



# AGROMETEOROLOGICAL BULLETIN

*March 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

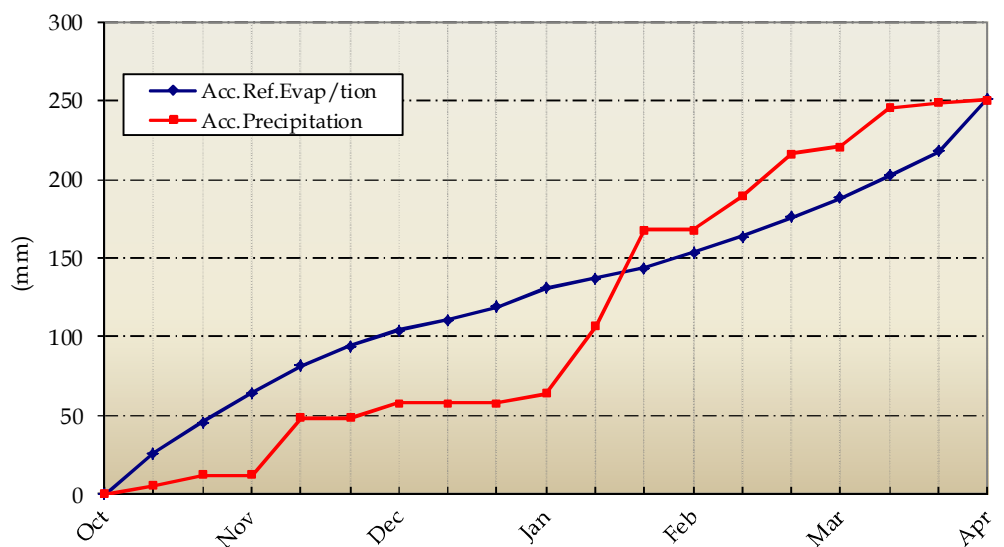
*Web addresses of HNMS*  
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Alexandroupoli

3rd 10-day period (21-31/03/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.4	20.6	21.4	21.0	21.6	18.0	15.2	17.8	21.8	21.0	19.0	19.7	15.5	14.1
	Min	6.0	8.0	8.2	7.4	3.6	5.4	5.4	-0.6	2.8	3.6	12.4	5.7	6.1	4.9
Relative Humidity	Max	97	86	69	89	90	88	85	89	83	77	97	86	92	-
	Min	52	33	28	37	39	46	34	33	25	37	38	37	57	-
Soil Temperature at 10 cm	06 UTC	10.6	12.0	11.4	11.4	11.0	12.0	11.6	9.0	10.4	11.4	14.2	11.4	10.4	8.3
	12 UTC	17.4	18.0	16.8	17.0	16.8	17.2	14.4	15.4	17.0	18.4	17.8	16.9	14.5	11.0
Sunshine Duration		8.4	10.9	11.4	11.0	10.2	9.5	7.1	11.4	11.4	10.9	9.6	10.2	5.8	5.5
Precipitation								1.6					1.6	8.3	15.2
Evaporation		3.4	5.4	8.2	5.0	2.6	3.7	0.0	0.0	3.9	6.2	6.7	45.1	27.6	32.3
Growing Degrees	5	7.7	9.3	9.8	9.2	7.6	6.7	5.3	3.6	7.3	7.3	10.7	84.5	64.3	51.2
	10	2.7	4.3	4.8	4.2	2.6	1.7	0.3	0.0	2.3	2.3	5.7	30.9	19.9	11.3

3rd 10-day period (21-31/03/2017)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	33.6	23.6	23.3
Precipitation - Reference Evapotranspiration	-32.0	-15.3	-8.1
Number of Rainy Days	1.0	4.0	2.7
Number of Dry Days	10.0	8.0	-

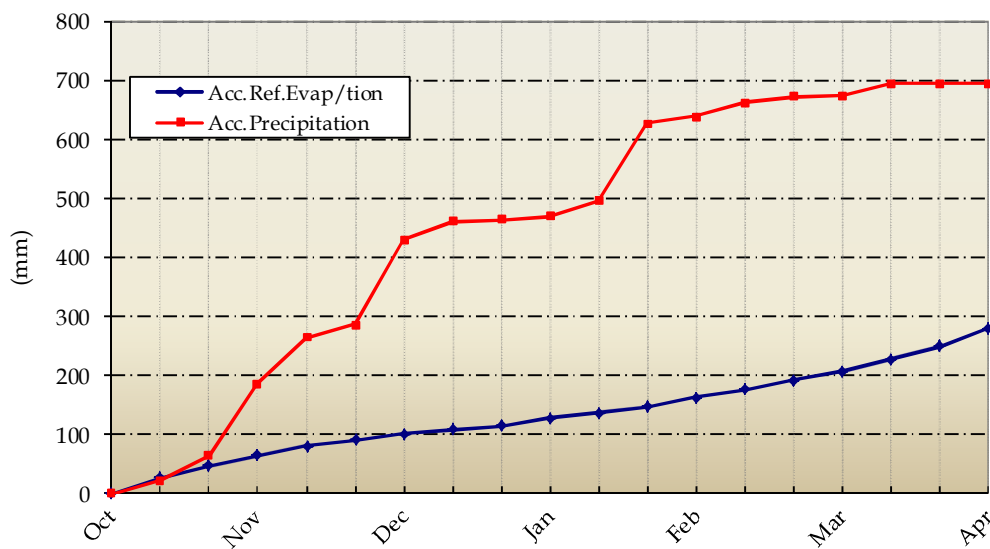
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/03/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.0	19.8	21.6	21.6	20.2	19.2	21.2	19.5	19.7	19.6	23.0	20.4	18.4	17.4
	Min	9.7	10.2	5.4	6.8	7.2	9.9	9.8	7.9	4.6	8.0	5.8	7.8	8.2	7.7
Relative Humidity	Max	90	90	91	87	90	91	91	87	85	88	85	89	89	-
	Min	57	60	33	34	54	57	38	33	26	36	30	42	47	-
Soil Temperature at 10 cm	06 UTC	14.8	15.5	15.0	15.0	15.0	11.8	12.0	14.6	14.4	15.0	14.0	14.3	-	11.5
	12 UTC	15.0	17.0	22.0	17.0	17.0	18.4	18.6	17.0	20.0	15.6	19.4	17.9	-	14.2
Sunshine Duration		8.1	9.1	9.5	10.6	8.7	4.5	9.9	9.9	9.7	3.8	10.2	8.5	6.8	6.8
Precipitation													0.0	31.7	19.5
Evaporation		5.0	1.0	5.4	3.8	0.8	4.0	4.4	3.6	5.0	7.0	3.0	43.0	31.4	33.3
Growing Degrees	5	9.4	10.0	8.5	9.2	8.7	9.6	10.5	8.7	7.2	8.8	9.4	99.9	91.0	83.1
	10	4.4	5.0	3.5	4.2	3.7	4.6	5.5	3.7	2.2	3.8	4.4	44.9	36.2	30.3

3rd 10-day period (21-31/03/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	30.3	28.1	27.1
Precipitation - Reference Evapotranspiration	-30.3	3.6	-7.6
Number of Rainy Days	0.0	5.0	3.2
Number of Dry Days	21.0	4.0	-

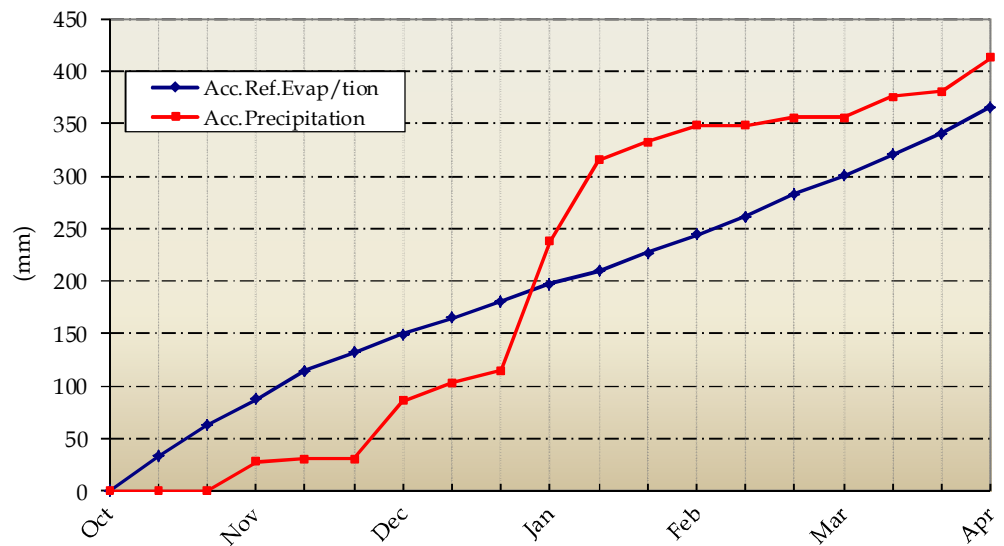
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/03/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.0	16.0	18.0	17.8	18.8	21.6	18.4	15.0	15.6	15.2	16.2	17.3	19.4	17.7
	Min	12.2	11.4	10.0	9.4	8.4	8.2	13.0	12.6	11.0	13.4	12.2	11.1	11.1	10.5
Relative Humidity	Max	95	95	95	94	89	88	95	97	92	97	93	94	85	-
	Min	79	83	76	78	70	56	77	76	76	82	80	76	46	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		5.5	1.7	9.0	10.0	10.2	8.7	9.1	1.3	1.8	0.3	0.6	5.3	7.9	6.6
Precipitation			1.8						1.8	3.0	16.5	9.4	32.5	9.4	15.8
Evaporation		3.8	0.6	1.3	4.1	2.7	2.0	4.6	1.4	1.8	0.4	3.4	26.1	39.8	48.5
Growing Degrees	5	10.1	8.7	9.0	8.6	8.6	9.9	10.7	8.8	8.3	9.3	9.2	101.2	112.9	100.1
	10	5.1	3.7	4.0	3.6	3.6	4.9	5.7	3.8	3.3	4.3	4.2	46.2	57.9	45.5

3rd 10-day period (21-31/03/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	24.2	36.4	-
Precipitation - Reference Evapotranspiration	8.3	-27.0	15.8
Number of Rainy Days	5.0	3.0	3.0
Number of Dry Days	6.0	9.0	-

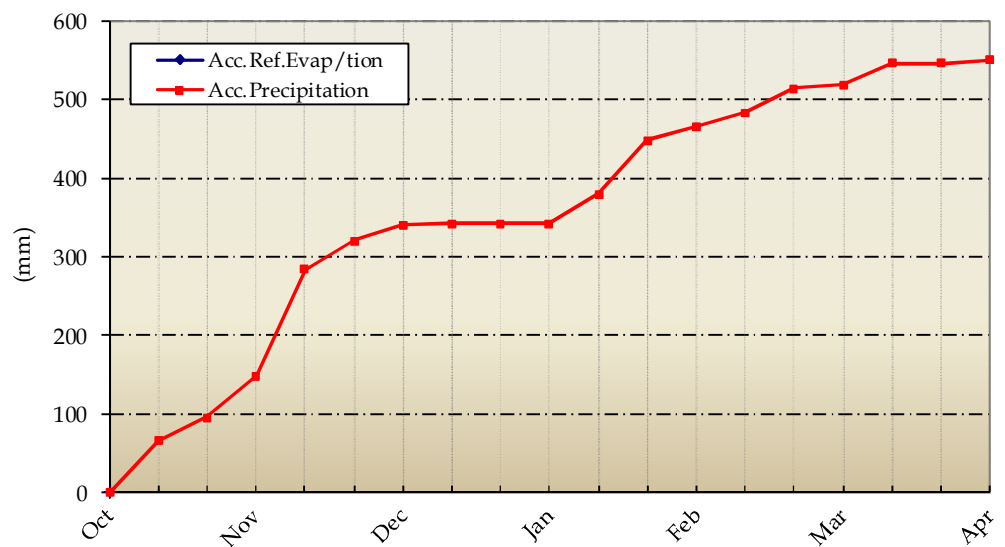
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/03/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.6	24.0	25.0	25.2	-	24.8	17.0	16.0	19.0	22.4	20.0	21.7	16.4	15.1
	Min	4.0	2.7	3.0	-	-	7.0	7.0	2.8	-	3.0	12.0	5.2	4.4	4.4
Relative Humidity	Max	100	90	-	-	100	97	97	-	71	79	98	92	99	-
	Min	23	20	-	-	25	51	35	-	18	19	28	27	43	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	7.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	10.5
Sunshine Duration		-	8.6	-	-	9.2	3.1	3.4	-	9.5	9.2	8.0	7.3	5.2	4.7
Precipitation			0.0					4.8					4.8	7.7	32.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	28.9
Growing Degrees	5	8.8	8.4	9.0	-	-	10.9	7.0	4.4	-	7.7	11.0	-	59.6	50.7
	10	3.8	3.4	4.0	-	-	5.9	2.0	0.0	-	2.7	6.0	-	15.9	11.1

3rd 10-day period (21-31/03/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	22.4
Precipitation - Reference Evapotranspiration	-	-	9.9
Number of Rainy Days	1.0	5.0	3.9
Number of Dry Days	18.0	5.0	-

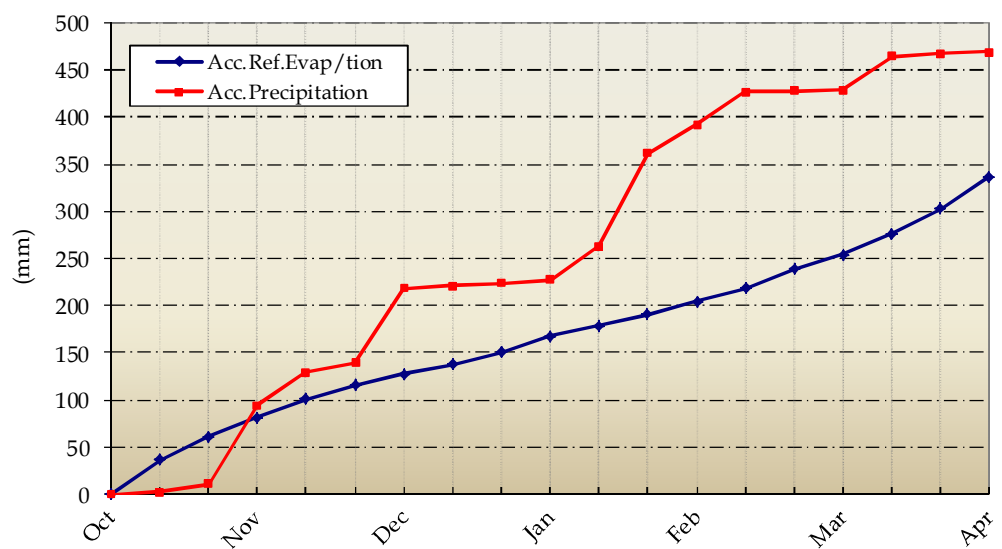
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/03/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.6	17.0	19.4	21.3	20.6	22.1	19.9	19.9	18.3	21.0	23.2	20.2	18.7	17.8
	Min	6.6	12.1	5.4	5.2	6.7	9.8	8.5	9.0	5.9	11.4	8.4	8.1	7.1	6.9
Relative Humidity	Max	93	93	94	93	93	91	93	82	88	85	74	89	93	-
	Min	53	69	53	33	44	32	49	38	29	34	23	42	46	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	13.2	11.8
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	14.4	14.2
Sunshine Duration		6.3	1.2	10.5	10.5	10.5	7.5	10.7	8.9	5.3	7.0	9.9	8.0	7.7	6.5
Precipitation			1.9										1.9	27.9	20.1
Evaporation		2.9	1.2	3.0	3.8	5.0	3.8	4.4	1.0	3.0	2.0	6.4	36.5	36.7	37.4
Growing Degrees	5	8.1	9.6	7.4	8.3	8.7	11.0	9.2	9.5	7.1	11.2	10.8	100.7	87.0	81.3
	10	3.1	4.6	2.4	3.3	3.7	6.0	4.2	4.5	2.1	6.2	5.8	45.7	32.1	28.3

3rd 10-day period (21-31/03/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	33.6	31.2	27.8
Precipitation - Reference Evapotranspiration	-31.7	-3.3	-7.7
Number of Rainy Days	1.0	4.0	3.3
Number of Dry Days	5.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



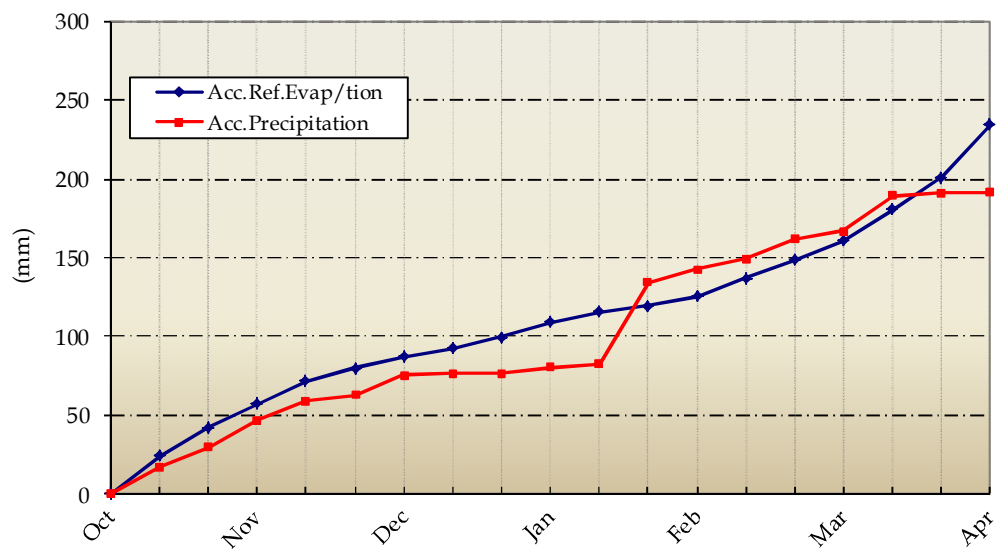


Larisa

3rd 10-day period (21-31/03/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.4	21.4	22.2	22.8	24.6	23.7	19.2	16.8	19.3	23.2	19.4	21.4	18.6	16.9
	Min	4.4	5.2	3.8	4.0	4.7	5.7	9.2	5.7	0.8	2.0	9.6	5.0	4.3	4.2
Relative Humidity	Max	100	100	100	100	100	98	92	100	93	90	91	97	99	-
	Min	46	40	36	27	33	23	46	28	31	23	35	33	44	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	12.3	10.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	12.2	11.4
Sunshine Duration		10.3	9.1	10.3	10.2	9.8	6.1	0.0	11.0	11.2	11.0	7.4	8.8	6.5	6.0
Precipitation								0.0				0.1	0.1	3.2	11.3
Evaporation		5.5	4.4	4.4	5.4	4.4	5.3	2.8	4.1	5.1	1.1	8.3	50.8	28.9	32.5
Growing Degrees	5	8.4	8.3	8.0	8.4	9.7	9.7	9.2	6.3	5.1	7.6	9.5	90.1	71.1	61.7
	10	3.4	3.3	3.0	3.4	4.7	4.7	4.2	1.3	0.1	2.6	4.5	35.1	24.7	16.3

3rd 10-day period (21-31/03/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	33.8	26.0	25.6
Precipitation - Reference Evapotranspiration	-33.7	-22.8	-14.3
Number of Rainy Days	1.0	2.0	3.1
Number of Dry Days	17.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

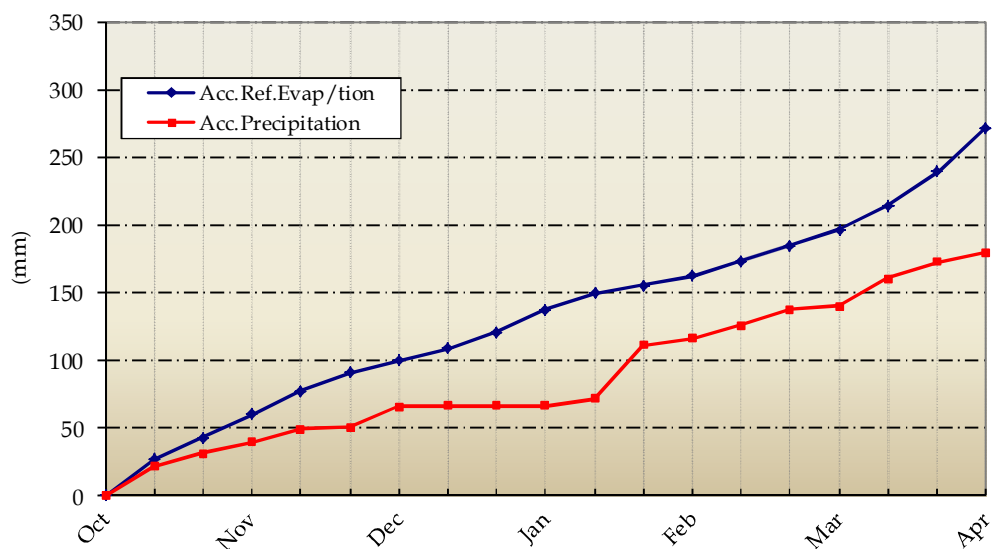


Mikra

3rd 10-day period (21-31/03/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	19.6	20.9	21.6	23.8	21.9	16.8	17.0	20.8	23.8	20.9	20.6	17.2	16.0
	Min	6.0	10.4	6.9	6.6	6.6	8.1	8.6	2.6	3.0	5.0	12.4	6.9	6.2	5.7
Relative Humidity	Max	98	98	88	83	91	76	94	97	82	79	87	88	89	-
	Min	28	44	34	28	29	40	57	27	26	22	42	34	43	-
Soil Temperature at 10 cm	06 UTC	12.0	13.9	13.2	12.9	13.2	14.0	13.8	10.6	11.2	12.0	15.2	12.9	11.3	9.6
	12 UTC	15.2	16.2	15.6	16.2	16.6	16.5	13.8	14.0	14.4	15.8	16.2	15.5	13.7	12.9
Sunshine Duration		10.5	9.1	11.6	10.0	10.3	8.7	0.0	11.7	11.0	10.7	5.4	9.0	6.6	5.4
Precipitation						0.0		2.7				4.2	6.9	12.5	11.2
Evaporation		1.9	1.1	10.7	2.3	6.7	3.6	1.0	2.7	5.1	6.3	3.6	45.0	36.9	35.2
Growing Degrees	5	8.0	10.0	8.9	9.1	10.2	10.0	7.7	4.8	6.9	9.4	11.7	96.7	73.2	64.3
	10	3.0	5.0	3.9	4.1	5.2	5.0	2.7	0.0	1.9	4.4	6.7	41.9	23.6	17.2

3rd 10-day period (21-31/03/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	32.4	29.6	25.7
Precipitation - Reference Evapotranspiration	-25.5	-17.1	-14.5
Number of Rainy Days	2.0	3.0	2.7
Number of Dry Days	13.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



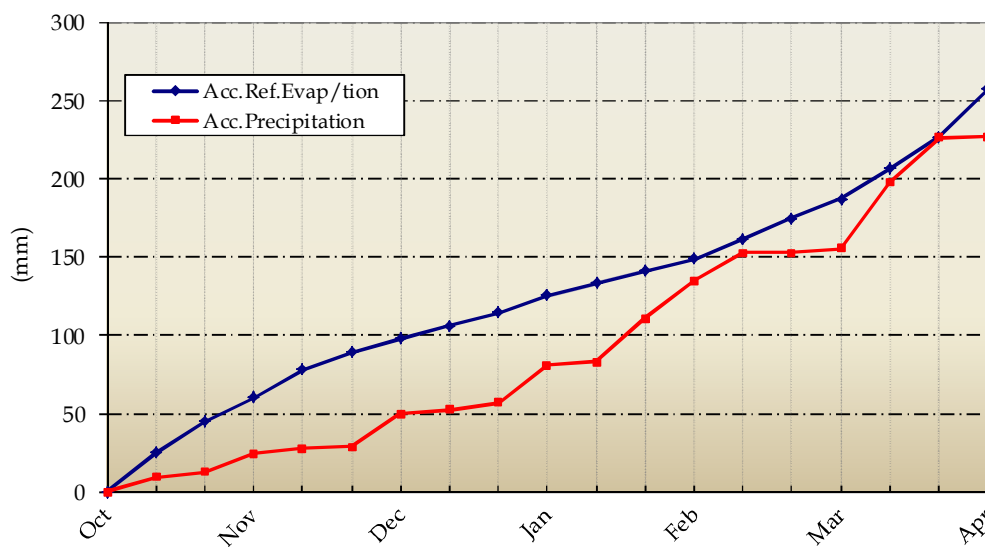


Tanagra

3rd 10-day period (21-31/03/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.8	19.8	20.0	21.6	24.1	23.4	13.4	14.1	17.0	19.9	17.0	19.3	18.1	16.7
	Min	6.9	9.1	6.7	5.9	4.0	8.4	11.1	3.3	3.5	7.3	10.4	7.0	5.9	5.4
Relative Humidity	Max	100	100	77	72	81	83	84	96	77	79	62	83	92	-
	Min	35	39	23	18	16	24	55	39	41	28	38	32	44	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		9.2	6.5	10.7	10.9	11.3	6.0	0.9	9.8	6.8	5.9	8.6	7.9	7.7	
Precipitation											0.6		0.6	15.6	12.3
Evaporation		4.9	3.3	6.0	6.5	5.0	6.5	4.0	3.0	4.0	5.0	7.0	55.2	35.1	
Growing Degrees	5	9.4	9.5	8.4	8.8	9.1	10.9	7.3	3.7	5.3	8.6	8.7	89.4	76.6	
	10	4.4	4.5	3.4	3.8	4.1	5.9	2.3	0.0	0.3	3.6	3.7	35.7	27.5	

3rd 10-day period (21-31/03/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	30.5	27.7	
Precipitation - Reference Evapotranspiration	-29.9	-12.1	12.3
Number of Rainy Days	1.0	4.0	3.6
Number of Dry Days	14.0	3.0	-

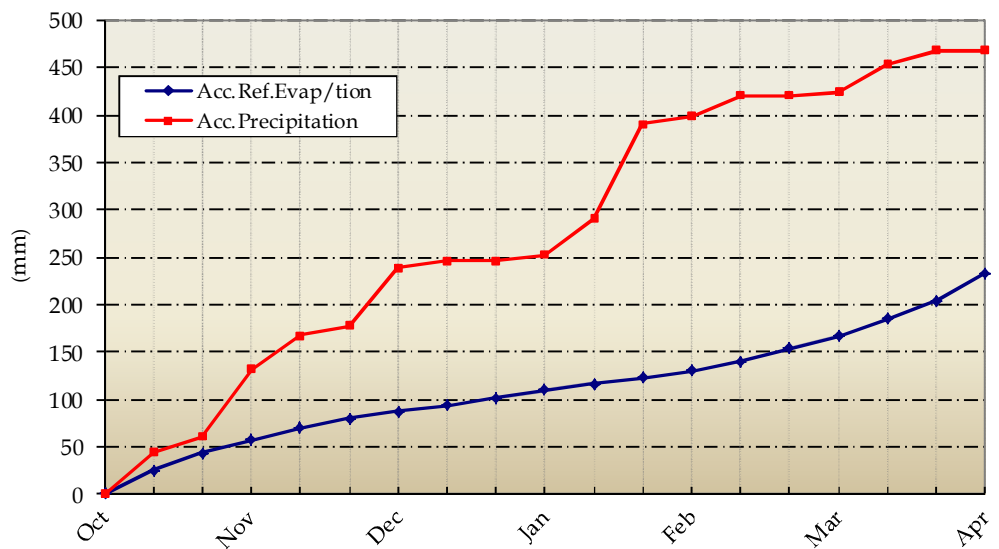
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/03/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.3	17.6	21.1	21.4	24.1	20.7	15.5	14.7	16.6	17.4	17.8	18.7	16.5	14.8
	Min	2.3	5.6	0.9	-0.4	-0.2	1.4	2.2	5.0	-1.2	6.7	8.9	2.8	2.6	3.1
Relative Humidity	Max	100	100	100	100	97	100	100	92	100	84	83	96	98	-
	Min	29	45	20	16	15	25	53	43	31	32	32	31	44	-
Soil Temperature at 10 cm	06 UTC	9.2	10.4	8.8	8.8	-	-	10.2	11.2	9.2	11.4	11.0	10.0	8.5	7.9
	12 UTC	15.6	13.6	15.2	15.8	-	-	15.6	14.6	15.4	13.2	16.6	15.1	13.3	9.5
Sunshine Duration		7.7	0.7	9.7	10.4	-	0.0	7.4	10.0	6.9	3.7	10.3	6.7	7.0	6.3
Precipitation								0.0	0.0				0.0	25.2	22.9
Evaporation		3.4	1.6	4.5	-	-	-	3.0	2.9	4.8	2.5	5.5	-	25.3	26.8
Growing Degrees	5	5.8	6.6	6.0	5.5	7.0	6.1	3.9	4.9	2.7	7.1	8.4	63.7	49.8	45.6
	10	0.8	1.6	1.0	0.5	2.0	1.1	0.0	0.0	0.0	2.1	3.4	12.3	8.4	7.9

3rd 10-day period (21-31/03/2017)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	29.1	26.1	25.6
Precipitation - Reference Evapotranspiration	-29.1	-0.9	-2.7
Number of Rainy Days	0.0	5.0	3.9
Number of Dry Days	15.0	4.0	-

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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