



AGROMETEOROLOGICAL BULLETIN

July 2011
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
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Helliniko, Athens

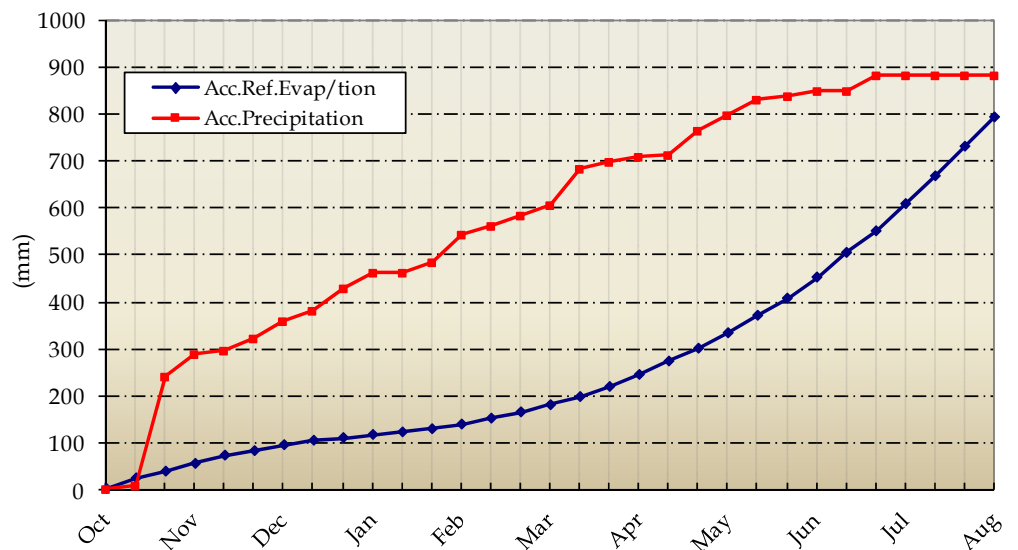
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
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Agrinio

3rd 10-day period (21-31/07/2011)		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	32.6	35.0	35.4	31.2	29.6	32.6	35.4	35.0	31.8	32.2	33.0	-	33.5
	Min	21.2	18.8	16.4	17.6	19.8	18.6	15.0	16.0	17.6	18.0	18.0	17.9	-	17.4
Relative Humidity	Max	86	90	94	88	87	88	94	94	92	94	94	91	-	-
	Min	32	31	27	27	31	43	34	29	32	31	39	32	-	-
Soil Temperature at 10 cm	06 UTC	31.6	30.8	30.6	31.2	31.2	30.6	28.8	29.6	30.6	30.6	30.6	30.6	-	28.0
	12 UTC	36.4	36.0	35.4	36.0	35.8	32.8	34.4	35.4	35.6	35.4	36.0	35.4	-	34.0
Sunshine Duration		13.5	13.4	12.8	13.2	13.3	6.3	13.2	13.6	13.4	13.3	13.2	12.7	-	11.6
Precipitation														-	3.2
Evaporation		9.6	10.0	8.5	8.4	10.8	3.9	9.1	10.4	11.4	10.6	9.8	102.5	-	91.3
Growing Degrees	5	21.6	20.7	20.7	21.5	20.5	19.1	18.8	20.7	21.3	19.9	20.1	224.9	-	224.3
	10	16.6	15.7	15.7	16.5	15.5	14.1	13.8	15.7	16.3	14.9	15.1	169.9	-	169.4

3rd 10-day period (21-31/07/2011)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	62.7	- 61.1
Precipitation - Reference Evapotranspiration	-62.7	- -57.9
Number of Rainy Days	0.0	- 0.7
Number of Dry Days	44.0	- -

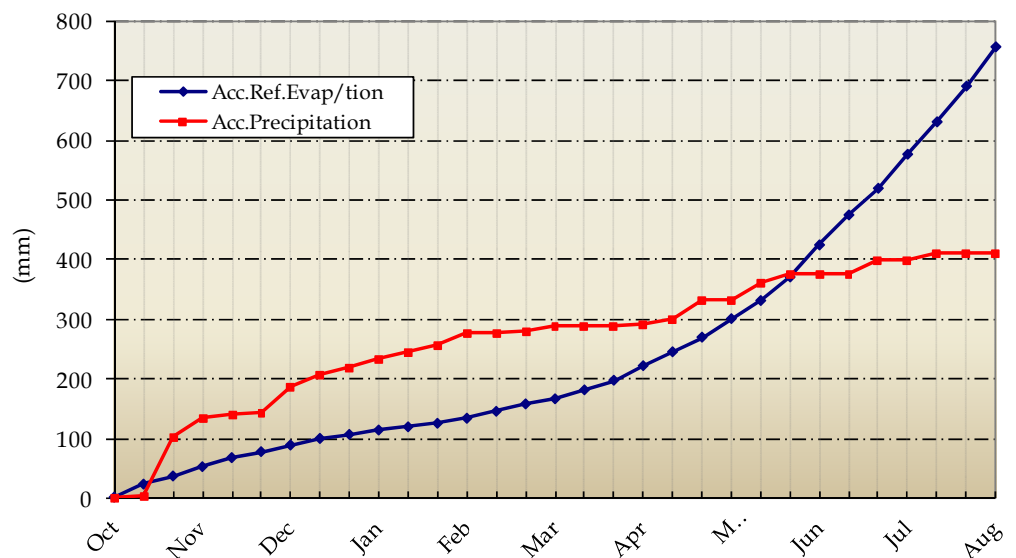
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/07/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.0	32.0	33.6	35.6	33.6	30.8	31.8	35.8	35.2	32.6	32.2	33.1	31.3	30.8
	Min	23.6	22.0	19.8	21.2	22.4	22.0	20.8	19.6	21.4	21.6	23.6	21.6	21.1	18.1
Relative Humidity	Max	77	75	73	73	75	80	77	81	85	72	76	77	82	-
	Min	38	36	26	24	38	49	50	26	30	44	34	36	43	-
Soil Temperature at 10 cm	06 UTC	28.0	28.8	27.2	27.4	27.5	30.0	27.4	28.6	30.0	30.0	28.4	28.5	26.4	24.5
	12 UTC	31.6	31.6	31.0	32.4	31.6	31.4	31.0	27.5	27.2	32.0	32.0	30.8	29.2	28.7
Sunshine Duration		11.0	12.9	11.9	12.0	12.4	12.2	12.6	13.1	12.9	12.8	12.6	12.4	11.0	10.3
Precipitation														14.5	5.5
Evaporation		5.4	10.9	8.0	13.5	4.8	10.2	6.5	13.0	7.0	9.7	10.0	99.0	86.0	104.4
Growing Degrees	5	22.3	22.0	21.7	23.4	23.0	21.4	21.3	22.7	23.3	22.1	22.9	246.1	233.5	213.8
	10	17.3	17.0	16.7	18.4	18.0	16.4	16.3	17.7	18.3	17.1	17.9	191.1	178.5	158.8

3rd 10-day period (21-31/07/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	66.0	61.2	64.5
Precipitation - Reference Evapotranspiration	-66.0	-46.7	-59.0
Number of Rainy Days	0.0	5.0	1.1
Number of Dry Days	27.0	12.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

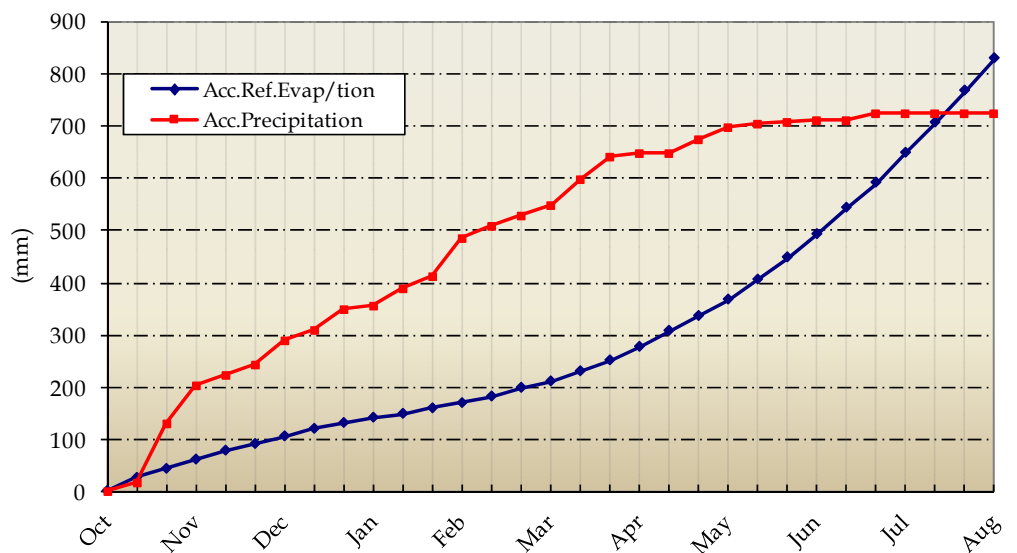


Andravida

3rd 10-day period (21-31/07/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.2	28.8	32.0	31.4	28.8	29.4	29.0	31.4	30.6	28.6	29.4	29.9	31.0	30.6
	Min	23.6	18.4	17.2	17.8	19.6	20.4	18.0	17.0	18.8	22.6	21.4	19.5	20.2	18.5
Relative Humidity	Max	82	87	88	89	89	87	93	92	86	78	84	87	89	-
	Min	45	41	29	39	43	50	40	38	40	48	40	41	40	-
Soil Temperature at 10 cm	06 UTC	29.0	27.2	27.0	27.6	28.0	28.0	27.2	26.4	27.0	28.2	26.7	27.5	28.9	27.4
	12 UTC	34.0	34.0	34.5	34.0	33.4	34.0	33.4	33.4	34.0	33.0	33.4	33.7	36.5	31.9
Sunshine Duration		12.0	11.7	11.5	12.0	11.6	10.5	12.4	12.6	12.4	12.5	12.4	12.0	12.4	11.8
Precipitation															2.9
Evaporation		8.1	10.3	8.6	8.8	8.1	9.0	1.4	13.3	7.4	10.9	8.5	94.4	98.9	81.3
Growing Degrees	5	21.4	18.6	19.6	19.6	19.2	19.9	18.5	19.2	19.7	20.6	20.4	216.7	226.6	215.1
	10	16.4	13.6	14.6	14.6	14.2	14.9	13.5	14.2	14.7	15.6	15.4	161.7	171.6	160.1

3rd 10-day period (21-31/07/2011)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.9	63.7
Precipitation - Reference Evapotranspiration	-61.9	-63.7
Number of Rainy Days	0.0	0.3
Number of Dry Days	46.0	38.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

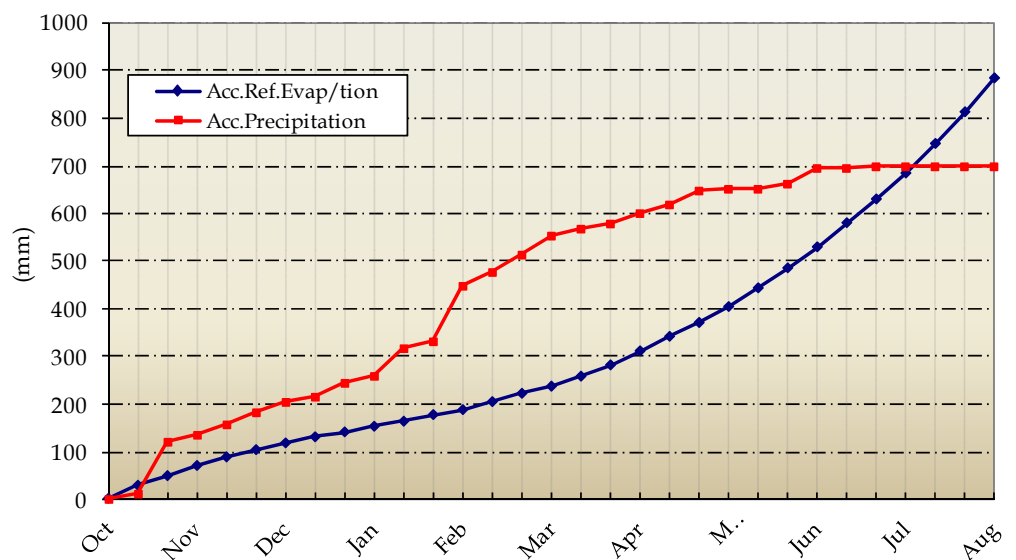


Kalamata

3rd 10-day period (21-31/07/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.2	34.0	30.8	33.6	31.4	30.0	31.2	31.8	34.0	33.2	32.0	32.1	32.2	31.5
	Min	23.8	19.4	18.4	17.4	18.6	18.0	18.2	17.0	17.4	21.0	21.0	19.1	19.7	18.2
Relative Humidity	Max	80	85	89	96	87	87	88	86	84	77	82	86	83	-
	Min	38	23	35	27	36	36	34	36	29	30	37	33	34	-
Soil Temperature at 10 cm	06 UTC	26.8	26.2	26.0	25.6	26.0	26.0	26.0	25.4	25.2	25.8	26.2	25.9	26.0	26.0
	12 UTC	29.2	29.2	28.6	28.4	28.6	28.4	28.4	28.2	28.6	29.2	29.4	28.7	28.4	30.3
Sunshine Duration		12.5	12.5	12.3	12.7	12.6	12.2	12.5	12.5	12.5	12.5	12.5	12.5	12.5	11.2
Precipitation															0.9
Evaporation		9.0	8.4	1.2	9.0	8.2	3.5	8.6	9.4	9.4	7.2	10.2	84.1	86.0	90.1
Growing Degrees	5	22.5	21.7	19.6	20.5	20.0	19.0	19.7	19.4	20.7	22.1	21.5	226.7	230.4	218.3
	10	17.5	16.7	14.6	15.5	15.0	14.0	14.7	14.4	15.7	17.1	16.5	171.7	175.4	163.3

3rd 10-day period (21-31/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	71.3	71.4	62.2
Precipitation - Reference Evapotranspiration	-71.3	-71.4	-61.3
Number of Rainy Days	0.0	0.0	0.4
Number of Dry Days	46.0	38.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

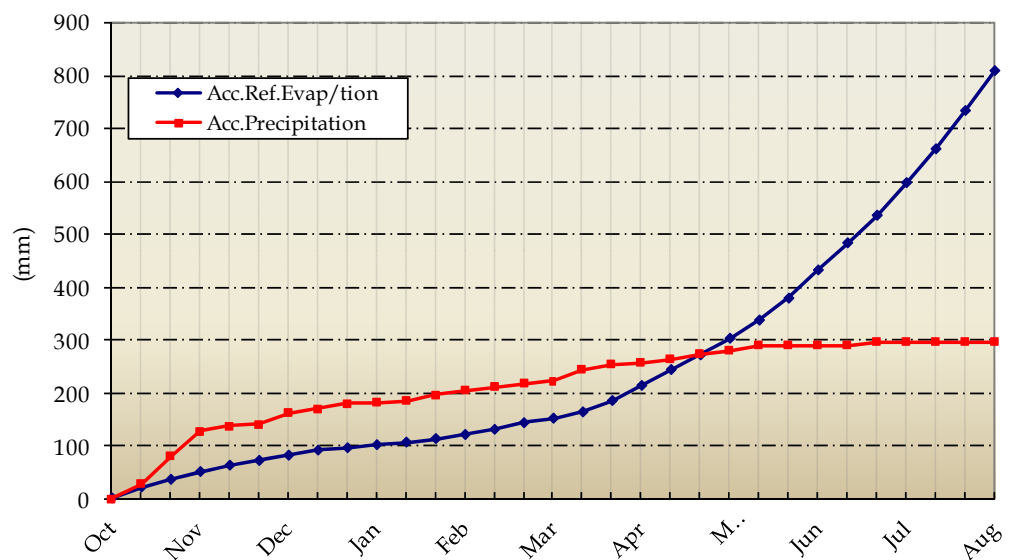


Larisa

3rd 10-day period (21-31/07/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	35.0	35.6	34.2	34.6	35.4	31.4	34.6	35.4	36.2	35.0	33.6	34.6	33.7	33.2
	Min	24.2	18.2	21.0	18.4	19.2	19.0	19.2	17.6	18.4	22.2	20.8	19.8	19.5	18.1
Relative Humidity	Max	43	59	58	66	65	66	70	75	74	50	90	65	80	-
	Min	13	16	21	21	16	28	16	23	22	24	30	21	31	-
Soil Temperature at 10 cm	06 UTC	30.0	28.2	28.6	28.6	28.6	28.4	28.2	27.0	28.6	27.4	29.0	28.4	27.4	26.9
	12 UTC	38.4	38.8	31.0	31.0	31.0	31.0	31.0	31.2	32.4	31.6	31.4	32.6	30.5	29.2
Sunshine Duration		12.9	12.9	11.3	11.7	11.7	9.7	12.7	12.7	11.5	12.4	12.1	12.0	11.2	10.7
Precipitation														35.6	4.4
Evaporation		13.4	3.0	20.3	10.4	3.5	13.8	8.1	12.4	12.9	9.9	11.7	119.4	118.4	104.1
Growing Degrees	5	24.6	21.9	22.6	21.5	22.3	20.2	21.9	21.5	22.3	23.6	22.2	244.6	237.7	227.1
	10	19.6	16.9	17.6	16.5	17.3	15.2	16.9	16.5	17.3	18.6	17.2	189.6	182.7	172.1

3rd 10-day period (21-31/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	75.4	65.1	66.2
Precipitation - Reference Evapotranspiration	-75.4	-29.5	-61.8
Number of Rainy Days	0.0	2.0	1.1
Number of Dry Days	45.0	16.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

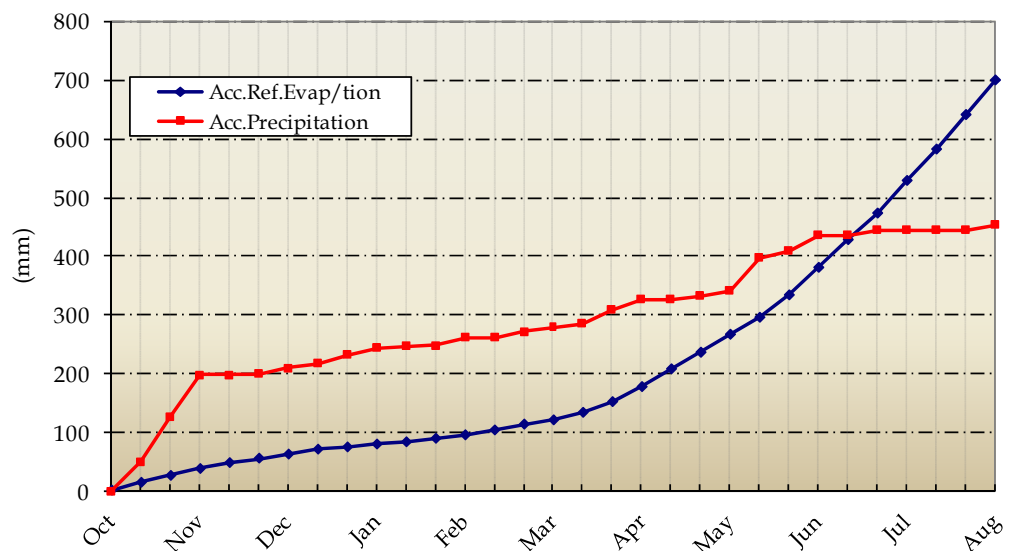


Series

3rd 10-day period (21-31/07/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.0	35.2	34.2	36.0	34.4	34.0	35.6	37.0	36.8	35.4	35.0	35.2	33.3	32.6
	Min	24.2	16.8	18.6	20.6	20.0	19.6	18.6	18.8	20.8	20.4	17.6	19.6	19.3	18.8
Relative Humidity	Max	57	64	77	76	94	92	78	79	72	77	80	77	80	-
	Min	16	20	26	19	28	24	21	20	21	19	18	21	36	-
Soil Temperature at 10 cm	06 UTC	31.6	30.4	30.8	31.0	31.2	29.0	28.0	28.8	29.4	30.0	29.4	30.0	26.3	26.3
	12 UTC	33.0	32.2	32.4	32.6	32.4	32.8	30.2	31.2	31.4	32.2	32.0	32.0	28.3	29.4
Sunshine Duration		12.6	12.6	11.2	11.1	9.8	10.6	11.3	12.4	10.6	11.4	11.9	11.4	10.0	10.1
Precipitation						9.0							9.0	35.5	13.1
Evaporation		10.6	6.8	7.1	6.9	8.0	10.4	8.4	8.6	11.3	13.1	8.6	99.8	63.2	76.8
Growing Degrees	5	24.1	21.0	21.4	23.3	22.2	21.8	22.1	22.9	23.8	22.9	21.3	246.8	234.7	227.1
	10	19.1	16.0	16.4	18.3	17.2	16.8	17.1	17.9	18.8	17.9	16.3	191.8	179.7	172.3

3rd 10-day period (21-31/07/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	59.2	54.0	53.7
Precipitation - Reference Evapotranspiration	-50.2	-18.5	-40.6
Number of Rainy Days	1.0	2.0	2.1
Number of Dry Days	12.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

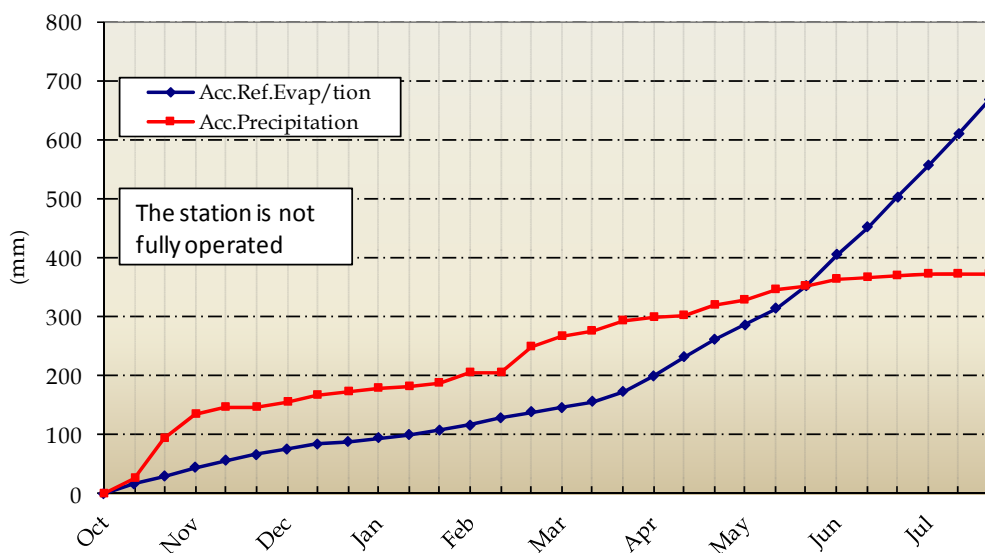


Trikala Imathias

3rd 10-day period (21-31/07/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	32.4	-	-	33.0	-	-	34.8	33.6	-	-	33.4	31.8	31.7
	Min	-	18.0	-	-	18.0	-	-	16.6	19.4	-	-	18.0	18.8	18.3
Relative Humidity	Max	61	-	-	95	-	-	75	87	-	-	100	84	93	-
	Min	24	-	-	37	-	-	32	33	-	-	80	41	48	-
Soil Temperature at 10 cm	06 UTC	-	26.4	-	-	26.2	-	-	26.2	26.4	-	-	26.3	25.9	25.7
	12 UTC	-	29.8	-	-	30.0	-	-	29.6	29.6	-	-	29.8	28.7	27.3
Sunshine Duration		13.1	-	-	-	-	-	11.5	12.9	-	-	0.0	9.4	10.4	9.6
Precipitation														19.8	4.6
Evaporation		-	-	-	-	-	-	6.3	5.5	-	-	5.4	-	48.8	70.8
Growing Degrees	5	-	20.2	-	-	20.5	-	-	20.7	21.5	-	-	-	223.3	220.3
	10	-	15.2	-	-	15.5	-	-	15.7	16.5	-	-	-	168.3	165.3

3rd 10-day period (21-31/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	54.2	53.4
Precipitation - Reference Evapotranspiration	-	-34.4	-48.8
Number of Rainy Days	0.0	4.0	1.4
Number of Dry Days	19.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

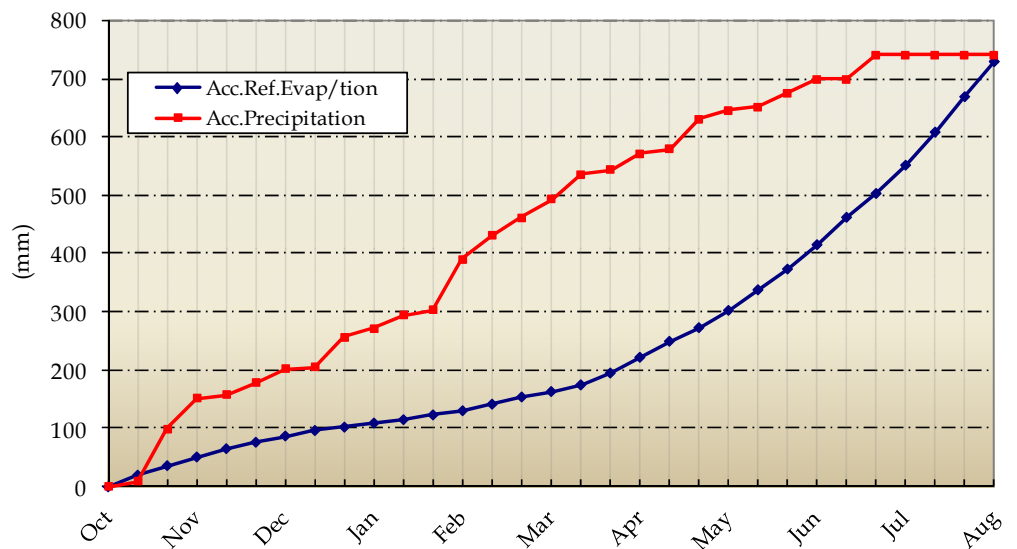


Tripoli

3rd 10-day period (21-31/07/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.6	34.0	34.2	31.8	30.2	28.6	33.2	33.2	34.6	32.2	33.2	32.3	-	30.5
	Min	19.4	11.8	12.6	13.6	14.2	15.2	12.2	11.8	14.2	14.0	12.4	13.8	-	14.6
Relative Humidity	Max	56	81	79	80	72	85	81	83	78	90	84	79	-	-
	Min	28	20	17	26	30	33	21	21	19	20	23	23	-	-
Soil Temperature at 10 cm	06 UTC	28.8	26.8	27.2	27.2	26.8	27.0	26.2	26.8	27.4	26.8	36.0	27.9	-	25.8
	12 UTC	34.8	34.2	34.4	34.0	32.6	32.6	32.2	34.6	35.0	34.0	38.0	34.2	-	28.5
Sunshine Duration		13.2	13.1	12.6	11.5	13.2	11.7	13.0	12.9	12.7	12.9	13.0	12.7	-	10.6
Precipitation														-	4.2
Evaporation		8.9	8.6	10.5	7.9	8.1	7.8	8.5	5.7	10.2	8.5	6.3	91.0	-	71.9
Growing Degrees	5	20.0	17.9	18.4	17.7	17.2	16.9	17.7	17.5	19.4	18.1	17.8	198.6	-	192.7
	10	15.0	12.9	13.4	12.7	12.2	11.9	12.7	12.5	14.4	13.1	12.8	143.6	-	137.7

3rd 10-day period (21-31/07/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	60.3	-	58.9
Precipitation - Reference Evapotranspiration	-60.3	-	-54.7
Number of Rainy Days	0.0	-	1.2
Number of Dry Days	45.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

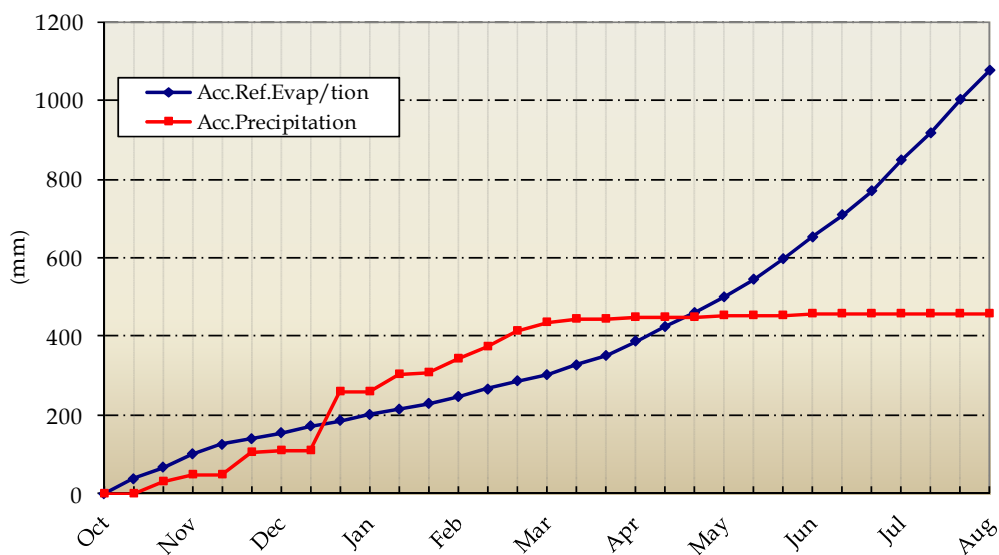


Tympaki

3rd 10-day period (21-31/07/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.0	29.6	32.6	28.2	30.2	28.6	30.2	33.8	34.6	30.4	30.6	30.7	32.8	31.8
	Min	22.2	19.8	20.8	19.4	20.2	19.6	19.6	23.6	23.4	20.4	20.8	20.9	21.6	20.7
Relative Humidity	Max	71	87	67	93	93	96	76	63	69	90	93	82	77	-
	Min	30	33	22	21	22	42	31	16	17	29	30	27	36	-
Soil Temperature at 10 cm	06 UTC	32.4	30.6	31.2	31.6	31.2	30.6	31.0	32.2	32.4	31.2	31.6	31.5	31.0	30.9
	12 UTC	36.4	36.8	36.8	37.4	36.8	35.6	35.8	35.0	37.2	36.6	37.2	36.5	35.9	35.3
Sunshine Duration		12.6	13.0	12.2	11.2	12.9	12.7	12.7	12.6	12.2	13.0	12.7	12.5	11.8	12.1
Precipitation															0.1
Evaporation		9.3	10.4	9.5	10.2	10.8	6.8	8.6	11.8	10.0	9.8	9.2	106.4	137.8	132.3
Growing Degrees	5	20.6	19.7	21.7	18.8	20.2	19.1	19.9	23.7	24.0	20.4	20.7	228.8	244.1	233.6
	10	15.6	14.7	16.7	13.8	15.2	14.1	14.9	18.7	19.0	15.4	15.7	173.8	189.1	178.6

3rd 10-day period (21-31/07/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	74.1	78.4	74.6
Precipitation - Reference Evapotranspiration	-74.1	-78.4	-74.5
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	64.0	56.0	-

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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ΕΘΝΙΚΗ
ΜΕΤΕΩΡΟΛΟΓΙΚΗ
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