



# AGROMETEOROLOGICAL BULLETIN

*September 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

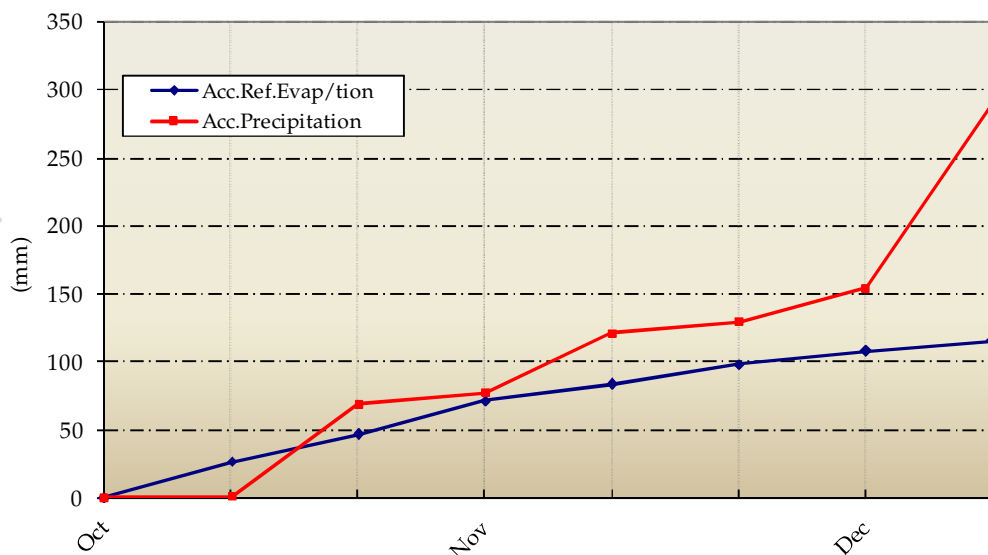
*Web addresses of HNMS*  
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[www.meteo.gov.gr](http://www.meteo.gov.gr)  
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Agrinio

1st 10-day period (1-10/09/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.0	33.0	32.0	32.0	33.0	33.0	-	-	33.0	33.0	32.8	33.9	30.5
	Min	17.0	16.2	16.2	18.0	17.0	17.0	-	-	17.4	17.6	17.0	16.1	15.4
Relative Humidity	Max	88	85	88	77	81	-	-	96	92	91	87	72	-
	Min	32	34	36	35	37	-	-	39	37	33	35	30	-
Soil Temperature at 10 cm	06 UTC	30.0	30.0	29.0	28.0	28.0	28.4	-	-	25.0	29.0	28.4	28.5	23.6
	12 UTC	34.0	33.0	33.0	33.0	33.0	-	-	-	34.0	33.0	33.3	32.9	28.8
Sunshine Duration		11.7	6.6	11.8	12.1	10.5	-	-	12.0	9.9	10.8	10.7	10.7	9.3
Precipitation														11.4
Evaporation		12.6	0.4	6.4	9.1	3.6	-	-	8.8	9.0	8.9	-	69.5	59.7
Growing Degrees	5	20.0	19.6	19.1	20.0	20.0	20.0	-	-	20.2	20.3	-	200.1	179.7
	10	15.0	14.6	14.1	15.0	15.0	15.0	-	-	15.2	15.3	-	150.1	129.7

1st 10-day period (1-10/09/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	43.3	45.0	39.5
Precipitation - Reference Evapotranspiration	-43.3	-45.0	-28.1
Number of Rainy Days	0.0	0.0	1.2
Number of Dry Days	51.0	39.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



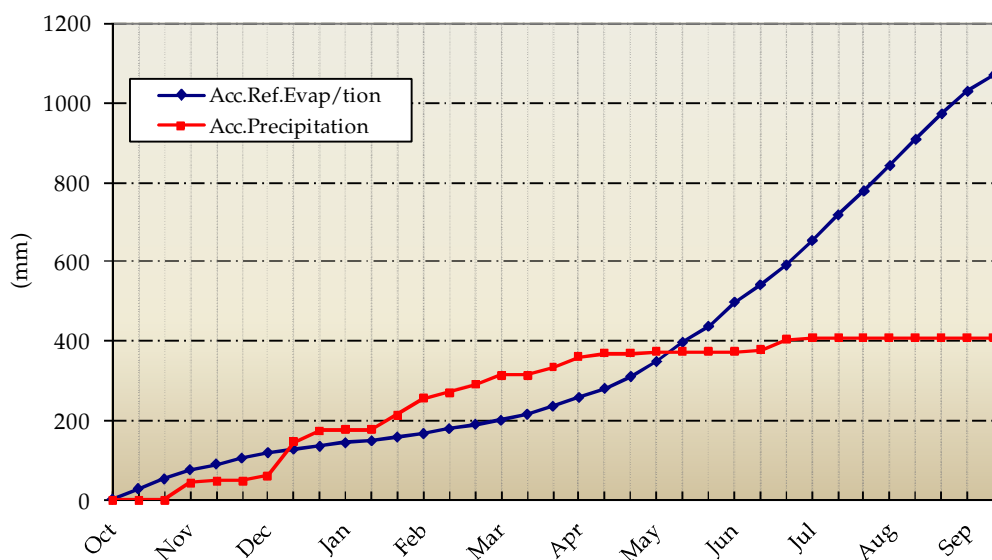
This station is not fully operated

Alexandroupoli

1st 10-day period (1-10/09/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.2	29.2	29.0	28.8	26.8	28.2	30.2	29.6	27.2	27.0	28.5	30.8	27.3
	Min	16.6	17.0	15.8	18.2	17.4	15.2	14.8	14.8	14.8	17.4	16.2	18.4	15.0
Relative Humidity	Max	77	77	79	68	68	73	85	74	79	80	76	78	-
	Min	28	25	32	23	30	35	26	25	39	44	31	30	-
Soil Temperature at 10 cm	06 UTC	26.6	25.4	25.8	26.8	25.2	24.8	25.4	25.4	25.0	25.4	25.6	26.4	21.2
	12 UTC	30.0	29.0	28.8	29.4	28.4	28.4	28.4	28.4	28.2	28.0	28.7	28.8	24.9
Sunshine Duration		11.3	10.6	10.7	11.6	12.0	11.4	11.5	10.2	10.7	8.3	10.8	11.8	8.8
Precipitation		0.0										0.0		6.6
Evaporation		7.9	5.3	9.0	7.0	7.8	6.0	10.6	9.2	6.2	5.7	74.7	95.8	73.7
Growing Degrees	5	17.9	18.1	17.4	18.5	17.1	16.7	17.5	17.2	16.0	17.2	173.6	195.9	161.8
	10	12.9	13.1	12.4	13.5	12.1	11.7	12.5	12.2	11.0	12.2	123.6	145.9	111.8

1st 10-day period (1-10/09/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	41.4	53.8	42.4
Precipitation - Reference Evapotranspiration	-41.4	-53.8	-35.8
Number of Rainy Days	0.0	0.0	1.1
Number of Dry Days	71.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

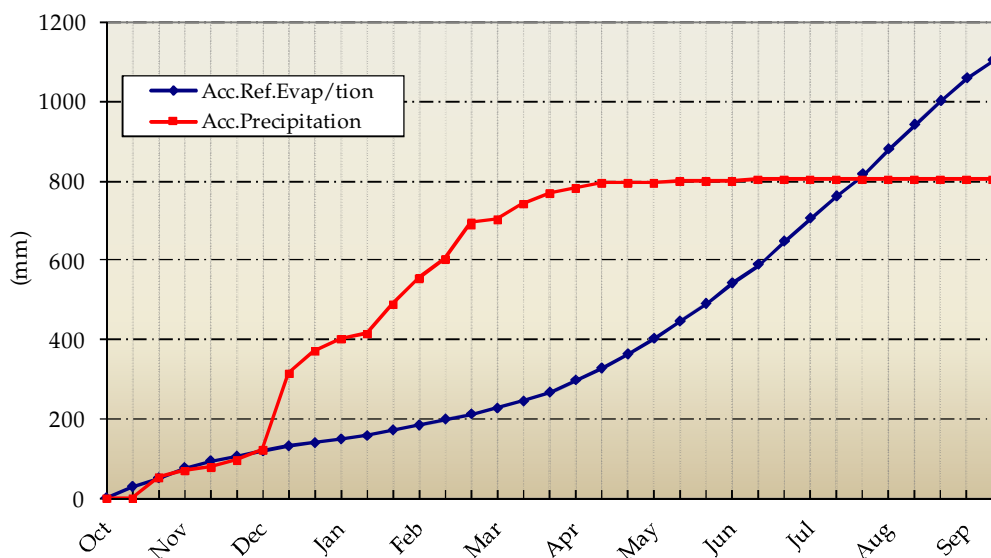


Andravida

1st 10-day period (1-10/09/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.0	30.2	29.4	31.6	29.6	29.6	29.8	30.1	31.0	31.2	30.4	31.9	28.8
	Min	19.3	19.7	19.2	18.6	19.3	19.2	20.3	18.5	19.1	19.9	19.3	18.6	17.3
Relative Humidity	Max	81	81	81	85	82	82	81	85	85	87	83	83	-
	Min	37	35	39	25	30	32	33	36	32	31	33	30	-
Soil Temperature at 10 cm	06 UTC	27.4	27.6	27.4	27.2	27.4	27.0	27.6	26.6	26.6	27.2	27.2	27.5	24.8
	12 UTC	33.0	33.6	33.2	33.0	33.2	33.2	32.8	32.4	33.2	33.4	33.1	34.6	28.9
Sunshine Duration		11.0	10.4	11.2	10.8	9.9	9.4	9.9	11.1	10.8	10.0	10.4	10.7	9.7
Precipitation														5.8
Evaporation		8.2	8.4	7.4	7.3	6.7	7.2	9.4	7.4	13.0	8.0	83.0	82.2	62.5
Growing Degrees	5	20.2	20.0	19.3	20.1	19.5	19.4	20.1	19.3	20.1	20.6	198.3	202.6	180.3
	10	15.2	15.0	14.3	15.1	14.5	14.4	15.1	14.3	15.1	15.6	148.3	152.6	130.3

1st 10-day period (1-10/09/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	45.5	47.6	40.4
Precipitation - Reference Evapotranspiration	-45.5	-47.6	-34.6
Number of Rainy Days	0.0	0.0	1.2
Number of Dry Days	92.0	104.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

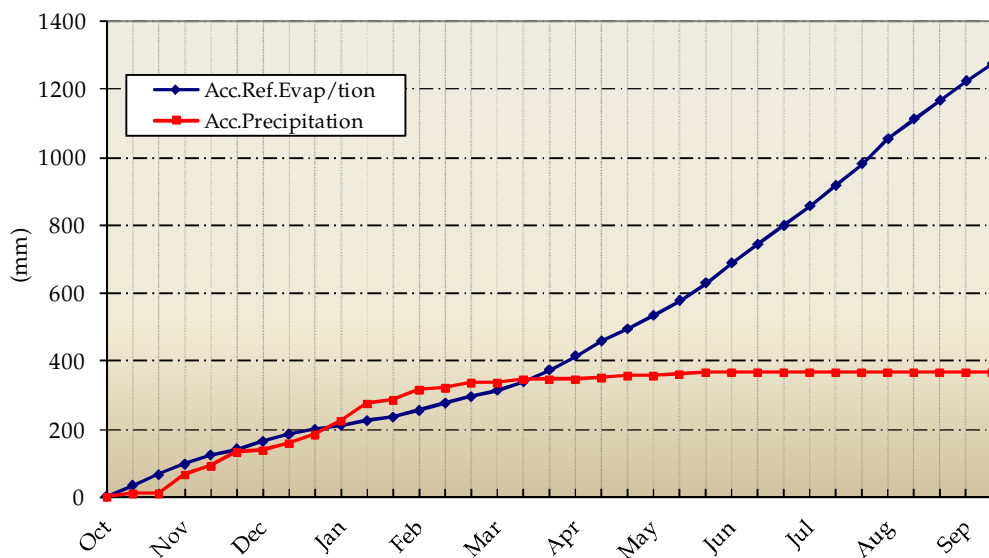


Iraklio

1st 10-day period (1-10/09/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.0	28.5	28.0	28.4	27.0	28.0	27.0	27.8	27.0	28.6	27.8	-	27.0
	Min	24.4	24.0	20.6	19.8	23.4	18.0	19.8	19.2	24.0	20.0	21.3	-	20.4
Relative Humidity	Max	70	75	72	81	63	70	92	85	77	77	76	-	-
	Min	45	49	59	53	44	51	58	53	51	29	49	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		11.4	11.1	10.8	10.9	11.5	11.1	3.0	11.0	10.8	10.3	10.2	-	9.9
Precipitation													-	1.6
Evaporation		7.6	10.7	4.4	7.1	8.1	5.0	2.2	5.5	7.0	4.8	62.4	-	74.3
Growing Degrees	5	21.2	21.3	19.3	19.1	20.2	18.0	18.4	18.5	20.5	19.3	195.8	-	187.3
	10	16.2	16.3	14.3	14.1	15.2	13.0	13.4	13.5	15.5	14.3	145.8	-	137.3

1st 10-day period (1-10/09/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	49.7	-	-
Precipitation - Reference Evapotranspiration	-49.7	-	1.6
Number of Rainy Days	0.0	-	0.3
Number of Dry Days	115.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

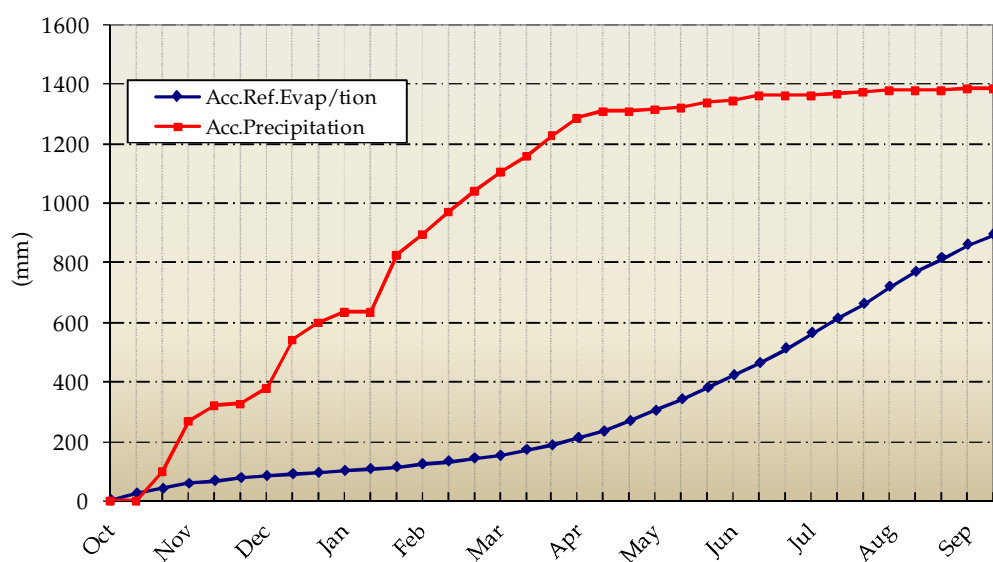


Ioannina

1st 10-day period (1-10/09/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.7	27.0	29.6	31.0	27.5	29.0	31.2	30.8	31.1	31.4	29.7	31.6	27.0
	Min	12.6	15.6	11.6	13.2	11.6	17.1	12.3	12.0	16.0	13.6	13.6	13.6	13.0
Relative Humidity	Max	89	68	93	72	70	96	80	84	88	74	81	80	-
	Min	26	37	24	17	32	24	28	24	20	27	26	25	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	19.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	22.8
Sunshine Duration		6.1	4.0	9.7	9.6	6.8	9.5	9.0	8.4	9.5	8.4	8.1	8.5	7.5
Precipitation						0.0		0.4				0.4		16.4
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	44.5
Growing Degrees	5	15.7	16.3	15.6	17.1	14.6	18.1	16.8	16.4	18.6	17.5	166.5	176.2	150.0
	10	10.7	11.3	10.6	12.1	9.6	13.1	11.8	11.4	13.6	12.5	116.5	126.2	100.0

1st 10-day period (1-10/09/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	34.4	38.2	33.0
Precipitation - Reference Evapotranspiration	-34.0	-38.2	-16.6
Number of Rainy Days	1.0	0.0	2.1
Number of Dry Days	9.0	24.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

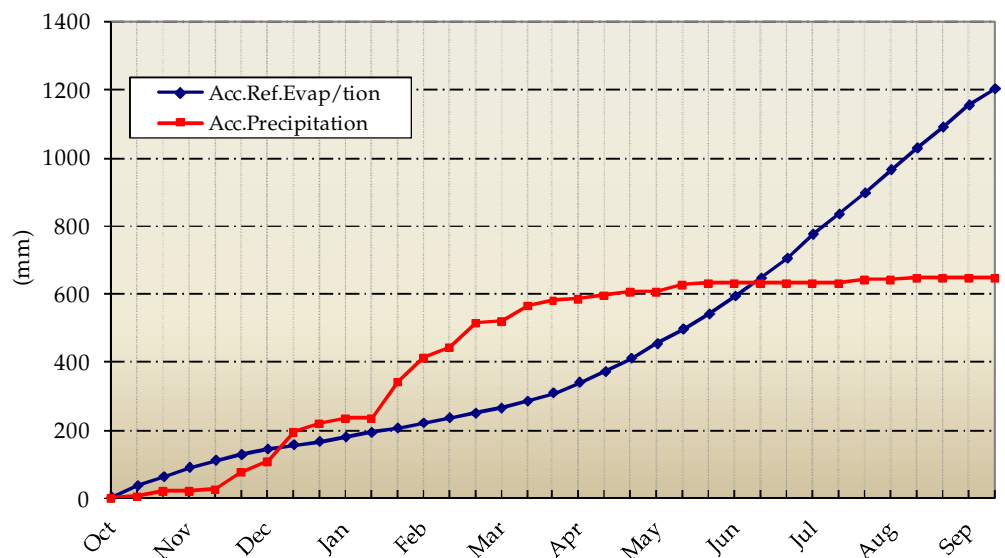


Kalamata

1st 10-day period (1-10/09/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.8	30.2	33.0	30.4	28.1	30.5	29.4	31.3	30.6	30.0	30.4	31.0	29.3
	Min	18.0	17.4	18.6	22.5	19.5	18.2	20.1	17.7	17.9	18.7	18.9	17.6	16.6
Relative Humidity	Max	85	90	84	69	85	86	83	85	85	88	84	86	-
	Min	45	34	25	29	48	33	44	29	28	43	36	36	-
Soil Temperature at 10 cm	06 UTC	26.2	26.0	26.0	26.0	26.0	25.0	25.4	24.6	25.0	25.4	25.6	25.1	23.8
	12 UTC	29.8	28.6	28.6	28.4	28.0	27.6	28.4	27.4	27.4	28.4	28.3	26.8	27.2
Sunshine Duration		10.8	10.6	11.3	11.1	5.1	7.6	6.3	10.9	9.8	10.8	9.4	10.9	9.3
Precipitation								0.1	0.1			0.2	31.6	7.7
Evaporation		3.6	4.0	8.7	8.3	1.4	3.6	4.7	7.7	5.1	7.4	54.5	63.5	67.1
Growing Degrees	5	19.4	18.8	20.8	21.5	18.8	19.4	19.8	19.5	19.3	19.4	196.5	193.2	179.8
	10	14.4	13.8	15.8	16.5	13.8	14.4	14.8	14.5	14.3	14.4	146.5	143.2	129.8

1st 10-day period (1-10/09/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	47.6	51.2	43.1
Precipitation - Reference Evapotranspiration	-47.4	-19.6	-35.4
Number of Rainy Days	2.0	2.0	1.1
Number of Dry Days	15.0	25.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

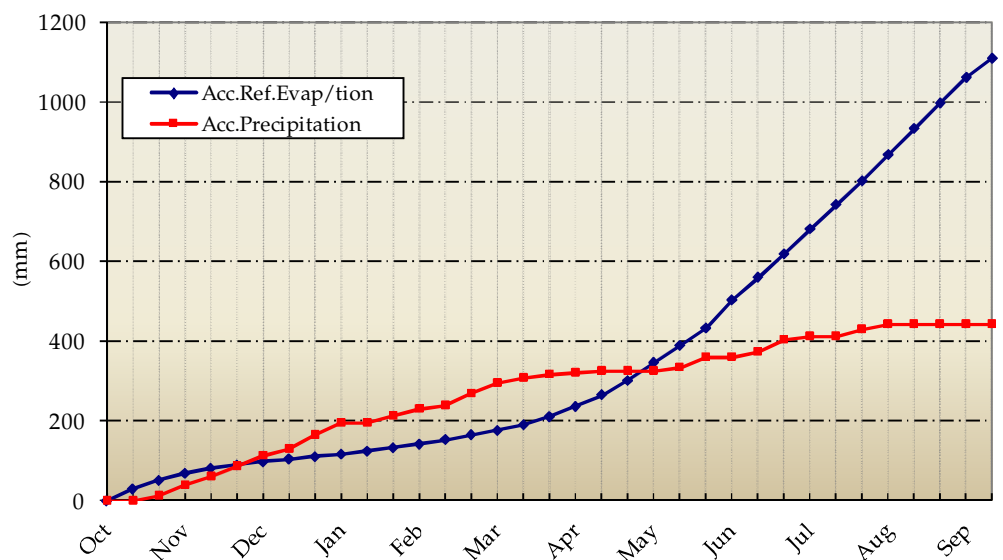


Larisa

1st 10-day period (1-10/09/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.0	28.0	34.0	32.1	31.0	30.6	31.6	32.2	31.4	32.8	31.4	31.7	29.4
	Min	17.4	21.0	14.8	19.2	13.6	16.6	19.6	17.0	14.0	16.6	17.0	15.3	14.9
Relative Humidity	Max	72	70	82	58	69	72	72	79	79	72	72	74	-
	Min	34	33	21	20	23	32	19	19	23	25	25	25	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	26.8	23.3
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	28.5	25.4
Sunshine Duration		9.5	3.6	9.3	10.5	10.6	9.3	9.1	10.0	9.1	8.3	8.9	9.7	8.7
Precipitation														5.6
Evaporation		12.6	4.6	8.8	10.4	8.5	5.1	10.0	8.2	6.2	6.8	81.2	75.2	63.7
Growing Degrees	5	18.7	19.5	19.4	20.7	17.3	18.6	20.6	19.6	17.7	19.7	191.8	185.0	171.4
	10	13.7	14.5	14.4	15.7	12.3	13.6	15.6	14.6	12.7	14.7	141.8	135.0	121.4

1st 10-day period (1-10/09/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	48.0	49.8	42.5
Precipitation - Reference Evapotranspiration	-48.0	-49.8	-36.9
Number of Rainy Days	0.0	0.0	1.4
Number of Dry Days	50.0	30.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



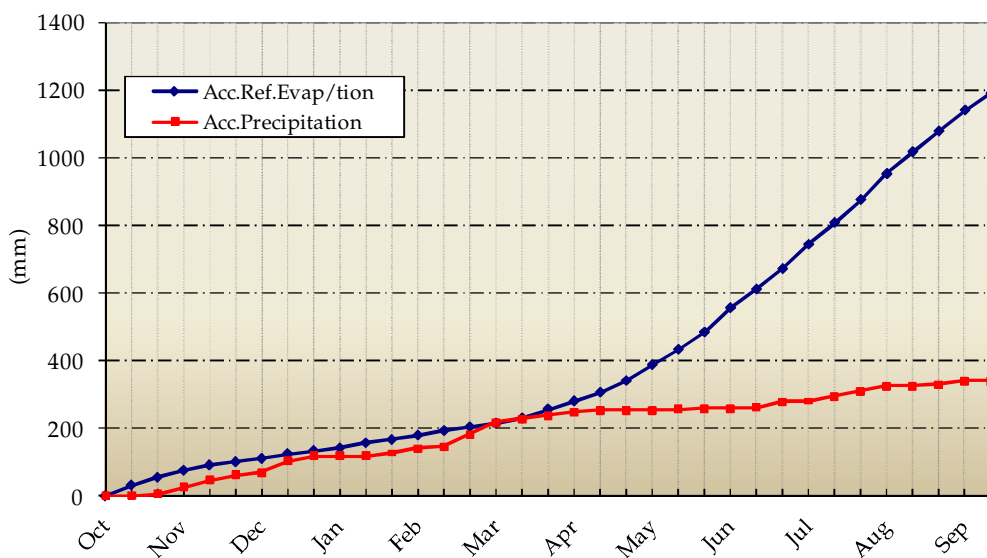


Mikra

1st 10-day period (1-10/09/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.2	27.2	30.6	30.0	28.4	29.3	30.3	30.8	29.1	30.0	29.4	30.2	28.1
	Min	16.5	19.4	16.0	22.3	16.8	16.8	16.6	15.3	16.1	18.6	17.4	18.3	16.4
Relative Humidity	Max	84	83	85	72	80	73	79	84	71	75	79	76	-
	Min	43	45	26	22	34	28	27	18	33	37	31	33	-
Soil Temperature at 10 cm	06 UTC	24.4	25.6	23.8	25.2	25.2	25.4	25.6	25.4	25.2	26.0	25.2	27.5	22.6
	12 UTC	29.2	27.8	29.2	29.2	29.2	30.6	30.8	30.6	30.2	30.2	29.7	31.5	26.5
Sunshine Duration		10.0	5.8	11.1	11.6	11.0	11.0	11.1	11.1	10.5	9.5	10.3	10.1	8.4
Precipitation			1.4									1.4	0.0	7.2
Evaporation		4.0	4.8	10.7	12.4	3.4	8.2	6.3	8.3	8.6	5.8	72.5	64.1	68.9
Growing Degrees	5	17.4	18.3	18.3	21.2	17.6	18.1	18.5	18.1	17.6	19.3	184.2	192.3	172.3
	10	12.4	13.3	13.3	16.2	12.6	13.1	13.5	13.1	12.6	14.3	134.2	142.3	122.3

1st 10-day period (1-10/09/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	49.7	49.6	42.4
Precipitation - Reference Evapotranspiration	-48.3	-49.6	-35.2
Number of Rainy Days	1.0	0.0	1.4
Number of Dry Days	1.0	30.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

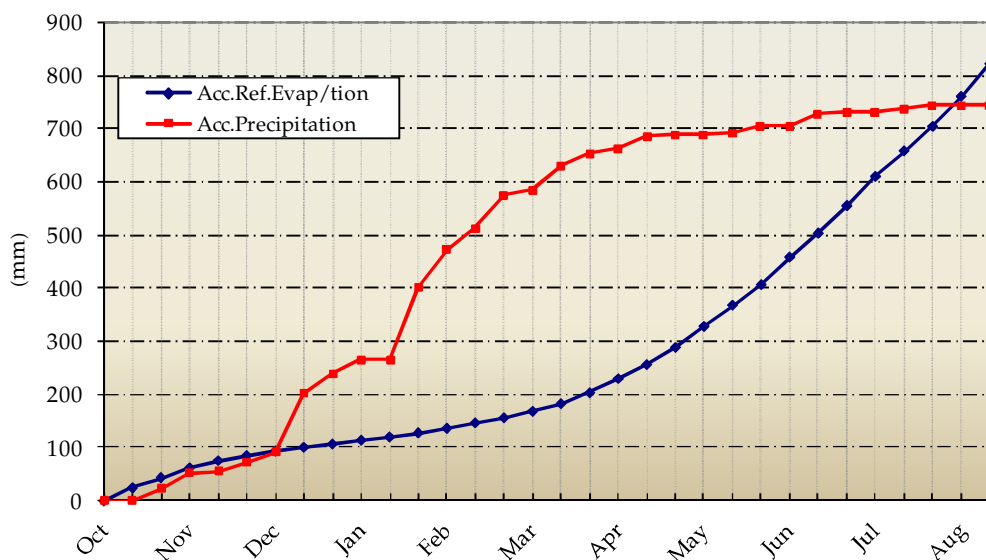


Tripoli

1st 10-day period (1-10/09/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.8	30.5	30.6	28.1	27.5	29.1	24.8	24.0	28.5	32.5	28.3	30.4	27.4
	Min	12.8	12.5	12.2	11.9	11.8	11.7	16.6	11.5	11.6	13.1	12.6	11.8	12.2
Relative Humidity	Max	92	85	68	70	91	81	86	88	73	83	82	75	-
	Min	27	29	23	29	29	27	78	67	21	20	35	21	-
Soil Temperature at 10 cm	06 UTC	-	23.8	24.0	23.4	23.4	23.2	24.2	20.0	20.2	20.4	22.5	23.2	21.7
	12 UTC	-	28.8	29.4	28.8	29.0	28.0	-	-	25.4	27.0	28.1	28.7	24.2
Sunshine Duration		11.7	10.4	11.4	8.9	9.4	7.3	1.9	8.5	10.2	10.4	9.0	11.3	9.3
Precipitation		0.0						31.1				31.1		5.8
Evaporation		5.0	4.8	6.3	4.1	5.8	2.7	2.1	4.7	3.5	6.9	45.9	-	47.2
Growing Degrees	5	15.3	16.5	16.4	15.0	14.7	15.4	15.7	12.8	15.1	17.8	154.6	160.7	148.0
	10	10.3	11.5	11.4	10.0	9.7	10.4	10.7	7.8	10.1	12.8	104.6	110.7	98.0

1st 10-day period (1-10/09/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	36.4	42.8	39.2
Precipitation - Reference Evapotranspiration	-5.3	-42.8	-33.4
Number of Rainy Days	1.0	0.0	1.6
Number of Dry Days	6.0	26.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



This station is not fully operated



◆ **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<sub>n</sub> 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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