



AGROMETEOROLOGICAL BULLETIN

*August 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



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Division of Climatology-Applications
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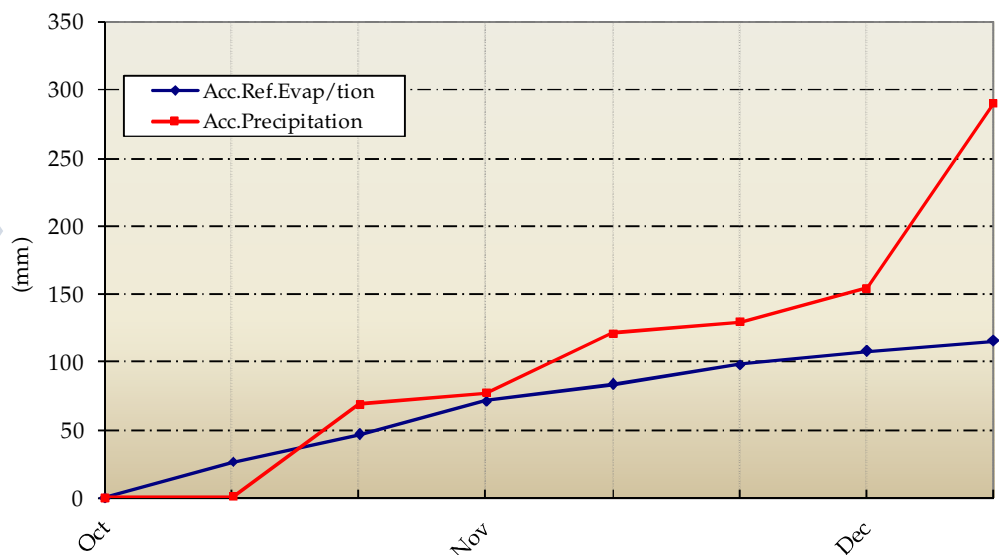
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

1st 10-day period (1-10/08/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	35.6	35.6	37.0	36.2	36.4	36.0	36.4	36.6	36.6	35.6	36.2	37.8	34.0
	Min	17.0	20.0	19.4	19.6	19.6	20.0	19.0	18.0	16.6	17.4	18.7	20.1	17.6
Relative Humidity	Max	69	66	60	56	61	62	82	83	73	73	68	76	-
	Min	34	26	24	26	26	26	26	26	24	22	26	27	-
Soil Temperature at 10 cm	06 UTC	32.4	32.0	32.0	34.0	32.0	32.0	31.6	31.4	31.4	31.4	32.0	30.0	27.9
	12 UTC	36.4	38.0	38.0	38.0	38.0	36.0	36.0	35.6	35.8	35.6	36.7	35.3	34.1
Sunshine Duration		9.7	12.9	12.9	13.1	13.0	13.1	12.9	12.9	12.8	11.5	12.5	11.8	11.2
Precipitation													8.6	3.2
Evaporation		9.0	10.4	10.0	12.4	12.0	13.0	10.4	9.6	11.2	9.0	107.0	91.8	80.8
Growing Degrees	5	21.3	22.8	23.2	22.9	23.0	23.0	22.7	22.3	21.6	21.5	224.3	239.8	208.2
	10	16.3	17.8	18.2	17.9	18.0	18.0	17.7	17.3	16.6	16.5	174.3	189.8	158.2

1st 10-day period (1-10/08/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	57.7	57.7	53.6
Precipitation - Reference Evapotranspiration	-57.7	-49.1	-50.4
Number of Rainy Days	0.0	1.0	0.5
Number of Dry Days	20.0	63.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

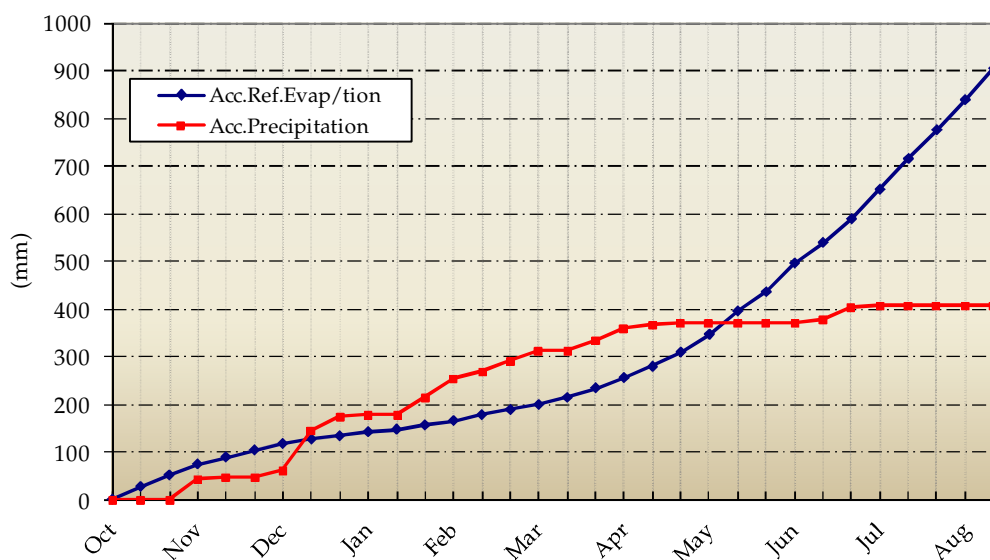
This station is not fully operated



1st 10-day period (1-10/08/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.4	34.2	32.6	35.0	32.4	33.4	33.0	34.4	33.6	34.2	33.4	35.9	31.3
	Min	22.0	22.0	21.0	20.0	20.4	19.4	22.4	17.6	20.4	23.4	20.9	22.4	17.9
Relative Humidity	Max	75	73	68	73	67	66	64	68	68	72	69	70	-
	Min	32	29	29	29	24	23	21	23	30	23	26	28	-
Soil Temperature at 10 cm	06 UTC	28.8	29.8	28.6	28.8	28.6	28.2	28.0	28.2	28.6	28.8	28.6	30.5	24.7
	12 UTC	31.2	31.8	32.0	32.6	31.6	31.2	30.2	31.2	31.8	31.8	31.5	33.5	29.0
Sunshine Duration		12.6	12.8	13.0	12.4	12.9	11.5	12.7	12.8	12.5	12.2	12.5	11.4	10.7
Precipitation														4.0
Evaporation		12.4	10.5	10.6	11.3	11.9	11.7	14.3	16.1	11.9	12.8	123.5	101.6	96.8
Growing Degrees	5	21.7	23.1	21.8	22.5	21.4	21.4	22.7	21.0	22.0	23.8	221.4	241.9	195.9
	10	16.7	18.1	16.8	17.5	16.4	16.4	17.7	16.0	17.0	18.8	171.4	191.9	145.9

1st 10-day period (1-10/08/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	66.3	59.1	58.5
Precipitation - Reference Evapotranspiration	-66.3	-59.1	-54.5
Number of Rainy Days	0.0	0.0	0.7
Number of Dry Days	40.0	65.0	-

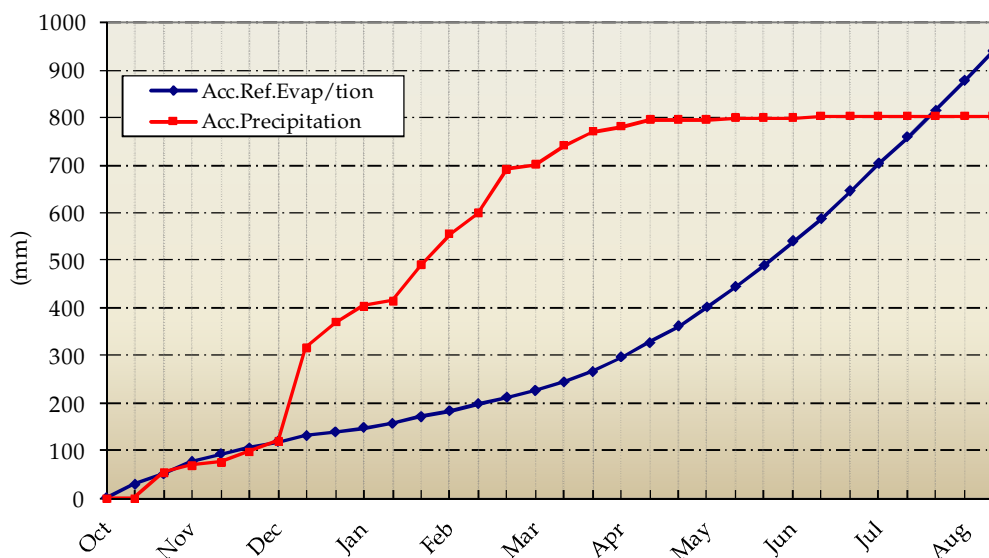
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/08/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.8	32.8	33.1	34.0	34.5	32.8	34.0	33.8	33.8	32.5	33.5	33.9	31.3
	Min	20.8	21.0	19.2	19.6	19.2	15.8	19.9	18.1	17.8	21.0	19.2	20.5	18.8
Relative Humidity	Max	87	85	88	86	78	73	72	75	81	87	81	85	-
	Min	34	32	33	33	27	27	28	27	25	41	31	33	-
Soil Temperature at 10 cm	06 UTC	29.4	30.2	29.2	29.2	28.6	27.6	28.4	27.6	27.6	28.8	28.7	29.8	27.8
	12 UTC	36.2	35.2	35.4	35.8	34.4	33.6	34.2	34.2	35.0	36.4	35.0	38.1	32.1
Sunshine Duration		10.6	12.2	12.7	12.4	12.4	12.9	12.4	12.6	12.6	11.7	12.2	11.6	11.6
Precipitation													0.0	0.2
Evaporation		12.4	9.7	9.7	9.2	12.0	10.6	13.6	13.2	10.0	8.1	108.5	84.1	74.9
Growing Degrees	5	22.3	21.9	21.2	21.8	21.9	19.3	22.0	21.0	20.8	21.8	213.8	222.0	200.3
	10	17.3	16.9	16.2	16.8	16.9	14.3	17.0	16.0	15.8	16.8	163.8	172.0	150.3

1st 10-day period (1-10/08/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.9	52.9	52.3
Precipitation - Reference Evapotranspiration	-61.9	-52.9	-52.1
Number of Rainy Days	0.0	0.0	0.1
Number of Dry Days	61.0	73.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

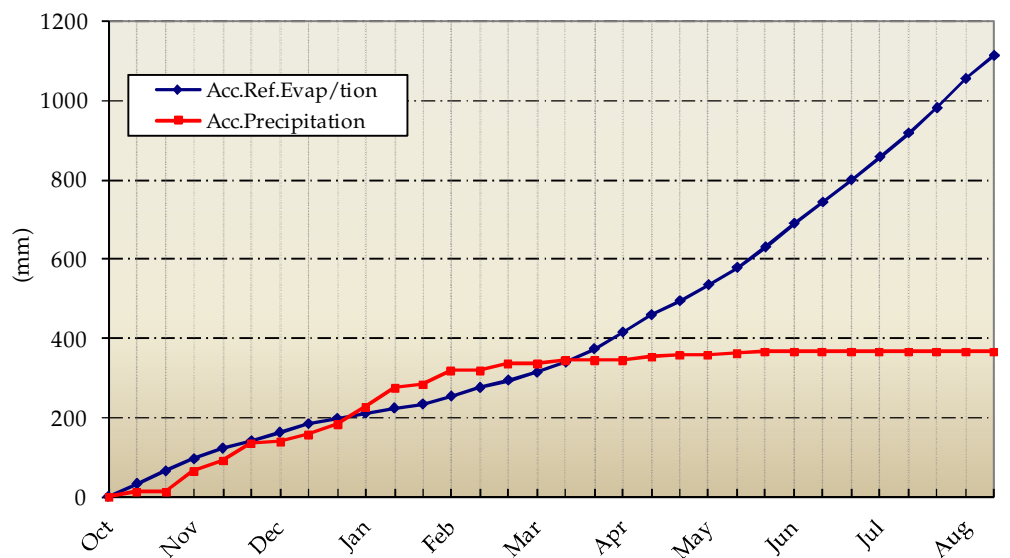


Iraklio

1st 10-day period (1-10/08/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.8	29.2	28.6	29.8	28.0	27.6	27.8	28.2	28.8	28.8	28.6	-	28.6
	Min	23.4	24.8	25.6	24.0	21.4	21.2	20.4	20.0	22.4	21.2	22.4	-	22.4
Relative Humidity	Max	78	70	69	77	74	73	75	79	79	81	76	-	-
	Min	57	54	56	53	57	61	59	58	63	53	57	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		11.5	11.9	12.2	12.6	11.8	12.2	11.9	11.9	11.9	12.0	12.0	-	11.6
Precipitation													-	0.0
Evaporation		6.3	8.5	7.0	7.2	7.2	6.5	6.9	6.4	5.9	6.0	67.9	-	88.8
Growing Degrees	5	21.1	22.0	22.1	21.9	19.7	19.4	19.1	19.1	20.6	20.0	205.0	-	205.0
	10	16.1	17.0	17.1	16.9	14.7	14.4	14.1	14.1	15.6	15.0	155.0	-	155.0

1st 10-day period (1-10/08/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	58.6	-	-
Precipitation - Reference Evapotranspiration	-58.6	-	0.0
Number of Rainy Days	0.0	-	0.0
Number of Dry Days	84.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

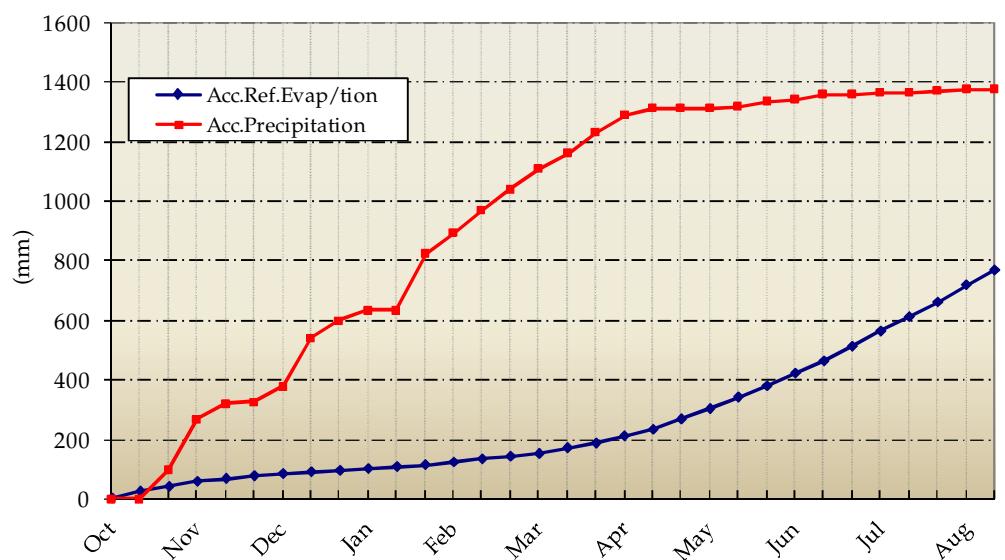


Ioannina

1st 10-day period (1-10/08/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.6	33.7	35.5	36.2	33.2	34.5	34.2	34.6	33.8	33.0	34.1	35.2	31.8
	Min	21.3	17.4	15.7	14.4	14.6	16.0	16.4	15.8	15.8	14.6	16.2	17.7	15.9
Relative Humidity	Max	49	61	66	59	52	30	58	48	62	76	56	84	-
	Min	27	24	23	15	23	18	19	20	18	21	21	28	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	24.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	28.0
Sunshine Duration		9.1	12.4	11.0	11.6	9.9	10.0	10.0	10.0	11.9	7.2	10.3	9.8	10.1
Precipitation													21.6	5.8
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	79.9
Growing Degrees	5	22.0	20.6	20.6	20.3	18.9	20.3	20.3	20.2	19.8	18.8	201.7	214.6	183.5
	10	17.0	15.6	15.6	15.3	13.9	15.3	15.3	15.2	14.8	13.8	151.7	164.6	134.7

1st 10-day period (1-10/08/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.4	51.0	50.7
Precipitation - Reference Evapotranspiration	-50.4	-29.4	-44.9
Number of Rainy Days	0.0	3.0	1.3
Number of Dry Days	10.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

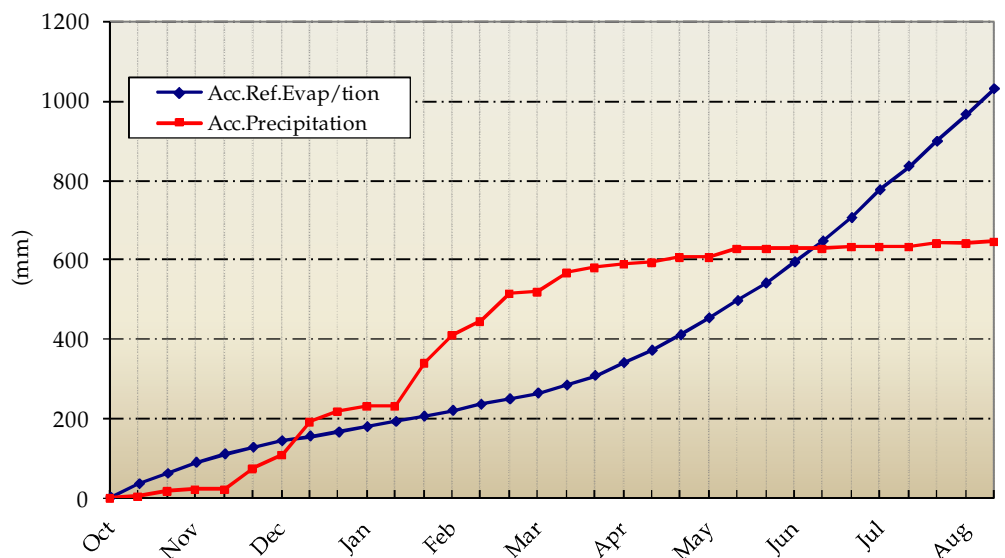


Kalamata

1st 10-day period (1-10/08/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.7	33.6	36.0	34.8	36.6	34.8	35.2	32.8	33.6	31.0	34.1	35.6	31.8
	Min	21.0	21.6	18.1	19.6	22.8	18.4	18.9	16.7	17.1	17.2	19.1	20.6	18.3
Relative Humidity	Max	90	89	87	82	65	84	69	88	89	78	82	82	-
	Min	42	28	22	30	19	18	22	25	24	37	27	26	-
Soil Temperature at 10 cm	06 UTC	27.0	26.2	25.6	25.8	26.2	26.0	26.8	25.2	26.2	25.6	26.1	27.1	26.3
	12 UTC	29.8	30.0	28.6	28.6	29.4	29.0	29.0	29.0	28.0	28.2	29.0	29.6	30.4
Sunshine Duration		8.9	10.0	11.8	12.5	11.8	12.5	12.4	12.4	12.4	12.0	11.7	11.2	11.0
Precipitation		4.4										4.4	11.4	3.9
Evaporation		8.1	10.7	6.4	9.0	15.8	7.4	7.8	11.4	10.4	12.2	99.2	-	84.1
Growing Degrees	5	21.9	22.6	22.1	22.2	24.7	21.6	22.1	19.8	20.4	19.1	216.3	231.4	200.7
	10	16.9	17.6	17.1	17.2	19.7	16.6	17.1	14.8	15.4	14.1	166.3	181.4	150.7

1st 10-day period (1-10/08/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	64.0	63.9	56.0
Precipitation - Reference Evapotranspiration	-59.6	-52.5	-52.1
Number of Rainy Days	1.0	1.0	0.5
Number of Dry Days	14.0	68.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

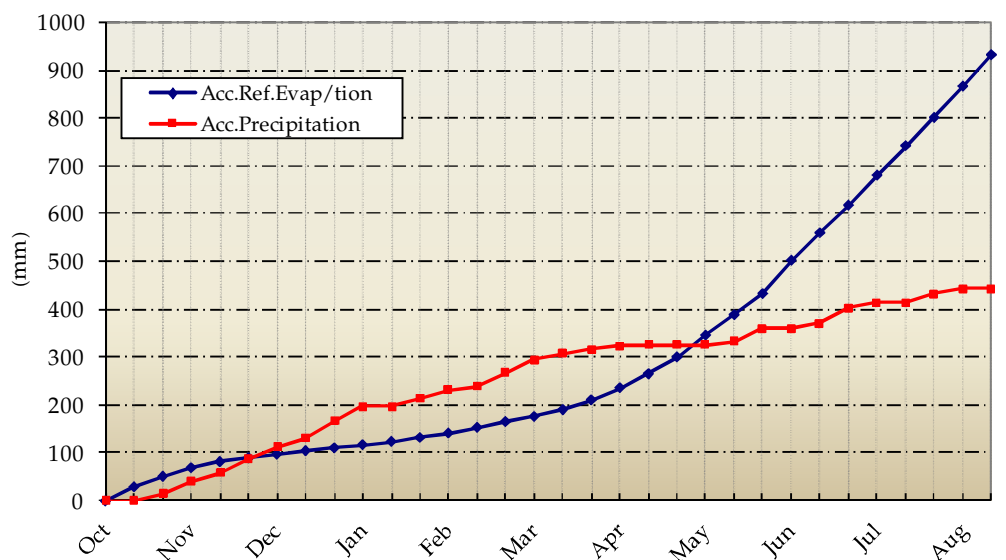


Larisa

1st 10-day period (1-10/08/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.4	33.4	35.0	37.2	33.8	33.2	34.9	34.5	36.0	33.1	34.4	36.8	33.2
	Min	26.8	20.2	18.2	18.9	24.9	19.8	19.7	19.7	17.1	17.4	20.3	20.9	18.0
Relative Humidity	Max	71	76	75	66	60	62	63	69	66	71	68	70	-
	Min	31	24	23	16	18	23	22	20	21	22	22	21	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	29.7	27.1
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	31.4	29.4
Sunshine Duration		10.4	11.0	12.2	12.1	11.1	12.0	12.2	12.2	11.9	11.9	11.7	10.0	10.5
Precipitation													2.6	4.2
Evaporation		7.7	-	9.7	11.3	16.5	11.7	9.8	12.9	7.0	-	-	95.9	91.8
Growing Degrees	5	24.6	21.8	21.6	23.1	24.4	21.5	22.3	22.1	21.6	20.3	223.1	238.7	206.1
	10	19.6	16.8	16.6	18.1	19.4	16.5	17.3	17.1	16.6	15.3	173.1	188.7	156.1

1st 10-day period (1-10/08/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	65.3	62.7	58.6
Precipitation - Reference Evapotranspiration	-65.3	-60.1	-54.4
Number of Rainy Days	0.0	2.0	1.1
Number of Dry Days	19.0	36.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

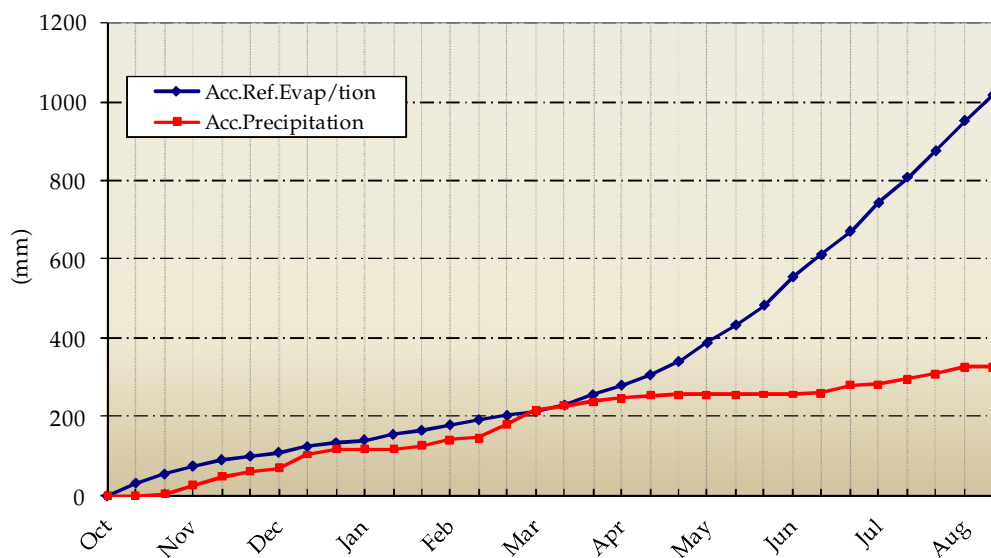


Mikra

1st 10-day period (1-10/08/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.4	33.0	34.8	37.2	32.8	33.5	33.4	34.0	34.2	32.6	33.8	35.1	31.9
	Min	23.3	24.7	16.0	21.0	24.8	19.9	21.4	21.5	21.0	21.4	21.5	22.2	19.4
Relative Humidity	Max	69	74	68	69	66	66	59	63	67	64	66	72	-
	Min	32	29	23	16	33	26	27	23	24	25	26	25	-
Soil Temperature at 10 cm	06 UTC	30.2	30.4	30.0	30.2	31.0	30.4	30.4	31.2	31.0	30.4	30.5	29.7	26.9
	12 UTC	33.8	34.0	34.0	34.2	35.6	35.6	36.0	36.2	35.2	34.8	34.9	34.8	31.6
Sunshine Duration		10.5	8.4	12.0	12.6	12.5	12.3	12.0	12.4	12.3	10.4	11.5	10.2	10.2
Precipitation													13.4	5.3
Evaporation		4.8	8.0	13.7	11.1	9.8	6.4	16.6	7.4	9.8	10.0	97.6	100.6	88.0
Growing Degrees	5	22.9	23.9	20.4	24.1	23.8	21.7	22.4	22.8	22.6	22.0	226.5	236.4	206.4
	10	17.9	18.9	15.4	19.1	18.8	16.7	17.4	17.8	17.6	17.0	176.5	186.4	156.4

1st 10-day period (1-10/08/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	64.8	66.7	56.6
Precipitation - Reference Evapotranspiration	-64.8	-53.3	-51.3
Number of Rainy Days	0.0	3.0	1.3
Number of Dry Days	19.0	36.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

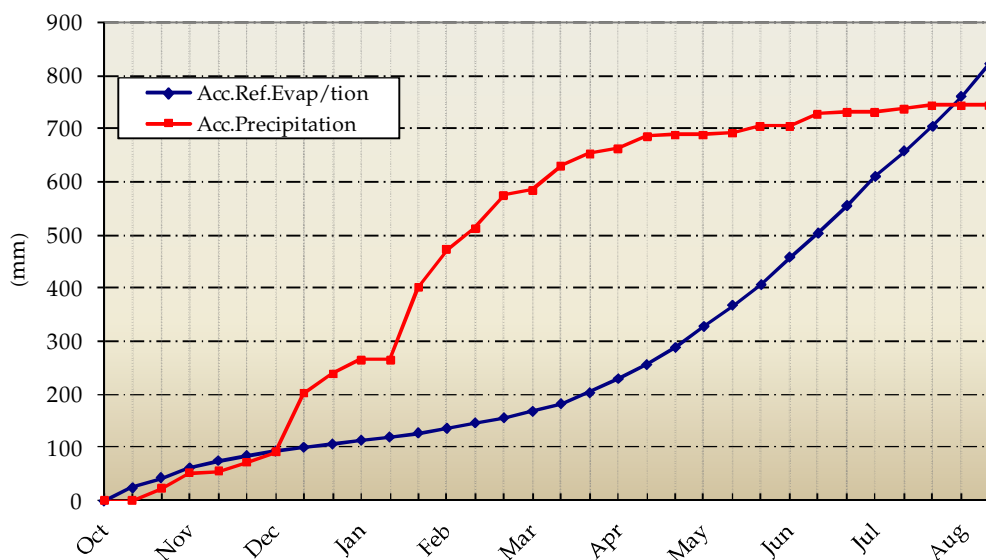


Tripoli

1st 10-day period (1-10/08/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.4	31.6	32.3	28.0	31.6	31.5	31.6	32.8	33.3	32.1	31.7	34.2	30.8
	Min	20.0	17.3	17.5	20.6	21.3	18.0	21.2	22.3	16.7	12.6	18.8	16.6	14.8
Relative Humidity	Max	52	54	38	30	53	39	43	36	39	58	44	73	-
	Min	31	26	32	25	16	15	22	27	14	48	26	19	-
Soil Temperature at 10 cm	06 UTC	28.0	26.2	26.4	27.2	27.2	26.8	27.2	26.8	26.6	26.2	26.9	24.7	25.8
	12 UTC	29.6	31.4	-	-	32.2	32.0	32.2	32.0	32.4	-	31.7	31.9	28.5
Sunshine Duration		11.1	12.5	12.8	12.9	12.3	13.0	12.8	12.8	12.9	8.1	12.1	9.5	10.5
Precipitation											0.0	0.0	6.0	6.7
Evaporation		6.9	10.1	10.4	11.4	9.4	11.0	9.8	9.1	8.7	6.8	93.6	-	66.4
Growing Degrees	5	21.2	19.5	19.9	19.3	21.5	19.8	21.4	22.6	20.0	17.4	202.4	204.2	178.4
	10	16.2	14.5	14.9	14.3	16.5	14.8	16.4	17.6	15.0	12.4	152.4	154.2	128.4

1st 10-day period (1-10/08/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	62.0	49.2	53.5
Precipitation - Reference Evapotranspiration	-62.0	-43.2	-46.8
Number of Rainy Days	0.0	2.0	1.1
Number of Dry Days	20.0	0.0	-

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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