



AGROMETEOROLOGICAL BULLETIN

March 2013
2nd 10-day period

- Temperature
- Relative Humidity
- Soil Temperature
- Sunshine Duration
- Precipitation
- Evaporation
- Growing Degrees
- Reference Evapotranspiration
- Accumulated Rainfall from the beginning of wet period
- Accumulated Reference Evapotranspiration
- Number of dry days



Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

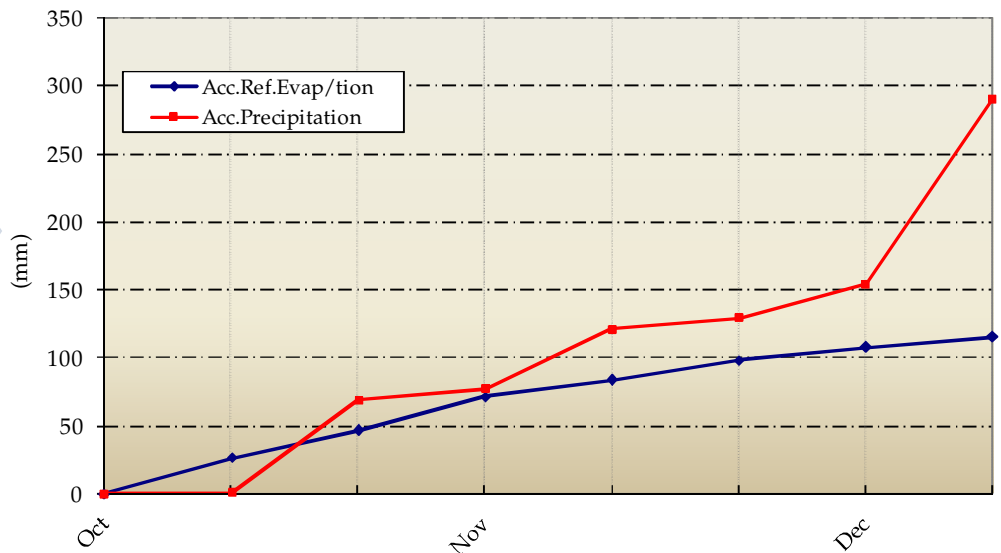
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

2nd 10-day period (11-20/03/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-		17.0	16.2
	Min	8.4	5.8	8.6	10.4	5.0	-	-	-	3.2	7.2	6.9	3.8	4.7
Relative Humidity	Max	97	94	87	91	-	-	-	94	93	97	93	89	-
	Min	45	58	68	82	-	-	-	78	63	47	63	46	-
Soil Temperature at 10 cm	06 UTC	12.2	12.4	12.4	12.6	11.6	-	-	-	9.4	11.0	11.7	9.6	9.3
	12 UTC	14.6	13.6	13.8	12.6	12.0	-	-	-	11.6	13.0	13.0	11.5	12.6
Sunshine Duration		7.3	7.1	0.9	0.0	-	-	-	-	6.5	6.4	4.7	7.9	5.6
Precipitation				5.0	16.7	4.0							4.0	28.1
Evaporation		3.8	3.3	2.4	-	-	-	-	3.5	0.8	5.4	-	-	29.9
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	54.1	55.0
	10	-	-	-	-	-	-	-	-	-	-	-	9.6	12.7

2nd 10-day period (11-20/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	22.6	20.4
Precipitation - Reference Evapotranspiration	-	-18.6	7.7
Number of Rainy Days	3.0	1.0	3.8
Number of Dry Days	4.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

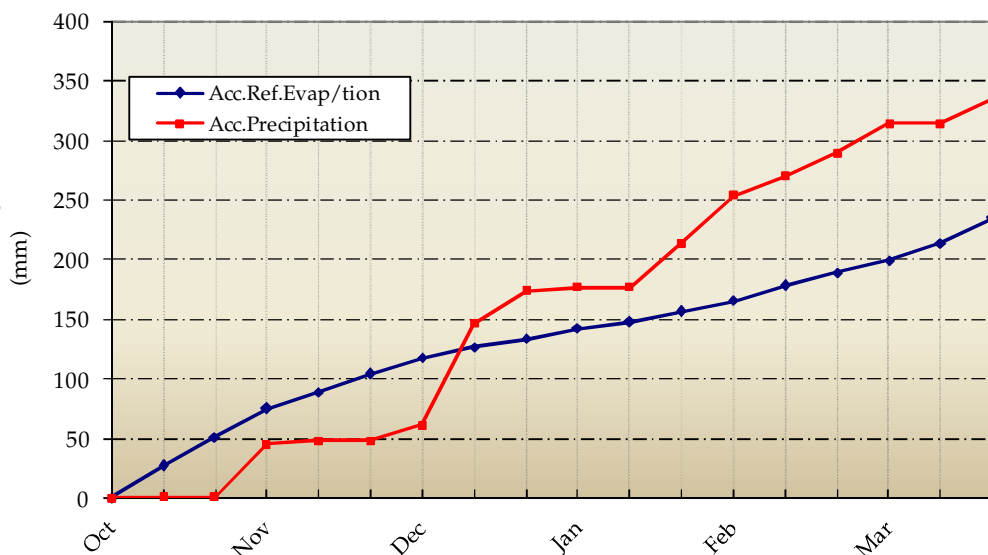
This station is not fully operated



2nd 10-day period (11-20/03/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.0	17.0	17.4	16.6	17.2	13.8	8.8	9.8	16.6	17.4	15.3	11.4	11.6
	Min	9.6	9.4	9.8	10.4	12.0	2.4	2.0	0.8	7.6	10.6	7.5	4.4	2.9
Relative Humidity	Max	95	97	90	91	88	83	85	90	90	95	90	91	-
	Min	70	52	56	56	47	56	44	42	55	58	54	58	-
Soil Temperature at 10 cm	06 UTC	11.4	12.0	11.6	12.6	12.0	10.0	7.0	6.2	9.8	11.8	10.4	6.7	6.6
	12 UTC	14.2	15.2	15.0	13.8	14.4	9.4	9.8	10.6	13.0	13.0	12.8	8.5	8.9
Sunshine Duration		5.8	7.9	7.2	1.8	6.1	0.0	8.4	6.2	9.3	3.9	5.7	5.2	4.9
Precipitation					0.2	15.0	2.4			3.1	0.0	20.7	9.8	14.4
Evaporation		0.8	3.0	3.9	6.5	5.4	1.0	0.8	6.3	2.7	1.0	31.4	21.2	21.8
Growing Degrees	5	8.8	8.2	8.6	8.5	9.6	3.1	0.4	0.3	7.1	9.0	63.6	31.0	27.0
	10	3.8	3.2	3.6	3.5	4.6	0.0	0.0	0.0	2.1	4.0	24.8	6.7	3.4

2nd 10-day period (11-20/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.4	16.9	18.1
Precipitation - Reference Evapotranspiration	0.3	-7.1	-3.7
Number of Rainy Days	4.0	3.0	2.2
Number of Dry Days	15.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

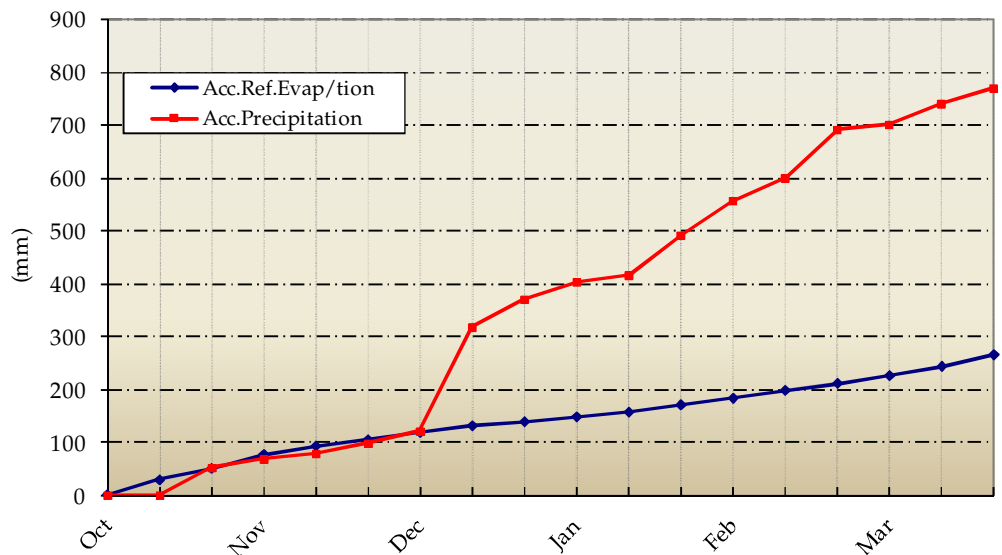


Andravida

2nd 10-day period (11-20/03/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.8	18.4	16.8	18.5	14.5	12.0	11.9	12.9	19.5	20.7	16.6	15.0	15.7
	Min	9.3	8.5	10.6	12.8	9.6	5.2	6.4	5.6	5.9	7.5	8.1	5.9	6.3
Relative Humidity	Max	92	91	86	80	88	91	77	86	92	91	87	92	-
	Min	53	58	51	43	49	42	43	52	52	40	48	56	-
Soil Temperature at 10 cm	06 UTC	13.6	14.0	14.4	14.2	12.4	11.0	10.4	11.6	10.4	12.2	12.4	10.3	10.6
	12 UTC	17.2	17.0	15.4	14.2	14.0	12.2	14.4	12.4	15.0	16.6	14.8	13.3	12.8
Sunshine Duration		6.0	8.9	0.8	0.0	4.7	4.4	9.6	0.0	9.5	5.2	4.9	7.1	6.4
Precipitation		2.4	0.4	3.2	3.9	5.1	14.2					29.2	5.3	25.8
Evaporation		6.5	-	1.5	2.6	4.0	0.0	3.9	0.4	1.4	1.6	-	24.6	26.9
Growing Degrees	5	10.1	8.5	8.7	10.7	7.1	3.6	4.2	4.3	7.7	9.1	73.7	54.5	60.4
	10	5.1	3.5	3.7	5.7	2.1	0.0	0.0	0.0	2.7	4.1	26.7	10.3	15.6

2nd 10-day period (11-20/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.0	20.4	21.0
Precipitation - Reference Evapotranspiration	7.2	-15.1	4.8
Number of Rainy Days	6.0	2.0	3.7
Number of Dry Days	1.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

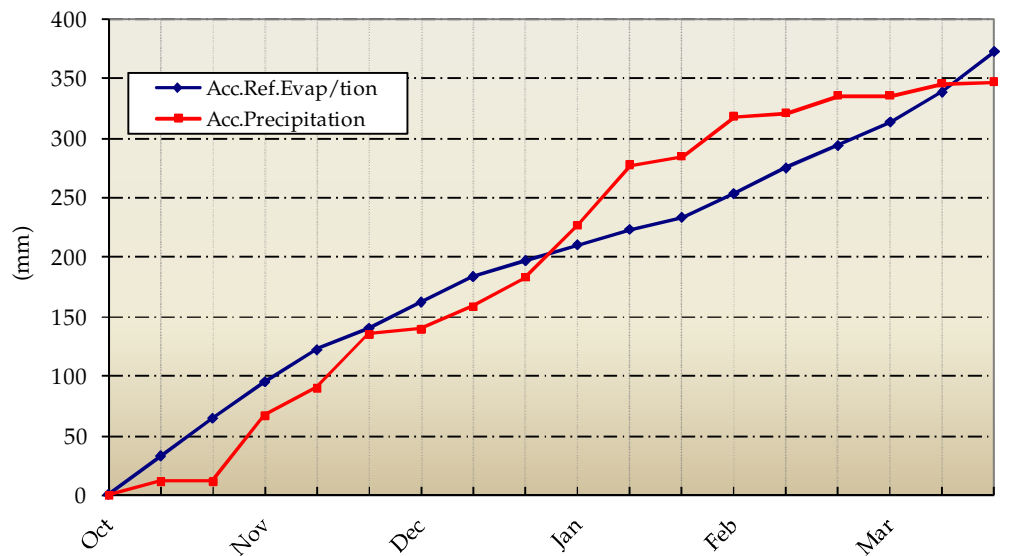


Iraklio

2nd 10-day period (11-20/03/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.6	20.0	19.4	22.4	23.0	15.8	14.4	15.0	21.6	23.4	20.0	-	15.9
	Min	16.0	13.2	11.0	14.8	13.8	7.8	9.8	6.2	9.4	14.2	11.6	-	9.4
Relative Humidity	Max	91	85	86	72	84	86	77	85	90	57	81	-	-
	Min	33	61	43	17	49	46	54	54	39	34	43	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		7.4	6.5	8.8	3.7	5.2	9.3	6.1	6.9	9.6	3.1	6.7	-	5.5
Precipitation							0.5	1.0				1.5	-	23.2
Evaporation		1.5	3.2	3.9	5.1	3.8	2.2	4.7	0.8	14.4	3.5	43.1	-	33.8
Growing Degrees	5	15.3	11.6	10.2	13.6	13.4	6.8	7.1	5.6	10.5	13.8	107.9	-	76.5
	10	10.3	6.6	5.2	8.6	8.4	1.8	2.1	0.6	5.5	8.8	57.9	-	28.0

2nd 10-day period (11-20/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	34.2	-	-
Precipitation - Reference Evapotranspiration	-32.7	-	23.2
Number of Rainy Days	2.0	-	3.5
Number of Dry Days	12.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

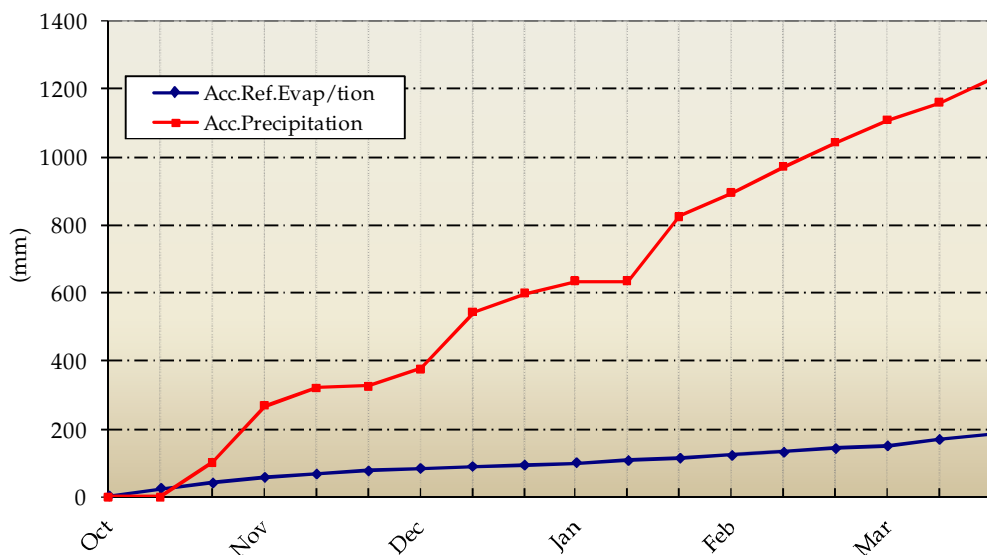


Ioannina

2nd 10-day period (11-20/03/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.8	12.4	13.2	11.0	8.0	6.7	9.4	7.0	13.4	17.6	11.8	15.4	12.6
	Min	10.0	6.4	6.2	7.2	5.1	2.0	-3.7	3.4	6.6	1.9	4.5	1.8	2.7
Relative Humidity	Max	97	-	97	-	97	95	93	91	96	99	96	82	-
	Min	25	-	42	-	63	52	29	55	64	36	46	32	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	6.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	8.8
Sunshine Duration		5.1	-	2.5	-	0.0	0.0	0.0	7.6	0.0	-	2.2	5.9	4.5
Precipitation		0.3	10.4	11.1	21.4	14.4	2.7		10.5	0.0	0.0	70.8	0.5	29.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	18.6
Growing Degrees	5	9.4	4.4	4.7	4.1	1.6	0.0	0.0	0.2	5.0	4.8	34.1	36.0	28.8
	10	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	4.7	3.0

2nd 10-day period (11-20/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.3	21.9	16.8
Precipitation - Reference Evapotranspiration	55.5	-21.4	12.7
Number of Rainy Days	7.0	1.0	3.4
Number of Dry Days	0.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

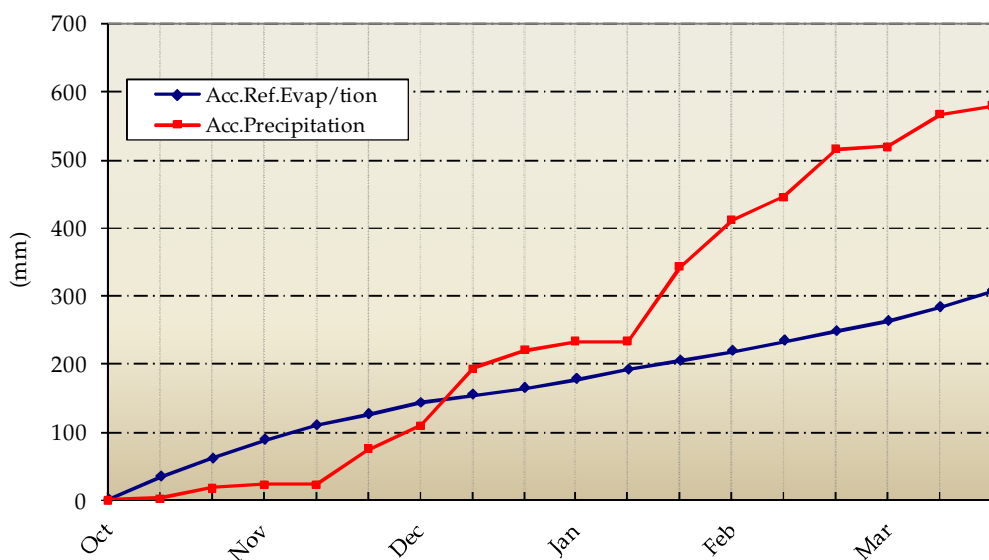


Kalamata

2nd 10-day period (11-20/03/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.0	20.5	19.0	19.0	15.8	13.4	14.5	13.7	18.6	19.9	17.5	16.2	16.3
	Min	9.6	10.0	7.3	13.8	7.0	5.1	1.9	3.0	6.4	9.8	7.4	6.1	5.8
Relative Humidity	Max	95	90	94	82	91	93	86	92	94	93	91	91	-
	Min	55	43	59	42	48	46	34	47	65	56	50	51	-
Soil Temperature at 10 cm	06 UTC	13.6	14.2	13.4	14.4	13.6	12.4	11.6	11.2	11.6	12.6	12.9	11.0	10.9
	12 UTC	14.6	15.2	14.6	14.6	14.0	13.0	12.8	12.2	12.8	14.0	13.8	12.5	13.0
Sunshine Duration		5.7	9.2	4.7	0.0	5.5	8.0	10.1	1.4	9.1	4.2	5.8	7.4	6.1
Precipitation				0.0	0.3	8.0	2.5		0.7			11.5	27.0	22.7
Evaporation		4.2	3.0	3.4	1.5	2.2	3.1	4.2	0.5	4.4	1.0	27.5	42.4	33.5
Growing Degrees	5	10.3	10.3	8.2	11.4	6.4	4.3	3.2	3.4	7.5	9.9	74.7	61.3	60.5
	10	5.3	5.3	3.2	6.4	1.4	0.0	0.0	0.0	2.5	4.9	28.9	14.4	15.1

2nd 10-day period (11-20/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	24.3	23.8	21.7
Precipitation - Reference Evapotranspiration	-12.8	3.2	1.0
Number of Rainy Days	4.0	3.0	3.8
Number of Dry Days	3.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

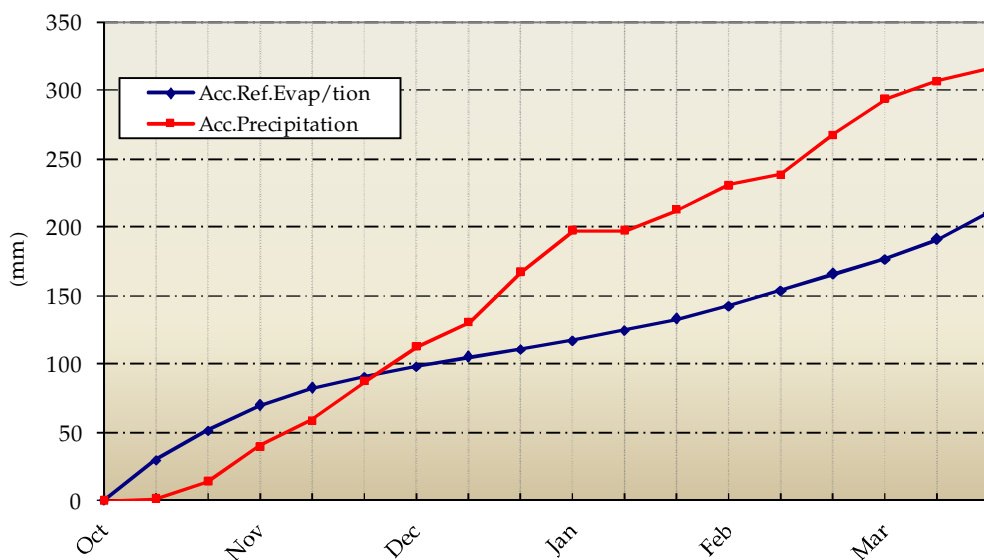


Larisa

2nd 10-day period (11-20/03/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.7	18.6	18.4	13.8	14.0	11.8	11.2	10.2	19.8	18.6	15.9	15.9	14.0
	Min	5.6	3.3	5.8	9.1	6.4	1.8	0.0	2.4	2.2	3.0	4.0	2.8	2.8
Relative Humidity	Max	98	90	89	97	98	89	79	98	100	98	94	94	-
	Min	25	35	44	64	48	42	34	57	44	42	44	41	-
Soil Temperature at 10 cm	06 UTC	11.0	11.0	10.8	11.6	10.6	9.4	8.0	9.4	9.2	10.0	10.1	7.6	8.4
	12 UTC	13.0	12.8	12.4	12.2	12.0	10.6	10.8	10.2	11.4	11.8	11.7	9.2	9.5
Sunshine Duration		8.6	5.3	4.9	0.0	1.9	5.4	8.0	0.7	7.9	5.7	4.8	6.4	5.1
Precipitation				0.1	4.8	1.1			3.3			9.3	13.6	13.9
Evaporation		6.6	3.3	2.6	0.5	1.3	1.2	4.3	0.1	4.2	2.0	26.1	35.2	20.7
Growing Degrees	5	9.2	6.0	7.1	6.5	5.2	1.8	0.6	1.3	6.0	5.8	49.4	43.2	36.4
	10	4.2	1.0	2.1	1.5	0.2	0.0	0.0	0.0	1.0	0.8	10.7	9.3	5.5

2nd 10-day period (11-20/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.2	20.8	18.5
Precipitation - Reference Evapotranspiration	-10.9	-7.2	-4.6
Number of Rainy Days	4.0	3.0	3.1
Number of Dry Days	3.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

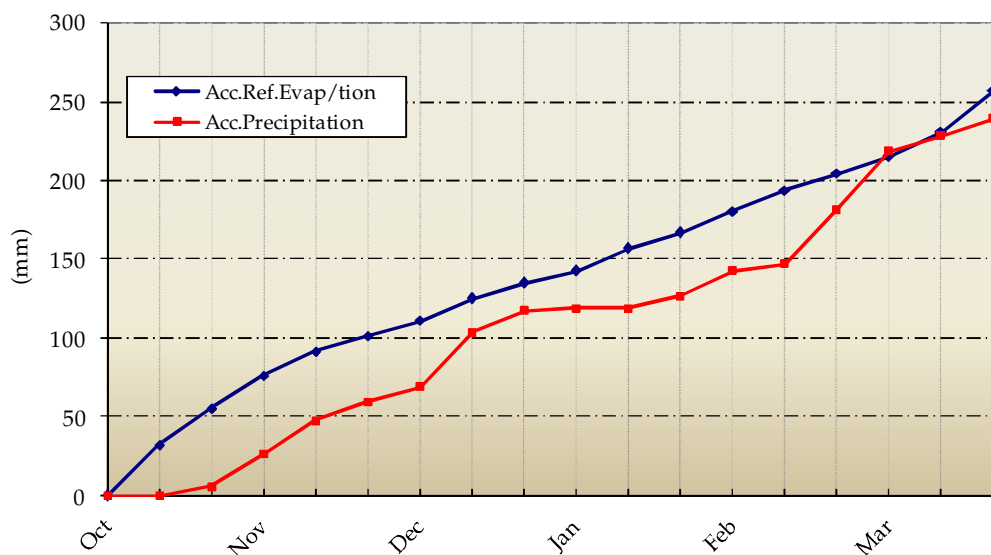


Mikra

2nd 10-day period (11-20/03/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.2	19.0	17.4	17.0	17.0	10.0	10.4	9.8	18.4	19.0	16.0	13.9	13.4
	Min	9.2	6.2	6.6	14.2	9.2	3.2	3.0	1.2	6.8	3.4	6.3	4.1	4.2
Relative Humidity	Max	88	82	80	75	76	59	80	91	93	93	82	86	-
	Min	32	34	44	52	40	38	29	56	46	35	41	49	-
Soil Temperature at 10 cm	06 UTC	11.4	11.8	11.4	12.6	11.6	8.8	7.2	8.4	9.4	10.0	10.3	7.3	8.1
	12 UTC	13.4	14.4	12.6	12.8	12.6	13.4	9.0	9.0	10.7	11.8	12.0	10.0	10.7
Sunshine Duration		8.4	5.1	3.9	0.0	2.8	9.3	10.3	0.0	7.3	9.8	5.7	6.2	4.9
Precipitation		0.0	0.1	0.4	1.9	0.9			7.8			11.1	10.6	13.5
Evaporation		3.6	4.2	1.5	1.3	3.0	0.2	0.8	0.3	4.3	1.4	20.6	29.7	27.0
Growing Degrees	5	10.7	7.6	7.0	10.6	8.1	1.6	1.7	0.5	7.6	6.2	61.6	40.1	38.9
	10	5.7	2.6	2.0	5.6	3.1	0.0	0.0	0.0	2.6	1.2	22.8	6.2	5.9

2nd 10-day period (11-20/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	26.4	21.7	20.0
Precipitation - Reference Evapotranspiration	-15.3	-11.1	-6.5
Number of Rainy Days	5.0	2.0	3.0
Number of Dry Days	2.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

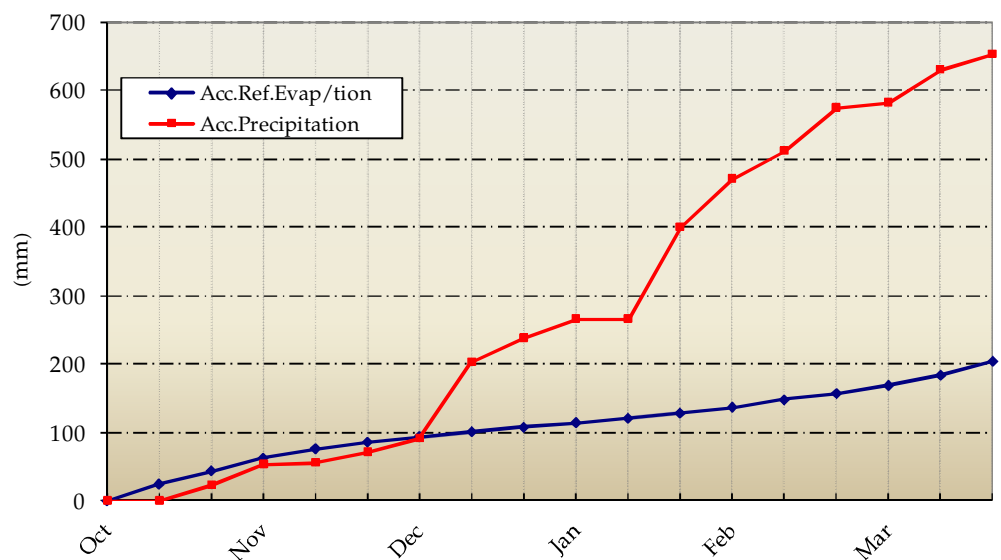


Tripoli

2nd 10-day period (11-20/03/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.8	15.6	15.2	15.8	10.2	8.6	11.4	10.0	16.1	19.4	14.3	13.1	12.2
	Min	4.7	4.5	7.5	7.3	1.9	1.0	-2.4	-1.6	0.9	1.6	2.5	-0.3	1.7
Relative Humidity	Max	97	71	69	75	92	79	69	94	95	97	84	92	-
	Min	27	36	52	33	52	52	35	59	44	38	43	68	-
Soil Temperature at 10 cm	06 UTC	9.0	9.4	9.4	9.6	8.4	6.6	4.4	6.0	6.4	7.6	7.7	5.4	6.6
	12 UTC	13.6	13.6	12.8	11.4	10.2	8.8	9.8	8.6	12.2	13.0	11.4	-	8.1
Sunshine Duration		8.1	10.4	5.4	0.0	3.6	6.9	10.7	0.9	9.7	7.2	6.3	7.1	5.7
Precipitation				0.1	8.2	12.5	3.2		0.0			24.0	21.7	22.3
Evaporation		2.8	3.5	2.9	0.3	2.1	1.8	2.3	0.9	2.4	1.6	20.6	19.7	20.1
Growing Degrees	5	7.8	5.1	6.4	6.6	1.1	0.0	0.0	0.0	3.5	5.5	35.8	20.8	24.1
	10	2.8	0.1	1.4	1.6	0.0	0.0	0.0	0.0	0.0	0.5	6.2	1.6	2.5

2nd 10-day period (11-20/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.4	18.1	19.5
Precipitation - Reference Evapotranspiration	3.6	3.6	2.8
Number of Rainy Days	4.0	3.0	4.1
Number of Dry Days	2.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





◆ **List of Symbols and Abbreviations**

Reference Evapotranspiration ETo (mm):

Calculated by the FAO Penman-Montieth equation

$$ET_0 = \frac{0.408 * \Delta * (R_n - G) + \gamma * \frac{900}{T + 273} * u_2 * (e_s - e_a)}{\Delta + \gamma * (1 + 0.34 * u_2)}$$

using 10-day step.

R_n is estimated from sunshine measurements and G assumed to be zero.

Growing Degrees: Degrees with mean temperature exceeding the base of 5 or 10 °C.

Number of Rainy Days: Number of days with precipitation of at least 0.1 mm.

Number of Dry Days: Number of dry days recorded since the last rainy day.

Measurements Units

- ◆ Temperature : °C
- ◆ Relative Humidity : %
- ◆ Soil Temperature : °C
- ◆ Sunshine Duration : Hours
- ◆ Precipitation : mm
- ◆ Evaporation (Pan) : mm
- ◆ Growing Degrees : °C

UTC (Universal Time coordinates) in Greece

- ◆ Winter : Time(UTC) = Local time - 2
- ◆ Summer : Time(UTC) = Local time - 3

© HELLENIC NATIONAL METEOROLOGICAL SERVICE

Reproduction is prohibited without written permission

El. Venizelou street 14, Zip Code 16777

Helliniko, Athens



ΕΘΝΙΚΗ
ΜΕΤΕΩΡΟΛΟΓΙΚΗ
ΥΠΗΡΕΣΙΑ

HELLENIC NATIONAL METEOROLOGICAL SERVICE

Division of Climatology-Applications

Issue Editors :

Papakrivou Anastasia

Charalabopoulos Christos

The present bulletin was designed and implemented under the support of Water Resources Management Division of Agriculture University of Athens