



# AGROMETEOROLOGICAL BULLETIN

*July 2017  
3rd 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  
El. Venizelou Street 14, 16777  
Helliniko, Athens

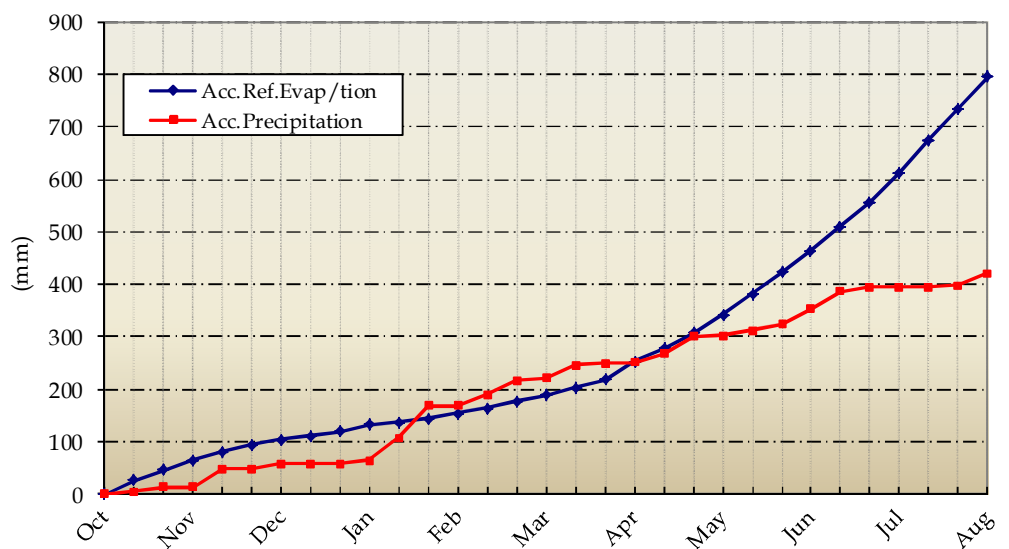
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Alexandroupoli

3rd 10-day period (21-31/07/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.2	33.8	33.0	34.4	32.4	33.0	29.4	27.6	29.4	34.0	32.6	32.2	33.6	30.8
	Min	15.8	15.8	17.4	18.6	19.8	20.8	17.6	16.8	16.8	17.4	21.8	18.1	19.8	18.1
Relative Humidity	Max	81	83	81	80	78	92	96	94	94	88	81	86	72	-
	Min	27	30	34	32	39	39	60	50	50	27	36	39	28	-
Soil Temperature at 10 cm	06 UTC	23.0	24.2	25.0	25.6	26.4	26.0	26.4	22.0	22.2	22.8	24.8	24.4	28.1	24.5
	12 UTC	28.0	29.0	29.6	30.2	29.2	30.4	26.0	25.0	25.4	28.0	28.2	28.1	34.7	28.7
Sunshine Duration		13.5	13.6	12.4	12.8	11.7	13.0	4.9	10.1	13.4	13.3	13.3	12.0	12.7	10.3
Precipitation						0.0		23.2	0.6				23.8		5.5
Evaporation		10.2	10.7	9.6	10.9	8.1	8.6	6.6	7.8	5.3	11.3	10.7	99.8	111.6	104.4
Growing Degrees	5	20.0	19.8	20.2	21.5	21.1	21.9	18.5	17.2	18.1	20.7	22.2	221.2	238.8	213.8
	10	15.0	14.8	15.2	16.5	16.1	16.9	13.5	12.2	13.1	15.7	17.2	166.2	183.8	158.8

3rd 10-day period (21-31/07/2017)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.1	68.9
Precipitation - Reference Evapotranspiration	-37.3	-68.9
Number of Rainy Days	2.0	0.0
Number of Dry Days	8.0	27.0

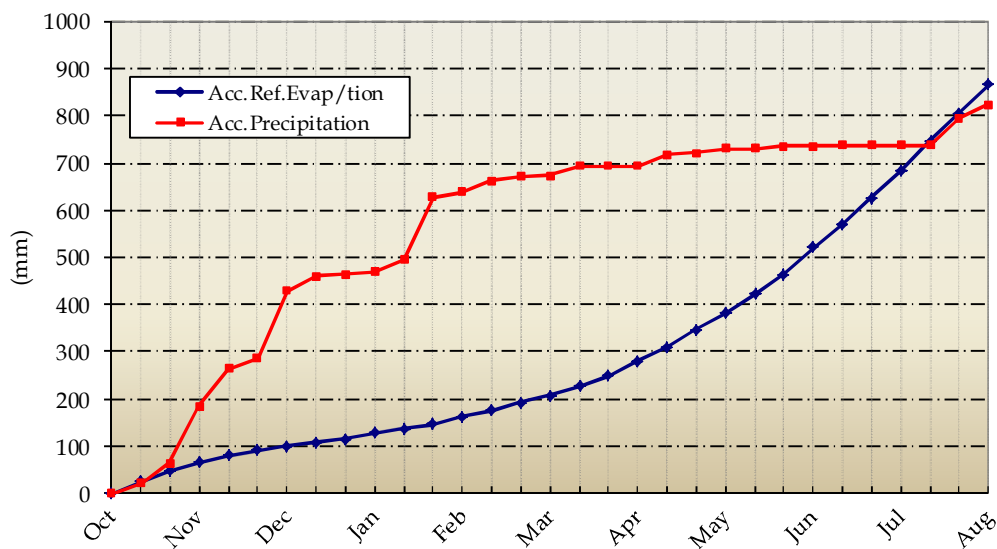
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/07/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.5	33.4	34.0	32.3	33.2	31.0	27.6	29.2	30.0	31.6	32.3	31.5	31.3	30.6
	Min	20.0	18.6	20.0	20.2	20.7	20.5	17.0	21.3	18.8	19.8	19.8	19.7	20.0	18.5
Relative Humidity	Max	86	88	85	84	88	87	86	81	84	84	85	85	87	-
	Min	33	31	27	37	39	46	48	38	42	39	33	38	43	-
Soil Temperature at 10 cm	06 UTC	27.0	27.2	28.0	28.8	28.6	29.0	25.0	26.2	26.5	26.0	28.0	27.3	-	27.4
	12 UTC	29.0	30.5	30.0	31.0	31.0	31.0	28.4	28.8	28.5	29.6	30.5	29.8	-	31.9
Sunshine Duration		12.8	13.0	12.0	10.9	11.7	12.6	8.7	13.0	13.0	12.9	13.0	12.1	12.6	11.8
Precipitation								29.9					29.9		2.9
Evaporation		9.0	8.0	4.0	10.0	5.0	14.6	6.3	4.1	8.9	8.0	3.0	80.9	93.0	81.3
Growing Degrees	5	20.8	21.0	22.0	21.3	22.0	20.8	17.3	20.3	19.4	20.7	21.1	226.4	227.5	215.1
	10	15.8	16.0	17.0	16.3	17.0	15.8	12.3	15.3	14.4	15.7	16.1	171.4	172.5	160.1

3rd 10-day period (21-31/07/2017)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.9	60.1
Precipitation - Reference Evapotranspiration	-32.0	-60.1
Number of Rainy Days	1.0	0.0
Number of Dry Days	9.0	35.0

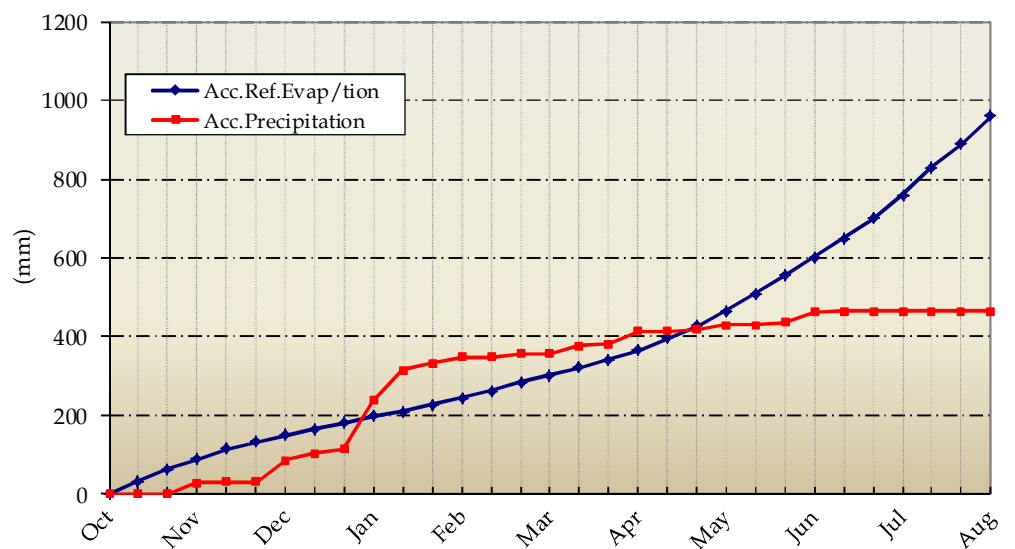
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/07/2017)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.0	28.6	30.6	32.4	35.6	30.6	30.6	28.6	28.4	29.8	28.6	30.3	29.8	28.6
	Min	24.2	25.0	23.0	25.0	22.6	25.2	22.6	23.2	22.6	21.6	26.0	23.7	24.2	22.4
Relative Humidity	Max	64	72	65	62	66	78	80	84	82	74	72	73	80	-
	Min	46	54	39	40	31	43	49	53	57	55	57	48	61	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		12.6	12.8	12.7	12.5	11.3	11.3	12.6	12.8	12.6	12.5	12.2	12.4	12.9	11.6
Precipitation															0.4
Evaporation		11.0	8.3	8.2	7.1	7.1	7.0	8.3	5.9	5.5	8.7	8.3	85.4	90.3	102.1
Growing Degrees	5	21.6	21.8	21.8	23.7	24.1	22.9	21.6	20.9	20.5	20.7	22.3	241.9	242.1	225.3
	10	16.6	16.8	16.8	18.7	19.1	17.9	16.6	15.9	15.5	15.7	17.3	186.9	187.1	170.3

3rd 10-day period (21-31/07/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	70.1	68.5	-
Precipitation - Reference Evapotranspiration	-70.1	-68.5	0.4
Number of Rainy Days	0.0	0.0	0.1
Number of Dry Days	13.0	53.0	-

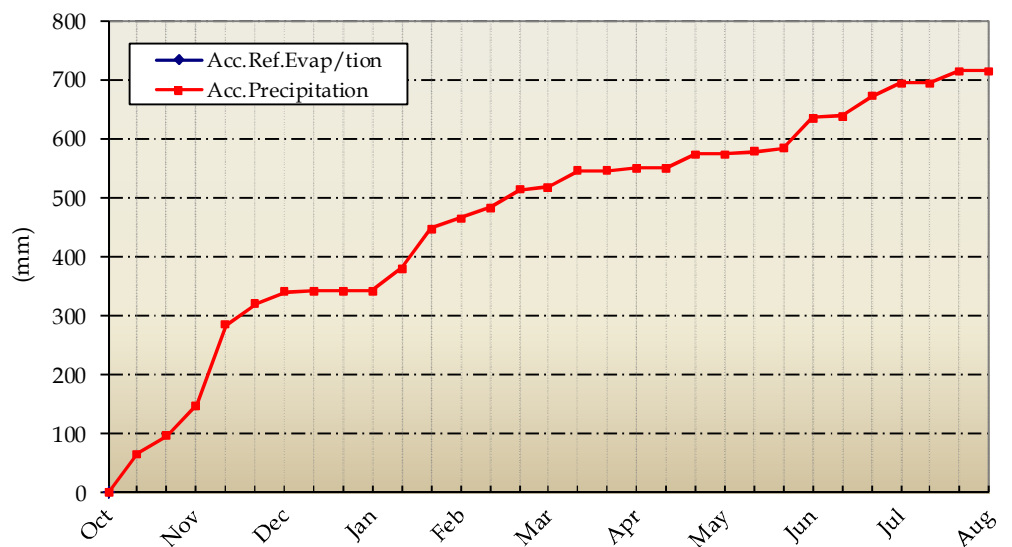
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/07/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.4	36.4	37.0	37.0	32.2	29.2	29.4	31.0	34.8	36.4	35.8	33.9	33.9	31.1
	Min	15.6	16.5	16.6	16.5	19.0	15.2	15.2	13.0	19.0	16.0	17.0	16.3	16.6	15.7
Relative Humidity	Max	87	92	75	94	94	98	78	96	72	97	96	89	98	-
	Min	29	27	18	26	28	38	25	31	19	23	22	26	27	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	23.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	27.8
Sunshine Duration		11.8	12.3	12.2	11.9	11.9	11.8	9.6	12.1	12.2	11.2	12.1	11.7	10.8	10.1
Precipitation														23.4	10.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	85.3
Growing Degrees	5	19.5	21.5	21.8	21.8	20.6	17.2	17.3	17.0	21.9	21.2	21.4	221.1	222.7	197.9
	10	14.5	16.5	16.8	16.8	15.6	12.2	12.3	12.0	16.9	16.2	16.4	166.1	167.7	144.4

3rd 10-day period (21-31/07/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	55.8
Precipitation - Reference Evapotranspiration	-	-	-45.5
Number of Rainy Days	0.0	1.0	1.5
Number of Dry Days	14.0	9.0	-

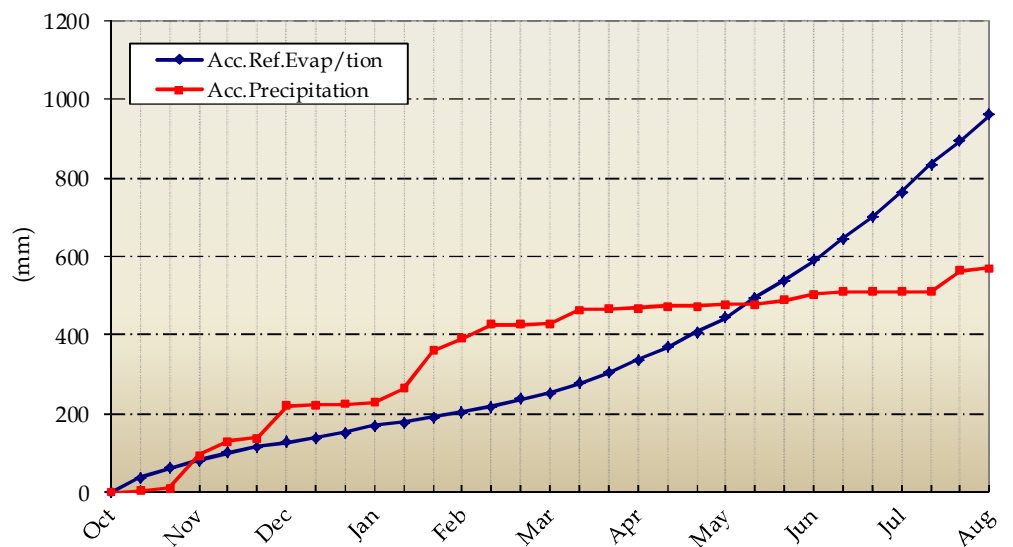
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/07/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.1	36.2	32.0	32.1	34.1	32.0	29.5	31.8	31.9	33.6	35.5	32.8	32.6	31.5
	Min	18.0	18.6	17.7	18.6	19.9	18.3	18.2	16.9	17.8	19.9	19.0	18.4	19.6	18.2
Relative Humidity	Max	81	82	83	80	89	88	89	88	76	74	88	83	85	-
	Min	31	24	39	32	30	38	31	29	30	26	25	30	34	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	26.1	26.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	28.1	30.3
Sunshine Duration		12.5	12.7	12.5	12.6	11.6	12.1	9.9	12.7	12.8	12.7	12.6	12.2	11.8	11.2
Precipitation								6.7					6.7		0.9
Evaporation		4.0	8.8	7.7	7.1	3.7	10.7	7.0	7.9	7.9	8.9	5.8	79.5	73.2	90.1
Growing Degrees	5	20.1	22.4	19.9	20.4	22.0	20.2	18.9	19.4	19.9	21.8	22.3	226.9	232.0	218.3
	10	15.1	17.4	14.9	15.4	17.0	15.2	13.9	14.4	14.9	16.8	17.3	171.9	177.0	163.3

3rd 10-day period (21-31/07/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	67.3	66.8	62.2
Precipitation - Reference Evapotranspiration	-60.6	-66.8	-61.3
Number of Rainy Days	1.0	0.0	0.4
Number of Dry Days	9.0	24.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

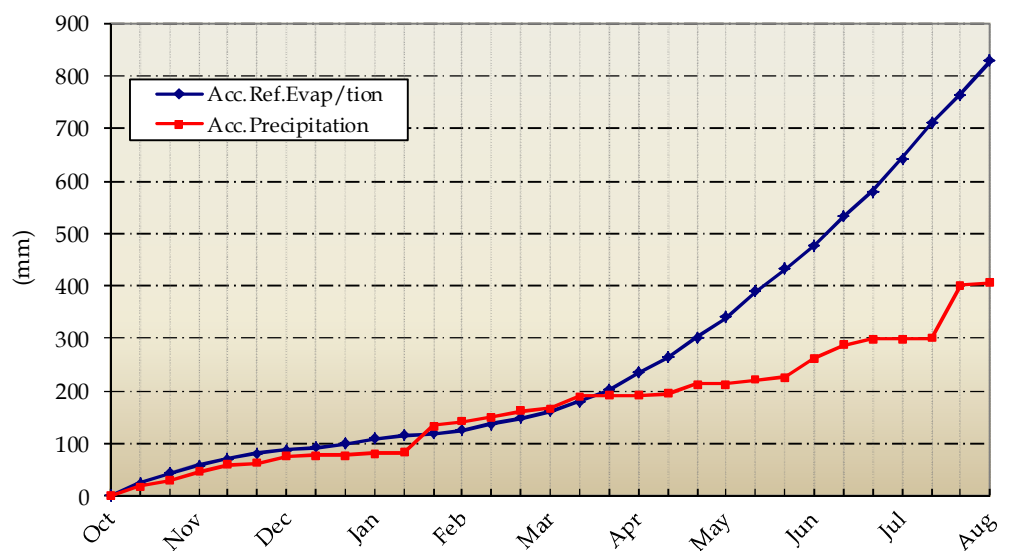


Larisa

3rd 10-day period (21-31/07/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.0	35.0	36.0	34.6	36.8	34.0	31.2	30.8	34.2	33.9	32.0	33.7	34.9	33.2
	Min	18.4	18.6	20.0	21.0	21.0	18.4	19.8	16.0	16.5	17.2	18.6	18.7	19.2	18.1
Relative Humidity	Max	86	86	86	89	84	79	93	95	88	86	83	87	74	-
	Min	28	32	30	34	18	23	33	34	23	27	37	29	21	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	28.7	26.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	28.6	29.2
Sunshine Duration		12.3	12.3	11.3	11.0	12.4	12.3	7.7	11.9	12.5	12.5	12.5	11.7	10.5	10.7
Precipitation								4.9					4.9	0.8	4.4
Evaporation		8.5	10.6	8.3	9.6	12.7	15.5	8.1	8.9	8.0	12.8	19.9	122.9	135.6	104.1
Growing Degrees	5	20.2	21.8	23.0	22.8	23.9	21.2	20.5	18.4	20.4	20.6	20.3	233.0	242.6	227.1
	10	15.2	16.8	18.0	17.8	18.9	16.2	15.5	13.4	15.4	15.6	15.3	178.0	187.6	172.1

3rd 10-day period (21-31/07/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	65.2	70.7	66.2
Precipitation - Reference Evapotranspiration	-60.3	-69.9	-61.8
Number of Rainy Days	1.0	1.0	1.1
Number of Dry Days	9.0	18.0	-

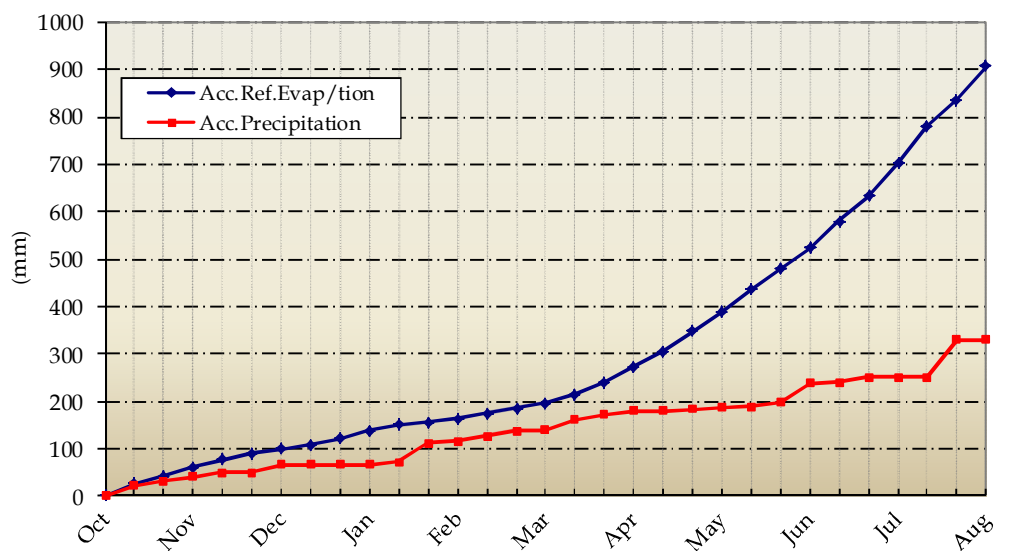
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/07/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.5	33.3	33.8	35.0	33.8	33.0	31.6	31.6	34.2	34.2	32.0	33.2	33.5	31.8
	Min	19.2	19.6	20.2	16.3	21.2	20.4	24.4	21.0	18.4	19.2	20.2	20.0	21.4	19.4
Relative Humidity	Max	70	70	73	71	73	74	65	50	68	62	72	68	71	-
	Min	25	27	27	23	31	23	28	24	22	21	34	26	27	-
Soil Temperature at 10 cm	06 UTC	25.8	26.4	27.6	28.2	28.6	29.0	29.2	28.8	28.4	28.4	28.9	28.1	30.4	26.8
	12 UTC	31.0	31.7	30.8	32.8	33.4	33.8	33.4	32.8	33.0	33.1	32.4	32.6	35.3	31.6
Sunshine Duration		12.7	12.5	12.5	12.4	10.7	12.7	9.8	13.0	12.9	12.7	12.2	12.2	11.1	10.5
Precipitation														0.2	9.4
Evaporation		7.1	10.7	9.4	9.7	7.8	9.8	13.5	9.2	11.8	10.1	9.4	108.5	119.0	101.0
Growing Degrees	5	20.9	21.5	22.0	20.7	22.5	21.7	23.0	21.3	21.3	21.7	21.1	237.6	247.0	226.2
	10	15.9	16.5	17.0	15.7	17.5	16.7	18.0	16.3	16.3	16.7	16.1	182.6	192.0	171.2

3rd 10-day period (21-31/07/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	71.6	73.6	65.4
Precipitation - Reference Evapotranspiration	-71.6	-73.4	-56.0
Number of Rainy Days	0.0	1.0	1.5
Number of Dry Days	14.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

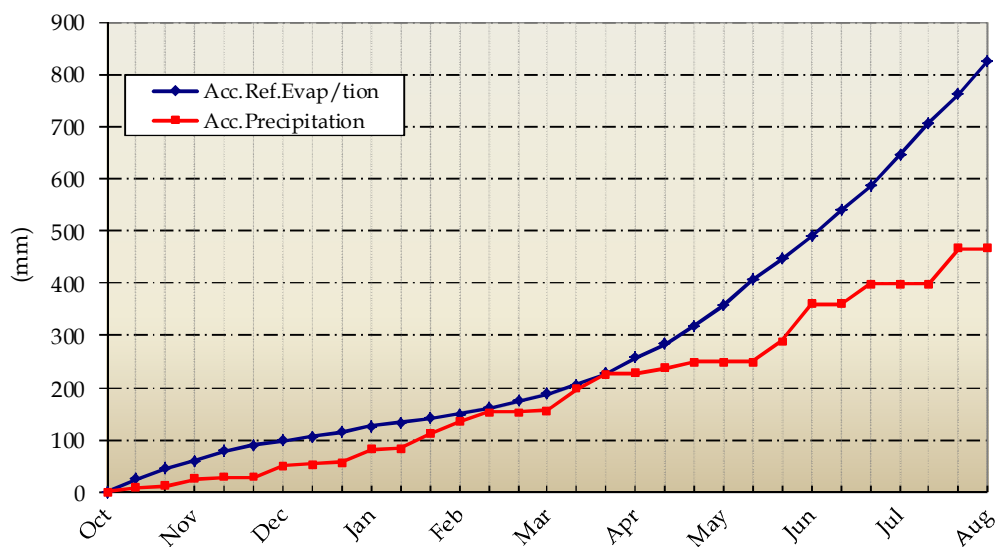




3rd 10-day period (21-31/07/2017)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.7	31.8	34.9	34.8	37.7	34.9	29.9	30.4	32.0	33.0	29.9	32.7	33.0	32.0
	Min	18.1	18.6	18.5	19.8	20.5	20.6	19.4	17.0	18.2	17.4	21.2	19.0	20.2	18.6
Relative Humidity	Max	67	69	65	74	71	72	84	86	83	59	59	72	56	-
	Min	26	24	20	24	12	17	30	27	19	25	28	23	22	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		13.0	13.2	12.7	12.2	11.7	12.0	7.9	12.5	13.4	13.3	13.2	12.3	12.3	
Precipitation								0.1	0.0				0.1		1.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	19.4	20.2	21.7	22.3	24.1	22.8	19.7	18.7	20.1	20.2	20.6	229.7	237.7	
	10	14.4	15.2	16.7	17.3	19.1	17.8	14.7	13.7	15.1	15.2	15.6	174.7	182.7	

3rd 10-day period (21-31/07/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	65.2	66.4	
Precipitation - Reference Evapotranspiration	-65.1	-66.4	1.3
Number of Rainy Days	1.0	0.0	0.7
Number of Dry Days	9.0	33.0	-

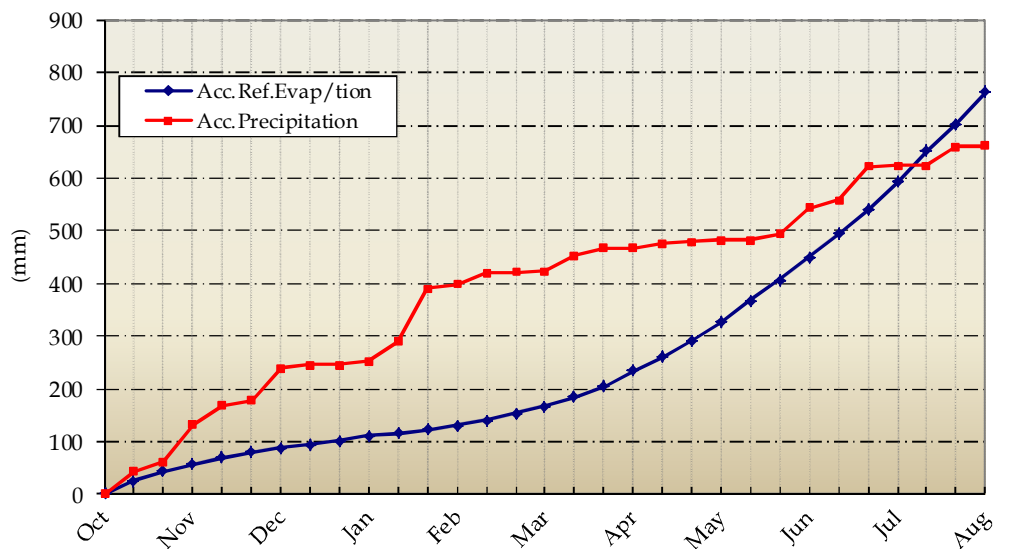
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/07/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.1	33.6	35.6	34.9	33.2	30.0	26.2	29.6	33.4	33.7	33.4	32.3	32.5	30.5
	Min	15.0	15.8	13.8	15.4	17.6	14.7	17.1	12.8	12.9	13.0	14.7	14.8	14.6	14.6
Relative Humidity	Max	80	79	89	89	86	82	85	91	88	89	83	86	92	-
	Min	24	21	18	18	18	24	30	22	17	17	24	21	23	-
Soil Temperature at 10 cm	06 UTC	23.8	24.2	-	25.4	26.2	25.8	26.0	24.2	24.6	25.6	26.2	25.2	26.0	25.8
	12 UTC	28.6	-	-	30.8	30.8	29.8	27.8	28.8	-	-	31.6	29.7	32.9	28.5
Sunshine Duration		12.8	12.9	12.9	12.3	11.9	12.7	9.7	12.7	11.2	12.7	12.5	12.2	10.3	10.6
Precipitation								0.9					0.9	0.8	4.2
Evaporation		6.9	-	-	8.6	7.2	10.1	5.6	6.5	7.2	8.0	9.8	-	82.2	71.9
Growing Degrees	5	18.6	19.7	19.7	20.2	20.4	17.4	16.7	16.2	18.2	18.4	19.1	204.3	204.1	192.7
	10	13.6	14.7	14.7	15.2	15.4	12.4	11.7	11.2	13.2	13.4	14.1	149.3	149.1	137.7

3rd 10-day period (21-31/07/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	60.4	55.2	58.9
Precipitation - Reference Evapotranspiration	-59.5	-54.4	-54.7
Number of Rainy Days	1.0	1.0	1.2
Number of Dry Days	9.0	22.0	-

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<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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