4.1
IT	—	—	—	—	—
LT	3.33	4.23	**3.36**	+ 1.1	– 20
LU	—	—	—	—	—
LV	3.08	3.42	**3.42**	+ 11	– 0.1
MT	—	—	—	—	—
NL	6.36	6.10	**6.70**	+ 5.4	+ 9.9
PL	3.44	3.65	**3.44**	+ 0.0	– 5.9
PT	—	—	—	—	—
RO	2.76	2.08	**2.71**	– 1.8	+ 30
SE	4.57	5.08	**4.88**	+ 6.8	– 3.9
SI	—	—	—	—	—
SK	4.46	4.91	**4.41**	– 1.3	– 10



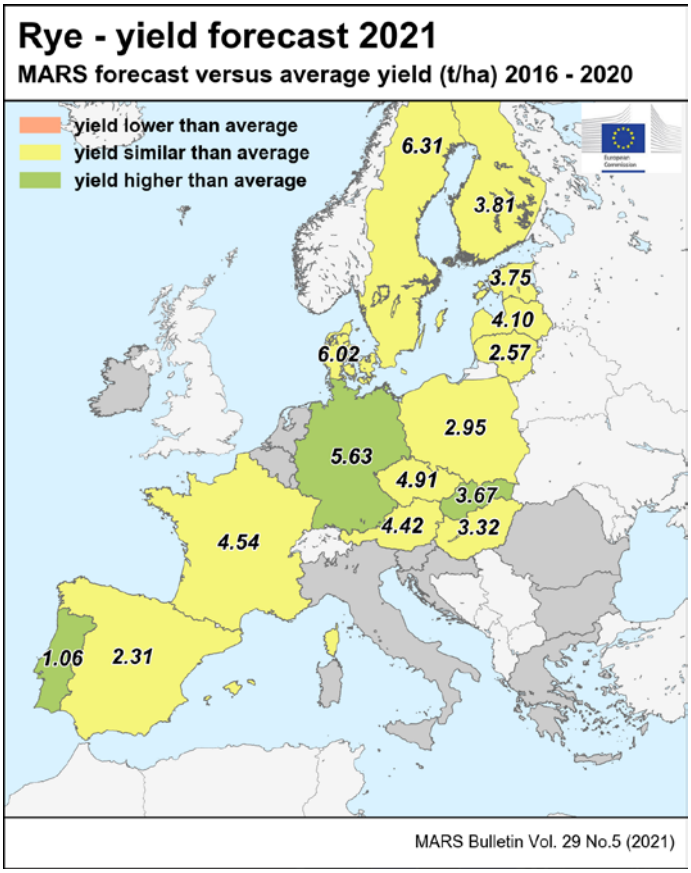
Country	Winter barley (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	5.62	5.39	**5.89**	+ 4.8	+ 9.4
AT	6.53	6.92	**6.55**	+ 0.2	– 5.4
BE	7.76	7.65	**8.42**	+ 8.4	+ 10
BG	4.47	4.23	**4.72**	+ 5.8	+ 12
CY	1.44	2.16	**1.69**	+ 17	– 22
CZ	5.81	6.09	**5.98**	+ 2.9	– 1.8
DE	6.90	6.75	**7.29**	+ 5.6	+ 8.0
DK	6.50	7.09	**6.53**	+ 0.5	– 7.9
EE	—	—	—	—	—
EL	2.68	2.54	**2.69**	+ 0.6	+ 6.1
ES	2.64	3.48	**2.85**	+ 7.7	– 18
FI	—	—	—	—	—
FR	6.21	5.56	**6.44**	+ 3.8	+ 16
HR	4.90	5.08	**5.57**	+ 14	+ 9.8
HU	5.40	5.65	**5.67**	+ 4.8	+ 0.3
IE	8.90	8.28	**9.26**	+ 4.1	+ 12
IT	4.05	4.14	**4.07**	+ 0.6	– 1.7
LT	4.14	4.63	**4.34**	+ 4.7	– 6.2
LU	—	—	—	—	—
LV	4.83	5.55	**4.87**	+ 0.8	– 12
MT	—	—	—	—	—
NL	8.06	7.46	**8.40**	+ 4.2	+ 13
PL	4.40	4.73	**4.48**	+ 1.8	– 5.4
PT	2.49	2.65	**2.59**	+ 4.2	– 2.3
RO	4.13	2.65	**4.69**	+ 14	+ 77
SE	6.00	6.54	**6.40**	+ 6.7	– 2.1
SI	4.63	4.51	**4.71**	+ 1.8	+ 4.4
SK	5.33	5.65	**5.29**	– 0.7	– 6.3



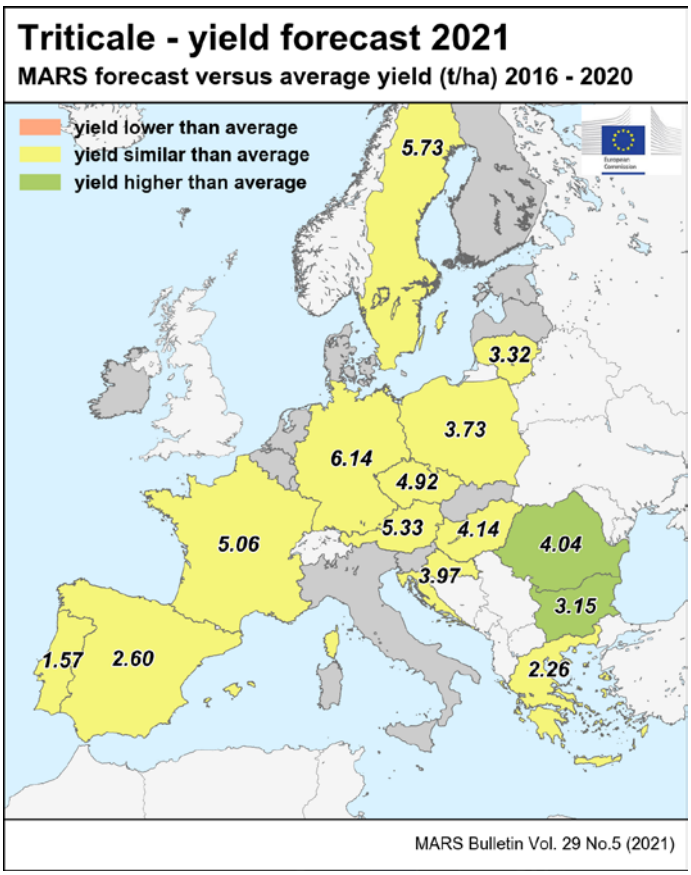
Country	Grain maize (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	7.75	7.30	**7.81**	+ 0.8	+ 7.0
AT	10.6	11.3	**10.6**	– 0.1	– 6.7
BE	9.63	7.67	**10.8**	+ 12	+ 41
BG	6.36	5.10	**6.34**	– 0.4	+ 24
CY	—	—	—	—	—
CZ	8.09	9.46	**8.18**	+ 1.0	– 14
DE	9.27	9.14	**9.61**	+ 3.7	+ 5.1
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	10.3	9.89	**11.0**	+ 6.7	+ 11
ES	11.6	11.9	**11.8**	+ 1.8	– 0.4
FI	—	—	—	—	—
FR	8.75	8.11	**9.05**	+ 3.4	+ 12
HR	8.39	8.96	**8.52**	+ 1.5	– 4.9
HU	8.12	8.62	**8.29**	+ 2.1	– 3.8
IE	—	—	—	—	—
IT	10.3	11.2	**10.2**	– 0.9	– 9.1
LT	6.83	6.95	**6.94**	+ 1.7	– 0.1
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	9.80	10.7	**10.7**	+ 9.5	+ 0.1
PL	6.59	7.10	**6.53**	– 0.9	– 8.0
PT	8.67	9.22	**9.02**	+ 4.1	– 2.1
RO	5.65	4.11	**5.60**	– 0.8	+ 36
SE	—	—	—	—	—
SI	9.23	10.8	**9.31**	+ 0.8	– 14
SK	7.58	8.58	**7.71**	+ 1.7	– 10



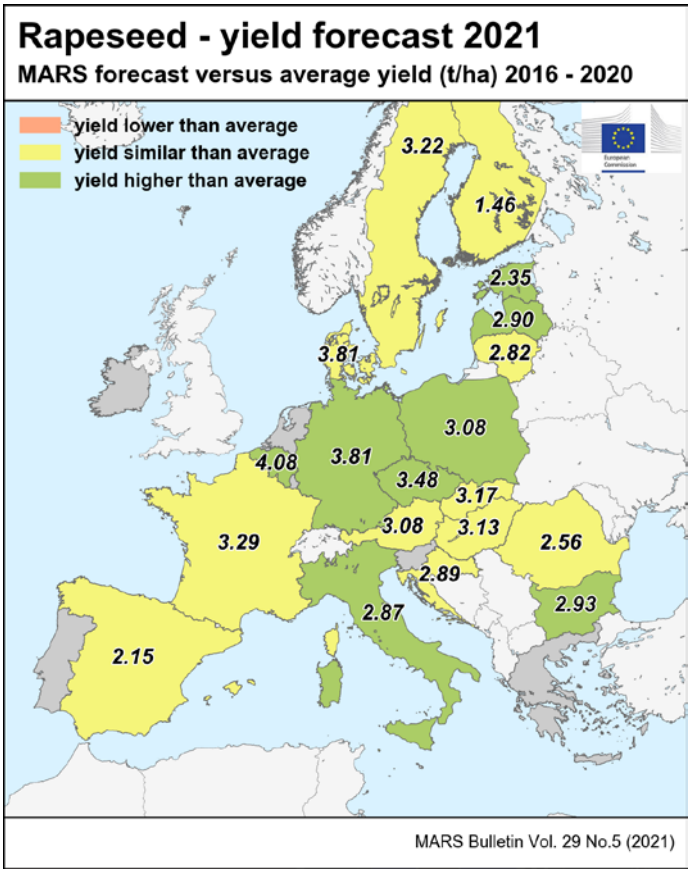
Country	Rye (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	3.83	4.19	**4.05**	+ 5.9	– 3.4
AT	4.60	5.13	**4.42**	– 3.9	– 14
BE	—	—	—	—	—
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	5.06	5.48	**4.91**	– 3.1	– 11
DE	5.15	5.51	**5.63**	+ 9.3	+ 2.1
DK	5.98	6.14	**6.02**	+ 0.7	– 1.9
EE	3.62	3.81	**3.75**	+ 3.6	– 1.4
EL	—	—	—	—	—
ES	2.29	2.83	**2.31**	+ 0.8	– 19
FI	3.85	3.60	**3.81**	– 1.0	+ 5.8
FR	4.49	4.59	**4.54**	+ 1.2	– 1.0
HR	—	—	—	—	—
HU	3.29	3.20	**3.32**	+ 1.2	+ 4.0
IE	—	—	—	—	—
IT	—	—	—	—	—
LT	2.55	2.98	**2.57**	+ 0.6	– 14
LU	—	—	—	—	—
LV	4.15	4.32	**4.10**	– 1.4	– 5.2
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	2.87	3.25	**2.95**	+ 2.7	– 9.3
PT	1.01	1.17	**1.06**	+ 4.5	– 10
RO	—	—	—	—	—
SE	6.15	6.21	**6.31**	+ 2.6	+ 1.6
SI	—	—	—	—	—
SK	3.51	3.90	**3.67**	+ 4.6	– 5.8



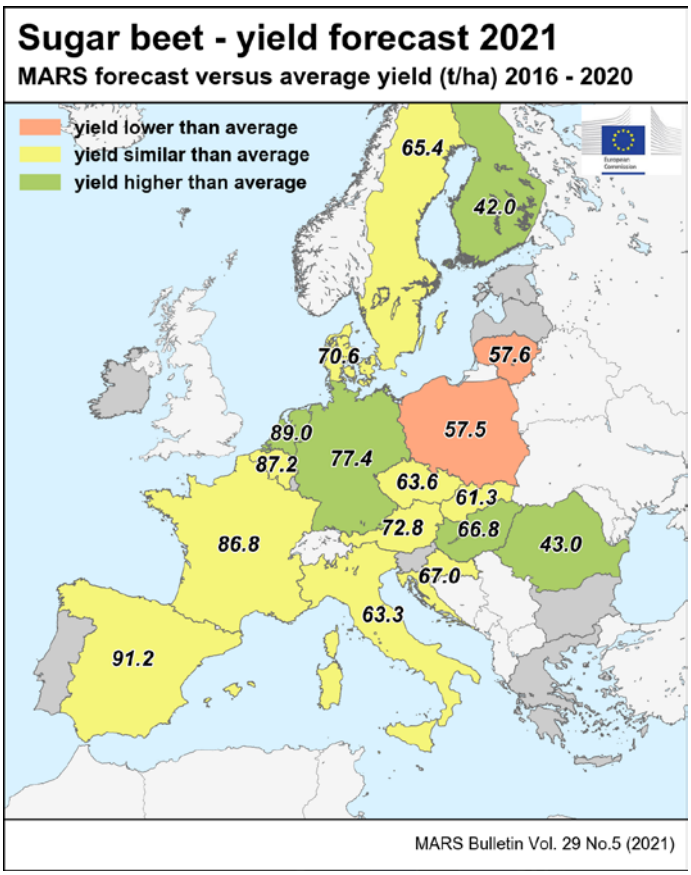
Country	Triticale (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	4.07	4.29	**4.17**	+ 2.5	– 2.9
AT	5.48	5.87	**5.33**	– 2.7	– 9.3
BE	—	—	—	—	—
BG	2.94	2.91	**3.15**	+ 6.9	+ 8.1
CY	—	—	—	—	—
CZ	4.87	5.07	**4.92**	+ 1.0	– 2.9
DE	5.91	5.98	**6.14**	+ 3.9	+ 2.7
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	2.22	2.07	**2.26**	+ 2.0	+ 9.4
ES	2.53	2.96	**2.60**	+ 2.8	– 12
FI	—	—	—	—	—
FR	4.89	4.67	**5.06**	+ 3.5	+ 8.4
HR	4.00	4.35	**3.97**	– 0.7	– 8.8
HU	4.00	4.10	**4.14**	+ 3.5	+ 1.0
IE	—	—	—	—	—
IT	—	—	—	—	—
LT	3.34	3.80	**3.32**	– 0.4	– 13
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	3.66	4.08	**3.73**	+ 1.9	– 8.5
PT	1.62	1.37	**1.57**	– 3.1	+ 15
RO	3.87	3.48	**4.04**	+ 4.2	+ 16
SE	5.60	6.04	**5.73**	+ 2.3	– 5.1
SI	—	—	—	—	—
SK	—	—	—	—	—



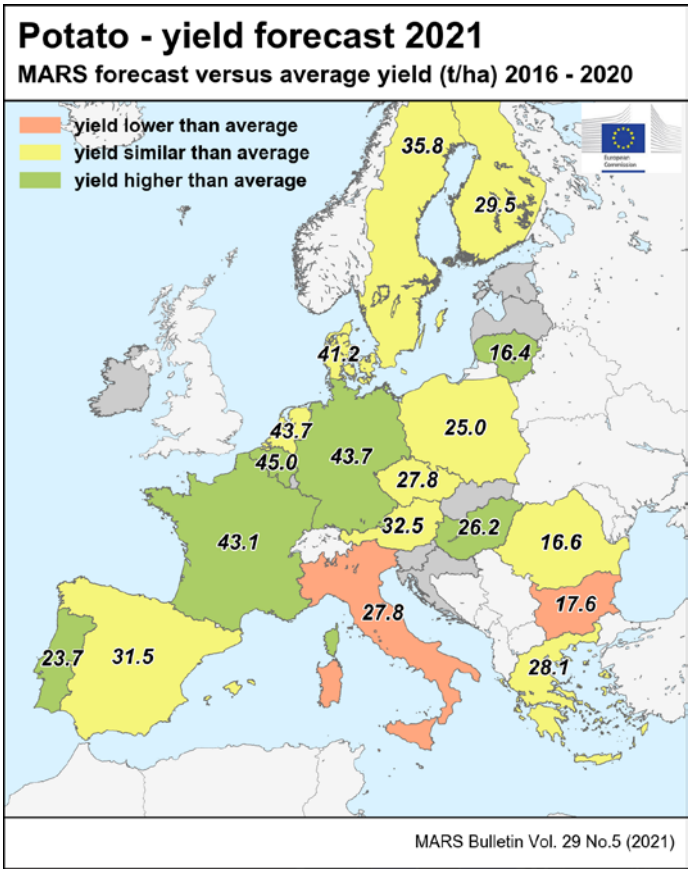
Country	Rape and turnip rape (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	3.06	3.16	**3.21**	+ 5.2	+ 1.8
AT	3.11	3.15	**3.08**	– 1.1	– 2.3
BE	3.77	3.80	**4.08**	+ 8.3	+ 7.5
BG	2.76	2.34	**2.93**	+ 6.0	+ 25
CY	—	—	—	—	—
CZ	3.25	3.38	**3.48**	+ 7.2	+ 2.9
DE	3.32	3.68	**3.81**	+ 15	+ 3.6
DK	3.81	3.84	**3.81**	+ 0.1	– 0.7
EE	2.15	2.86	**2.35**	+ 9.0	– 18
EL	—	—	—	—	—
ES	2.20	2.72	**2.15**	– 2.1	– 21
FI	1.46	1.27	**1.46**	– 0.1	+ 15
FR	3.21	2.90	**3.29**	+ 2.4	+ 13
HR	2.82	2.87	**2.89**	+ 2.7	+ 0.8
HU	3.09	2.80	**3.13**	+ 1.4	+ 12
IE	—	—	—	—	—
IT	2.70	2.86	**2.87**	+ 6.1	+ 0.3
LT	2.85	3.41	**2.82**	– 0.8	– 17
LU	—	—	—	—	—
LV	2.74	3.08	**2.90**	+ 5.7	– 5.9
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	2.87	3.40	**3.08**	+ 7.3	– 9.4
PT	—	—	—	—	—
RO	2.56	2.13	**2.56**	– 0.3	+ 20
SE	3.12	3.46	**3.22**	+ 3.2	– 6.9
SI	—	—	—	—	—
SK	3.07	3.01	**3.17**	+ 3.4	+ 5.5



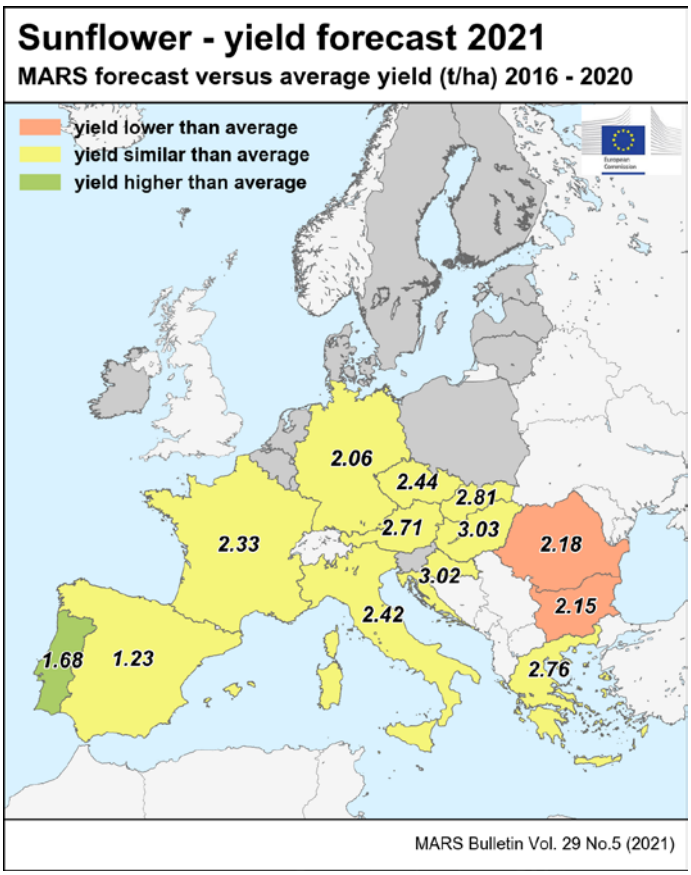
Country	Sugar beets (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	74.2	N/A	**75.5**	+ 1.8	N/A
AT	74.2	79.5	**72.8**	– 1.9	– 8.4
BE	84.8	84.4	**87.2**	+ 2.8	+ 3.2
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	63.1	61.5	**63.6**	+ 0.9	+ 3.4
DE	73.9	N/A	**77.4**	+ 4.9	N/A
DK	72.0	77.1	**70.6**	– 2.0	– 8.4
EE	—	—	—	—	—
EL	—	—	—	—	—
ES	89.2	93.6	**91.2**	+ 2.2	– 2.5
FI	39.2	38.5	**42.0**	+ 7.1	+ 9.1
FR	84.2	72.5	**86.8**	+ 3.1	+ 20
HR	66.3	73.8	**67.0**	+ 1.0	– 9.3
HU	62.4	58.3	**66.8**	+ 7.1	+ 15
IE	—	—	—	—	—
IT	65.5	59.4	**63.3**	– 3.4	+ 6.6
LT	62.3	68.1	**57.6**	– 7.5	– 15
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	82.9	82.1	**89.0**	+ 7.4	+ 8.3
PL	61.7	57.9	**57.5**	– 6.8	– 0.8
PT	—	—	—	—	—
RO	40.2	40.4	**43.0**	+ 7.0	+ 6.5
SE	64.9	68.0	**65.4**	+ 0.8	– 3.9
SI	—	—	—	—	—
SK	60.6	60.4	**61.3**	+ 1.2	+ 1.5



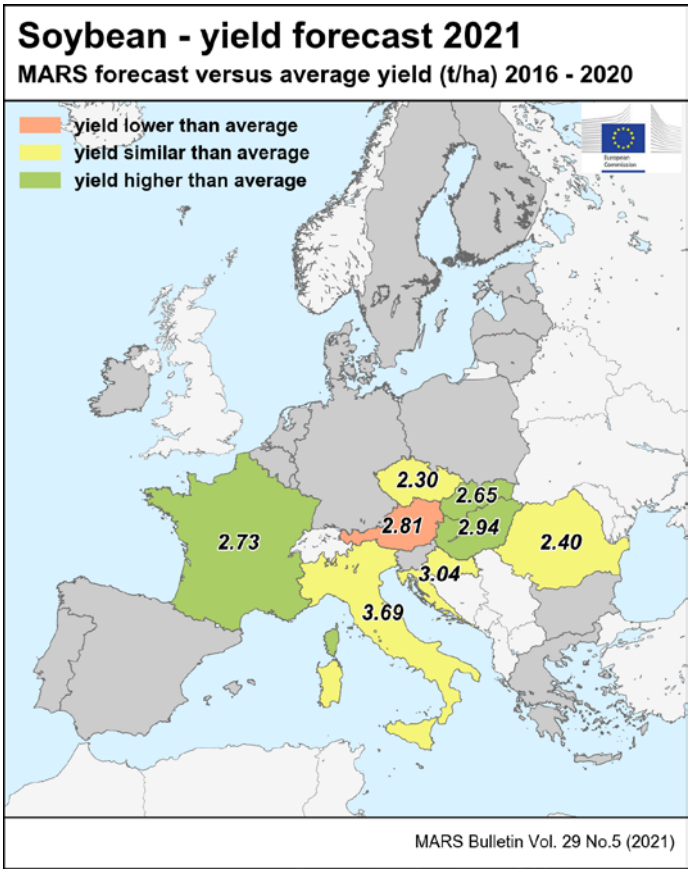
Country	Potato (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	32.8	N/A	**34.0**	+ 3.7	N/A
AT	32.3	36.5	**32.5**	+ 0.4	– 11
BE	40.1	40.8	**45.0**	+ 12	+ 10
BG	18.4	19.2	**17.6**	– 4.6	– 8.4
CY	—	—	—	—	—
CZ	28.3	29.2	**27.8**	– 1.5	– 4.6
DE	41.5	42.0	**43.7**	+ 5.5	+ 4.1
DK	41.6	44.0	**41.2**	– 0.8	– 6.3
EE	—	—	—	—	—
EL	28.4	29.9	**28.1**	– 0.8	– 5.9
ES	31.7	32.0	**31.5**	– 0.7	– 1.6
FI	28.6	30.2	**29.5**	+ 3.0	– 2.4
FR	41.0	N/A	**43.1**	+ 5.1	N/A
HR	—	—	—	—	—
HU	25.1	28.9	**26.2**	+ 4.1	– 9.4
IE	—	—	—	—	—
IT	29.1	30.3	**27.8**	– 4.5	– 8.3
LT	15.5	15.7	**16.4**	+ 5.7	+ 4.3
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	42.0	42.7	**43.7**	+ 4.0	+ 2.4
PL	25.7	25.2	**25.0**	– 2.4	– 0.8
PT	21.6	23.5	**23.7**	+ 10	+ 1.1
RO	16.2	16.2	**16.6**	+ 2.0	+ 2.2
SE	34.5	36.3	**35.8**	+ 3.5	– 1.6
SI	—	—	—	—	—
SK	—	—	—	—	—



Country	Sunflower (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	2.27	2.00	**2.21**	– 2.9	+ 11
AT	2.74	2.39	**2.71**	– 1.2	+ 13
BE	—	—	—	—	—
BG	2.28	2.10	**2.15**	– 6.0	+ 2.4
CY	—	—	—	—	—
CZ	2.52	2.58	**2.44**	– 3.3	– 5.5
DE	2.09	2.21	**2.06**	– 1.3	– 6.7
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	2.72	2.52	**2.76**	+ 1.3	+ 9.3
ES	1.21	1.35	**1.23**	+ 2.1	– 8.5
FI	—	—	—	—	—
FR	2.28	2.08	**2.33**	+ 2.2	+ 12
HR	2.98	3.10	**3.02**	+ 1.3	– 2.6
HU	2.93	2.75	**3.03**	+ 3.4	+ 10
IE	—	—	—	—	—
IT	2.41	2.43	**2.42**	+ 0.3	– 0.5
LT	—	—	—	—	—
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	—	—	—	—	—
PT	1.61	1.77	**1.68**	+ 4.2	– 5.3
RO	2.46	1.70	**2.18**	– 12	+ 28
SE	—	—	—	—	—
SI	—	—	—	—	—
SK	2.72	2.53	**2.81**	+ 3.1	+ 11



Country	Soybean (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
EU	2.93	2.81	**2.99**	+ 2.1	+ 6.3
AT	2.97	2.96	**2.81**	– 5.2	– 4.9
BE	—	—	—	—	—
BG	—	—	—	—	—
CY	—	—	—	—	—
CZ	2.24	2.33	**2.30**	+ 3.0	– 1.3
DE	—	—	—	—	—
DK	—	—	—	—	—
EE	—	—	—	—	—
EL	—	—	—	—	—
ES	—	—	—	—	—
FI	—	—	—	—	—
FR	2.56	2.26	**2.73**	+ 6.5	+ 21
HR	2.98	3.10	**3.04**	+ 1.9	– 2.0
HU	2.80	2.90	**2.94**	+ 4.9	+ 1.5
IE	—	—	—	—	—
IT	3.55	3.77	**3.69**	+ 4.0	– 2.1
LT	—	—	—	—	—
LU	—	—	—	—	—
LV	—	—	—	—	—
MT	—	—	—	—	—
NL	—	—	—	—	—
PL	—	—	—	—	—
PT	—	—	—	—	—
RO	2.35	1.85	**2.40**	+ 2.0	+ 30
SE	—	—	—	—	—
SI	—	—	—	—	—
SK	2.45	2.53	**2.65**	+ 8.2	+ 4.8



Country	Wheat (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
BY	3.27	3.29	**3.65**	+ 12	+ 11
DZ	1.66	1.61	**1.20**	– 28	– 25
MA	1.70	0.91	**2.07**	+ 22	+ 128
TN	1.83	1.77	**1.85**	+ 1.1	+ 4.1
TR	2.80	2.97	**2.91**	+ 4.1	– 1.8
UA	4.00	3.80	**4.17**	+ 4.2	+ 9.7
UK	8.05	7.16	**8.16**	+ 1.3	+ 14

Country	Barley (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
BY	2.72	2.76	**3.23**	+ 19	+ 17
DZ	1.13	1.20	**0.89**	– 21	– 26
MA	1.06	0.43	**1.40**	+ 33	+ 225
TN	0.85	0.79	**0.99**	+ 17	+ 25
TR	2.66	2.65	**2.69**	+ 0.9	+ 1.3
UA	3.25	3.22	**3.31**	+ 1.9	+ 2.7
UK	6.11	5.91	**6.19**	+ 1.3	+ 4.7

Country	Grain maize (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
BY	5.94	6.00	**5.79**	– 2.5	– 3.5
DZ	—	—	**—**	—	—
MA	—	—	**—**	—	—
TN	—	—	**—**	—	—
TR	9.42	9.41	**9.61**	+ 2.0	+ 2.1
UA	6.52	5.62	**7.14**	+ 9.4	+ 27
UK	—	—	**—**	—	—

Country	Soybean (t/ha)				
	Avg 5yrs	2020	MARS 2021 forecasts	%21/5yrs	%21/20
BY	—	—	**—**	—	—
DZ	—	—	**—**	—	—
MA	—	—	**—**	—	—
TN	—	—	**—**	—	—
TR	4.33	4.42	**4.62**	+ 6.6	+ 4.5
UA	2.25	2.05	**2.39**	+ 6.3	+ 17
UK	—	—	**—**	—	—

NB: Yields are forecast for crops with more than 10 000 ha per country with sufficently long and coherent yield time series.

Sources: 2016-2020 data come from DG Agriculture and Rural Development short-term-outlook data (dated April 2021, received on 03.05.2021), Eurostat Eurobase (last update: 07.05.2021) and EES (last update: 15.11.2017).

Non-EU 2016-2020 data come from USDA, DSASI-MADR Algeria, INRA Maroc, ONICL Maroc, Ministère de l'agriculture des ressources hydrauliques et de la pêche Tunisie, MED-Amin baseline DB, Turkish Statistical Institute (TurkStat), Eurostat Eurobase (last update: 07.05.2021), State Statistics Service of Ukraine, FAO and PSD-online.

2021 yields come from MARS Crop Yield Forecasting System (output up to 10.05.2021).

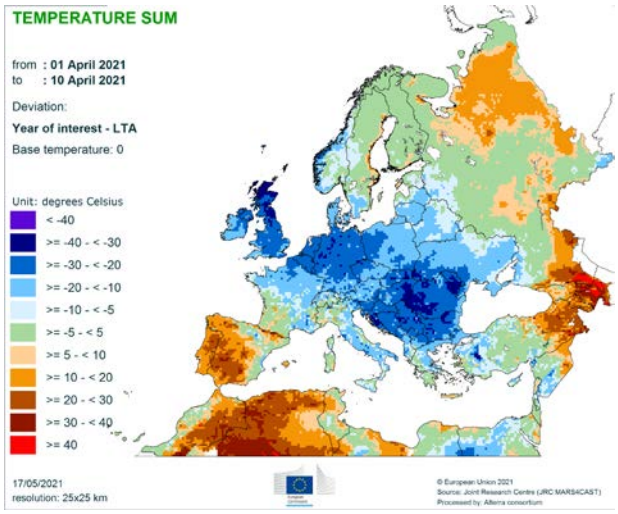
EU aggregate after 1.2.2020 is reported.

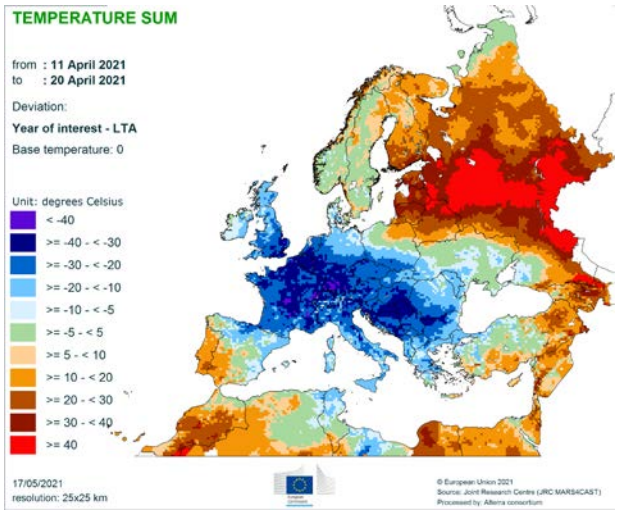
N/A = Data not available.

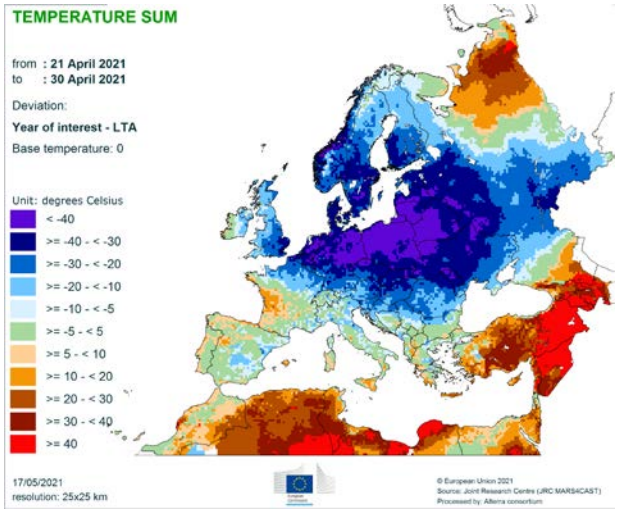
The column header '%21/5yrs' stands for the 2021 change with respect to the 5-year average(%). Similarly, '%21/20' stands for the 2021 change with respect to 2020(%).

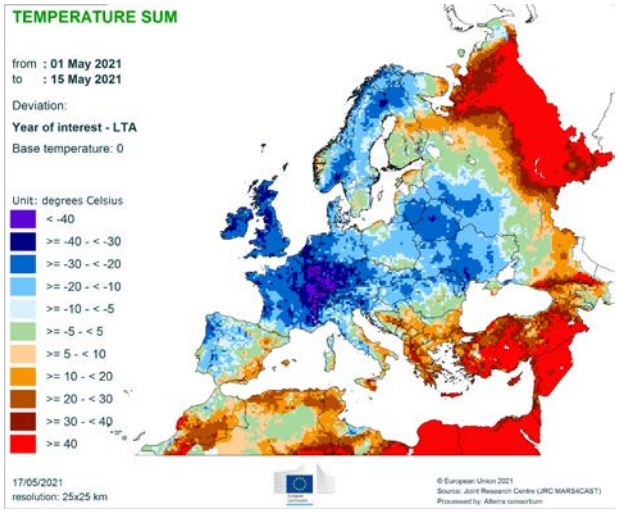
7. Atlas

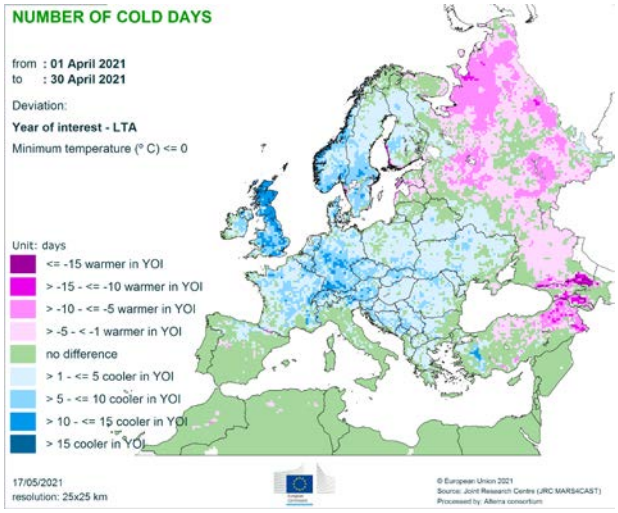
Temperature regime

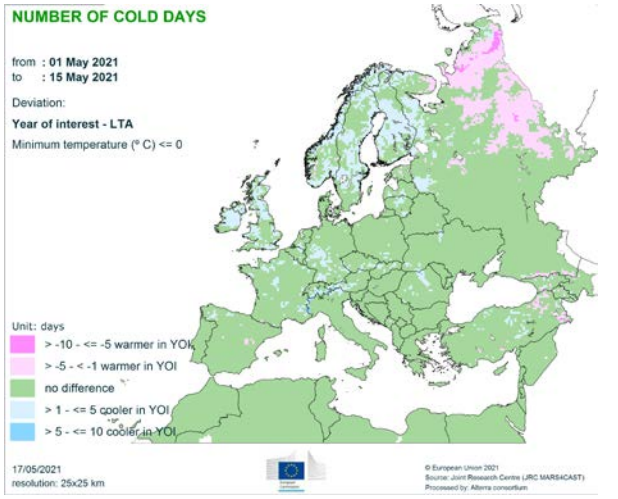


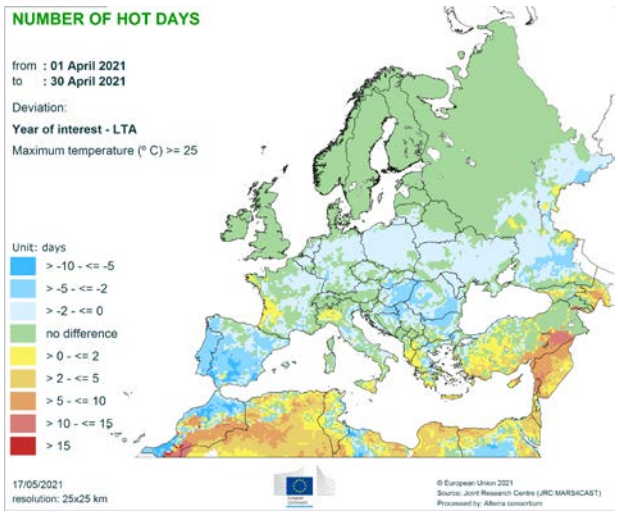


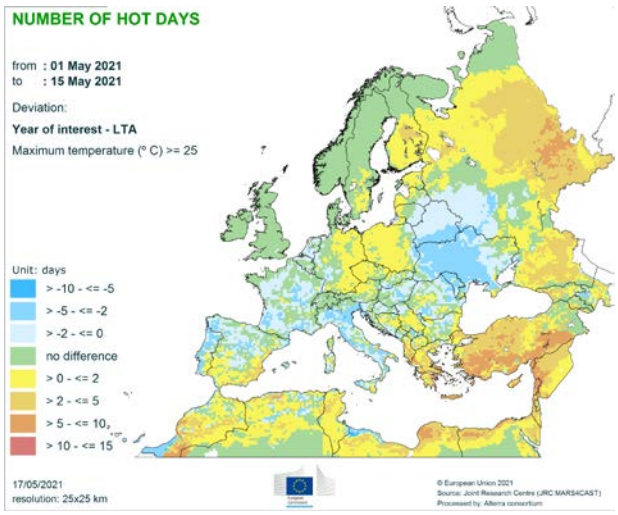




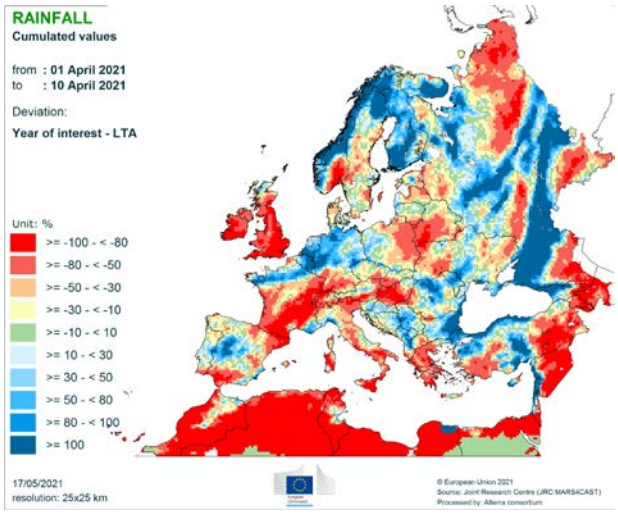


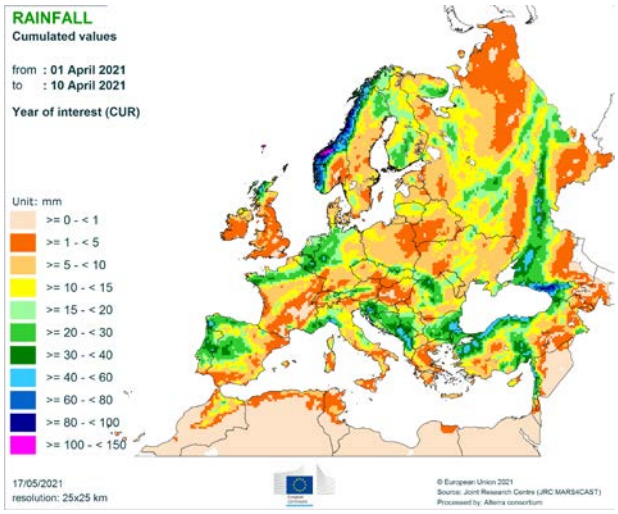


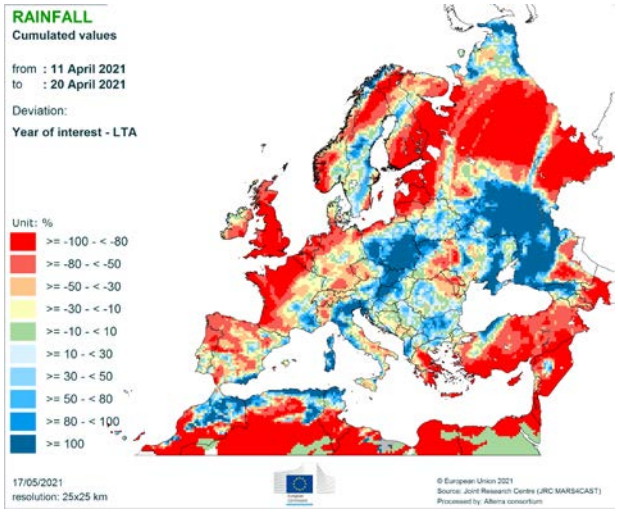


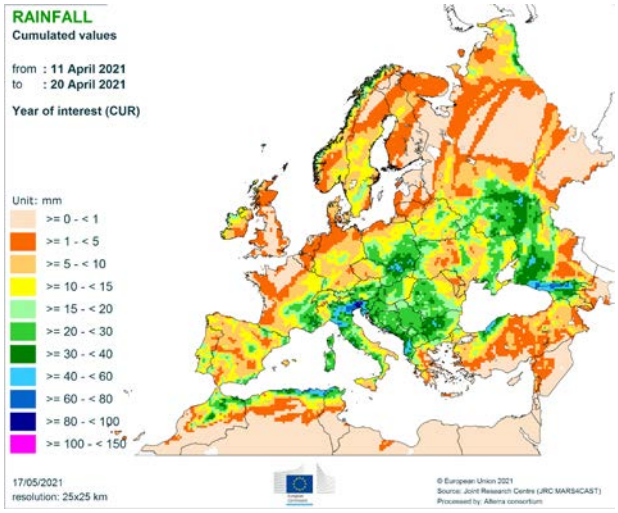


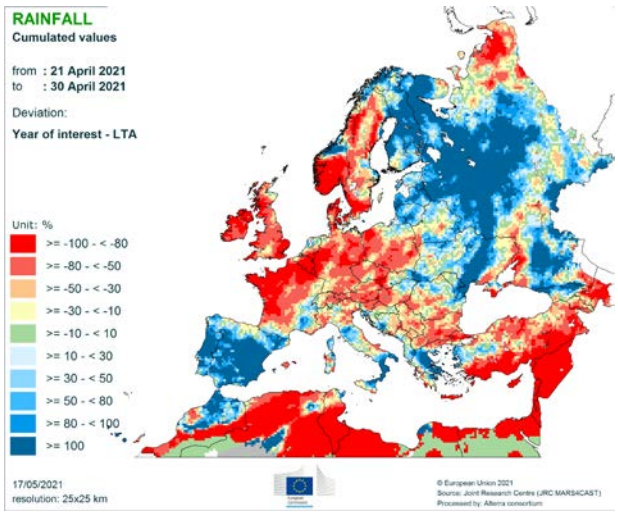
Precipitation

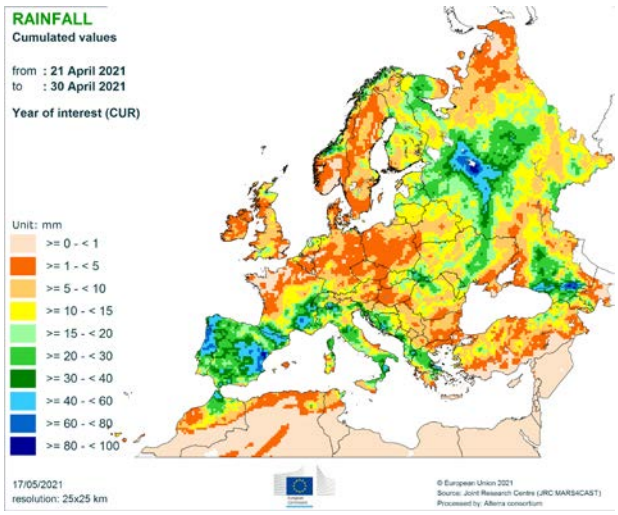


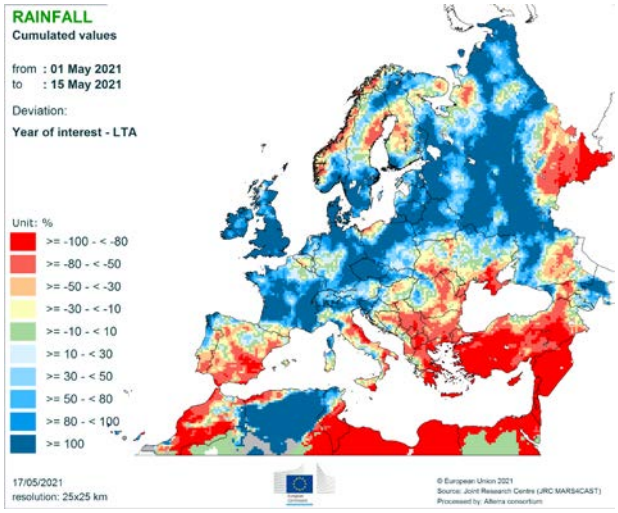


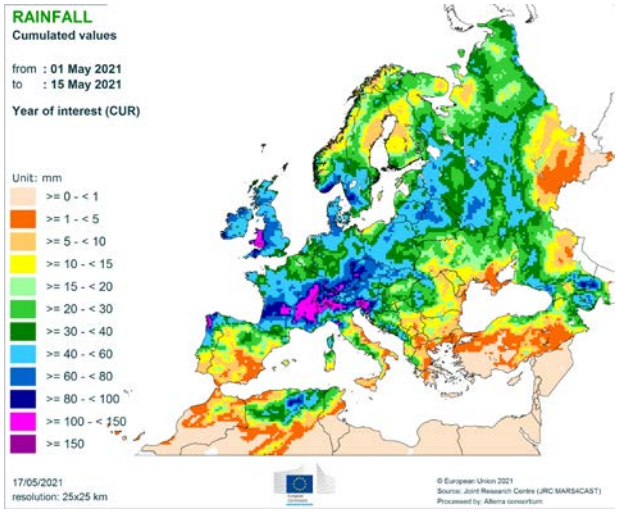





RAINFALL
Cumulated values
from : 21 April 2021
to : 30 April 2021
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
17/05/2021
resolution: 25x25 km
© European Union 2021
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 21 April 2021
to : 30 April 2021
Year of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
17/05/2021
resolution: 25x25 km
© European Union 2021
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 May 2021
to : 15 May 2021
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
17/05/2021
resolution: 25x25 km
© European Union 2021
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 May 2021
to : 15 May 2021
Year of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
17/05/2021
resolution: 25x25 km
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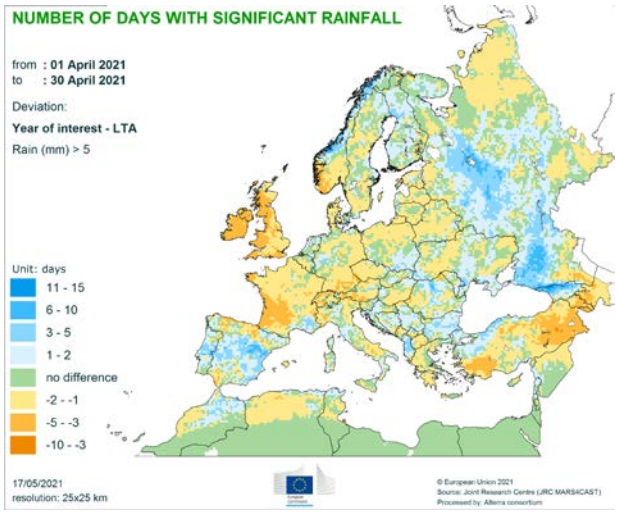
NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 April 2021
to : 30 April 2021
Deviation:
Year of interest - LTA
Rain (mm) > 5
Unit: days
11 - 15
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
-10 - -3
17/05/2021
resolution: 25x25 km
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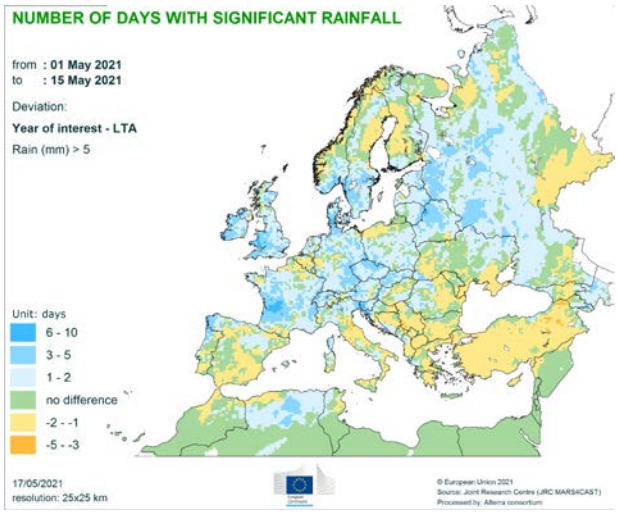
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 May 2021
to : 15 May 2021
Deviation:
Year of interest - LTA
Rain (mm) > 5
Unit: days
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
17/05/2021
resolution: 25x25 km
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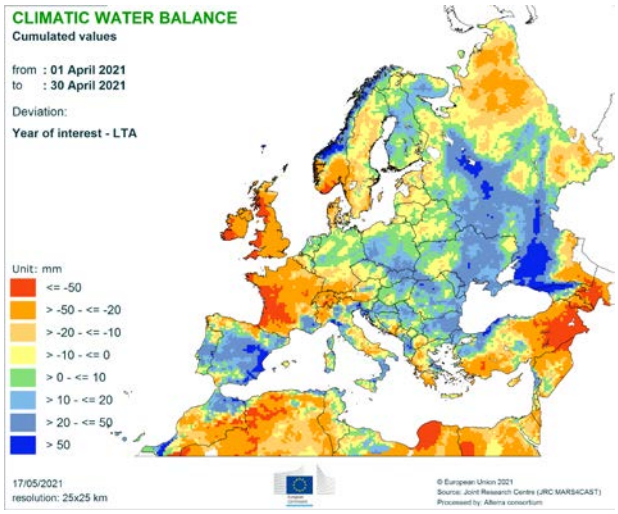
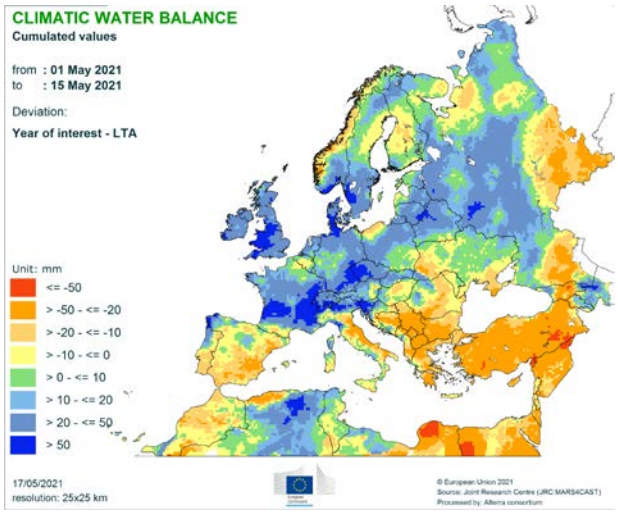
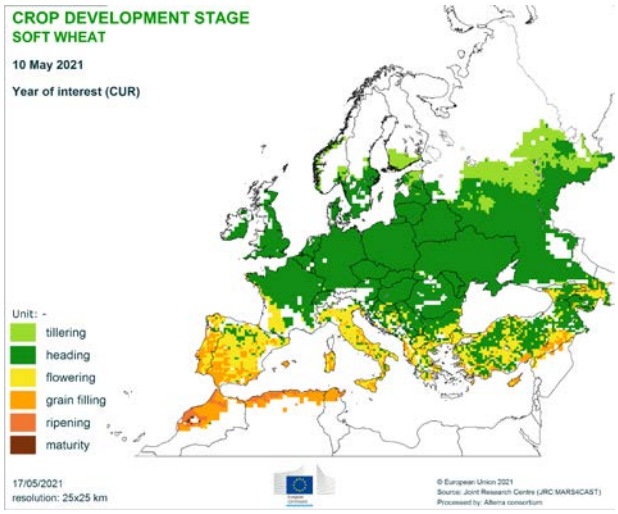
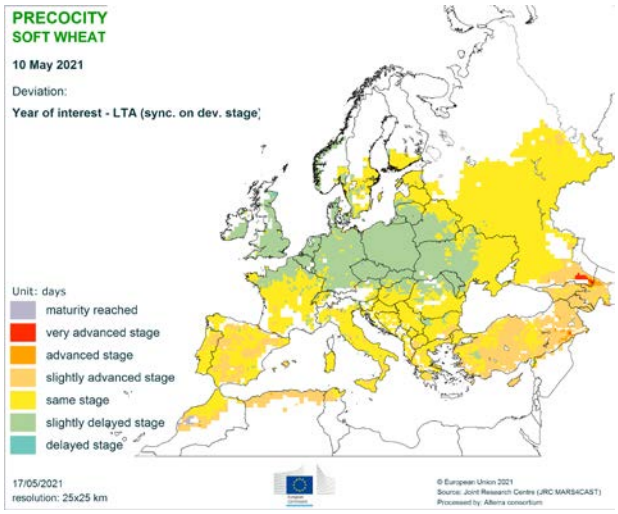
Climatic water balance

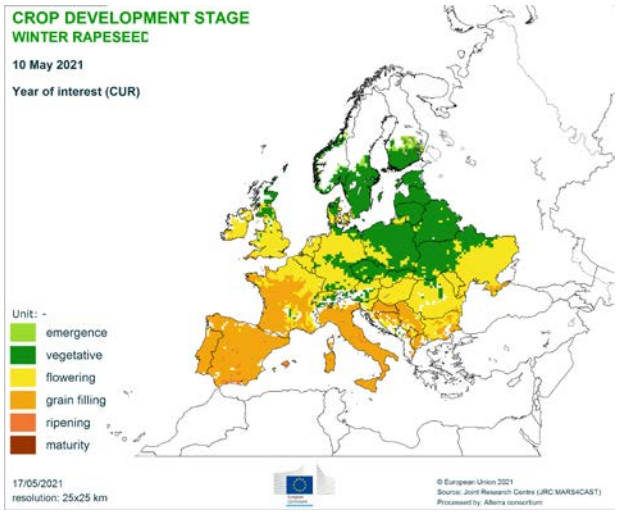


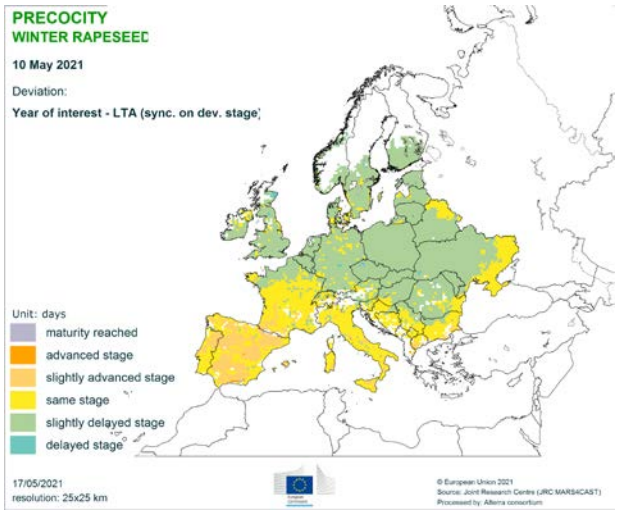


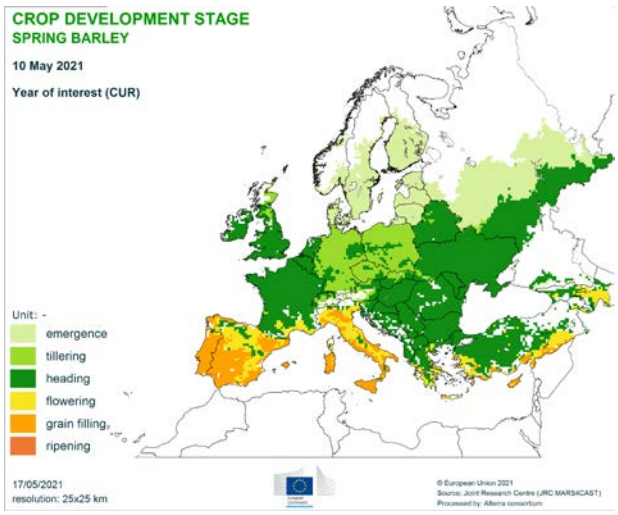
Crop development stages and precocity

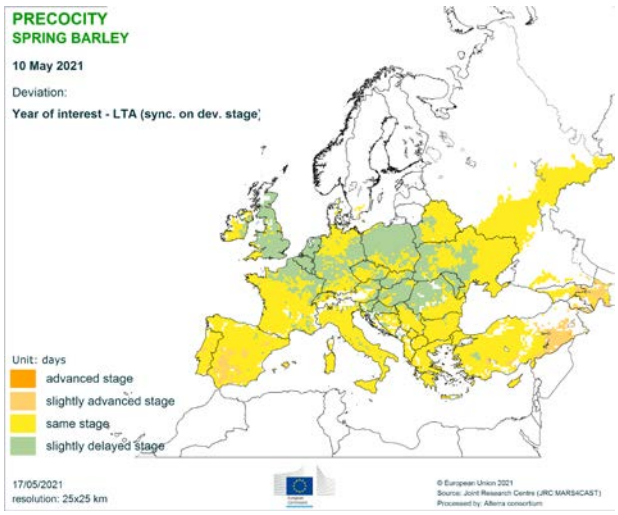




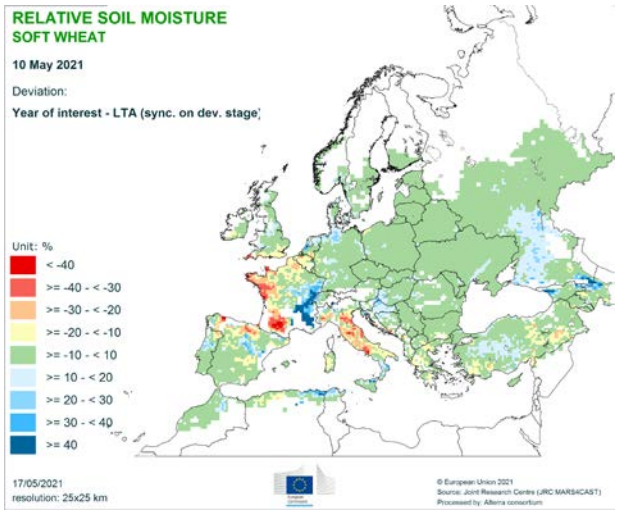


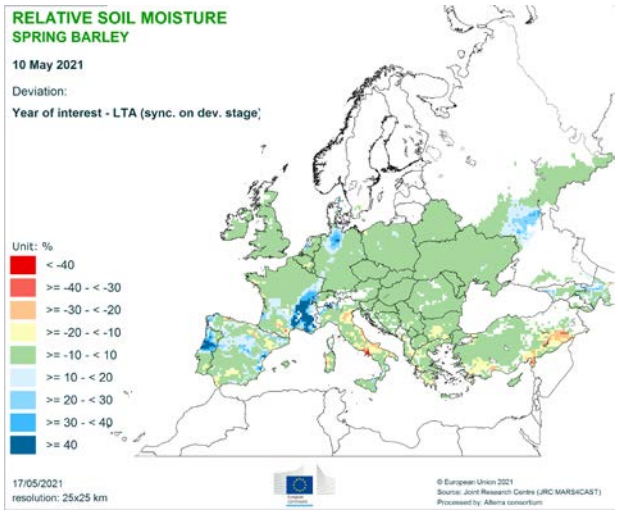




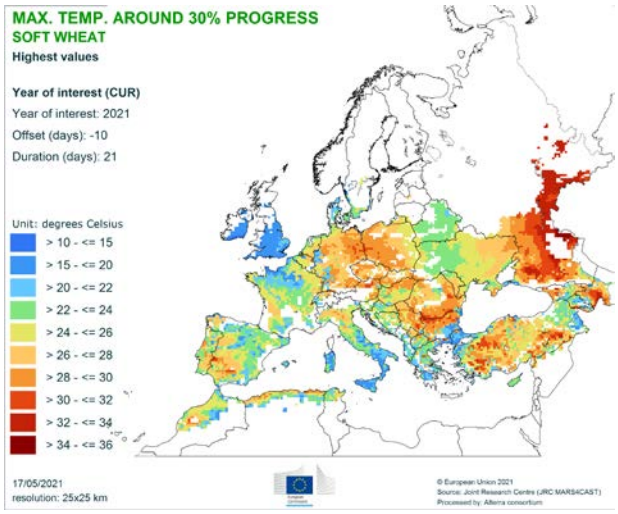


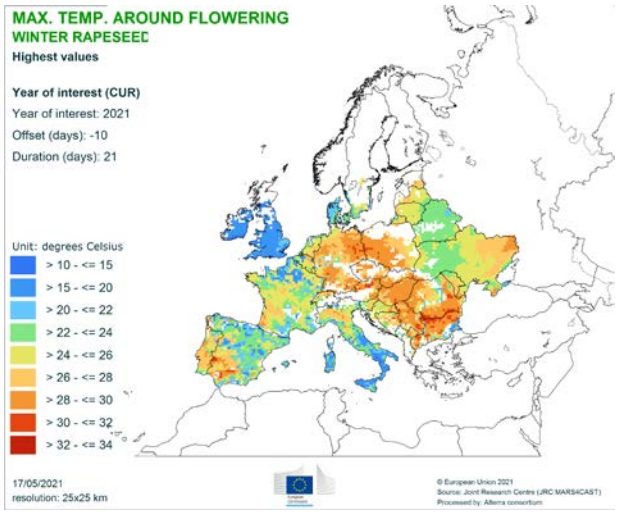
Relative soil moisture



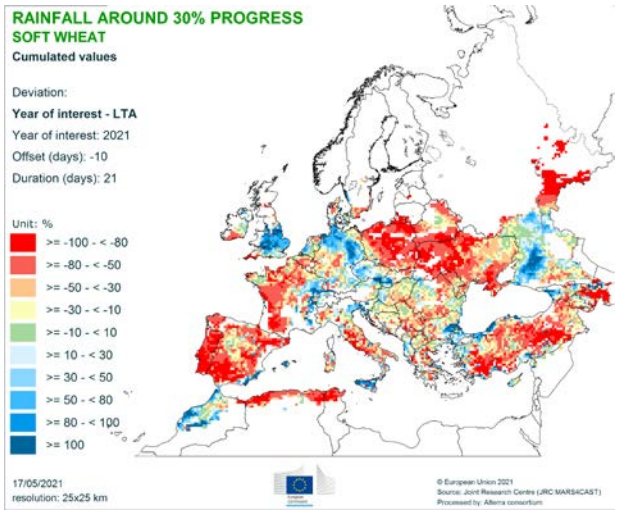


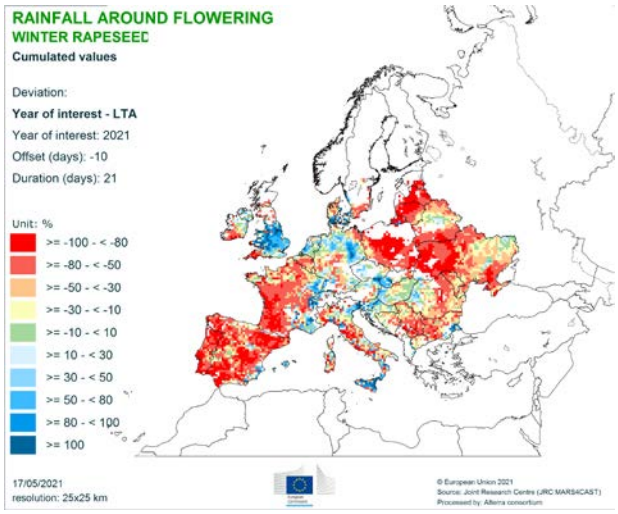
Maximum temperature around crop development





Precipitation around crop development





JRC MARS Bulletins 2021

Date	Publication	Reference
25 Jan	Agromet analysis	Vol. 29 No 1
22 Feb	Agromet analysis	Vol. 29 No 2
15 Mar	Agromet analysis, yield forecast	Vol. 29 No 3
26 Apr	Agromet analysis, remote sensing, pasture analysis, sowing conditions, yield forecast	Vol. 29 No 4
25 May	Agromet analysis, remote sensing, pasture analysis, sowing update, yield forecast	Vol. 29 No 5
21 Jun	Agromet analysis, remote sensing, pasture analysis, rice analysis, yield forecast	Vol. 29 No 6
26 Jul	Agromet analysis, remote sensing, pasture analysis, harvesting conditions, yield forecast	Vol. 29 No 7
23 Aug	Agromet analysis, remote sensing, pasture update, harvesting update, yield forecast	Vol. 29 No 8
20 Sep	Agromet analysis, remote sensing, pasture analysis, rice analysis, harvesting update, yield forecast,	Vol. 29 No 9
25 Oct	Agromet analysis, pasture update, sowing conditions, harvesting update, yield forecast	Vol. 29 No 10
22 Nov	Agromet analysis, sowing update, harvesting update	Vol. 29 No 11
13 Dec	Agromet analysis	Vol. 29 No 12

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Analysis and reports
B. Baruth, S. Bassu, W. Ben Aoun, I. Biavetti, A. Ceglar, I. Cerrani, Y. Chemin, M. Claverie, P. De Palma, D. Fumagalli, R. Lecerf, G. Manfron, L. Nisini, L. Panarello, G. Ronchetti, L. Seguini, A. Toreti, M. van den Berg, M. van der Velde, Z. Zajac, A. Zucchini

Reporting support
SeproTec, I. Biavetti, G. Mulhern

Edition
M. van den Berg, B. Baruth, S. Niemeyer, M. van der Velde

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MARS4CAST (JRC Unit D5), WENR (NL), MeteoGroup (NL), VITO (BE)

Contact
JRC D5/MARS4CAST
JRCMARSBULLETIN@ec.europa.eu

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The long-term average (LTA) used within this Bulletin as a reference is calculated on the basis of weather data from 1991-2020.

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