



AGROMETEOROLOGICAL BULLETIN

June 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



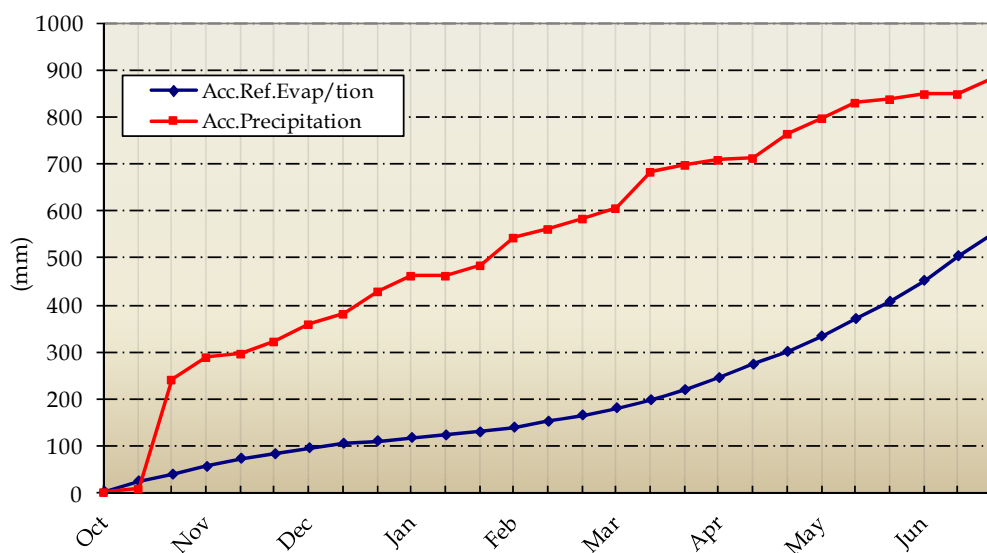
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2nd 10-day period (11-20/06/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.8	26.4	29.4	30.4	26.7	27.4	30.4	30.8	31.6	33.0	29.5	-	30.7
	Min	16.0	15.0	14.2	16.6	17.6	13.4	15.6	16.4	19.2	15.0	15.9	-	15.5
Relative Humidity	Max	93	94	100	96	98	98	98	98	94	93	96	-	-
	Min	35	45	46	44	52	46	41	50	38	40	44	-	-
Soil Temperature at 10 cm	06 UTC	26.4	26.0	23.2	25.4	23.6	21.0	22.2	23.4	24.2	24.4	24.0	-	24.5
	12 UTC	32.0	29.6	28.0	31.2	26.6	26.4	27.4	27.6	28.6	29.2	28.7	-	30.5
Sunshine Duration		12.5	3.4	11.8	6.6	1.4	7.1	10.8	13.1	13.1	13.6	9.3	-	10.9
Precipitation			2.4	0.2	16.9	3.7	0.5	8.5				32.2	-	7.2
Evaporation		10.0	2.4	8.6	7.9	2.1	5.3	7.5	7.6	8.1	5.3	64.8	-	80.5
Growing Degrees	5	17.4	15.7	16.8	18.5	17.2	15.4	18.0	18.6	20.4	19.0	177.0	-	180.7
	10	12.4	10.7	11.8	13.5	12.2	10.4	13.0	13.6	15.4	14.0	127.0	-	130.7

2nd 10-day period (11-20/06/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	46.2	-	53.4
Precipitation - Reference Evapotranspiration	-14.0	-	-46.2
Number of Rainy Days	6.0	-	1.1
Number of Dry Days	12.0	-	-

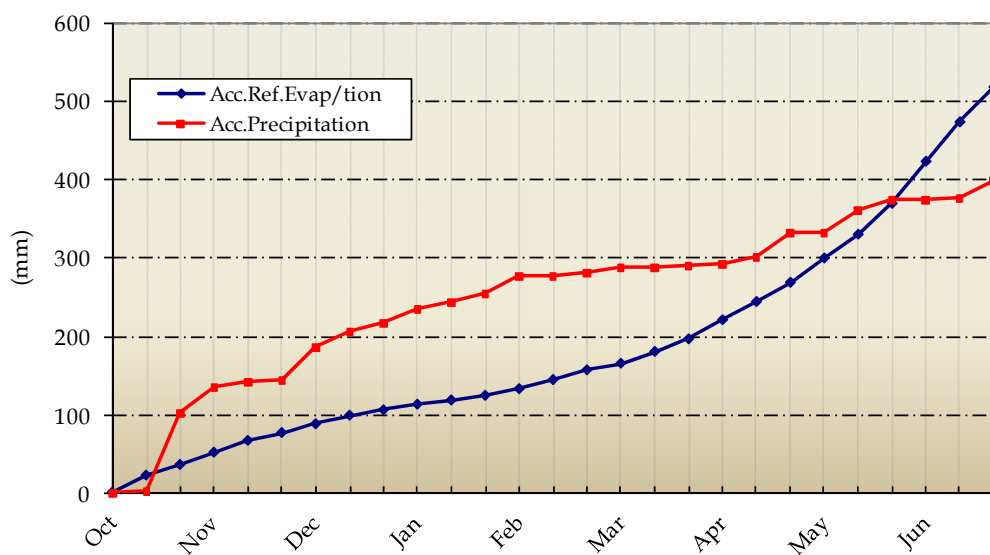
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/06/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.2	23.6	25.6	25.0	29.0	29.0	30.0	29.6	29.0	32.2	27.8	31.8	27.5
	Min	17.2	17.6	18.6	15.0	15.0	18.8	16.0	16.8	17.6	18.8	17.1	20.4	15.2
Relative Humidity	Max	90	94	94	93	91	92	94	88	96	85	92	80	-
	Min	52	61	51	60	37	35	45	42	43	34	46	38	-
Soil Temperature at 10 cm	06 UTC	24.0	23.0	23.0	19.8	19.0	20.2	22.0	22.6	24.4	25.0	22.3	25.9	22.6
	12 UTC	26.6	23.2	24.0	21.8	24.6	23.8	26.5	26.8	29.0	29.0	25.5	28.5	27.3
Sunshine Duration		6.1	1.3	2.5	5.6	12.4	10.2	12.7	13.0	12.9	9.9	8.7	12.3	10.3
Precipitation			16.3	2.7	2.1		1.4					22.5		11.6
Evaporation		7.0	0.5	0.1	3.0	8.6	4.7	10.0	11.0	8.0	6.0	58.9	95.9	79.3
Growing Degrees	5	16.2	15.6	17.1	15.0	17.0	18.9	18.0	18.2	18.3	20.5	174.8	211.3	163.4
	10	11.2	10.6	12.1	10.0	12.0	13.9	13.0	13.2	13.3	15.5	124.8	161.3	113.4

2nd 10-day period (11-20/06/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	44.7	59.2	52.7
Precipitation - Reference Evapotranspiration	-22.2	-59.2	-41.1
Number of Rainy Days	4.0	0.0	1.6
Number of Dry Days	10.0	10.0	-

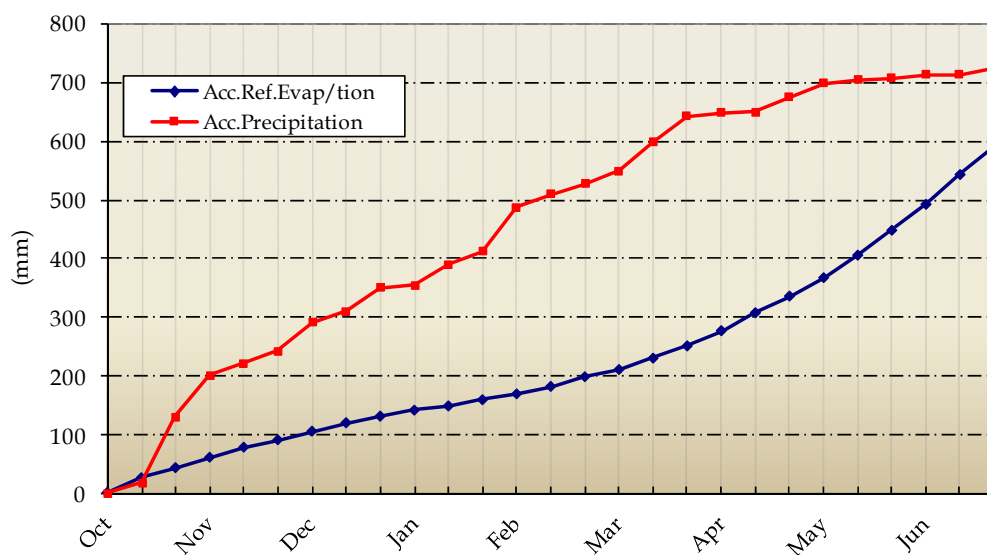
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/06/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.0	25.4	26.4	26.8	27.0	27.0	27.2	27.4	29.0	28.6	27.1	31.6	28.1
	Min	20.8	16.8	17.4	16.6	18.8	15.0	16.0	17.2	17.0	17.8	17.3	19.0	16.4
Relative Humidity	Max	81	88	94	92	94	96	92	92	90	90	91	91	-
	Min	49	49	50	51	52	47	48	55	35	38	47	38	-
Soil Temperature at 10 cm	06 UTC	25.0	25.2	25.2	25.4	26.0	21.0	22.2	24.0	24.2	25.2	24.3	27.0	24.8
	12 UTC	31.0	31.2	32.2	32.6	32.0	32.6	31.5	31.0	32.0	32.4	31.8	35.3	29.7
Sunshine Duration		10.6	11.3	12.9	6.2	1.7	8.2	11.1	12.7	12.8	12.0	10.0	11.1	11.5
Precipitation					5.6	7.6						13.2		2.1
Evaporation		6.1	7.5	6.5	1.9	1.9	6.0	1.2	11.7	8.5	6.7	58.0	87.6	71.4
Growing Degrees	5	18.4	16.1	16.9	16.7	17.9	16.0	16.6	17.3	18.0	18.2	172.1	203.0	172.2
	10	13.4	11.1	11.9	11.7	12.9	11.0	11.6	12.3	13.0	13.2	122.1	153.0	122.2

2nd 10-day period (11-20/06/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	48.1	54.1	50.2
Precipitation - Reference Evapotranspiration	-34.9	-54.1	-48.1
Number of Rainy Days	2.0	0.0	0.4
Number of Dry Days	16.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

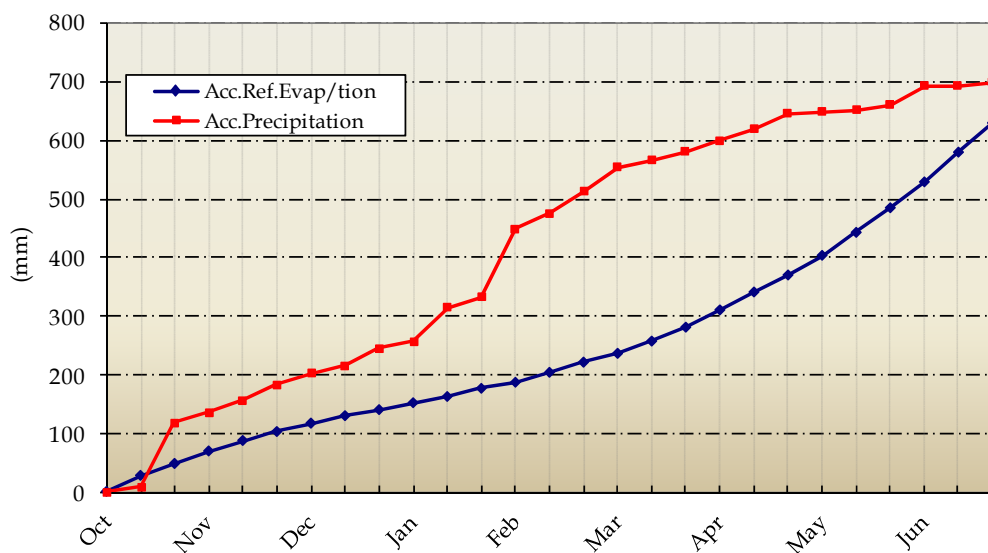


Kalamata

2nd 10-day period (11-20/06/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.2	28.2	27.6	26.2	26.2	25.8	26.4	30.0	32.4	29.6	28.2	33.7	29.3
	Min	18.0	17.8	16.8	17.2	16.0	14.0	14.8	17.6	17.8	17.4	16.7	19.0	15.9
Relative Humidity	Max	91	92	96	94	96	96	96	96	96	98	95	84	-
	Min	28	40	48	56	52	52	49	46	26	46	44	31	-
Soil Temperature at 10 cm	06 UTC	22.8	22.6	22.4	22.6	21.8	21.2	20.6	22.0	22.6	23.0	22.2	23.2	23.0
	12 UTC	25.2	24.8	25.2	25.0	23.8	23.2	23.4	25.0	25.4	25.2	24.6	25.8	27.4
Sunshine Duration		13.0	12.4	12.0	7.4	3.1	5.7	10.4	1.9	12.7	12.6	9.1	11.6	11.0
Precipitation					4.4	0.2						4.6		3.1
Evaporation		7.6	8.4	5.4	4.4	3.8	3.8	7.0	4.5	11.2	9.6	65.7	68.2	80.7
Growing Degrees	5	18.6	18.0	17.2	16.7	16.1	14.9	15.6	18.8	20.1	18.5	174.5	213.5	175.9
	10	13.6	13.0	12.2	11.7	11.1	9.9	10.6	13.8	15.1	13.5	124.5	163.5	125.9

2nd 10-day period (11-20/06/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.0	63.7	54.6
Precipitation - Reference Evapotranspiration	-45.4	-63.7	-51.5
Number of Rainy Days	2.0	0.0	0.9
Number of Dry Days	14.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

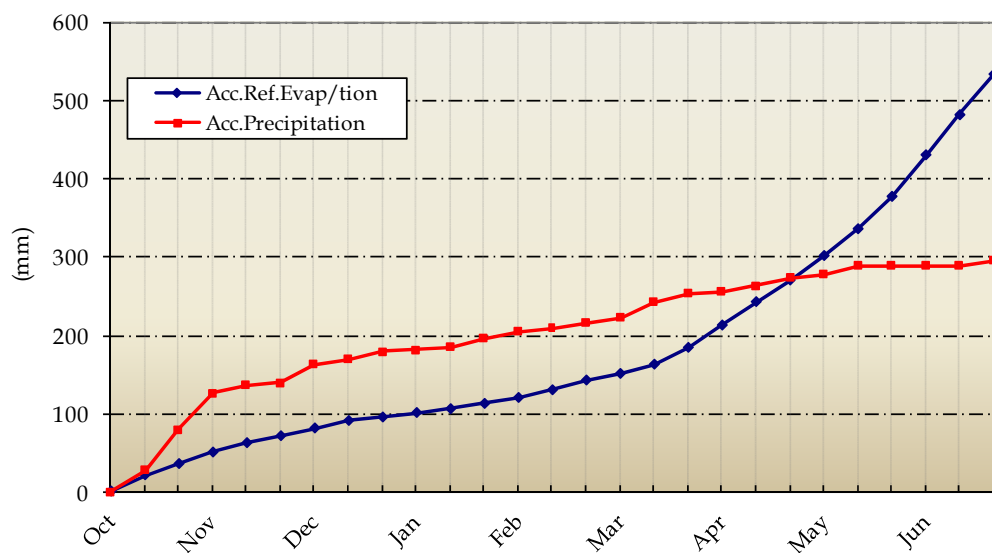


Larisa

2nd 10-day period (11-20/06/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.6	26.0	28.0	29.0	26.8	28.6	31.2	35.0	35.8	34.4	30.5	35.4	31.7
	Min	18.0	16.0	15.4	17.2	17.0	16.0	14.6	15.8	17.6	18.0	16.6	20.3	15.7
Relative Humidity	Max	94	94	93	86	79	96	89	81	84	73	87	78	-
	Min	29	44	25	30	41	32	32	24	16	26	30	26	-
Soil Temperature at 10 cm	06 UTC	23.4	23.4	21.6	22.0	22.0	21.0	22.0	22.6	23.0	24.4	22.5	25.5	23.9
	12 UTC	26.0	24.8	24.6	24.6	24.4	24.4	25.0	27.6	28.6	27.2	25.7	28.0	26.6
Sunshine Duration		10.6	5.3	9.9	8.0	4.4	8.4	11.2	11.4	12.7	12.8	9.5	10.4	10.5
Precipitation			4.0				2.0					6.0	0.1	6.2
Evaporation		3.2	6.4	2.8	6.6	6.3	6.7	11.7	7.0	9.9	10.4	71.0	102.3	85.8
Growing Degrees	5	19.3	16.0	16.7	18.1	16.9	17.3	17.9	20.4	21.7	21.2	185.5	228.8	186.8
	10	14.3	11.0	11.7	13.1	11.9	12.3	12.9	15.4	16.7	16.2	135.5	178.8	136.8

2nd 10-day period (11-20/06/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	52.1	65.1	58.5
Precipitation - Reference Evapotranspiration	-46.1	-65.0	-52.3
Number of Rainy Days	2.0	1.0	1.7
Number of Dry Days	14.0	9.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

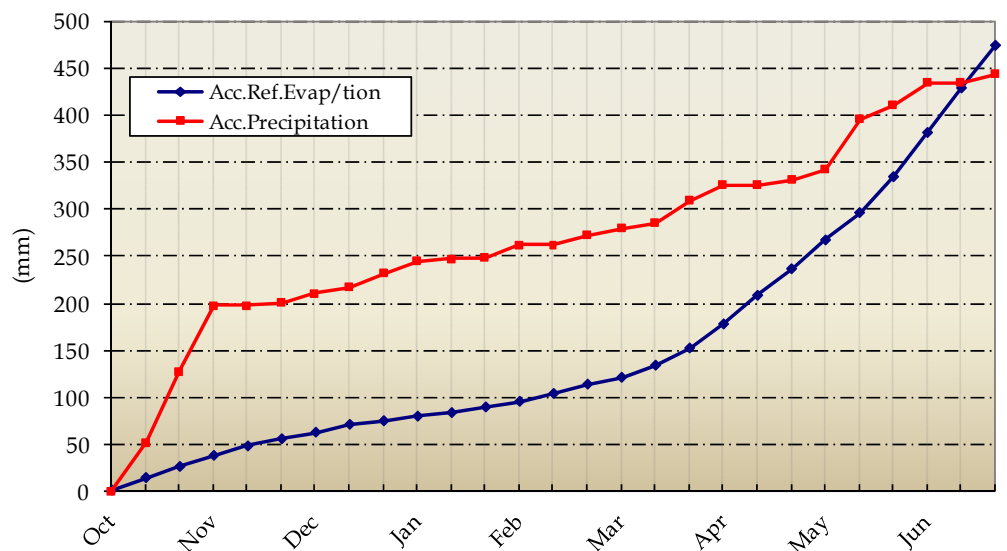


2nd 10-day period (11-20/06/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.8	28.2	30.8	31.2	28.4	31.2	33.8	34.6	35.6	35.0	31.9	34.7	30.1
	Min	19.8	18.2	17.4	15.4	16.6	16.0	15.6	17.2	18.2	18.4	17.3	19.9	16.9
Relative Humidity	Max	65	88	88	93	92	94	93	86	87	87	87	72	-
	Min	28	37	28	27	34	25	16	26	29	21	27	34	-
Soil Temperature at 10 cm	06 UTC	24.6	25.0	23.2	23.2	23.2	22.0	23.0	24.6	26.0	26.6	24.1	26.5	23.1
	12 UTC	27.0	25.8	24.2	25.0	25.0	25.0	26.2	26.8	29.5	29.0	26.4	28.0	27.0
Sunshine Duration		11.9	1.8	7.8	7.3	3.4	7.4	10.8	11.2	11.7	11.6	8.5	8.7	9.7
Precipitation			2.6		5.0	1.1	0.1					8.8	19.5	13.8
Evaporation		7.4	2.6	4.0	3.6	2.0	5.5	4.3	6.7	9.0	7.0	52.1	60.4	66.8
Growing Degrees	5	19.8	18.2	19.1	18.3	17.5	18.6	19.7	20.9	21.9	21.7	195.7	223.3	185.2
	10	14.8	13.2	14.1	13.3	12.5	13.6	14.7	15.9	16.9	16.7	145.7	173.3	135.2

Series

2nd 10-day period (11-20/06/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	45.4	49.7	48.5
Precipitation - Reference Evapotranspiration	-36.6	-30.2	-34.7
Number of Rainy Days	4.0	2.0	2.4
Number of Dry Days	11.0	11.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

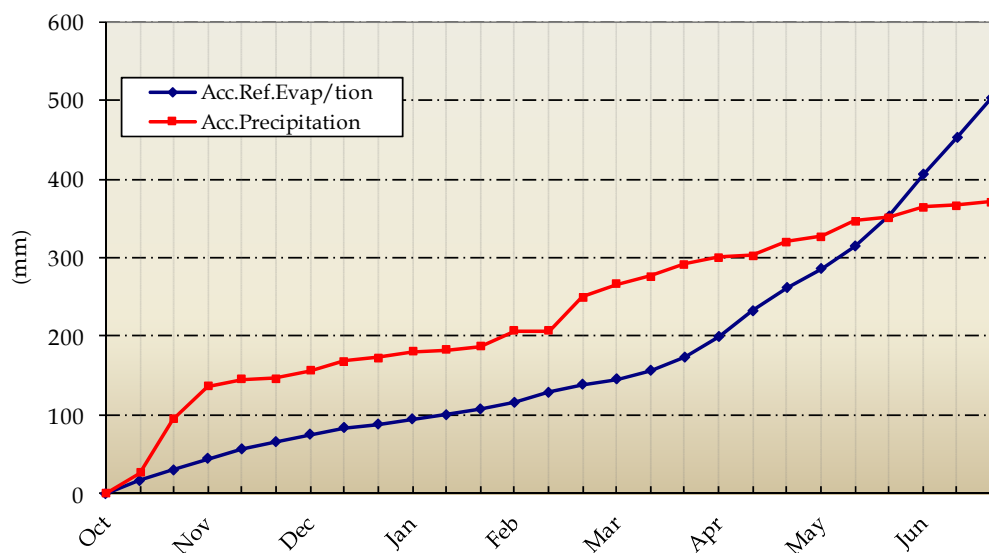


Trikala Imathias

2nd 10-day period (11-20/06/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.4	28.4	30.4	31.2	27.2	30.2	32.0	33.0	32.6	32.0	30.6	33.4	29.6
	Min	16.6	18.4	15.6	17.0	19.0	17.8	18.0	18.0	19.2	19.0	17.9	20.3	16.3
Relative Humidity	Max	90	97	98	97	97	97	98	91	98	76	94	93	-
	Min	32	41	40	33	60	40	39	44	38	28	40	45	-
Soil Temperature at 10 cm	06 UTC	23.4	23.2	22.6	23.4	23.6	23.0	23.2	24.0	24.4	25.0	23.6	26.2	23.4
	12 UTC	26.0	24.8	25.2	25.8	25.0	25.0	26.0	27.6	27.8	28.8	26.2	29.7	25.1
Sunshine Duration		10.4	4.8	10.8	10.2	5.4	8.7	11.1	12.2	11.6	11.5	9.7	9.6	9.7
Precipitation			1.0			3.4						4.4	3.1	9.0
Evaporation		6.5	5.0	5.8	5.0	3.4	5.4	4.8	4.2	6.3	4.4	50.8	45.7	63.6
Growing Degrees	5	18.0	18.4	18.0	19.1	18.1	19.0	20.0	20.5	20.9	20.5	192.5	218.4	179.2
	10	13.0	13.4	13.0	14.1	13.1	14.0	15.0	15.5	15.9	15.5	142.5	168.4	129.2

2nd 10-day period (11-20/06/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.2	52.2	50.0
Precipitation - Reference Evapotranspiration	-45.8	-49.1	-41.0
Number of Rainy Days	2.0	2.0	2.0
Number of Dry Days	8.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

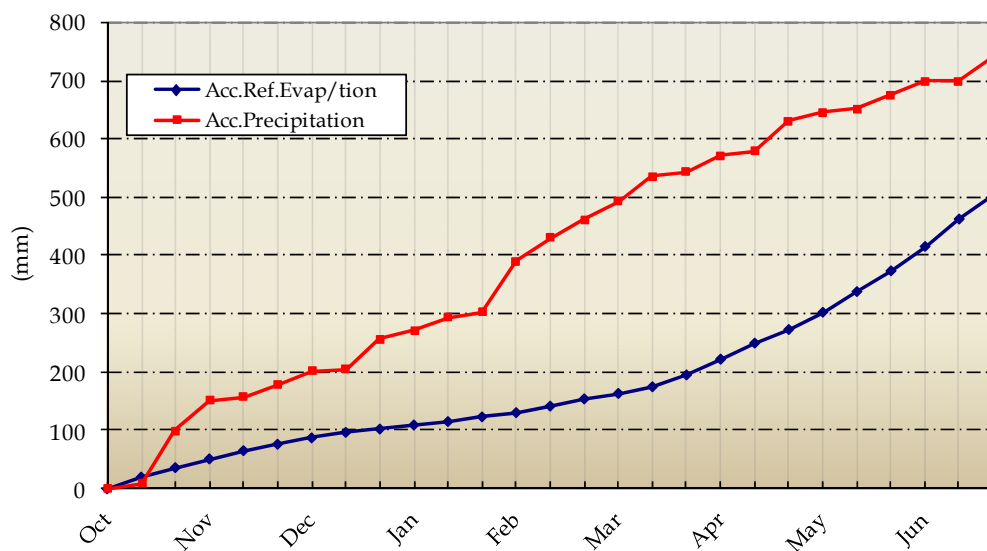


Tripoli

2nd 10-day period (11-20/06/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.4	23.8	24.8	24.0	19.8	21.6	25.4	28.2	30.4	31.0	25.6	-	28.6
	Min	10.6	10.2	9.8	12.0	13.2	10.4	9.0	11.6	12.8	11.4	11.1	-	11.6
Relative Humidity	Max	88	86	95	100	98	95	97	95	95	78	93	-	-
	Min	27	41	42	48	60	58	34	38	29	26	40	-	-
Soil Temperature at 10 cm	06 UTC	22.4	22.0	20.0	19.8	18.4	16.6	17.2	19.2	21.2	22.2	19.9	-	22.7
	12 UTC	29.8	26.0	26.4	24.4	20.6	21.4	25.6	27.8	29.8	31.0	26.3	-	25.9
Sunshine Duration		12.5	6.4	8.4	4.3	0.7	7.6	9.1	10.7	13.1	13.5	8.6	-	10.8
Precipitation			1.4	13.7	22.8	3.6	0.2					41.7	-	5.7
Evaporation		5.0	3.4	0.3	0.1	1.3	1.2	4.0	6.0	7.0	7.0	35.3	-	62.0
Growing Degrees	5	14.0	12.0	12.3	13.0	11.5	11.0	12.2	14.9	16.6	16.2	133.7	-	151.2
	10	9.0	7.0	7.3	8.0	6.5	6.0	7.2	9.9	11.6	11.2	83.7	-	101.2

2nd 10-day period (11-20/06/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	40.9	-	52.3
Precipitation - Reference Evapotranspiration	0.8	-	-46.6
Number of Rainy Days	5.0	-	1.4
Number of Dry Days	12.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

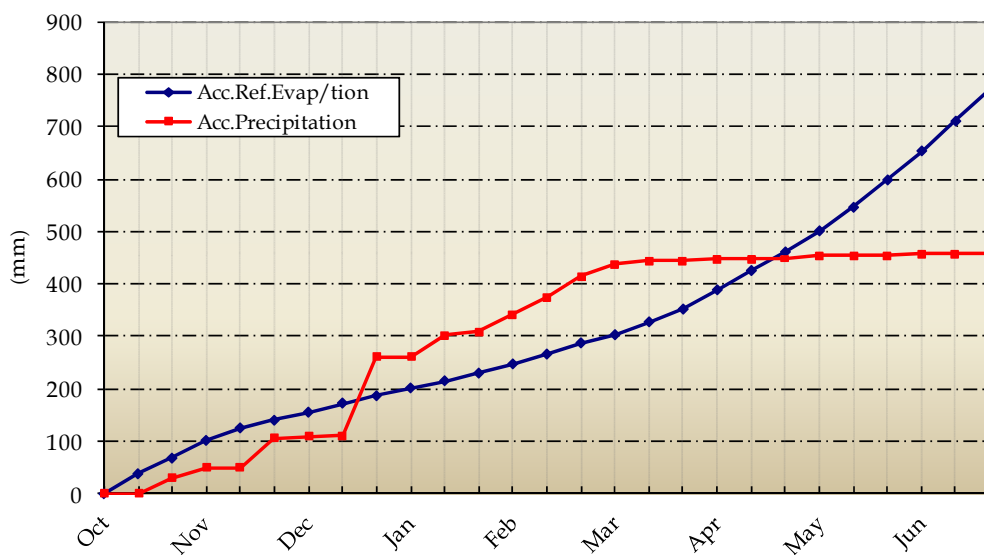


Tympaki

2nd 10-day period (11-20/06/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.0	26.2	28.4	26.2	26.0	26.4	29.6	32.4	28.0	28.4	27.8	32.6	28.8
	Min	15.8	16.6	17.0	15.6	17.6	17.6	17.8	15.8	18.2	17.2	16.9	21.3	17.7
Relative Humidity	Max	97	98	80	97	88	89	74	74	96	97	89	77	-
	Min	45	40	28	41	41	49	28	21	40	22	36	30	-
Soil Temperature at 10 cm	06 UTC	27.2	27.8	27.0	26.8	28.0	27.6	28.2	27.6	28.6	28.6	27.7	30.1	28.7
	12 UTC	33.0	33.0	32.2	33.8	32.8	34.4	33.4	34.4	34.8	35.2	33.7	36.5	33.6
Sunshine Duration		12.9	10.6	13.1	12.7	10.9	12.7	13.6	13.3	12.9	13.4	12.6	10.6	12.2
Precipitation														0.0
Evaporation		7.7	8.5	9.8	9.6	8.2	7.5	11.6	13.1	8.5	8.5	93.0	100.2	98.1
Growing Degrees	5	15.9	16.4	17.7	15.9	16.8	17.0	18.7	19.1	18.1	17.8	173.4	219.2	182.4
	10	10.9	11.4	12.7	10.9	11.8	12.0	13.7	14.1	13.1	12.8	123.4	169.2	132.4

2nd 10-day period (11-20/06/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	60.8	64.0	55.6
Precipitation - Reference Evapotranspiration	-60.8	-64.0	-55.6
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	23.0	15.0	-

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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HELLENIC NATIONAL METEOROLOGICAL SERVICE

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