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MARS AGROMETEOROLOGICAL

Crop Monitoring in Europe

11 July to 10 September 2010

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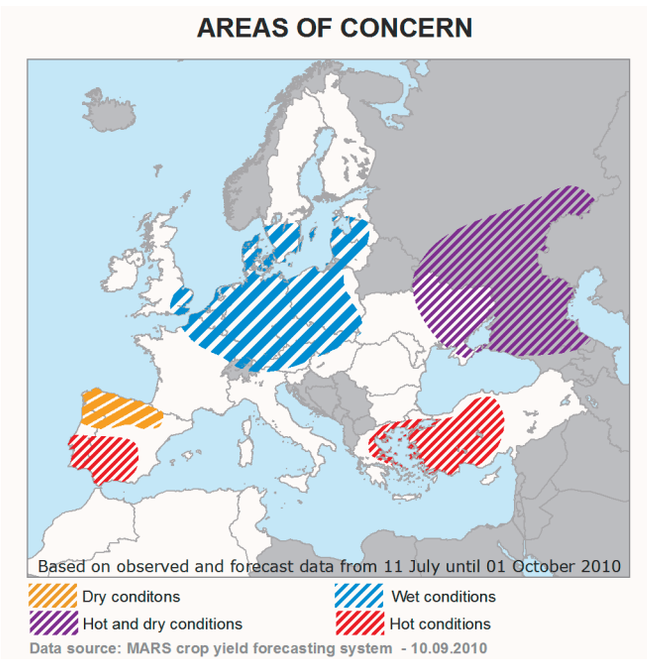
Northern Europe was affected by high rainfall, which hampered harvesting and preparations for the new season, while exceptionally hot and dry conditions in Russia led to crop



Eastern Europe and in particular Russia experienced persistent high temperatures coupled with high rainfall deficits which impacted winter crops and jeopardized final yields. Mid-August, also in western Mediterranean countries, extreme temperatures were recorded. Abundant rain in eastern EU (in July) and central EU (in August) hampered the harvesting and affected the quality of the grain. Favourable rains occurred in September in southern Italy, southern France and eastern EU.

Soft wheat yields are good in Spain (+21% compared to 2009) and Romania (+23%), but quite low in Portugal (-28%), Bulgaria (-12%), France and Germany (around -8%). Durum wheat in Spain is forecast at 1.9 t/ha (-24%). For barley, good yields are expected in Bulgaria (+66 %) and Spain (+24%); on the contrary the situation is particularly unfavourable in The Netherlands, Slovakia, Cyprus, Portugal and Denmark. Grain maize yield is forecast at +33% above the figure for 2009 in Bulgaria; +15% in Romania but -11% in Germany and -10% in Belgium. Sugar beet yield is also estimated at lower levels compared to 2009, -10%/-12% in Sweden, Belgium, The Netherlands and Poland.

EU 27 (21 September 2010)					
Crops	Yield t/ha				
	2009	2010	Avg 5yrs	%10/09	%10/5yrs
TOTAL CEREALS	5.1	**5.0**	4.9	-1.3	+2.7
Total Wheat	5.5	**5.3**	5.2	-2.9	+1.2
soft wheat	5.7	**5.6**	5.5	-3.1	+0.5
durum wheat	3.1	**3.1**	3.0	-1.4	+2.3
Total Barley	4.4	**4.3**	4.2	-2.1	+2.3
spring barley	3.8	**3.7**	3.7	-2.3	+1.4
winter barley	5.3	**5.2**	5.1	-1.6	+2.6
Grain maize	6.9	**7.0**	6.7	+1.8	+4.2
Other cereals	3.6	**3.5**	3.4	-1.9	+2.4
Sunflower	1.8	**1.8**	1.7	+4.2	+8.1
Rapeseed	3.3	**3.0**	3.1	-10.3	-3.8
Potato	30.0	**27.6**	28.2	-8.1	-2.2
Sugar beets	71.2	**65.0**	64.2	-8.8	+1.3

Sources: 2005-2009 data come from EUROSTAT EUROBASE and EES (last update: 08/09/2010) ; 2010 yields come from MARS CROP YIELD FORECASTING SYSTEM (up to 09/09/2010); Yields are forecast for crops with more than 10,000 ha per country; figures are rounded to 100 kg.
(1) Sorghum, rye, maslin, oats, triticale, mixed grain other than maslin, millet, buckwheat.

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1. Crop yield forecasts

AGRI4CAST crop yield forecasts at national level for EU-27 (21 September 2010)

Country	TOTAL WHEAT					SOFT WHEAT					DURUM WHEAT				
	2009	2010	Avg 5yrs	%10/09	%10/5yrs	2009	2010	Avg 5yrs	%10/09	%10/5yrs	2009	2010	Avg 5yrs	%10/09	%10/5yrs
EU27	5.5	**5.3**	5.2	-2.9	+1.2	5.7	**5.6**	5.5	-3.1	+0.5	3.1	**3.1**	3.0	-1.4	+2.3
AT	4.9	**4.9**	5.1	-0.2	-2.8	5.0	**5.0**	5.1	-0.2	-2.6	4.0	**4.0**	4.3	+0.9	-6.8
BE	9.4	**8.4**	8.5	-10.6	-1.5	9.4	**8.4**	8.5	-10.6	-1.5	-	**-**	-	-	-
BG	4.2	**3.7**	3.4	-12.0	+7.3	4.2	**3.7**	3.4	-12.0	+7.3	-	**-**	-	-	-
CY	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
CZ	5.2	**5.2**	5.1	-1.7	+1.0	5.2	**5.2**	5.1	-1.7	+1.0	-	**-**	-	-	-
DE	7.8	**7.2**	7.5	-8.3	-4.5	7.8	**7.2**	7.5	-8.3	-4.5	5.8	**5.2**	5.4	-9.7	-3.1
DK	8.0	**7.4**	7.3	-7.7	+1.1	8.0	**7.4**	7.3	-7.7	+1.1	-	**-**	-	-	-
EE	3.0	**3.1**	3.0	+3.8	+3.5	3.0	**3.1**	3.0	+3.8	+3.5	-	**-**	-	-	-
ES	2.7	**3.0**	2.8	+11.7	+7.0	2.8	**3.4**	3.1	+21.2	+10.1	2.5	**1.9**	2.3	-23.9	-15.7
FI	4.1	**3.7**	3.8	-8.3	-1.2	4.1	**3.7**	3.8	-8.3	-1.2	-	**-**	-	-	-
FR	7.5	**6.8**	6.9	-8.3	-1.1	7.7	**7.0**	7.1	-8.2	-1.0	5.1	**4.9**	4.8	-3.1	+3.0
GR	2.6	**2.5**	2.4	-6.3	+0.6	2.9	**2.7**	2.7	-5.1	-0.1	2.5	**2.4**	2.4	-6.8	+0.2
HU	3.8	**3.9**	4.2	+2.0	-6.6	3.8	**3.9**	4.2	+1.9	-6.6	3.7	**4.0**	4.0	+8.3	-1.4
IE	8.6	**8.7**	8.7	+1.5	-0.2	8.6	**8.7**	8.7	+1.5	-0.2	-	**-**	-	-	-
IT	3.5	**3.7**	3.6	+4.1	+1.1	5.0	**5.3**	5.2	+5.0	+1.1	2.9	**3.0**	2.9	+2.9	+1.0
LT	4.2	**3.9**	3.7	-7.1	+5.5	4.2	**3.9**	3.7	-7.1	+5.5	-	**-**	-	-	-
LU	6.6	**6.3**	6.2	-3.5	+2.8	6.6	**6.3**	6.2	-3.5	+2.8	-	**-**	-	-	-
LV	3.6	**3.5**	3.5	-3.2	+0.6	3.6	**3.5**	3.5	-3.2	+0.6	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	9.3	**8.7**	8.5	-6.1	+3.0	9.3	**8.7**	8.5	-6.1	+3.0	-	**-**	-	-	-
PL	4.2	**3.9**	3.9	-6.6	+0.5	4.2	**3.9**	3.9	-6.6	+0.5	-	**-**	-	-	-
PT	1.8	**1.3**	1.8	-27.9	-26.5	1.8	**1.3**	1.8	-27.9	-26.5	-	**-**	-	-	-
RO	2.4	**2.9**	2.6	+23.9	+13.1	2.4	**2.9**	2.6	+23.9	+13.1	-	**-**	-	-	-
SE	6.1	**5.7**	6.1	-6.0	-5.4	6.1	**5.7**	6.1	-6.0	-5.4	-	**-**	-	-	-
SI	4.0	**4.5**	4.3	+12.7	+3.6	4.0	**4.5**	4.3	+12.7	+3.6	-	**-**	-	-	-
SK	4.1	**3.8**	4.2	-5.5	-8.1	4.0	**3.8**	4.2	-5.3	-8.0	4.3	**3.8**	4.4	-10.6	-12.1
UK	7.9	**8.1**	7.9	+3.4	+3.3	7.9	**8.1**	7.9	+3.4	+3.3	-	**-**	-	-	-

Country	TOTAL BARLEY					GRAIN MAIZE					RAPE SEED				
	2009	2010	Avg 5yrs	%10/09	%10/5yrs	2009	2010	Avg 5yrs	%10/09	%10/5yrs	2009	2010	Avg 5yrs	%10/09	%10/5yrs
EU27	4.4	**4.3**	4.2	-2.1	+2.3	6.9	**7.0**	6.7	+1.8	+4.2	3.3	**3.0**	3.1	-10.3	-3.8
AT	4.6	**4.5**	4.6	-2.1	-2.1	10.6	**10.3**	10.2	-2.9	+0.6	3.0	**3.0**	3.1	-1.6	-3.3
BE	8.7	**8.0**	8.1	-7.3	-1.0	12.1	**10.9**	11.6	-10.2	-6.0	4.3	**4.1**	3.9	-4.7	+4.1
BG	2.0	**3.3**	2.8	+61.2	+19.6	4.2	**5.5**	3.9	+33.3	+41.2	2.6	**2.5**	2.2	-5.0	+16.4
CY	1.8	**1.5**	1.1	-15.2	+33.6	-	**-**	-	-	-	-	**-**	-	-	-
CZ	4.4	**4.3**	4.1	-1.9	+4.2	8.4	**7.8**	7.3	-7.8	+6.7	3.2	**3.1**	3.0	-2.1	+3.3
DE	6.5	**6.0**	6.0	-8.9	-0.4	9.8	**8.7**	9.2	-11.3	-6.5	4.3	**3.8**	3.8	-11.2	+0.3
DK	5.7	**5.2**	5.1	-10.0	+0.6	-	**-**	-	-	-	3.8	**3.6**	3.5	-5.3	+2.6
EE	2.7	**2.6**	2.5	-5.4	+1.8	-	**-**	-	-	-	1.7	**1.6**	1.6	-2.9	+0.9
ES	2.4	**3.1**	2.7	+25.9	+14.7	10.1	**10.0**	9.9	-0.4	+1.2	1.5	**1.6**	1.6	+8.4	+2.9
FI	3.6	**3.5**	3.5	-3.3	-1.5	-	**-**	-	-	-	1.7	**1.5**	1.4	-15.7	+2.5
FR	6.8	**6.3**	6.4	-7.1	-0.4	9.1	**8.8**	8.9	-3.1	-0.9	3.8	**3.3**	3.3	-12.2	-0.4
GR	2.3	**2.3**	2.3	+0.2	+0.2	9.8	**9.3**	9.7	-5.3	-4.2	-	**-**	-	-	-
HU	3.2	**3.5**	3.6	+9.4	-3.7	6.4	**6.7**	6.4	+4.1	+4.2	2.1	**2.2**	2.3	+6.3	-3.8
IE	6.1	**6.4**	6.5	+5.8	-1.9	-	**-**	-	-	-	-	**-**	-	-	-
IT	3.4	**3.6**	3.7	+6.3	-1.1	8.6	**9.4**	9.2	+8.8	+2.1	2.0	**1.9**	2.0	-8.4	-3.7
LT	3.1	**2.8**	2.7	-8.8	+6.2	-	**-**	-	-	-	2.2	**2.0**	1.8	-9.7	+9.3
LU	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
LV	2.5	**2.5**	2.3	-2.7	+5.2	-	**-**	-	-	-	2.2	**2.2**	2.0	-0.2	+6.7
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	6.8	**5.9**	6.1	-14.2	-4.0	13.0	**11.8**	11.5	-9.4	+2.1	-	**-**	-	-	-
PL	3.4	**3.1**	3.1	-9.8	+0.2	6.2	**5.8**	5.7	-6.2	+2.5	3.1	**2.9**	2.8	-7.0	+4.0
PT	1.8	**1.6**	1.9	-13.2	-13.8	6.8	**6.0**	5.7	-11.8	+4.6	-	**-**	-	-	-
RO	2.3	**2.5**	2.3	+11.4	+11.1	3.4	**3.9**	3.2	+15.0	+22.3	1.3	**1.5**	1.5	+9.9	-1.6
SE	4.6	**4.1**	4.2	-10.9	-2.5	-	**-**	-	-	-	3.0	**2.6**	2.7	-13.5	-2.1
SI	3.5	**3.9**	3.8	+11.1	+4.3	7.8	**8.0**	7.6	+2.2	+5.6	-	**-**	-	-	-
SK	3.4	**3.0**	3.6	-13.6	-16.5	6.8	**6.4**	6.3	-7.0	+1.1	2.3	**2.2**	2.3	-4.8	-2.5
UK	5.8	**5.9**	5.8	+2.0	+1.8	-	**-**	-	-	-	3.4	**3.1**	3.3	-6.3	-4.4

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 100 kg
Sources: 2005-2009 data come from EUROSTAT EUROBASE and EES (last update: 08/09/2010)
2010 yields come from MARS CROP YIELD FORECASTING SYSTEM (up to 09/09/2010)

AGRI4CAST crop yield forecasts at national level for EU-27 (21 SEPTEMBER 2010)

Country	SUNFLOWER					SUGAR BEETS					POTATO				
	2009	2010	Avg 5yrs	%10/09	%10/5yrs	2009	2010	Avg 5yrs	%10/09	%10/5yrs	2009	2010	Avg 5yrs	%10/09	%10/5yrs
EU27	1.8	**1.8**	1.7	+4.2	+8.1	71.2	**65.0**	64.2	-8.8	+1.3	30.0	**27.6**	28.2	-8.1	-2.2
AT	2.7	**2.7**	2.6	-2.4	+2.2	70.3	**68.0**	67.8	-3.3	+0.2	32.5	**31.6**	31.9	-2.8	-1.0
BE	-	**-**	-	-	-	82.7	**73.6**	72.7	-11.0	+1.2	44.7	**41.8**	43.8	-6.6	-4.7
BG	1.8	**1.9**	1.5	+3.7	+22.9	-	**-**	-	-	-	16.3	**17.2**	15.5	+5.7	+11.2
CY	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
CZ	2.4	**2.2**	2.3	-7.7	-4.9	57.9	**57.9**	54.6	+0.0	+6.0	26.2	**24.1**	25.8	-7.9	-6.5
DE	2.4	**2.0**	2.3	-15.5	-10.9	66.6	**60.6**	61.8	-8.9	-1.9	44.3	**38.6**	41.8	-12.9	-7.7
DK	-	**-**	-	-	-	54.1	**53.7**	56.3	-0.8	-4.5	35.4	**36.7**	36.9	+3.5	-0.6
EE	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
ES	1.0	**1.2**	1.0	+16.1	+14.3	83.6	**76.3**	74.2	-8.7	+2.8	29.1	**28.9**	27.9	-0.5	+3.9
FI	-	**-**	-	-	-	37.8	**39.6**	38.4	+4.9	+3.3	28.6	**26.3**	25.2	-8.2	+4.2
FR	2.4	**2.3**	2.4	+0.0	-2.0	93.7	**83.8**	85.2	-10.6	-1.7	43.8	**41.3**	43.0	-5.7	-4.0
GR	1.2	**1.2**	1.2	+2.6	+4.0	66.1	**62.9**	64.3	-4.9	-2.2	25.3	**25.3**	24.7	-0.1	+2.5
HU	2.3	**2.3**	2.3	+0.0	+2.1	53.0	**56.0**	52.6	+5.8	+6.5	25.3	**24.7**	25.1	-2.5	-1.7
IE	-	**-**	-	-	-	-	**-**	-	-	-	28.3	**33.3**	32.3	+17.8	+3.1
IT	2.3	**2.2**	2.2	-2.2	-0.4	54.6	**57.4**	55.7	+5.1	+3.0	24.8	**24.9**	24.9	+0.3	-0.1
LT	-	**-**	-	-	-	45.2	**45.2**	41.7	+0.1	+8.5	14.2	**12.0**	12.0	-15.4	+0.4
LU	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	-	**-**	-	-	-	17.5	**16.4**	15.6	-6.2	+5.7
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	-	**-**	-	-	-	78.9	**69.4**	69.8	-12.0	-0.7	46.3	**41.3**	43.9	-10.7	-5.9
PL	-	**-**	-	-	-	54.3	**48.1**	47.5	-11.4	+1.3	19.9	**18.4**	18.8	-7.4	-1.9
PT	0.6	**0.5**	0.6	-14.8	-12.8	-	**-**	-	-	-	14.4	**14.7**	14.6	+1.9	+0.6
RO	1.4	**1.5**	1.3	+9.4	+18.8	34.6	**36.2**	30.6	+4.5	+18.1	15.8	**14.1**	14.3	-10.4	-1.2
SE	-	**-**	-	-	-	60.5	**53.8**	52.9	-11.0	+1.7	31.8	**28.0**	30.0	-12.0	-6.6
SI	-	**-**	-	-	-	-	**-**	45.3	-	-	-	**-**	-	-	-
SK	2.2	**2.1**	2.2	-7.1	-6.2	56.4	**55.3**	52.8	-1.8	+4.7	18.4	**15.1**	16.2	-18.2	-7.1
UK	-	**-**	2.0	-	-	70.0	**64.7**	61.8	-7.5	+4.6	40.9	**41.3**	41.5	+0.9	-0.7

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 100 kg
Sources: 2005-2009 data come from EUROSTAT EUROBASE and EES (last update: 08/09/2010)
2010 yields come from MARS CROP YIELD FORECASTING SYSTEM (up to 09/09/2010)

AGRI4CAST crop yield forecasts at national level for Maghreb and Black Sea (21 SEPTEMBER 2010)

Country	WHEAT (t/ha)					BARLEY (t/ha)					GRAIN MAIZE (t/ha)				
	2009	2010	Avg 5yrs	%10/09	%10/5yrs	2009	2010	Avg 5yrs	%10/09	%10/5yrs	2009	2010	Avg 5yrs	%10/09	%10/5yrs
BY	3.5	**3.2**	3.4	-8.9	-5.4	3.5	**3.3**	3.1	-4.8	+6.0	4.7	**5.1**	4.4	+9.2	+16.1
DZ	-	**1.4**	1.4	-	-2.8	-	**1.2**	1.4	-	-15.7	-	**-**	5.0	-	-
MA	2.1	**1.8**	1.4	-15.0	+27.3	1.7	**1.3**	0.9	-24.9	+46.0	-	**-**	0.8	-	-
TN	2.2	**1.7**	1.7	-20.3	+4.1	1.8	**1.2**	1.3	-36.3	-12.2	-	**-**	-	-	-
TR	-	**2.2**	2.3	-	-0.7	-	**2.5**	2.3	-	+8.3	-	**7.1**	7.0	-	+0.7
UA	3.1	**2.5**	2.9	-17.8	-12.1	2.4	**2.0**	2.2	-18.2	-11.8	5.0	**4.5**	4.3	-9.1	+5.0

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 100 kg

Sources: DZ (FAO, last 5 years: 2003-2007), MA (Min. of Agriculture & partner INRA-Maroc, last 5 years: 2005-2009), TN (Min. of Agriculture and CNCT, last 5 years: 2005-2009), TR (FAO, last 5 years: 2005-2009), UA (data from Leonid Pogorilyy Ukrainian Scientific Research Institute).

Abstract

The 5th printed MARS Bulletin 2010 (Vol. 18, No. 5) covers meteorological analysis and crop yield forecasts for the period 11 July to 10 September 2010.

Previous related analysis available:

—Climatic update, 11/06/2010 to 04/07/2010, (CU2010/6)

—**Complete Bulletin, 11 June to 10 July, (Vol. 18, No. 4)**

Next printed issue

Vol. 18, No. 6: 11 September - 20 October 2010 analysis and forecasts.

Contributions

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

Head of Unit: S. Kay

Editor: B. Baruth

Analysis and reports: J. Bojanowski, A. Bussay, M. El Aydam, I. Garcia de Cortazar-Atauri, W. Kasperska-Wolowicz, F. Micale, A. Rosenmund, L. Seguini

Reporting support: C. Aspinall

Data production: I. Cerrani, D. Fanchini (JRC/IPSC/MARS); Alterra (NI)/Vito (BE)/Meteoc-lt (NI) Consortium, Meteofrance (FR).

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MARS Agrometeorological web database is accessible at: http://www.marsop.info

MARS stands for Monitoring Agricultural Resources.

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Technical note The long-term average used within this bulletin as a reference is based on an archive of data covering 1975–2009. The CNDVI is an unmixed normalised vegetation index on the base of Corine land cover 2000 for arable land or grassland.

Contact information

For any questions contact the editorial staff at: JRC — IPSC, T.P. 483, I-21027 Ispra (VA), Italy

E-mail: agri4cast@jrc.ec.europa.eu - Tel.: (39) 03 32 78 50 86 - Fax: (39) 03 32 78 30 33

http://ipsc.jrc.ec.europa.eu/ - http://ec.europa.eu/dgs/jrc/index.cfm

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The mission of the IPSC is to provide research results and to support EU Policy-makers in their efforts towards global security nd towards protection of European citizens from accidents, deliberate attacks, fraud and illegal actions against EU policies.

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2. Agrometeorological overview

Persistently high temperatures in eastern Europe and Russia severely affected winter crops, jeopardising final yields. In mid-August, extreme temperatures were also recorded in western Mediterranean countries. Abundant rain in eastern Europe (in July) and central Europe (in August) hampered harvesting and affected the quality of grain.

2.2. TEMPERATURES AND SOLAR RADIATION

In general, GDD accumulation in the Europe was normal while again unusually high temperatures characterised the Black Sea area and southern Russia. Portugal and southern Spain also suffered from unseasonably high temperatures.

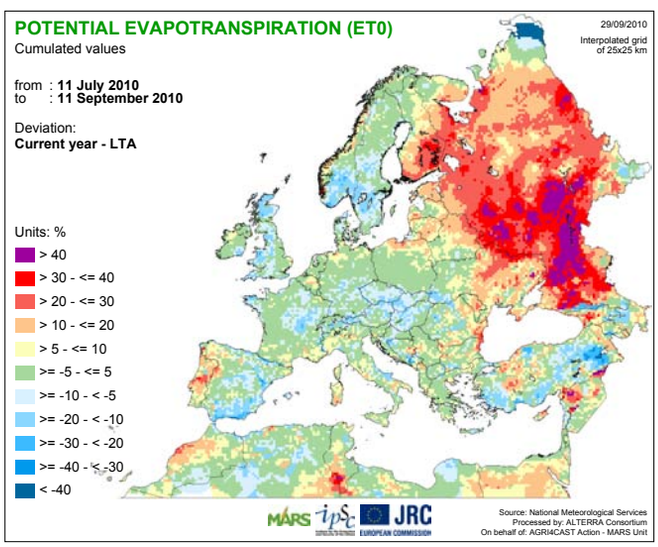
During almost the entire month of **July**, a Siberian anticyclone remained in place over Russia and influenced the weather over the whole continent: persistently high temperatures in Russia and the Black Sea basin, more seasonal temperatures in western Europe (British Isles, France, Benelux), and high temperatures in the Iberian peninsula. In eastern Europe (including Finland) and Russia, maximum daily temperatures were 10°-14 °C above the seasonal average: in southern Russia maximum temperatures remained above 40 °C for several days. These thermal conditions severely hit winter crops, halting biomass accumulation and accelerating senescence. Generally, more seasonal conditions were recorded in the EU countries. However, in eastern Germany, western Poland, Greece and Cyprus, maximum temperatures reached 38 °C, 36.2 °C, 38.5 °C and 45 °C, respectively.

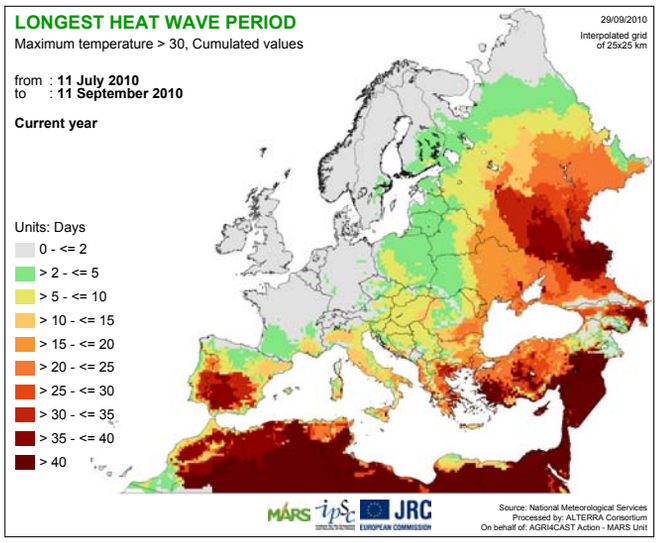
GDD accumulation was obviously very high in Russia and in the whole of eastern Europe, as well as around the Black Sea basin.

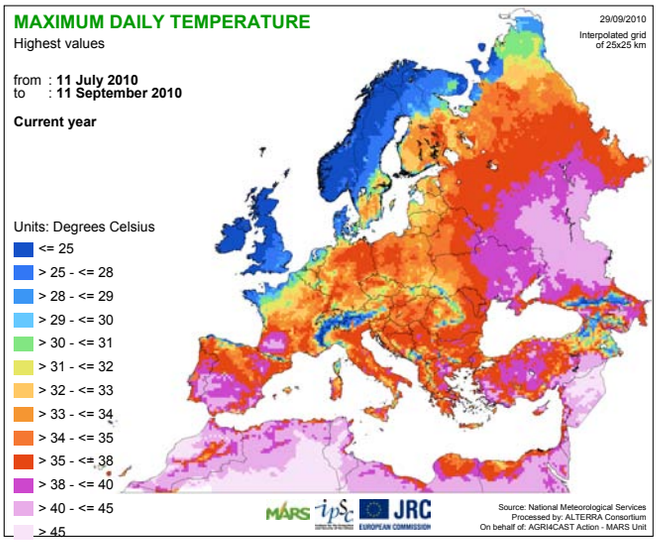
In **August** weather conditions were mainly influenced by three consecutive cyclones, all centred on northern Europe. These led to relatively cooler conditions in northern Europe, while hot African winds blew over the Mediterranean, in particular the extreme west, and the Black Sea basin. There, the Siberian anticyclone practically remained static during the whole first half of the summer, with dry and hot weather persisting in all areas between Greece and southern Russia, including Turkey and Belorussia. August was one of the hottest since 1975; in fact, several consecutive days (between 10 July and 15 August) saw the highest temperatures ever recorded in the MARS dataset.

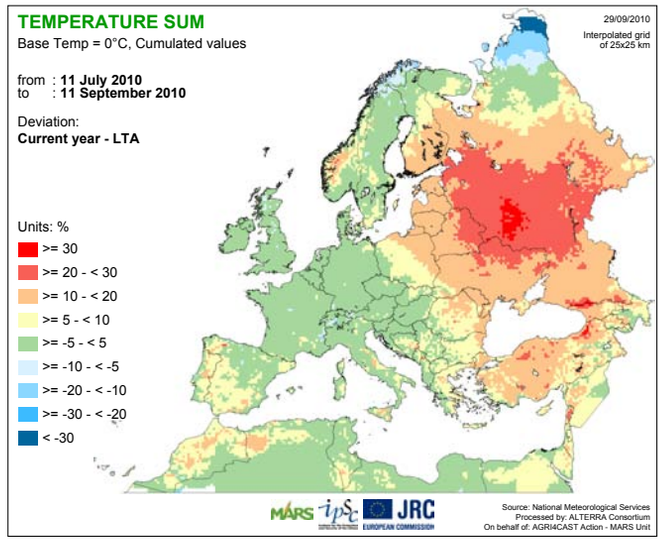
Unseasonably high temperatures were also recorded on the opposite side of the Mediterranean (Spain, Portugal and Morocco). There, maximum temperatures even exceeded 41 °-42 °C (in Morocco rising to around 47 °- 48 °C) and persisted above 30 °C over the entire period considered. Generally the highest temperatures were recorded during the second ten-day period in August. In this period, similar to July, minimum temperatures were also largely above seasonal values, significantly accelerating crop development and very likely stopping biomass accumulation. At the end of the period, GDD accumulation (Tbase 0 °C) significantly exceeded LTA values: 80°-120° (+15 % compared to the LTA) in Greece, Bulgaria, southern Romania, central and eastern Ukraine, Russia and Turkey. In southern Spain and Portugal, similarly high values were estimated. Areas also saw cumulative evapotranspiration levels significantly higher than seasonal values, except in southern Spain where, due to more cloudy conditions and less wind than usual, estimated values were somewhat below the LTA values. In central and western Europe as well (central and northern France, Germany, United Kingdom, Benelux, Denmark, Sweden, Czech Republic, Slovakia, Austria and northern Hungary) lower than normal cumulative ET0 values were estimated. This was mainly because of the relatively cooler temperatures in these areas.

In **September**, synoptic air mass circulation changed, leading to generally more seasonal weather. Temperatures returned to within normal ranges, and seasonal or slightly lower GDD accumulation values were estimated over almost the entire continent. The exception was central and eastern Turkey, which still had higher than normal values. In central and eastern Europe in particular, maximum temperatures were below the average. Only in southern Russia, the Iberian peninsula and south-west France were values above 32 °C recorded. Evapotranspiration was significantly lower than average in the central part of eastern Europe but again much higher in Russia.







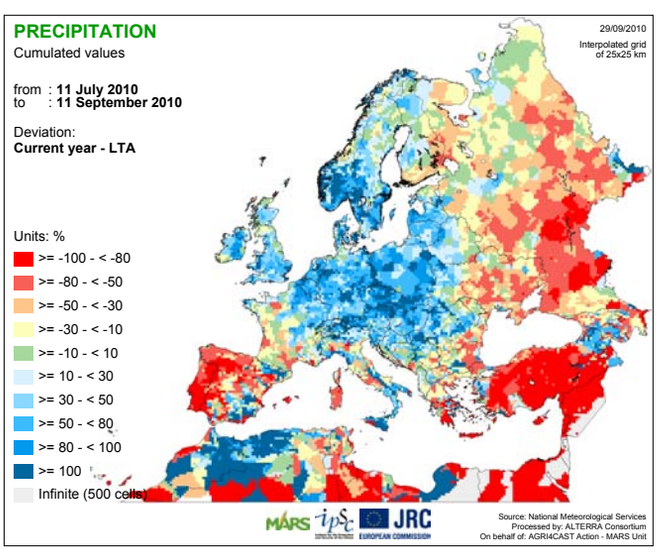


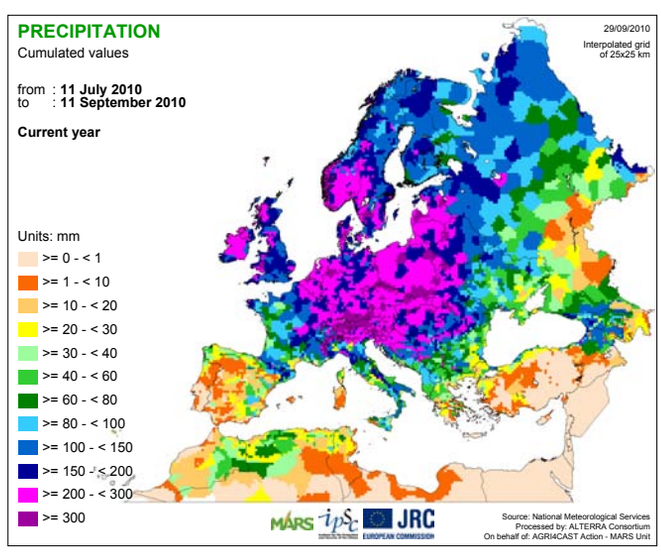
2.2. RAIN AND CLIMATIC WATER BALANCE

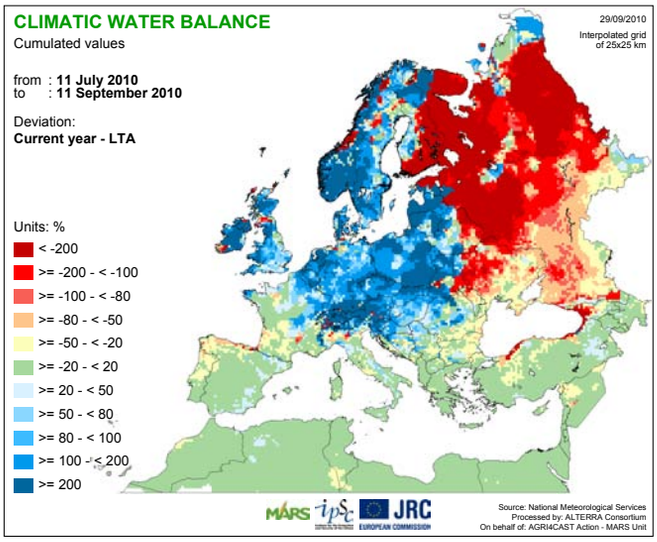
Abundant and persistent rain in central and northern Europe hampered cereal harvesting, while rain was absent over the whole Mediterranean and Russia. Favourable rains occurred in September in southern Italy, southern France and eastern Europe.

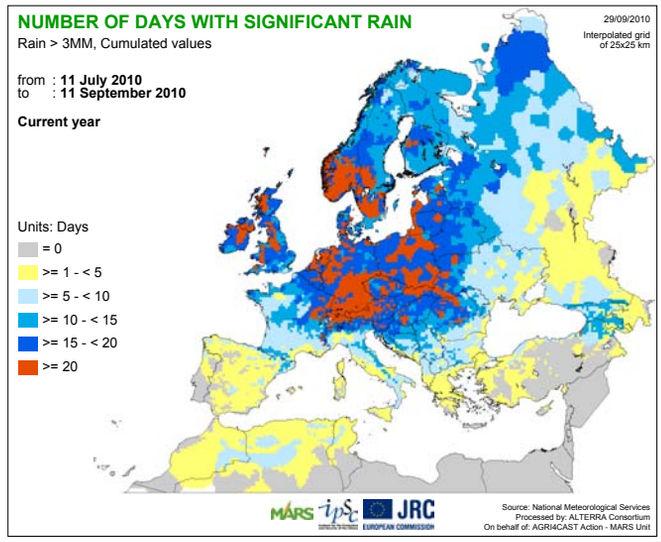
In **July**, the unusual synoptic configuration recorded led to a prolonged and persistent absence of rain over Russia, which, coupled with high temperatures, resulted in highly stressing conditions for winter crops during the last part of their life cycle, as soil moisture was rapidly depleted. Also, the entire Mediterranean area (with the exception of central and northern Italy) did not receive any rain. At the same time, the presence of the Siberian anticyclone kept all Atlantic rain fronts in place over continental Europe. Therefore, abundant and quite persistent rains were recorded in Ireland, the western UK, Germany (particularly in the south), the Czech Republic, Poland, Slovakia, Slovenia, the Baltic states, southern Sweden, Hungary and Romania.

The most significant agro-meteorological events occurred in **August**, when there was persistent and abundant rain all over central, northern and eastern Europe. Rainfall in July had already negatively affected these areas. The rain in August hampered cereal harvesting. In particular, north-east France, the southern UK, Benelux, Germany, Poland, Austria and Slovakia experienced very persistent and abundant rain: in northern Germany, for example, there were more than 12 rainy days with a total rainfall of around 300 mm (+350 %); in Belgium, there was 150-200 mm of rain (+250 %); in southern Poland, already affected by flooding in previous months, 100-120 mm fell (+120 %); Denmark saw 200-220 mm (+250 %); 120 mm fell in north-east France (+200 %); and 100 mm fell in the eastern UK (+150 %). Dry time-windows never exceeded 2 or 3 days, and given the soil characteristics accessibility for heavy harvesting machinery was very limited or impossible. The rain not only delayed open field activities (e.g. harvesting, field preparation, rape seed sowing, etc.) but also affected grain quality because of the favourable conditions for fungus and mycotoxins. In these areas, the weather was luckily more favourable in the first ten days of September, when the rain was mainly concentrated in Ireland, southern France, southern Italy, and, unfortunately, again in Hungary, Slovakia, and eastern and southern Poland. In contrast, rain was practically absent in August around all of the Mediterranean basin, the only exceptions being Andalucía and Algeria, where local showers brought 30-60 mm of water.









In **September** on average, around 56-60 mm of rain was recorded in several Mediterranean areas, favouring the spring crops still in active growth. In Ireland, the rain shortage experienced in July and August was partially made up in September by quite abundant rain: 120 mm (+300 %).

In August, the climatic water balance in southern France, Ireland, Finland, Ukraine and Russia was influenced by both higher evapotranspiration and reduced rainfall. In these areas, large deficits were estimated as compared with the LTA. The situation was the opposite in central and northern Europe due to the above-mentioned abundant rain.

3. Review of the season at country level

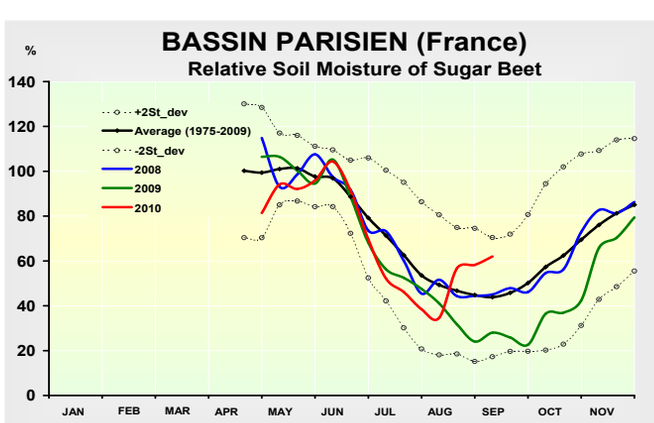
E U - 27

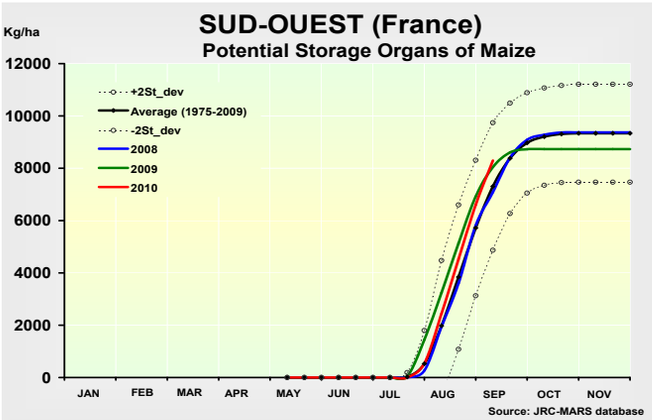
France — Dry conditions in the south slightly affected grain maize and sunflower yields. Rainfall in August allowed average yield levels for sugar beet to be reached in northern regions. Only potato production appeared to be affected by the previous dry conditions.

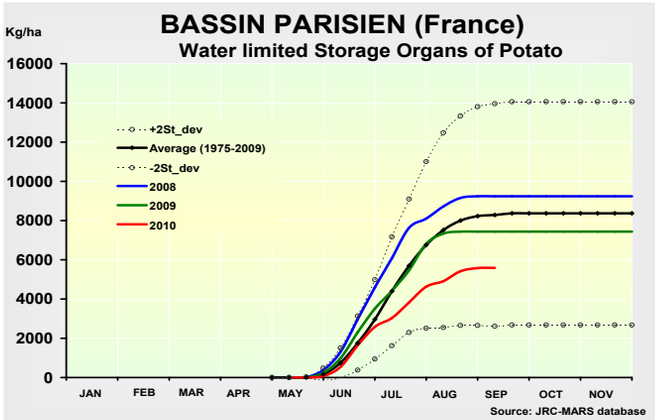
Sunflower and grain maize yields are forecast to be 2.3 t/ha (-2.0 %) and 8.8 t/ha (-0.9 %), respectively. The sugar beet forecast is 83.8 t/ha, 1.7 % below the average, and the forecast for potato is 41.3 t/ha (-4.0 %). Forecasts for soft wheat remain 7.0 t/ha and for durum wheat 4.9 t/ha (-1.0 % and +3.0 %, respectively, compared with the 5-year average). The winter barley forecast is 6.6 t/ha (0.4 % up on the 5-year average) and the forecast for rapeseed is 3.3 t/ha (-0.4 %). For spring barley, the forecast is 5.8 t/ha, 4.4 % below average.

Temperatures were fairly low for the season during the second dekad of August, but then approached normal values. On the other hand, rainfall at the end of August was higher than the seasonal average, particularly in northern regions. This improved the water conditions for summer crops in these areas (sugar beet and potato). In contrast, south-western areas were relatively dry in the last two dekads of August, and low but significant rainfall was registered in the first dekad of September. This lack of water during the last two months (July and August) could affect the soil water content available for grain maize and sunflower in these regions. However, given that radiation levels were near seasonal values and temperatures were not too high, crop water demand was moderate.

Thus, production levels of grain maize remained close to the average values of recent years, with a slight decrease compared to the last 3 years, when production reached the highest values ever registered. For sunflower, the weather conditions of recent weeks have allowed the harvesting of early-planting fields in all the main production areas (Midi-Pyrénées, Poitou-Charentes, Centre and Aquitaine). However, because of the lack of rainfall in recent months in these regions, crop yield values are quite variable depending on soil water availability. Thus, the weather in the coming weeks and harvest conditions will be crucial for maintaining good production levels.







In northern regions (Picardie, Nord, Pas de Calais, Champagne-Ardenne) the situation is different for sugar beet and potato production. Potato production thus appears very affected by dry conditions in early summer, with yields well below average. However, rainfall recorded in these areas from 10 August has had a positive impact on the sugar beet yield, even though it remains lower than that of recent years (-10.6 % compared with 2009). Climatic conditions in the coming weeks could reduce the decline in yield performance.

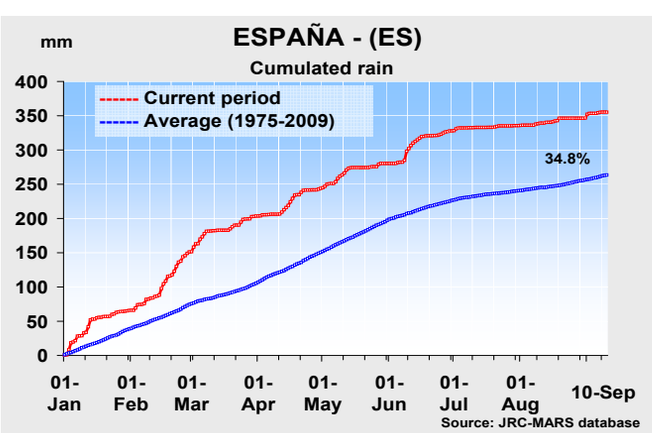
Spain — After a dry summer, average production levels for summer crops.

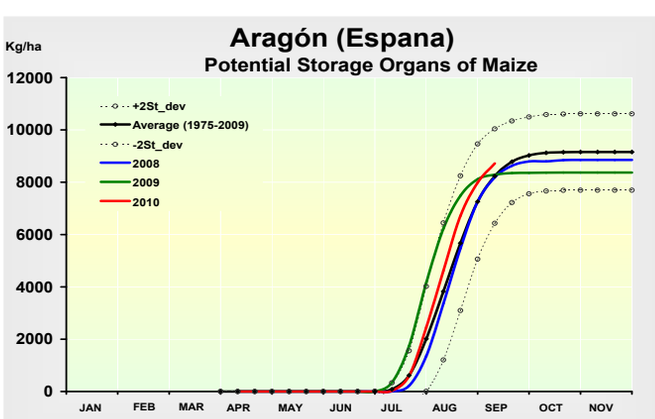
Sunflower and grain maize are forecast to yield 1.2 t/ha and 10.0 t/ha, respectively (+14.3 % and +1.2 % compared with the 5-year average). The sugar beet forecast is 76.3 t/ha (+2.8 %) and the potato forecast is 28.9 t/ha (+3.9 %). The forecasts for soft wheat and durum wheat remain 3.4 t/ha and 1.9 t/ha, respectively (+10.1 % and -15.7 %). The winter and spring barley forecasts are 2.9 t/ha and 3.1 t/ha, respectively (+17.8 % and +13.4 % above the 5-year average).

Temperatures during the second and the last weeks of August were quite variable. Those recorded in the second dekad of August were thus slightly below seasonal values (up to -8 °C in northern areas). However, this situation was quickly reversed by a very warm period (25-26 August), where temperatures above normal values (up to 8 °C) were registered. The north-eastern regions (Pais Vasco, Navarra and Aragon) were the most affected by this warm period. The first dekad of September saw average temperatures. At the same time, rainfall levels were well below seasonal values, especially in the northern half of the country. Only some areas of the Mediterranean coast (Cataluña and Murcia) saw significant rainfall during the second dekad of August, but without exceeding seasonal values. Cumulative radiation during this period remained close to seasonal values.

These conditions have had only a very slight effect on the yield forecasts for summer crops. This could be partly explained by the high quantities of cumulated rain during the winter and spring in Spain. These rains helped fill the watersheds, and supplied enough water for irrigation during the dry period. Thus, grain maize shows production levels similar to those of recent years. The availability of water combined with seasonal weather conditions led to good development and growth levels.

Moreover, the sunflower harvest is virtually complete in Andalucía (main production area), and shows production levels above normal. Good weather conditions during the entire crop cycle for this crop favoured these results. The expected yield for potato remains very close to that of last year. Water availability (for irrigation) has helped crops benefit from good temperatures without being too affected by the lack of rain. Finally, the planting conditions for sugar beet during spring have affected its development and growth. The weather conditions during the coming weeks will be crucial to maintain yield levels close to the average for the last 5 years, though well short of 2009 values.



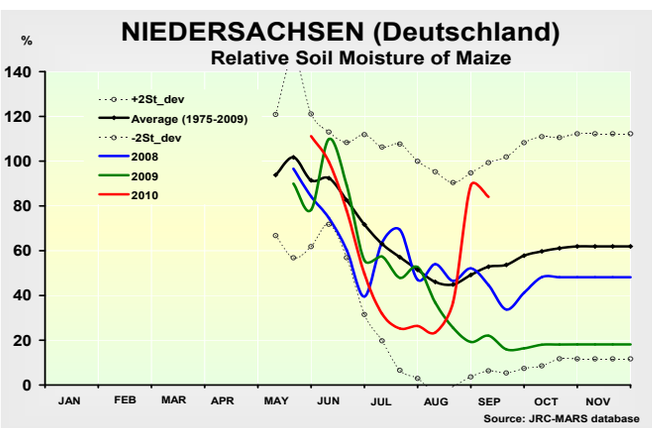


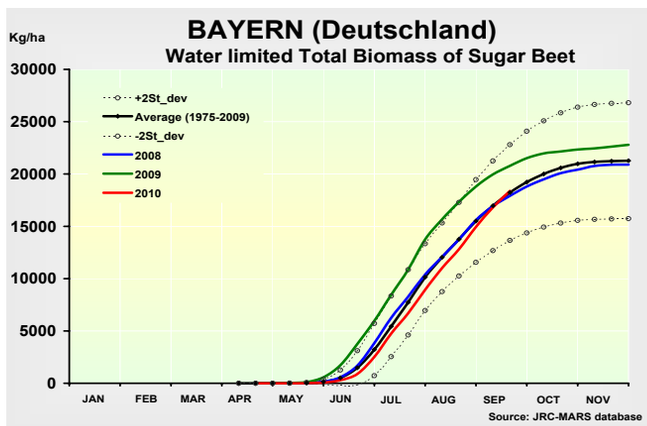
Germany — Wet conditions confirmed the poor yield expectations and reduced grain quality.

The poor yield forecast is confirmed, and due to the heavy rainfall quality also seems to be compromised: 5.2 t/ha and 7.2 t/ha for durum and soft wheat, respectively (-3.1 % and -4.5 % compared with the 5-year average, and even lower compared to last year's figures), 4.6 t/ha and 6.4 t/ha for spring and winter barley (-1.2 % and -0.6 %) and 3.8 t/ha for rapeseed (+0.3 %). Due to the extremely wet conditions, forecasts for summer crops have been revised downwards: grain maize is estimated at 8.7 t/ha (-6.5 %), potato at 38.6 t/ha (-7.7 %), sugar beet at 60.6 t/ha (-1.9 %) and sunflower at 2.0 t/ha (-10.9 %).

The accumulated temperature sum in the first two dekads of July was above the LTA, especially in the northern half of the country. Starting from 20 July, however, temperatures dropped below average, leading to a slight deficit (up to -10 %). In the same period, the entire country was hit by extremely rainy weather. Alone in the period considered, rainfall at country level was 128 mm, more than double the long-term average. Even higher values were observed in eastern regions (176 mm in Nordrhein-Westfalen and 154 mm in Niedersachsen). These extremely high values were coupled with a high number of rainy days (7 – 16) across the country, negatively affecting the harvest. The delay in the cereal harvest significantly reduced grain yields, leading to pre-harvest sprouting and a greater risk of fungal attacks.
For grain maize, the wet conditions have caused fertility problems in the lighter soils due to the leaching of nutrients and the impossibility to access fields, affecting the final part of the grain filling phase.

Sugar beet and potato restarted their biomass accumulation, previously reduced due to the dry spell in July, but need some sunny days in order to reach a satisfactory sugar content and yield. Simulated values for sunflower biomass and storage organ accumulation point to a sub-optimal situation strongly affected by excess water and low sunshine.





Poland — After a warm July, conditions were again too wet, which hampered cereal harvesting and summer crop yield formation.

For Poland, the crop yield forecasts are: soft wheat 3.9 t/ha (-6.6 % compared to 2009), winter barley 3.8 t/ha (-10.0 %), spring barley 2.9 t/ha (-9.6%), rapeseed 2.9 t/ha (-7.0 %), grain maize 5.8 t/ha (-6.2%), potato 18.4 t/ha (-7.4 %) and sugar beet 48.1 (-11.4%).

June was warmer than usual by 2.5 °C in the south and 3.5 °C in the north of Poland. The hottest period in the summer was between 10 and 24 July, when several days with maximum temperatures above 30 °C were recorded. This time, cumulative active temperatures in the northern part of the country were 30-40 % and in the southern part 25-30 % higher than LTA. On 22 July in western areas, mainly in Wielkopolskie, the maximum temperature exceeded 35°C. In this region and Dolnośląskie, the main areas of grain maize cultivation, the warm spell persisted for 8 days and most likely brought heat stress for the maize, which was just flowering. In August, temperatures remained seasonal in the west, whereas the east was warmer, for example in the middle of the month in Lubelskie a short heat wave was recorded with temperatures up to 34 °C.

The first dekad spell in September was colder than usual, all over the country by 15 %.

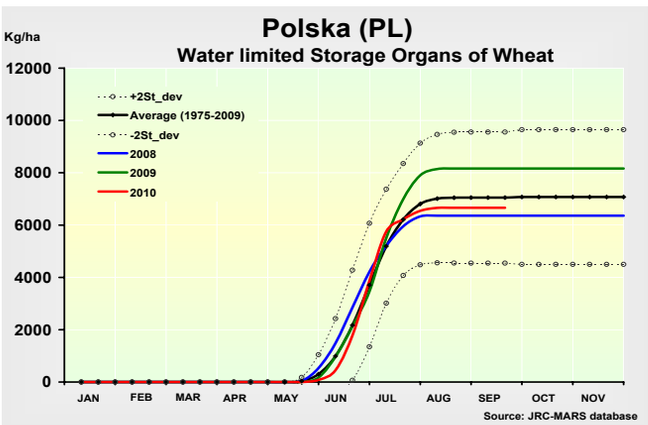
In July across the country (over three warm weeks), cumulative rainfall was slightly below the LTA. The western part of Poland experienced very scarce rain and drought (in Pomorskie, Kujawsko-Pomorskie and Wielkopolskie <20 mm) mainly on light soils. Since 24-25 July, frequent rainfalls have been recorded all over the country; initially, the western and (again) southern regions in particular experienced intensive showers (80-100 mm in just a few days). Rainfall continued in August.

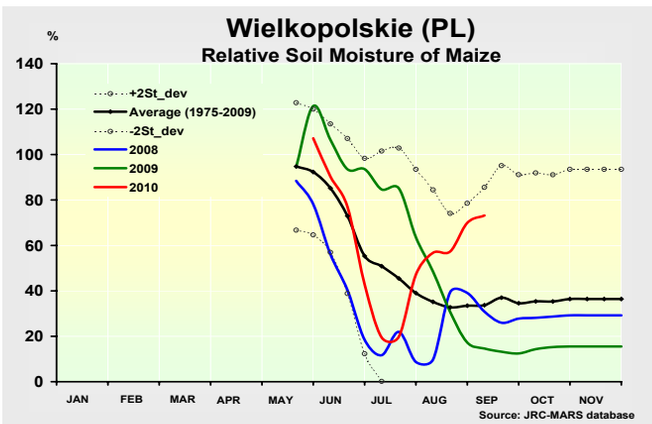
The rain was less frequent in the middle of the month, and the last ten days in August were again wet. Showers continued in September, especially in the eastern part of Poland, where rainfall above 60-80 mm was recorded. Between 1 July and 10 September cumulative rainfall in the country exceeded the seasonal value by 75 % (by 50 % since the beginning of the year). Most summer precipitation fell during the period of cereal harvesting, possibly reducing

grain quality and causing sprouting in late harvested grains. The changeable agro-meteorological conditions in Poland (too wet then warm and again wet) increased the risk of summer crop diseases and rotting potatoes. The frequent rainfall impeded harvesting and hindered machinery access to fields to finish the process and prepare fields for the next winter crops.

The development of winter crops in Poland was delayed compared to the average, but spring crops experienced accelerated development during the long hot spell in July.

Now, because of the cold weather this has slowed down. Soil moisture under potato crops is very high, the model pointing to potato yields worse than average. Grain maize is ripening and is slightly advanced compared to the average, while sugar beet development is average. The yield potential is average for sugar beet, but good for grain maize in water-limited conditions.





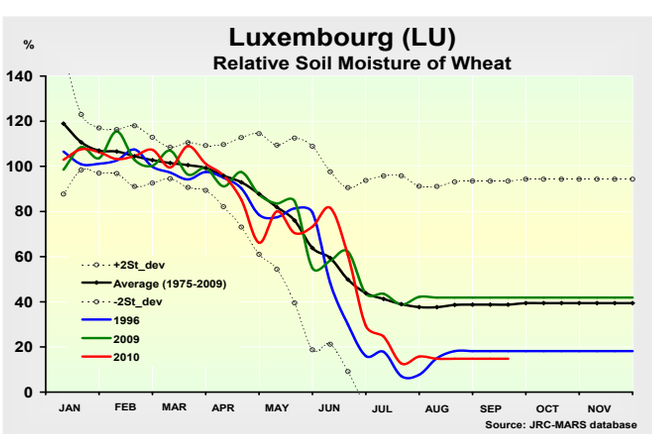
Belgium, Luxemburg, The Netherlands — long drought followed by exceptionally high rainfall in August.

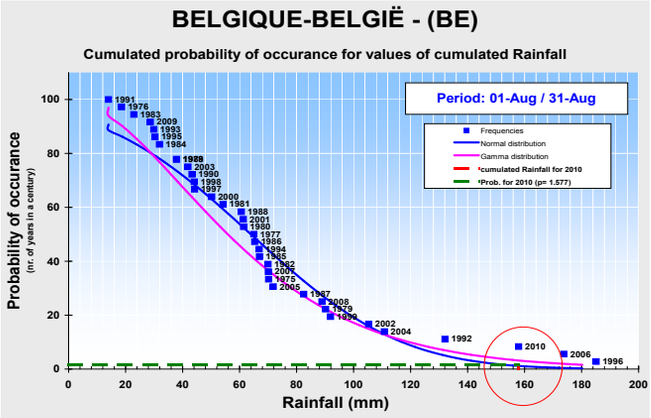
Soft wheat yield forecasts are 8.4 t/ha, 6.3 t/ha and 8.7 t/ha, respectively, in Belgium, Luxembourg and The Netherlands. This means, compared to 2009, decreases of -10.6 %, -3.5 % and -6.1 %. The forecast yields are nevertheless higher than the average for the last 5 years in Luxembourg (+2.8 %) and The Netherlands (+3.0 %), but lower in Belgium (-1.5 %). The forecasts for winter barley and rapeseed in Belgium are 8.0 t/ha (-7.3 % compared to 2009) and 4.1 t/ha (-4.7 % compared to 2009). For spring cereals, the barley yield in the Netherlands is forecast to be 5.9 t/ha (-14.9 % compared to 2009) and the grain maize forecast is 10.9 t/ha in Belgium (-10.2 %) and 11.8 t/ha in The Netherlands (-9.4 %). Potato and sugar beet yields are forecast to be 41.8 t/ha and 73.6 t/ha in Belgium (-6.6 % and -11.0 % compared to 2009), and 41.3 t/ha and 69.4 t/ha in The Netherlands (-10.7 % and -12.0 %).

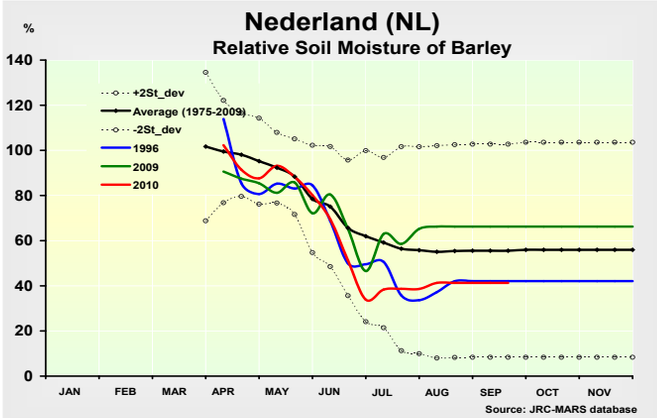
The three Benelux countries have faced a similar agro-meteorological situation since April. The droughts in April and in June and July were particularly unfavourable, with relative soil moisture for all crops at very low levels. This led to accelerated plant growth and grain maturity with subsequently low yield expectations. Abundant rain then followed in August (very unusual for the time of year), making access difficult to fields for harvesting late varieties of cereals or early potato varieties.

Temperatures from early August to mid-September remained within normal ranges. Known leaf diseases of grain maize or germination of cereal grains in the field should therefore have been quite limited. In contrast, the models show that potato is not recovering very well from the drought, despite good relative soil moisture from August to September. The expected quality and size of tubers should remain low. For sugar beet, the picture is completely different due to the late precipitation. Consequently, the models predict an average potential for storage organs, though at a level much lower than recorded in 2009.

Since the last forecast, yields have been maintained or have slightly decreased for wheat and barley. Despite the good relative soil moisture, potato performance is also lower both in Belgium and in The Netherlands. In contrast, forecasts for sugar beet and, to a lesser extent, grain maize have been revised upward.







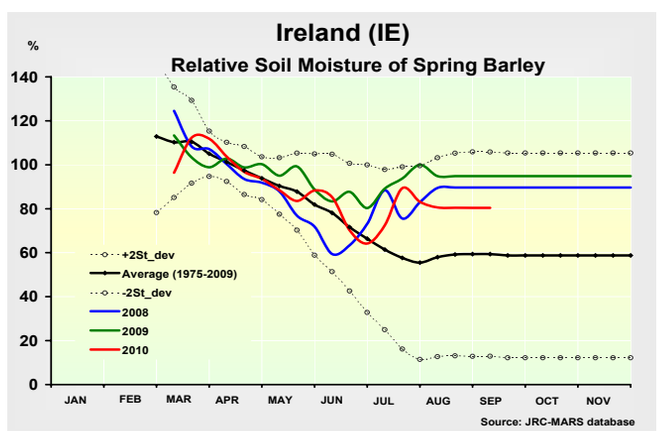
UK and Republic of Ireland — In the UK, persistent rain hampered field activities. Unfavourable rain amounts in IE.

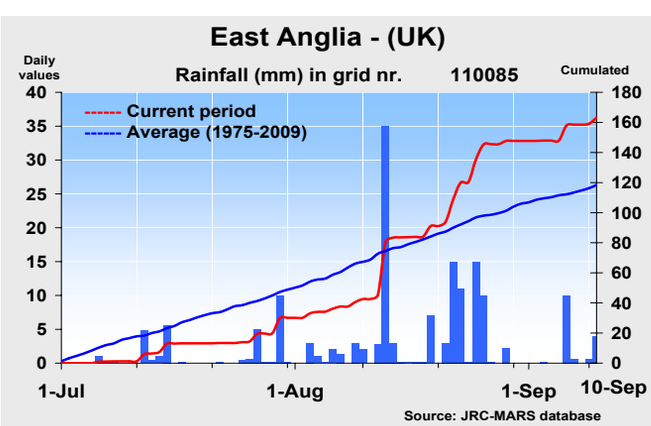
In the UK the advanced stage of winter cereal development was in the second half of August, avoiding the unfavourable weather. Therefore, yield forecasts are almost unchanged: 8.1 t/ha for soft wheat (+3.2 % compared to the 5-year average), 6.7 t/ha for winter barley (+3.7 %), 3.1 t/ha for rapeseed (-4.4 % compared to the 5-year average), 5.4 t/ha for spring barley (+0.2 %), 41.3 t/ha for potato (-0.7 %) and 64.7 t/ha for sugar beet (+4.6 %).
In IE, the yield forecast has been revised downward due to the unfavourable conditions: 8.7 t/ha for soft wheat (-0.2 % compared to the 5-year average), 8.0 t/ha (+3.3 %) for winter barley, 6.2 t/ha for spring barley (-3.6 %) and 33.3 t/ha for potato (+3.1 %).

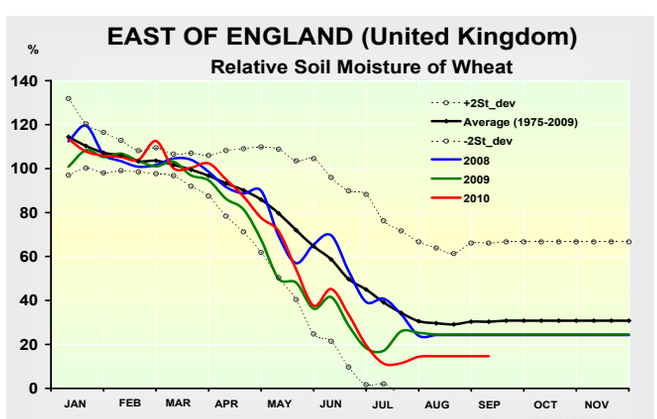
In the UK, the dry weather since the beginning of May, which is likely to have had a modest impact on final yields, was interrupted in August by light rain, which became progressively heavier and more persistent in the last half of the month. Thanks to the advanced development of the majority of winter crops, most farmers succeeded in harvesting winter cereals before the start of the wet period.

Therefore, the final cereal yields remained close to the previous forecasts. However, the rains recorded in the following days impeded field preparation for new sowing (e.g. rape seed), postponing it to the beginning of September when drier weather finally returned. In the second half of August, the rain was concentrated in the southern and eastern parts of the UK. It was quite abundant (+100/150 % compared with the LTA) and persistent (8-10 rainy days). In Ireland, due to the longer winter crop cycle compared with the UK, the rain in August unfortunately coincided with the main harvesting period, depleting yields and reducing grain quality. Only the earlier varieties and the more prompt farmers could profit from the relatively dry time-window in mid-August.

This period saw good solar irradiance with a positive effect on still active crops (e.g. potato, pasture).







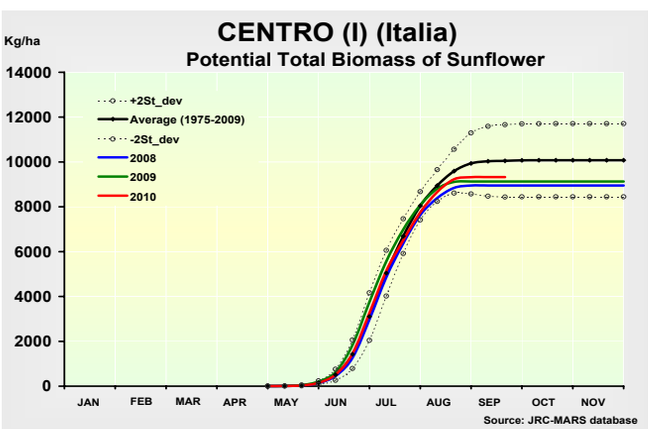
Italy — Rain in August replenished soil moisture but reduced grain quality.

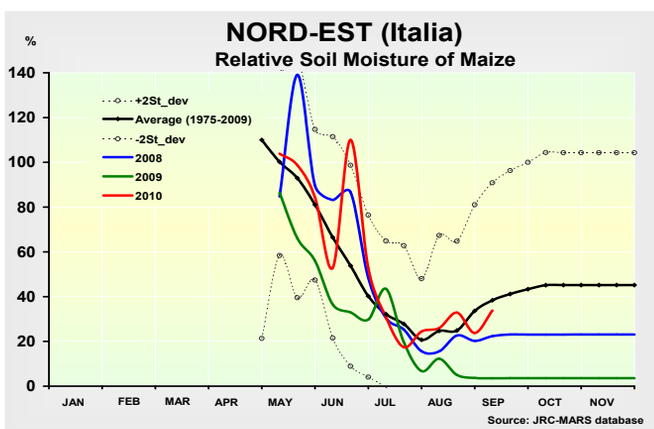
The yield forecasts for summer crops have changed slightly: grain maize is up to 9.4 t/ha (+2.1 % compared to the 5-year average), sunflower remains at 2.2 t/ha (-0.4 %), whereas potato and sugar beet are revised slightly downward to 24.9 t/ha (-0.1 %) and 57.4 t/ha (+3.0 %). Winter crop forecasts are unchanged: durum wheat is estimated at 3.0 t/ha (+1.0 % compared with the 5-year average), soft wheat at 5.3 t/ha (+1.1 %), barley at 3.6 t/ha (-1.1 %) and rapeseed at 1.9 t/ha (-3.7 %).

The anticyclone bringing hot and dry conditions in July was replaced during the first part of August by a vast cyclonic structure coming from the North Sea and significantly influencing temperatures and rainfall. In northern and central regions, temperatures around mid-August were consistently below the average (on 14 August, the maximum temperature in Lombardy was below 22 °C) and precipitation replenished soil moisture, thus benefiting vegetative summer crops.

Afterwards, typical summer conditions returned, pushing temperatures above the average. The subsequent lack of rainfall led to slightly lower cumulative values at the end of the month. In southern regions, in contrast, low precipitation characterised the whole period, but without major effects given that values were not significantly below average. Despite delayed sowing due to the rain during the spring, the grain maize harvest got under way. A satisfactory season is forecast, although the low irradiance levels due to the cloudy weather during the first part of the period under review might have reduced accumulation rates during the grain filling stage. In addition, there are some concerns that the rainfall at the beginning of September might have increased the risk of disease.

Satisfactory yields are also expected for sugar beet (especially in the main productive areas) and potato thanks to the good canopy expansion due to abundant water availability, also in southern regions. Conditions were suitable for the winter and spring crop harvests, so the yield values have not been revised.

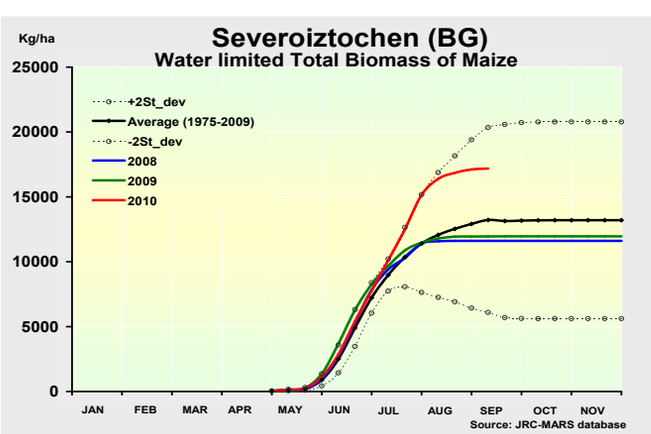


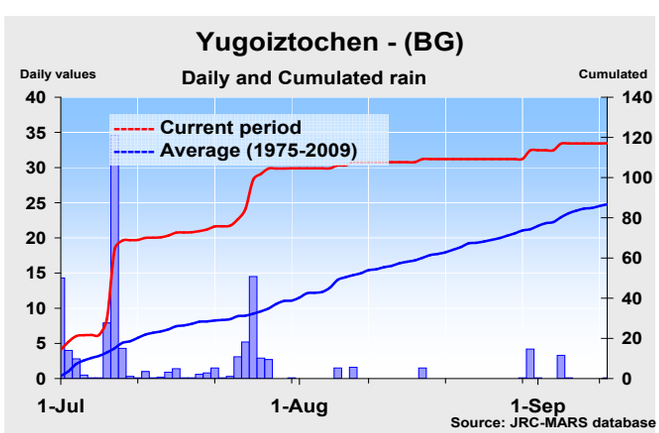


Bulgaria - Heavy rains, but average yields for winter crops so far.

The yield forecasts are 3.7 t/ha for soft wheat (–12 % less than in 2009), 3.3 t/ha for winter barley (+19.6 % vs LTA) and 2.5 t/ha for rapeseed (+16.4 % vs LTA). The potential yields for summer crops are very high: the grain maize yield is expected to be 5.5 t/ha (+33.3 % up on last year). The yield outlook for sunflower is 1.9 t/ha (+3.7 % compared to 2009) while the forecast for potato is stable at 17.2 t/ha (+5.7 %).

The spring crop cycle was characterised by persistent and abundant precipitation until the end of July. The rich water supply during the flowering phase of maize can be considered the basis for the good yield in 2010. In August, there was a significantly lower precipitation, but soil moisture remained high above the average until mid-August, providing favourable conditions for biomass accumulation. The cumulative water balance consistently exceeded the average. The mild temperatures that characterised the months of July and August, combined with high solar radiation, provided good conditions for yield formation in spring crops.





The winter cereal harvest was affected and delayed by heavy rains. The wet weather caused significant losses at harvest time. The current modelling results show above-average canopy development and very promising yield potential over central and eastern Bulgaria for spring crops. The estimated above-ground biomass for maize and sunflower has prompted an upward revision of the previous yield estimates. Assuming friendly weather conditions for the imminent harvesting period, even a record high yield is imaginable for maize and sunflower.

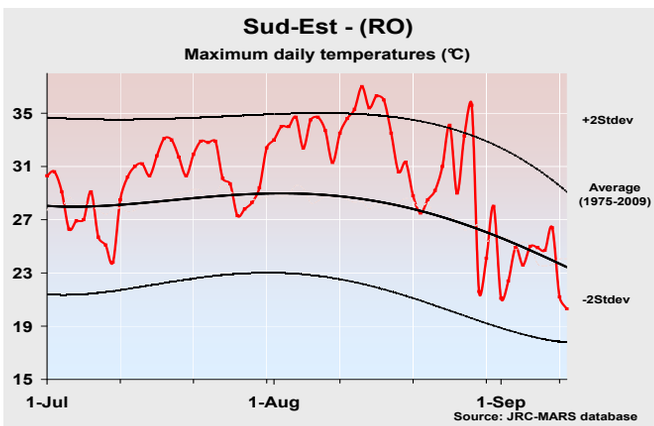
Romania — Promising conditions for maize and sunflower crops.

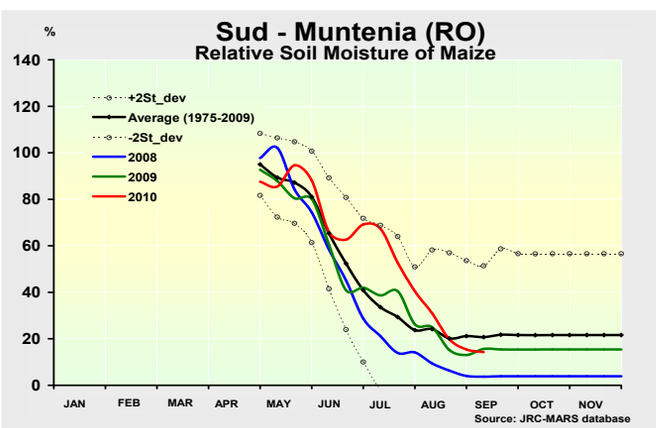
The yield forecast for soft wheat is 2.9 t/ha (+23.9 % on 2009), for winter barley 2.9 t/ha (+7.7 %), for spring barley 1.8 t/ha (+15.2 %), for rapeseed 1.5 t/ha (+9.9 %), for grain maize 3.9 t/ha (+15.0 %), for sunflower 1.5 t/ha (+9.4 %), for potato 14.1 t/ha (–10.4 % lower than the previous year) and for sugar beet 36.2 t/ha (+4.5 %).

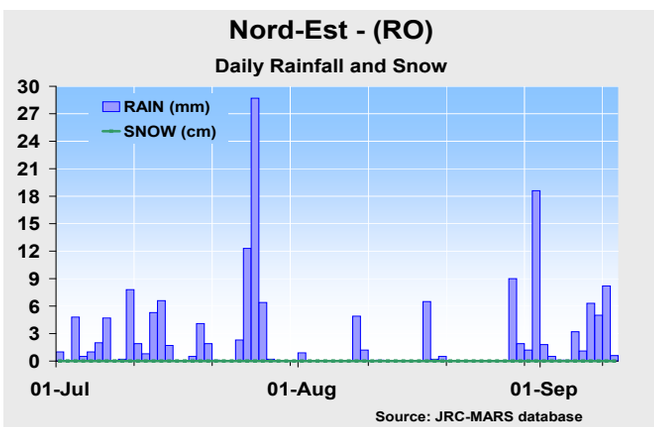
After a period of evenly distributed and abundant rain (80 mm on average) during July, August saw precipitation in the first week and in the very last days. August was characterised mostly by dry conditions combined with a general increase in temperatures. Daily maximum and minimum values were continuously above average with the exception of some days. Extremely high values (temperature maxima > 36 °C) were measured in wide areas of the south and east from 13 to 17 August. In the first dekad of September precipitation was concentrated in the northern part of Romania, with dry conditions continuing in the Sud-Vest Oltenia, Sud Muntenia and Sud-Est regions.

The water excess of June and July reduced the good yield expectations for winter cereals and hampered harvesting activities. The milling quality ratio for wheat was significantly lower this year. Maize development was earlier due to the increased temperature sum and suffered from a reduction in available soil moisture during the delicate phases of grain filling and maturation. This is the main reason for the sharp downward revision of the maize yield forecast. The high irradiation levels were favourable mainly for irrigated or well-watered crops.

Sugar beet took advantage of some rainfall and wetter conditions mainly in the Nord-Vest, Nord-Est and Centru regions. However, the moist and warm weather conditions, combined with inadequate crop protection, led to serious phytophthora infections of potato in several places, reducing both yield quantity and quality. The current very low soil moisture conditions on the Romanian plains are delaying preparations for sowing.



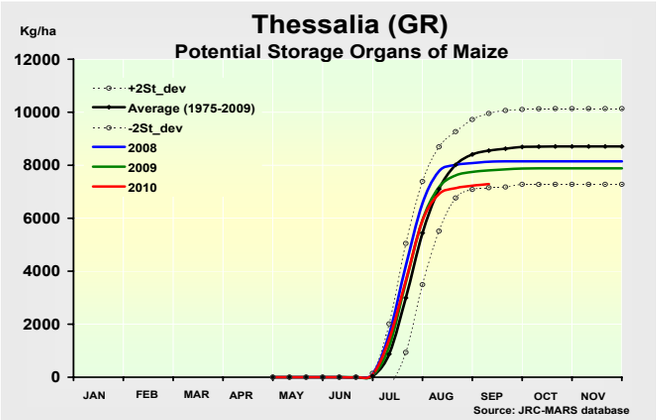


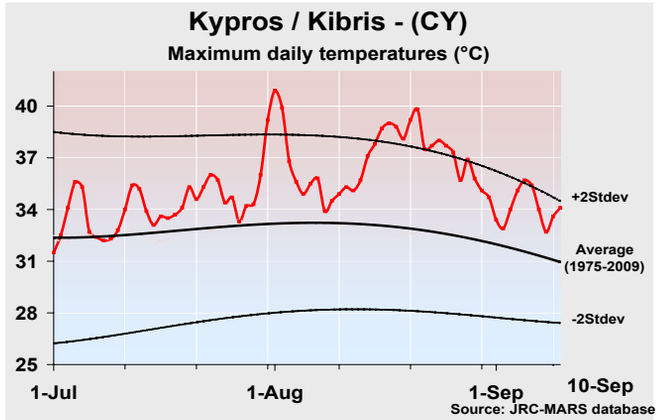


Greece and Cyprus — Dry spell in August may affect spring crops.

The yield expectation for maize is lower compared to the previous season: 9.3 t/ha (-5.3% as against 2009 and -4.2% down on the 5-year average). Sugar beet is forecast to yield 62.9 t/ha, -4.9% below the previous year and -2.2% below the 5-year average. Potato is expected to yield 25.3 t/ha, thus close to the average and to last year. The barley is forecast at 1.5 t/ha in Cyprus.

The northern region of Greece received hardly any rain during August. Temperatures were high in August, though with some fluctuations. Almost every day saw above 32 degrees in the main agricultural regions, whereas the long-term average only indicates around 2-5 days at these temperatures for the northern part of Greece. Cumulative active temperatures were well above the average (10-15 %). Grain maize is concentrated in Kentriki Makedonia, and since it is mostly cultivated under irrigation, the crop suffered only moderately from the lower soil moisture. The phenological cycle, though slightly early, proceeded normally to maturation. Only limited effects on final yields are expected. The effects on sugar beet, due to its wider distribution outside the main irrigation districts, will be more marked with reduced yields. Both water-limited and potential biomass is estimated to be below average.





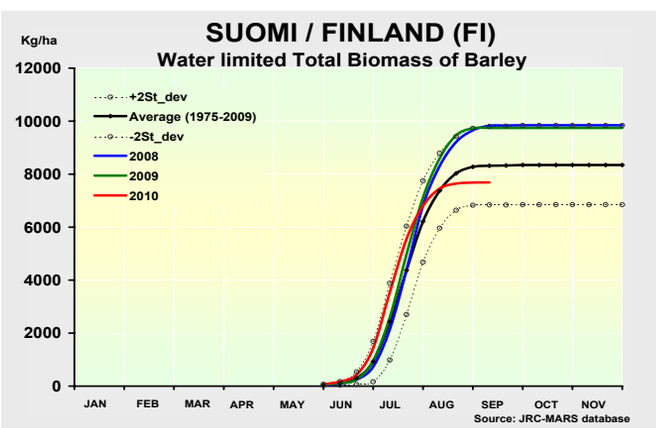
Finland — Exceptionally long-lasting high temperatures and rain scarcity have reduced yield expectations.

The yield forecast for soft wheat is 3.7 t/ha (-8.3 % compared to the previous year 2009), for rapeseed 1.5 t/ha (-15.7 %), for spring barley 3.5 t/ha (-3.3 %), for potato 26.3 t/ha (-8.2 %) and for sugar beet 39.6 % (+4.9%).

This year, Finland has experienced two warm spells. The first, in May, boosted crop development above average levels. The second persisted for an extremely long spell between 11 July and 20 August. Almost throughout, temperatures remained significantly above the long-term average. June was the warmest month recorded since 1975, with average temperatures more than 3.5°C higher than usual. The period since 1 April has been the second warmest since 2002. Cumulative active temperatures in July exceeded seasonal values by 35 % in southern Finland and by 15 % in the north of the country.

Cumulative rainfall since 1 July has been 25 % lower than usual, with evapotranspiration very high as a result of the persistent warm temperatures. The country has suffered a significant climatic water deficit of 100 mm since the beginning of July. Soil moisture has consequently been falling since June. Finland saw rainfall between the end of July and first ten days in August, which slightly replenished the soil moisture. It could have been too late for cereals after the persistent dry conditions.

Spring crop development was advanced throughout the season because of the high temperatures. The model estimates a good yield potential for cereals up to the beginning of July. Although the high temperatures in May probably did not negatively affect plants, the persistent warm conditions with scarce rain are likely to have reduced potential crop yields.

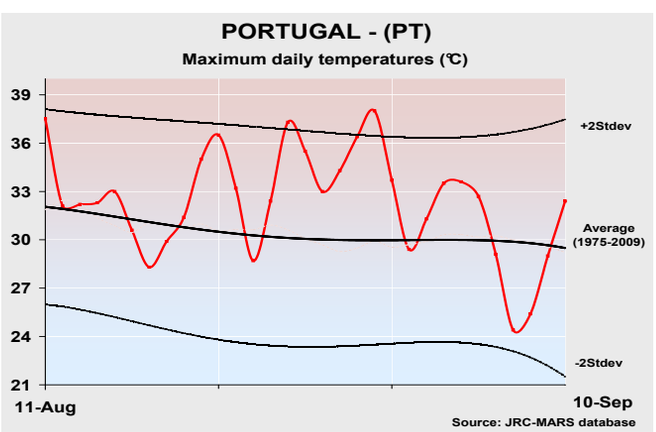


Portugal — Potato and grain maize maintain average yield levels. Sunflower affected by the warm and dry climatic conditions of the previous months.

Sunflower and grain maize are forecast to yield 0.5 t/ha and 6.0 t/ha respectively (-12.8 % and 4.6 % above the 5-year average). The potato forecast is 14.7 t/ha (0.6 % above the 5-year average). The forecasts for soft wheat and winter barley remain 1.3 t/ha and 1.6 t/ha, respectively (-26.5 % and -13.8 % compared with the 5-year average).

Temperatures registered during the second dekad of August were near seasonal values. A very warm period followed at the end of August, when maximum temperatures of around 37-41 °C (9 °C above normal values) were registered. Only at the end of the first dekad of September did temperatures slightly drop below seasonal values. These temperature changes were accompanied by a total lack of rainfall in all regions, continuing a dry period from the beginning of July. This led to very low soil water content in all areas.

The sunflower yield was thus affected by these climatic conditions. Development was shortened and accelerated, and the dry conditions throughout the summer months affected yield production.



The situation was different for the other two spring crops (potato and grain maize) because the availability of irrigation water due to the significant rains in winter and spring helped to reduce the water deficit for these crops during the warmest periods. Thus, production levels are close to the average values of recent years.

Denmark and Sweden: favourable conditions until July, very wet August, harvesting window in September.

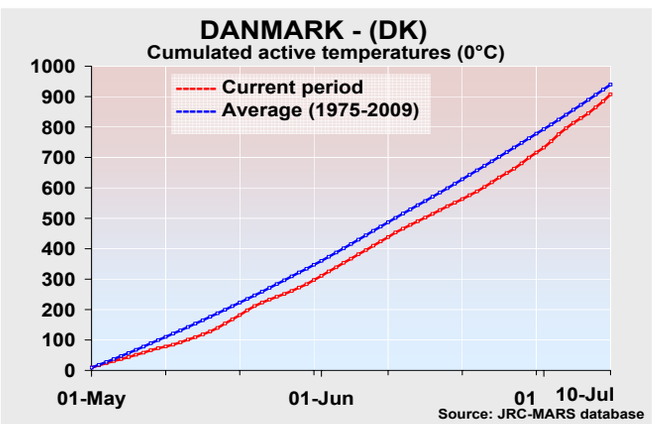
Denmark: soft wheat is forecast at 7.4 t/ha (+1.1 % as compared to the 5-years average, but -7.7% as compared to 2009), winter barley at 5.7 t/ha (-1.1% as compared to the 5-years average and -12.0% vs. 2009), spring barley at 5.0 t/ha (+1.3% as compared to the 5-years average and -8.8% vs. 2009), rapeseed at 3.6 t/ha (respectively +2.6% and -5.3%) and potato at 36.7 t/ha (respectively -0.6% and +3.5%), sugar beet at 53.7 t/ha (respectively 4.5% and -0.8%).

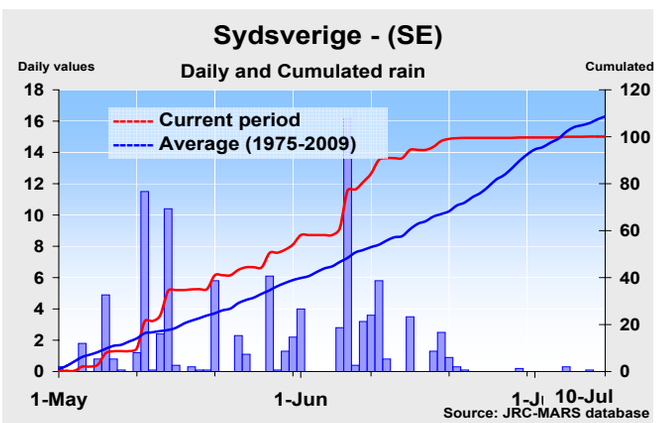
Sweden: soft wheat is forecast at 5.7 t/ha (-5.4 % as compared to the 5-years average), winter barley at 5.1 t/ha (-5.0% as compared to the 5-years average), spring barley at 4.1 t/ha (+3.3% as compared to the 5-years average and -11.4% vs. 2009) and rapeseed at 2.6 t/ha (-2.1% and -13.5%), sugar beet at 53.8 t/ha (respectively +1.7% and -11.0%) and potato at 28.0 t/ha (respectively -5.4% and -6.0%).

The season course was generally quite favourable (appropriate water supplies, good thermal conditions, high level of solar radiation) until the beginning of August, which permitted to accumulate a relevant amount of biomass leading to forecast quite high yields. However August started with very wet conditions and the rain persisted during the whole month depleting the crops' potentiality. Dry conditions returned in September.

Thanks to the accumulated delayed in development of the winter wheat, the harvesting of this crops very likely escaped the wettest period and it was possible to use the dry time-window occurred in September. On the contrary, due to the earlier harvesting of winter barley and spring barley in DK as well as the winter wheat in Sweden these crops were probably affected by the rain occurred in August and the quality was deteriorated. Therefore, for these crops the yields were downward revised.

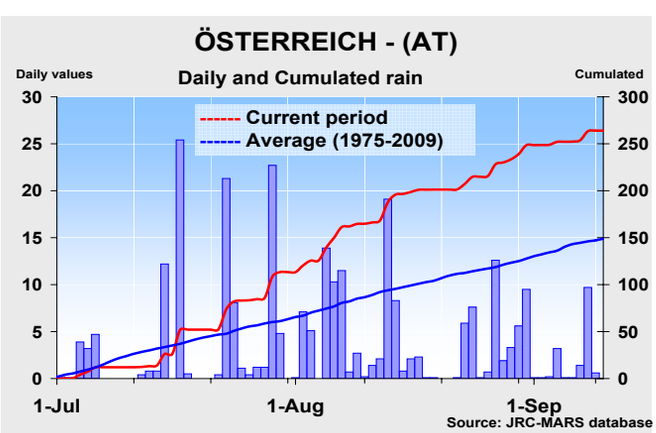
The excessive rain had also a negative influence on the other active spring crops (potato, sugar beet).

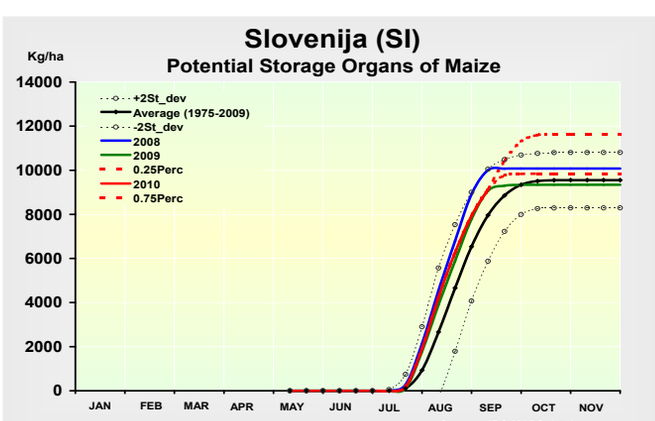




Austria and Slovenia — Persistent rainfall in Austria affected the winter crop harvest.

Due to the unfavourable weather conditions in Austria during the harvest,yield forecasts have been revised downwards, especially for cereals: durum wheat is estimated at 4 t/ha (-6.8 % compared with the 5-year average), soft wheat at 5.0 t/ha (-2.6 %), and barley at 3.7 t/ha (-7.7 %) and 5.3 t/ha (-3.7 %) for the spring and winter crop, respectively. Rapeseed has been confirmed at 3.0 t/ha (-3.3 %). Slightly better are the yield expectations for summer crops, which seem to be close to the 5-year average. Maize is estimated at 10.3 t/ha (+0.6 %), potato





at 31.6 t/ha (-1.0 %), sugar beet at 68.0 t/ha (+0.2 %) and sunflower at 2.7 t/ha (+2.2 %). Previous forecasts have been confirmed for Slovenia and continue to be higher than last year: 3.9 t/ha for barley (+11.1 % vs 2009), 4.5 t/ha for soft wheat (+12.7 %) and 8.0 t/ha for grain maize (+2.2 %).

In both countries, warm conditions persisted during August, but temperatures dropped at the beginning of September. Slovenia experienced quite dry conditions without this affecting yield expectations for winter crops, whereas Austria was characterised by persistent rainfall that significantly affected the harvest period (cumulative rain exceeded the average by more than 50 %). In fact, access to the fields was only possible for a few days, which not only delayed the harvest but also reduced grain quality.

Despite the cloudy weather and the below-average irradiance levels, a good accumulation rate was maintained up to the end of August. However, this seems now to have been reduced due to the drop in temperatures.

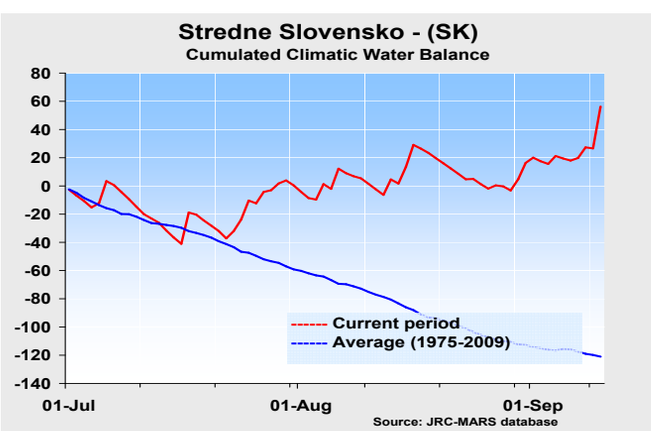
Spring crops (maize, sugar beets and potato) have taken advantage of the positive soil moisture during the vegetative and flowering phases. However, the following weeks have to be sufficiently dry to allow for optimal ripening. Therefore, even if yield expectations are below 2009 levels, satisfactory production levels can be expected. In Slovenia,

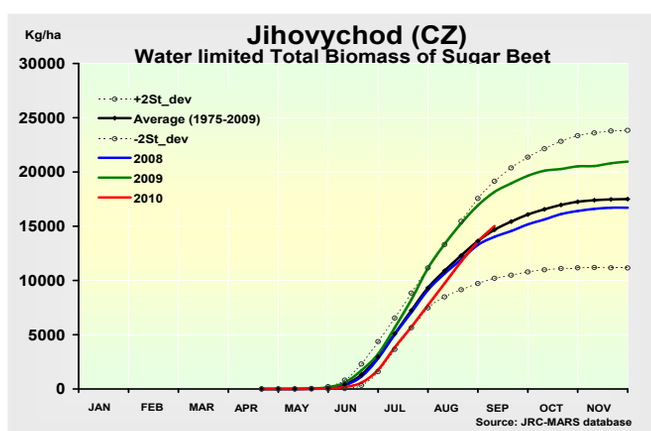
Czech Republic and Slovakia — Continuous rain leads to problems with harvesting.

Winter crop forecasts for the Czech Republic and Slovakia are: 5.2 t/ha and 3.8 t/ha for soft wheat (-1.7 % and -5.3 % on 2009), 4.8 t/ha and 3.3 t/ha for winter barley (-1.1 % and -13.8 %), 3.1 t/ha and 2.2 t/ha for rapeseed (-2.1 % and -4.8 %) and 4.2 t/ha (-1.1 %) and 3.0 t/ha (-13.4 %) for spring barley. Similar yield potentials are expected for summer crops. In the Czech Republic, the forecast for sunflower is 2.2 t/ha, (-4.9 %), for potato 24.1 t/ha, (-7.8 % compared to 2009), for sugar beet 57.9 t/ha, (0.0 %) and for grain maize 7.8 t/ha (-7.8 %). In Slovakia, the forecast for sunflower is 2.1 t/ha, (-7.1 %), for potato 15.1 t/ha, (-18.2 %), for sugar beet 55.3 t/ha (-1.8 %) and for grain maize 6.4 t/ha (-7.0 %).

Weather conditions over the period under review were similar for both countries. Cumulative rainfall from 1 July to 10 September was approximately +70 % above the long-term average. To date, this year could be considered particularly wet because yearly precipitation totals have already reached the highest cumulative values (characteristically 600-720 mm) for Moravia and Slovakia since 1975. Irradiance remained average. Daily minimum temperatures mostly exceeded the climatological mean, increasing plant respiration losses. The higher-than-average thermal conditions and cumulative temperature sum could have been due to the high daily minimum values.

The abundant summer precipitation not only postponed the harvest for winter cereals, but caused pre-harvest sprouting and significant decreases in the proportion of milling wheat and malting barley. Grain maize expectations were revised down due to the excessive and continuous precipitation. Sunflower developed a smaller-sized canopy with less photosynthetic capacity. This crop was adversely affected by the high soil moisture values. The crop development simulations point to a negative picture for potato with low yield expectations. The sugar beet yield seems to be less affected by the unfavourable weather, but lower sugar content is likely. Further rains could significantly hinder harvesting and field preparation activities.





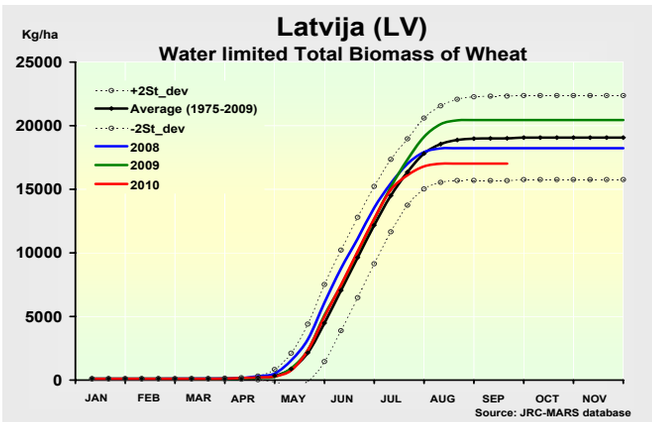
Estonia, Latvia, Lithuania — Good yield potential reduced by continuing abnormal weather conditions.

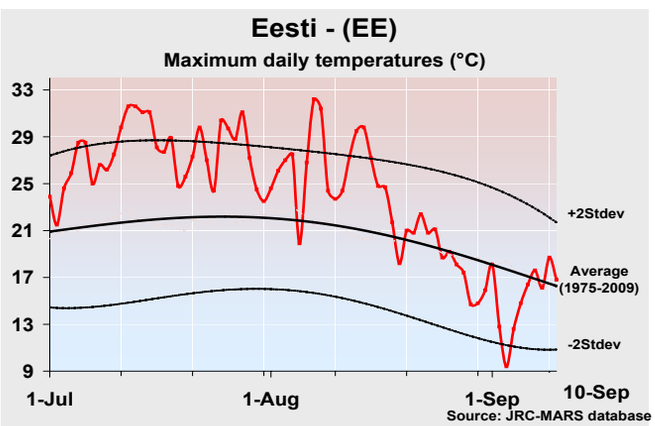
Yield forecasts for Estonia are: soft wheat 3.1 t/ha (+3.8% compared to 2009), 2.6 t/ha for spring barley (-5.4%), 1.6 t/ha for rapeseed (-2.9%). For Latvia, yield forecasts are: 3.5 t/ha for soft wheat (-3.2%), 2.4 t/ha for spring barley (-4.2 %), 2.2 t/ha for rapeseed (-0.2%) and 16.4 t/ha for potato (-6.2%). For Lithuania, yield forecasts are: 3.9 t/ha for soft wheat (-7.1%), 3.6 t/ha for winter barley (-5.6 %), 2.8 t/ha for spring barley (-7.9%), 2.0 t/ha for rapeseed (-9.7%), 12.0 t/ha for potato (-15.4%) and 45.2 t/ha for sugar beet (in line with 2009).

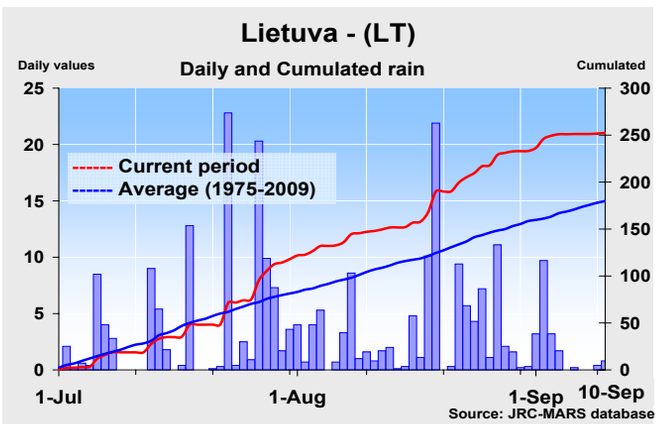
As in the previous period, temperatures in the north of the Baltic countries were hotter and drier than usual, whereas temperatures were slightly lower further south. In July, especially in the second dekad, cumulative active temperatures exceeded seasonal values by 35 % in the southeast of Estonia and by 25 % in Lithuania. The high temperatures persisted in July and for most of August. In all the countries,

several days with temperatures above twice the standard deviation were recorded and the maximum exceeded 30 °C. Evapotranspiration was very high and plant development was advanced compared to the LTA. These exceptional thermal conditions persisted almost until the end of the second ten-day period in August, with a likely negative impact on grain formation. Then a rapid fall in temperature, below the seasonal average, was observed.

This year, Estonia had less rain than the two other countries. In the period under review cumulative rainfall in Estonia was close to the average, whereas in Lithuania and Latvia it exceeded seasonal levels by at least 70 mm. These two countries suffered heavy rainfall during harvesting, with likely impacts on grain quality and obstacles to field access. Better conditions for harvesting were found in Estonia. In all three countries, throughout the season the development of spring barley and other spring crops was advanced compared to the previous year and to the average. Winter crop development was also advanced, most likely reducing grain yield potential. Now, crops still remaining in the field are at the advanced development stage. Sugar beet presents good yield potential, whereas the opposite is the case for potato.







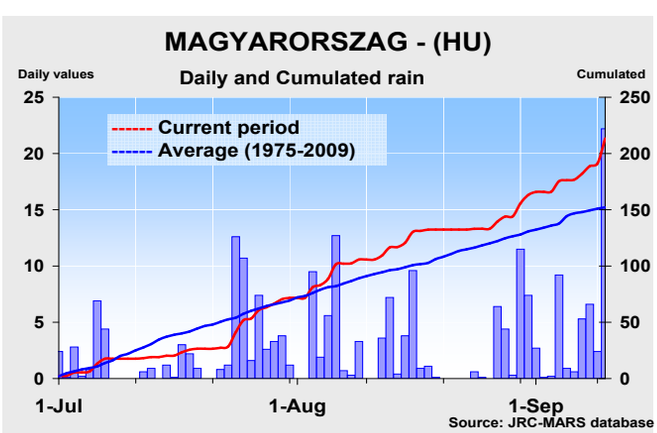
Hungary — A negative season for winter cereals and the outlook still uncertain for summer crops.

Yield estimates are reduced for winter cereals: 3.9 t/ha for soft wheat (-6.6 % compared with the 5-year average) and 3.8 t/ha for winter barley (-3.8 %). The forecast for turnips is 2.2 t/ha (-3.8 %). For spring barley, the forecast yield is just 3.0 t/ha -6.7 % below the average. The yield estimate for grain maize has been revised down to 6.7 t/ha and for sugar beet to 56.0 t/ha, but these figures still exceed the five-year average by +4.2 % and +6.5 %, respectively. Expectations are also reduced to 2.3 t/ha for sunflower and 24.7 t/ha for potato.

After the very wet May and June, precipitation was mostly below the long-term average in July, especially in the first half of the month. The number of hot days (temperature maxima > +30°C) was between 12-17 days for this month, exceeding the usual values by 4-7 days. The cumulative thermal sum and solar radiation just slightly exceeded the normal figures for the period considered. The weather turned rainy again in the last days of July. Cumulative rainfall in August was significantly above the average. The largest precipitation amounts were experienced in the western regions (Eszak and Del Dunántúl), exceeding the LTA by 50%. The wet weather with abundant precipitation continued into September.

The harvesting of winter cereals and spring barley saw significant delays. The warmer, dryer weather of July supported the harvest, but it was still one of the most difficult in recent decades due to very wet soil.

The general grain quality of wheat and barley remained below standard. Sunflower and potato are completing their ripening phases, reaching maturity now. For all summer crops the harvest seems to be very problematic due to the high soil moisture. Taking into consideration the high water content of maize and sunflower seeds, farmers probably will postpone the harvest to wait for drying. This delay may increase the chances of yield and quality losses.



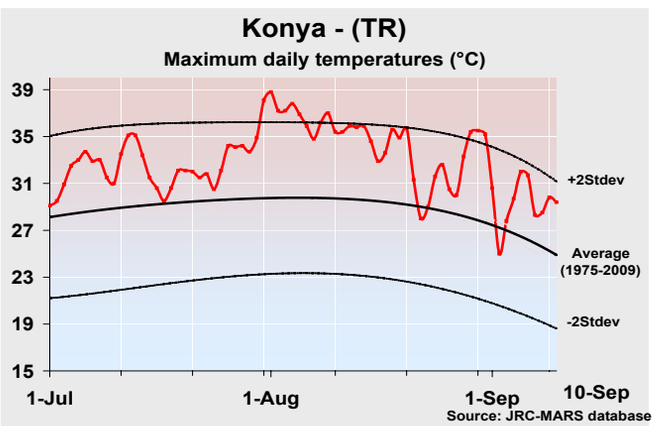
Black Sea area

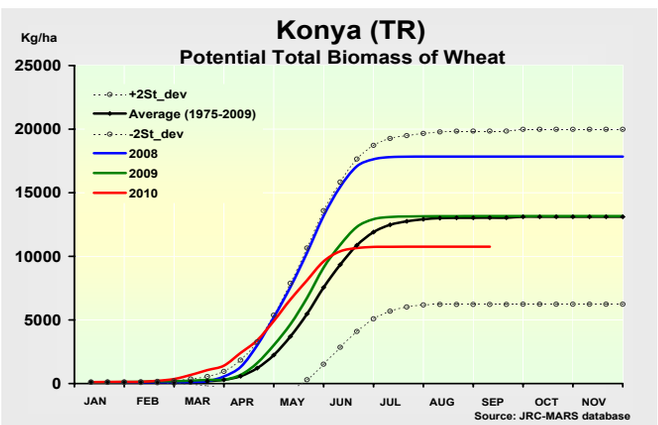
Turkey — Dry July and August, average yields.

The forecast for wheat is 2.2 t/ha, a drop of around 1% compared with the 5-year average. For barley, the outlook is more positive with a forecast yield of 2.5 t/ha, 8.3% above the 5-year average. As regards spring crops, grain maize is mostly cultivated under irrigation, and experienced high temperatures during final maturation. The yield is forecast to be 7.1 t/ha.

The season was characterised by sufficient rainfall until July. Cumulative rainfall over arable land for the whole country from October 2009 until 10 September 2010 was 530 mm compared to the long-term average of 468 mm. June was even characterised by heavy rainfall on occasions, causing problems for farmers. The remaining part of the summer (July, August) was very dry. The replenishment of soil moisture in June meant a slower decrease in the climatic water balance.

The beginning of August brought some extremely hot days with temperatures close to 40 degrees. In general, for the period August/September the temperature sum was 20 % above the LTA. The main areas for winter and spring cereals are located in the central highlands (Antalya and Ankara) where the harvest takes place during July. In these regions, the dry weather coincided with the final maturation phases of wheat and barley. Crops in these regions are expected to have a lower final yield. However, wheat is harvested during June in the western and Mediterranean regions, coinciding this year with heavy rainfalls and possibly negatively affecting grain quality.





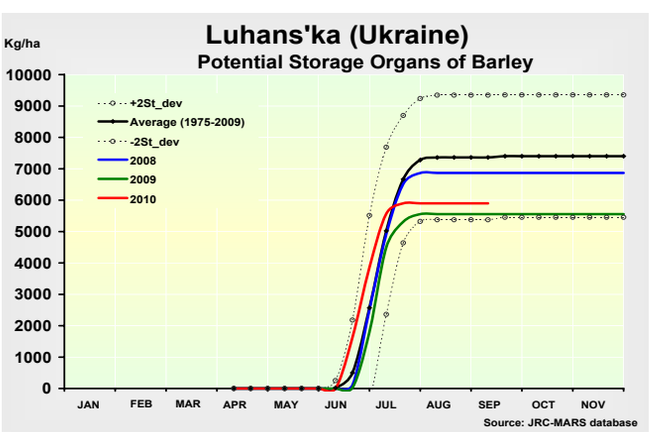
Ukraine - Mediocre yield expectations for wheat and barley; maize and rapeseed remaining average.

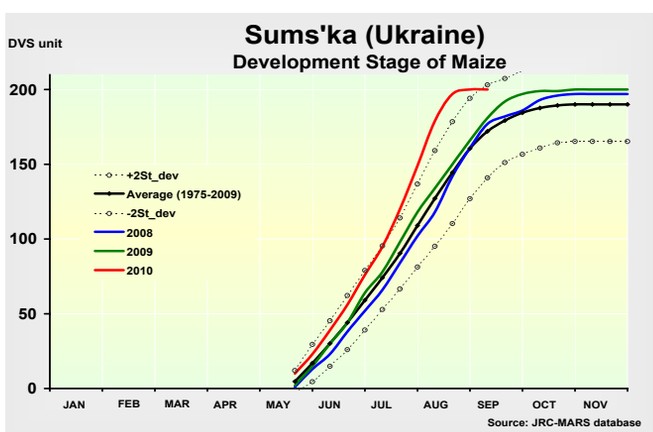
The yield forecast for wheat is 2.5 t/ha (-18 % compared to 2009, -12 % compared to the five-year average). Barley is forecast to reach 2.0 t/ha (-18 %; -12 %). Maize and rapeseed remain in line with previous expectations, at 4.5 t/ha (-9 %; +5 %) and 1.6 t/ha (20 % less than in 2008, similar to the five-year average).

August was warmer than usual in the whole country. The more easterly the area, the greater the difference compared to the long-term average. Thus, western oblasts experienced temperatures slightly higher than usual, while cumulative temperatures in eastern oblasts were 100 °C higher than the LTA.

The western part of Ukraine received a normal or even slightly higher amount of rainfall in the period under review. In Lvivska oblast, intensive rainfall in the third dekad of August resulted in a +32 % higher total precipitation. Eastern oblasts experienced a drier period, but rainfall at the end of August managed to keep a significant drought at bay.

It was quite an unfavourable year for wheat and barley, which can be seen in the yields. Maize and rapeseed profited from high temperatures and their yields are forecast to be close to the average.



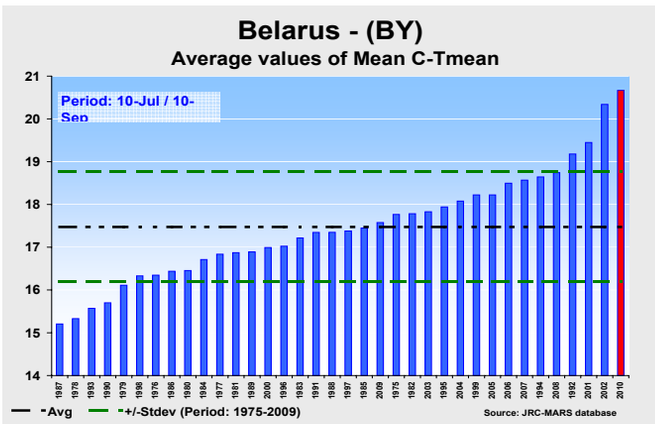


Eastern countries

Belarus — High temperatures favouring the grain maize yield.

Compared with previously, forecasts are slightly lower except for maize, which developed well towards the end of the season. Wheat is forecast to yield 3.2 t/ha (15% less than the previous forecast; -9% compared with 2009), while barley remains at 3.3 t/ha (-5% compared with 2009). The grain maize yield is likely to be higher than previously forecast, reaching 5.1 t/ha (9% more compared with 2009). Rapeseed is estimated at 1.5 t/ha (-15% compared with 2009).

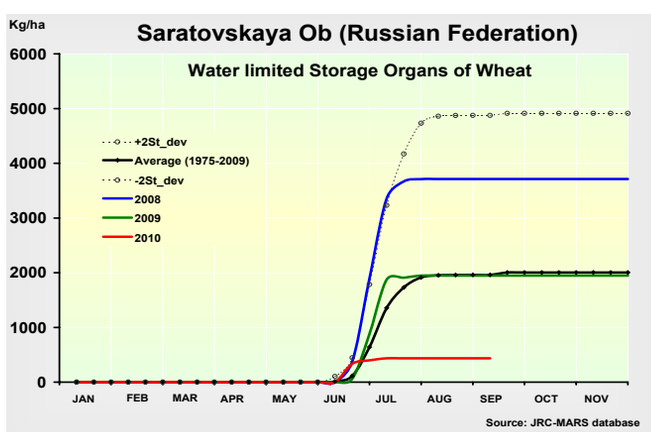
In the period considered, Belarus experienced high daily temperatures. The second dekad of August in particular was very hot, reaching 34 °C in the western oblasts and 40 °C in the eastern oblasts. The end of August and beginning of September brought a cold snap across the entire country, with temperatures slightly lower than the long-term average. The amount of rainfall differed from west to east. Western oblasts received enough precipitation, and the cumulative value for the period considered was 60 % more than the LTA. The eastern part of the country, however, experienced a dry August, but the end of month and early September brought rainfall, so the cumulative value for the whole period turned out close to normal. In spite of very high temperatures in July and August (the highest cumulative temperature since 1975), no serious drought occurred due to sufficient precipitation. However, the growing season was hastened, reducing the yields of winter crops.



Russia — Worst drought for decades, hard season for all crops.

The second half of August was still hot, but without temperatures as extreme as before. Only in the Caucasian and Volga Districts was the cumulative temperature 100°C higher than the long-term average. After the very hot and dry June and July, August brought the usual amount of rainfall. Some regions, however, like Krasnodarsky Kray, Dagestan or Saratovskaya Oblast, continued to have insufficient precipitation.

In general, the end of August and beginning of September were much milder for crops than June and July. However, the damage caused by the drought was lasting, significantly reducing yields for all crops with the known consequences for Russian exports.

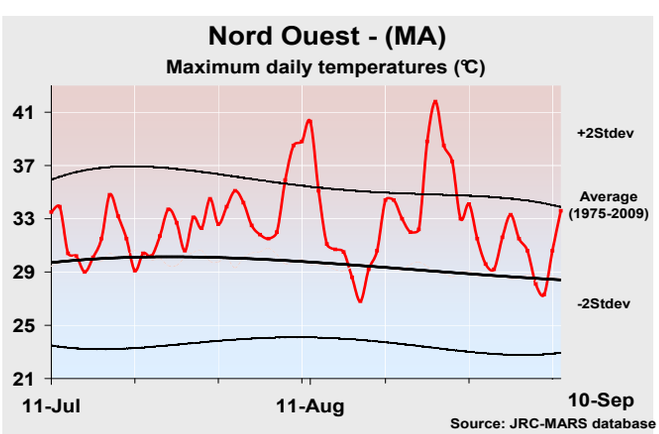


Maghreb countries

An average winter cereal season.

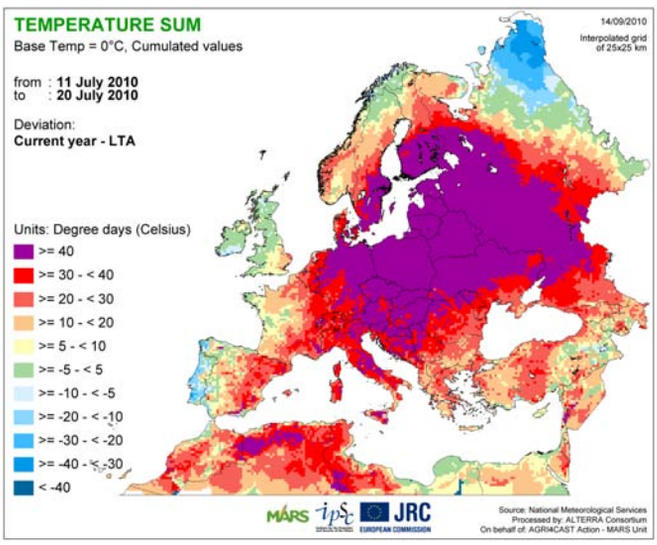
Cereals were harvested from mid-June to mid-July in the three countries. The forecast yields were estimated on 20 July. For Morocco the forecast is 1.8 t/ha for (durum and soft) wheat, which represents a decrease of -15.0 % compared to 2009, but an increase of 27.3 % compared to the long term average. Barley is estimated at 1.3 t/ha (-24.9 % in comparison to 2009 and +46.0 % compared to the LTA). For Tunisia: wheat is estimated at 1.7 t/ha (-20.3 % and +4.1 %) and barley at 1.2 t/ha (-36.3 % and -12.2 %). In Algeria, wheat is estimated at 1.4 t/ha (-2.8 % compared to the LTA) and barley at 1.2 t/ha (-15.7 %).

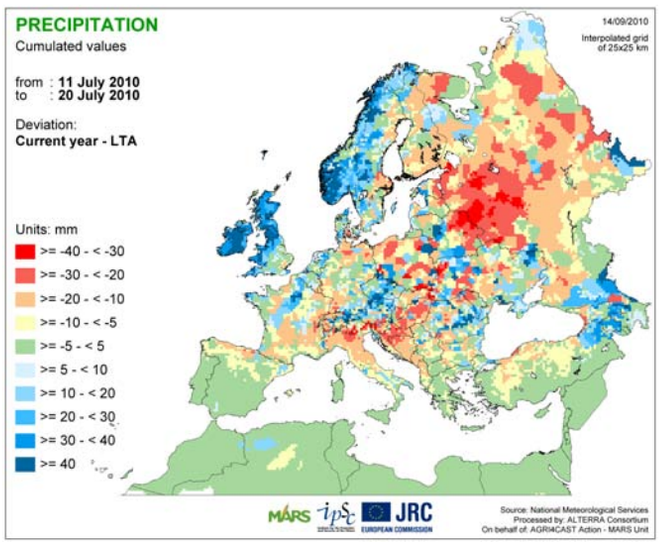
During the period from the first dekad of July to the first dekad of September, the Maghreb countries saw high temperatures, often above the normal range of variation, as for example in Nord Ouest, one of the main cereal regions in Morocco. The precipitation recorded was at best average, therefore leading to a cumulative climatic water balance below the long-term average, except in only very few locations.

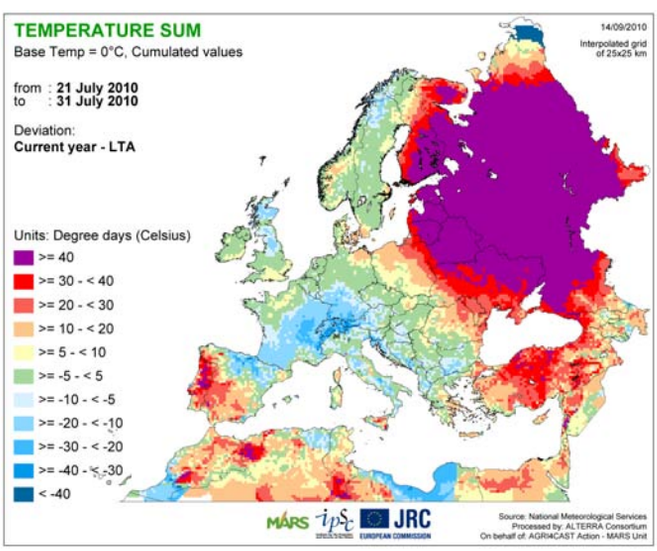


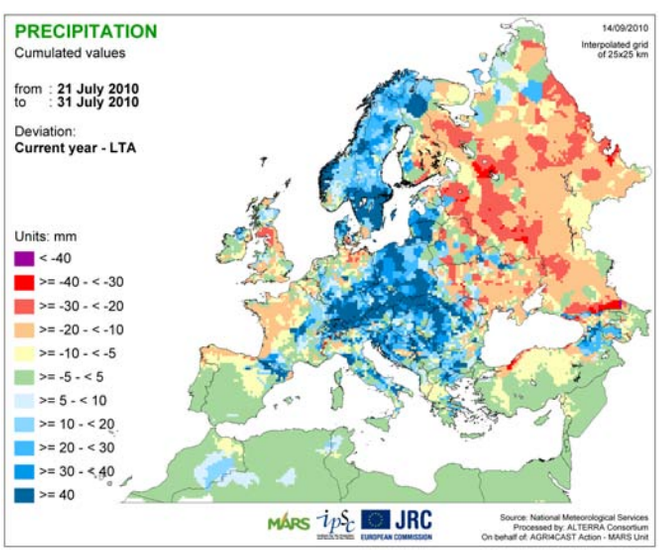
4. Map analysis

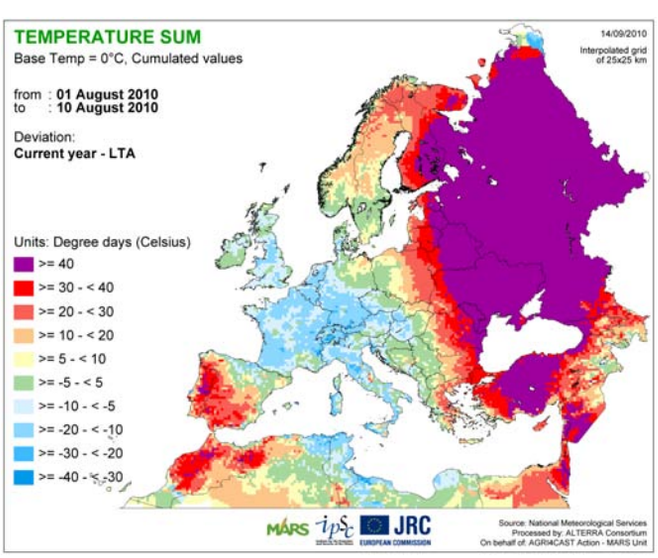
4.1. Temperature and precipitation (1)

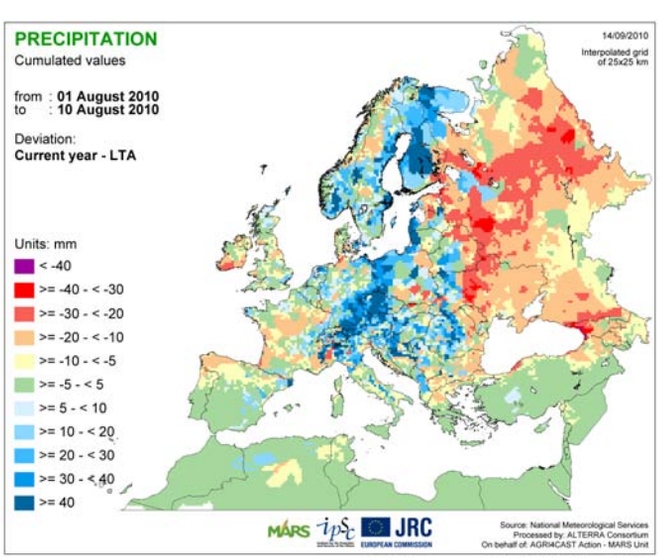












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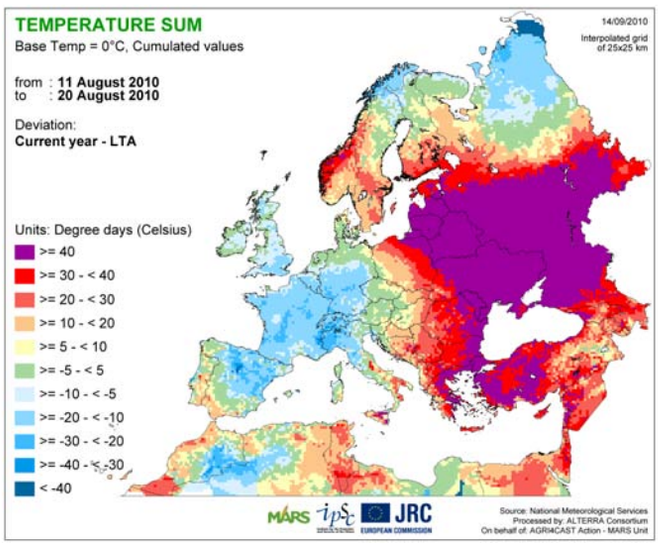
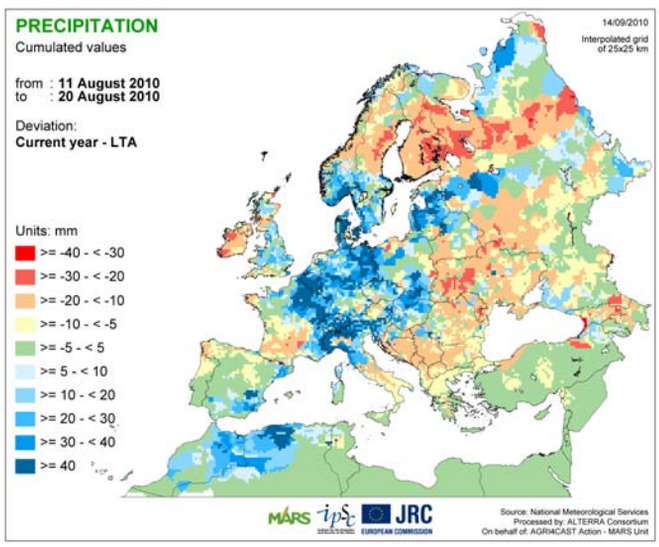
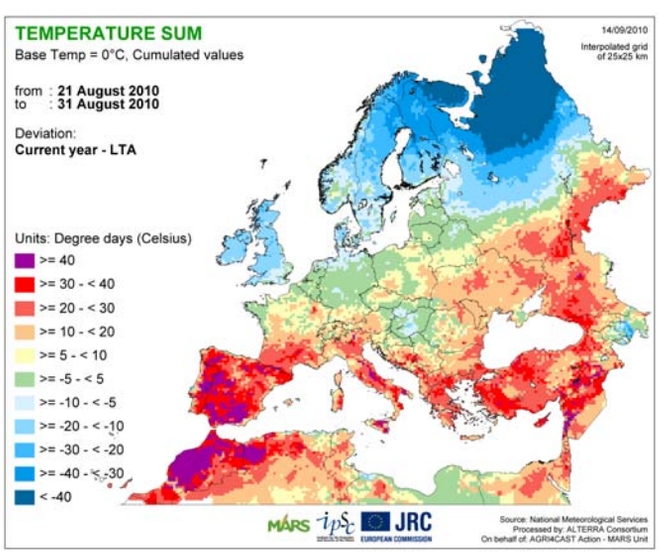
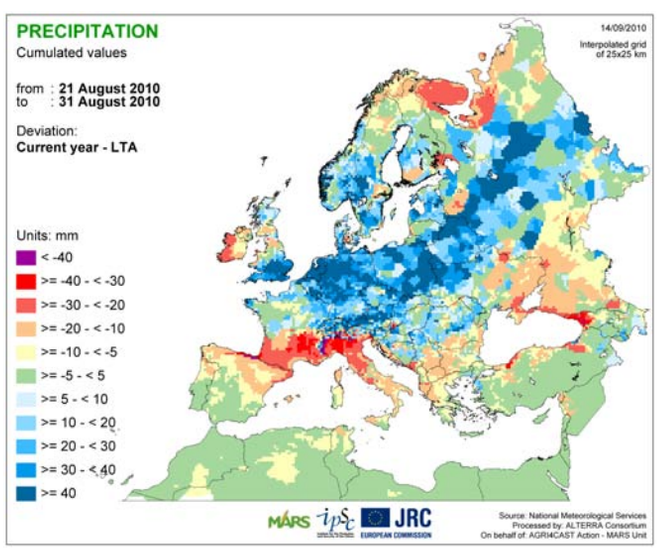
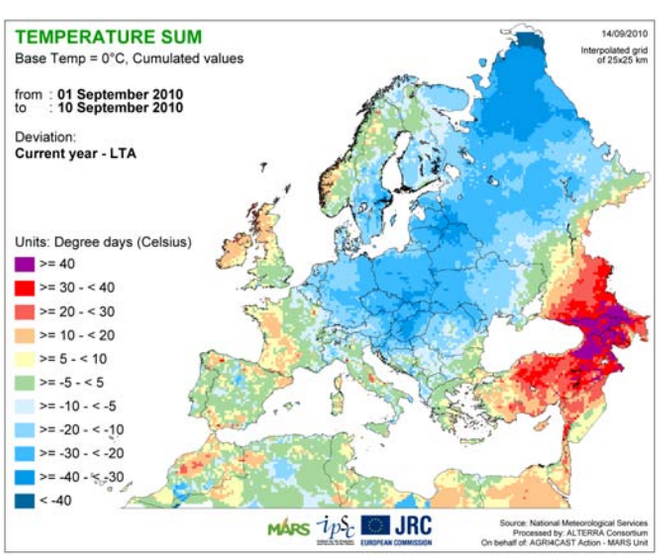
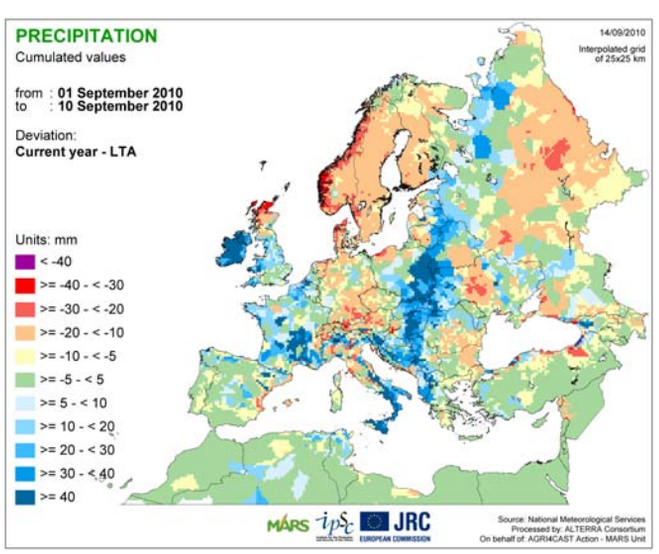




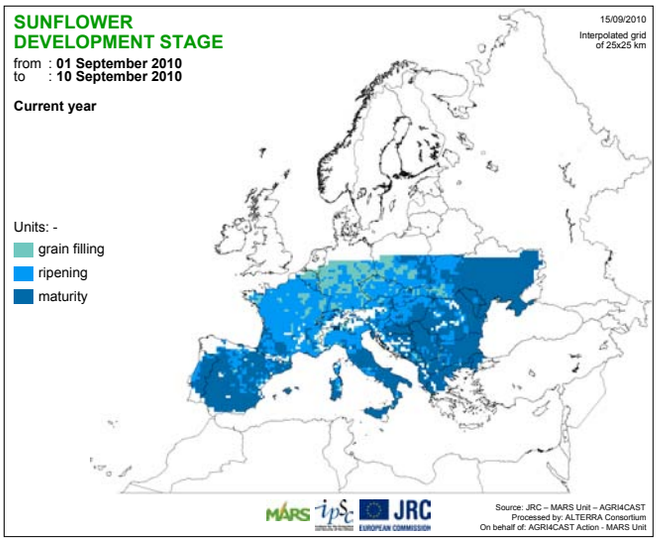


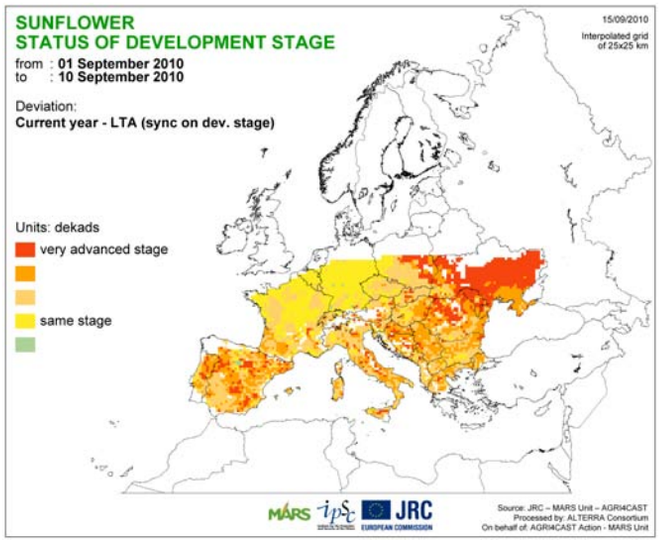


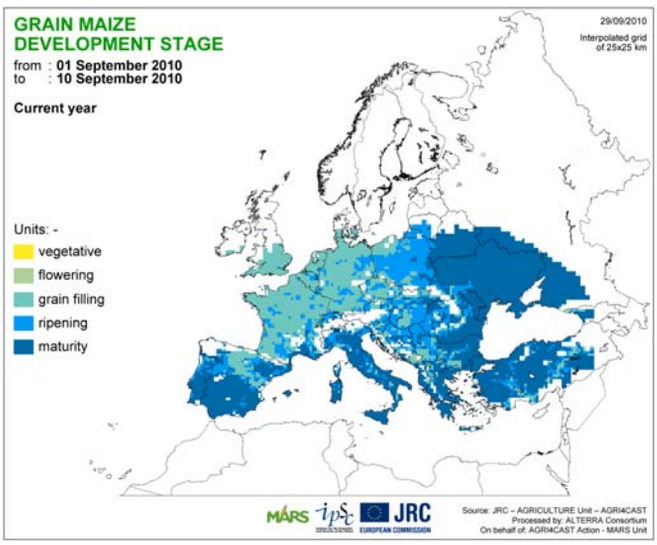


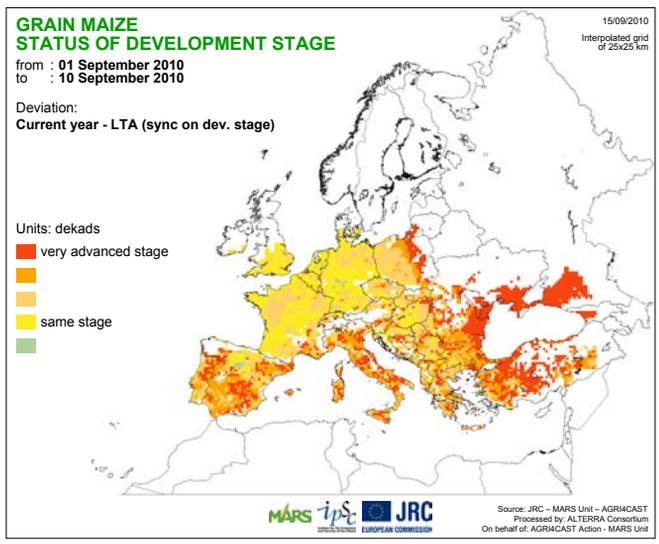


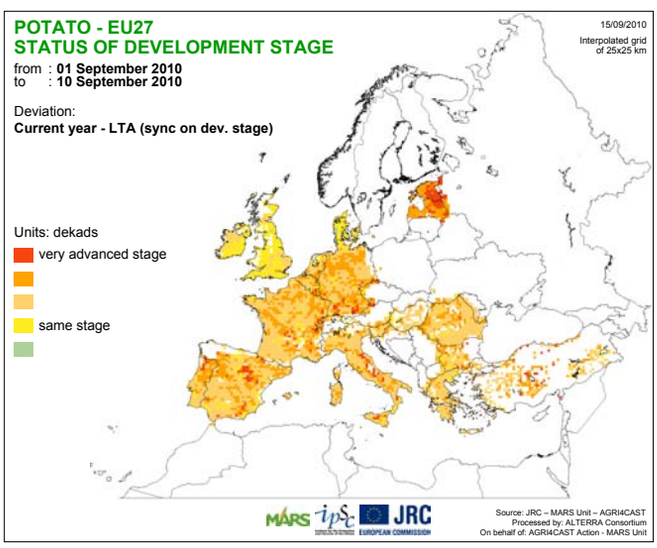
4.2. Crop development stage

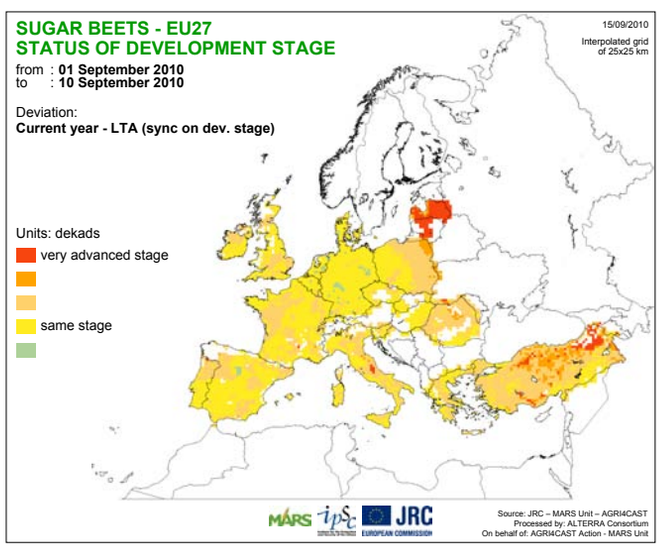




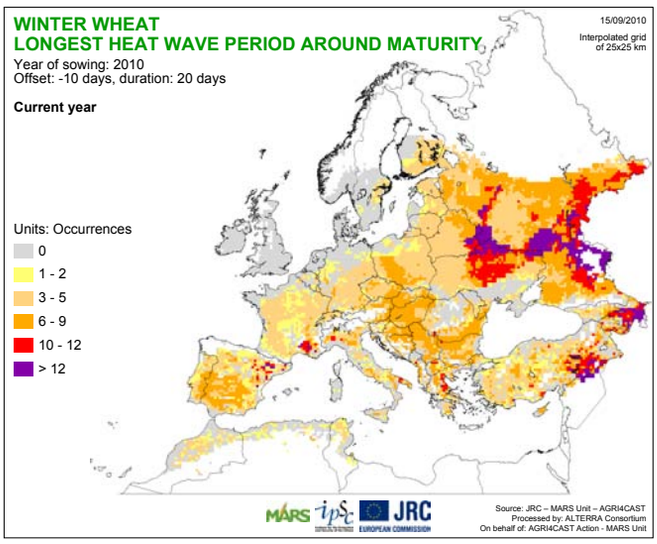


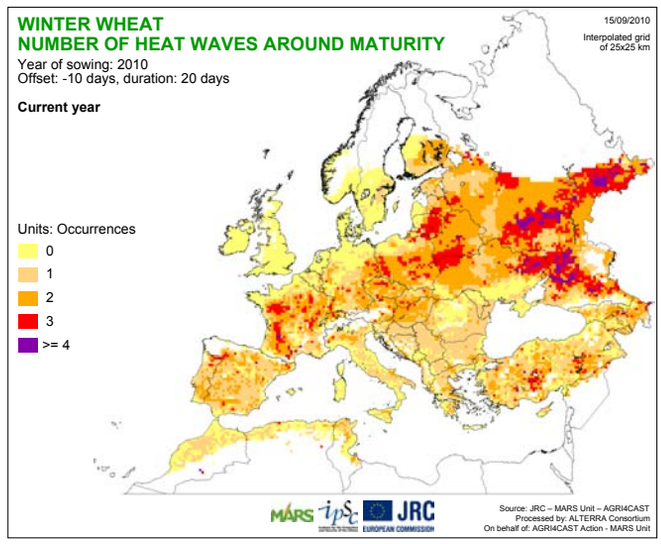


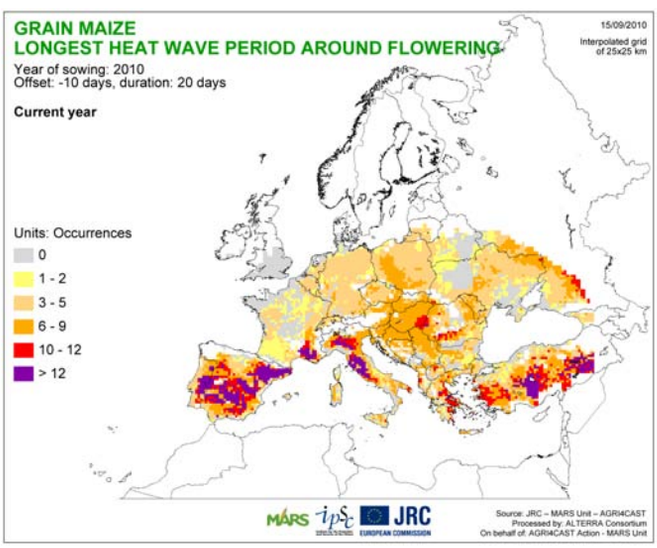


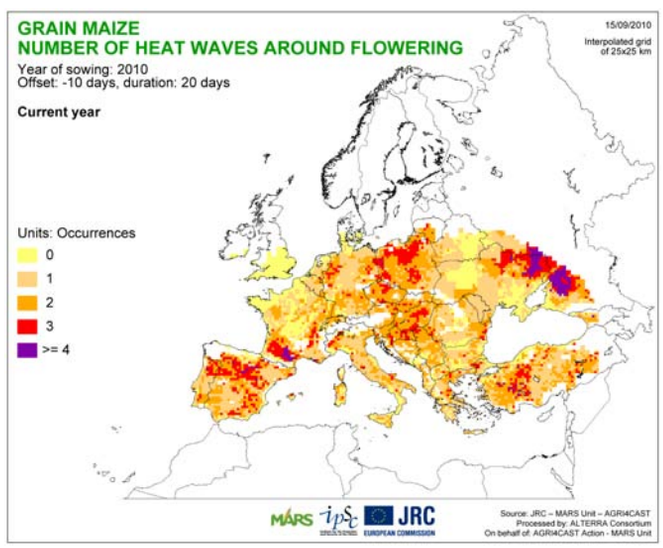


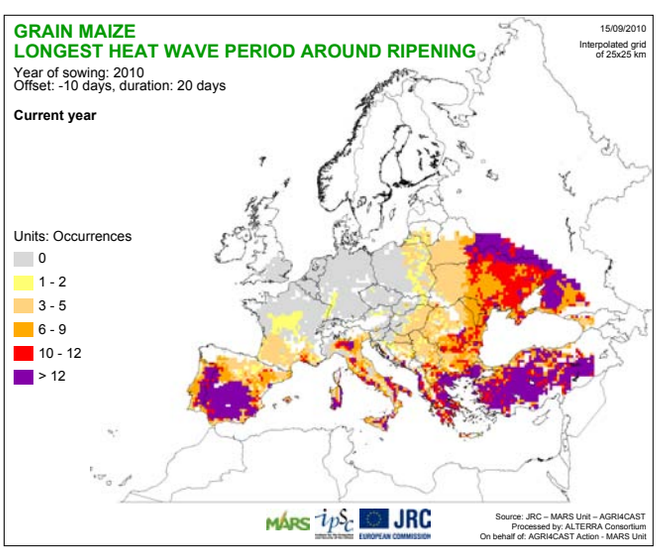
4.3. Heat wave during crop development

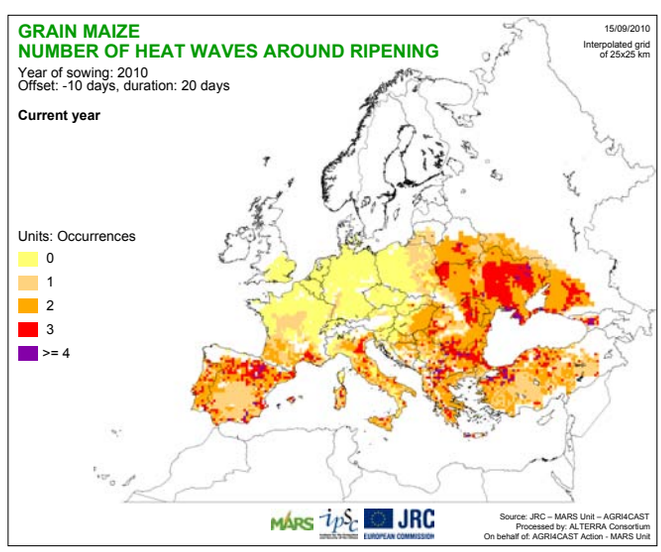




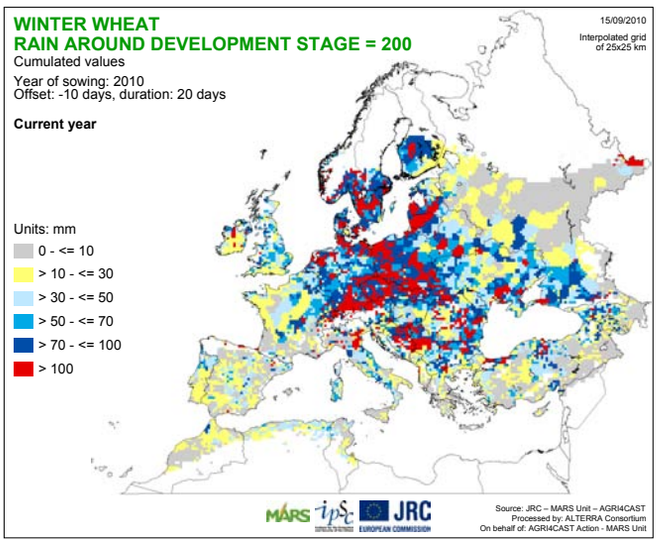


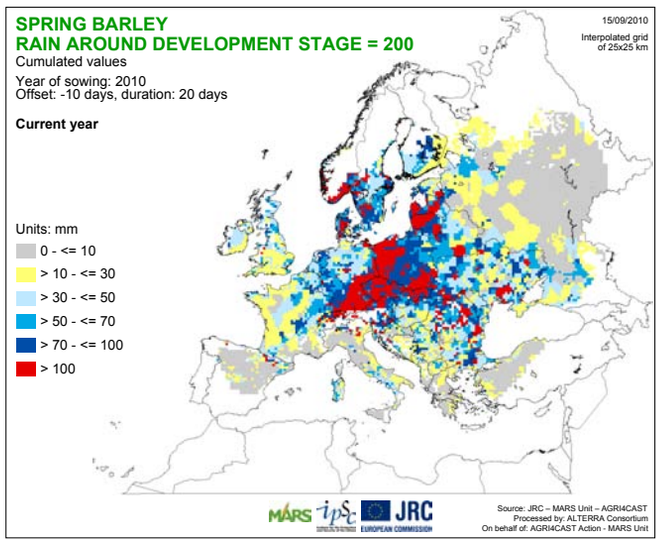


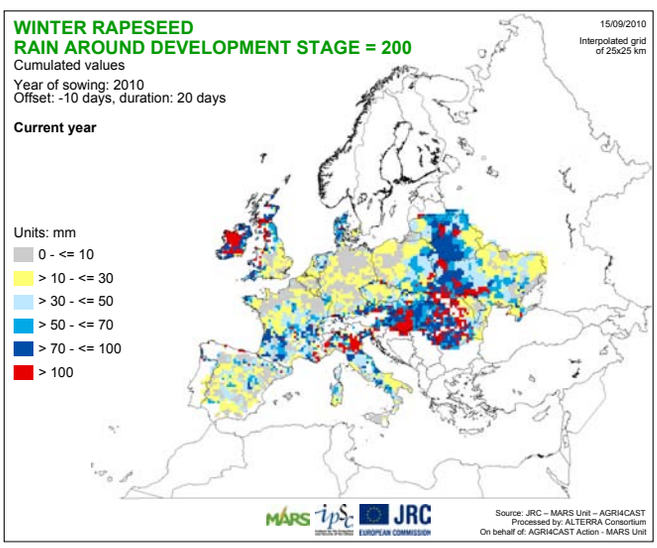


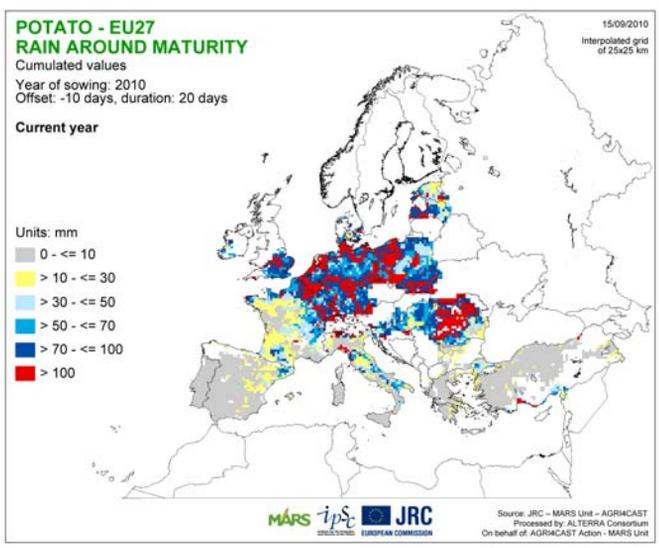


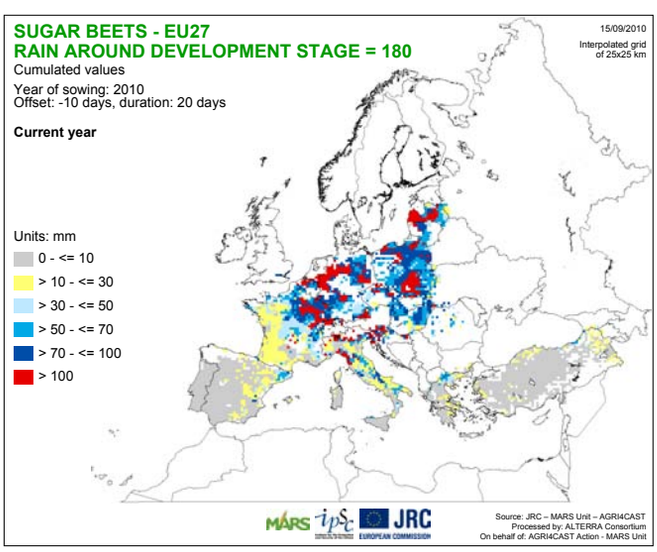
4.4. Rain around crop development

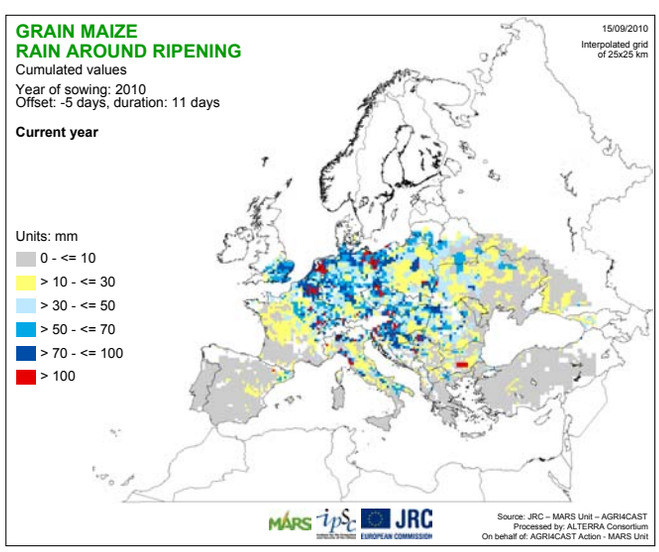






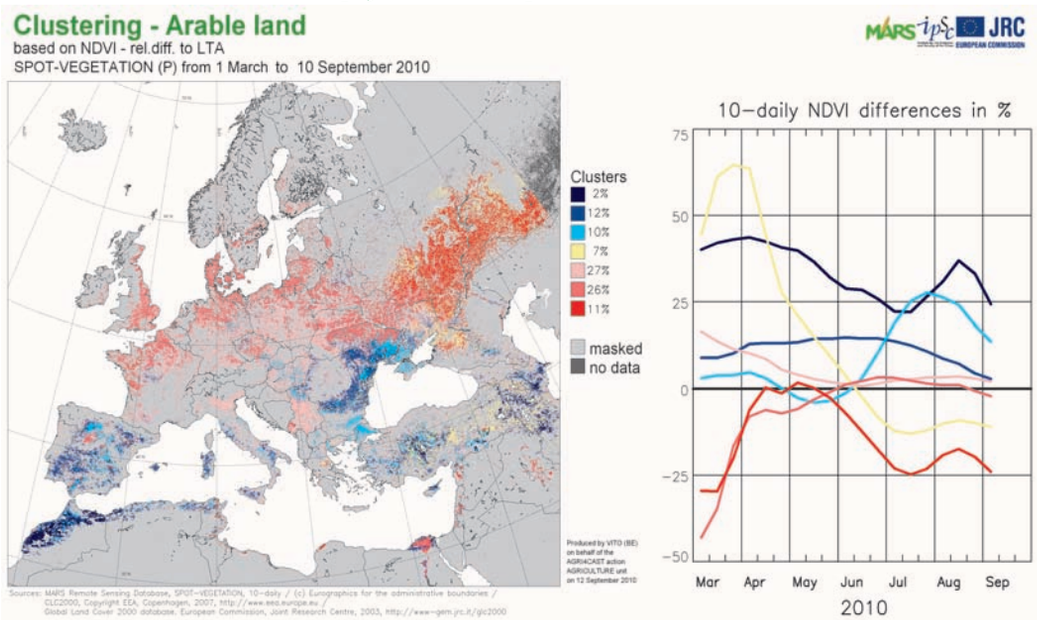






4. Satellite analysis: SPOT Vegetation

Normal to below-average biomass conditions across central and northern Europe. Good NDVI values along the Black Sea coast. Persistently bad canopy development in Russia.



The cluster map displays **NDVI behaviour** throughout the season from March until the end of August compared with values for the calculated long-term average year (1998 – 2009).

The **red** profile represents regions with bad vegetation development: the whole season has NDVI values lower than average. The prolonged drought dramatically affected crop development across Russia's main agricultural areas. The NDVI profile for the Penzenskaya Oblast region highlights the negative canopy conditions: the incomplete green biomass development is coupled with a shortened phenological cycle.

The **yellow** profile describes the NDVI trend in regions mainly located at the borders of the red areas. Here, the drought started later and the vegetation was less stressed. Development significantly slowed from July, in some places only from August, leading in both cases to early senescence.

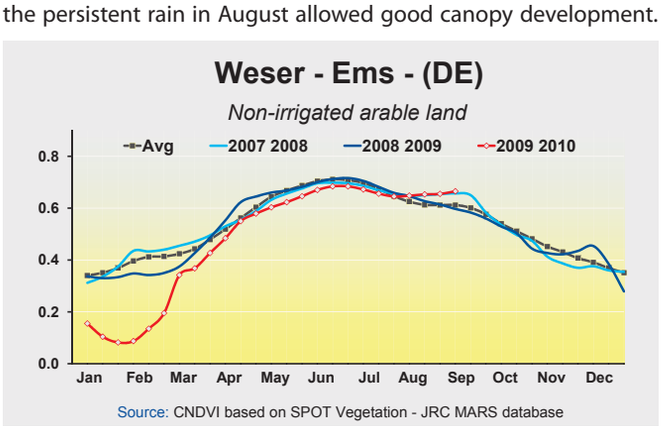
The **dark pink** curve refers to areas around or slightly below the average. These regions are mainly located in central Europe, indicating an east-west gradient moving from bad to normal conditions. The profile for Weser-Ems in Germany displays normal to slightly below-average NDVI values for spring crops, but shows a good trend for summer crops. The high radiation levels of July and the persistent rain in August allowed good canopy development.

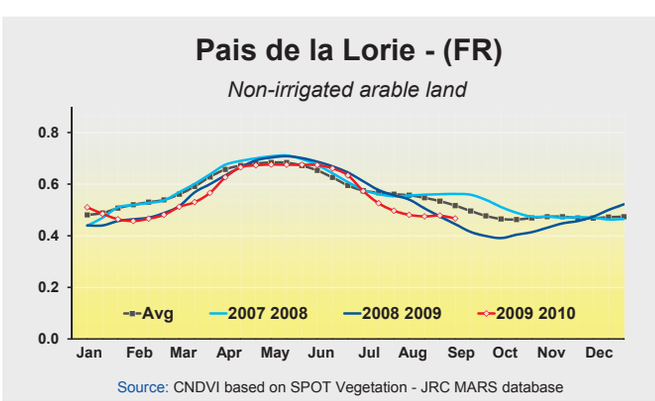
Thanks to the abundant precipitation in late August, crops were not affected by the rain scarcity in early summer. However, conditions were worse in the north-western regions of France, (i.e Pays de la Loire). Here, the lack of precipitation continued and affected crop growth, mainly during the middle weeks of August.

The **light pink** curve describes normal to slightly good vegetation. This behaviour is found in regions with a good balance between rain and temperature, as in northern Italy. The irregular precipitation distribution was offset by temperatures slightly below the average, allowing sufficient soil moisture for fairly good biomass development.

Normal to very good conditions are present in areas marked as **light blue.** The abundant rain of the early summer was followed by temperatures above the average. This combination triggered a good canopy development for summer crops.

Even better conditions are highlighted by the **dark blue curve**. Across the main agricultural regions of Romania, Bulgaria, Moldova and Ukraine, the combination of above-average temperatures and good soil moisture throughout the summer resulted in good growing conditions.





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