



# AGROMETEOROLOGICAL BULLETIN

*September 2012*  
*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

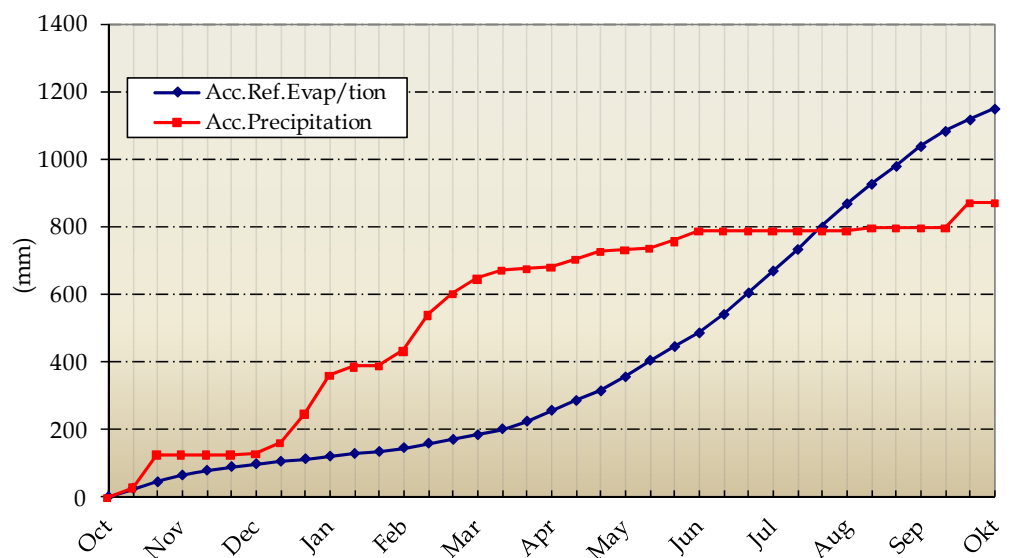
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Agrinio

3rd 10-day period (21-30/09/2012)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.8	28.0	29.4	30.0	32.4	32.2	32.8	34.4	34.4	34.6	31.4	28.9	28.4
	Min	14.6	11.6	12.4	14.0	15.6	16.0	15.2	15.6	14.8	13.8	14.4	13.6	13.9
Relative Humidity	Max	88	89	91	91	94	92	90	94	84	88	90	91	-
	Min	36	32	37	40	45	24	39	32	27	24	34	32	-
Soil Temperature at 10 cm	06 UTC	22.6	21.2	21.0	22.0	22.6	23.2	23.0	23.0	23.0	23.0	22.5	21.2	20.7
	12 UTC	25.4	24.2	24.2	24.8	25.6	26.2	25.6	26.0	26.0	25.6	25.4	24.3	24.9
Sunshine Duration		10.8	10.6	10.0	10.3	10.1	10.3	10.2	10.2	10.2	10.3	10.3	9.8	7.7
Precipitation													7.1	17.6
Evaporation		5.5	4.6	2.6	5.1	3.5	5.8	4.6	5.8	4.4	5.0	46.9	62.6	47.0
Growing Degrees	5	15.2	14.8	15.9	17.0	19.0	19.1	19.0	20.0	19.6	19.2	178.8	162.9	161.3
	10	10.2	9.8	10.9	12.0	14.0	14.1	14.0	15.0	14.6	14.2	128.8	112.9	111.3

3rd 10-day period (21-30/09/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	32.2	32.9	31.0
Precipitation - Reference Evapotranspiration	-32.2	-25.8	-13.4
Number of Rainy Days	0.0	2.0	1.7
Number of Dry Days	10.0	0.0	-

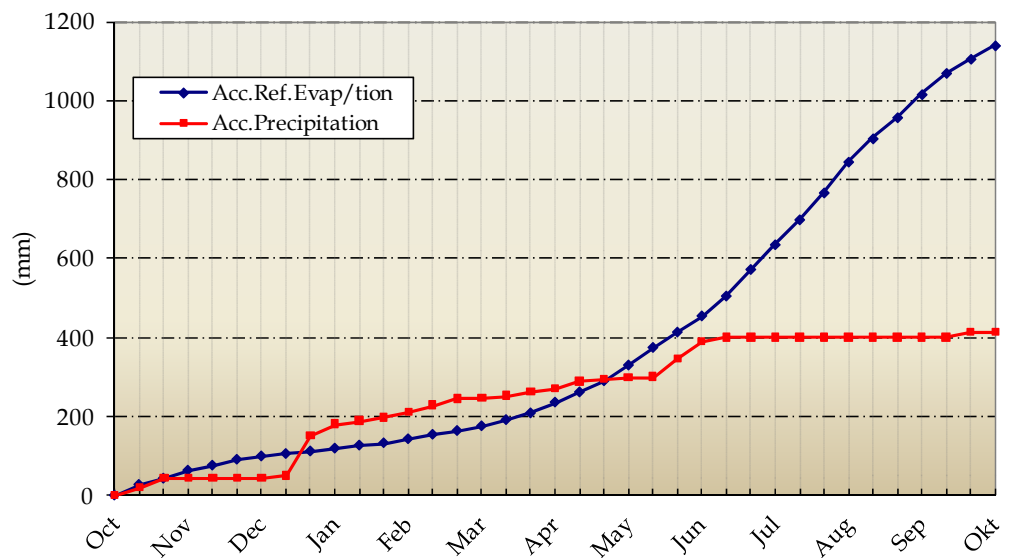
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/09/2012)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.4	23.4	26.6	26.8	26.4	27.8	30.4	33.4	33.2	33.0	28.4	26.2	24.9
	Min	16.6	12.0	11.8	12.0	13.0	16.6	16.4	14.5	15.8	18.4	14.7	15.6	13.0
Relative Humidity	Max	78	79	81	96	95	92	94	78	71	81	84	80	-
	Min	30	36	35	35	57	62	36	23	21	26	36	34	-
Soil Temperature at 10 cm	06 UTC	23.2	21.6	20.4	21.2	21.4	22.8	23.2	23.2	23.8	23.6	22.4	20.9	19.0
	12 UTC	24.2	23.6	28.2	24.4	24.4	25.4	26.0	25.6	26.0	26.0	25.4	23.6	22.4
Sunshine Duration		6.6	10.4	11.1	10.9	10.5	10.7	10.5	11.3	10.8	10.8	10.4	8.3	7.5
Precipitation													9.7	12.3
Evaporation		8.9	4.5	5.4	5.4	4.5	4.7	6.6	10.5	6.4	7.9	64.8	65.3	59.3
Growing Degrees	5	15.0	12.7	14.2	14.4	14.7	17.2	18.4	19.0	19.5	20.7	165.8	159.2	139.4
	10	10.0	7.7	9.2	9.4	9.7	12.2	13.4	14.0	14.5	15.7	115.8	109.2	89.4

3rd 10-day period (21-30/09/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	34.1	37.4	31.9
Precipitation - Reference Evapotranspiration	-34.1	-27.7	-19.6
Number of Rainy Days	0.0	2.0	1.1
Number of Dry Days	13.0	40.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

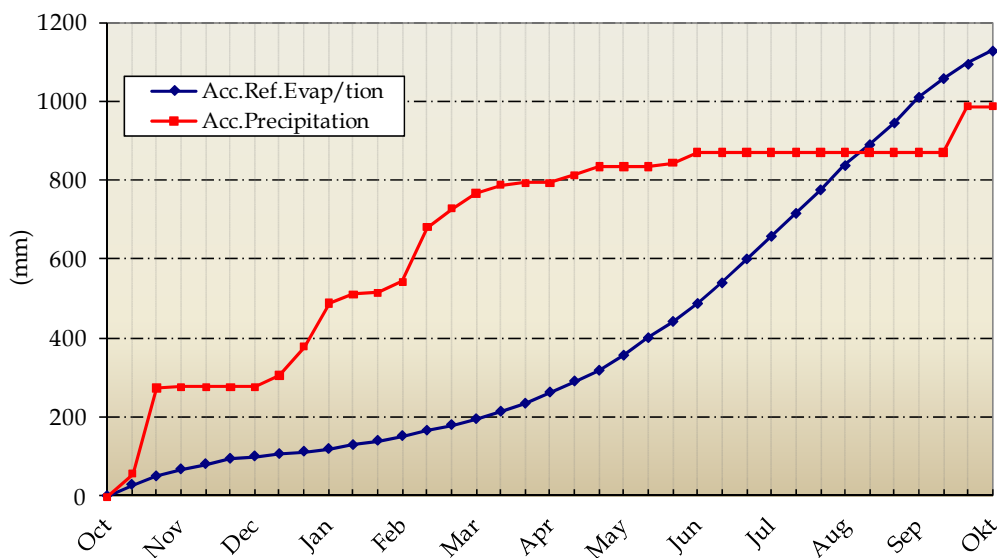


Andravida

3rd 10-day period (21-30/09/2012)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.4	25.6	26.1	28.3	28.9	30.7	30.4	30.0	31.4	31.3	28.7	28.8	27.0
	Min	20.5	14.3	14.2	16.0	18.4	18.0	17.2	17.2	15.6	14.7	16.6	14.3	15.6
Relative Humidity	Max	79	87	96	89	91	94	90	89	89	88	89	87	-
	Min	42	47	48	41	57	33	34	34	35	29	40	29	-
Soil Temperature at 10 cm	06 UTC	21.8	20.4	20.6	21.4	23.0	22.8	22.4	22.4	22.2	22.0	21.9	21.1	22.0
	12 UTC	25.8	26.0	25.8	27.2	28.2	27.8	27.6	27.6	27.0	27.6	27.1	28.1	25.5
Sunshine Duration		10.3	9.9	9.3	9.6	9.7	9.3	9.5	9.4	9.2	9.8	9.6	9.3	8.1
Precipitation													18.7	16.0
Evaporation		7.2	6.7	4.8	4.8	3.0	7.2	6.4	4.1	7.0	5.0	56.2	59.6	48.4
Growing Degrees	5	17.5	15.0	15.2	17.2	18.7	19.4	18.8	18.6	18.5	18.0	176.6	165.2	162.7
	10	12.5	10.0	10.2	12.2	13.7	14.4	13.8	13.6	13.5	13.0	126.6	115.2	112.7

3rd 10-day period (21-30/09/2012)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	33.5	37.4	30.8
Precipitation - Reference Evapotranspiration	-33.5	-18.7	-14.8
Number of Rainy Days	0.0	1.0	1.5
Number of Dry Days	15.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

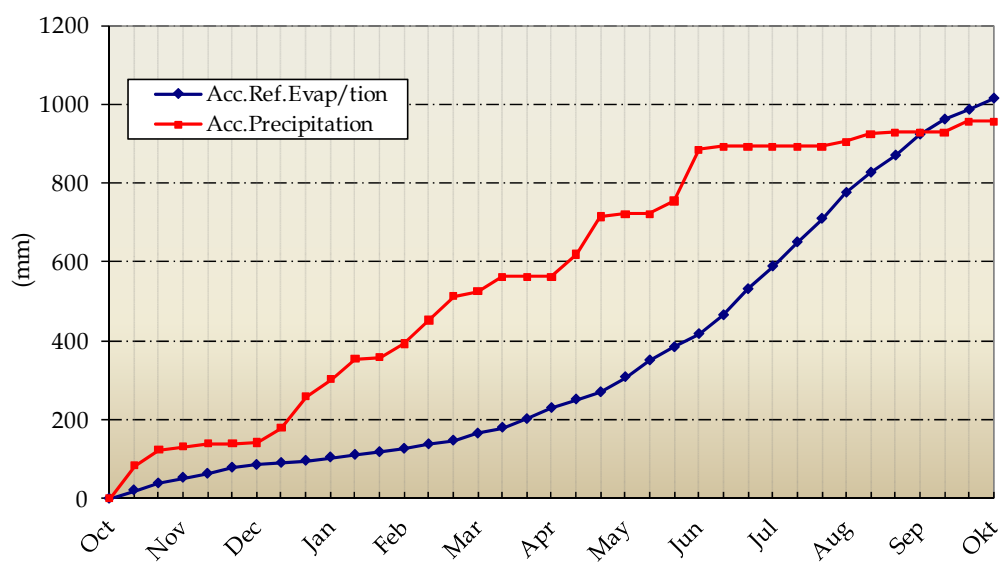


Ioannina

3rd 10-day period (21-30/09/2012)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.8	24.8	28.0	29.8	30.4	28.8	30.6	32.0	33.4	31.6	29.1	-	24.8
	Min	9.0	5.2	8.2	10.6	11.0	13.0	11.5	11.6	11.6	12.0	10.4	-	11.3
Relative Humidity	Max	88	73	92	95	93	98	79	93	93	89	89	-	-
	Min	42	25	32	26	32	35	34	24	28	18	30	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	16.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	19.5
Sunshine Duration		7.6	8.6	8.3	8.3	8.3	7.6	8.8	8.4	8.6	8.6	8.3	-	6.4
Precipitation													-	24.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	40.6
Growing Degrees	5	10.4	10.0	13.1	15.2	15.7	15.9	16.1	16.8	17.5	16.8	147.5	-	130.3
	10	5.4	5.0	8.1	10.2	10.7	10.9	11.1	11.8	12.5	11.8	97.5	-	80.3

3rd 10-day period (21-30/09/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	28.5	-	25.1
Precipitation - Reference Evapotranspiration	-28.5	-	-0.6
Number of Rainy Days	0.0	-	2.5
Number of Dry Days	10.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

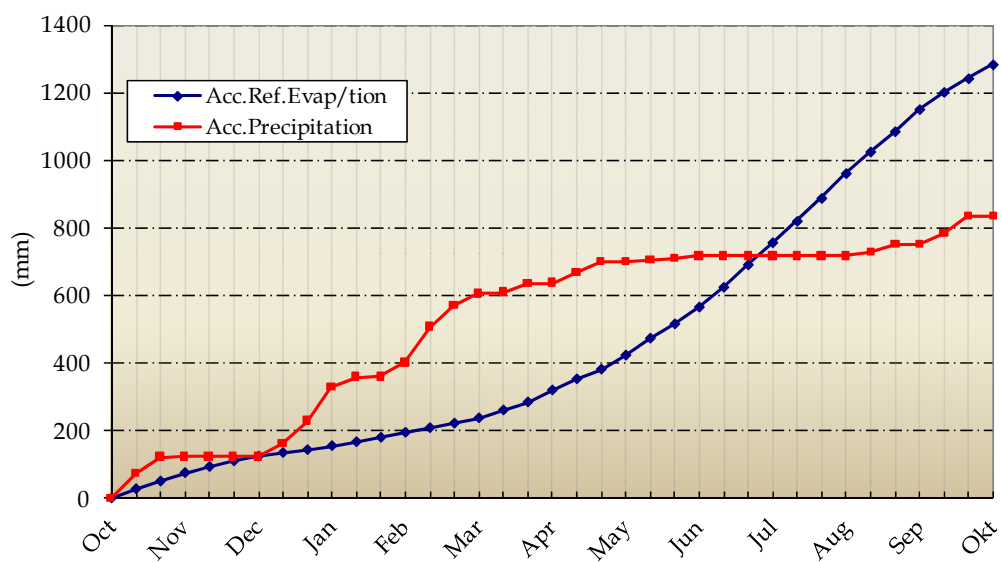


Kalamata

3rd 10-day period (21-30/09/2012)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.8	26.2	26.8	27.7	31.0	34.6	33.4	33.0	31.8	30.7	30.2	28.3	27.6
	Min	16.1	14.0	13.7	14.8	16.4	19.7	18.7	17.6	16.9	13.1	16.1	16.0	15.0
Relative Humidity	Max	91	84	91	92	92	75	81	82	77	87	85	80	-
	Min	34	52	39	47	44	24	25	32	31	28	36	34	-
Soil Temperature at 10 cm	06 UTC	22.6	22.6	21.8	21.8	22.2	22.2	22.6	22.6	22.6	22.0	22.3	21.6	21.4
	12 UTC	24.0	24.2	23.6	23.6	23.6	24.6	24.4	24.6	24.6	24.6	24.2	23.2	24.4
Sunshine Duration		10.5	8.9	10.0	9.7	10.3	10.6	10.8	10.2	10.3	10.8	10.2	9.7	7.7
Precipitation													2.8	12.3
Evaporation		5.6	8.6	3.2	3.4	5.0	6.8	6.2	4.4	7.2	3.7	54.1	56.3	51.4
Growing Degrees	5	16.5	15.1	15.3	16.3	18.7	22.2	21.1	20.3	19.4	16.9	181.5	171.8	162.8
	10	11.5	10.1	10.3	11.3	13.7	17.2	16.1	15.3	14.4	11.9	131.5	121.8	112.8

3rd 10-day period (21-30/09/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	41.3	39.7	32.9
Precipitation - Reference Evapotranspiration	-41.3	-36.9	-20.6
Number of Rainy Days	0.0	1.0	1.7
Number of Dry Days	14.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

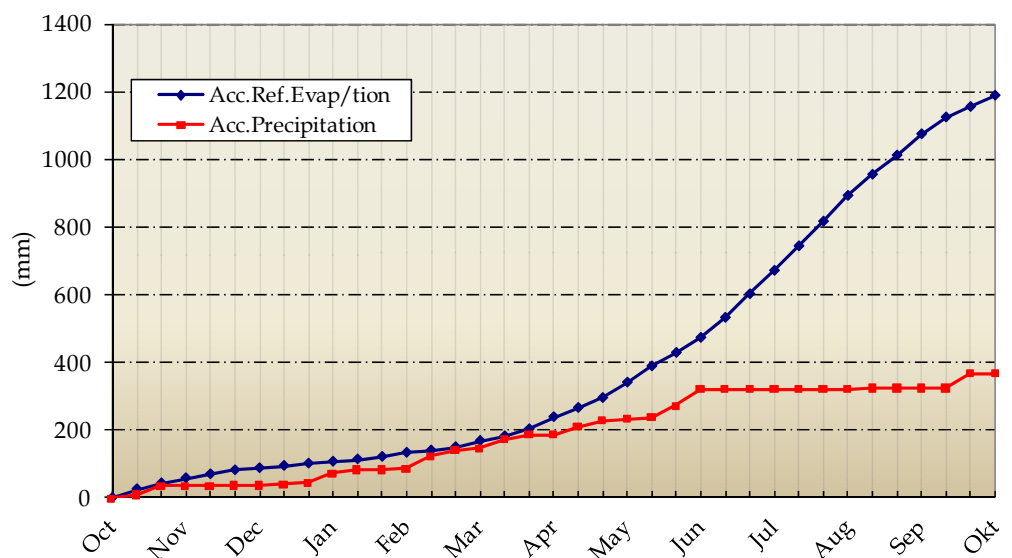


Larisa

3rd 10-day period (21-30/09/2012)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.0	26.2	29.2	31.0	34.8	34.8	34.2	33.6	33.4	33.6	31.6	26.3	27.3
	Min	14.0	9.6	10.6	13.2	14.2	17.0	16.1	16.1	14.6	13.7	13.9	12.6	13.0
Relative Humidity	Max	85	86	94	93	96	93	76	78	85	81	87	90	-
	Min	23	23	22	30	20	20	23	25	22	22	23	36	-
Soil Temperature at 10 cm	06 UTC	23.2	21.4	21.0	21.4	21.0	23.0	22.2	23.0	23.0	22.4	22.2	20.9	20.9
	12 UTC	29.0	23.0	22.8	23.6	24.8	24.8	24.4	25.0	25.0	24.4	24.7	23.1	22.7
Sunshine Duration		9.3	8.5	8.9	8.4	8.0	8.3	7.8	7.9	8.1	8.0	8.3	7.0	7.0
Precipitation													8.9	7.0
Evaporation		6.7	4.0	4.0	5.0	5.3	6.9	3.7	7.4	6.7	3.9	53.6	58.6	51.2
Growing Degrees	5	14.5	12.9	14.9	17.1	19.5	20.9	20.2	19.9	19.0	18.7	177.5	144.7	151.5
	10	9.5	7.9	9.9	12.1	14.5	15.9	15.2	14.9	14.0	13.7	127.5	94.7	101.5

3rd 10-day period (21-30/09/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	33.4	31.1	31.7
Precipitation - Reference Evapotranspiration	-33.4	-22.2	-24.7
Number of Rainy Days	0.0	2.0	1.7
Number of Dry Days	13.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

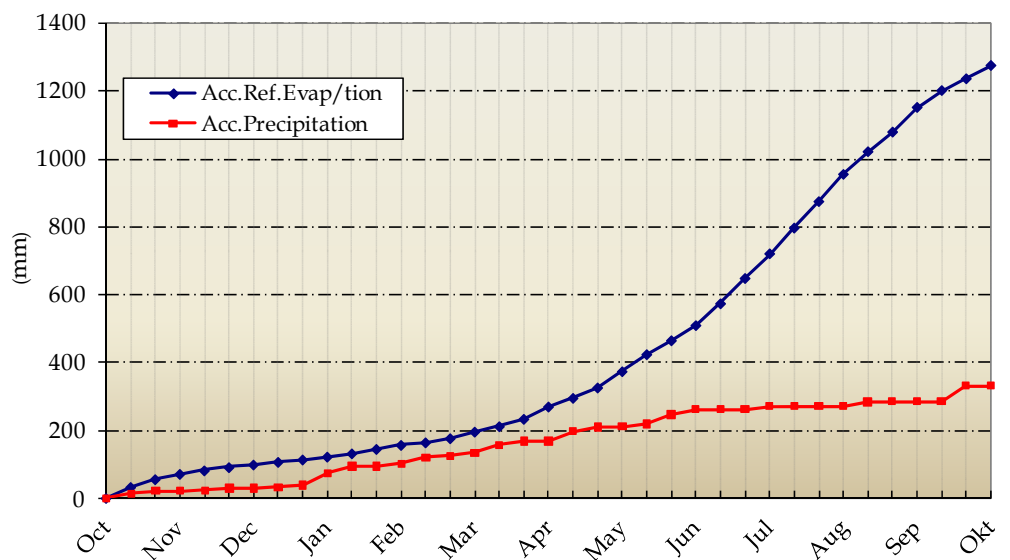


Mikra

3rd 10-day period (21-30/09/2012)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.1	23.8	26.4	26.7	26.0	32.3	31.3	31.8	32.0	31.9	28.3	-	25.8
	Min	15.6	15.6	10.6	13.5	14.0	16.7	16.0	17.0	17.0	16.0	15.2	-	14.1
Relative Humidity	Max	59	69	77	80	82	86	78	85	80	80	78	-	-
	Min	34	27	26	43	37	22	29	30	25	30	30	-	-
Soil Temperature at 10 cm	06 UTC	19.4	18.0	18.6	20.0	20.6	21.8	21.6	23.4	23.2	23.0	21.0	-	19.9
	12 UTC	26.0	28.8	23.2	23.8	24.2	29.4	26.4	26.4	27.0	27.2	26.2	-	23.6
Sunshine Duration		10.0	10.9	10.5	10.2	9.4	10.3	10.1	9.7	9.9	9.6	10.1	-	6.9
Precipitation													-	10.7
Evaporation		11.4	8.0	5.6	4.0	6.2	4.8	7.5	7.3	15.0	10.6	80.4	-	49.1
Growing Degrees	5	13.4	14.7	13.5	15.1	15.0	19.5	18.7	19.4	19.5	19.0	167.7	-	149.6
	10	8.4	9.7	8.5	10.1	10.0	14.5	13.7	14.4	14.5	14.0	117.7	-	99.6

3rd 10-day period (21-30/09/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	39.2	-	29.8
Precipitation - Reference Evapotranspiration	-39.2	-	-19.1
Number of Rainy Days	0.0	-	1.5
Number of Dry Days	10.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



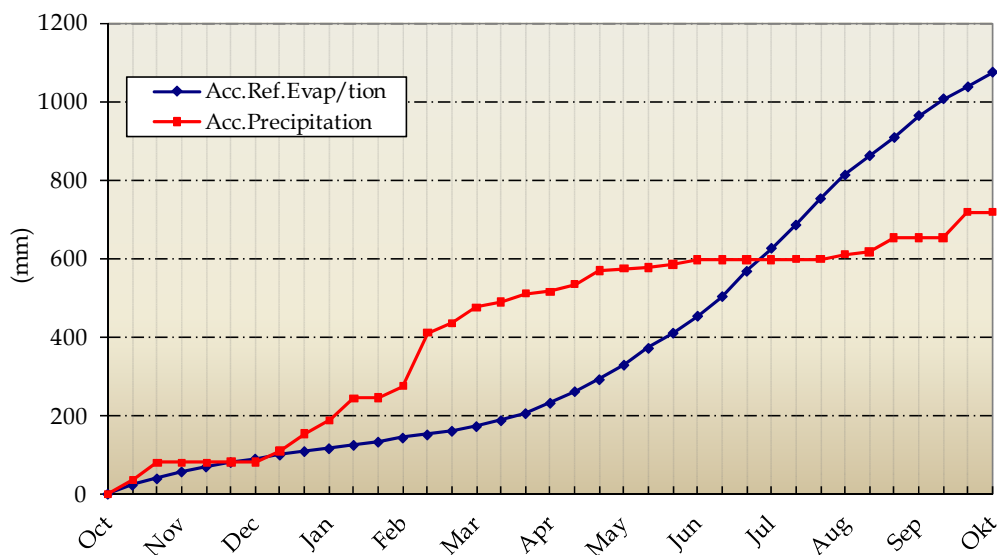


Tripoli

3rd 10-day period (21-30/09/2012)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.8	25.2	28.1	29.5	33.4	32.4	31.0	31.2	31.5	32.4	30.0	23.7	25.0
	Min	11.2	9.5	8.6	10.7	11.3	11.9	10.4	11.1	11.8	8.6	10.5	11.8	10.2
Relative Humidity	Max	94	93	94	94	91	83	80	89	83	85	89	82	-
	Min	24	22	21	24	14	13	19	21	15	11	18	35	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	17.7	18.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	22.2	21.1
Sunshine Duration		-	-	-	-	-	-	-	-	-	-	-	9.6	7.8
Precipitation													3.6	11.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	43.7	36.1
Growing Degrees	5	13.0	12.4	13.4	15.1	17.4	17.2	15.7	16.2	16.7	15.5	152.3	127.2	126.3
	10	8.0	7.4	8.4	10.1	12.4	12.2	10.7	11.2	11.7	10.5	102.3	77.2	76.4

3rd 10-day period (21-30/09/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	37.4	34.3	29.5
Precipitation - Reference Evapotranspiration	-37.4	-30.7	-17.9
Number of Rainy Days	0.0	1.0	1.5
Number of Dry Days	13.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

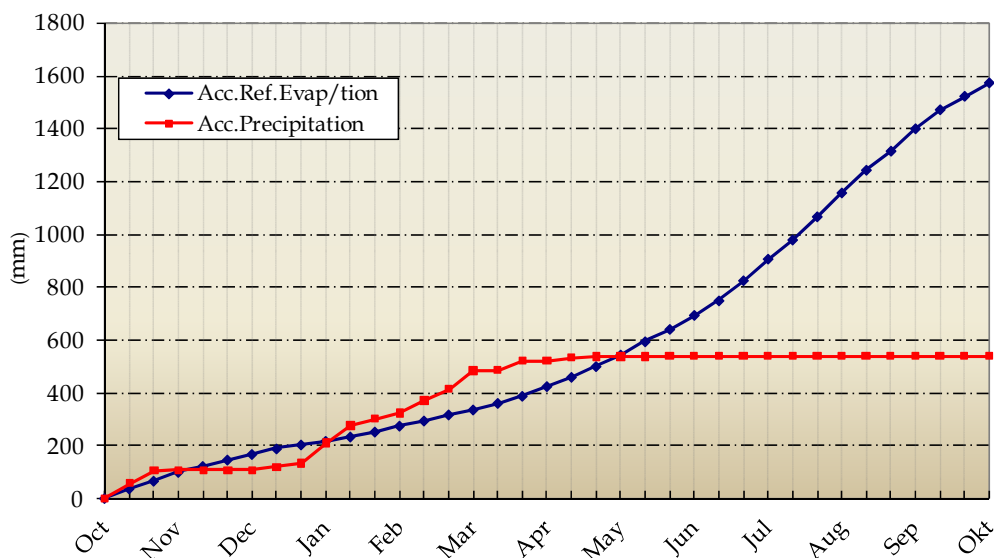


Tympaki

3rd 10-day period (21-30/09/2012)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.0	29.4	30.0	28.2	27.8	28.8	30.8	33.0	32.8	30.8	30.1	28.6	27.8
	Min	19.0	19.4	16.0	16.6	15.6	16.0	17.2	21.2	19.4	18.4	17.9	16.9	17.1
Relative Humidity	Max	83	78	74	79	83	93	82	70	66	74	78	85	-
	Min	48	28	10	14	16	28	18	18	17	22	22	37	-
Soil Temperature at 10 cm	06 UTC	27.2	26.8	26.2	25.8	28.4	25.8	26.0	27.0	26.4	26.6	26.6	25.6	25.4
	12 UTC	32.4	-	-	30.6	30.8	31.2	30.8	32.4	-	-	31.4	29.4	29.1
Sunshine Duration		10.6	10.3	10.3	11.3	10.7	9.8	8.1	10.2	9.8	9.9	10.1	9.5	8.7
Precipitation													1.2	4.2
Evaporation		6.8	7.8	6.3	8.3	6.3	4.6	8.6	6.6	9.4	9.0	73.7	92.0	67.1
Growing Degrees	5	19.0	19.4	18.0	17.4	16.7	17.4	19.0	22.1	21.1	19.6	189.7	177.3	174.3
	10	14.0	14.4	13.0	12.4	11.7	12.4	14.0	17.1	16.1	14.6	139.7	127.3	124.3

3rd 10-day period (21-30/09/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.8	50.6	38.0
Precipitation - Reference Evapotranspiration	-50.8	-49.4	-33.8
Number of Rainy Days	0.0	1.0	0.6
Number of Dry Days	136.0	115.0	-

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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