



AGROMETEOROLOGICAL BULLETIN

July 2011
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



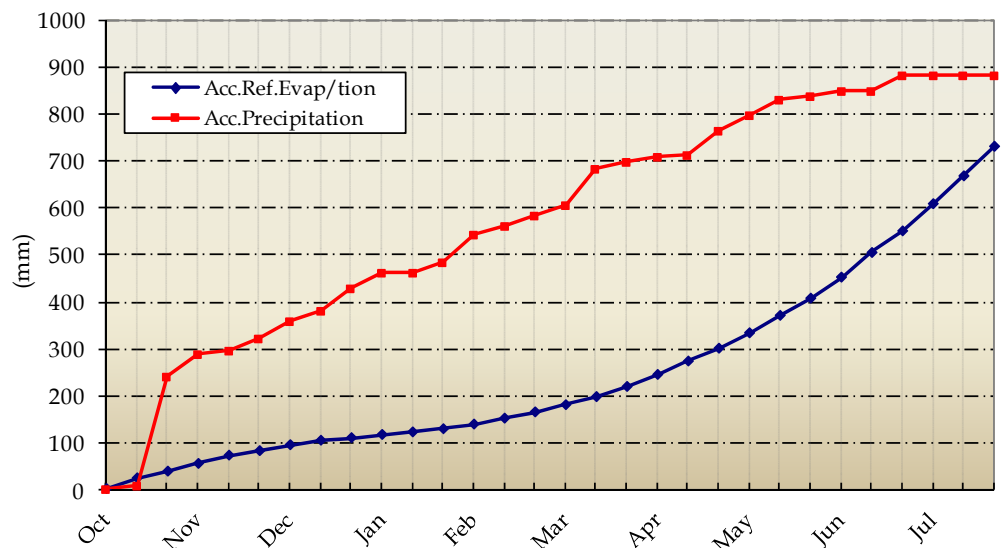
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Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
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2nd 10-day period (11-20/07/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	37.4	38.0	37.0	37.8	37.5	38.4	35.2	34.4	38.0	37.6	37.1	-	33.3
	Min	17.4	18.0	21.0	21.4	21.0	21.6	19.0	18.8	17.4	18.0	19.4	-	17.4
Relative Humidity	Max	80	85	82	84	86	82	83	92	92	80	85	-	-
	Min	23	24	27	28	34	37	37	36	30	26	30	-	-
Soil Temperature at 10 cm	06 UTC	30.6	31.6	32.0	32.4	31.2	32.6	31.6	31.4	31.4	31.4	31.6	-	27.6
	12 UTC	36.0	37.2	37.0	37.0	37.6	37.2	36.8	36.8	36.8	36.4	36.9	-	33.5
Sunshine Duration		13.6	13.2	12.7	13.2	12.8	13.0	13.5	13.3	13.6	12.2	13.1	-	11.8
Precipitation													-	3.6
Evaporation		8.2	11.2	13.6	10.5	10.3	8.4	9.8	9.9	9.8	9.6	101.3	-	85.2
Growing Degrees	5	22.4	23.0	24.0	24.6	24.3	25.0	22.1	21.6	22.7	22.8	232.5	-	203.8
	10	17.4	18.0	19.0	19.6	19.3	20.0	17.1	16.6	17.7	17.8	182.5	-	153.8

2nd 10-day period (11-20/07/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	63.2	-	56.6
Precipitation - Reference Evapotranspiration	-63.2	-	-53.0
Number of Rainy Days	0.0	-	0.7
Number of Dry Days	33.0	-	-

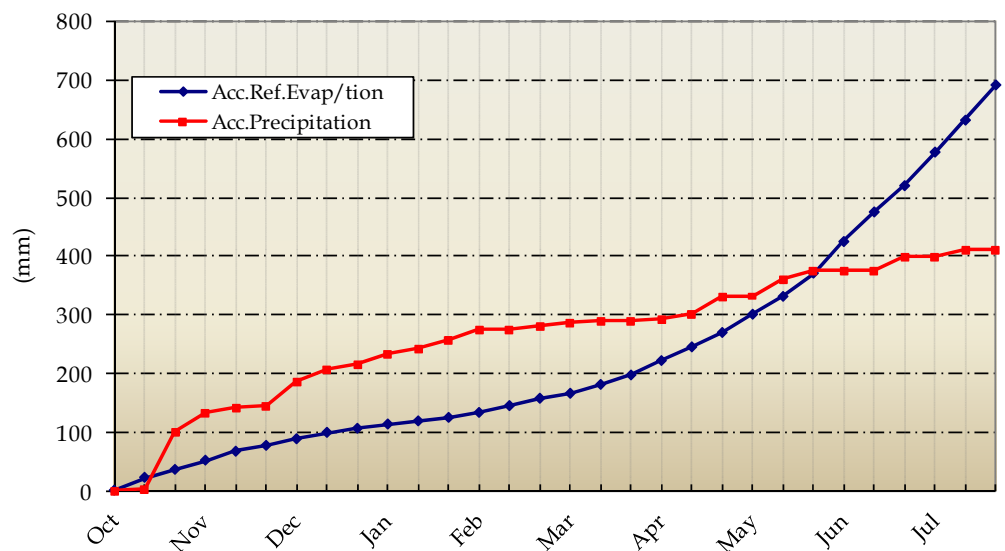
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/07/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	35.8	35.0	34.6	34.8	34.6	35.0	34.4	35.0	35.0	33.6	34.8	32.8	30.5
	Min	23.0	21.2	21.2	20.2	20.8	19.2	19.8	23.4	21.4	22.0	21.2	21.4	17.5
Relative Humidity	Max	73	75	84	84	77	81	69	66	68	74	75	76	-
	Min	22	27	27	32	29	24	29	30	32	39	29	40	-
Soil Temperature at 10 cm	06 UTC	26.6	27.0	26.8	27.8	26.8	27.8	27.0	28.4	28.0	29.0	27.5	26.2	24.2
	12 UTC	30.6	31.0	31.0	30.6	31.2	30.0	31.4	31.6	31.0	32.0	31.0	29.0	28.8
Sunshine Duration		13.2	12.3	0.0	12.7	13.1	12.7	12.1	12.5	12.7	12.1	11.3	12.6	11.2
Precipitation														5.1
Evaporation		10.0	10.7	11.0	9.8	8.3	10.0	14.8	19.0	10.7	11.2	115.5	88.6	98.7
Growing Degrees	5	24.4	23.1	22.9	22.5	22.7	22.1	22.1	24.2	23.2	22.8	230.0	221.0	190.1
	10	19.4	18.1	17.9	17.5	17.7	17.1	17.1	19.2	18.2	17.8	180.0	171.0	140.1

2nd 10-day period (11-20/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	60.0	61.3	60.3
Precipitation - Reference Evapotranspiration	-60.0	-61.3	-55.2
Number of Rainy Days	0.0	0.0	0.9
Number of Dry Days	16.0	12.0	-

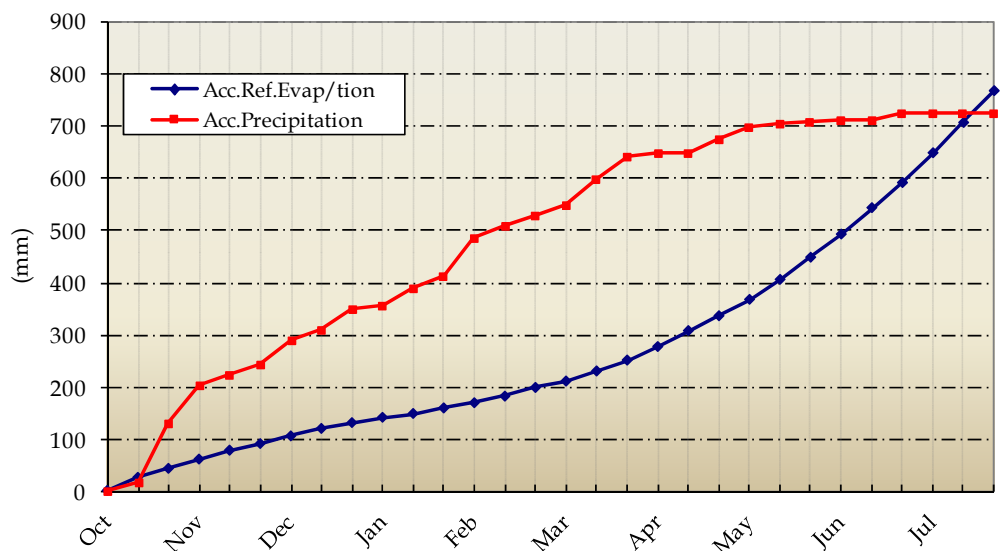
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/07/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.0	35.0	36.2	35.2	34.0	32.8	31.6	30.2	32.4	34.6	33.6	32.2	30.4
	Min	17.2	18.6	20.6	20.2	21.8	21.6	21.6	21.2	19.0	20.0	20.2	20.1	18.1
Relative Humidity	Max	91	79	80	91	88	89	81	91	90	82	86	90	-
	Min	32	34	31	32	41	45	42	53	35	29	37	41	-
Soil Temperature at 10 cm	06 UTC	27.0	27.6	28.4	28.4	29.2	29.2	28.4	28.6	27.8	28.2	28.3	28.9	27.1
	12 UTC	32.8	33.2	33.6	34.4	34.4	33.0	34.0	34.4	33.0	33.2	33.6	36.4	31.8
Sunshine Duration		12.9	12.7	12.6	12.3	12.0	12.3	12.0	12.7	12.7	10.0	12.2	12.3	12.3
Precipitation														0.8
Evaporation		11.3	10.5	6.0	16.0	12.5	10.1	9.2	7.9	12.7	9.3	105.5	90.0	77.4
Growing Degrees	5	20.6	21.8	23.4	22.7	22.9	22.2	21.6	20.7	20.7	22.3	218.9	211.2	192.4
	10	15.6	16.8	18.4	17.7	17.9	17.2	16.6	15.7	15.7	17.3	168.9	161.2	142.4

2nd 10-day period (11-20/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.1	57.4	55.3
Precipitation - Reference Evapotranspiration	-61.1	-57.4	-54.5
Number of Rainy Days	0.0	0.0	0.1
Number of Dry Days	35.0	27.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

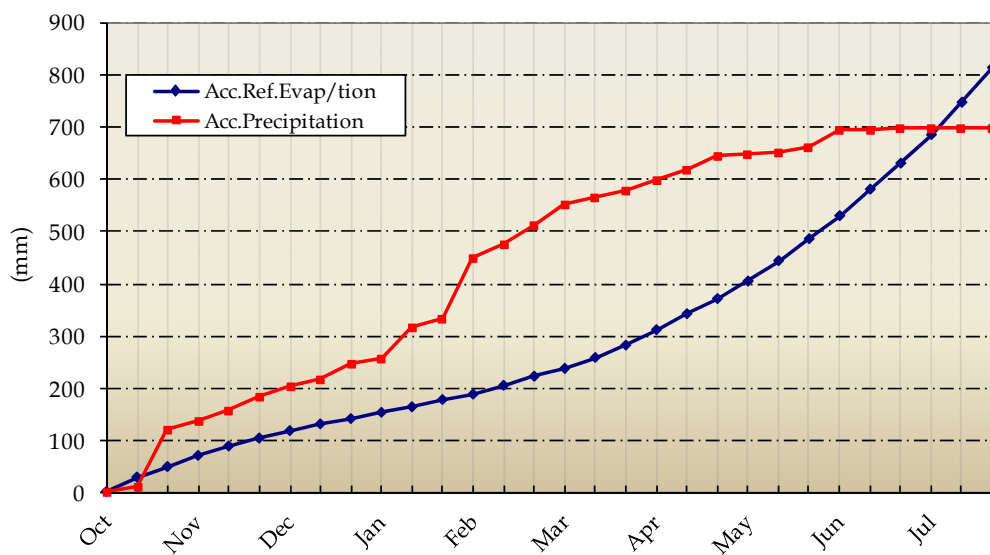


Kalamata

2nd 10-day period (11-20/07/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.2	35.4	36.2	34.0	33.0	31.4	38.0	34.6	33.6	35.0	34.5	32.1	31.2
	Min	16.8	18.4	20.0	19.8	18.6	19.8	22.0	21.0	19.8	21.4	19.8	19.7	17.8
Relative Humidity	Max	82	84	91	91	95	94	86	86	86	81	88	85	-
	Min	29	24	24	33	35	52	22	30	35	33	32	41	-
Soil Temperature at 10 cm	06 UTC	24.0	24.6	25.4	25.6	25.4	26.0	26.4	26.4	25.6	26.2	25.6	25.7	25.6
	12 UTC	27.4	28.0	28.2	28.4	28.4	28.8	29.2	29.2	29.4	28.4	28.5	28.4	30.0
Sunshine Duration		12.5	12.7	11.0	12.3	12.1	11.9	12.6	12.7	12.4	11.1	12.1	11.2	11.5
Precipitation													0.0	3.4
Evaporation		8.6	8.6	11.4	8.0	9.2	7.4	10.8	14.0	7.4	6.8	92.2	75.8	87.7
Growing Degrees	5	20.5	21.9	23.1	21.9	20.8	20.6	25.0	22.8	21.7	23.2	221.5	209.1	195.0
	10	15.5	16.9	18.1	16.9	15.8	15.6	20.0	17.8	16.7	18.2	171.5	159.1	145.0

2nd 10-day period (11-20/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	66.7	59.2	57.1
Precipitation - Reference Evapotranspiration	-66.7	-59.2	-53.7
Number of Rainy Days	0.0	0.0	0.4
Number of Dry Days	35.0	27.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

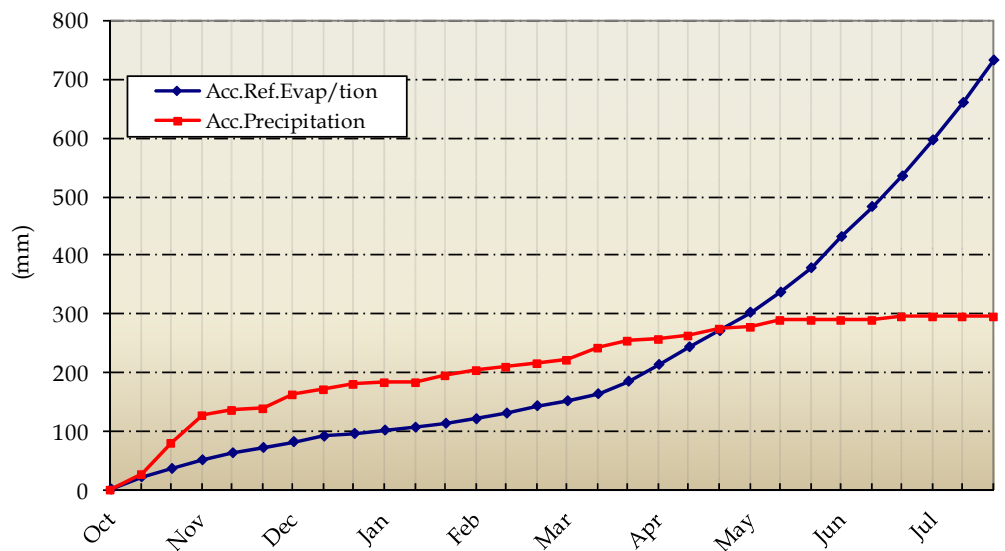


Larisa

2nd 10-day period (11-20/07/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	35.8	35.4	35.4	35.4	36.6	37.0	37.0	36.2	38.4	40.8	36.8	35.2	33.3
	Min	19.2	19.2	21.4	19.4	20.4	20.8	21.6	21.0	22.4	20.4	20.6	21.5	17.9
Relative Humidity	Max	62	62	70	70	71	70	72	79	72	75	70	69	-
	Min	26	29	26	29	27	23	23	33	24	18	26	26	-
Soil Temperature at 10 cm	06 UTC	27.6	27.8	27.4	27.6	28.8	28.4	29.0	29.2	29.4	29.0	28.4	28.2	26.6
	12 UTC	31.0	32.0	32.4	32.6	31.0	31.4	31.8	32.0	32.2	39.0	32.5	31.7	29.2
Sunshine Duration		12.8	12.0	13.1	12.2	12.6	12.5	12.7	12.6	12.9	11.6	12.5	11.6	11.0
Precipitation														9.9
Evaporation		10.3	7.6	11.5	10.0	10.2	12.1	6.1	16.4	10.2	15.6	110.0	107.9	96.3
Growing Degrees	5	22.5	22.3	23.4	22.4	23.5	23.9	24.3	23.6	25.4	25.6	236.9	233.5	205.9
	10	17.5	17.3	18.4	17.4	18.5	18.9	19.3	18.6	20.4	20.6	186.9	183.5	155.9

2nd 10-day period (11-20/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	72.4	64.9	62.2
Precipitation - Reference Evapotranspiration	-72.4	-64.9	-52.3
Number of Rainy Days	0.0	0.0	1.2
Number of Dry Days	34.0	12.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

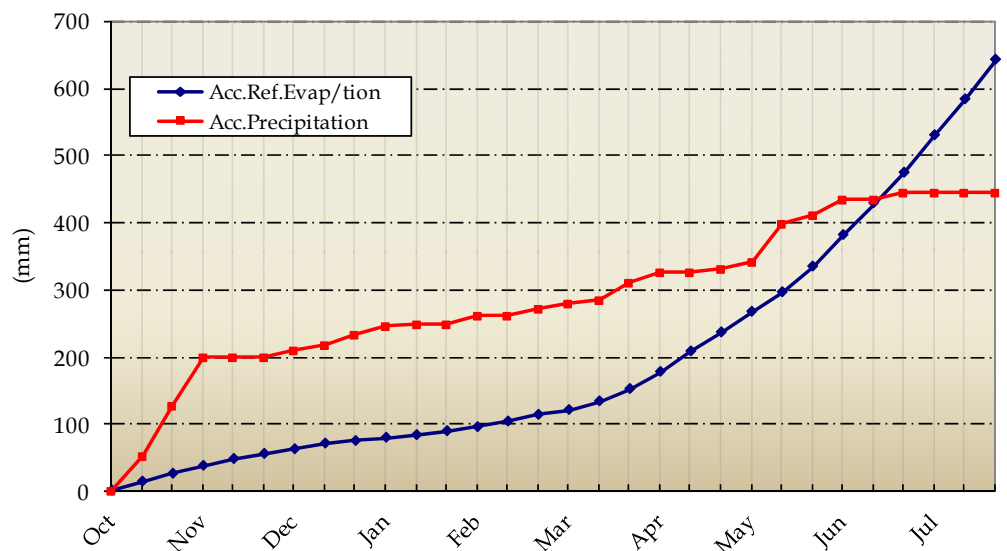


2nd 10-day period (11-20/07/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	38.2	38.2	38.8	37.8	38.0	38.6	37.8	38.8	40.2	37.0	38.3	36.5	32.6
	Min	22.0	22.0	21.2	21.0	22.4	22.2	21.8	21.0	20.4	21.2	21.5	20.9	18.6
Relative Humidity	Max	68	85	89	82	74	72	75	79	84	80	79	69	-
	Min	20	23	21	23	26	26	23	15	19	25	22	27	-
Soil Temperature at 10 cm	06 UTC	30.6	31.0	30.4	30.8	31.2	31.2	31.6	31.4	31.6	31.8	31.2	28.4	25.7
	12 UTC	32.2	32.4	32.2	32.6	32.8	33.0	33.2	33.0	33.2	33.2	32.8	30.0	29.2
Sunshine Duration		11.8	9.3	11.7	11.5	11.8	12.4	12.4	12.6	12.6	12.1	11.8	10.8	10.5
Precipitation			0.1									0.1	0.7	5.2
Evaporation		8.5	7.3	8.2	8.8	8.8	8.4	8.5	8.8	9.4	10.8	87.5	83.1	73.2
Growing Degrees	5	25.1	25.1	25.0	24.4	25.2	25.4	24.8	24.9	25.3	24.1	249.3	236.9	197.9
	10	20.1	20.1	20.0	19.4	20.2	20.4	19.8	19.9	20.3	19.1	199.3	186.9	149.8

Series

2nd 10-day period (11-20/07/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	59.0	55.6	50.4
Precipitation - Reference Evapotranspiration	-58.9	-54.9	-45.2
Number of Rainy Days	1.0	1.0	1.6
Number of Dry Days	8.0	7.0	-

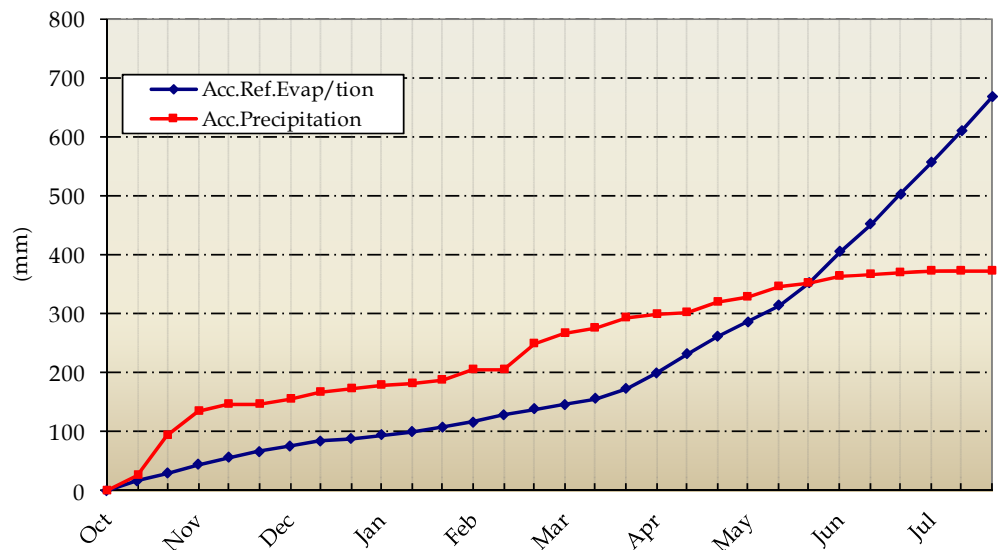
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/07/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	37.2	37.0	38.4	35.8	35.4	33.2	33.8	35.4	35.2	33.4	35.5	35.2	31.4
	Min	20.6	20.4	21.4	21.4	21.4	21.4	20.8	21.4	22.0	22.6	21.3	21.3	17.9
Relative Humidity	Max	85	100	100	100	98	94	98	100	100	-	97	90	-
	Min	31	40	45	48	45	48	43	42	44	-	43	38	-
Soil Temperature at 10 cm	06 UTC	26.4	26.6	27.4	26.6	26.8	27.4	27.2	27.2	27.4	27.6	27.1	28.2	25.5
	12 UTC	29.4	29.2	29.8	29.6	29.8	30.0	29.2	30.4	29.8	29.8	29.7	31.8	27.1
Sunshine Duration		12.6	11.9	12.5	12.1	11.7	10.5	12.5	11.0	12.7	-	11.9	12.1	10.3
Precipitation			0.6									0.6	1.8	2.1
Evaporation		6.1	4.5	6.9	4.8	5.4	4.8	6.6	7.6	6.0	-	-	53.0	67.1
Growing Degrees	5	23.9	23.7	24.9	23.6	23.4	22.3	22.3	23.4	23.6	23.0	234.1	232.4	196.2
	10	18.9	18.7	19.9	18.6	18.4	17.3	17.3	18.4	18.6	18.0	184.1	182.4	146.2

2nd 10-day period (11-20/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	57.8	57.5	50.9
Precipitation - Reference Evapotranspiration	-57.2	-55.7	-48.8
Number of Rainy Days	1.0	1.0	0.9
Number of Dry Days	12.0	10.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

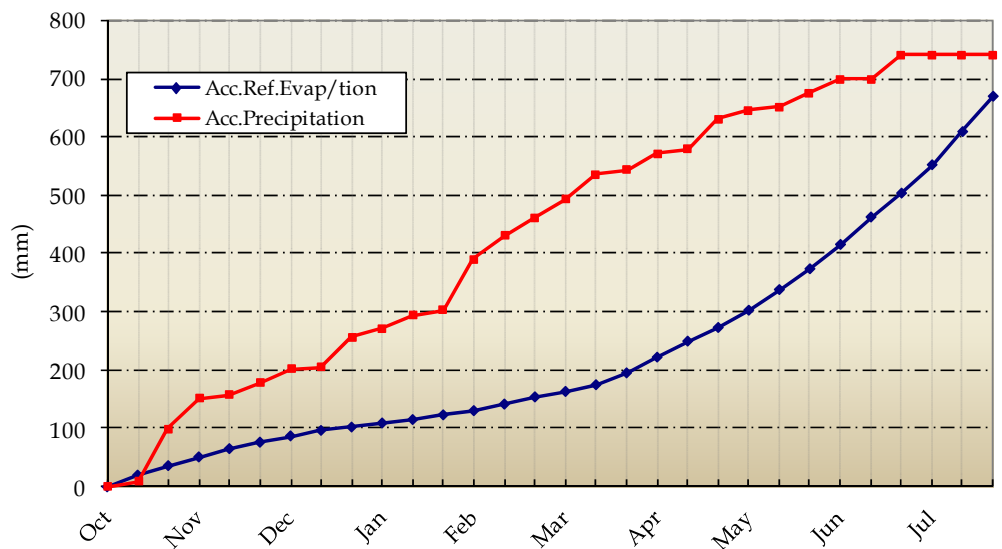


Tripoli

2nd 10-day period (11-20/07/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.8	32.6	32.6	34.2	34.2	34.2	37.2	34.2	34.8	38.0	34.6	-	30.6
	Min	16.6	14.8	20.6	15.4	15.4	16.4	16.2	13.8	15.4	14.6	15.9	-	14.1
Relative Humidity	Max	58	63	50	74	79	80	85	82	83	77	73	-	-
	Min	24	18	31	28	30	29	18	13	24	16	23	-	-
Soil Temperature at 10 cm	06 UTC	27.0	27.0	28.2	27.4	27.6	28.2	28.2	27.8	28.6	28.6	27.9	-	25.3
	12 UTC	33.8	33.6	34.2	34.2	34.8	35.4	35.4	34.0	35.8	35.0	34.6	-	28.3
Sunshine Duration		13.3	13.4	13.3	11.6	12.5	11.5	13.2	13.4	12.9	12.7	12.8	-	10.5
Precipitation													-	9.1
Evaporation		11.6	10.1	10.4	8.5	8.9	7.9	8.6	3.1	13.9	11.0	94.0	-	63.7
Growing Degrees	5	20.2	18.7	21.6	19.8	19.8	20.3	21.7	19.0	20.1	21.3	202.5	-	173.2
	10	15.2	13.7	16.6	14.8	14.8	15.3	16.7	14.0	15.1	16.3	152.5	-	123.2

2nd 10-day period (11-20/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	60.7	-	53.3
Precipitation - Reference Evapotranspiration	-60.7	-	-44.2
Number of Rainy Days	0.0	-	1.4
Number of Dry Days	34.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

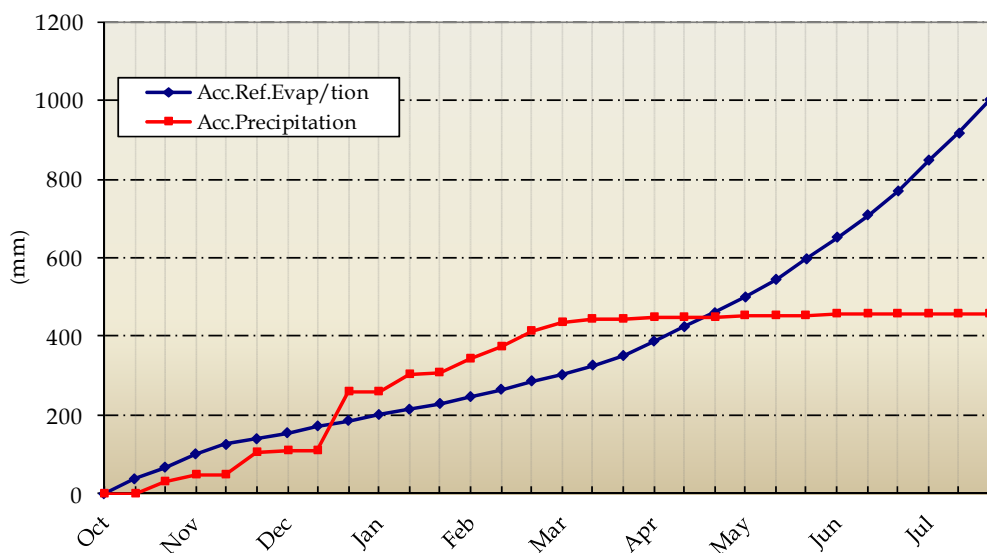


Tympani

2nd 10-day period (11-20/07/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	36.4	33.4	33.8	33.6	34.4	36.2	32.6	35.6	37.6	34.0	34.8	33.9	32.0
	Min	22.4	22.2	22.0	20.8	21.4	19.2	20.8	20.6	23.8	22.0	21.5	22.2	20.5
Relative Humidity	Max	39	50	53	62	68	52	80	87	48	89	63	76	-
	Min	14	24	27	23	22	13	24	19	14	21	20	35	-
Soil Temperature at 10 cm	06 UTC	31.0	31.2	31.0	30.8	30.6	30.8	31.4	31.6	32.2	32.4	31.3	31.0	31.2
	12 UTC	36.4	35.2	35.2	35.6	36.0	36.2	37.6	37.4	37.6	38.0	36.5	36.0	35.7
Sunshine Duration		13.5	13.6	13.5	13.5	13.5	13.4	12.7	13.0	13.2	12.1	13.2	12.2	12.4
Precipitation														
Evaporation		16.9	12.0	13.5	15.3	14.2	15.0	9.8	13.3	17.0	8.7	135.7	135.6	121.3
Growing Degrees	5	24.4	22.8	22.9	22.2	22.9	22.7	21.7	23.1	25.7	23.0	231.4	230.3	211.0
	10	19.4	17.8	17.9	17.2	17.9	17.7	16.7	18.1	20.7	18.0	181.4	180.3	161.4

2nd 10-day period (11-20/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	85.4	77.1	67.8
Precipitation - Reference Evapotranspiration	-85.4	-77.1	-67.8
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	53.0	45.0	-

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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