



AGROMETEOROLOGICAL BULLETIN

July 2011
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



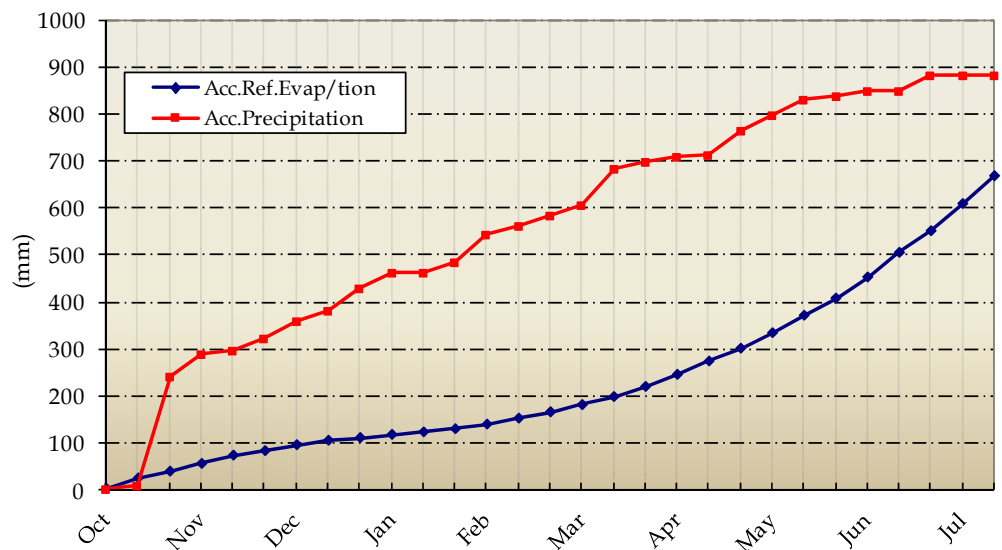
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www.hnms.gr
www.emy.gov.gr
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1st 10-day period (1-10/07/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.0	31.4	30.2	30.8	32.6	32.2	35.2	35.4	36.4	37.6	33.4	-	32.4
	Min	-	16.8	17.2	16.0	15.6	17.4	17.2	18.6	18.4	17.4	17.2	-	16.9
Relative Humidity	Max	87	92	94	94	93	94	92	92	88	80	91	-	-
	Min	35	38	43	21	32	39	29	29	27	26	32	-	-
Soil Temperature at 10 cm	06 UTC	-	28.4	28.6	28.2	28.4	29.0	29.2	30.4	30.6	30.6	29.3	-	27.2
	12 UTC	33.0	33.6	33.2	33.2	33.6	34.4	34.8	35.6	35.8	36.2	34.3	-	33.2
Sunshine Duration		14.0	13.8	12.7	13.5	12.8	13.1	13.9	13.7	13.4	13.5	13.4	-	11.6
Precipitation													-	8.3
Evaporation		9.4	8.2	9.5	9.5	9.1	8.7	10.2	12.0	9.6	11.8	98.0	-	82.3
Growing Degrees	5	-	19.1	18.7	18.4	19.1	19.8	21.2	22.0	22.4	22.5	-	-	196.6
	10	-	14.1	13.7	13.4	14.1	14.8	16.2	17.0	17.4	17.5	-	-	146.6

1st 10-day period (1-10/07/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	59.4	-	56.1
Precipitation - Reference Evapotranspiration	-59.4	-	-47.8
Number of Rainy Days	0.0	-	1.0
Number of Dry Days	23.0	-	-

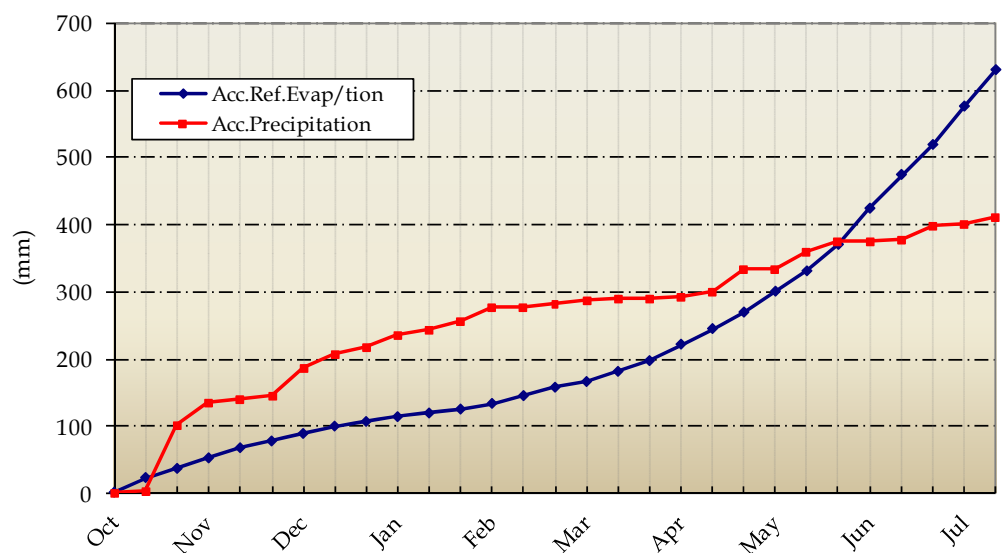
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/07/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.0	27.4	28.2	26.2	28.2	28.4	30.4	33.2	35.0	36.4	30.0	29.4	29.3
	Min	17.8	16.4	16.0	15.8	16.6	19.2	18.0	18.6	20.0	19.8	17.8	19.1	17.0
Relative Humidity	Max	84	89	92	96	80	81	84	81	69	80	84	84	-
	Min	65	41	48	48	51	42	34	33	24	22	41	43	-
Soil Temperature at 10 cm	06 UTC	23.8	24.4	24.0	24.0	23.0	24.0	24.2	24.4	26.4	25.5	24.4	24.1	23.7
	12 UTC	25.6	27.2	28.0	25.6	27.2	27.2	27.0	29.0	29.4	29.0	27.5	26.6	28.2
Sunshine Duration		5.9	10.0	11.6	11.8	13.0	7.5	13.0	13.2	13.2	13.1	11.2	9.4	10.3
Precipitation					10.7							10.7	31.0	12.1
Evaporation		5.9	7.5	9.2	6.5	8.5	3.0	7.9	9.6	10.5	12.5	81.1	68.2	85.9
Growing Degrees	5	17.4	16.9	17.1	16.0	17.4	18.8	19.2	20.9	22.5	23.1	189.3	192.7	181.3
	10	12.4	11.9	12.1	11.0	12.4	13.8	14.2	15.9	17.5	18.1	139.3	142.7	131.3

1st 10-day period (1-10/07/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	54.4	50.6	56.1
Precipitation - Reference Evapotranspiration	-43.7	-19.6	-44.0
Number of Rainy Days	1.0	2.0	2.2
Number of Dry Days	7.0	1.0	-

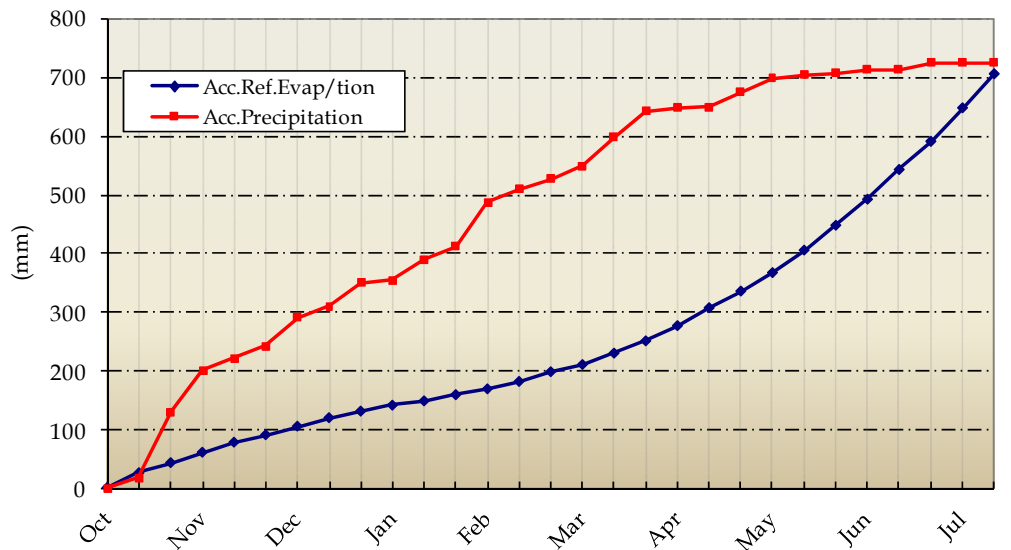
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/07/2011)		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	28.2	28.6	28.0	31.0	29.6	32.4	31.4	32.0	33.6	30.4	29.4	29.5
	Min	19.0	18.2	19.4	19.2	16.4	19.4	18.4	19.8	19.0	17.0	18.6	19.2	17.7
Relative Humidity	Max	98	90	91	88	87	91	96	85	91	90	91	94	-
	Min	49	46	50	25	34	35	37	41	40	32	39	47	-
Soil Temperature at 10 cm	06 UTC	26.8	26.4	26.4	26.2	25.6	26.5	26.8	27.2	27.8	27.2	26.7	27.8	26.9
	12 UTC	33.5	32.8	32.4	31.0	32.0	33.0	33.0	33.2	33.6	34.0	32.8	34.9	31.6
Sunshine Duration		11.7	13.0	11.7	13.3	12.2	12.8	12.9	12.9	13.0	13.2	12.7	12.0	12.0
Precipitation														0.7
Evaporation		6.4	5.0	10.4	10.6	7.9	7.8	7.4	7.1	12.6	9.6	84.8	76.0	75.0
Growing Degrees	5	18.9	18.2	19.0	18.6	18.7	19.5	20.4	20.6	20.5	20.3	194.7	193.0	186.1
	10	13.9	13.2	14.0	13.6	13.7	14.5	15.4	15.6	15.5	15.3	144.7	143.0	136.1

1st 10-day period (1-10/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	58.1	54.0	53.6
Precipitation - Reference Evapotranspiration	-58.1	-54.0	-52.9
Number of Rainy Days	0.0	0.0	0.3
Number of Dry Days	25.0	17.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

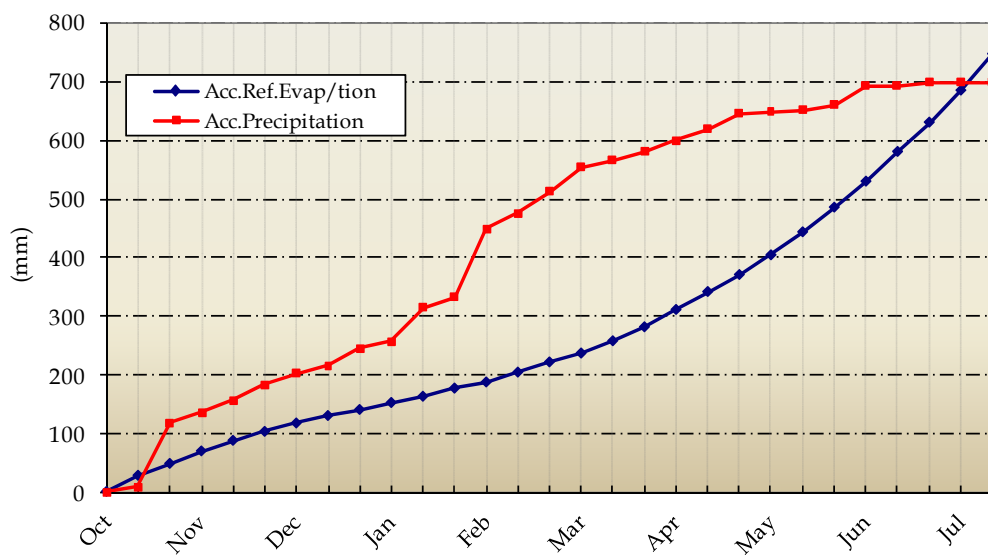


Kalamata

1st 10-day period (1-10/07/2011)		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	28.6	30.0	32.2	30.4	32.4	31.6	32.2	33.0	32.8	31.2	29.7	30.8
	Min	16.4	18.6	17.0	19.0	16.4	17.0	19.0	18.0	16.2	15.6	17.3	18.6	17.6
Relative Humidity	Max	90	92	96	88	87	90	74	88	90	93	89	92	-
	Min	48	46	35	20	36	29	39	32	30	34	35	47	-
Soil Temperature at 10 cm	06 UTC	23.6	24.0	24.2	24.0	23.6	24.4	24.4	24.6	24.2	24.4	24.1	24.7	25.3
	12 UTC	26.0	26.6	26.6	26.4	26.4	27.0	27.2	27.4	27.6	27.4	26.9	27.6	29.5
Sunshine Duration		12.6	12.7	12.4	12.7	12.5	12.1	12.7	12.6	12.7	12.8	12.6	11.4	11.4
Precipitation														1.0
Evaporation		5.0	9.6	9.6	5.0	8.4	9.4	8.0	9.6	6.6	6.6	77.8	66.6	89.7
Growing Degrees	5	17.6	18.6	18.5	20.6	18.4	19.7	20.3	20.1	19.6	19.2	192.6	191.7	191.7
	10	12.6	13.6	13.5	15.6	13.4	14.7	15.3	15.1	14.6	14.2	142.6	141.7	141.7

1st 10-day period (1-10/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	62.3	55.4	56.4
Precipitation - Reference Evapotranspiration	-62.3	-55.4	-55.4
Number of Rainy Days	0.0	0.0	0.3
Number of Dry Days	25.0	17.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

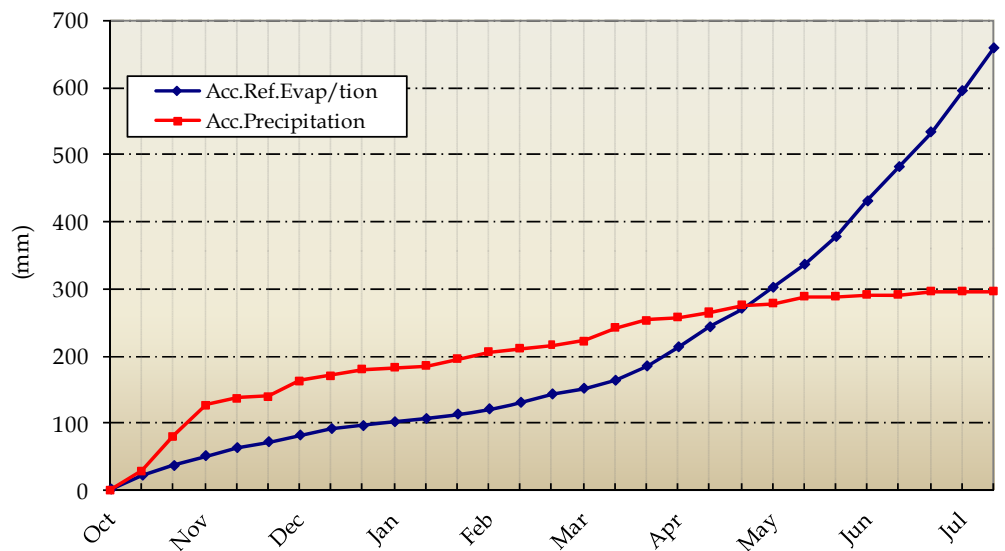


Larisa

1st 10-day period (1-10/07/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.4	31.6	33.2	32.0	35.4	32.8	33.8	35.0	35.0	35.8	33.5	32.4	32.9
	Min	17.0	18.0	18.4	16.0	15.8	18.6	19.0	19.2	19.4	18.4	18.0	19.4	17.5
Relative Humidity	Max	80	74	83	77	75	66	72	72	66	71	74	79	-
	Min	34	32	26	24	20	26	23	23	24	18	25	31	-
Soil Temperature at 10 cm	06 UTC	25.4	25.2	25.8	26.0	25.8	26.6	27.0	27.0	27.0	27.2	26.3	25.7	26.1
	12 UTC	27.0	27.8	29.0	28.2	28.4	29.0	29.6	30.0	30.6	31.0	29.1	29.3	28.7
Sunshine Duration		6.8	12.0	9.5	11.1	9.7	10.9	12.8	12.8	12.8	12.8	11.1	9.9	10.7
Precipitation													9.6	5.5
Evaporation		6.9	9.0	9.5	9.1	10.0	10.0	12.7	10.3	13.7	10.8	102.0	89.6	95.9
Growing Degrees	5	18.7	19.8	20.8	19.0	20.6	20.7	21.4	22.1	22.2	22.1	207.4	209.0	202.1
	10	13.7	14.8	15.8	14.0	15.6	15.7	16.4	17.1	17.2	17.1	157.4	159.0	152.1

1st 10-day period (1-10/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	63.9	56.2	62.4
Precipitation - Reference Evapotranspiration	-63.9	-46.6	-56.9
Number of Rainy Days	0.0	3.0	1.4
Number of Dry Days	24.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

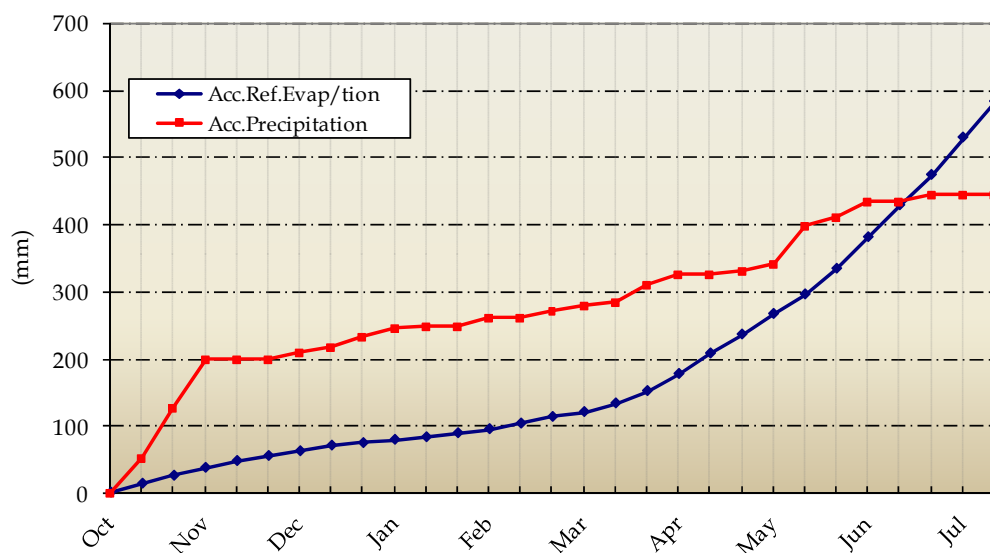


1st 10-day period (1-10/07/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.0	32.8	32.2	32.6	35.2	33.4	34.6	37.0	38.2	38.8	34.6	32.7	31.9
	Min	18.2	16.0	19.8	13.8	16.4	17.8	16.4	17.4	19.4	19.6	17.5	18.6	18.2
Relative Humidity	Max	80	81	83	87	90	82	90	81	74	83	83	70	-
	Min	30	22	29	23	21	24	20	16	19	20	22	32	-
Soil Temperature at 10 cm	06 UTC	27.6	26.8	28.2	27.0	27.8	28.2	28.0	28.6	29.2	30.0	28.1	25.7	25.0
	12 UTC	28.8	29.0	29.8	30.2	29.8	30.2	30.0	30.4	30.8	31.2	30.0	27.0	28.8
Sunshine Duration		7.2	10.2	9.1	12.1	10.3	9.7	12.3	13.0	12.2	12.1	10.8	8.3	10.3
Precipitation				0.2								0.2	6.0	9.9
Evaporation		6.4	6.2	6.9	8.8	6.4	8.7	7.0	7.2	7.8	8.1	73.5	62.8	76.5
Growing Degrees	5	19.6	19.4	21.0	18.2	20.8	20.6	20.5	22.2	23.8	24.2	210.3	206.7	195.2
	10	14.6	14.4	16.0	13.2	15.8	15.6	15.5	17.2	18.8	19.2	160.3	156.7	146.6

Series

1st 10-day period (1-10/07/2011)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	53.6	48.5
Precipitation - Reference Evapotranspiration	-53.4	-42.5
Number of Rainy Days	1.0	3.0
Number of Dry Days	4.0	3.0

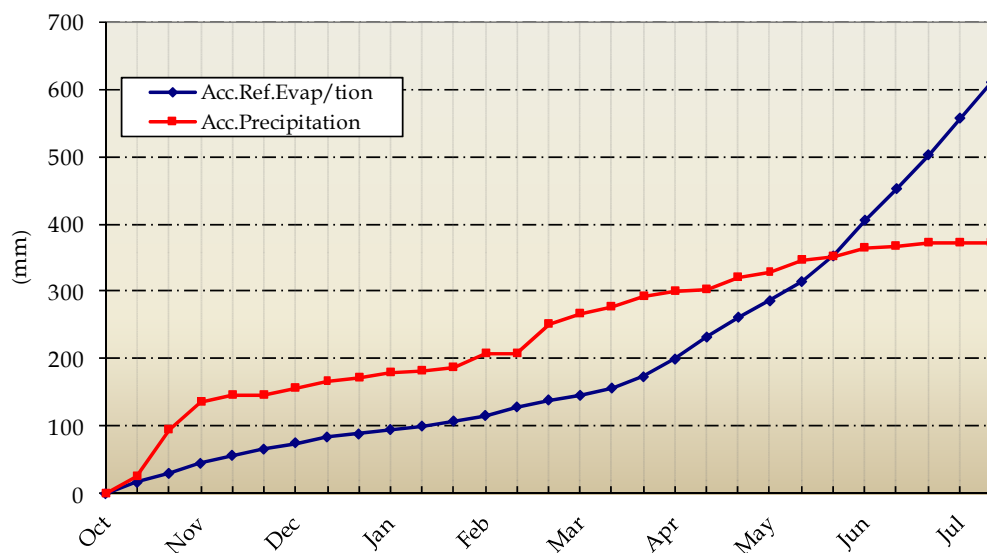
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/07/2011)		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	30.0	-	33.2	32.0	34.0	33.6	34.8	36.6	36.6	33.3	32.0	31.1
	Min	15.6	17.8	-	18.2	17.8	19.2	17.4	17.6	19.6	20.8	18.2	18.4	17.8
Relative Humidity	Max	91	-	99	95	96	91	100	93	86	85	93	88	-
	Min	48	-	50	35	42	38	33	29	34	34	38	36	-
Soil Temperature at 10 cm	06 UTC	24.2	23.2	-	23.4	24.2	24.8	25.0	25.4	25.6	26.2	24.7	25.6	25.2
	12 UTC	25.4	26.4	-	24.0	24.2	24.8	25.2	28.2	28.6	29.4	26.2	29.1	26.8
Sunshine Duration		6.4	-	12.4	11.4	10.6	9.9	12.8	12.6	12.6	12.8	11.3	10.8	10.2
Precipitation													10.8	6.2
Evaporation		3.9	-	-	5.4	4.4	5.8	6.0	5.2	5.8	5.9	-	54.8	68.1
Growing Degrees	5	17.4	18.9	-	20.7	19.9	21.6	20.5	21.2	23.1	23.7	-	202.3	194.5
	10	12.4	13.9	-	15.7	14.9	16.6	15.5	16.2	18.1	18.7	-	152.3	144.5

1st 10-day period (1-10/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	53.2	52.9	52.1
Precipitation - Reference Evapotranspiration	-53.2	-42.1	-45.9
Number of Rainy Days	0.0	3.0	1.3
Number of Dry Days	11.0	9.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

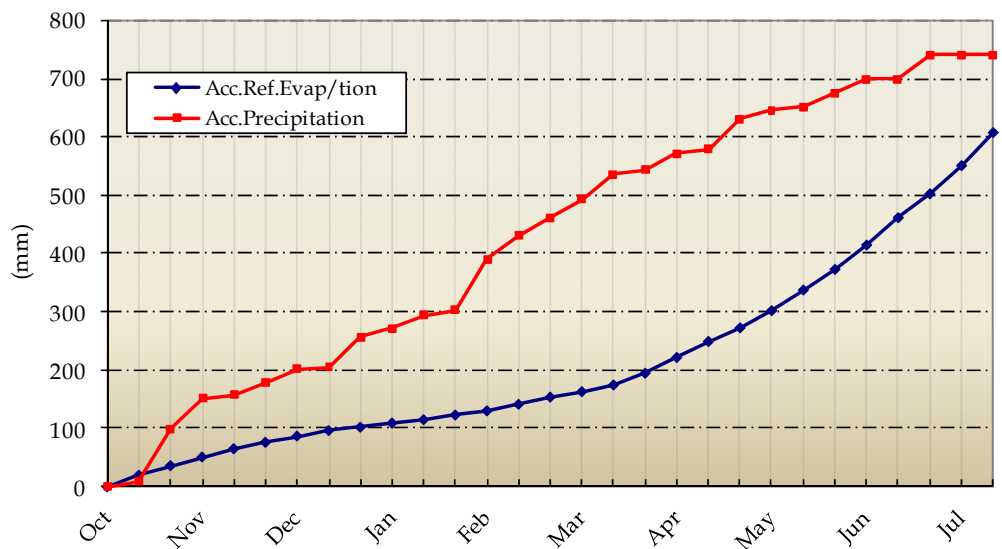


Tripoli

1st 10-day period (1-10/07/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.4	30.6	28.4	30.6	31.0	30.2	29.6	30.2	32.6	34.2	30.8	-	30.2
	Min	12.2	12.8	12.4	11.8	11.0	13.6	13.4	14.6	13.6	15.2	13.1	-	13.4
Relative Humidity	Max	87	91	91	88	81	87	75	87	80	68	84	-	-
	Min	32	29	33	15	28	23	33	26	23	17	26	-	-
Soil Temperature at 10 cm	06 UTC	22.6	24.8	25.4	24.0	23.8	25.6	26.2	26.4	26.4	26.6	25.2	-	25.0
	12 UTC	30.2	32.8	32.4	31.4	32.4	32.8	32.4	33.2	32.8	33.4	32.4	-	28.1
Sunshine Duration		13.3	13.1	13.4	13.6	13.3	12.0	11.8	13.4	13.4	13.4	13.1	-	10.6
Precipitation													-	7.1
Evaporation		8.0	9.0	8.0	7.0	8.0	9.4	5.6	7.2	8.2	10.0	80.4	-	64.6
Growing Degrees	5	16.3	16.7	15.4	16.2	16.0	16.9	16.5	17.4	18.1	19.7	169.2	-	167.9
	10	11.3	11.7	10.4	11.2	11.0	11.9	11.5	12.4	13.1	14.7	119.2	-	117.9

1st 10-day period (1-10/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	56.8	-	53.2
Precipitation - Reference Evapotranspiration	-56.8	-	-46.1
Number of Rainy Days	0.0	-	1.3
Number of Dry Days	24.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

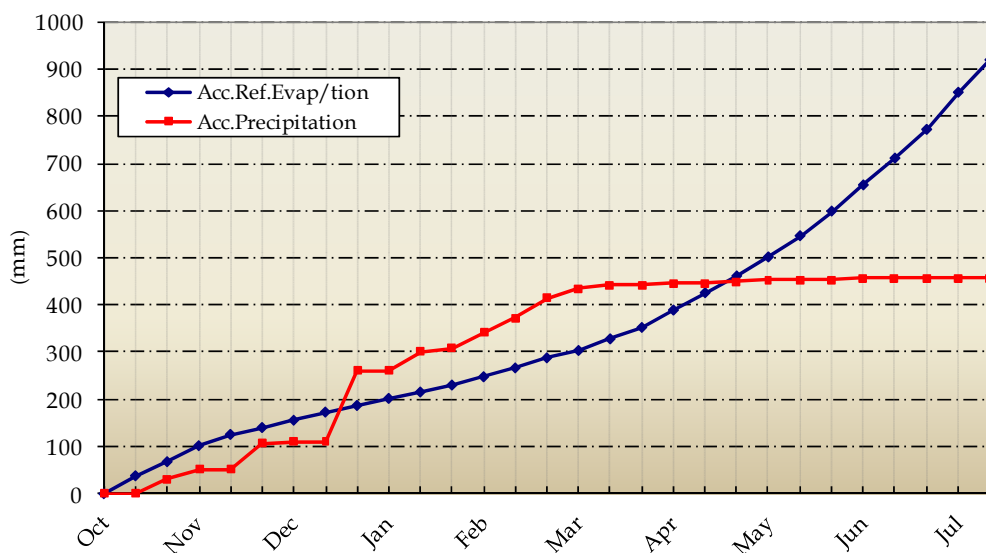


Tympaki

1st 10-day period (1-10/07/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.2	27.4	26.8	29.0	33.0	29.6	30.2	34.8	33.4	36.0	30.6	32.3	31.1
	Min	18.0	21.0	17.0	18.2	18.4	24.0	18.4	19.8	21.4	23.6	20.0	21.7	19.8
Relative Humidity	Max	98	97	98	81	80	98	67	49	57	44	77	76	-
	Min	66	64	56	33	15	27	24	15	19	14	33	32	-
Soil Temperature at 10 cm	06 UTC	29.0	30.4	29.8	29.0	29.6	30.2	30.0	30.4	30.6	31.4	30.0	30.4	31.0
	12 UTC	34.8	35.6	35.4	35.0	35.2	36.0	35.8	36.0	36.4	36.6	35.7	36.0	35.6
Sunshine Duration		13.4	13.4	13.3	13.5	13.5	13.3	9.9	13.3	13.5	13.5	13.1	12.2	12.4
Precipitation														0.0
Evaporation		6.7	7.4	8.9	7.7	14.5	7.2	9.4	15.0	11.8	13.1	101.7	124.2	112.2
Growing Degrees	5	17.1	19.2	16.9	18.6	20.7	21.8	19.3	22.3	22.4	24.8	203.1	220.3	204.6
	10	12.1	14.2	11.9	13.6	15.7	16.8	14.3	17.3	17.4	19.8	153.1	170.3	154.6

1st 10-day period (1-10/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	68.7	71.5	62.1
Precipitation - Reference Evapotranspiration	-68.7	-71.5	-62.1
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	43.0	35.0	-

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.

Mesurements 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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