

# AGROMETEOROLOGICAL BULLETIN

*August 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



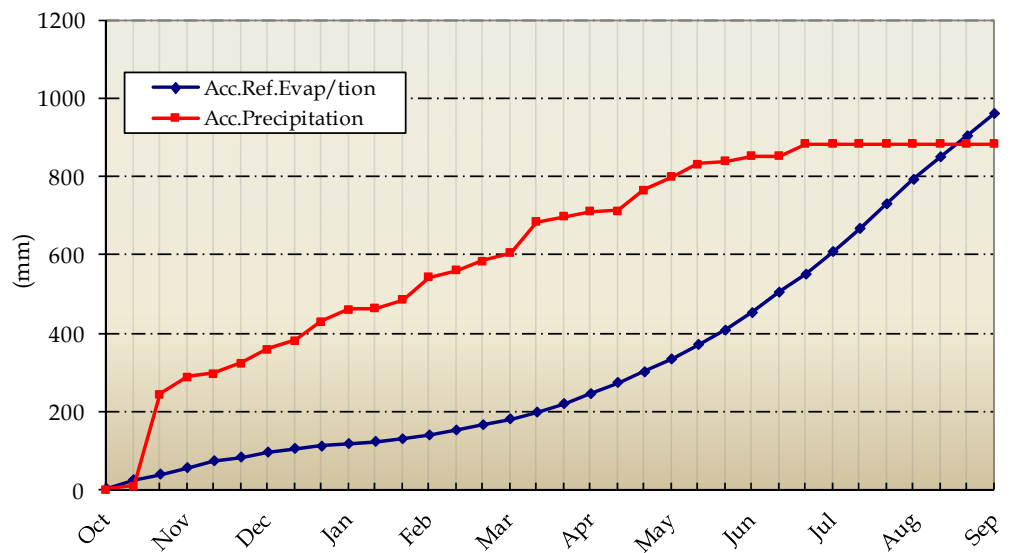
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*Web addresses of HNMS*  
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3rd 10-day period (21-31/08/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	37.6	37.0	37.2	37.6	37.6	37.6	34.4	33.8	33.4	33.0	33.0	35.7	-	32.2
	Min	20.0	20.0	16.6	18.2	20.0	20.4	18.6	15.6	16.4	17.0	19.8	18.4	-	16.7
Relative Humidity	Max	81	81	80	88	73	75	76	86	80	90	94	82	-	-
	Min	24	26	22	22	23	21	26	26	26	39	43	27	-	-
Soil Temperature at 10 cm	06 UTC	31.6	31.2	30.2	31.0	31.2	31.2	30.6	30.0	29.6	29.4	30.2	30.6	-	25.7
	12 UTC	36.4	36.0	36.0	36.0	35.6	35.6	35.6	34.6	33.8	34.0	34.4	35.3	-	31.3
Sunshine Duration		11.1	12.3	12.6	12.4	12.3	12.2	12.3	12.1	12.0	11.5	9.2	11.8	-	10.2
Precipitation														-	9.6
Evaporation		9.5	11.2	7.0	12.0	10.0	10.0	9.0	10.2	7.9	6.7	7.4	100.9	-	73.7
Growing Degrees	5	23.8	23.5	21.9	22.9	23.8	24.0	21.5	19.7	19.9	20.0	21.4	242.4	-	214.1
	10	18.8	18.5	16.9	17.9	18.8	19.0	16.5	14.7	14.9	15.0	16.4	187.4	-	159.1

3rd 10-day period (21-31/08/2011)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	57.6	- 50.3
Precipitation - Reference Evapotranspiration	-57.6	- -40.7
Number of Rainy Days	0.0	- 1.2
Number of Dry Days	75.0	- -

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

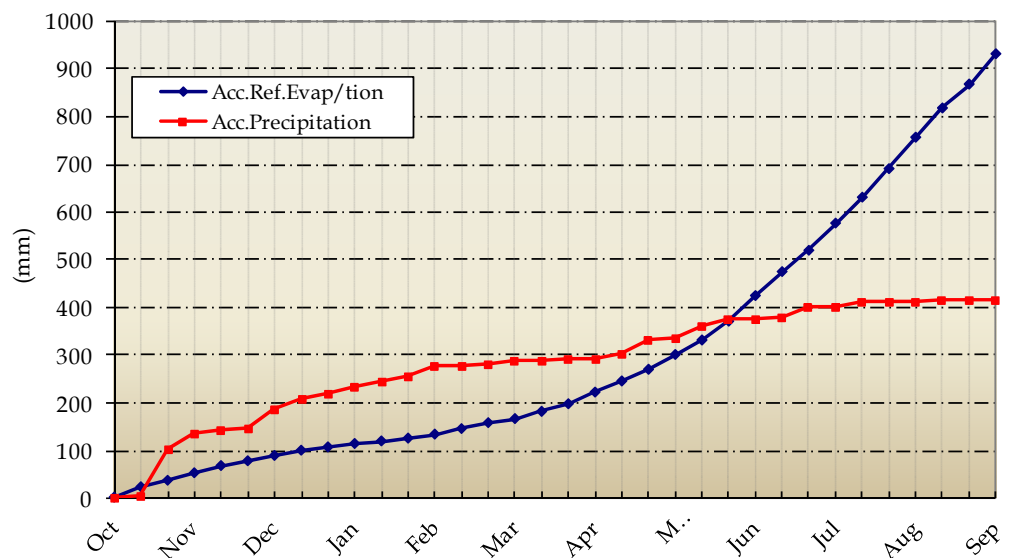


Alexandroupoli

3rd 10-day period (21-31/08/2011)		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	33.6	34.4	34.0	33.4	31.6	31.0	31.0	31.6	27.4	29.2	31.9	31.7	29.1
	Min	18.4	20.6	21.0	21.6	20.2	21.0	21.0	19.0	19.6	15.0	16.2	19.4	21.0	16.6
Relative Humidity	Max	79	82	65	69	73	75	67	72	73	79	82	74	76	-
	Min	30	23	24	23	30	32	31	32	32	48	57	33	41	-
Soil Temperature at 10 cm	06 UTC	26.8	26.4	27.2	27.4	26.4	28.4	25.6	25.2	25.0	25.4	27.2	26.5	28.3	23.0
	12 UTC	30.0	29.6	29.4	29.6	30.0	28.8	30.0	29.4	29.4	29.0	28.0	29.4	29.9	27.1
Sunshine Duration		12.0	12.6	12.4	12.4	12.0	11.6	12.0	12.2	11.9	12.3	11.8	12.1	11.6	9.8
Precipitation															4.5
Evaporation		10.5	10.5	8.5	9.2	8.0	9.5	8.0	9.8	12.2	8.7	11.2	106.1	108.7	93.1
Growing Degrees	5	21.2	22.1	22.7	22.8	21.8	21.3	21.0	20.0	20.6	16.2	17.7	227.4	235.0	196.4
	10	16.2	17.1	17.7	17.8	16.8	16.3	16.0	15.0	15.6	11.2	12.7	172.4	180.0	141.4

3rd 10-day period (21-31/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	63.7	59.7	54.2
Precipitation - Reference Evapotranspiration	-63.7	-59.7	-49.7
Number of Rainy Days	0.0	0.0	1.0
Number of Dry Days	20.0	34.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

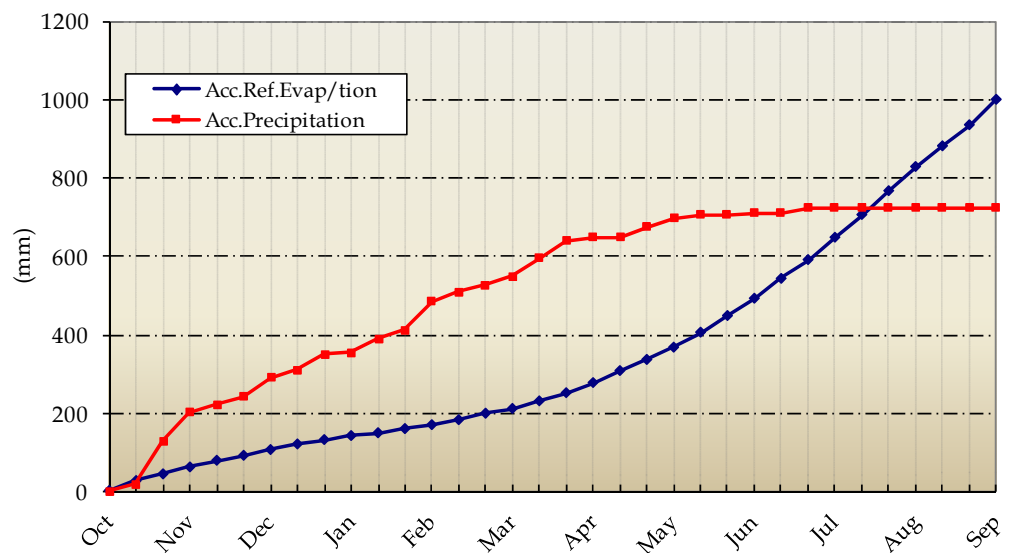


Andravida

3rd 10-day period (21-31/08/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	36.8	36.6	36.0	35.4	38.0	39.0	33.6	31.0	31.0	31.0	30.0	34.4	32.5	30.0
	Min	19.8	22.8	15.6	17.0	19.6	22.8	18.8	18.8	16.2	20.4	22.2	19.5	20.1	18.5
Relative Humidity	Max	83	68	82	86	67	86	88	91	90	91	93	84	89	-
	Min	23	19	18	24	17	14	23	34	28	50	52	27	37	-
Soil Temperature at 10 cm	06 UTC	28.0	28.6	26.4	27.4	27.6	28.4	28.2	27.8	26.4	27.8	28.6	27.7	28.3	26.8
	12 UTC	34.0	34.2	34.6	34.0	34.4	35.0	35.2	40.6	35.0	34.6	34.4	35.1	36.1	30.8
Sunshine Duration		11.1	11.4	12.0	11.5	11.5	11.6	11.1	11.2	11.5	10.7	7.7	11.0	11.3	10.6
Precipitation															3.8
Evaporation		-	23.8	-	10.4	12.0	13.9	-	10.1	8.6	4.8	5.5	-	96.3	74.7
Growing Degrees	5	23.3	24.7	20.8	21.2	23.8	25.9	21.2	19.9	18.6	20.7	21.1	241.2	234.5	211.8
	10	18.3	19.7	15.8	16.2	18.8	20.9	16.2	14.9	13.6	15.7	16.1	186.2	179.5	156.8

3rd 10-day period (21-31/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	65.0	58.2	49.7
Precipitation - Reference Evapotranspiration	-65.0	-58.2	-45.9
Number of Rainy Days	0.0	0.0	0.7
Number of Dry Days	77.0	69.0	-

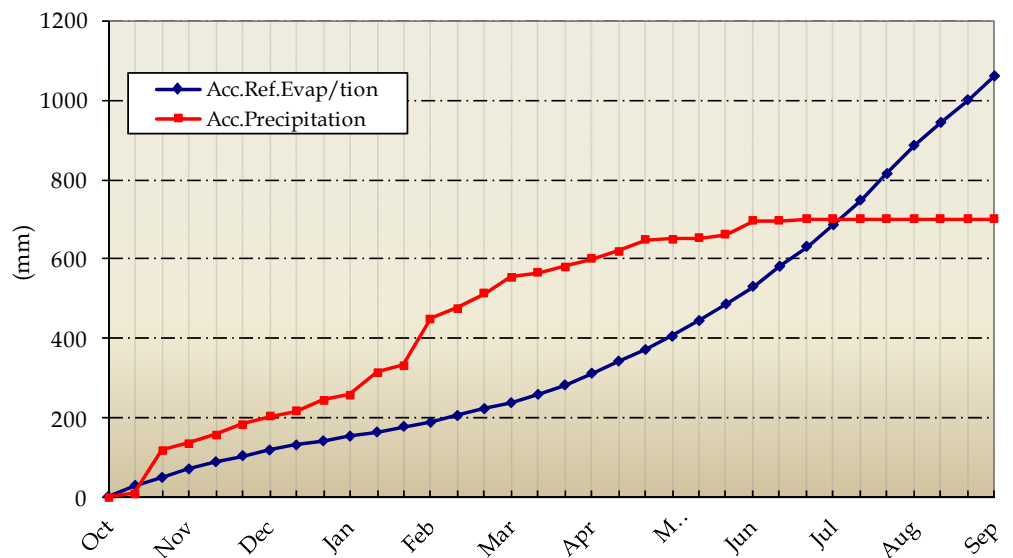
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	36.0	34.4	32.4	32.2	32.8	34.2	30.0	29.4	29.2	30.4	32.0	32.1	33.2	30.5
	Min	20.4	23.0	17.8	18.0	19.0	22.4	18.0	19.8	17.4	17.0	20.0	19.3	20.0	17.7
Relative Humidity	Max	93	91	89	91	90	88	80	95	94	96	96	91	84	-
	Min	22	27	36	34	31	16	42	50	37	42	44	35	34	-
Soil Temperature at 10 cm	06 UTC	26.2	27.0	25.6	25.8	26.2	26.6	26.0	26.8	25.4	25.2	26.0	26.1	26.1	25.4
	12 UTC	29.2	29.6	29.6	28.8	29.2	29.4	29.4	29.2	27.6	27.6	28.4	28.9	28.3	29.0
Sunshine Duration		10.0	12.0	11.9	9.8	9.0	11.7	8.9	10.3	11.7	11.7	10.1	10.6	11.7	10.0
Precipitation									1.3				1.3		3.6
Evaporation		14.0	7.2	9.2	9.1	7.1	2.5	14.6	6.3	7.9	1.9	14.9	94.7	81.4	81.7
Growing Degrees	5	23.2	23.7	20.1	20.1	20.9	23.3	19.0	19.6	18.3	18.7	21.0	227.9	237.5	210.0
	10	18.2	18.7	15.1	15.1	15.9	18.3	14.0	14.6	13.3	13.7	16.0	172.9	182.5	155.0

3rd 10-day period (21-31/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	60.2	63.8	52.5
Precipitation - Reference Evapotranspiration	-58.9	-63.8	-48.9
Number of Rainy Days	1.0	0.0	0.9
Number of Dry Days	73.0	69.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

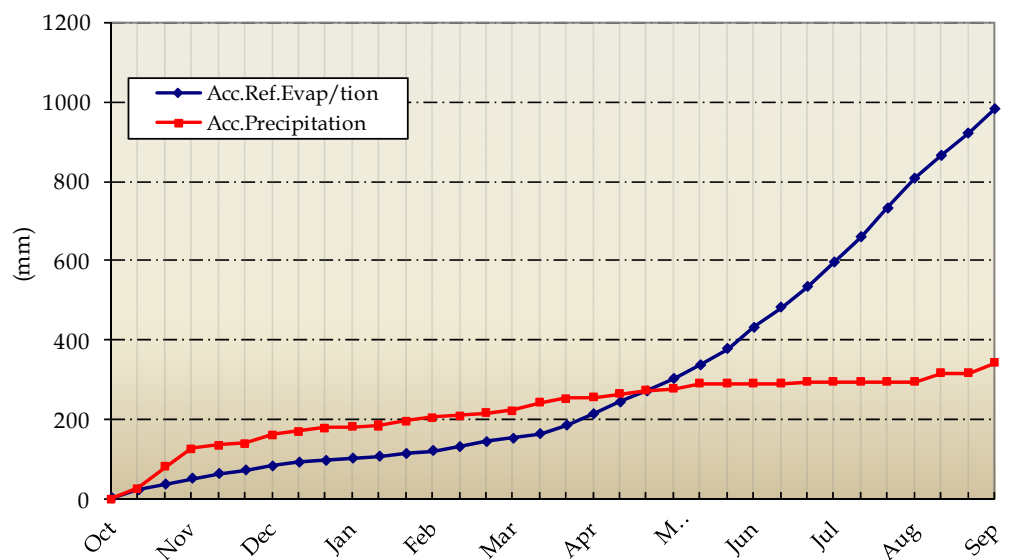


Larisa

3rd 10-day period (21-31/08/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.4	32.4	33.2	34.4	34.4	31.0	29.8	30.2	30.8	34.2	33.0	32.5	34.0	31.3
	Min	20.4	22.0	18.0	17.8	18.4	22.0	19.0	15.6	15.6	14.4	20.0	18.5	20.3	16.4
Relative Humidity	Max	78	69	77	80	75	81	81	81	84	87	90	80	79	-
	Min	23	40	37	32	33	42	43	40	40	32	35	36	31	-
Soil Temperature at 10 cm	06 UTC	27.8	28.4	27.6	27.4	27.2	28.0	27.4	27.0	26.2	26.0	27.2	27.3	27.4	25.5
	12 UTC	30.2	30.4	29.8	34.8	29.8	34.6	29.4	28.4	28.2	28.2	29.8	30.3	32.0	27.7
Sunshine Duration		12.4	11.8	12.1	11.9	11.9	11.8	11.6	11.5	11.4	10.3	6.4	11.2	10.5	9.7
Precipitation												24.2	24.2	0.4	8.3
Evaporation		8.5	11.5	14.0	8.0	12.4	10.4	6.2	10.0	7.8	8.2	11.0	108.0	100.6	85.2
Growing Degrees	5	22.4	22.2	20.6	21.1	21.4	21.5	19.4	17.9	18.2	19.3	21.5	225.5	243.7	207.5
	10	17.4	17.2	15.6	16.1	16.4	16.5	14.4	12.9	13.2	14.3	16.5	170.5	188.7	152.5

3rd 10-day period (21-31/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.5	62.2	54.4
Precipitation - Reference Evapotranspiration	-37.3	-61.8	-46.1
Number of Rainy Days	1.0	1.0	1.6
Number of Dry Days	20.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



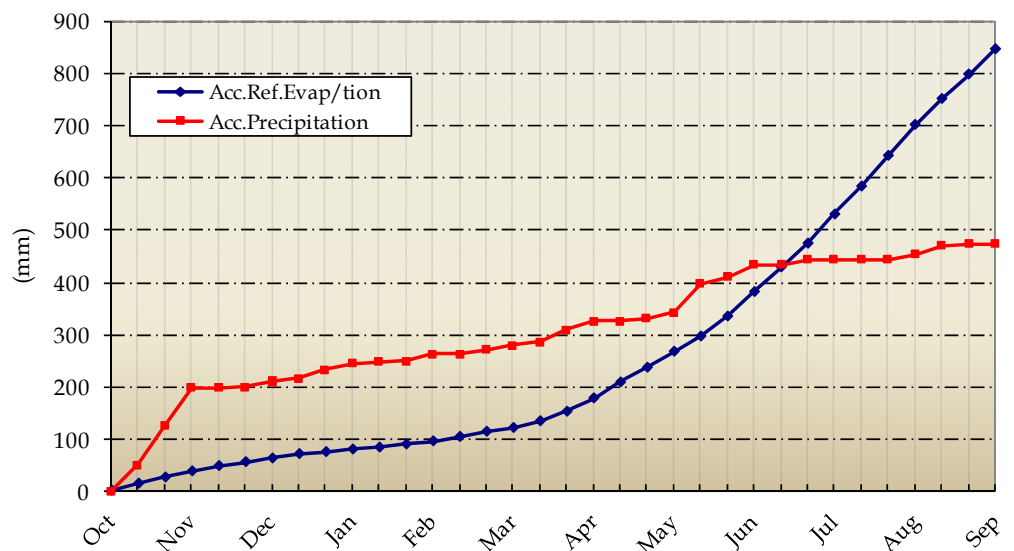


Series

3rd 10-day period (21-31/08/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	36.6	35.8	36.6	38.2	37.8	33.8	33.6	32.8	34.4	35.6	35.2	35.5	35.8	30.6
	Min	19.4	21.0	19.2	18.8	19.2	21.0	18.0	17.0	14.6	14.8	17.4	18.2	20.3	16.8
Relative Humidity	Max	82	80	79	85	80	77	78	74	80	80	86	80	68	-
	Min	21	27	22	23	24	31	23	23	15	16	24	23	26	-
Soil Temperature at 10 cm	06 UTC	29.2	30.0	29.2	29.2	29.2	29.4	28.4	27.8	27.0	26.8	27.4	28.5	29.4	24.4
	12 UTC	31.0	32.2	31.6	31.6	31.6	31.6	31.6	31.4	31.2	31.4	31.6	31.5	30.7	27.5
Sunshine Duration		11.3	10.3	11.8	11.5	11.0	11.1	10.7	10.5	8.3	8.7	4.7	10.0	10.3	9.1
Precipitation														0.7	10.2
Evaporation		7.6	7.4	7.9	5.7	7.8	5.6	5.8	6.6	5.5	7.0	6.7	73.6	63.6	65.5
Growing Degrees	5	23.0	23.4	22.9	23.5	23.5	22.4	20.8	19.9	19.5	20.2	21.3	240.4	253.6	205.9
	10	18.0	18.4	17.9	18.5	18.5	17.4	15.8	14.9	14.5	15.2	16.3	185.4	198.6	150.9

3rd 10-day period (21-31/08/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	48.3	50.8	43.4
Precipitation - Reference Evapotranspiration	-48.3	-50.1	-33.2
Number of Rainy Days	0.0	1.0	2.1
Number of Dry Days	20.0	35.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

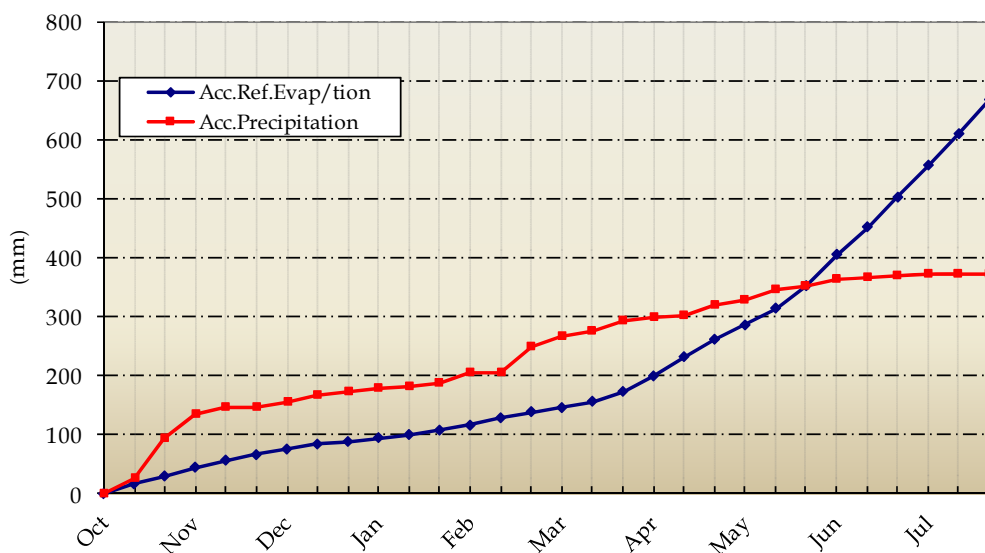


3rd 10-day period (21-31/08/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	32.4	31.0	33.0	32.1	33.3	30.0
	Min	-	-	-	-	-	-	-	-	-	15.0	18.0	16.5	19.9	16.3
Relative Humidity	Max	-	-	-	-	-	-	-	-	97	95	100	97	95	-
	Min	-	-	-	-	-	-	-	-	32	45	44	40	42	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	24.4	24.2	25.2	24.6	27.2	24.6
	12 UTC	-	-	-	-	-	-	-	-	24.8	26.0	26.6	25.8	29.5	26.0
Sunshine Duration		-	-	-	-	-	-	-	-	11.1	10.7	4.3	8.7	9.9	9.1
Precipitation		-	-	-	-	-	-	-	-	-	-	2.1	-	1.2	9.5
Evaporation		-	-	-	-	-	-	-	-	2.2	3.4	5.1	-	54.8	55.8
Growing Degrees	5	-	-	-	-	-	-	-	-	-	18.0	20.5	-	237.5	199.7
	10	-	-	-	-	-	-	-	-	-	13.0	15.5	-	182.5	144.7

3rd 10-day period (21-31/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	49.8	44.2
Precipitation - Reference Evapotranspiration	-	-48.6	-34.7
Number of Rainy Days	-	1.0	1.4
Number of Dry Days	-	25.0	-

The station is temporarily closed

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



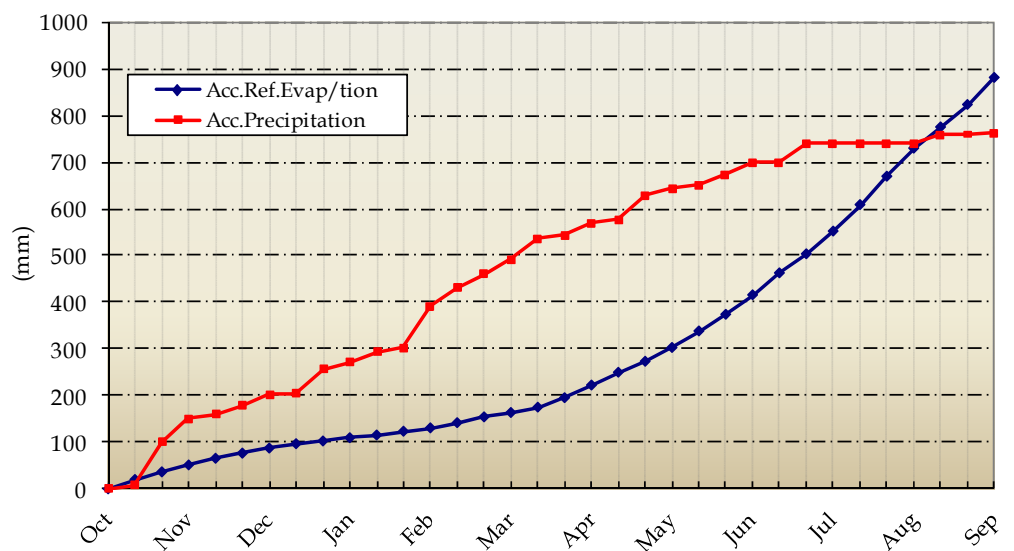


Tripoli

3rd 10-day period (21-31/08/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.4	30.0	31.6	31.0	30.4	29.4	29.4	28.2	28.4	31.0	32.0	30.1	-	29.3
	Min	22.0	22.2	14.6	17.0	22.4	22.2	17.6	11.0	10.4	11.2	15.0	16.9	-	13.3
Relative Humidity	Max	43	52	40	43	47	47	63	83	86	65	76	59	-	-
	Min	35	29	26	29	29	20	30	36	52	26	26	31	-	-
Soil Temperature at 10 cm	06 UTC	26.6	26.4	25.0	25.8	26.4	26.4	25.4	24.2	23.4	23.6	24.6	25.3	-	23.4
	12 UTC	31.2	31.4	30.4	30.0	31.4	30.2	30.8	29.6	-	29.8	29.8	30.5	-	26.2
Sunshine Duration		12.0	12.0	12.1	12.0	11.9	12.0	11.6	10.2	9.4	9.2	7.9	10.9	-	9.5
Precipitation											0.0	1.9	1.9	-	5.3
Evaporation		7.4	17.1	2.7	8.6	7.8	12.1	7.1	6.8	5.9	5.0	4.7	85.2	-	54.7
Growing Degrees	5	20.7	21.1	18.1	19.0	21.4	20.8	18.5	14.6	14.4	16.1	18.5	203.2	-	179.5
	10	15.7	16.1	13.1	14.0	16.4	15.8	13.5	9.6	9.4	11.1	13.5	148.2	-	124.5

3rd 10-day period (21-31/08/2011)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	57.9	47.4
Precipitation - Reference Evapotranspiration	-56.0	-42.1
Number of Rainy Days	1.0	1.2
Number of Dry Days	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

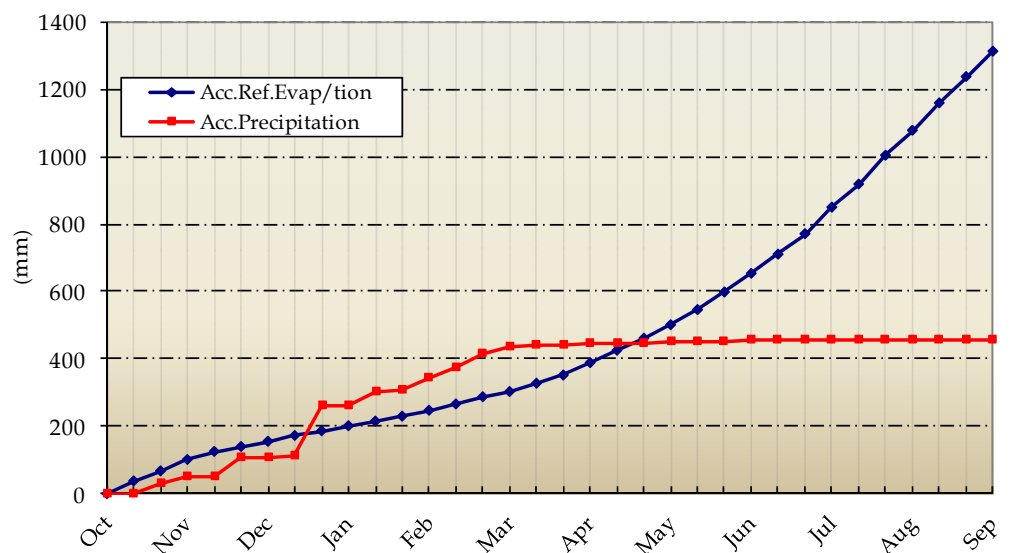


Tympaki

3rd 10-day period (21-31/08/2011)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.2	33.6	33.6	33.4	34.6	33.8	32.8	31.0	29.4	30.0	29.0	32.2	32.5	30.8
	Min	16.5	19.4	19.4	20.2	19.6	20.6	19.6	19.6	20.2	18.6	17.4	19.2	22.7	19.9
Relative Humidity	Max	57	68	62	71	69	87	95	84	64	71	97	75	82	-
	Min	23	32	27	26	26	33	34	32	29	26	43	30	43	-
Soil Temperature at 10 cm	06 UTC	28.2	18.8	29.2	29.8	30.0	30.0	30.0	29.2	29.0	28.0	28.4	28.2	30.6	29.7
	12 UTC	33.8	25.0	35.0	25.2	35.6	35.2	35.0	33.6	32.8	33.6	33.6	32.6	35.0	33.5
Sunshine Duration		12.4	12.3	12.4	12.5	12.4	12.2	11.9	12.1	12.0	12.4	11.8	12.2	11.0	11.2
Precipitation															
Evaporation		23.2	1.7	15.6	12.3	13.3	10.1	11.5	10.1	14.2	9.9	6.9	128.8	136.7	108.9
Growing Degrees	5	19.9	21.5	21.5	21.8	22.1	22.2	21.2	20.3	19.8	19.3	18.2	227.8	248.2	224.3
	10	14.9	16.5	16.5	16.8	17.1	17.2	16.2	15.3	14.8	14.3	13.2	172.8	193.2	169.3

3rd 10-day period (21-31/08/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	75.2	74.2	61.2
Precipitation - Reference Evapotranspiration	-75.2	-74.2	-61.2
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	95.0	87.0	-

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.

**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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