



AGROMETEOROLOGICAL BULLETIN

*January 2019
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



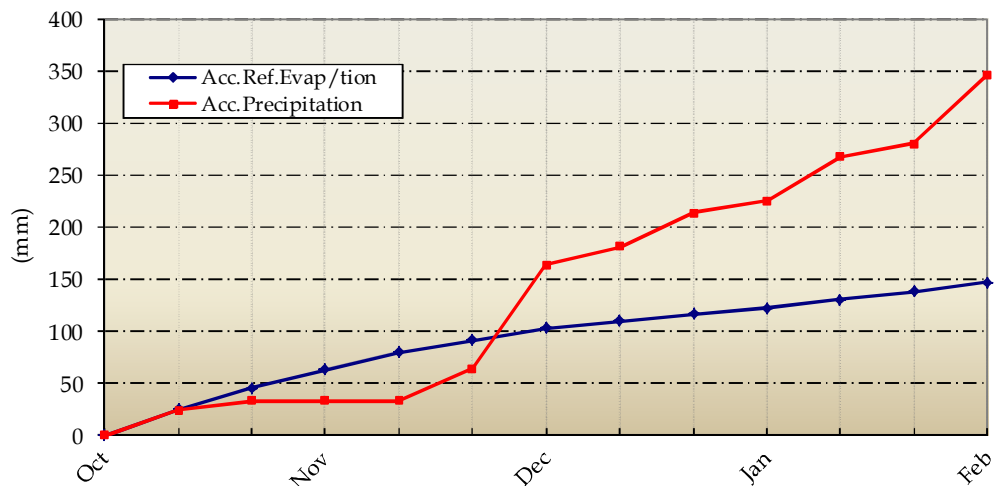
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3rd 10-day period (21-31/01/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.0	8.4	13.4	12.0	11.6	11.2	10.0	12.6	14.0	12.8	12.4	11.7	9.7	8.8
	Min	5.6	4.6	6.2	9.0	8.6	7.2	5.4	3.6	7.0	8.8	7.0	6.6	0.1	1.4
Relative Humidity	Max	94	88	92	99	98	92	85	96	93	95	94	93	88	-
	Min	79	75	84	74	73	66	59	77	83	78	76	75	49	-
Soil Temperature at 10 cm	06 UTC	7.6	6.4	7.6	7.8	8.6	8.0	7.6	6.8	9.0	9.2	8.8	7.9	3.9	4.6
	12 UTC	8.0	6.8	9.4	9.6	9.0	9.2	8.6	8.4	10.2	9.8	10.0	9.0	5.8	5.8
Sunshine Duration		0.2	0.9	0.0	0.3	0.0	1.1	2.6	0.3	0.4	0.0	1.1	0.6	6.4	3.3
Precipitation		0.0		29.9	13.9	2.2	9.0	1.4		3.9	3.6	2.3	66.2	28.0	16.6
Evaporation		2.5	2.2	0.4	2.6	2.2	2.9	1.4	0.5	0.2	0.2	0.7	15.8	5.4	10.0
Growing Degrees	5	2.8	1.5	4.8	5.5	5.1	4.2	2.7	3.1	5.5	5.8	4.7	45.7	12.4	16.7
	10	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.5	0.8	0.0	1.9	0.0	2.2

3rd 10-day period (21-31/01/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.9	11.0	10.8
Precipitation - Reference Evapotranspiration	57.3	17.0	5.8
Number of Rainy Days	8.0	2.0	2.7
Number of Dry Days	2.0	0.0	-

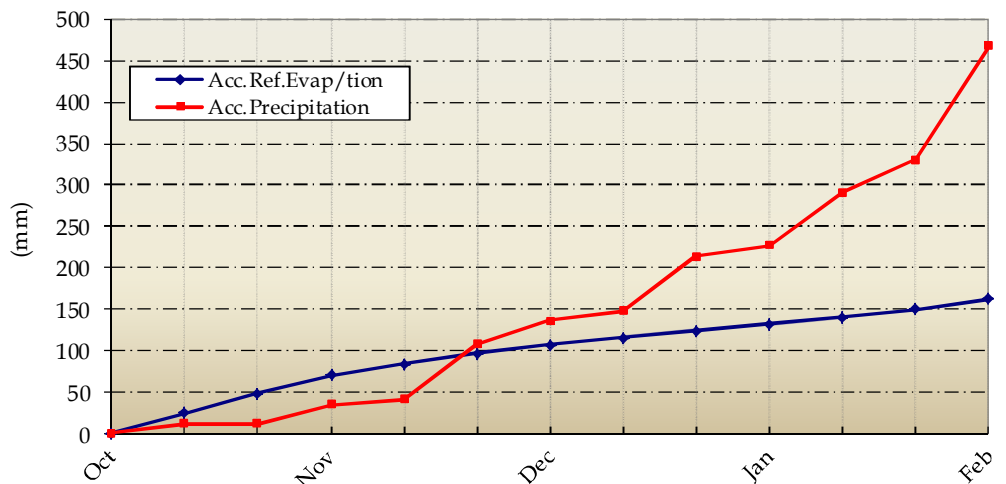
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/01/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.5	16.8	17.2	12.8	11.8	13.5	14.8	14.3	13.0	14.8	14.1	14.5	13.4	14.0
	Min	5.7	8.8	9.1	6.0	7.9	6.2	7.4	7.0	7.6	8.0	7.2	7.4	4.3	5.3
Relative Humidity	Max	99	88	96	94	98	100	90	93	100	100	100	96	85	-
	Min	53	54	50	71	69	61	50	65	89	50	51	60	52	-
Soil Temperature at 10 cm	06 UTC	9.0	10.6	10.4	9.8	10.0	9.4	10.4	10.2	10.6	8.6	10.4	9.9	9.0	8.6
	12 UTC	10.0	13.4	13.0	12.8	12.0	13.0	10.8	11.0	11.6	13.0	10.6	11.9	10.4	10.2
Sunshine Duration		5.5	5.5	0.0	1.6	0.0	3.5	6.7	2.2	0.0	5.3	5.1	3.2	5.9	4.8
Precipitation		0.2	6.2	32.3	7.0	16.0	8.2	0.4	2.4	42.4	8.7	13.3	137.1	21.8	33.1
Evaporation		0.8	1.0	0.3	0.7	0.5	0.2	1.0	0.3	0.0	0.0	0.8	5.6	23.3	18.6
Growing Degrees	5	6.1	7.8	8.2	4.4	4.9	4.9	6.1	5.7	5.3	6.4	5.7	65.3	42.1	51.2
	10	1.1	2.8	3.2	0.0	0.0	0.0	1.1	0.7	0.3	1.4	0.7	11.2	5.4	9.9

3rd 10-day period (21-31/01/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.0	13.4	11.9
Precipitation - Reference Evapotranspiration	125.1	8.4	21.2
Number of Rainy Days	11.0	2.0	4.6
Number of Dry Days	0.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

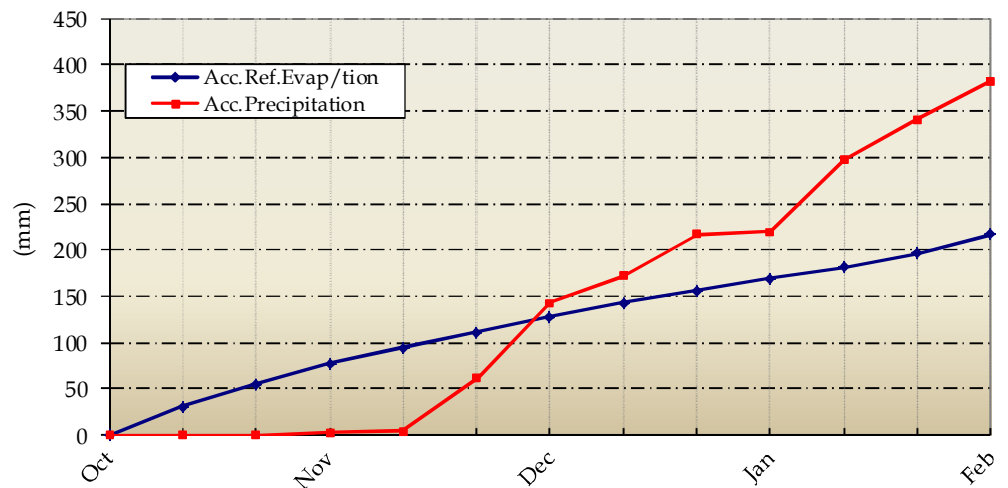


Iraklio

3rd 10-day period (21-31/01/2019)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.8	18.0	18.4	15.4	16.8	16.0	15.0	16.0	18.2	15.6	14.4	16.3	13.8	15.0
	Min	9.2	8.6	12.6	11.4	12.4	10.8	8.6	8.0	12.2	11.4	11.6	10.6	9.7	8.9
Relative Humidity	Max	100	91	78	87	84	86	85	79	67	83	90	85	86	-
	Min	67	49	52	54	51	59	54	56	40	53	60	54	65	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		7.5	8.3	5.9	3.3	0.0	2.8	7.4	6.6	7.8	4.4	2.4	5.1	4.6	4.0
Precipitation		11.0			4.1	5.2	11.4	0.2			1.0	8.4	41.3	4.5	25.2
Evaporation		1.3	1.8	0.7	1.0	3.4	3.1	1.0	9.0	3.3	0.0	0.7	25.3	28.2	29.5
Growing Degrees	5	7.5	8.3	10.5	8.4	9.6	8.4	6.8	7.0	10.2	8.5	8.0	93.2	74.4	76.7
	10	2.5	3.3	5.5	3.4	4.6	3.4	1.8	2.0	5.2	3.5	3.0	38.2	20.7	23.4

3rd 10-day period (21-31/01/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	21.3	18.7	-
Precipitation - Reference Evapotranspiration	20.0	-14.2	25.2
Number of Rainy Days	7.0	4.0	4.4
Number of Dry Days	0.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

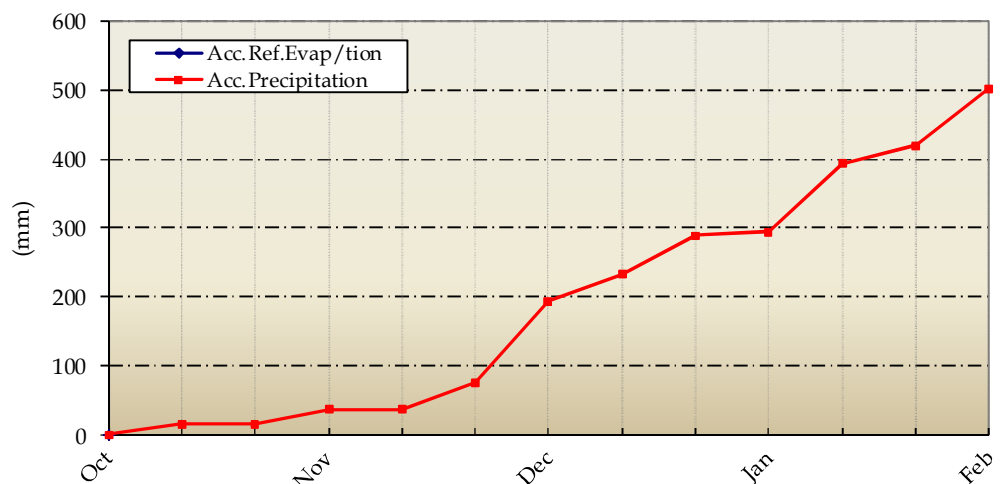


Ioannina

3rd 10-day period (21-31/01/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	6.6	8.0	5.8	8.6	9.8	9.2	9.8	8.6	7.8	6.2	5.4	7.8	10.6	9.3
	Min	-0.6	5.0	4.4	0.8	5.2	1.0	-2.6	6.0	3.0	2.2	1.6	2.4	-2.0	0.7
Relative Humidity	Max	100	100	100	100	100	96	100	100	97	100	100	99	99	-
	Min	88	83	94	70	72	69	50	87	80	91	90	79	54	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	3.7
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	4.6
Sunshine Duration		1.6	0.0	0.0	5.6	1.3	4.3	6.1	0.4	0.0	0.0	0.8	1.8	4.6	3.1
Precipitation			20.9	34.8	13.8	5.9			2.0	3.4	1.6	0.7	83.1	12.3	37.2
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	8.0
Growing Degrees	5	0.0	1.5	0.1	0.0	2.5	0.1	0.0	2.3	0.4	0.0	0.0	6.9	2.2	13.3
	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	0.4

3rd 10-day period (21-31/01/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	8.6
Precipitation - Reference Evapotranspiration	-	-	28.6
Number of Rainy Days	8.0	2.0	4.3
Number of Dry Days	1.0	0.0	-

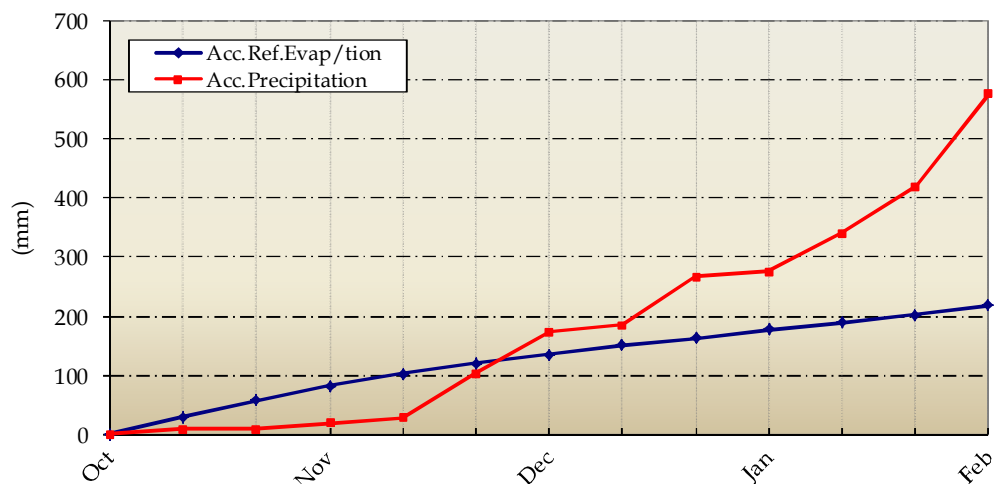
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/01/2019)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.2	15.0	16.4	14.1	13.0	13.8	14.3	14.8	16.9	13.6	15.4	15.0	15.3	14.8
	Min	4.4	7.4	9.3	5.2	9.2	7.6	5.2	5.4	10.4	8.5	8.6	7.4	3.9	5.3
Relative Humidity	Max	94	93	93	93	91	92	92	92	91	93	91	92	88	-
	Min	48	69	60	64	70	63	51	46	56	64	41	57	42	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	9.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	10.3
Sunshine Duration		6.8	0.0	0.5	2.3	0.0	2.7	5.9	1.6	1.0	4.3	5.8	2.8	7.7	4.4
Precipitation		10.5	29.7	8.6	17.9	45.6	6.1	0.2	7.6	8.2	14.5	7.5	156.4	7.1	36.5
Evaporation		0.4	0.9	0.0	3.9	0.0	0.3	1.0	0.0	0.3	0.0	0.1	6.9	26.5	21.4
Growing Degrees	5	5.8	6.2	7.9	4.7	6.1	5.7	4.8	5.1	8.7	6.1	7.0	67.9	50.2	55.6
	10	0.8	1.2	2.9	0.0	1.1	0.7	0.0	0.1	3.7	1.1	2.0	13.5	5.9	9.3

3rd 10-day period (21-31/01/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.6	17.5	13.4
Precipitation - Reference Evapotranspiration	140.8	-10.4	23.1
Number of Rainy Days	11.0	2.0	4.7
Number of Dry Days	0.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

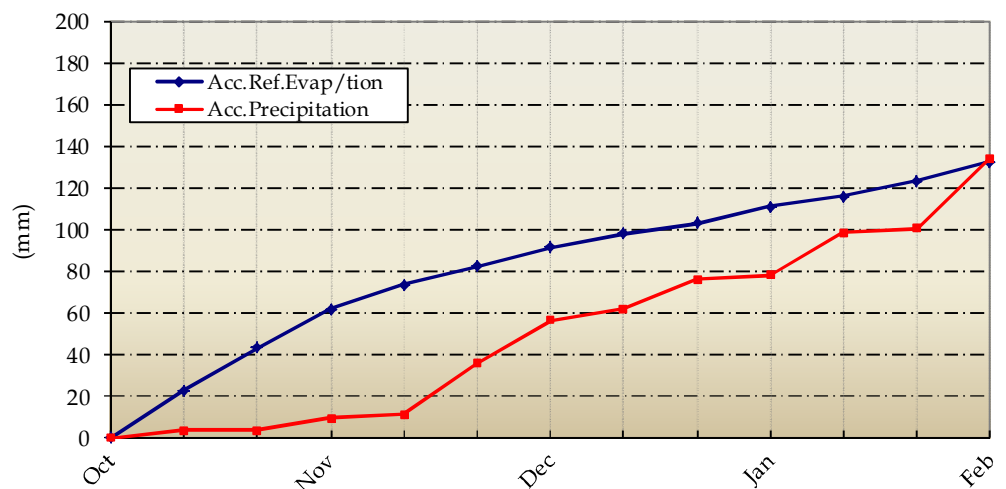


Larisa

3rd 10-day period (21-31/01/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.9	14.0	9.6	14.2	13.2	10.5	11.8	11.2	13.6	12.2	13.2	12.4	11.4	10.7
	Min	0.4	6.4	1.4	3.6	8.6	5.7	-0.2	0.0	5.6	4.7	4.6	3.7	-0.7	1.2
Relative Humidity	Max	100	99	80	87	99	93	85	83	99	100	98	93	96	-
	Min	60	66	70	61	83	60	77	63	89	77	46	68	55	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	5.5
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	6.2
Sunshine Duration		5.8	0.3	7.2	3.0	0.0	1.7	5.0	6.5	0.0	8.4	4.3	3.8	6.2	3.5
Precipitation			5.3	0.5	0.1	16.5	0.3	0.3	0.0	7.4	0.3	2.9	33.6	3.8	10.7
Evaporation		2.3	1.5	1.0	0.4	0.1	0.3	2.4	0.5	0.6	0.6	1.3	11.0	14.8	7.0
Growing Degrees	5	1.7	5.2	0.5	3.9	5.9	3.1	0.8	0.6	4.6	3.5	3.9	33.6	9.8	18.5
	10	0.0	0.2	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.5

3rd 10-day period (21-31/01/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.1	9.5	8.6
Precipitation - Reference Evapotranspiration	24.5	-5.7	2.1
Number of Rainy Days	9.0	2.0	3.0
Number of Dry Days	9.0	5.0	-

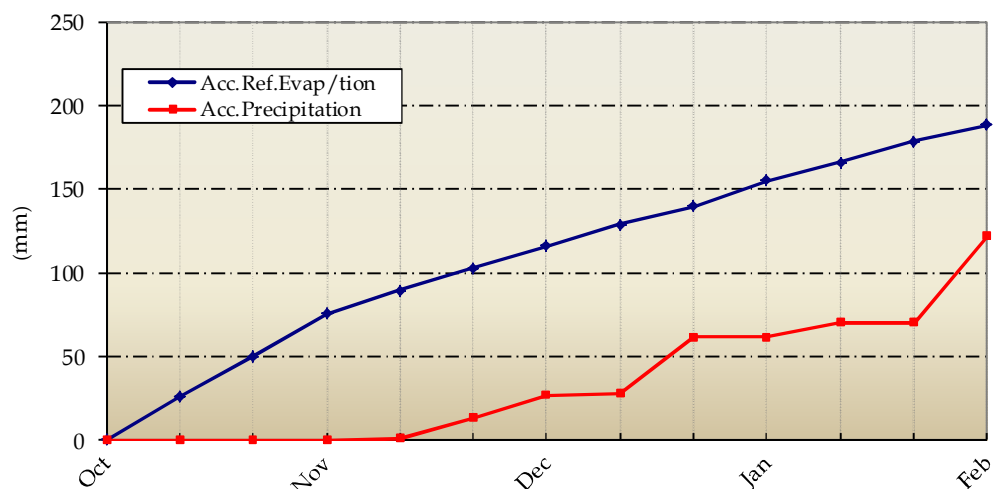
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/01/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.4	12.0	10.4	14.0	13.8	11.2	10.2	8.8	12.8	14.2	9.6	11.9	10.9	9.8
	Min	1.6	7.2	5.2	8.0	6.8	3.2	3.0	3.0	5.0	8.6	4.6	5.1	0.3	1.9
Relative Humidity	Max	100	94	100	85	95	94	90	94	97	100	100	95	81	-
	Min	64	71	68	50	73	70	48	81	75	72	84	69	47	-
Soil Temperature at 10 cm	06 UTC	6.0	7.4	7.0	8.0	8.4	6.4	4.8	5.5	6.2	8.0	8.0	6.9	5.1	5.1
	12 UTC	7.2	8.0	8.0	9.0	10.0	6.0	6.5	6.6	7.5	9.8	8.4	7.9	5.8	6.5
Sunshine Duration		4.4	0.0	0.0	7.9	0.0	0.0	8.3	0.2	0.0	2.5	1.6	2.3	6.7	3.5
Precipitation			2.1	9.8	0.6	12.7	13.7			1.1	11.4	0.2	51.6	5.6	11.8
Evaporation		1.3	0.1	0.8	0.8	0.2	0.5	4.0	4.0	0.6	0.1	0.1	12.5	8.6	12.6
Growing Degrees	5	2.5	4.6	2.8	6.0	5.3	2.2	1.6	0.9	3.9	6.4	2.1	38.3	13.2	18.0
	10	0.0	0.0	0.0	1.0	0.3	0.0	0.0	0.0	0.0	1.4	0.0	2.7	0.0	1.5

3rd 10-day period (21-31/01/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.9	12.9	9.9
Precipitation - Reference Evapotranspiration	41.7	-7.3	1.9
Number of Rainy Days	8.0	1.0	3.3
Number of Dry Days	11.0	3.0	-

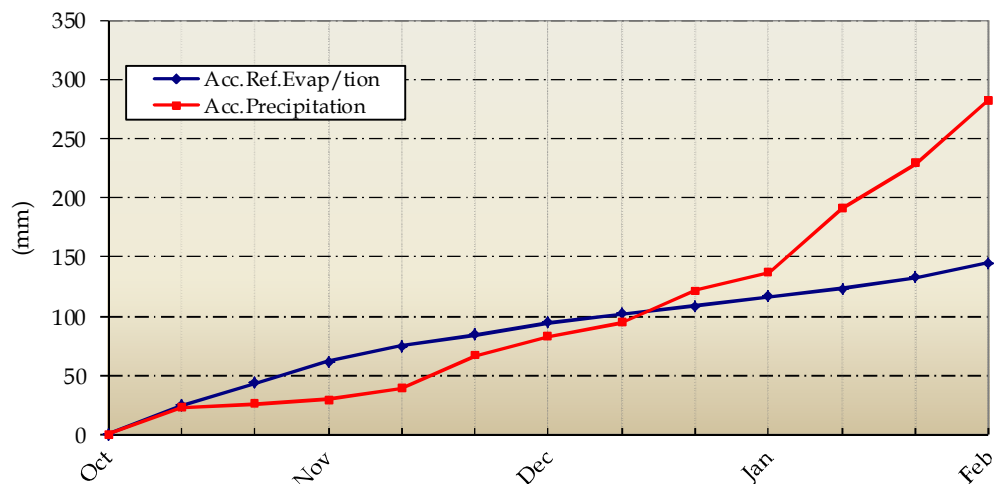
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/01/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.3	15.2	15.5	15.1	11.6	11.4	12.7	15.0	16.7	14.7	13.6	14.2	11.6	11.7
	Min	3.5	3.3	10.8	6.4	8.9	7.2	3.0	2.0	11.7	7.6	5.8	6.4	2.1	3.1
Relative Humidity	Max	100	100	75	97	100	100	99	100	72	96	78	92	95	-
	Min	59	56	56	38	69	61	48	46	41	37	42	50	49	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		7.4	4.9	1.4	7.4	0.0	3.2	7.7	6.8	3.7	7.2	2.5	4.7	4.8	
Precipitation			0.7	3.1	6.3	28.9	12.0				1.8	0.5	53.3	19.5	24.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	3.9	4.3	8.2	5.8	5.3	4.3	2.9	3.5	9.2	6.2	4.7	58.0	23.4	
	10	0.0	0.0	3.2	0.8	0.3	0.0	0.0	0.0	4.2	1.2	0.0	9.5	1.9	

3rd 10-day period (21-31/01/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.9	10.9	
Precipitation - Reference Evapotranspiration	40.4	8.6	24.3
Number of Rainy Days	7.0	3.0	5.1
Number of Dry Days	1.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

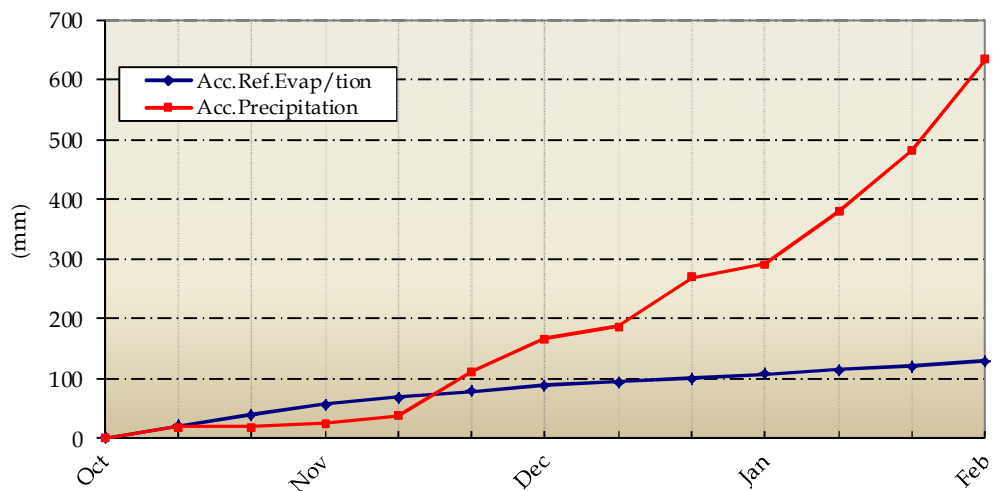


Tripoli

3rd 10-day period (21-31/01/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.2	9.1	12.3	9.6	6.8	9.0	10.0	10.9	12.3	9.9	8.3	10.1	11.6	9.8
	Min	0.9	0.1	4.7	0.6	3.0	0.4	-0.4	-0.2	5.2	3.8	3.2	1.9	-2.1	0.9
Relative Humidity	Max	100	100	100	100	100	100	100	100	99	97	96	99	100	-
	Min	45	76	51	58	81	61	57	64	53	57	51	59	38	-
Soil Temperature at 10 cm	06 UTC	3.4	3.6	5.8	4.2	5.2	4.0	3.6	4.2	6.4	6.0	5.4	4.7	3.8	4.6
	12 UTC	6.8	-	-	-	-	-	-	-	-	-	-	6.8	5.3	5.4
Sunshine Duration		4.5	1.7	2.3	3.0	0.0	2.8	5.3	2.4	2.1	3.7	3.6	2.9	6.7	4.0
Precipitation		1.2	6.9	25.9	15.3	58.8	15.4	0.0	2.4	5.7	10.8	10.5	152.9	4.3	32.5
Evaporation		0.6	0.3	1.6	-	0.4	1.1	1.6	0.1	1.5	0.2	1.5	-	2.2	8.6
Growing Degrees	5	2.1	0.0	3.5	0.1	0.0	0.0	0.0	0.4	3.8	1.9	0.8	12.4	9.3	14.3
	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	0.9

3rd 10-day period (21-31/01/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.7	10.6	11.0
Precipitation - Reference Evapotranspiration	144.2	-6.3	21.5
Number of Rainy Days	10.0	3.0	4.6
Number of Dry Days	0.0	2.0	-

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.

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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