



# AGROMETEOROLOGICAL BULLETIN

*October 2018  
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



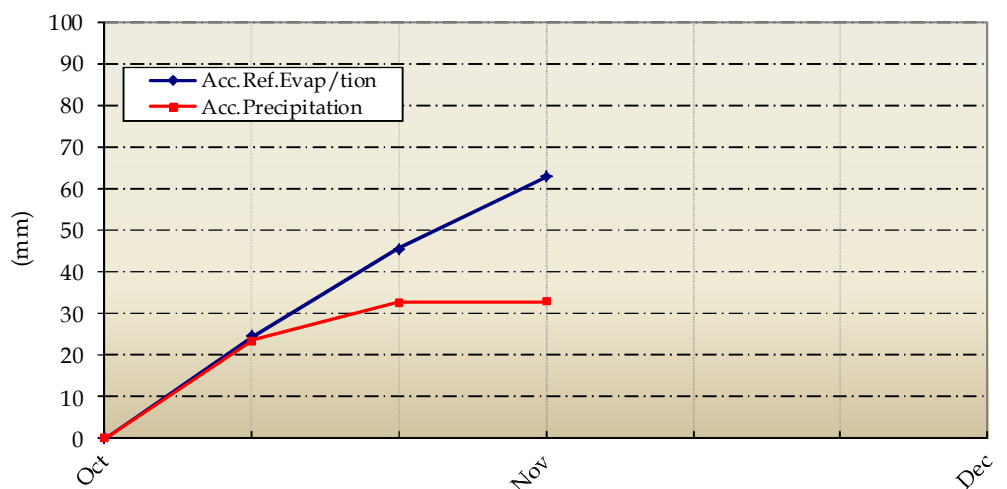
Hellenic National Meteorological Service  
Division of Climatology-Applications  
El. Venizelou Street 14, 16777  
Helliniko, Athens

*Web addresses of HNMS*  
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3rd 10-day period (21-31/10/2018)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.6	20.4	16.8	19.6	15.6	19.4	21.6	20.0	22.0	21.4	21.2	19.9	18.6	17.4
	Min	8.2	11.8	13.6	7.8	3.6	4.2	7.8	14.6	13.0	11.6	13.2	9.9	8.0	8.0
Relative Humidity	Max	95	88	74	94	70	85	87	88	93	97	95	88	94	-
	Min	63	43	59	60	26	41	46	71	60	70	73	56	55	-
Soil Temperature at 10 cm	06 UTC	15.0	15.4	15.6	13.6	13.2	11.0	13.6	16.0	16.0	16.2	26.6	15.7	13.6	12.7
	12 UTC	17.2	17.6	16.0	17.6	16.2	16.2	17.6	18.0	19.4	19.0	19.6	17.7	16.1	15.2
Sunshine Duration		6.5	5.1	0.0	6.2	9.6	9.6	7.5	1.0	7.7	4.2	7.1	5.9	6.1	5.2
Precipitation				0.1									0.1	79.9	22.3
Evaporation		2.5	3.6	1.7	3.0	6.8	3.3	3.5	1.2	2.0	2.7	1.3	31.6	33.9	41.1
Growing Degrees	5	9.4	11.1	10.2	8.7	4.6	6.8	9.7	12.3	12.5	11.5	12.2	109.0	91.6	85.3
	10	4.4	6.1	5.2	3.7	0.0	1.8	4.7	7.3	7.5	6.5	7.2	54.4	37.9	34.4

3rd 10-day period (21-31/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.2	16.4	20.4
Precipitation - Reference Evapotranspiration	-17.1	63.5	1.9
Number of Rainy Days	1.0	6.0	2.2
Number of Dry Days	2.0	14.0	-

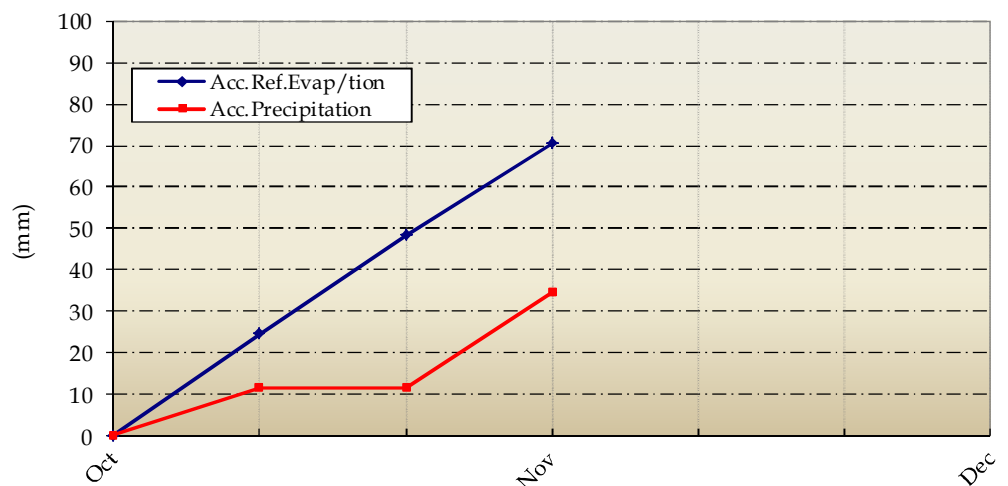
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/10/2018)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.9	20.6	24.0	23.4	22.2	24.5	24.6	24.2	25.0	25.4	26.4	24.2	21.9	21.5
	Min	12.0	14.3	14.5	12.8	12.0	7.4	15.2	13.2	15.3	14.1	15.7	13.3	11.5	11.4
Relative Humidity	Max	98	96	100	93	89	82	92	92	87	94	100	93	87	-
	Min	44	49	46	37	13	37	60	47	47	50	56	44	47	-
Soil Temperature at 10 cm	06 UTC	19.8	19.8	19.0	18.2	18.8	17.2	18.0	18.6	18.4	18.8	19.4	18.7	17.7	16.1
	12 UTC	21.6	20.0	19.6	19.4	19.2	19.4	19.8	19.8	20.0	20.0	21.0	20.0	19.8	18.7
Sunshine Duration		8.5	0.0	1.5	9.7	10.2	9.3	8.3	6.8	6.8	5.0	7.6	6.7	7.0	6.3
Precipitation			1.7	21.4									23.1	29.3	50.1
Evaporation		1.2	0.0	1.2	8.2	4.0	4.0	4.1	3.4	3.0	2.2	2.0	33.3	39.3	31.6
Growing Degrees	5	14.0	12.5	14.3	13.1	12.1	11.0	14.9	13.7	15.2	14.8	16.1	151.4	129.0	126.2
	10	9.0	7.5	9.3	8.1	7.1	6.0	9.9	8.7	10.2	9.8	11.1	96.4	74.0	71.3

3rd 10-day period (21-31/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.1	20.9	18.7
Precipitation - Reference Evapotranspiration	1.0	8.4	31.4
Number of Rainy Days	2.0	5.0	3.7
Number of Dry Days	13.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

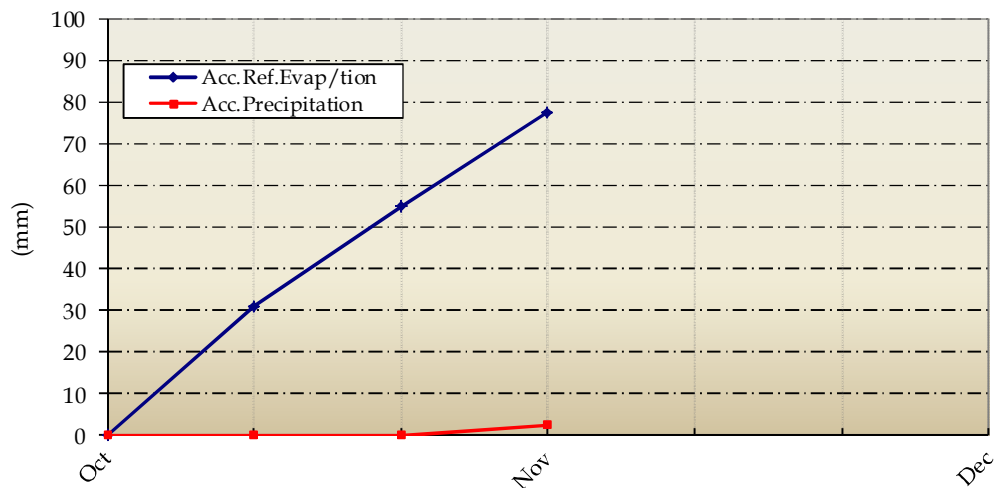


Iraklio

3rd 10-day period (21-31/10/2018)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.0	22.4	25.8	20.6	19.0	20.2	23.4	25.0	23.8	23.6	23.4	22.7	22.5	21.6
	Min	19.8	15.4	17.4	17.0	15.4	11.4	12.0	15.6	15.0	17.8	15.8	15.7	15.6	15.6
Relative Humidity	Max	90	91	93	94	95	83	90	93	89	94	96	92	86	-
	Min	69	75	64	79	62	59	48	61	69	68	81	67	59	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		6.6	6.7	4.1	0.0	0.8	9.4	9.6	9.3	9.3	4.6	5.9	6.0	5.5	5.7
Precipitation				0.0	2.5								2.5	9.1	29.2
Evaporation		2.1	5.3	2.5	1.0	2.5	4.8	1.9	3.1	5.4	0.8	1.1	30.5	27.8	48.8
Growing Degrees	5	16.4	13.9	16.6	13.8	12.2	10.8	12.7	15.3	14.4	15.7	14.6	156.4	154.3	149.6
	10	11.4	8.9	11.6	8.8	7.2	5.8	7.7	10.3	9.4	10.7	9.6	101.4	99.3	94.6

3rd 10-day period (21-31/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.6	24.8	-
Precipitation - Reference Evapotranspiration	-20.1	-15.7	29.2
Number of Rainy Days	1.0	2.0	3.0
Number of Dry Days	24.0	17.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

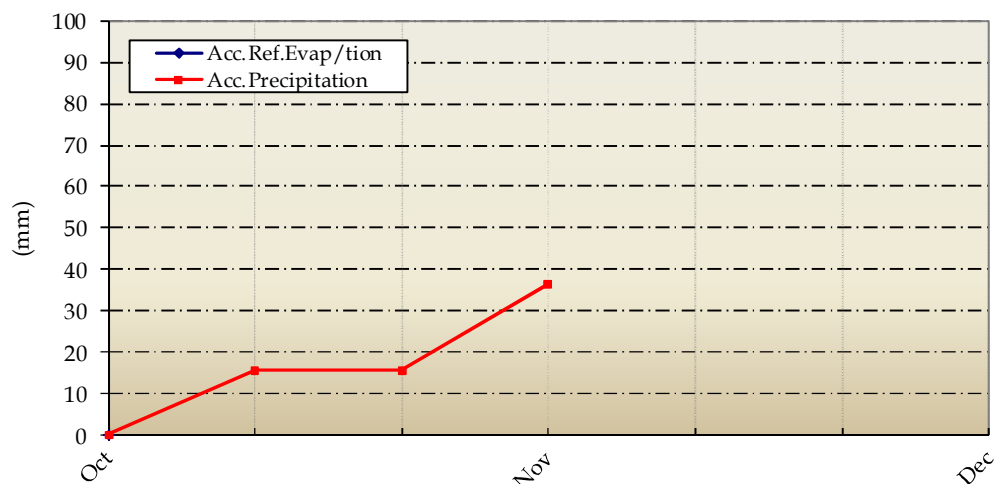


Ioannina

3rd 10-day period (21-31/10/2018)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.4	19.6	17.6	20.0	18.0	20.0	21.6	20.6	21.0	20.4	24.0	20.3	19.5	17.6
	Min	8.4	9.0	9.0	5.6	5.6	0.2	12.0	15.0	15.0	14.6	14.6	9.9	5.5	7.0
Relative Humidity	Max	93	100	85	100	94	100	89	100	98	96	96	96	98	-
	Min	48	52	42	40	17	33	46	55	44	53	58	44	43	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	11.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	13.8
Sunshine Duration		2.7	1.8	0.0	7.8	7.4	7.4	4.0	4.1	1.5	0.6	5.8	3.9	5.0	4.6
Precipitation		0.3	0.8	10.8					1.6		0.2	7.2	20.9	2.5	37.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	18.9
Growing Degrees	5	9.4	9.3	8.3	7.8	6.8	5.1	11.8	12.8	13.0	12.5	14.3	111.1	82.7	81.3
	10	4.4	4.3	3.3	2.8	1.8	0.1	6.8	7.8	8.0	7.5	9.3	56.1	29.2	30.0

3rd 10-day period (21-31/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	14.7
Precipitation - Reference Evapotranspiration	-	-	22.9
Number of Rainy Days	6.0	2.0	3.8
Number of Dry Days	12.0	15.0	-

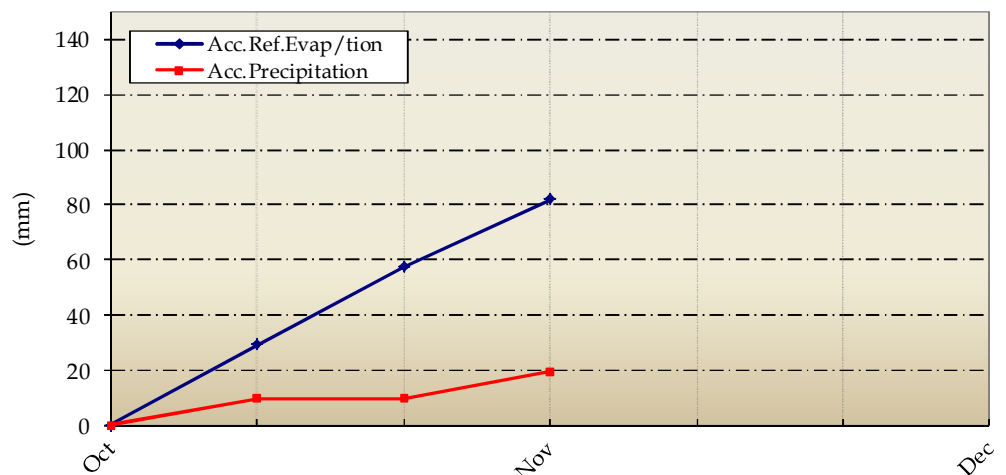
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/10/2018)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.4	20.6	21.5	26.8	25.2	23.4	24.0	23.8	24.2	24.7	27.1	24.2	23.3	22.3
	Min	15.7	14.4	14.6	15.4	12.9	9.8	11.0	13.3	13.7	13.6	17.4	13.8	11.3	11.5
Relative Humidity	Max	90	91	91	86	89	90	90	92	89	90	92	90	88	-
	Min	54	65	64	40	29	42	58	51	47	52	49	50	41	-
Soil Temperature at 10 cm	06 UTC	20.4	20.0	19.4	18.6	17.8	17.6	17.6	18.6	18.6	18.6	19.6	18.8	-	16.7
	12 UTC	22.4	20.6	19.4	20.6	20.2	20.4	20.6	20.6	20.8	20.4	21.6	20.7	-	18.5
Sunshine Duration		5.8	0.3	0.0	8.7	9.5	8.1	5.2	8.9	8.0	2.9	7.8	5.9	6.8	5.9
Precipitation		0.0	0.2	9.4								0.1	9.7	45.5	43.6
Evaporation		1.9	2.8	6.5	4.0	5.0	5.2	5.7	4.0	2.8	1.1	4.0	43.0	29.4	36.3
Growing Degrees	5	15.6	12.5	13.1	16.1	14.1	11.6	12.5	13.6	14.0	14.2	17.3	154.3	135.6	130.7
	10	10.6	7.5	8.1	11.1	9.1	6.6	7.5	8.6	9.0	9.2	12.3	99.3	80.6	75.7

3rd 10-day period (21-31/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	24.4	24.9	21.6
Precipitation - Reference Evapotranspiration	-14.7	20.6	22.0
Number of Rainy Days	3.0	4.0	3.7
Number of Dry Days	12.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

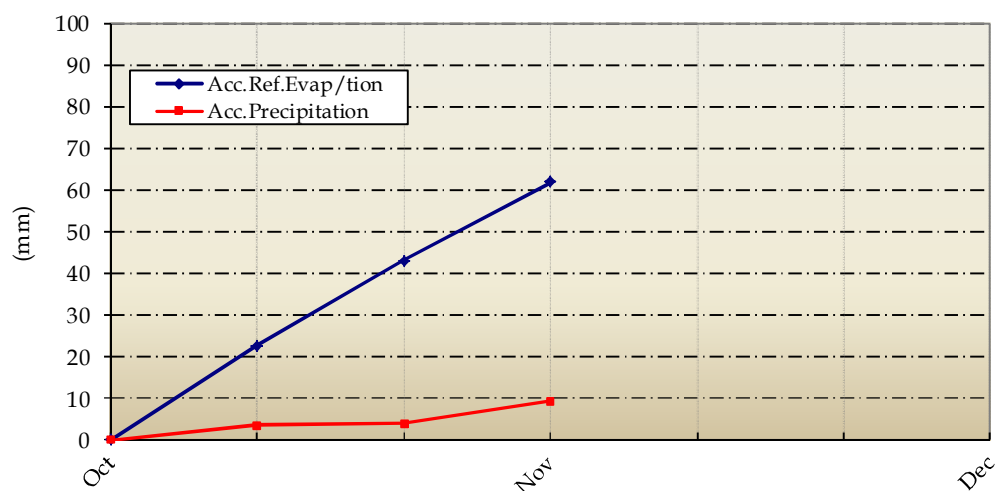


Larisa

3rd 10-day period (21-31/10/2018)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.4	17.5	16.6	21.6	18.8	21.8	25.4	24.2	23.6	22.6	25.9	21.8	20.1	18.9
	Min	12.1	13.8	14.0	7.2	9.9	1.0	4.8	9.5	11.0	11.3	12.2	9.7	7.6	8.3
Relative Humidity	Max	95	97	97	99	73	80	96	95	95	97	98	93	88	-
	Min	47	75	66	50	15	24	39	52	52	61	51	48	36	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	14.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	15.6
Sunshine Duration		2.7	2.7	0.0	6.8	8.0	7.9	6.5	5.1	4.0	2.3	6.1	4.7	4.5	4.4
Precipitation		0.1	2.2	3.2									5.5	9.9	23.9
Evaporation		1.3	1.8	1.6	3.8	2.7	3.2	3.6	4.5	2.9	1.5	3.2	30.1	34.8	24.8
Growing Degrees	5	11.8	10.7	10.3	9.4	9.4	6.4	10.1	11.9	12.3	12.0	14.1	118.1	97.6	94.1
	10	6.8	5.7	5.3	4.4	4.4	1.4	5.1	6.9	7.3	7.0	9.1	63.1	42.6	41.5

3rd 10-day period (21-31/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.8	18.7	16.4
Precipitation - Reference Evapotranspiration	-13.3	-8.8	7.5
Number of Rainy Days	3.0	4.0	3.5
Number of Dry Days	6.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

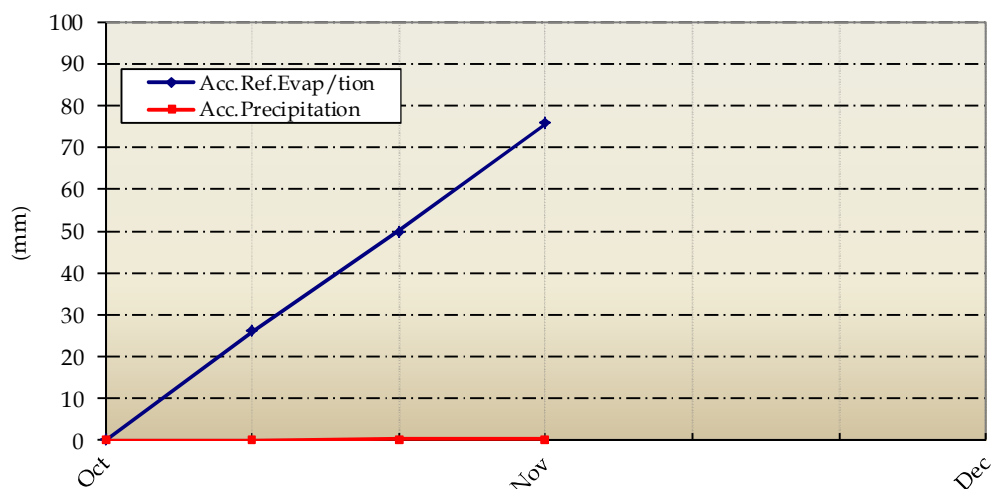


Mikra

3rd 10-day period (21-31/10/2018)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.7	20.4	20.0	21.7	21.0	20.2	20.6	22.4	22.7	22.4	23.3	21.3	19.5	18.1
	Min	11.1	14.4	13.0	8.1	11.5	5.0	6.9	11.5	12.9	12.8	13.0	10.9	10.5	9.2
Relative Humidity	Max	81	78	71	76	45	59	78	85	89	88	89	76	73	-
	Min	52	53	38	33	21	26	46	56	54	54	52	44	36	-
Soil Temperature at 10 cm	06 UTC	18.4	18.6	18.2	15.6	16.2	14.8	15.0	17.2	17.8	18.2	18.2	17.1	15.5	13.8
	12 UTC	20.0	20.2	19.0	19.4	19.8	17.4	18.6	18.5	20.0	20.0	21.0	19.4	16.9	16.0
Sunshine Duration		0.1	1.7	0.7	8.7	9.0	9.2	8.7	5.0	4.4	1.9	8.4	5.3	7.0	4.6
Precipitation			0.0										0.0	14.1	21.1
Evaporation		0.4	1.7	3.8	5.4	7.7	2.9	3.2	2.6	1.0	2.5	2.6	33.8	45.0	29.7
Growing Degrees	5	10.4	12.4	11.5	9.9	11.3	7.6	8.8	12.0	12.8	12.6	13.2	122.3	110.2	95.5
	10	5.4	7.4	6.5	4.9	6.3	2.6	3.8	7.0	7.8	7.6	8.2	67.3	55.2	42.9

3rd 10-day period (21-31/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	25.8	28.9	17.3
Precipitation - Reference Evapotranspiration	-25.8	-14.8	3.8
Number of Rainy Days	0.0	4.0	3.2
Number of Dry Days	19.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

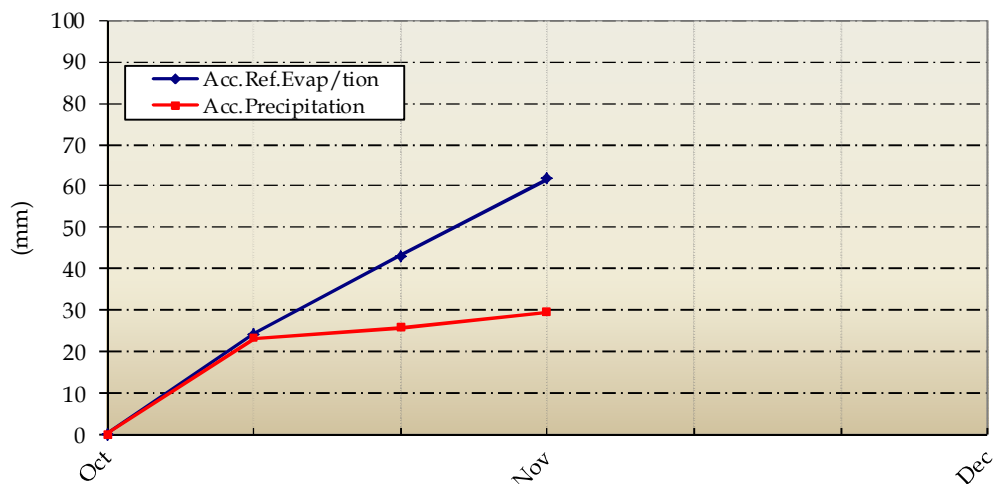




3rd 10-day period (21-31/10/2018)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.4	19.8	17.9	20.6	15.3	20.9	24.7	23.7	23.3	24.4	24.2	21.5	20.8	19.8
	Min	12.4	13.1	14.6	12.7	12.2	3.8	8.6	11.1	10.7	13.4	15.8	11.7	11.0	10.1
Relative Humidity	Max	98	96	99	99	72	94	99	99	99	97	100	96	91	-
	Min	46	54	76	56	34	33	42	42	49	51	55	49	35	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		9.9	1.5	0.0	6.7	8.8	8.8	8.1	7.6	7.6	5.7	7.5	6.6	6.1	
Precipitation			0.3	1.4	1.5							0.7	3.9	19.5	27.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	11.9	11.5	11.3	11.7	8.8	7.4	11.7	12.4	12.0	13.9	15.0	127.3	119.9	
	10	6.9	6.5	6.3	6.7	3.8	2.4	6.7	7.4	7.0	8.9	10.0	72.3	64.9	

3rd 10-day period (21-31/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.7	20.1	
Precipitation - Reference Evapotranspiration	-14.8	-0.6	27.5
Number of Rainy Days	4.0	4.0	3.7
Number of Dry Days	6.0	21.0	-

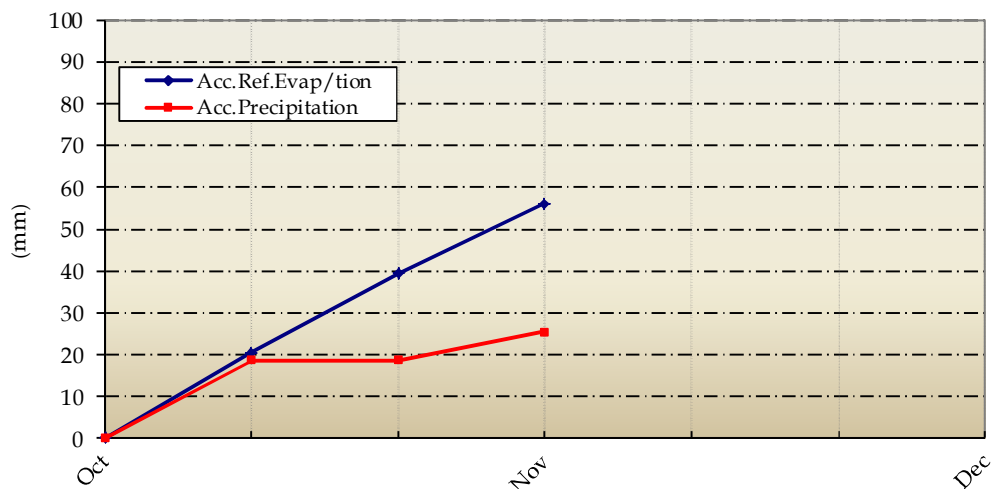
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/10/2018)		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	15.0	13.8	21.5	17.5	20.6	21.9	20.7	21.6	22.4	26.7	20.1	18.3	17.6
	Min	7.1	11.9	12.0	9.1	5.1	1.1	4.7	9.0	7.3	9.6	11.2	8.0	6.6	6.5
Relative Humidity	Max	100	95	99	99	100	97	100	100	100	100	100	99	97	-
	Min	57	66	79	45	31	38	51	47	53	43	31	49	43	-
Soil Temperature at 10 cm	06 UTC	14.4	15.6	15.0	14.0	12.8	10.4	11.4	14.0	13.0	14.4	15.0	13.6	13.6	12.8
	12 UTC	-	16.2	16.2	17.6	17.6	14.4	-	-	16.8	17.0	18.4	16.8	14.8	14.2
Sunshine Duration		2.8	0.0	0.0	8.9	9.2	9.4	8.9	8.4	8.5	4.0	7.4	6.1	5.0	5.3
Precipitation		1.8	1.5	2.8	0.2							0.4	6.7	17.3	39.1
Evaporation		0.9	0.3	0.2	2.0	2.3	1.7	2.0	2.6	1.6	2.3	6.4	22.3	-	23.9
Growing Degrees	5	8.4	8.5	7.9	10.3	6.3	5.9	8.3	9.9	9.5	11.0	14.0	99.7	81.7	77.8
	10	3.4	3.5	2.9	5.3	1.3	0.9	3.3	4.9	4.5	6.0	9.0	44.7	27.4	27.7

3rd 10-day period (21-31/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.8	17.2	18.0
Precipitation - Reference Evapotranspiration	-10.1	0.1	21.1
Number of Rainy Days	5.0	4.0	3.8
Number of Dry Days	12.0	15.0	-

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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