



AGROMETEOROLOGICAL BULLETIN

February 2013
1st 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
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Helliniko, Athens

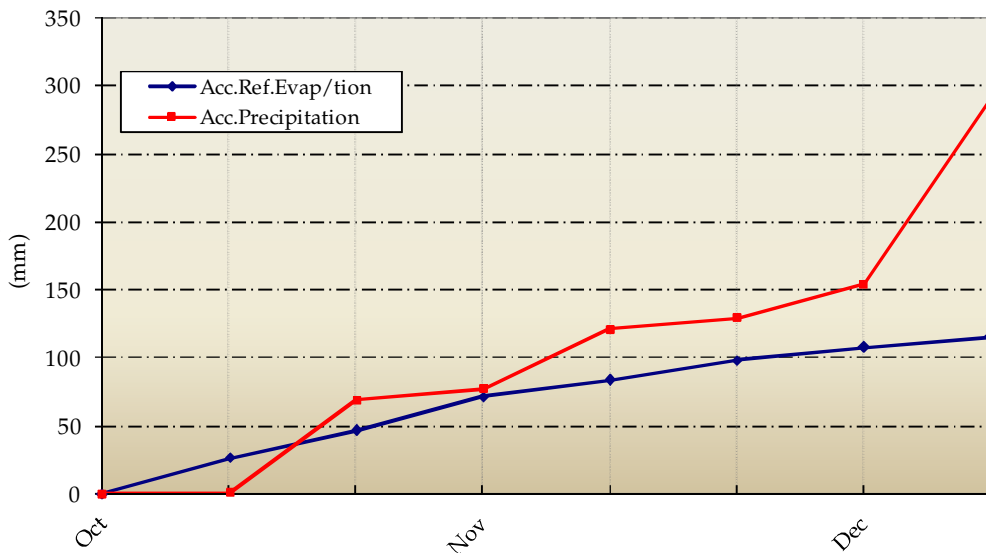
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

Agrinio

1st 10-day period (1-10/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-		10.7	14.2
	Min	-0.4	-	-	6.8	2.4	3.8	9.8	5.0	-	-	4.6	3.9	2.8
Relative Humidity	Max	-	-	91	94	96	97	93	-	-	97	95	89	-
	Min	-	-	56	60	53	62	88	-	-	42	60	57	-
Soil Temperature at 10 cm	06 UTC	7.2	-	-	10.6	9.4	8.4	8.0	8.6	-	-	8.7	6.4	7.6
	12 UTC	8.2	-	-	11.0	10.6	10.2	9.6	8.8	-	-	9.7	7.1	9.8
Sunshine Duration		-	-	-	0.7	8.1	4.0	0.0	-	-	-	3.2	1.0	4.8
Precipitation								67.5	10.8			-	105.8	36.3
Evaporation		-	-	1.8	1.4	2.2	3.4	1.3	-	-	1.5	-	24.7	16.2
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	29.6	36.7
	10	-	-	-	-	-	-	-	-	-	-	-	4.5	4.3

1st 10-day period (1-10/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	13.2	12.1
Precipitation - Reference Evapotranspiration	-	92.6	24.2
Number of Rainy Days	2.0	8.0	3.7
Number of Dry Days	12.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

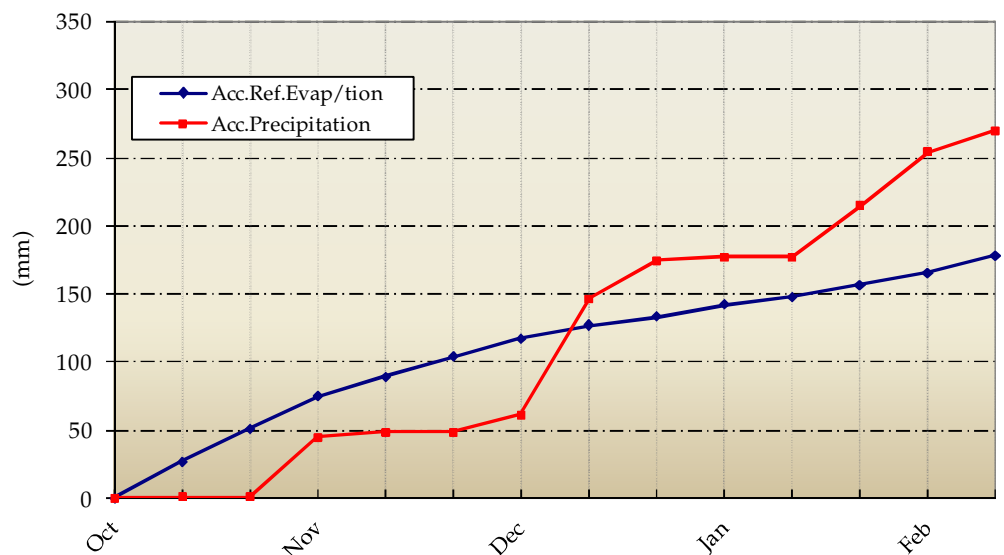


This station is not fully operated

1st 10-day period (1-10/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.4	13.2	16.6	15.0	14.6	11.8	15.4	15.4	13.4	14.4	14.2	4.7	9.1
	Min	-0.4	1.8	13.0	10.8	3.0	1.2	7.4	7.2	4.0	5.0	5.3	-0.7	0.8
Relative Humidity	Max	92	92	85	93	87	93	94	94	93	94	92	80	-
	Min	54	71	66	75	50	71	69	57	60	59	63	57	-
Soil Temperature at 10 cm	06 UTC	4.4	5.4	9.2	11.0	6.6	6.8	9.2	10.2	8.8	8.4	8.0	2.6	5.3
	12 UTC	6.2	7.2	10.6	11.4	9.6	9.6	10.6	11.0	9.4	10.0	9.6	2.6	6.6
Sunshine Duration		6.7	1.5	0.4	0.0	9.1	6.9	0.9	2.2	5.1	5.9	3.9	3.3	3.9
Precipitation					2.6			0.0	9.8	1.3	2.2	15.9	18.0	19.4
Evaporation		0.0	0.4	2.4	3.3	1.5	0.2	1.1	1.8	0.6	0.1	11.4	3.4	11.6
Growing Degrees	5	1.0	2.5	9.8	7.9	3.8	1.5	6.4	6.3	3.7	4.7	47.6	10.9	14.1
	10	0.0	0.0	4.8	2.9	0.0	0.0	1.4	1.3	0.0	0.0	10.4	0.7	1.4

1st 10-day period (1-10/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.7	11.3	10.9
Precipitation - Reference Evapotranspiration	3.2	6.7	8.5
Number of Rainy Days	4.0	3.0	2.5
Number of Dry Days	3.0	8.0	-

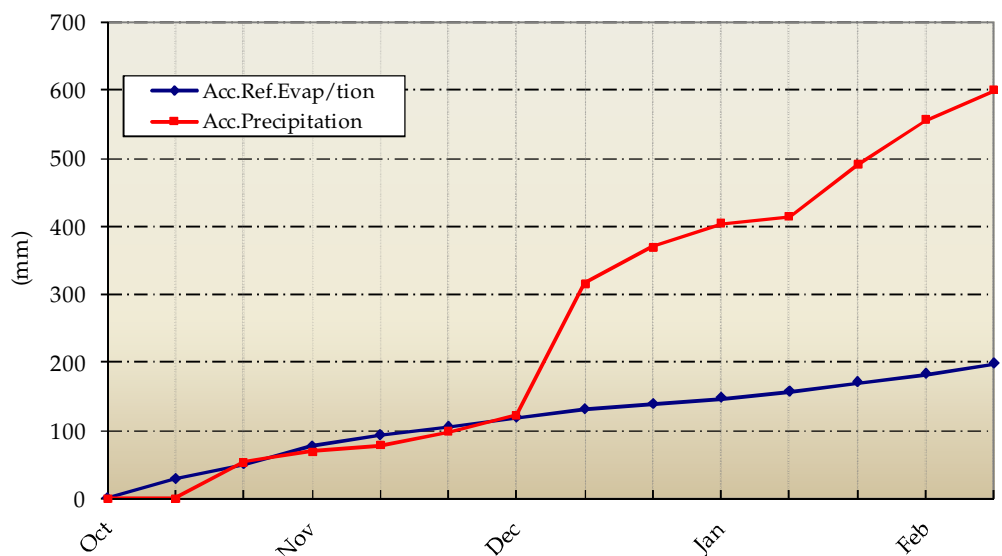
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.8	16.9	18.5	16.0	19.0	15.2	15.3	12.4	13.2	12.8	15.6	12.5	14.0
	Min	3.8	10.0	11.8	7.9	5.8	7.6	10.2	6.8	6.2	6.0	7.6	5.8	4.8
Relative Humidity	Max	91	89	90	91	91	90	87	90	90	90	90	92	-
	Min	40	67	61	59	48	54	61	61	57	49	56	56	-
Soil Temperature at 10 cm	06 UTC	9.0	11.2	12.6	11.4	10.2	11.2	12.0	10.6	9.4	9.6	10.7	8.0	9.2
	12 UTC	12.0	12.2	14.2	13.6	13.4	12.8	12.6	12.2	11.4	10.8	12.5	9.5	10.9
Sunshine Duration		7.8	6.9	3.1	3.7	7.0	4.3	3.0	2.2	3.4	2.6	4.4	1.7	5.2
Precipitation							2.1	14.1	8.8	15.5	3.4	43.9	138.6	28.0
Evaporation		0.9	1.3	3.6	0.4	2.9	0.1	0.8	1.3	0.2	4.1	15.6	10.3	19.1
Growing Degrees	5	5.3	8.5	10.2	7.0	7.4	6.4	7.8	4.6	4.7	4.4	66.1	44.3	44.7
	10	0.3	3.5	5.2	2.0	2.4	1.4	2.8	0.0	0.0	0.0	17.4	11.0	7.9

1st 10-day period (1-10/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.0	13.8	12.4
Precipitation - Reference Evapotranspiration	28.9	124.8	15.6
Number of Rainy Days	5.0	9.0	4.1
Number of Dry Days	8.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

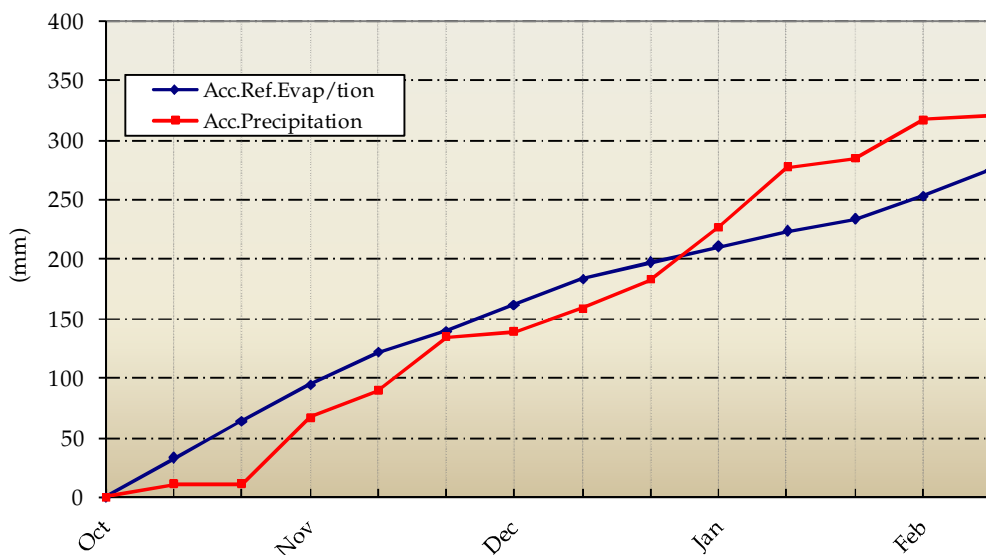


Iraklio

1st 10-day period (1-10/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.4	18.8	19.2	20.2	17.0	16.6	18.2	15.8	17.4	15.4	17.4	-	14.6
	Min	11.0	8.4	14.4	14.2	10.6	13.8	11.6	12.8	10.0	10.6	11.7	-	8.7
Relative Humidity	Max	78	81	77	83	95	90	84	85	85	89	85	-	-
	Min	58	65	55	56	67	74	50	52	56	58	59	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.4	8.4	8.4	7.5	7.2	6.5	7.3	3.6	5.0	6.9	6.9	-	4.3
Precipitation		0.5					0.4		1.8			2.7	-	22.4
Evaporation		1.7	3.4	3.0	3.1	2.6	1.6	3.2	2.0	-	1.8	-	-	29.3
Growing Degrees	5	8.2	8.6	11.8	12.2	8.8	10.2	9.9	9.3	8.7	8.0	95.7	-	66.4
	10	3.2	3.6	6.8	7.2	3.8	5.2	4.9	4.3	3.7	3.0	45.7	-	19.8

1st 10-day period (1-10/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	21.5	-	-
Precipitation - Reference Evapotranspiration	-18.8	-	22.4
Number of Rainy Days	3.0	-	4.2
Number of Dry Days	1.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

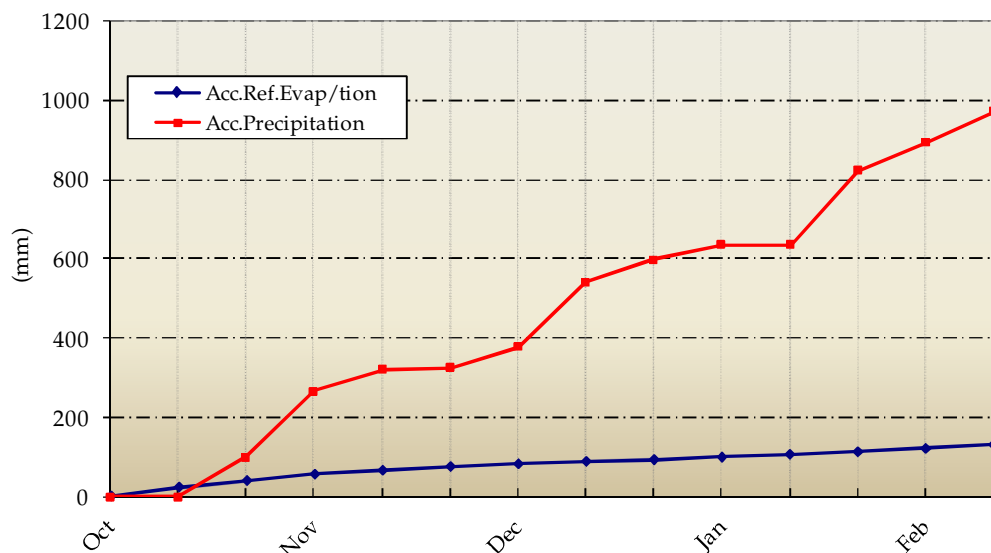


Ioannina

1st 10-day period (1-10/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.2	14.6	15.0	10.6	11.6	11.0	6.6	4.6	5.6	7.0	10.0	6.8	10.0
	Min	-3.6	4.0	8.4	2.9	-3.5	-1.5	3.6	0.8	1.6	0.2	1.3	1.2	0.6
Relative Humidity	Max	95	89	88	96	98	97	96	97	97	98	95	88	-
	Min	22	65	49	55	45	49	77	78	71	41	55	53	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	4.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	5.1
Sunshine Duration		6.3	0.0	1.4	1.4	2.7	-	0.0	0.0	0.6	3.2	1.7	0.9	3.6
Precipitation				0.9	1.4	0.1	7.0	33.5	10.0	10.7	13.1	76.7	59.5	35.8
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	5.0
Growing Degrees	5	0.0	4.3	6.7	1.8	0.0	0.0	0.1	0.0	0.0	0.0	12.9	8.2	13.4
	10	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.3

1st 10-day period (1-10/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.6	11.4	9.3
Precipitation - Reference Evapotranspiration	67.1	48.1	26.5
Number of Rainy Days	8.0	8.0	3.5
Number of Dry Days	7.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

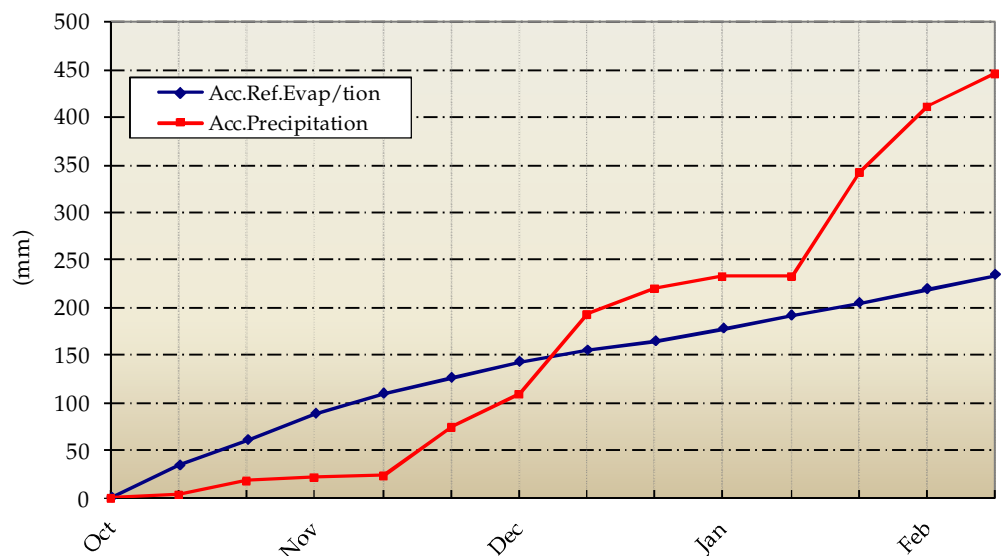


Kalamata

1st 10-day period (1-10/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.8	17.8	18.6	18.4	20.0	16.8	16.5	10.6	12.6	13.3	16.2	12.8	14.9
	Min	3.3	7.6	13.4	10.4	7.0	6.7	10.4	6.8	5.4	4.8	7.6	6.4	4.8
Relative Humidity	Max	89	93	94	94	91	94	90	93	94	94	93	93	-
	Min	29	58	65	58	46	48	66	68	68	61	57	65	-
Soil Temperature at 10 cm	06 UTC	10.0	11.0	12.4	12.6	12.0	11.8	12.6	11.0	10.5	10.4	11.4	8.9	9.7
	12 UTC	11.0	12.0	13.4	13.2	13.0	12.8	12.6	11.2	11.0	11.2	12.1	9.6	11.0
Sunshine Duration		8.8	6.3	4.9	2.8	4.9	5.5	0.8	1.3	1.8	4.6	4.2	2.6	5.1
Precipitation							0.8	11.9	8.0	6.2	7.4	34.3	106.0	28.3
Evaporation		1.6	3.6	1.0	2.2	2.2	1.0	-	0.2	0.6	0.9	-	25.1	24.5
Growing Degrees	5	5.6	7.7	11.0	9.4	8.5	6.8	8.5	3.7	4.0	4.1	69.1	45.9	48.9
	10	0.6	2.7	6.0	4.4	3.5	1.8	3.5	0.0	0.0	0.0	22.4	12.8	8.7

1st 10-day period (1-10/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.1	13.7	14.4
Precipitation - Reference Evapotranspiration	19.2	92.3	13.9
Number of Rainy Days	5.0	8.0	4.1
Number of Dry Days	9.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

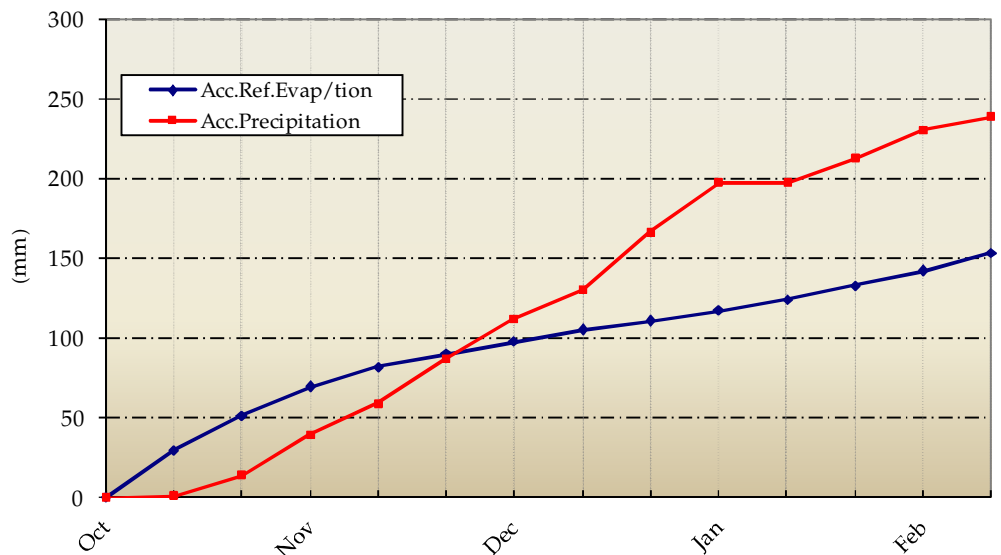


Larisa

1st 10-day period (1-10/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.4	18.6	21.8	16.0	15.2	11.2	12.0	11.0	12.4	12.4	14.6	4.6	11.2
	Min	-1.2	0.8	5.8	3.8	0.4	0.1	3.0	3.5	0.8	0.8	1.8	0.6	0.4
Relative Humidity	Max	90	96	78	93	100	100	100	98	98	98	95	94	-
	Min	29	46	27	40	40	69	72	50	55	26	45	77	-
Soil Temperature at 10 cm	06 UTC	5.4	5.8	7.4	8.0	7.2	7.0	7.6	7.2	6.6	6.4	6.9	3.6	6.1
	12 UTC	7.0	7.8	9.4	9.2	8.8	8.2	8.4	8.0	8.2	8.2	8.3	4.0	6.8
Sunshine Duration		8.0	4.5	7.5	1.1	7.8	2.8	0.2	1.8	4.6	7.3	4.6	0.1	4.3
Precipitation								7.9		0.0		7.9	36.5	9.7
Evaporation		0.0	1.9	4.0	2.1	1.0	0.5	0.7	0.7	1.3	1.8	14.0	19.4	6.9
Growing Degrees	5	2.1	4.7	8.8	4.9	2.8	0.7	2.5	2.3	1.6	1.6	31.9	2.5	16.7
	10	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.7

1st 10-day period (1-10/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.6	6.7	9.6
Precipitation - Reference Evapotranspiration	-3.7	29.8	0.1
Number of Rainy Days	1.0	6.0	2.8
Number of Dry Days	11.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

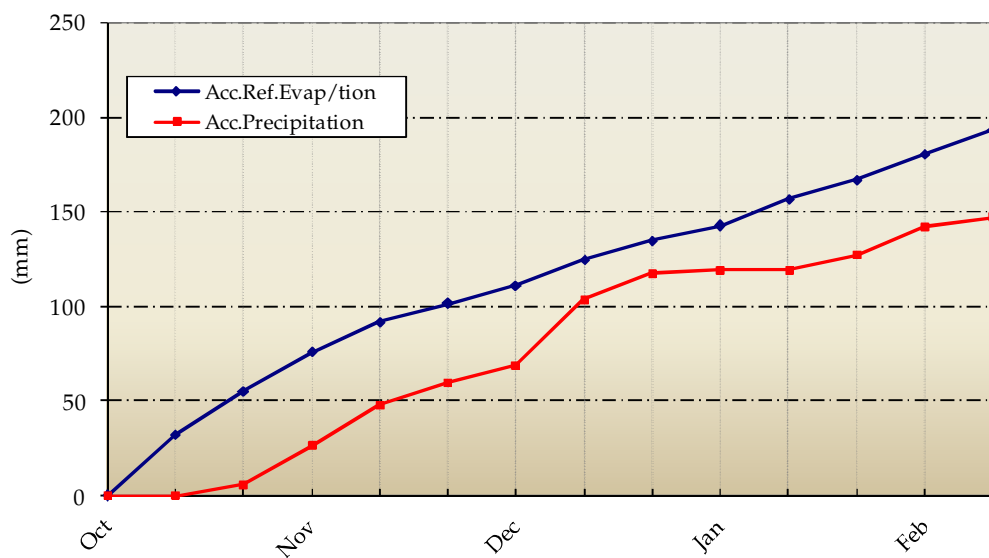


Mikra

1st 10-day period (1-10/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.6	14.8	20.0	14.0	14.4	12.6	15.1	10.0	9.4	12.6	13.6	4.8	10.3
	Min	-0.3	1.2	3.6	5.8	0.2	4.4	8.6	5.9	-0.4	1.6	3.1	-0.1	1.6
Relative Humidity	Max	84	88	91	82	90	89	93	85	84	92	88	94	-
	Min	35	57	43	47	36	70	55	47	53	29	47	69	-
Soil Temperature at 10 cm	06 UTC	6.2	6.2	7.4	9.0	7.0	8.0	9.2	8.8	6.4	7.2	7.5	3.6	5.6
	12 UTC	7.6	7.6	9.6	9.6	8.6	9.4	10.0	8.8	8.0	7.8	8.7	4.5	7.1
Sunshine Duration		8.5	2.0	5.4	2.2	8.4	3.5	0.0	5.3	2.1	7.0	4.4	0.9	4.3
Precipitation								4.9				4.9	17.9	10.5
Evaporation		1.8	1.3	3.8	1.0	1.1	1.9	0.7	0.4	1.9	1.8	15.7	5.3	12.4
Growing Degrees	5	1.2	3.0	6.8	4.9	2.3	3.5	6.9	3.0	0.0	2.1	33.6	2.7	17.2
	10	0.0	0.0	1.8	0.0	0.0	0.0	1.9	0.0	0.0	0.0	3.7	0.0	0.8

1st 10-day period (1-10/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.9	7.7	11.4
Precipitation - Reference Evapotranspiration	-8.0	10.2	-0.9
Number of Rainy Days	1.0	8.0	2.6
Number of Dry Days	11.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

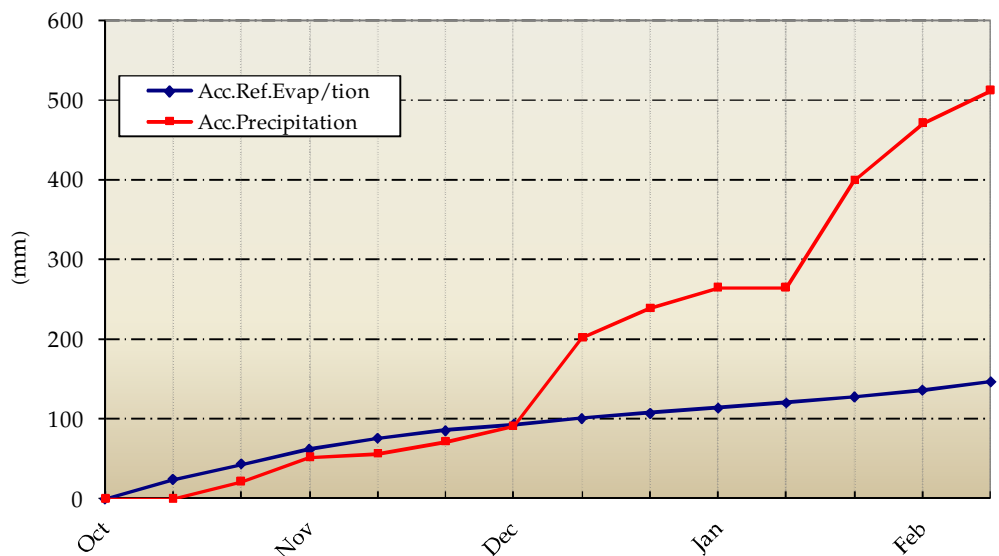


Tripoli

1st 10-day period (1-10/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.6	14.2	16.1	16.2	13.3	12.7	9.9	8.1	8.1	8.0	12.1	6.8	10.0
	Min	-2.7	7.1	8.9	3.9	4.2	0.5	5.2	0.8	2.1	0.8	3.1	0.8	0.4
Relative Humidity	Max	100	79	73	100	99	100	82	97	84	98	91	91	-
	Min	18	70	69	54	65	49	65	67	69	96	62	69	-
Soil Temperature at 10 cm	06 UTC	3.6	6.4	6.8	7.0	7.0	6.6	6.6	5.4	4.4	4.4	5.8	3.2	5.0
	12 UTC	7.2	-	-	9.6	8.8	9.6	8.4	6.8	6.8	-	8.2	4.1	5.8
Sunshine Duration		7.9	4.7	7.7	4.2	1.9	6.2	0.4	1.0	2.4	5.5	4.2	1.6	4.9
Precipitation							0.0	13.9	15.7	2.5	8.3	40.4	135.4	26.5
Evaporation		0.0	1.2	2.1	0.8	0.1	0.9	0.0	0.7	0.0	1.5	7.3	-	8.6
Growing Degrees	5	1.0	5.7	7.5	5.1	3.8	1.6	2.6	0.0	0.1	0.0	27.2	10.4	13.4
	10	0.0	0.7	2.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.4

1st 10-day period (1-10/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.5	8.0	11.6
Precipitation - Reference Evapotranspiration	29.9	127.4	14.9
Number of Rainy Days	4.0	10.0	4.1
Number of Dry Days	10.0	6.0	-

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

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