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MARS AGROMETEOROLOGICAL

Crop Monitoring in Europe

11th May to 10th June 2009

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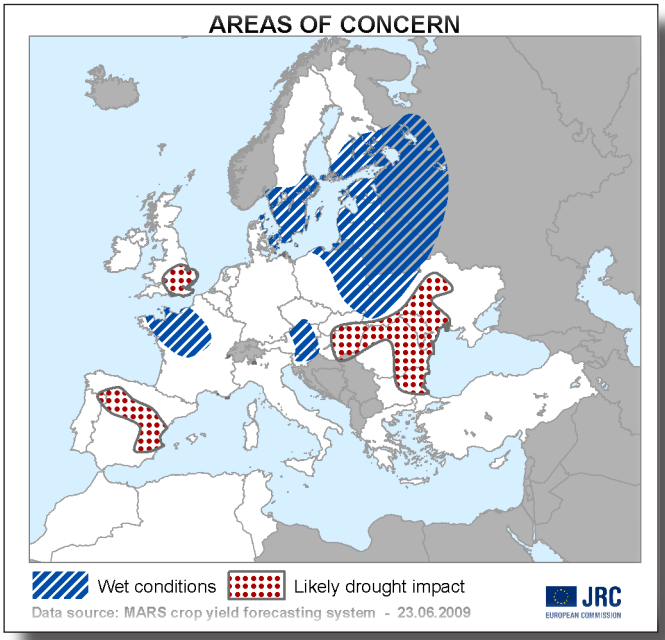
An average year for winter cereals — favourable conditions for France and Germany are compensated by reduced yield expectations for Spain



Early summer conditions in May with very high temperatures (particularly in southern EU) and scarce rain in the Mediterranean Basin, created stressing conditions with probable negative impacts on crop potentiality. There were more seasonal agrometeorological conditions in June and more favourable ones in northern latitudes, with a high level of solar radiation. Conditions for Spain and in Eastern Europe remain worrying due to the persistent rain shortage, affecting particularly the spring rainfed crops (spring barley).

The expected better performances of the northern countries compensated the limited potentiality of the southern areas and therefore overall at EU27 generally the yield potential was kept at a good level and comparable with the last 5-year average. However, many crops yield forecasts were downward revised in comparison to the previous Bulletin and there is still potential for further variations.

CROPS	EU27 yield forecast (t/ha) as of 23 June 2009				
	2008	2009	Average 5 years	% 2009/08	% 2009/ Average
TOTAL CEREALS	5.2	**4.9**	4.9	-5.8	+0.0
Soft wheat	6.0	**5.6**	5.6	-6.3	+0.2
Durum wheat	3.2	**3.1**	3.0	-5.1	+3.7
Total wheat	5.7	**5.3**	5.3	-6.3	+0.9
Spring barley	4.0	**3.6**	3.7	-9.5	-4.4
Winter barley	5.5	**5.3**	5.2	-3.3	+2.2
Total barley	4.5	**4.3**	4.3	-6.0	-0.9
Grain maize	7.1	**6.7**	6.7	-6.3	-0.6
Other cereals (1)	3.4	**3.2**	3.2	-6.2	-0.1
Rape seed	3.1	**3.0**	3.1	-2.1	-2.5
Sunflower	1.9	**1.7**	1.7	-9.2	-0.5
Potato	29.3	**30.0**	27.9	+2.4	+7.4
Sugar beet	66.0	**64.9**	61.8	-1.8	+5.0

Yields are forecasted for crops with more than 10000 ha per country; figures are rounded to 100 kg
(1) Sorghum, rye, maslin, oats, triticale, mixed grain other than maslin, millet, buckwheat
Sources:
2004-2008 data come from EUROSTAT CRONOS (last update: 10/06/2009) and EES (last update: 15/06/2009)
2009 yields come from MARS CROP YIELD FORECASTING SYSTEM (up to 10/06/2009)

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1. Crop yield forecasts

MARS crop yield forecasts at national level for EU27 as of 23 June 2009

Country	TOTAL WHEAT (t/ha)					SOFT WHEAT (t/ha)					DURUM WHEAT (t/ha)				
	2008	2009	Avg 5yrs	%09/08	%09/5yrs	2008	2009	Avg 5yrs	%09/08	%09/5yrs	2008	2009	Avg 5yrs	%09/08	%09/5yrs
EU27	5.7	**5.3**	5.3	-6.3	+0.9	6.0	**5.6**	5.6	-6.3	+0.2	3.2	**3.1**	3.0	-5.1	+3.7
AT	5.7	**5.3**	5.3	-6.7	+0.9	5.7	**5.4**	5.3	-6.3	+1.1	5.1	**4.4**	4.5	-14.1	-2.2
BE	8.4	**8.6**	8.4	+3.1	+3.2	8.4	**8.6**	8.4	+3.1	+3.2	-	**-**	-	-	-
BG	4.2	**3.2**	3.3	-22.0	-2.6	4.2	**3.2**	3.3	-22.0	-2.6	-	**-**	-	-	-
CZ	5.8	**4.8**	5.2	-16.8	-7.7	5.8	**4.8**	5.2	-16.8	-7.7	-	**-**	-	-	-
DE	8.1	**7.7**	7.6	-5.4	+0.9	8.1	**7.7**	7.6	-5.4	+0.9	-	**-**	-	-	-
DK	7.9	**7.3**	7.2	-7.1	+2.4	7.9	**7.3**	7.2	-7.1	+2.4	-	**-**	-	-	-
EE	3.2	**2.8**	2.9	-10.5	-3.2	3.2	**2.8**	2.9	-10.5	-3.2	-	**-**	-	-	-
ES	3.2	**3.0**	2.9	-6.4	+3.5	3.6	**3.3**	3.2	-7.9	+2.9	2.2	**2.3**	2.3	+5.5	-2.2
FI	3.6	**3.6**	3.6	+1.2	+0.4	3.6	**3.6**	3.6	+1.2	+0.4	-	**-**	-	-	-
FR	7.1	**7.2**	6.9	+0.8	+3.4	7.3	**7.4**	7.1	+0.8	+3.2	4.9	**5.0**	4.8	+1.6	+4.6
GR	3.0	**2.8**	2.4	-4.9	+19.5	3.0	**3.0**	2.8	-0.8	+7.5	2.9	**2.8**	2.2	-6.1	+22.5
HU	5.0	**4.0**	4.5	-19.4	-9.2	5.0	**4.0**	4.5	-19.5	-9.3	4.3	**4.0**	4.2	-7.1	-5.2
IE	9.1	**8.9**	9.0	-2.2	-2.0	9.1	**8.9**	9.0	-2.2	-2.0	-	**-**	-	-	-
IT	3.9	**3.5**	3.7	-9.0	-3.7	5.4	**5.0**	5.3	-6.3	-5.0	3.2	**2.9**	3.0	-9.8	-2.9
LT	4.3	**3.9**	3.7	-9.8	+5.2	4.3	**3.9**	3.7	-9.8	+5.2	-	**-**	-	-	-
LU	6.7	**6.4**	6.2	-4.6	+2.2	6.7	**6.4**	6.2	-4.6	+2.2	-	**-**	-	-	-
LV	3.9	**3.5**	3.4	-9.7	+3.8	3.9	**3.5**	3.4	-9.7	+3.8	-	**-**	-	-	-
NL	8.7	**8.5**	8.4	-2.3	+1.6	8.7	**8.5**	8.4	-2.3	+1.6	-	**-**	-	-	-
PL	4.1	**3.9**	3.9	-3.7	+0.6	4.1	**3.9**	3.9	-3.7	+0.6	-	**-**	-	-	-
PT	2.2	**1.6**	1.8	-24.7	-5.9	2.2	**1.6**	1.8	-24.7	-5.9	-	**-**	-	-	-
RO	3.4	**2.5**	2.8	-27.4	-12.6	3.4	**2.5**	2.8	-27.4	-12.6	-	**-**	-	-	-
SE	6.1	**6.0**	6.0	-2.4	-1.1	6.1	**6.0**	6.0	-2.4	-1.1	-	**-**	-	-	-
SI	4.5	**4.3**	4.4	-5.4	-3.1	4.5	**4.3**	4.4	-5.4	-3.1	-	**-**	-	-	-
SK	4.9	**3.7**	4.3	-23.3	-13.5	4.9	**3.7**	4.3	-23.3	-13.5	-	**-**	-	-	-
UK	8.3	**8.1**	7.9	-2.4	+2.6	8.3	**8.1**	7.9	-2.4	+2.6	-	**-**	-	-	-

Country	TOTAL BARLEY (t/ha)					GRAIN MAIZE (t/ha)					RAPE SEED (t/ha)				
	2008	2009	Avg 5yrs	%09/08	%09/5yrs	2008	2009	Avg 5yrs	%09/08	%09/5yrs	2008	2009	Avg 5yrs	%09/08	%09/5yrs
EU-27	4.5	**4.3**	4.3	-6.0	-0.9	7.1	**6.7**	6.7	-6.3	-0.6	3.1	**3.0**	3.1	-2.1	-2.5
AT	5.2	**4.3**	4.7	-17.4	-9.3	11.1	**10.1**	10.0	-8.3	+1.8	3.1	**2.8**	3.1	-9.1	-9.9
BE	7.7	**8.2**	7.7	+6.1	+6.6	10.4	**12.1**	11.3	+16.7	+7.0	-	**-**	-	-	-
BG	3.9	**3.2**	3.0	-19.5	+4.2	4.2	**4.0**	4.2	-3.7	-4.6	2.3	**2.1**	2.0	-6.0	+9.7
CZ	4.6	**3.7**	4.2	-19.4	-11.6	7.5	**7.5**	6.9	-0.4	+9.2	2.9	**2.8**	3.1	-6.3	-11.0
DE	6.1	**6.2**	6.0	+1.8	+3.6	9.8	**9.6**	9.1	-1.6	+5.8	3.8	**3.8**	3.8	+0.8	+0.8
DK	4.7	**5.0**	5.0	+7.4	+0.8	-	**-**	-	-	-	3.7	**3.8**	3.5	+1.9	+8.4
EE	2.6	**2.3**	2.4	-10.7	-6.6	-	**-**	-	-	-	1.4	**1.6**	1.5	+11.1	+2.2
ES	3.3	**2.5**	2.8	-22.5	-11.5	9.9	**10.0**	9.9	+0.4	+0.5	2.0	**1.5**	1.6	-26.2	-9.9
FI	3.5	**3.4**	3.4	-2.9	-1.8	-	**-**	-	-	-	1.3	**1.3**	1.2	+0.0	+6.6
FR	6.8	**6.5**	6.4	-3.9	+2.6	9.1	**9.3**	8.9	+2.2	+4.8	3.3	**3.5**	3.3	+4.1	+5.4
GR	2.5	**2.5**	2.5	-1.3	+1.6	10.3	**9.7**	9.5	-6.1	+2.0	-	**-**	-	-	-
HU	4.4	**3.0**	3.9	-31.9	-21.5	7.5	**5.5**	6.5	-26.2	-15.3	2.6	**2.3**	2.5	-12.4	-6.6
IE	6.9	**6.8**	6.8	-1.3	+0.4	-	**-**	-	-	-	-	**-**	-	-	-
IT	3.8	**3.6**	3.8	-5.2	-4.3	9.6	**9.3**	9.3	-2.5	+0.2	2.3	**1.9**	1.9	-15.2	+1.5
LT	2.9	**2.7**	2.6	-8.3	+1.7	-	**-**	-	-	-	2.0	**1.8**	1.8	-13.2	+0.4
LV	2.2	**2.2**	2.3	-2.4	-3.0	-	**-**	-	-	-	2.4	**2.1**	2.0	-13.1	+5.2
NL	6.1	**6.2**	5.9	+2.2	+4.2	11.4	**12.1**	11.3	+6.5	+7.5	-	**-**	-	-	-
PL	3.0	**3.1**	3.1	+3.6	-0.2	5.8	**5.6**	5.6	-4.0	-0.3	2.7	**2.7**	2.7	-1.9	-2.4
PT	2.4	**1.7**	1.8	-31.5	-9.2	5.8	**5.5**	5.4	-5.5	+2.1	-	**-**	-	-	-
RO	3.0	**2.2**	2.5	-27.1	-10.4	3.2	**3.0**	3.4	-6.5	-10.3	1.8	**1.4**	1.6	-20.2	-10.2
SE	4.2	**4.2**	4.2	+0.4	+0.5	-	**-**	-	-	-	2.9	**2.8**	2.6	-3.1	+7.9
SI	4.0	**3.7**	3.8	-6.1	-2.1	7.3	**7.7**	7.6	+4.8	+1.3	-	**-**	-	-	-
SK	4.4	**2.9**	3.7	-34.3	-23.2	7.4	**5.9**	6.0	-20.7	-0.9	2.6	**2.2**	2.4	-14.0	-5.0
UK	6.0	**6.1**	5.9	+2.4	+3.9	-	**-**	-	-	-	3.3	**3.2**	3.2	-4.0	+0.0

Note: Yields are forecasted for crops with more than 10000 ha per country; figures are rounded to 100 kg
Sources: 2004-2008 data come from EUROSTAT CRONOS (last update: 10/06/2009) and EES (last update: 15/06/2009)
2009 yields come from MARS CROP YIELD FORECASTING SYSTEM (up to 10/06/2009)

MARS crop yield forecasts at national level for EU27 as of 23 June 2009

Country	SUNFLOWER (t/ha)					SUGAR BEET (t/ha)					POTATO (t/ha)				
	2008	2009	Avg 5yrs	%09/08	%09/5yrs	2008	2009	Avg 5yrs	%09/08	%09/5yrs	2008	2009	Avg 5yrs	%09/08	%09/5yrs
EU27	1.9	**1.7**	1.7	-9.2	-0.5	66.0	**64.9**	61.8	-1.8	+5.0	29.3	**30.0**	27.9	+2.4	+7.4
AT	3.0	**2.6**	2.6	-12.4	-0.1	71.8	**63.6**	66.7	-11.4	-4.6	33.2	**30.5**	31.7	-8.3	-4.0
BE	-	**-**	-	-	-	68.8	**73.3**	69.5	+6.5	+5.5	44.1	**47.3**	44.2	+7.3	+7.1
BG	1.6	**1.6**	1.5	-1.0	+8.8	-	**-**	-	-	-	17.5	**16.1**	16.2	-7.9	-0.5
CZ	2.5	**2.4**	2.3	-3.7	+6.5	57.3	**55.9**	53.1	-2.4	+5.2	25.8	**25.0**	25.3	-3.1	-1.1
DE	2.0	**2.1**	2.2	+8.8	-5.1	61.9	**63.1**	60.8	+1.9	+3.8	43.8	**42.3**	41.8	-3.3	+1.3
DK	-	**-**	-	-	-	55.4	**55.8**	57.0	+0.8	-2.2	35.0	**39.1**	37.8	+11.7	+3.5
ES	1.1	**1.0**	1.0	-9.8	-1.1	76.3	**70.9**	71.5	-7.1	-0.8	27.8	**27.9**	27.6	+0.4	+1.2
FI	-	**-**	-	-	-	34.4	**37.4**	37.7	+8.8	-0.8	25.8	**25.2**	23.7	-2.6	+6.1
FR	2.6	**2.5**	2.4	-3.0	+3.3	86.5	**85.9**	82.4	-0.7	+4.2	43.2	**44.5**	43.3	+3.0	+2.9
GR	-	**-**	-	-	-	65.4	**63.1**	63.8	-3.6	-1.2	25.3	**21.1**	24.4	-16.9	-13.7
HU	2.7	**2.3**	2.3	-16.1	-1.9	59.2	**50.8**	52.4	-14.3	-3.2	25.7	**23.1**	24.9	-10.2	-7.2
IE	-	**-**	-	-	-	-	**-**	-	-	-	31.1	**33.6**	34.9	+8.1	-3.7
IT	2.2	**2.2**	2.2	+0.6	+0.2	62.3	**55.6**	54.0	-10.8	+2.9	25.6	**25.1**	25.2	-2.1	-0.6
LT	-	**-**	-	-	-	39.0	**38.9**	40.4	-0.3	-3.8	14.8	**11.0**	11.7	-25.4	-5.9
LV	-	**-**	-	-	-	-	**-**	-	-	-	17.8	**14.8**	14.6	-17.0	+1.1
NL	-	**-**	-	-	-	72.2	**71.4**	67.0	-1.2	+6.6	46.0	**45.7**	43.8	-0.8	+4.2
PL	-	**-**	-	-	-	46.5	**45.9**	45.2	-1.2	+1.6	19.8	**18.7**	18.7	-5.4	-0.1
PT	-	**-**	-	-	-	-	**-**	-	-	-	14.8	**14.9**	15.0	+1.0	-0.4
RO	1.4	**1.1**	1.3	-19.8	-13.0	38.3	**28.1**	30.9	-26.8	-9.2	14.3	**14.1**	14.3	-1.4	-1.6
SE	-	**-**	-	-	-	53.7	**52.8**	50.4	-1.7	+4.7	31.6	**29.1**	29.8	-7.8	-2.2
SK	2.6	**2.1**	2.2	-17.3	-3.2	61.1	**51.7**	50.6	-15.3	+2.2	17.2	**16.9**	15.7	-1.7	+7.7
UK	-	**-**	2.0	-	-	62.5	**60.8**	58.3	-2.8	+4.3	42.7	**42.4**	41.7	-0.8	+1.8

Note: Yields are forecasted for crops with more than 10000 ha per country; figures are rounded to 100 kg
Sources: 2004-2008 data come from EUROSTAT CRONOS (last update: 10/06/2009) and EES (last update: 15/06/2009)
2009 yields come from MARS CROP YIELD FORECASTING SYSTEM (up to 10/06/2009)

MARS crop yield forecasts at national level for Black Sea and Maghreb as of 23 June 2009

Country	WHEAT (t/ha)					BARLEY (t/ha)					GRAIN MAIZE (t/ha)				
	2008	2009	Avg 5yrs	%09/08	%09/5yrs	2008	2009	Avg 5yrs	%09/08	%09/5yrs	2008	2009	Avg 5yrs	%09/08	%09/5yrs
DZ	-	**1.6**	1.4	-	+11.4	-	**1.7**	1.5	-	+16.1	-	**-**	4.4	-	-
MA	-	**2.1**	1.4	-	+51.7	-	**1.4**	0.8	-	+74.3	-	**1.1**	0.9	-	+24.6
TN	-	**1.9**	1.6	-	+18.6	-	**1.1**	0.9	-	+18.4	-	**-**	-	-	-
TR	-	**2.2**	2.3	-	-1.2	2.5	**2.5**	2.5	-0.7	+1.8	7.5	**7.0**	6.8	-7.3	+2.5
UA	-	**2.2**	2.7	-	-17.0	-	**1.7**	2.0	-	-16.6	-	**4.1**	3.8	-	+6.6

Country	RAPE SEED (t/ha)					SUNFLOWER (t/ha)				
	2008	2009	Avg 5yrs	%09/08	%09/5yrs	2008	2009	Avg 5yrs	%09/08	%09/5yrs
UA	-	**1.1**	1.4	-	-17.3	-	**1.0**	0.9	-	+2.4

Note: Yields are forecasted for crops with more than 10000 ha per country; figures are rounded to 100 kg
Sources: TR: 2004-2008 data come from EUROSTAT CRONOS (last update: 10/06/2009) and EES (last update: 15/06/2009)
DZ, MA, TN, UA: FAO statistical database - 2008 data not yet available, therefore the 5-yrs average is computed on 2004-2007
2009 yields come from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/06/2009)

Abstract

The 3rd 2009 printed MARS Bulletin (Vol. 17, No. 3) covers meteorological analysis and crop yield forecasts for the period 11 May to 10 June 2009.

Previous related analysis available:

—Climatic update, 20/05/2009 to 07/06/2009, (CU2009/5)

—Complete Bulletin, 01/03/2009 to 10/05/2009, (Vol. 17, No. 2)

Next printed issue

Vol. 17, No. 4: 11 June - 30 June 2009 analysis and forecasts.

Contributions

The ***MARS technical report*** is an EC publication from JRC/IPSC MARS Unit-AGRI4CAST Action

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MARS stands for Monitoring Agricultural Resources.

Technical note

The long-term average used within this bulletin as a reference is based on an archive of data covering 1975–2008.

The CNDVI is an unmixed normalised vegetation index on the base of Corine land cover 2000 for arable land or grassland.

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2. Agrometeorological overview

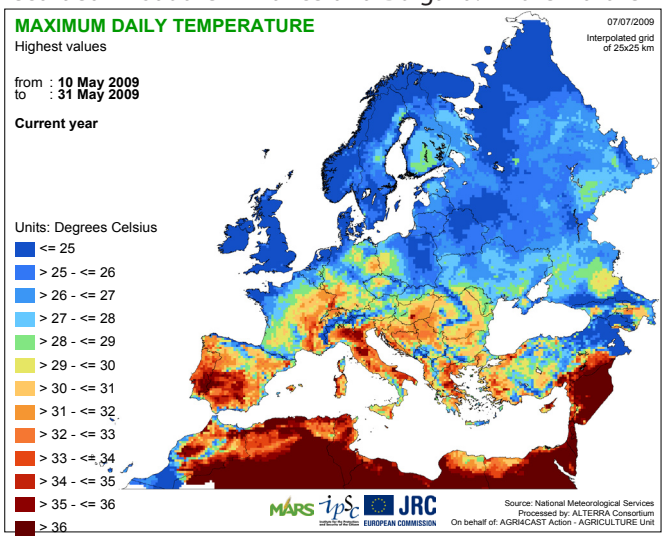
2.1. Temperature and evapotranspiration

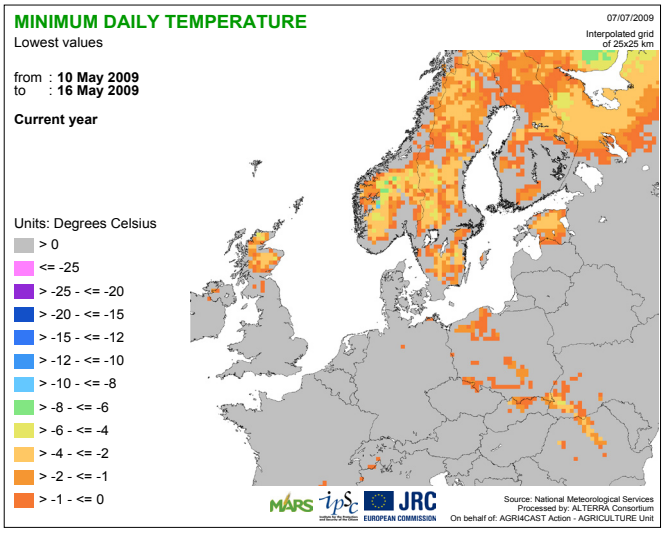
In the Mediterranean area, the anomalous high temperatures started at the beginning of May, and persisted during the whole month. More seasonal temperatures occurred in June, but were slightly cooler than normal at high latitudes.

The African hot air flow which started at the beginning of **May**, determined anomalous high temperatures in Morocco and the Iberian Peninsula, and persisted during the second half of May, influencing the whole Mediterranean basin. The maximum daily temperatures in these areas, particularly during the second and last dekad, reached extreme values: **36–37 °C** in Italy (the Po valley, central and southern Italy), southern France (the Rhone valley), Spain (Andalusia, Extremadura) and Portugal (Alentejo). Moreover, in Germany, Hungary, Romania and Greece, anomalous high temperatures (34 °C) occurred. These temperatures probably created stressing conditions for the active crops, particularly those already in the reproductive stages (winter cereals) accelerating crop development. Those thermal conditions therefore determined a general surplus of the cumulated active temperatures in all the Mediterranean countries and in particular (+ 100°/150° GDD) in Italy, east and southern Spain and Greece. Higher-than-normal values were also recorded in southern France and Bulgaria. In the northern latitudes, during the second dekad of May, the African hot air flow was compensated by one coming from the north and a sudden but temporary frost event occurred: – 1 °C in central and southern Poland and – 2/–3 °C in southern Sweden.

In **June**, the synoptic circulation pattern changed, with a north-coming flow, and in the EU more seasonal temperatures returned, with a drop in maximum temperatures of around 8–10 °C. However, the warm front moved eastward and above-average temperatures were recorded in the Black Sea basin and Russia. Between 5 and 9 June, the north-coming flux produced a very late frost event affecting southern Sweden (– 3 °C), Finland, western Germany and the northern Czech Republic (– 1.5 °C) very locally. However, the sizes of the affected areas are negligible in a national context.

Evapotranspiration was strongly influenced by the high temperatures, and cumulated values presented very large differences (>+ 30 %) as compared with the long-term average: mainly in Iberia, Italy, southern France, Bulgaria, eastern Romania, Hungary and Turkey. Moreover, higher-than-average values were estimated too in Benelux, the eastern UK, western Ireland and northern Germany, but mainly because of the high level of solar radiation.





2.2. Rainfall and climatic water balance

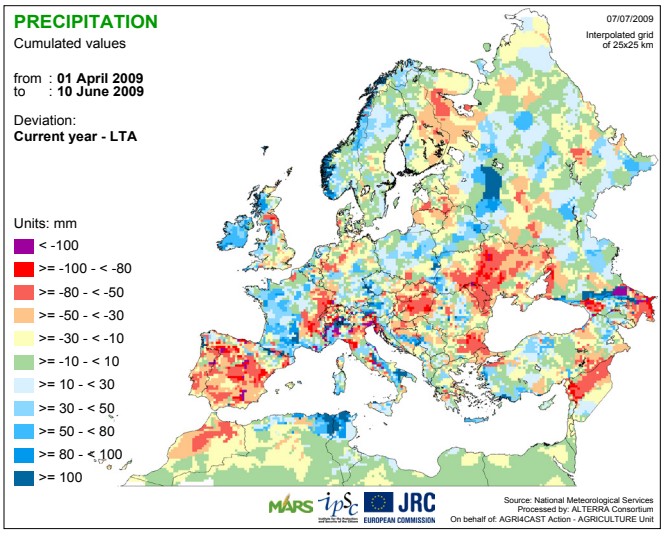
In May: anticipated summer rain spatial distribution; scarce rain in the Mediterranean basin and more abundant in the higher latitudes; persisting rain shortage in central-western Spain, Bulgaria and the northern Black Sea basin.

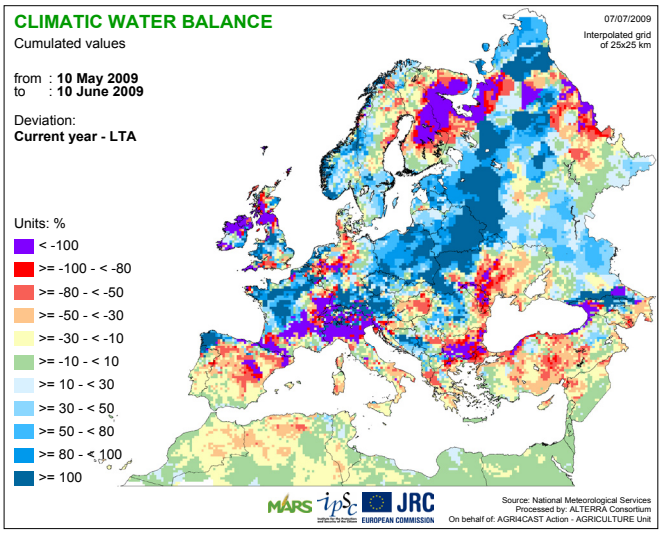
The unseasonal agrometeorological conditions also involved the spatial distribution and quantity of rain. **From mid-May**, the anticipated summer temperatures recorded were determined by typical summer synoptic circulation patterns: high pressure in the Mediterranean basin which pushed the rain front towards the higher latitudes. Rainfall was therefore also strongly influenced by those conditions: the rain was scarce or absent in southern and eastern Spain (Andalucia, Valencia, Murcia, Cataluña and Aragon which had a significant deficit compared with the seasonal average), north and southern Italy (the Po valley, where the largest deficit occurred: around 100 mm less than the long-term average; Sicily, Sardinia), southern Greece (Peloponnese), southern Bulgaria and between Moldova and southern Ukraine.

Due to the particular and persistent barometric configuration even **in June**, the rain was more abundant than normal in north-west France, the Baltic Sea basin, the north-east EU, Belarus and western Ukraine, but limited in other areas.

In particular, in the **Po valley**, **France**, **Hungary**, **Bulgaria**,

Ukraine and **Moldova**, the limited water supplies in combination with higher-than-normal evapotranspiration values determined large climatic water balance deficits which limited the potentiality both of the winter crops, in the last part of the reproductive stages, and the summer crops, demanding (where infrastructure was available) out-of-the-ordinary irrigation interventions. In these areas, the water shortage assumed particular relevance considering the cumulated deficits since the beginning of April.





3. Campaign analysis at country level

E U - 27

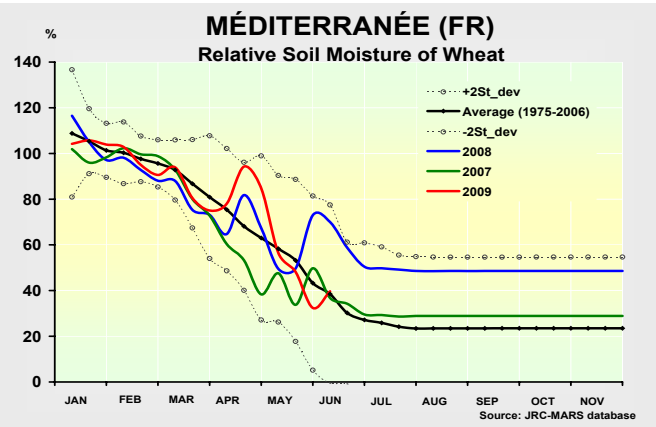
France: seasonal course in the north, slightly drier and warmer in the south

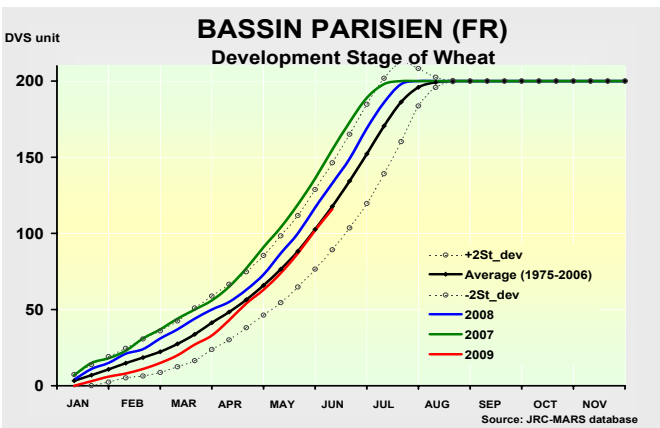
Conditions were still quite favourable, allowing for good yield potentiality to be maintained. Soft wheat is forecasted at 7.4 t/ha: higher than the five-year average (+ 3.2 %) and also than last year (+ 0.8 %). The durum wheat yield is progressing slightly, with 5.0 t/ha (+ 1.6 % on 2008, + 4.6 % on the five-year average). The winter barley yield is foreseen at 6.7t/ha (– 1.9 % on 2008). The rapeseed yield is at 3.5 t/ha higher both than the average (+ 5.4 %) and on 2008 (+ 4.1 %). Sugar beet is at 85.9 t/ha (– 0.7 % compared to 2008, but + 4.2 % on the five-year average). Grain maize is at 9.3 t/ha (+ 2.2 % as compared to 2008). Potato is at 44.5 t/ha (+ 3.0 % on 2008).

In general, the agrometeorological course was quite favourable, and no particular events created stressing conditions or determined anomalous crop development.

In the north, within the period under consideration, both thermal and rain values remained very close to the seasonal average. This permitted a normal development for winter and spring crops. The limited delay simulated at the beginning of the season for the winter crops was recovered and the biomass accumulation appeared adequate. As a whole, the cumulated active temperatures presented a small departure from the long-term average only from the end of May, when a sudden and temporary increase of the temperatures occurred. The rains were mainly grouped in two events: mid-May and mid-June, and provided adequate water supply. Therefore, generally, the winter crop yields are forecasted higher than the five-year average. These conditions were also favourable for potato and sugar beet which started their cycle with good potentiality.

In the south, the rain was quantitatively reduced, but



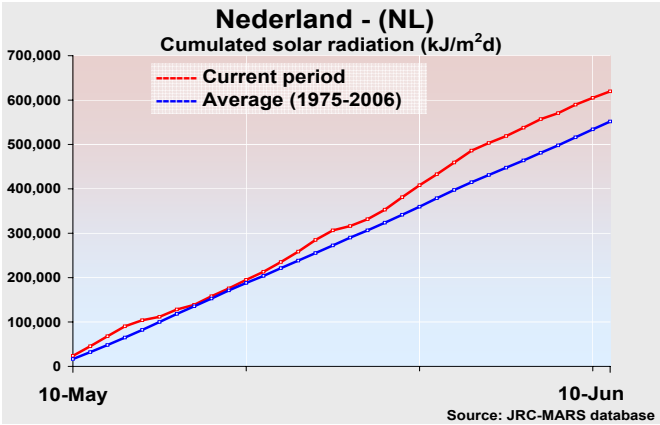


anyhow cumulated with the rain recorded in the first part of May, allowing for an adequate water supply. Even in the Rhone valley in June, the rain was within the normal range of variability. However, this is the only area where the effect of the soil water deficit occurring in the previous months remained evident in the simulation for winter crops.

Belgium, the Netherlands, Luxembourg: favourable climatic conditions continue characterising a good campaign

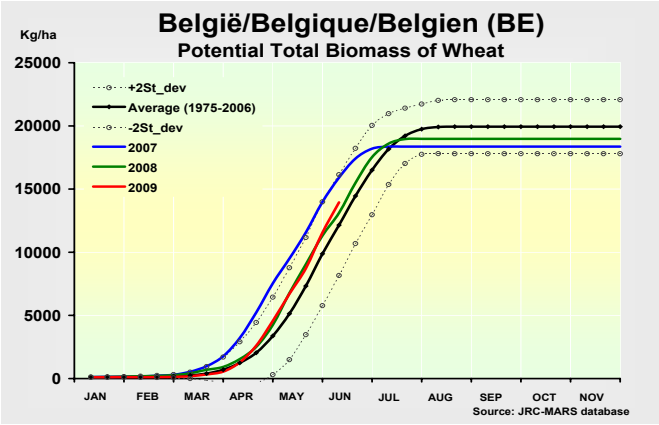
Soft wheat is at 8.6 t/ha, + 3.1 % compared to 2008 in Belgium, 8.5 t/ha, – 2.3 % compared to 2008 in the Netherlands and 6.4 t/ha in Luxembourg. Winter barley in Belgium is forecasting a yield of 8.4 t/ha (+ 4.9 % on 2008 and + 4 % on the average). Sugar beet in Belgium is 73.3 t/ha and in the Netherlands 71.4 t/ha. Spring barley in the Netherlands is forecasted at 6.2 t/ha in line with last year. Grain maize is expected to be 12.1 t/ha in both Belgium and the Netherlands, 7 % more than the five-year average in Belgium.

In the three countries, average to warmer temperatures, as compared to the long-term average, were recorded during the period 10 May to 10 June even though there was a drop in the first days of June with abundant rainfall events in the Netherlands.



The cumulated rain was on average with the seasonal values but precipitations were concentrated in a few days, which led to a higher evapotranspiration due to the high level of radiation.

The development stage of grain maize and spring barley is on the average, while for sugar beet it is advanced compared to the long-term average. The potential leaf area index of winter crops is simulated strongly above the average due to high solar radiation. The development stage of sugar beet is advanced compared to the average and with a good potential leaf area index. Yield expectations are normal to good.



Germany: good crop potential due to favourable conditions

In Germany, the forecasts for yields have been generally revised upward: 7.7 t/ha for soft wheat now in line with the five-year average, 6.6 t/ha for winter barley (+ 2.5 % on the five-year average and the same level as 2008), 4.8 t/ha for spring barley (average level), 3.8 t/ha for rapeseed (equivalent to the five-year average) and 9.6 t/ha for grain maize (– 2 % compared to last year, + 6 % on the five-year average). The forecasted yield for sunflower is set to 2.1 t/ha, (+ 8 % compared to last year) and potato is forecasted at 42.3 t/ha for potato.

May was characterised by warmer-than-usual temperatures (2–4 °C above the long-term average of temperature), and absolute values as high as 34 °C were reached in the Rhine Valley on one day (25 May), but no particular heat stress occurred affecting large areas. The cumulated temperature for the month of May shows a surplus of above 20 % in the southern part of the country and values in line with the long-term average for the north-eastern part. Temperature fluctuations between minimum and maximum were quite large, with some frost events occurring locally at the end of May. April being the warmest month in our time series, May brought more seasonal temperatures, but it was still the 13th warmest month in our database. With the beginning of June, a different temperature regime with unusually low temperatures started; cumulated temperatures are in general below the average, balancing out the surplus recorded in May.

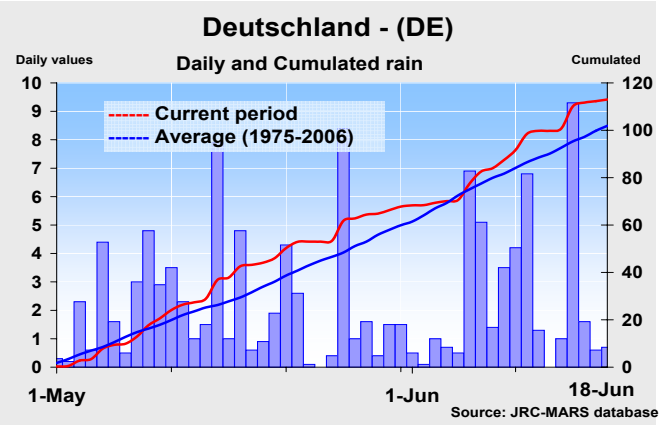
After the dry spell in April (which was less pronounced than in 2008 for Niedersachsen and most of Mecklenburg-Vorpommern and Brandenburg), the country experienced beneficial rainfalls throughout May and June covering the country bit by bit and replenishing soil moisture. Consequently, the dry period in April will have impacted crop potential only on the light soils.

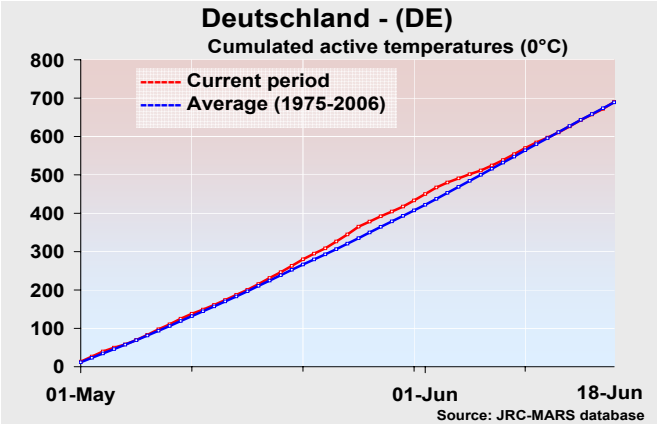
Southern Germany received between 150 and 200 mm of rainfall in the period observed. The remaining part of the country received between 80 and 150 mm, with the exception of Detmold which experienced a rather dry period (around – 40 % compared to the long-term average). Currently, only Mecklenburg-Vorpommern still shows a slight deficit in cumulated rain since the beginning of the growing period (– 6 %).

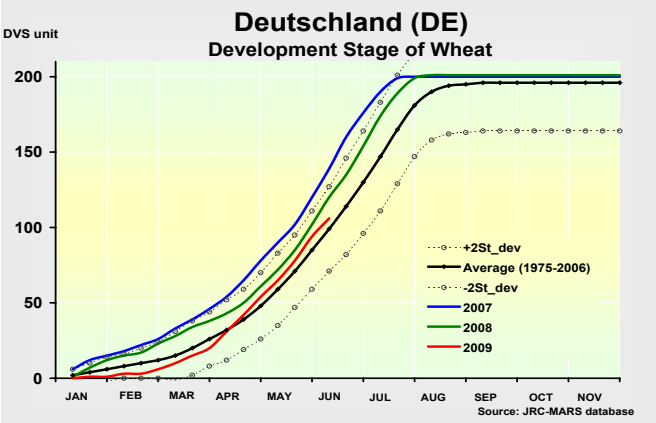
The winter cereals caught up with their delayed development throughout April and now show a constant development close to the long-term average. Their development ranged

from grain filling in the south to flowering in the north. Thanks to the normal temperatures, grain filling should take place in beneficial conditions. Winter rapeseed is between grain filling and ripening and should have benefited from the precipitation in May that replenished the soil moisture to be favourable for the grain filling. The crop cycle is slightly advanced, as in 2008, but less as compared to 2007, and now shows some slowdown.

The spring and summer crops so far could benefit from a good soil moisture (with the exception of north and north-east Germany) and show an optimal development.





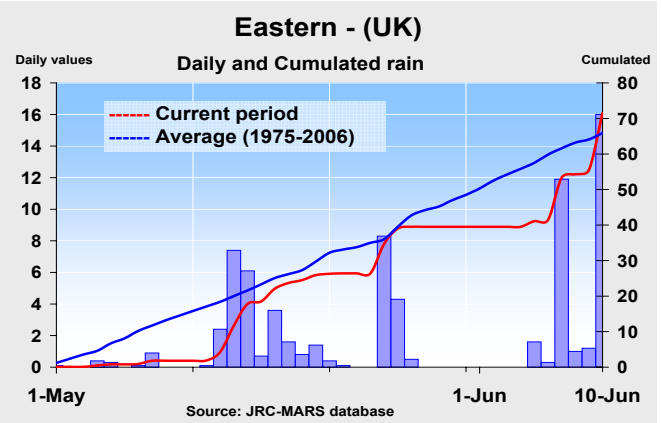


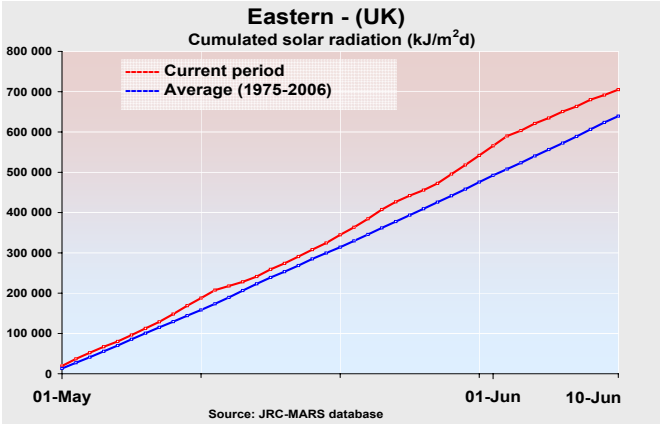
UK and Republic of Ireland: favourable conditions

The yield forecasts in the UK are generally revised upward slightly: 8.1 t/ha for soft wheat (+ 2.6 % compared to the previous five-year average), 7.0 t/ha for winter barley (+ 6.8 %), 3.2 t/ha for rapeseed (equivalent to the previous five-year average), 5.6 t/ha for spring barley (+ 4.1 %) and 42.4 t/ha for potato (+ 1.8 %).
In Ireland, the crop potential is maintained with soft wheat at 8.9 t/ha (– 2.2 % compared to last year), winter barley at 7.8 t/ha (– 8.6 %), spring barley at 6.7 t/ha (+ 0.2 %) and potato at 33.6 t/ha (+ 8.1 %).

The worrying water shortage in April and the first part of May was luckily attenuated in the last dekad of May with a series of consecutive rainy days, but these did not compensate the cumulated deficit. Depending on the water supply in the coming weeks, the crop potential could be decreased significantly. Nevertheless, although the temperatures remained close to the seasonal average, the **higher-than-normal level of solar radiation** boosted evapotranspiration and crop water consumption. Therefore, up to June, when new rainy events occurred, the **soil water content continued to decrease, but it never reached critical values**. This condition probably stimulated the crops' rooting system with a positive effect for future rains which will be valorised. For these reasons, despite the relatively limited (as compared to the long-term average) water supplies, in general the crop yields were revised upward in the UK. The advance of crop development, cumulated in the previous periods, was attenuated. However, both winter and spring crop development simulations still presented advanced stages (5–7 days) as compared to the long-term average and the previous year. The prolongation of the reproductive stage is also a positive factor to guarantee high-yield levels.

In **Ireland**, more abundant amounts of rain and more seasonal temperature were recorded. Even the global solar radiation presented values very close to the average or even lower in the south. However, the good level of crop yield potentiality was kept.





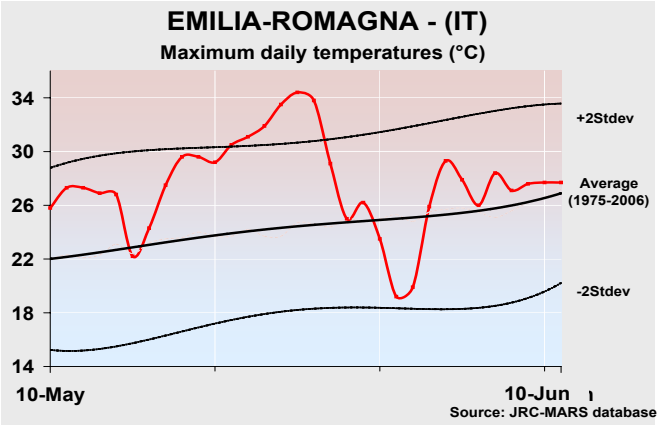
Italy: moderate yield expectations; heat wave compromised the yield potential of the Po valley

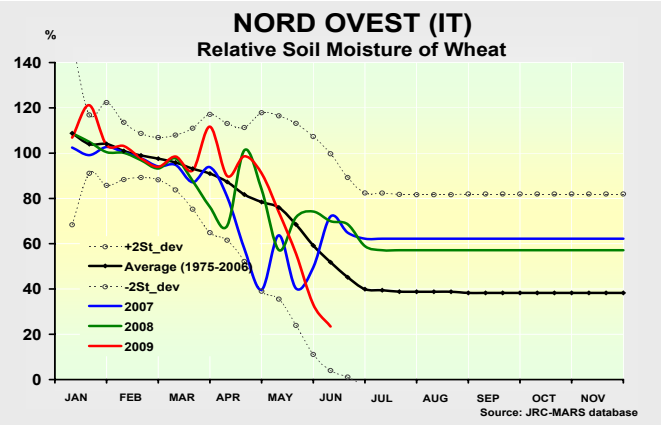
Expectations for winter crops yields are below the average. Durum wheat is estimated at 2.9 t/ha (– 9.8 % compared to 2008 and – 2.9 % on the five-year average). The yield for soft wheat is simulated at 5 t/ha (– 5 % on the five-year average and – 6.3 % on last year). The estimate for barley is 3.6 t/ha, – 4. % on the average and – 5 % on last year's value). Turnips (rape) have been estimated at 1.9 t/ha (+ 1.5 % on the five-year average). Grain maize is expected as last year: 9.3 t/ha (+ 0.2 % on the five-year average).

The climatic evolution of the season was characterised by abundant rainfall all over Italy which has locally compromised the winter cereals' growth in terms of quantity (late sowings: shorter crop cycle) and qualitatively (nitrogen losses due to leaching). The harvest of durum wheat in the southern regions of Italy is starting in these days under favourable conditions. The yield for durum is expected to be lower than average due to the intense rainfall leading to losses because of asphyxia of the young plants.

In the central, west and south of Italy, sowing was badly delayed (February–March) due to weather conditions, with the consequent shortening of the crop cycle. Moreover, the high temperatures during the period 20–27 May, especially in the Po valley, damaged the yield potential of winter cereals and speeded up the development stage of spring crops. For winter **barley**, values are moderately below the average.

The development stage of potatoes is slightly more advanced than average with a yield potential in the norm. The development stage of **rape seed** is advanced as well as for **grain maize** and sunflower.



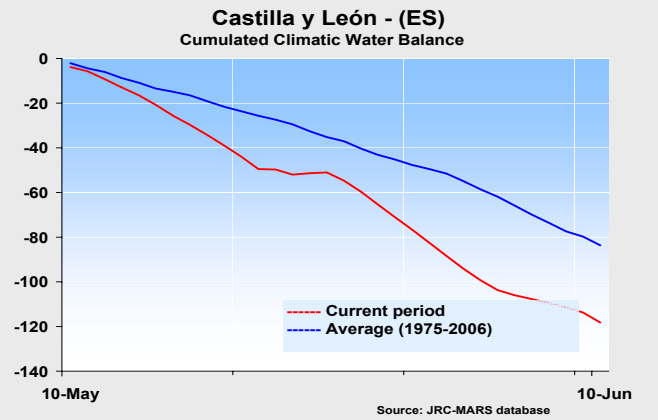


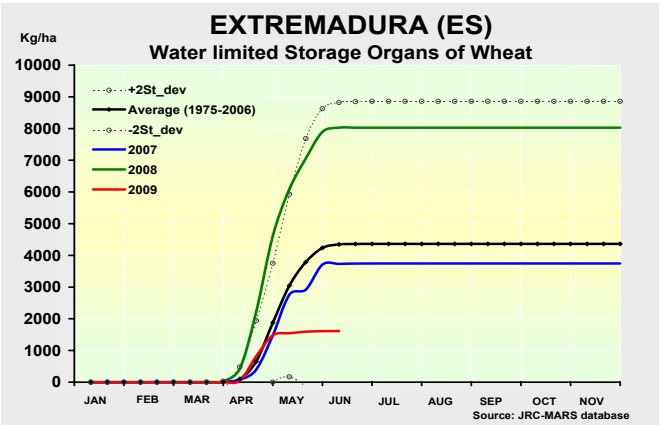
Spain: winter crops in western Spain faced dry conditions leading to a yield decrease; concerns for spring crops as rainfall keeps scarce

The average yield of durum wheat is estimated at 2.3 t/ha and the estimate for soft wheat is decreased to 3.3 t/ha. The estimate for winter barley is 2.6 t/ha. The oil seed rape yield is forecasted at 1.5 t/ha (– 10 % on the five-year average and – 26.2 % on 2008). Spring barley is also forecasted at a much lower level: 2.5 t/ha (– 25.7 % on 2008 and – 13.8 % on the average). Grain maize has been forecast at 10.0 t/ha, sunflower and potatoes are forecasted respectively at 1.0 t/ha and 27.9 t/ha. All three crops are in line with the five-year average.

The yield expectations for winter cereals (soft wheat and barley) of Castilla y Leon are lower than last year as the crops suffered dry conditions during most of the growing period. The drought started in mid-February, in all western Spain including Extremadura and western Andalucía. The overall yield is, however, partially compensated by better expectations in southern Spain, also due to water reservoirs having been filled over the winter.

In Andalucía, durum wheat developed well, and Aragon (the second main production area) had no serious problems during the growing season.



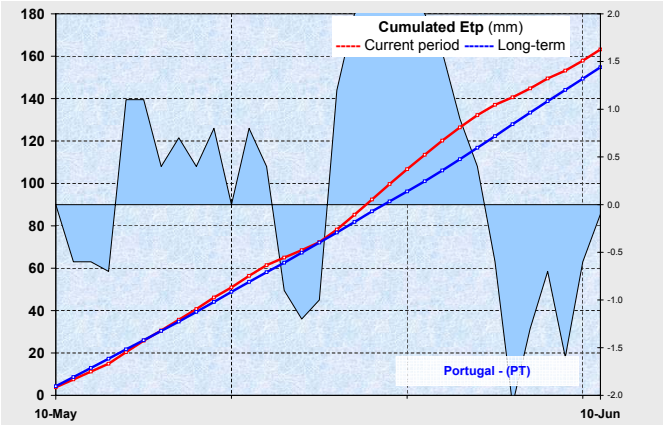


Due to the scarce or absent precipitation in the southern and eastern part of Spain: Andalucía, Valencia, Murcia, Cataluña Aragon have significant water balance deficit (– 30 % compared to the long-term average) and the relative soil moisture of spring crops is much lower than normal. Therefore the situation is worrying too for the spring crop growth.

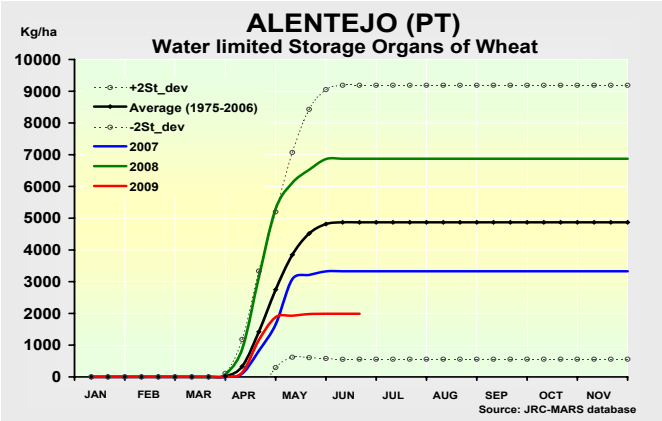
Temperatures have been generally higher than average during the period 10 May to 10 June with high cumulated active T (Tbase 10°C).

Portugal: dry conditions negatively impacted on winter cereals yield

Yields of winter crops are lower than last year and the five-year average. The yield for soft wheat is estimated at 1.6 t/ha (– 24.7 % on last year and – 5.9 % on the five-year average) and for winter barley at 1.7 t/ha (– 31.5 % on last year and – 9.2 % on the five-year average). Grain maize is forecasted at 5.5 t/ha (– 5.5 % compared to last year, but still 2 % more than the five-year average). Potato is forecasted at 14.9 t/ha.

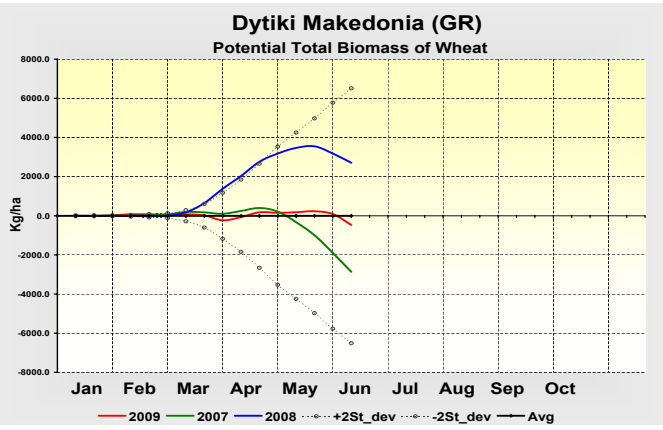


Low precipitations from mid-February until mid-June have led to problems for rainfed winter cereals. Winter wheat and winter barley yields are simulated lower than last year and the five-year average. The temperatures were in the norms during May and higher towards the end of May/beginning of June. The cumulated solar radiation was also higher in the last period. The development stage of summer crops is on average and normal yield potential is simulated.



Greece: favourable conditions leading to upward revision of forecast for winter cereals

The current forecast figures are generally being revised upward with the exception of winter barley. The forecast for soft wheat in Greece is at 3.0 t/ha, better than the five-year average (2.8 t/ha; + 7 %). Durum wheat is currently estimated at 2.8 t/ha (close to 2008 and + 22 % compared to the five-year average). Winter barley is forecasted for 2.50 t/ha, reaching the average level. The forecasted yield for grain maize is 9.7 t/ha (6 % below 2008). Potato is set at 21.1 t/ha (– 14 % on the five-year average) and sugar beet is forecasted at 63.1 t/ha in line with the average.



Greece saw rainfall at the beginning and end of May as well as in June for Kentriki Makedonia preventing sudden soil moisture drops. The soil moisture is anyhow decreasing now towards the end of the cycle (e.g. winter wheat). In general terms, the soil water availability has been good this season, even if rainfall for Kentriki Makedonia was below the long-term average, but Ditiki Makedonia and Thessalia show above-average values for the period observed and favourable soil moisture conditions. Cumulated temperatures in May and the beginning of June are clearly above the long-term average. In the ranked time series, the period between 11 May and 18 June 2009 is the warmest recorded, but no particular heat waves occured. Winter cereals are between ripening and maturity, and the simulated storage organ weight for Kentriki Makedonia is showing favourable values above the long-term average but below 2007 and 2008. Maize, still in its vegetative stage, has reached its maximum leaf area index very close to the long-term average in the simulation, but two dekads in advance.

Denmark, Sweden and Finland: favourable conditions in Finland, wetter and cooler in Denmark and Sweden

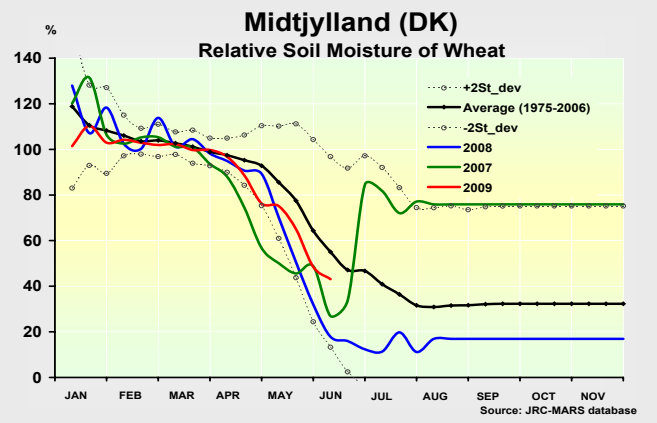
In Denmark, yield forecasts are 7.3 t/ha for soft wheat (– 7.1 % compared to the previous year), 3.8 t/ha for rapeseed (+ 1.9 %), 4.9 t/ha for spring barley (+ 9.1 %) and 5.7 t/ha for winter barley (– 1.5 %).

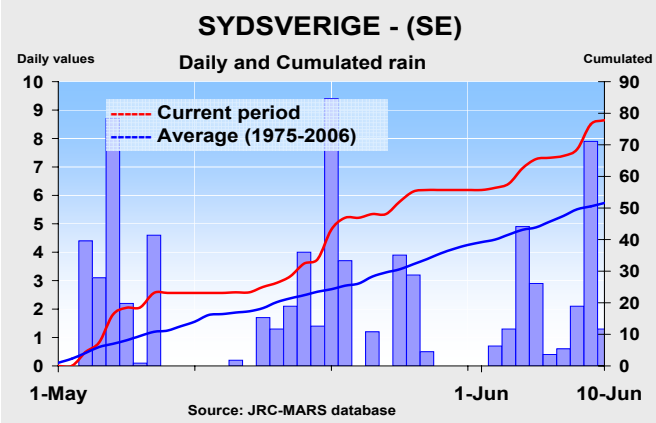
In Sweden, yield forecasts are 6.0 t/ha for soft wheat (– 2.4 % compared to the previous year), 2.8 t/ha for rapeseed (– 3.1 %), 4.1 t/ha for spring barley (– 0.8 %) and 5.7 t/ha for winter barley (– 0.4 %).

In Finland, yield forecasts are 3.6 t/ha for soft wheat (+ 1.2 % compared to the previous year), 1.3 t/ha for rapeseed (at the same level of the previous year) and 3.4 t/ha for spring barley (– 2.9 %).

In Denmark and Sweden, **May** was generally characterised by a seasonal course: both maximum and minimum temperatures remained within the normal range of variation and the rainfalls were concentrated in two main events of consecutive rainy days (at the beginning and during the second dekad), but quantitatively more abundant than average. On the other hand, in **June**, a settled north-coming air flux influenced the two countries: temperatures dropped significantly, particularly the minimum daily values, locally **in Sweden** even below 0 °C (**– 3.1 °C on 6 June**). Those conditions at least impacted on the crops, slowing down their development and biomass accumulation and even direct damages on leaf were likely. Moreover, in Sweden, the rainfalls were even more abundant and persistent than in Denmark. Excess water was possible, especially towards the end of the period under consideration, due to the intense and persistent rainy events.

Different conditions occurred in **Finland**, which experienced a drier than seasonal period: the rain was concentrated at the beginning of May and then only very limited events occurred. The influence of the north flux was reduced and the thermal course was closer to average. The fairly high level of solar radiation, which probably boosted the biomass formation, was very important. Good potentiality is expected.

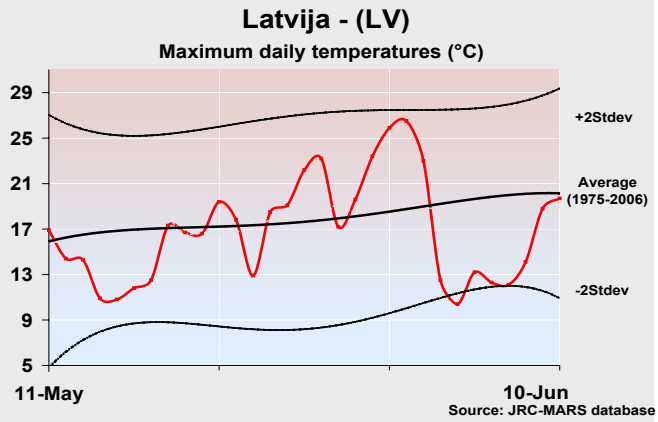


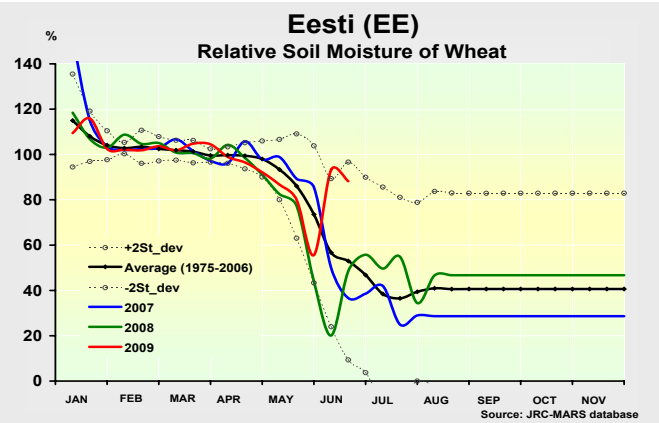


Estonia, Latvia, Lithuania: humid and colder conditions than usual

Yield forecasts for Estonia are 2.8 t/ha for soft wheat (10.5 % less than last year and 3.2 % less than the five-year average), 2.3 t/ha for spring barley (respectively – 10.7 % and – 6.6 %) and 1.6 t/ha for rapeseed (+ 11.1 % and + 2.2 %). For Latvia, yield forecasts are 3.5 t/ha for soft wheat (– 9.7 % on 2008 and + 3.8 % on the five-year average), 2.2 t/ha for spring barley (– 2.4 % and – 3.0 %), 2.1 t/ha for rapeseed (– 13.1 % and + 5.2 %) and 14.8 t/ha for potato (– 17.0 % and + 1.1 %). For Lithuania, yield forecasts are 3.9 t/ha for soft wheat (– 9.8 % on 2008 and + 5.2 % on the five-year average), 3.5 t/ha for winter barley (respectively – 11.9 % and + 5.9 %), 2.6 t/ha for spring barley (– 9.0 % on 2008), 1.8 t/ha for rapeseed (– 13.2 % on 2008), 38.9 t/ha for sugar beet (in line with 2008 but 3.8 % less than the average) and 11.0 t/ha for potato (– 25.4 % and – 5.9 %).

In the Baltic countries, after the scarcity of rain observed in April and May, abundant rain has been registered since the





beginning of June. In Estonia, cumulated rain exceeded the long-term average by more than 40 %. In June, the values of climatic water balance in all the countries were higher than normal. Cumulated active temperatures in May were in line with the long-term average, but, since the beginning of June, temperatures lower than the long-term average have been recorded. Cumulated solar radiation in all the countries was close to the normal values.

Winter wheat is in the heading development stage for all three countries. Rapeseed in Lithuania is in the grain-filling stage. Spring barley in Lithuania is in the heading stage; in Estonia and northern Latvia, barley is still at the tillering stage. The status of development is comparable to the long-term average, but a slight delay is noticeable. At the end of the period under consideration, the total biomass of soft wheat was in line with the long-term average in Estonia and slightly below in Latvia and Lithuania.

Despite sufficient soil moisture available for plants, the revised yield for summer crops is lower than the five-year average.

Poland: persistent rain replenished water reservoirs, moderate yield expectation for cereals

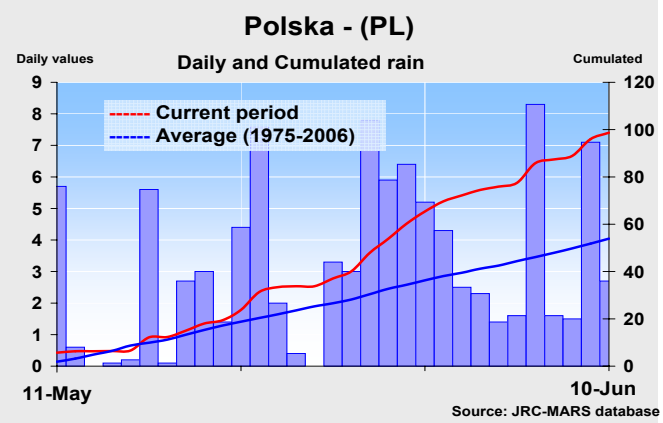
The revised crop yield is slightly higher than presented in the last bulletin, but still close to the average. The yield forecasts for Poland are: soft wheat 3.9 t/ha, winter barley 3.8 t/ha, spring barley 3.0 t/ha, rapeseed 2.7 t/ha, grain maize 5.6 t/ha, potato 18.7 t/ha, all in line with the five-year average. Sugar beet is forecasted at 45.9 t/ha which is 1.2 % less than last year and + 1.6 compared with the five-year average.

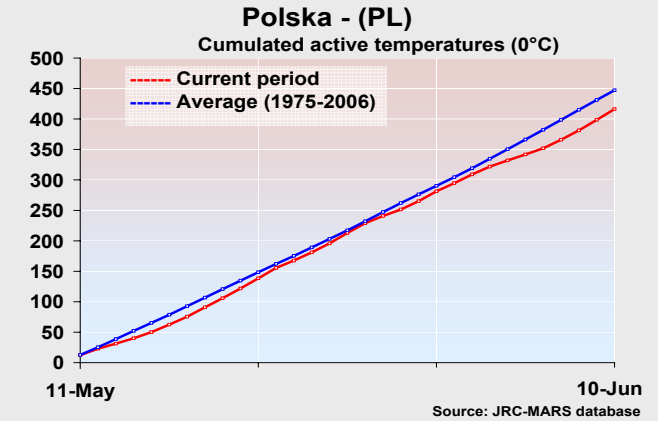
In Poland, persistent rain occurred in May and June (twice the normal amount), being beneficial after an extremely dry winter and spring. In the whole country, cumulated rain since January is now around 80 mm above the average. Cumulated active temperatures were slightly lower than average and solar radiation was in line with the long-term average. In the middle of May and in June, cold air irruptions were observed with minimum temperatures on average 2–4 °C degrees cooler than normal. These low temperatures and frequent rain could slightly restrain crop development. Young maize plants might have suffered especially from these conditions impacting negatively on the maize crop yield potential. The biomass, development stage and leaf area index of maize are below the long-term average and below last year's values.

The total biomass of winter crops (wheat and rape seeds) as well as spring barley is in line with the long-term average. In May, the development of sugar beet and potato was anticipated and reached a higher level than the long-term average and in the last two years. Since the beginning of June, it has been slightly delayed. Now, the status of development is at the same stage as for the long-term average.

At the 16th dekad, winter wheat is in the heading development stage in north-eastern Poland and is flowering in the south-western part of the country. Rapeseed is at the grain-filling stage. Spring barley is heading in the north, and flowering in central and southern Poland.

According to the remote sensing analysis, dry matter productivity in central Poland (the zone from northern-east to southern-west) is lower than the long-term average. In south-eastern Poland, this productivity is at the same level as the long-term average and even 10 % higher than usual.





Czech Republic and Slovakia: possible yield reduction in eastern regions caused by rainfall deficit

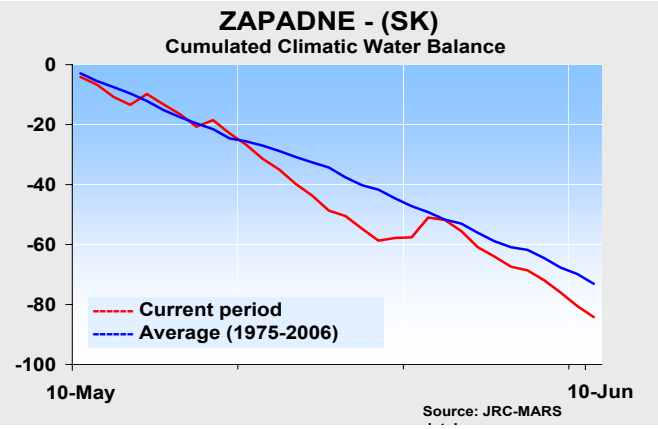
Except for grain maize (7.5 t/ha, 9.2 % compared to the five-year average), the yield potential of cereals and winter crops in the Czech Republic seems to be lowered by the drought: soft wheat (4.8 t/ha, – 7.7 %), winter barley (4.2 t/ha, – 7.7 %), spring barley (3.6 t/ha, – 13.0 %) and rapeseed (2.8 t/ha, – 11.0 %). Better conditions are depicted for summer crops: sunflower (2.4 t/ha, 6.5 %), potato (25.0 t/ha, – 1.1 %) and sugar beets (55.9 t/ha, 5.2 %). The situation is even worse for Slovakia and the forecasts are consistently lower if compared to the five-year average. The expected yields are: 3.7 t/ha for soft wheat (– 13.5 %), 3.3 t/ha for winter barley (– 12.4 %), 2.2 t/ha for rapeseed (– 5 %), 2.8 t/ha for spring barley (– 24.2 %), 5.9 t/ha for grain maize (– 0.9 %), 16.9 t/ha for potato (+ 7.7 %), 51.7 t/ha for sugar beet (2.2 %) and 2.1 t/ha for sunflower (– 3.2 %).

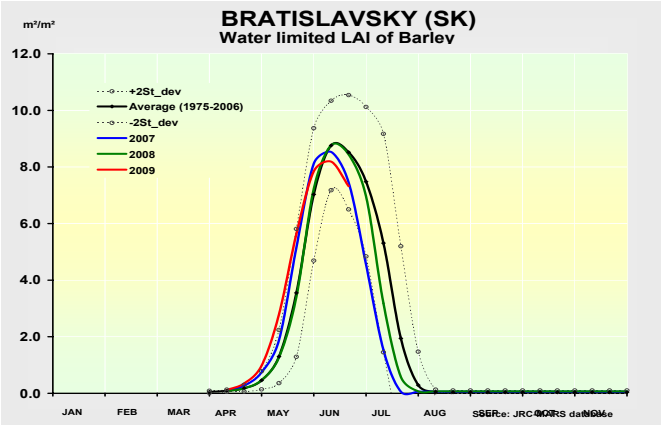
In both the Czech Republic and Slovakia, precipitations have been generally light but homogeneously spread and the rain presented a spatial gradient distribution from north-west to south-east. This has led to satisfactory cumulated values of rainfall in the western half of the Czech Republic while in the east of the country and in Slovakia a rainfall deficit persisted. Sub-optimal irradiative levels have been recorded and this drove the evapotranspiration values below the long-term average.

The relative soil moisture for winter wheat and rapeseed has been very low for a prolonged period; nevertheless simulated yield biomass shows a positive trend. The crucial flowering, however, and the grain-filling phases did not take place in good conditions.

Spring barley has reached the mid-flowering stage a few days in advance compared to the average. In southern regions (Jihovychod and Bratislavsky), where precipitation did not allow satisfactory soil moisture values, the canopy development has been sub-optimal.

With the exception of grain maize which entered into the vegetative phase according to the average, an advance in development is depicted for summer crops.





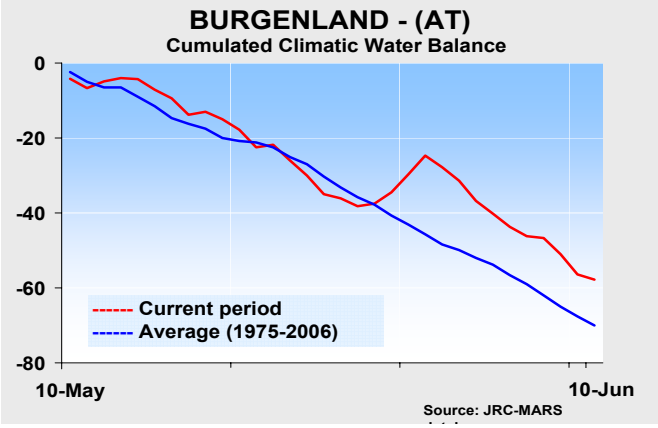
Austria: low soil moisture might have affected crops in eastern regions

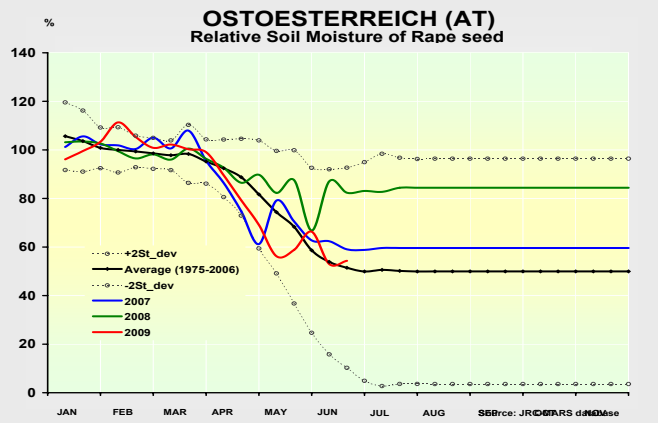
Yield forecasts are 5.4 t/ha for soft wheat (– 6.3 % with respect to 2008), 4.4 t/ha for durum wheat (– 14.1 %), 5.5 t/ha for winter barley (– 0.9 % compared to the five-year average), 2.8 t/ha for rapeseed (–9.9 %), 3.3 t/ha for spring barley (– 22.5 %), 10.1 t/ha for grain maize (+ 1.8 %), 30.5 t/ha for potato (–4.0 %), 63.6 t/ha for sugar beet (– 4.6 %) and 2.60 t/ha for sunflower (– 0.1 %).

Starting from mid-May, well-distributed rainfalls were recorded, especially in the west of the country which pushed cumulated values above the long-term average guaranteeing water reserves above normal values. As a consequence of the frequent precipitations, irradiance levels decreased slightly although satisfactory cumulated values were reached. In eastern regions (Burgenland and Wien), however, the dry conditions persisted and there the lack of rain associated with high temperatures might have had a negative impact on yield potential for winter crops, especially during flowering. The warm conditions which have characterised the previous dekads lead on to a drop in temperatures during the first dekad of June. But cumulated temperatures are still consistent with the long-term average.

Winter wheat is completing flowering or entering in the grain-filling stage with a one-dekad advance compared to the long-term average and with a significant east–west gradient. Despite the reduced values of relative soil moisture of the previous dekads, an exceptional development of the canopy has been registered and the simulated biomass accumulation rate is above average. Although young maize seedlings could have partly suffered the excess of water during the emergence, the simulated leaf area index and above-ground biomass do not show any constraints in development.

Average conditions are depicted for summer crops which are almost characterised by an advance of more than one week and forecasted rainfalls will recharge irrigation reserves for the upcoming summer.



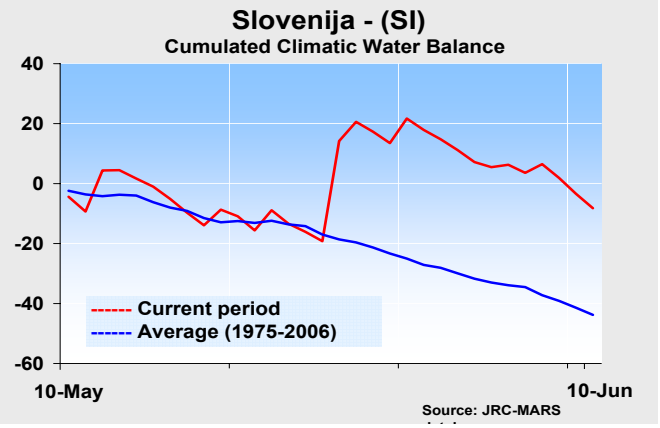


Slovenia: the advance in development is maintained

Forecasts are 4.3 t/ha for soft wheat (– 3.1 % compared to the five-year average), 3.7 t/ha for barley (– 2.1 %) and 7.7 t/ha for maize (+ 1.3 %).

An important precipitation event occurred on 26 May (38.8 mm) pushing cumulated rainfall values consistently above the long-term average and allowing a recovery of soil moisture. Despite the drop in temperatures occurring at the end of May, mild conditions were registered during the whole period of analysis, leading to a moderate surplus of the active temperature sum, estimable at 50 GDD (Tbase 10 °C, + 20 to + 25 % as compared to the long-term average).

The one-dekad advance in development, simulated for winter crops from the start of the season, is maintained and has led to a consequent advance in leaf-area senescence; however the impact on the simulated biomass and storage organs accumulation rate is, especially in the case of rapeseed, negligible. The spring crops (barley at the end of flowering) experienced a lower canopy development with respect to the long-term average while summer grain maize entered into the second part of the vegetative phase showing an optimal yield potential.

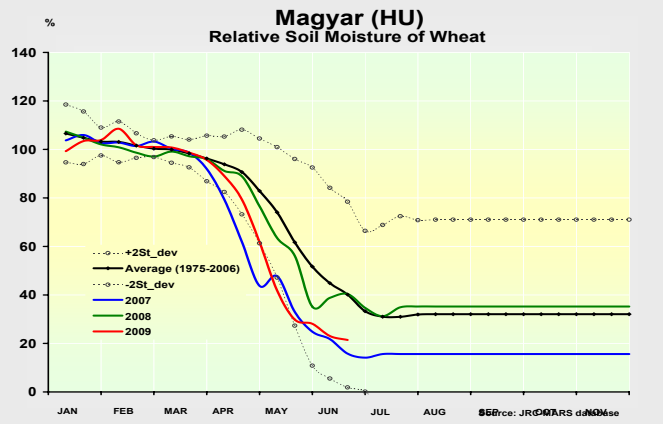


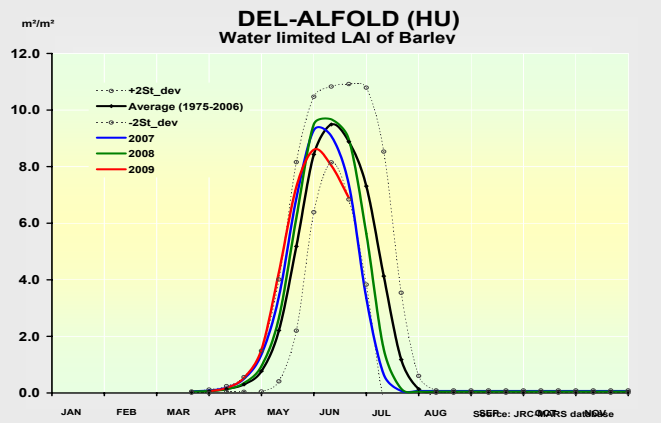
Hungary: crop yield potential negatively impacted by the drought

Yields are forecasted to be lower both than the five-year average and than those recorded in 2008: 4.0 t/ha for soft wheat (– 19.5 % compared to last year), 4.0 t/ha for durum wheat (– 7.1 %), 3.3 t/ha for winter barley (– 30.9 %), 2.3 t/ha for rapeseed (– 12.4 %), 2.6 t/ha for spring barley (– 33.7 %), 5.5t/ha for grain maize (– 26.2 %), 23.1 t/ha for potato (– 10.2 %), 50.8 t/ha for sugar beet (– 14.3 %) and 2.3 t/ha for sunflower (– 16.1 %).

The dry conditions experienced in April did not improve in May because of the reduced rainfall levels which did not allow replenishing of soil moisture. The recorded precipitations, although well distributed, have been spare, especially in the east of the country. These dry conditions, coupled with a very high transpirative demand due to the heat and irradiance levels consistently higher than the long-term average, are causing concerns for crops yield.

Rapeseed has probably suffered heavily from the scarcity of water during grain filling, and winter wheat too will probably experience a reduction in yield formation due to the shortening of the vegetative phase and the water stress which has characterised these last dekads. Spring barley as well might be negatively affected by these conditions if the weather is drier than needed to recharge irrigation reserves for the upcoming summer. The development of summer crops could have been slightly slowed by the lack of water during May but these handicaps could be overcome if weather conditions are mainly favourable in the coming weeks.



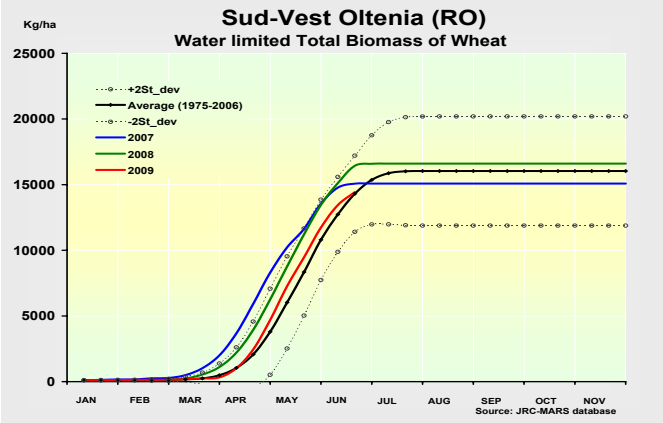


Romania: moisture condition recovered; however, the impact on the yield potential of winter cereals is significant

The dry spell in May reduced the yield forecast for soft wheat to 2.5 t/ha, decreasing both with respect to 2008 (– 27 %) and the five-year average (– 13 %). Winter barley has a parallel trend and is now forecasted for 2.4 t/ha, – 28 % on 2008 (2.5 t/ha) and also – 12 % on the five-year average (2.8 t/ha). Turnip with 1.5 t/ha also shows a reduction in expectations and a significant reduction on both 2008 (– 20 %) and the five-year average (– 10 %). Spring barley was affected by the drought in the shooting stages and is forecasted for 1.8 t/ha (– 27.6 % on 2008 and – 12 % on the five-year average). The major spring crops were in the early stages of development at the moment of the dry spell and this is reflected in the yield forecast even though there might be some recovery

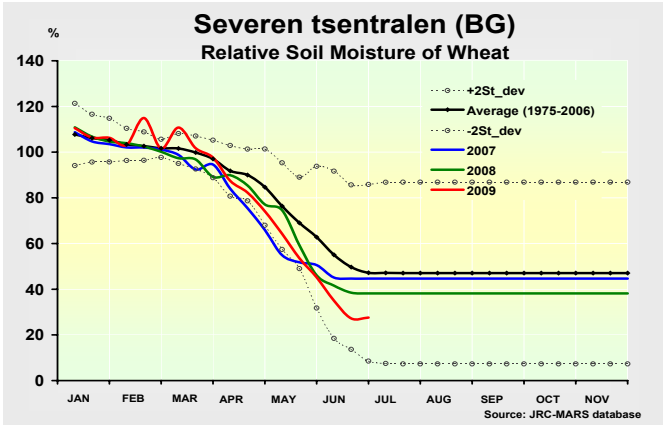
further in the season. Maize yield is estimated at 3.0 t/ha (3.2 in 2008 and 3.4 for the five-year average). Sunflower is 1.1 t/ha (– 19.8 % on 2008 and – 13.0 % on the five-year average). Finally, both potato (14.1 t/ha) and sugar beet (28.1 t/ha) show reduced expectation though it is less evident with respect to the five-year average (14.3 t/ha for potato and 30.1 t/ha for sugar beet).

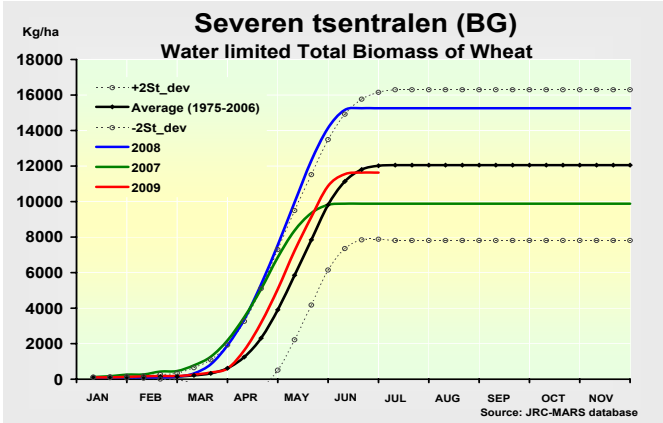
The dry period that started in the north of the country in mid-May gradually affected most of southern Romania. This hazard coincided with the particularly sensitive flowering and heading phenological phases of wheat which, in combination with pollination, are the most important for the establishment of the yield potential. Significant rain events in southern Romania at the end of May and early June reduced and partly compensated for the losses in the climatic water balance. The precipitation was combined with a cold spell and this arrangement, slowing the vegetative activity of the crops, may have mitigated the effects of the drought. This particular sequence of events, however, has taken place too late to make up for the acquired damage and consequently the timing of the drought will have had a strong negative impact on the yield potential of winter cereals. A strong negative impact on the yield potential of spring crops may be expected as the drought took place in the initial development stages. For these crops, however, the recent rains may be a good sign for a certain recovery.



Bulgaria: dry period is reducing the yield potential, average year

The yield forecast for winter cereals is revised down due to the dry period experienced. Winter wheat is set to 3.3 t/ha with a significant reduction (– 22.0 %) on the exceptional level of 2008 (4.2 t/ha) and –3.0 % compared to the five-year average. Winter barley is forecasted at 3.2 t/ha (+ 4.0 % on the five-year average) and spring barley has been reduced to 2.4 t/ha (– 2.0 % on the five-year average). Winter rape with 2.1 t/ha also performs better than the five-year average (+ 10.0 %) but below the 2008 levels (– 6 %). The forecasted yield for grain maize is 4.0 t/ha, slightly reduced with respect to both 2008 (– 4 %) and the five-year average (– 5.0 %). Sunflower is set at 1.6 t/ha (+ 9.0 % compared to the five-year average). Potato is forecasted at 16.0 t/ha.





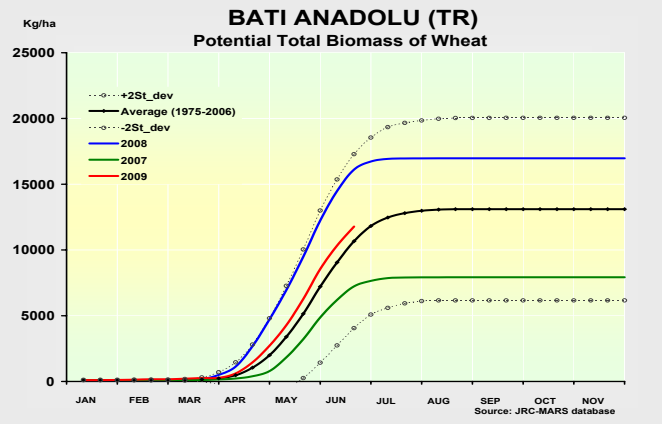
Cumulated precipitation levels for the period observed were below the average (between – 30 % and – 60 %) with the exception of the eastern part of the country (Yugozapaden) creating some concerns for further summer crop development. Cumulated temperatures are clearly above the five-year average, but no particular heat stress has occurred yet. Winter cereals are in the grain-filling phase and in the northern part of the country the ripening stage has started with one dekad in advance compared to the long-term average. Soil moisture in the north-east is fluctuating between 35 % and 80 % for Yugozapanden. Biomass accumulation is forecasted to be above the five-year average for all the main producing regions but with a slight downturn in Severentsentralen. In general, an average year is being simulated. Forecasted persistent rains for the next days could be a concern related to the quality of winter cereals. Sunflower has entered the flowering stage, showing sharp decreasing values of soil moisture probably affecting the yield potential, but persistent rain is forecasted for the coming days with the exception of the Black Sea coast.

BLACK SEA AREA

Turkey: a positive seasonal trend characterised by sufficient rain and moderate temperatures is supportive to a positive outcome

The yield forecast for wheat is confirmed at 2.2 t/ha, close to the five-year average (2.3 t/ha) though still significantly less than the exceptional levels of yield achieved in 2008 (2.5 t/ha). Barley reports a certain delay in development with respect to wheat and also for this reason is expected to take advantage of a longer period of development and perform better; the yield forecast is updated to 2.5 t/ha (– 0.7 % on 2008 and + 1.8 % on the five-year average). Maize is still in the early development stages and mostly under irrigation or cultivated in the more humid coastal region. The yield is at present forecasted for 7.0 t/ha (– 7 % on 2008 and + 2 % on the five-year average).

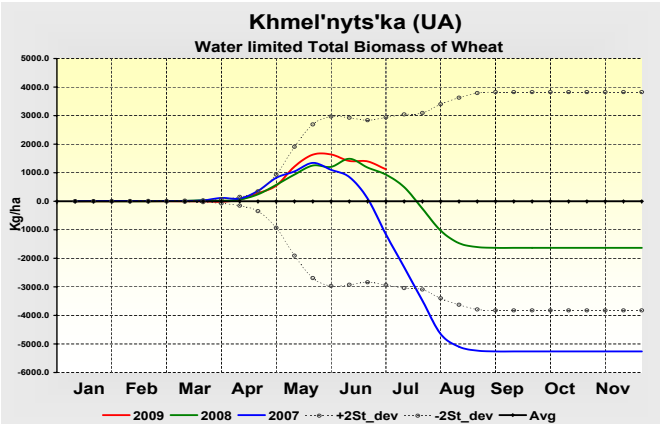
In central Anatolia, the wheat crop is mostly in the flowering phase and at this stage of the season has not suffered from any further hazard following the snow in February. The climatic conditions actually show a further improvement with respect to May and this has allowed an almost complete recovery on the thermal and moisture stresses which occurred during winter. Precipitation in the main cereal-producing regions of Ankara and Konya showed a constant increase from May onward and even if there has been a certain reduction in rain during the last two weeks, these conditions, coinciding with the flowering stage, may be favourable for pollination and consequently for yield establishment. This is, however, still a potential and only the after-flowering climate will determine the final outcome. A limited cold spell in late May further delayed and slowed crop development, especially for barley, which can then take advantage of the specific climatic setup for further extending the growth season and consequently the yield potential. The maize crop is still in a very early stage of development and is taking particular advantage of the rain of this period.



Ukraine: a long dry spell in the central area is affecting the yield potential of winter cereals

The yield forecast for wheat is reduced to 2.2 t/ha, coming to – 9 % on 2008 (2.4 t/ha) and –17 % on the five-year average. Barley in Ukraine is essentially a spring crop which this season took advantage of a certain delay in development and is now forecasted for 1.7 t/ha (improving by 16 % on 2008 but still – 17 % on the five-year average of 2.0 t/ha). Rape seed is expected to yield 1.1 t/ha (–17.3 % compared to the five-year average). Spring crops such as maize and sunflower are taking advantage of rain in May in the south of the country coinciding with the beginning of the vegetative phase. The forecasted yield for maize is at present 4.1 t/ha (+ 6.6 % on the five-year average) while for sunflower it is 1.0 t/ha, ranging around the average (0.9 t/ha).

The spring season has been diverse throughout the vast agricultural extents of Ukraine. The centre-west of the country was affected by a dry period that started in April and is continuing in June. Meanwhile, the south and Black Sea regions started receiving sufficient precipitation from early May. This distribution had conflicting effects on the overall yield expectations of crops which are uniformly distributed across these areas. Overall, winter cereals in central Ukraine, currently in the heading stage, are being strongly stricken and the fact that precipitation does not appear to be picking up makes the outlook bleaker. The perspectives are more positive for crops cultivated in the south and south-west (Odes'ka and Kherson'ka), where precipitation from the beginning of May started compensating for the previous losses in the climatic water balance. In these areas, winter cereals and rapeseed are in a more advanced stage of development and are taking advantage of the increased soil moisture. The thermal trend remained within average levels and the cumulated active temperature was not a limiting factor to crop development. The rains in the south are in any case a good sign for spring crops in their early stages of development.



EASTERN COUNTRIES

Belarus: high amounts of rain and colder than normal; good expectation for winter wheat

Yield for wheat is estimated at 2.9 t/ha, barley at 2.8 t/ha, rapeseed at 1.0 t/ha and grain maize at 3.8 t/ha.

In Belarus, cumulated rain for the analysed period exceeded the long-term average by more than 70 %. The climatic water balance was above the normal level. Cumulated active temperatures and cumulated solar radiation were slightly under the long-term average, because of unusually low temperatures at the beginning of the period as well as in June (tmax close to the – 2 SD).

Persistent rain improved the relative soil moisture, after a previous dry period. Crop development is now a little delayed compared to the long-term average. Nevertheless, potential biomass of winter wheat is progressing well and is higher than normal. Yield expectations for this crop are close to average. According to the remote sensing analysis for the 16th dekad (1–10 June), dry matter productivity in Belarus is at the long-term average.

Russia: unfavourable conditions still persist in the southern and Volga regions

Despite the strong delay in development which has only partially been recovered, the period analysed is the end of winter crop flowering and the mid-vegetative stage for spring crops. In southern regions (Krasnoda, Stavropol and Rostov), temperatures (especially daily maxima) have been slightly below the average. Therefore, at the end of May, the monthly cumulated active temperatures presented a deficit which did not allow for recovering of the delay which characterised the start of the season. On the other hand, in the central and central-Chernozermic regions, air temperature was close to normal. With the exception of some heavy rains, in western and southern regions the precipitations were lower than the seasonal average; however, normal values of soil moisture are depicted everywhere. Crop growth indicators are generally worse than last year mainly due to the delay in sowings and the reduced amount of thermal accumulation during springtime. This unfavourable condition seems to have affected mostly croplands in the south of the country and in the Volga regions. Simulated values of leaf area index and above-ground biomass are strongly below the long-term average, leading to significantly lower winter wheat yield expectation. A better situation is depicted for the central area of European Russia. The yield of spring crops in European Russia is likely to be lower than normal too.

MAGHREB

Maghreb: a positive agricultural season with particularly high yields in Morocco, Algeria and Tunisia

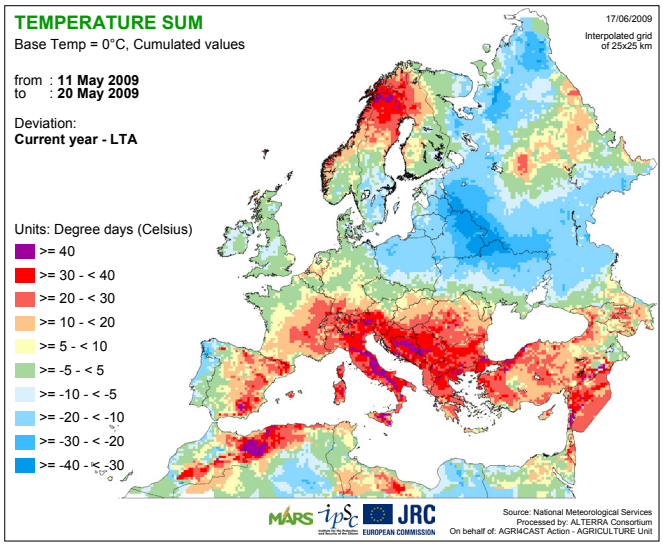
The yield estimates for winter cereal in the 2008–09 agricultural season are significantly higher than those of the long-term average (1979–2008) and also those of the 2007–08 season. In Morocco, the average yield of wheat (durum and soft wheat) is estimated at 2.1 t/ha, increasing by over 50 % on the five-year average, which is, however, strongly affected by the particularly low levels of the 2008 yield (0.62 t/ha). Barley is cultivated in less favourable areas and the yield estimate is 1.4 t/ha (still + 74 % on the five-year average). Morocco is the only country in the Maghreb that reports maize cultivation and this crop also took advantage of the particularly high levels of soil moisture and is at present forecasted for 1.1 t/ha (+ 24.6 % on the five-year average). A similar situation can be found in Algeria where wheat is estimated at 1.6 t/ha, + 11.4 % on the five-year average which is, however, not biased by any particular low level in the case of Morocco. Barley in Algeria is estimated at 1.7 t/ha (+ 16.1 % on the five-year average). Wheat in Tunisia is forecasted at 1.9 t/ha and barley at 1.1 t/ha (both with an almost 20 % increase on the five-year average).

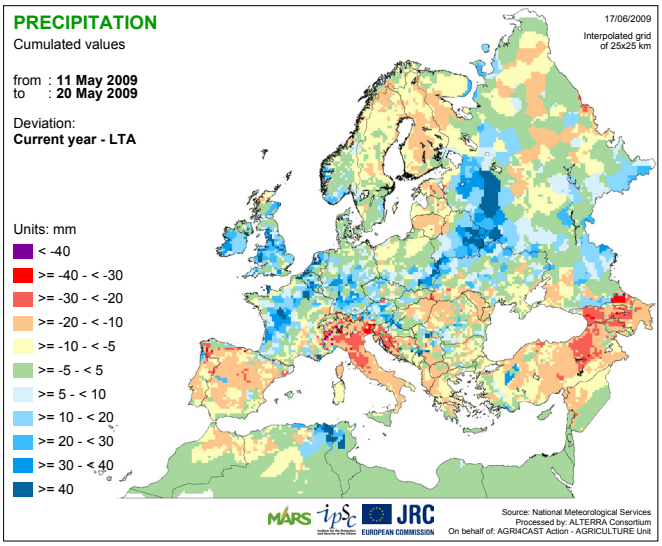
The 2008–09 agricultural season was characterised by abundant and well-distributed precipitation and given that rainfall is by far the most important factor affecting cereal production in the Moroccan and in general in the Maghreb agricultural environment, the combination of events was such as to make this an exceptional year from the yield point of view. Currently, with the harvest completed over almost all the region, it can be considered to be the one of the best seasons for winter cereals in the last 20 years.

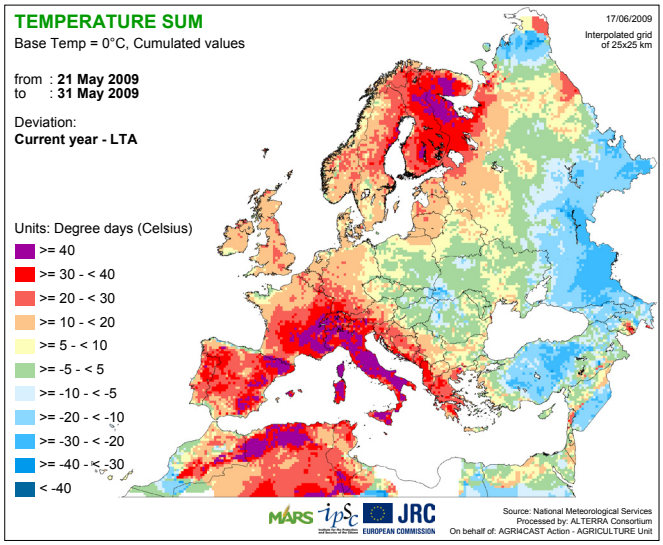
In Morocco specifically, the outcome could have been even better if the weeds had been better controlled, nitrogen optimally applied and if sowing had taken place earlier in all parts of the country. Precipitation was particularly abundant in the north-eastern and central parts of the country specifically where most of the wheat cultivation is concentrated. The values of the NDVI show an increase at national level from November 2008 to March 2009, with values exceeding those of both the five-year average and the previous season. A similar trend was observed both in eastern Algeria and in north-western Tunisia where most of the cereal cultivation is concentrated.

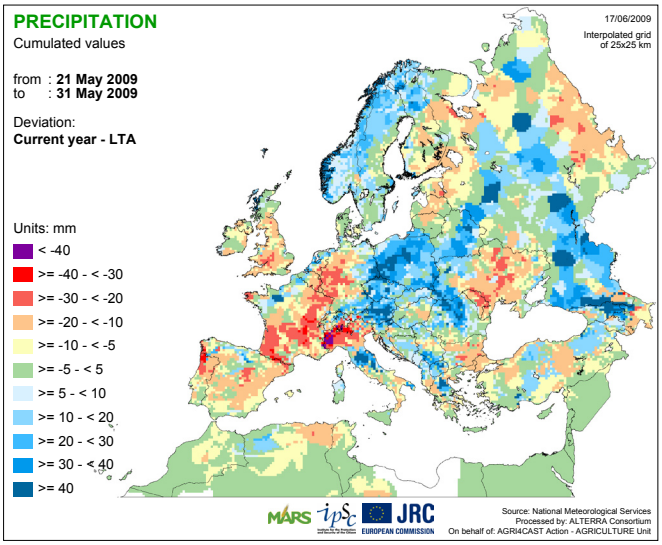
4. Map analysis

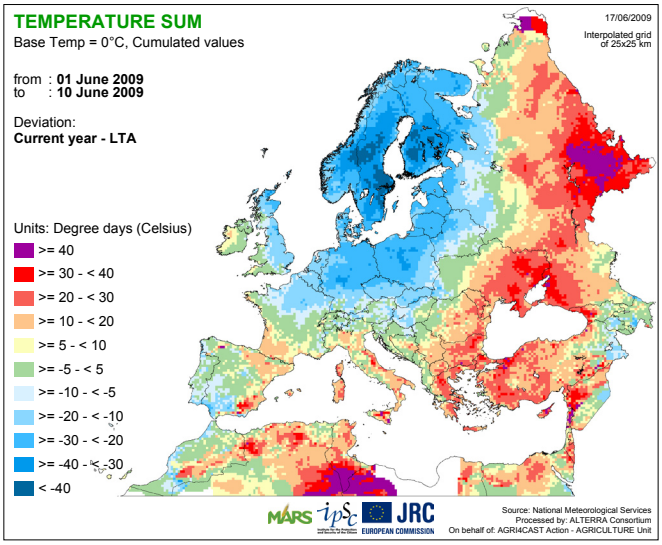
4.1. Temperature and precipitation - 2009 compared with Long Term Average -

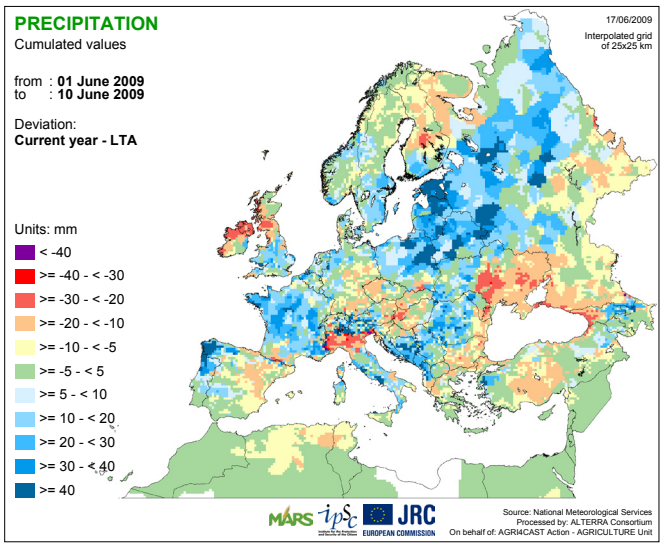




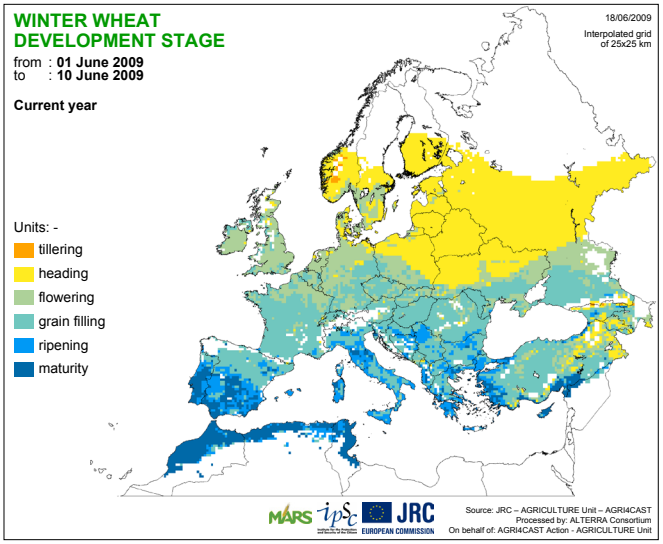


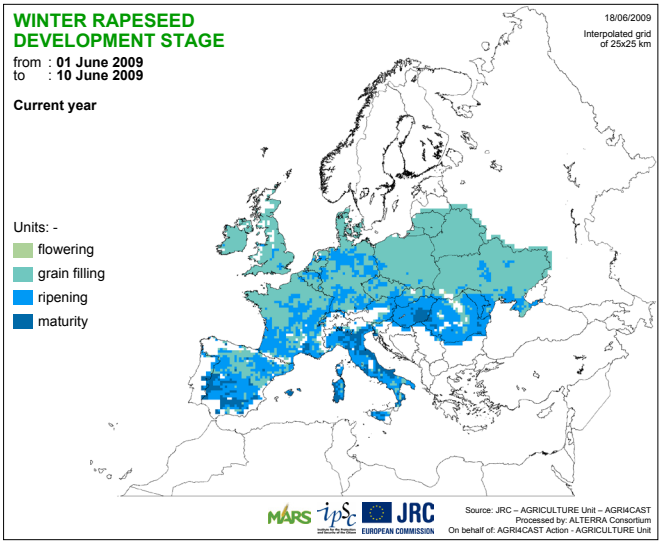


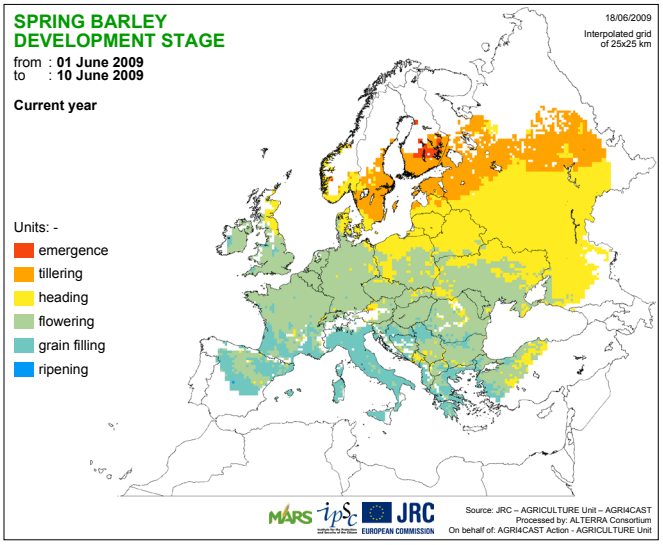


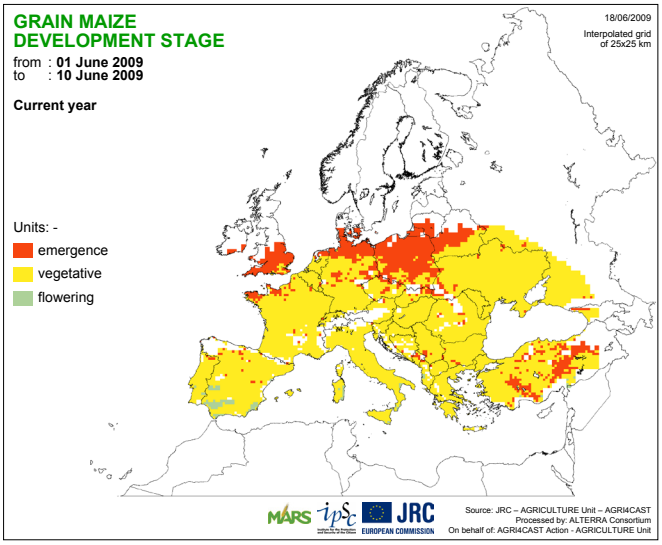


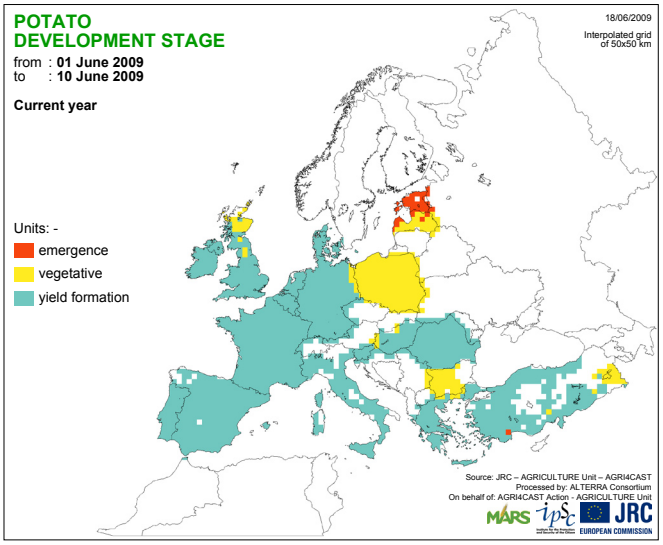
4.2. Crop development stage

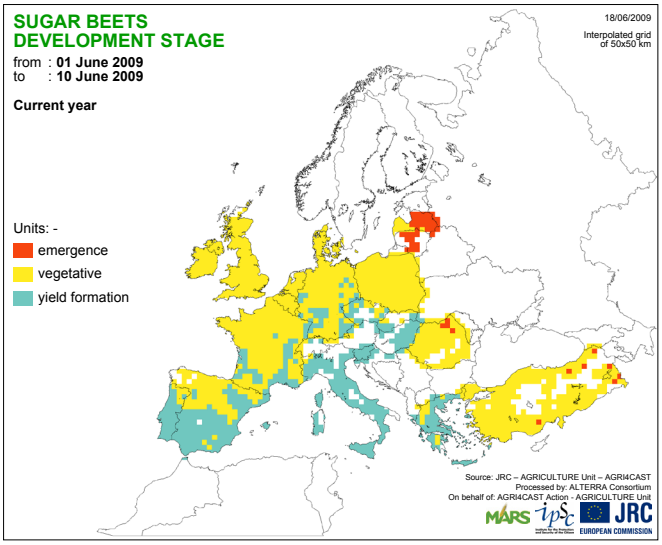




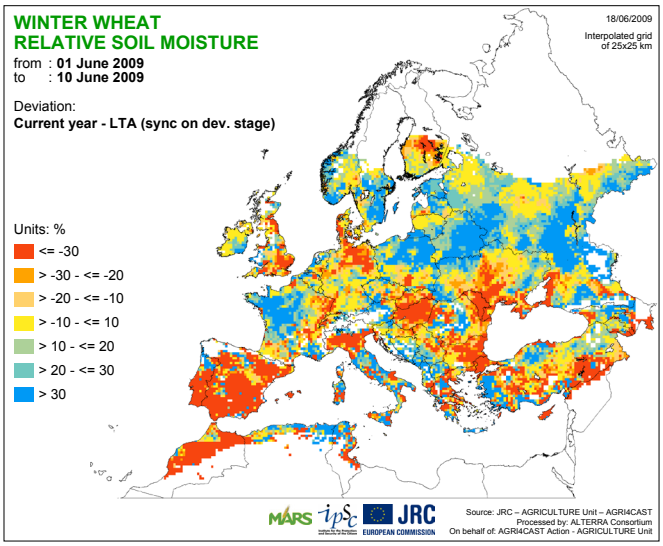


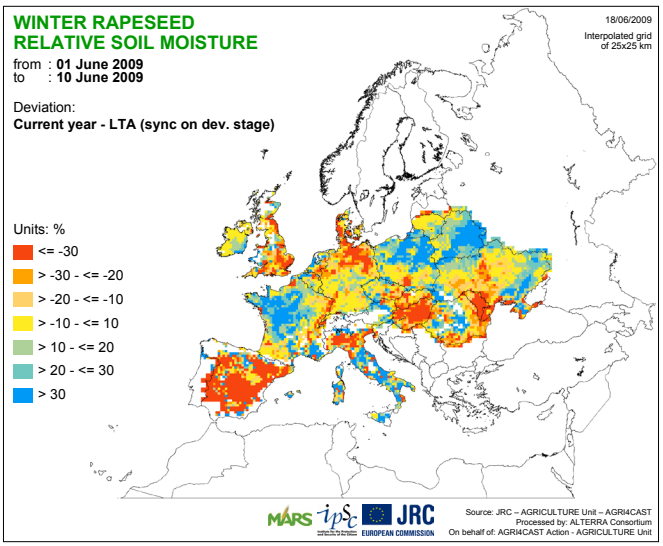


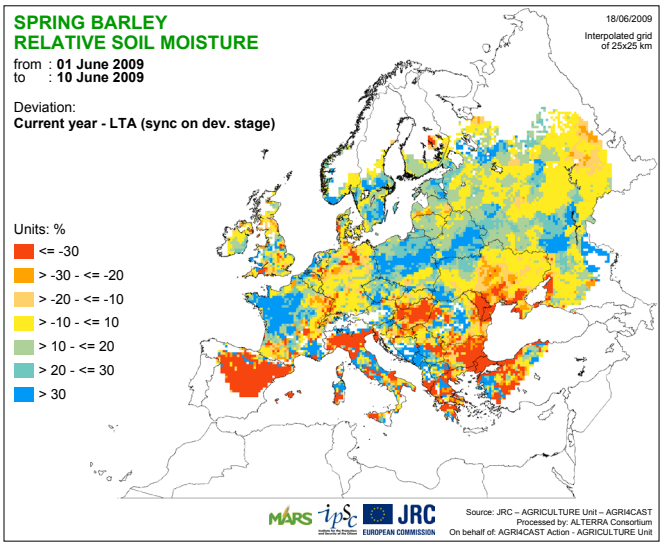


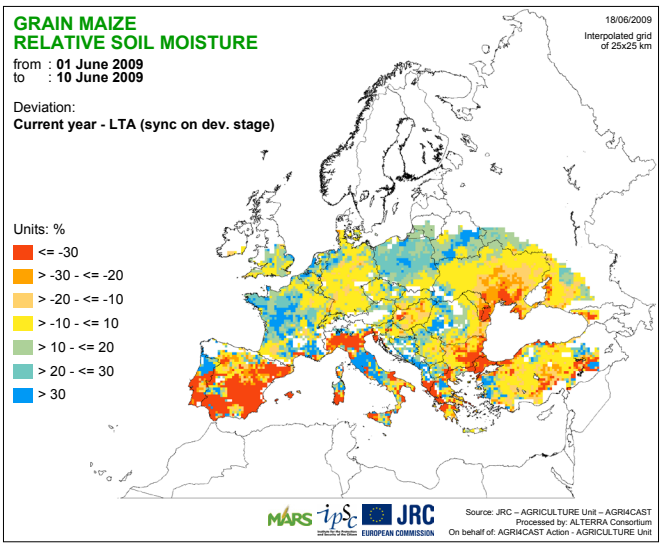


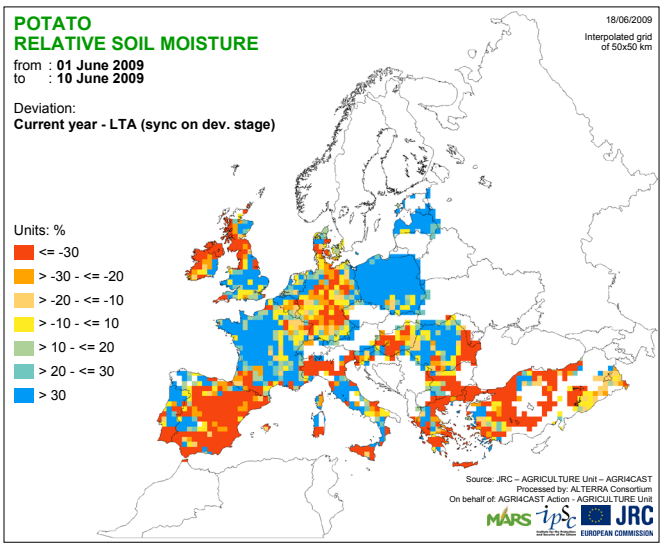
4.3. Relative soil moisture

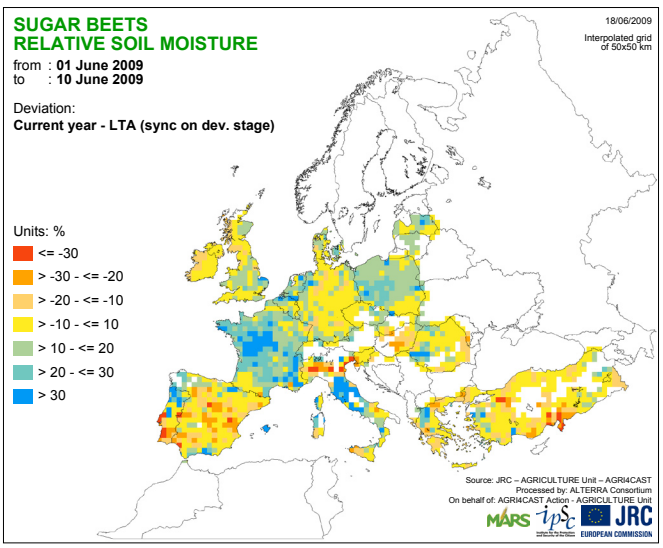






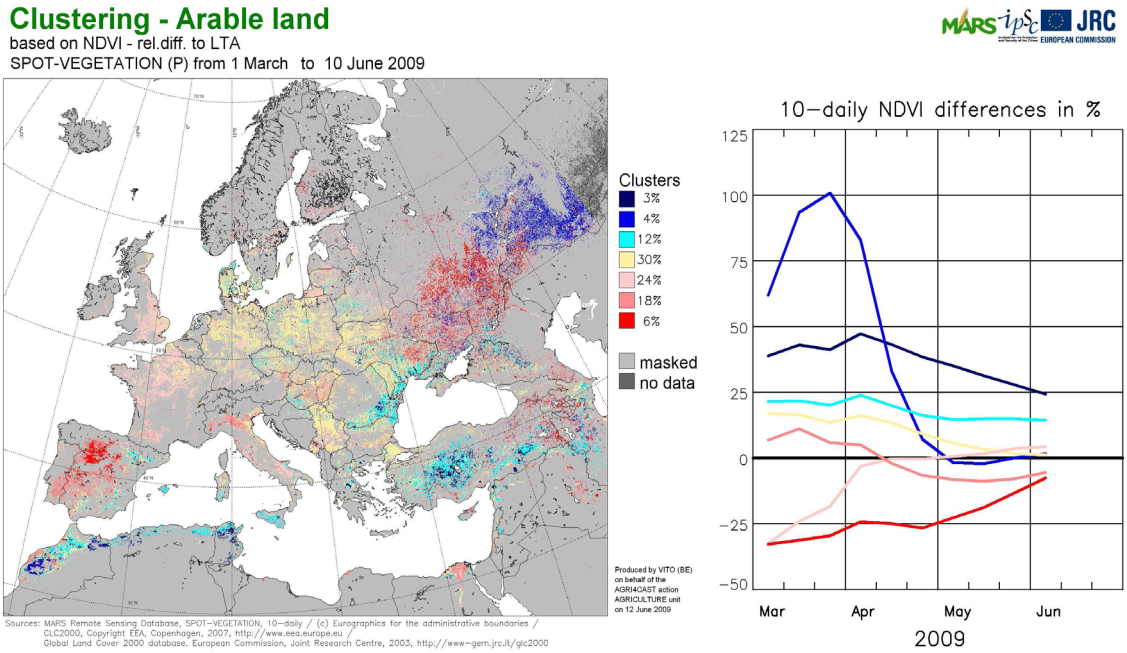




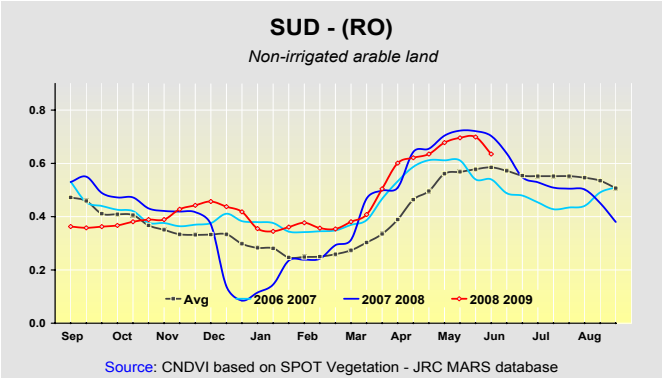


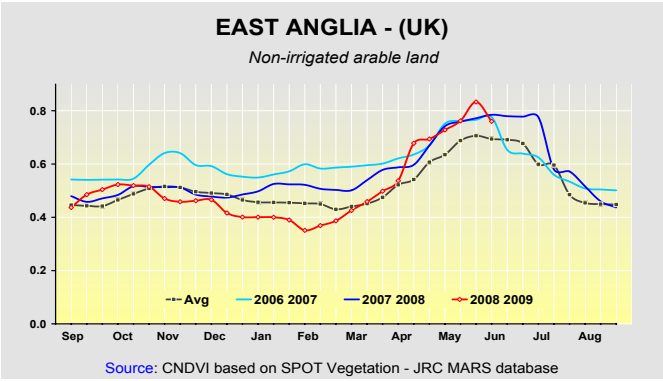
5. Satellite analysis: SPOT Vegetation

Normal to moderate conditions across Europe, low NDVI values in northern Spain. Good development along the western Caspian basin and Mediterranean areas.



The above map shows the results of the cluster analysis of NDVI values throughout the season from the first dekad of March to the first dekad of June. The behaviour of the NDVI values of the current year is compared with the one calculated for the long-term average (1998–2008). The red profile represents areas with negative conditions for the ongoing season: the maximum biomass peak was low and only in the very last dekads, in the senescence phase, did the actual NDVI values rise toward the average. The same profile in **Russia** indicates a delay in the vegetation development, due to the late sowing. The light pink curve is related to a less-than-optimal condition that climbed to normal through a vegetation boost in April. The warm temperature determined a steep increase in the NDVI curve leading the values to range around the NDVI saturation threshold. These conditions are mainly visible in **France** and across the principal agriculture regions in the **United Kingdom**. Here the crop development changed from advanced stages into normal stages, reaching the maximum of the biomass accumulation. The East Anglia profile is given as an example. The light-red areas highlights where the start of season was anticipated. In the cluster mentioned, the NDVI values, when approaching the senescence period, drop below the average. This behaviour in Hungary describes an early maximum stage followed by an early senescence; probably the scarce soil moisture affected the winter crops, shortening their phenological cycle. The yellow profile is correlated to an anticipated vegetation development with values slightly higher than average. The NDVI curve stoops toward normal values when the maximum is reached, but still remains above average. Similar conditions are present in **Northern Italy** and **Germany** and through central Europe. Good to very good conditions are displayed by light and dark blue respectively. In these areas, mostly along the Mediterranean and Caspian basins, the NDVI values are definitely above average through all the current growing season, For instance in **Romania** (Sud profile) and **Bulgaria**, NDVI profiles exhibit very high values with a steep decrease at the beginning of the senescence phase, owing to the prolonged water shortage. The blue profile, for eastern Russia, outlines the anticipated start of the season caused by less-than-average snow cover, and the frost kill that followed which dropped NDVI values to the average.





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