



# AGROMETEOROLOGICAL BULLETIN

*December 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



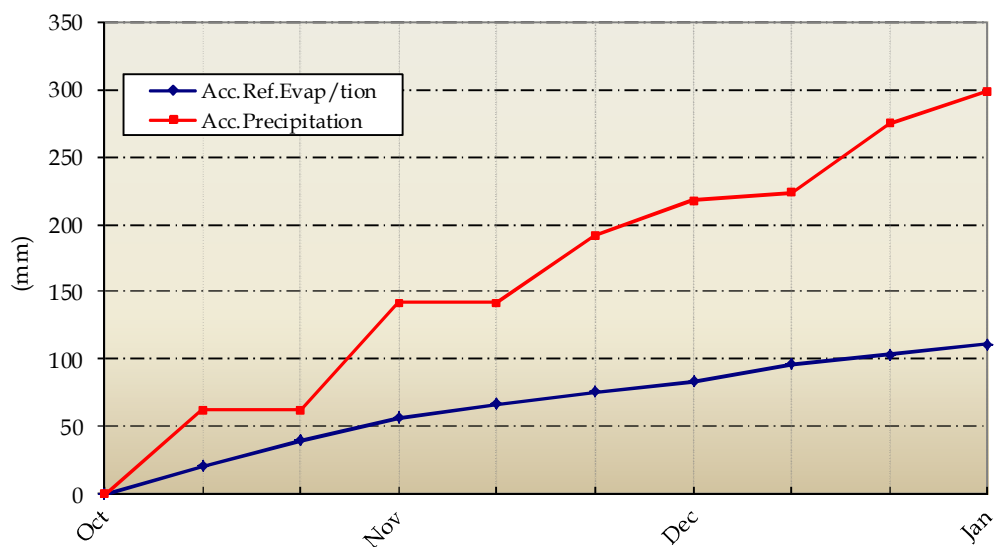
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3rd 10-day period (21-31/12/2017)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	3.8	4.6	9.0	7.8	13.2	14.4	15.6	16.2	14.4	11.0	11.0	11.0	7.1	9.8
	Min	1.6	0.0	0.6	0.0	0.0	4.0	4.6	6.6	8.0	6.4	-0.2	2.9	0.3	2.4
Relative Humidity	Max	83	75	92	92	94	97	97	91	97	97	96	92	73	-
	Min	74	44	38	63	73	72	73	80	72	82	64	67	43	-
Soil Temperature at 10 cm	06 UTC	4.6	3.2	3.8	3.0	3.0	5.6	7.0	9.0	11.0	9.4	6.4	6.0	4.2	6.0
	12 UTC	5.0	4.0	5.2	3.4	6.4	8.2	9.0	10.6	11.0	9.4	8.2	7.3	6.2	7.2
Sunshine Duration		0.0	0.0	4.4	1.0	7.7	5.4	8.1	2.7	1.2	0.0	7.4	3.4	3.5	2.6
Precipitation									0.5	13.7	9.0		23.2	5.9	24.7
Evaporation		0.0	1.8	0.0	0.0	0.0	1.5	0.5	1.0	0.6	0.0	0.0	5.4	8.0	12.0
Growing Degrees	5	0.0	0.0	0.0	0.0	1.6	4.2	5.1	6.4	6.2	3.7	0.4	27.6	1.0	24.9
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.4	1.2	0.0	0.0	2.7	0.0	4.2

3rd 10-day period (21-31/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.3	12.5	8.4
Precipitation - Reference Evapotranspiration	15.9	-6.6	16.3
Number of Rainy Days	3.0	1.0	2.9
Number of Dry Days	8.0	31.0	-

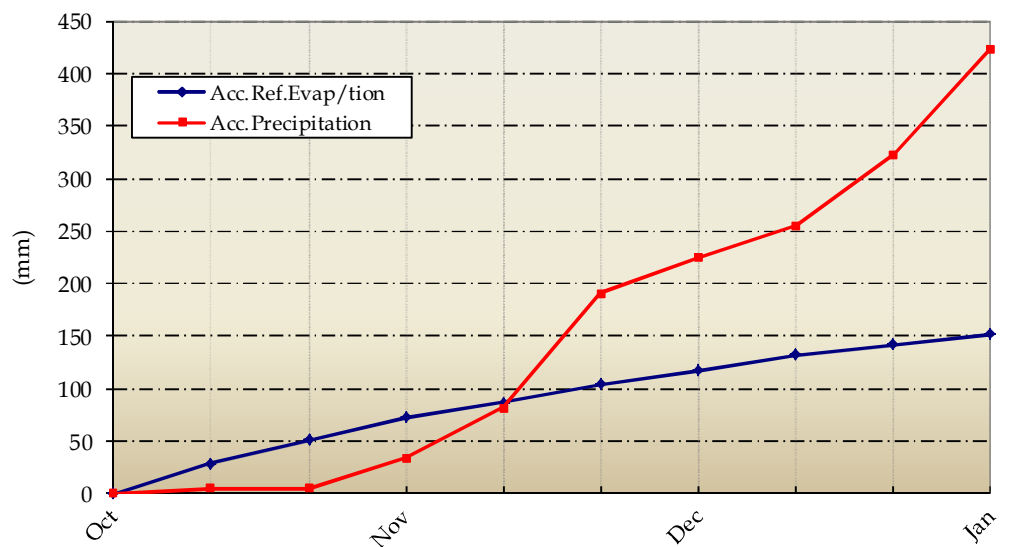
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/12/2017)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.8	7.6	12.0	13.1	16.3	17.2	15.6	15.8	14.7	13.0	12.4	13.2	12.6	14.4
	Min	6.5	6.4	5.7	0.1	4.1	7.6	9.0	10.5	8.8	5.5	1.6	6.0	0.8	6.0
Relative Humidity	Max	92	92	84	84	90	90	90	88	87	91	89	89	83	-
	Min	78	60	32	40	46	53	61	70	48	53	42	53	34	-
Soil Temperature at 10 cm	06 UTC	10.6	9.6	8.8	7.8	8.2	9.8	10.0	11.4	11.4	10.2	9.2	9.7	-	9.0
	12 UTC	10.3	9.8	9.6	9.1	9.8	11.0	12.6	12.4	11.8	10.8	10.2	10.7	-	10.5
Sunshine Duration		0.0	0.0	6.5	6.0	6.5	5.4	0.0	0.0	0.6	3.4	6.4	3.2	4.7	4.0
Precipitation		26.6	33.7					11.1	14.9	2.3	12.0		100.6	5.6	44.5
Evaporation		2.6	1.2	6.0	2.0	2.0	0.7	5.5	3.1	1.6	0.4	4.0	29.1	16.6	21.9
Growing Degrees	5	2.2	2.0	3.9	1.6	5.2	7.4	7.3	8.2	6.8	4.3	2.0	50.7	21.2	57.7
	10	0.0	0.0	0.0	0.0	0.2	2.4	2.3	3.2	1.8	0.0	0.0	9.8	0.0	13.8

3rd 10-day period (21-31/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.0	12.6	9.5
Precipitation - Reference Evapotranspiration	90.6	-7.0	35.0
Number of Rainy Days	6.0	1.0	4.8
Number of Dry Days	1.0	14.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

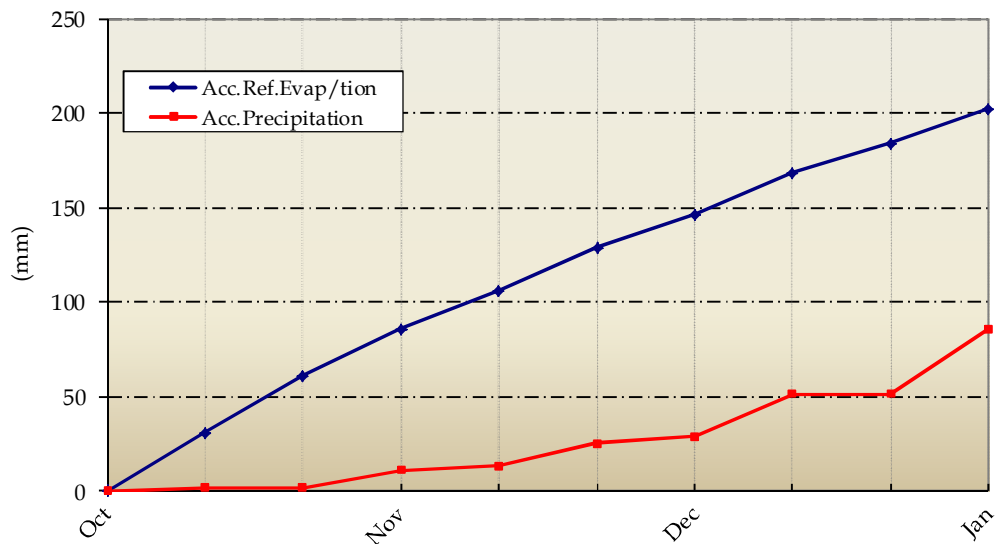


Iraklio

3rd 10-day period (21-31/12/2017)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.2	18.6	11.0	12.4	15.6	17.0	17.8	18.6	16.2	15.6	14.2	15.7	11.5	15.9
	Min	13.0	14.0	10.6	8.0	12.4	8.2	10.0	12.8	13.6	11.0	9.0	11.1	7.9	10.0
Relative Humidity	Max	72	90	90	80	86	88	82	73	88	86	89	84	87	-
	Min	59	67	58	57	62	58	61	49	49	56	55	57	59	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		0.6	0.0	0.0	0.2	6.6	6.0	5.5	5.0	1.1	5.0	3.6	3.1	1.8	3.8
Precipitation			0.1	18.8	6.1					2.0	1.8	5.7	34.5	122.7	34.5
Evaporation		0.9	1.0	0.2	0.6	4.3	0.8	4.1	3.9	0.4	3.8	0.9	20.9	30.0	28.1
Growing Degrees	5	9.1	11.3	5.8	5.2	9.0	7.6	8.9	10.7	9.9	8.3	6.6	92.4	51.3	87.3
	10	4.1	6.3	0.8	0.2	4.0	2.6	3.9	5.7	4.9	3.3	1.6	37.4	7.1	33.4

3rd 10-day period (21-31/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.4	16.8	-
Precipitation - Reference Evapotranspiration	16.1	105.9	34.5
Number of Rainy Days	6.0	11.0	4.5
Number of Dry Days	1.0	3.0	-

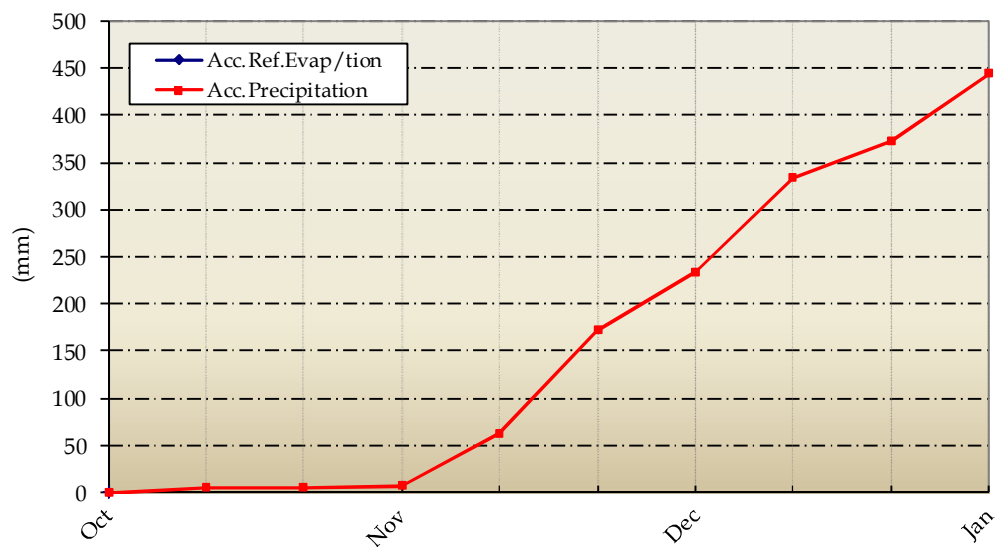
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/12/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	3.0	8.4	8.8	10.8	12.0	10.0	9.4	9.0	6.8	8.0	7.4	8.5	9.5	8.8
	Min	-6.6	-0.5	-1.0	-3.4	-4.0	-4.0	5.0	5.8	2.8	0.6	-4.0	-0.8	-5.0	0.9
Relative Humidity	Max	99	85	97	100	100	100	100	100	100	100	100	98	89	-
	Min	80	27	21	39	58	67	89	91	88	66	71	63	30	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	4.7
Sunshine Duration		0.0	0.0	6.0	5.9	5.3	3.5	0.1	0.0	0.8	3.0	4.1	2.6	5.0	2.4
Precipitation		0.0					0.4	10.8	53.2	6.9			71.3	0.0	50.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	9.0
Growing Degrees	5	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.4	0.0	0.0	0.0	4.6	-	14.1
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.9

3rd 10-day period (21-31/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	6.2
Precipitation - Reference Evapotranspiration	-	-	44.4
Number of Rainy Days	4.0	0.0	4.3
Number of Dry Days	7.0	25.0	-

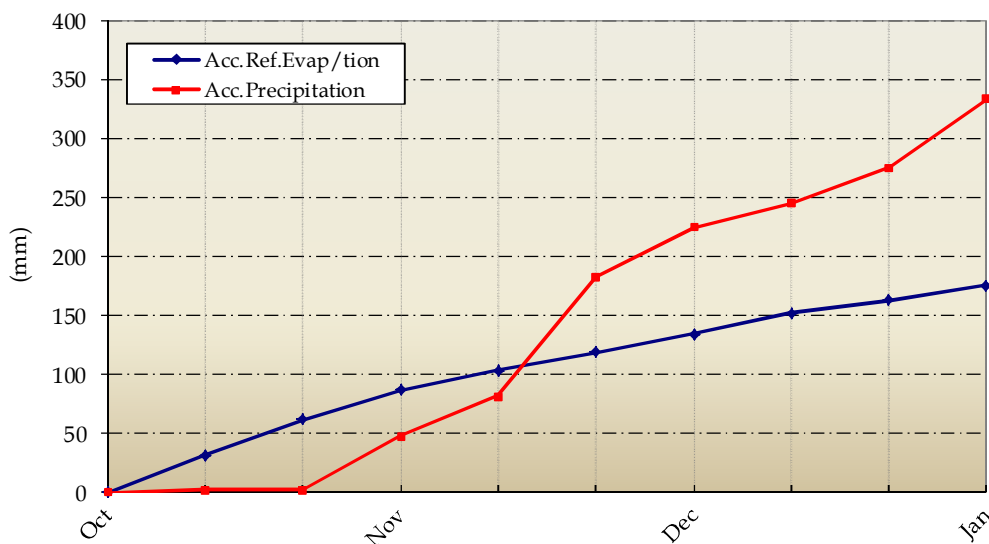
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/12/2017)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.8	11.7	11.3	14.9	17.2	18.5	14.8	15.5	13.1	14.2	16.1	14.3	14.1	15.2
	Min	7.0	6.8	7.0	-1.1	1.1	6.2	6.4	7.6	7.1	4.0	2.6	5.0	2.2	6.1
Relative Humidity	Max	90	88	80	80	91	92	93	93	93	94	88	89	79	-
	Min	65	57	41	30	40	48	76	71	78	51	28	53	29	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	10.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	10.9
Sunshine Duration		0.0	0.1	0.0	8.5	7.9	5.0	1.9	0.0	1.3	6.0	8.1	3.5	7.0	3.9
Precipitation		4.1	13.6	1.2				7.0	10.2	20.1	1.7		57.9	4.2	41.5
Evaporation		0.8	0.8	0.6	3.2	1.6	0.0	0.2	0.1	0.2	3.0	3.0	13.5	25.6	22.7
Growing Degrees	5	3.4	4.3	4.2	1.9	4.2	7.4	5.6	6.6	5.1	4.1	4.4	50.9	36.0	62.1
	10	0.0	0.0	0.0	0.0	0.0	2.4	0.6	1.6	0.1	0.0	0.0	4.6	0.2	14.5

3rd 10-day period (21-31/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.4	17.6	11.8
Precipitation - Reference Evapotranspiration	45.5	-13.4	29.7
Number of Rainy Days	7.0	2.0	4.8
Number of Dry Days	2.0	14.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

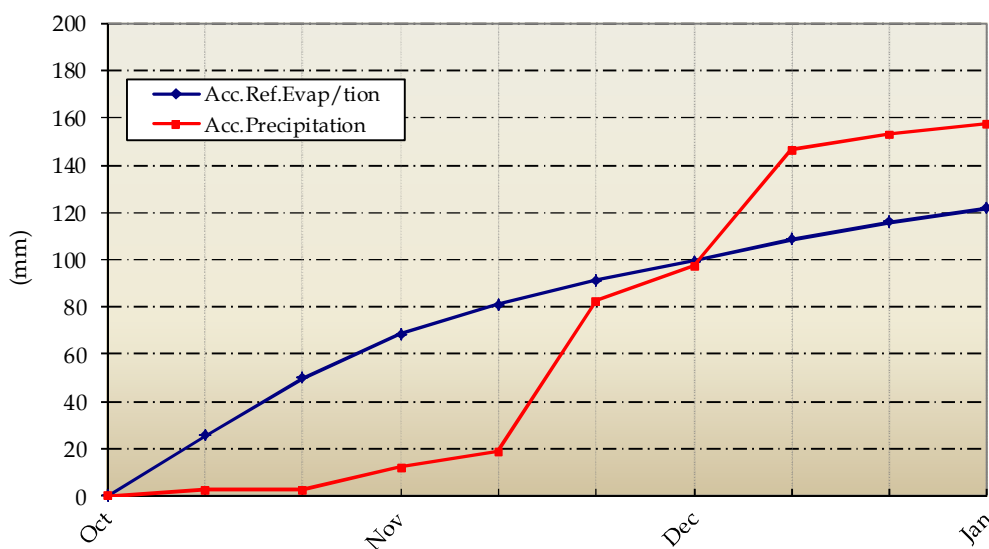


Larisa

3rd 10-day period (21-31/12/2017)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	3.0	4.0	8.4	11.1	14.2	13.2	14.4	14.0	14.0	13.6	12.0	11.1	9.1	10.0
	Min	-0.2	0.2	-2.3	-2.2	-2.9	-2.2	-1.9	3.2	4.0	-0.2	-3.2	-0.7	-2.3	1.1
Relative Humidity	Max	100	100	99	100	100	100	100	100	100	97	99	100	87	-
	Min	71	61	57	61	66	74	72	78	65	45	47	63	37	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	4.9	5.7
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	6.2	6.1
Sunshine Duration		0.0	0.0	6.7	8.2	6.5	6.8	5.8	0.0	3.9	6.3	6.8	4.6	3.9	3.0
Precipitation		3.3	0.2						0.9				4.4	3.8	14.0
Evaporation		3.2	1.8	1.3	5.0	2.8	1.2	1.7	0.2	1.7	1.0	3.0	22.9	3.9	7.2
Growing Degrees	5	0.0	0.0	0.0	0.0	0.7	0.5	1.3	3.6	4.0	1.7	0.0	11.7	3.2	18.9
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2

3rd 10-day period (21-31/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.0	9.4	6.4
Precipitation - Reference Evapotranspiration	-1.6	-5.6	7.6
Number of Rainy Days	3.0	3.0	3.0
Number of Dry Days	2.0	14.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

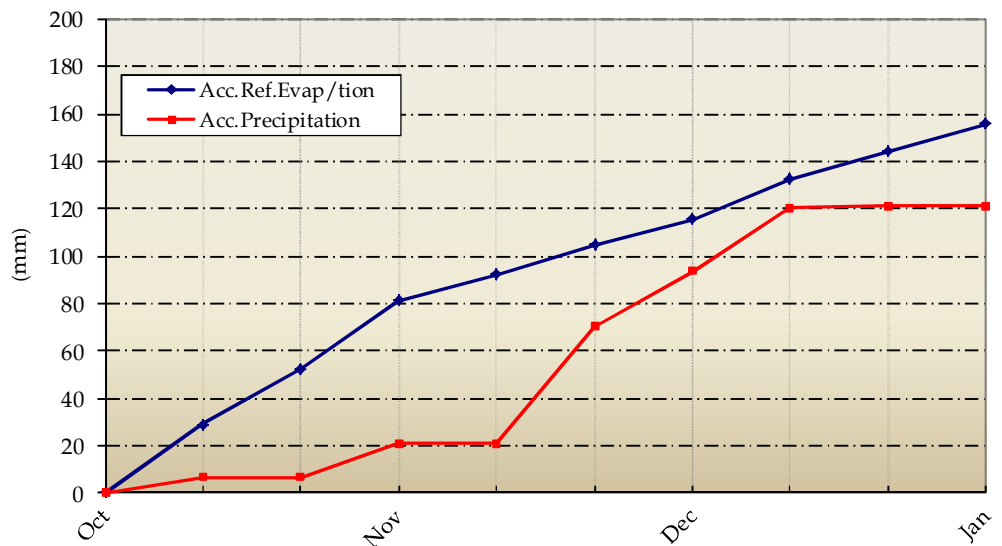


Mikra

3rd 10-day period (21-31/12/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	4.8	5.6	10.4	13.8	13.6	12.1	12.9	15.6	13.6	11.4	11.3	11.4	9.7	10.2
	Min	3.4	0.8	3.2	4.1	3.0	0.7	3.8	3.9	7.1	3.5	-1.6	2.9	0.3	2.2
Relative Humidity	Max	67	77	59	66	81	89	92	91	88	90	76	80	72	-
	Min	44	43	34	43	54	65	66	54	61	47	35	50	38	-
Soil Temperature at 10 cm	06 UTC	5.1	5.0	4.4	5.1	7.0	5.8	7.0	7.2	9.0	7.4	6.5	6.3	4.0	5.3
	12 UTC	5.2	5.4	5.2	6.4	10.0	7.2	7.6	7.6	9.0	9.6	7.6	7.3	5.5	6.8
Sunshine Duration		0.0	0.0	7.8	8.2	8.1	6.4	6.6	0.0	3.5	7.6	8.3	5.1	4.9	3.0
Precipitation		0.0							0.1				0.1	0.0	14.9
Evaporation		0.5	1.8	1.4	2.6	3.5	0.9	2.4	2.9	0.8	3.0	0.0	19.8	13.6	13.5
Growing Degrees	5	0.0	0.0	1.8	4.0	3.3	1.4	3.4	4.8	5.4	2.5	0.0	26.4	11.5	22.3
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.0	3.0

3rd 10-day period (21-31/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.9	17.0	8.7
Precipitation - Reference Evapotranspiration	-11.8	-17.0	6.2
Number of Rainy Days	1.0	0.0	3.0
Number of Dry Days	9.0	27.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



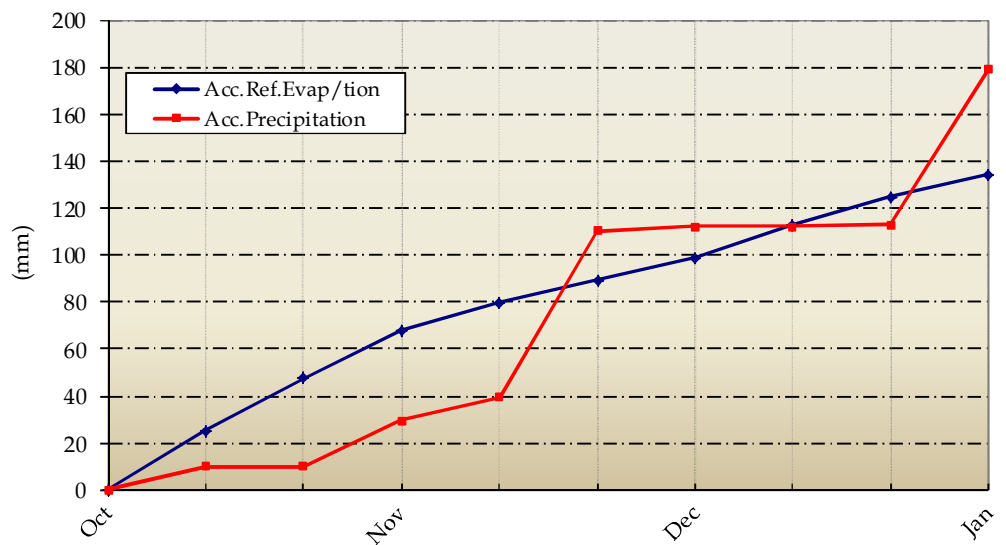


Tanagra

3rd 10-day period (21-31/12/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	3.0	2.2	8.3	10.8	16.6	15.6	16.8	16.4	14.9	13.2	12.4	11.8	8.5	13.1
	Min	2.4	0.6	1.6	4.3	1.4	0.1	2.7	9.4	9.1	4.0	1.0	3.3	3.1	4.6
Relative Humidity	Max	100	100	90	85	99	100	100	79	95	82	81	92	84	-
	Min	56	95	60	44	42	51	47	52	49	41	33	52	44	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	"
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	"
Sunshine Duration		0.0	0.0	1.9	5.4	7.2	7.1	7.1	2.8	5.8	6.5	7.5	4.7	2.8	
Precipitation		14.7	44.1	4.1	1.9				0.8	0.7			66.3	24.1	24.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	0.0	0.0	0.0	2.6	4.0	2.9	4.8	7.9	7.0	3.6	1.7	34.4	18.9	
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	2.0	0.0	0.0	4.9	0.0	

3rd 10-day period (21-31/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.6	11.3	
Precipitation - Reference Evapotranspiration	56.7	12.8	24.3
Number of Rainy Days	6.0	6.0	
Number of Dry Days	2.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

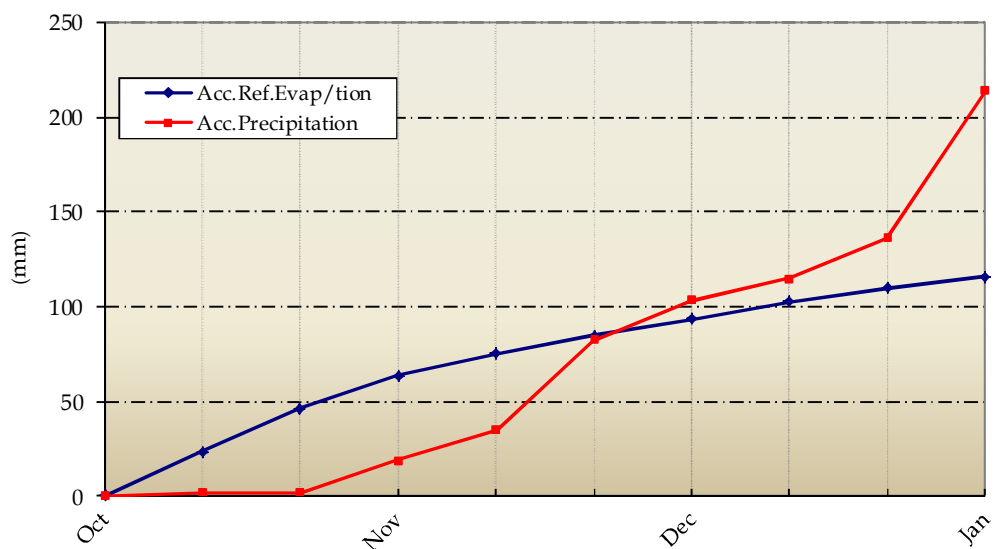


Tripoli

3rd 10-day period (21-31/12/2017)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	3.8	2.3	4.8	8.6	13.0	11.6	9.0	10.8	10.0	8.9	11.3	8.6	7.6	9.8
	Min	0.5	0.2	0.6	-5.4	-3.9	-3.6	0.6	5.6	2.7	-0.6	-4.6	-0.7	-4.1	1.5
Relative Humidity	Max	100	100	86	100	100	100	100	100	100	100	100	99	96	-
	Min	89	81	54	47	51	54	79	65	62	52	25	60	43	-
Soil Temperature at 10 cm	06 UTC	5.2	3.2	-	-	-	-	3.4	5.4	5.8	4.8	3.2	4.4	1.9	5.3
	12 UTC	5.2	3.0	-	-	-	-	5.2	6.4	7.2	-	-	5.4	3.2	6.0
Sunshine Duration		0.0	0.0	4.1	6.4	6.8	6.2	1.5	0.5	3.6	3.9	6.7	3.6	4.6	3.7
Precipitation		14.8	35.0	0.9				0.7	19.5	6.9	0.2		78.0	6.0	36.8
Evaporation		0.2	-	-	-	-	0.0	0.7	0.1	0.6	0.0	0.0	-	0.0	9.0
Growing Degrees	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	1.4	0.0	0.0	4.6	0.0	18.6
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8

3rd 10-day period (21-31/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.1	8.8	8.4
Precipitation - Reference Evapotranspiration	71.9	-2.8	28.4
Number of Rainy Days	7.0	3.0	4.5
Number of Dry Days	2.0	20.0	-

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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