



# AGROMETEOROLOGICAL BULLETIN

*October 2018  
2nd 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  
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Helliniko, Athens

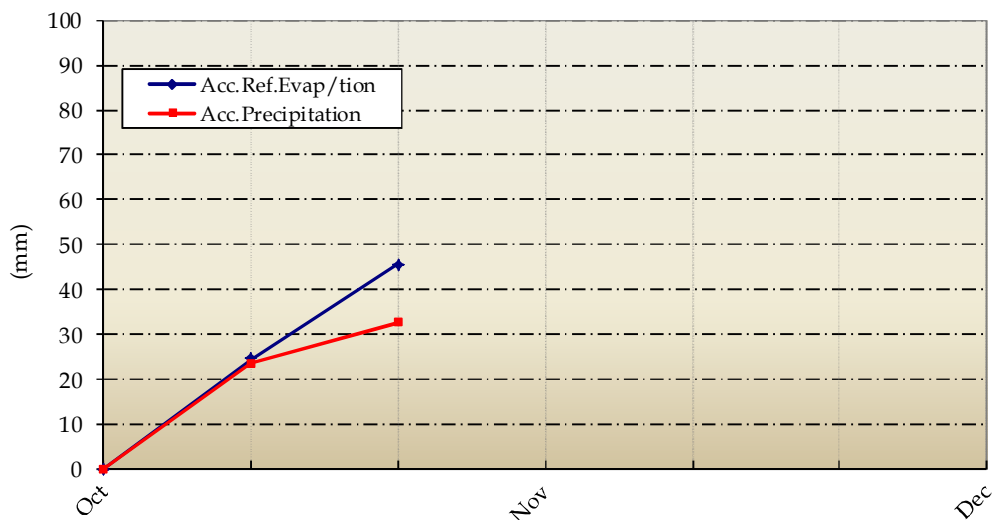
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Alexandroupoli

2nd 10-day period (11-20/10/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.0	21.4	21.4	19.8	19.8	24.2	22.6	23.2	23.8	23.0	22.0	23.3	20.8
	Min	11.8	17.4	16.0	15.4	14.0	13.6	11.0	13.6	11.0	11.0	13.5	8.3	10.8
Relative Humidity	Max	77	68	69	69	70	86	82	95	93	99	81	95	-
	Min	52	46	47	57	59	41	47	53	52	73	53	47	-
Soil Temperature at 10 cm	06 UTC	17.0	28.4	18.2	18.0	17.4	16.6	17.2	17.6	16.8	16.6	18.4	14.9	15.2
	12 UTC	19.0	20.4	20.0	19.0	17.6	20.6	18.4	19.4	19.8	19.6	19.4	18.8	18.0
Sunshine Duration		2.7	5.7	2.2	1.0	0.4	9.5	5.3	1.7	7.3	3.0	3.9	9.4	5.9
Precipitation											9.2	9.2		15.0
Evaporation		3.7	5.6	4.4	2.0	3.2	4.1	1.7	5.1	2.5	2.1	34.4	31.9	42.1
Growing Degrees	5	11.4	14.4	13.7	12.6	11.9	13.9	11.8	13.4	12.4	12.0	127.5	108.2	107.7
	10	6.4	9.4	8.7	7.6	6.9	8.9	6.8	8.4	7.4	7.0	77.5	58.2	58.4

2nd 10-day period (11-20/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	21.2	19.2	22.7
Precipitation - Reference Evapotranspiration	-12.0	-19.2	-7.7
Number of Rainy Days	1.0	0.0	1.9
Number of Dry Days	17.0	12.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

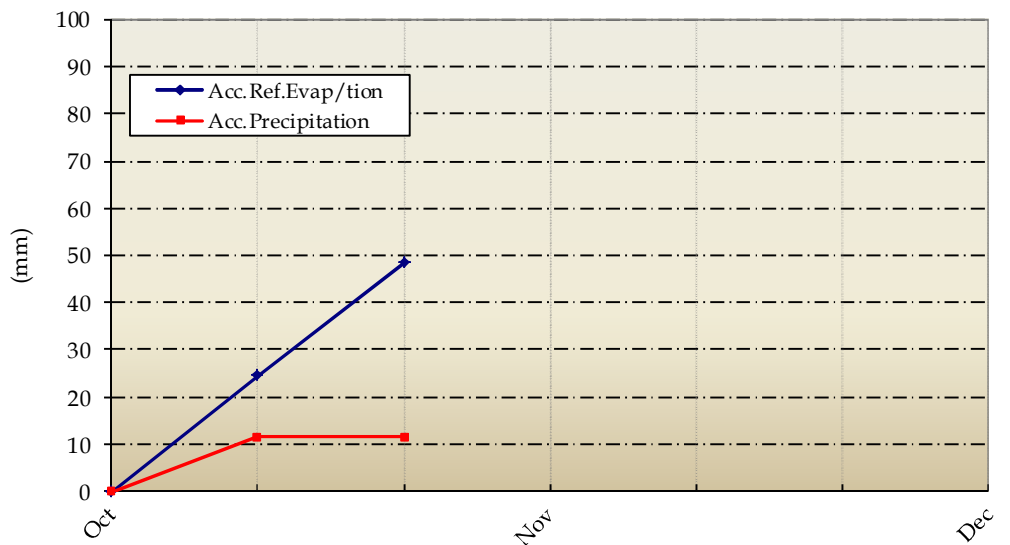


Andravida

2nd 10-day period (11-20/10/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.2	26.0	26.5	25.4	25.0	24.7	25.7	25.8	27.5	26.0	25.9	25.4	24.1
	Min	10.9	11.4	18.0	11.7	11.0	12.9	10.6	12.1	13.8	12.8	12.5	11.4	13.2
Relative Humidity	Max	85	84	77	87	86	91	95	90	89	92	88	86	-
	Min	31	29	32	33	37	42	34	41	35	36	35	36	-
Soil Temperature at 10 cm	06 UTC	20.2	19.2	20.4	20.0	19.8	19.8	19.6	19.4	19.5	19.4	19.7	19.3	18.6
	12 UTC	24.2	24.8	24.6	23.4	21.0	23.2	23.8	24.4	24.0	24.0	23.7	21.7	21.5
Sunshine Duration		9.8	9.4	7.9	9.4	9.0	8.8	8.7	8.7	6.6	8.6	8.7	8.9	7.1
Precipitation													0.0	23.9
Evaporation		4.0	7.6	5.0	5.0	6.0	3.3	4.2	4.0	3.0	3.6	45.7	-	36.4
Growing Degrees	5	13.6	13.7	17.3	13.6	13.0	13.8	13.2	14.0	15.7	14.4	142.0	134.1	136.6
	10	8.6	8.7	12.3	8.6	8.0	8.8	8.2	9.0	10.7	9.4	92.0	84.1	86.6

2nd 10-day period (11-20/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	23.8	22.8	22.5
Precipitation - Reference Evapotranspiration	-23.8	-22.8	1.4
Number of Rainy Days	0.0	0.0	2.6
Number of Dry Days	12.0	13.0	-

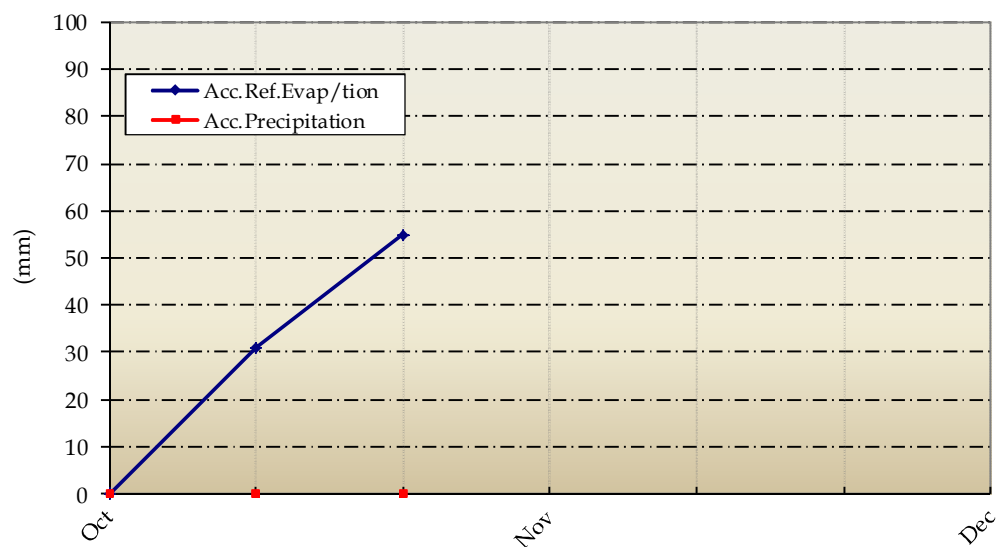
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/10/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.4	22.0	23.0	23.2	22.8	23.0	22.8	23.4	23.4	23.6	23.0	23.0	24.0
	Min	20.2	19.8	19.0	20.0	18.6	20.0	18.0	18.8	17.0	18.6	19.0	17.4	17.1
Relative Humidity	Max	80	83	85	88	90	91	91	92	93	92	88	82	-
	Min	66	73	77	77	74	74	65	74	79	79	74	60	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		6.1	5.3	5.9	6.2	7.9	5.2	6.9	6.2	6.1	7.1	6.3	8.1	6.5
Precipitation			0.0									0.0		12.5
Evaporation		2.2	7.8	2.3	2.2	3.7	4.6	1.5	1.8	3.2	2.1	31.4	38.9	49.3
Growing Degrees	5	16.3	15.9	16.0	16.6	15.7	16.5	15.4	16.1	15.2	16.1	159.8	151.7	155.9
	10	11.3	10.9	11.0	11.6	10.7	11.5	10.4	11.1	10.2	11.1	109.8	101.7	105.9

2nd 10-day period (11-20/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	23.9	30.1	-
Precipitation - Reference Evapotranspiration	-23.9	-30.1	12.5
Number of Rainy Days	0.0	0.0	1.7
Number of Dry Days	21.0	14.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

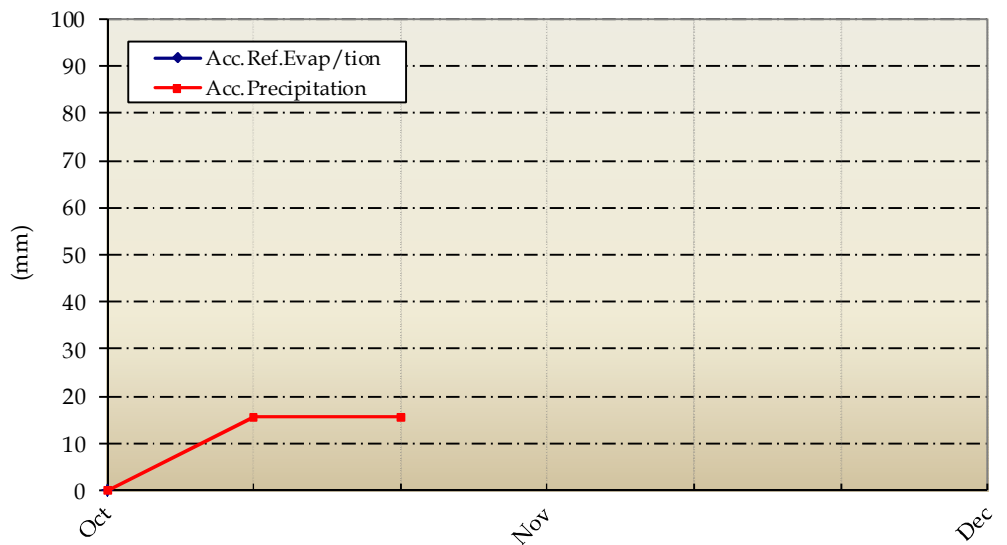


Ioannina

2nd 10-day period (11-20/10/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.0	21.0	22.2	24.2	24.0	22.6	22.0	25.6	25.0	25.0	23.7	26.0	20.6
	Min	6.4	8.0	16.0	11.2	8.0	7.6	6.4	6.4	8.4	8.4	8.7	5.0	8.9
Relative Humidity	Max	94	89	59	66	94	89	94	91	94	100	87	97	-
	Min	32	37	35	39	43	41	34	36	41	47	38	25	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	14.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	16.3
Sunshine Duration		9.2	5.5	7.4	8.5	6.7	8.0	7.7	7.1	6.6	6.8	7.4	8.1	5.3
Precipitation														37.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	30.1
Growing Degrees	5	10.7	9.5	14.1	12.7	11.0	10.1	9.2	11.0	11.7	11.7	111.7	105.1	98.7
	10	5.7	4.5	9.1	7.7	6.0	5.1	4.2	6.0	6.7	6.7	61.7	55.1	49.1

2nd 10-day period (11-20/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	17.6
Precipitation - Reference Evapotranspiration	-	-	19.5
Number of Rainy Days	0.0	0.0	3.4
Number of Dry Days	12.0	13.0	-

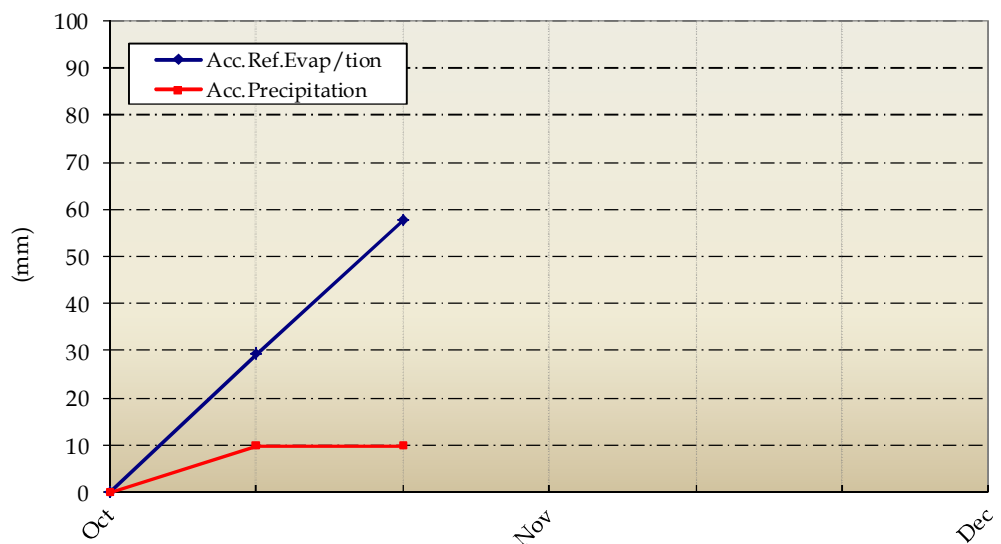
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/10/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.1	25.5	26.0	26.6	25.0	25.4	24.6	25.8	29.2	26.0	25.9	26.0	24.7
	Min	13.0	13.2	16.0	13.2	14.0	14.1	12.8	12.3	14.0	15.0	13.8	11.0	13.1
Relative Humidity	Max	82	76	77	78	82	90	91	90	88	90	84	86	-
	Min	31	34	37	35	40	40	43	45	35	40	38	37	-
Soil Temperature at 10 cm	06 UTC	20.0	19.8	19.8	19.8	19.8	19.6	19.0	19.2	19.6	19.8	19.6	-	18.6
	12 UTC	22.8	21.2	21.6	21.2	20.8	21.0	21.0	21.6	21.6	22.4	21.5	-	20.9
Sunshine Duration		9.1	7.2	9.2	9.2	3.4	9.7	8.9	9.0	3.8	8.8	7.8	9.0	6.8
Precipitation				0.0						0.0		0.0	0.0	24.4
Evaporation		4.0	5.4	5.8	11.6	4.8	4.5	2.1	3.8	3.6	4.4	50.0	36.6	39.0
Growing Degrees	5	14.1	14.4	16.0	14.9	14.5	14.8	13.7	14.1	16.6	15.5	148.4	135.4	138.6
	10	9.1	9.4	11.0	9.9	9.5	9.8	8.7	9.1	11.6	10.5	98.4	85.4	88.6

2nd 10-day period (11-20/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	28.2	30.2	24.3
Precipitation - Reference Evapotranspiration	-28.2	-30.2	0.1
Number of Rainy Days	0.0	0.0	2.7
Number of Dry Days	11.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

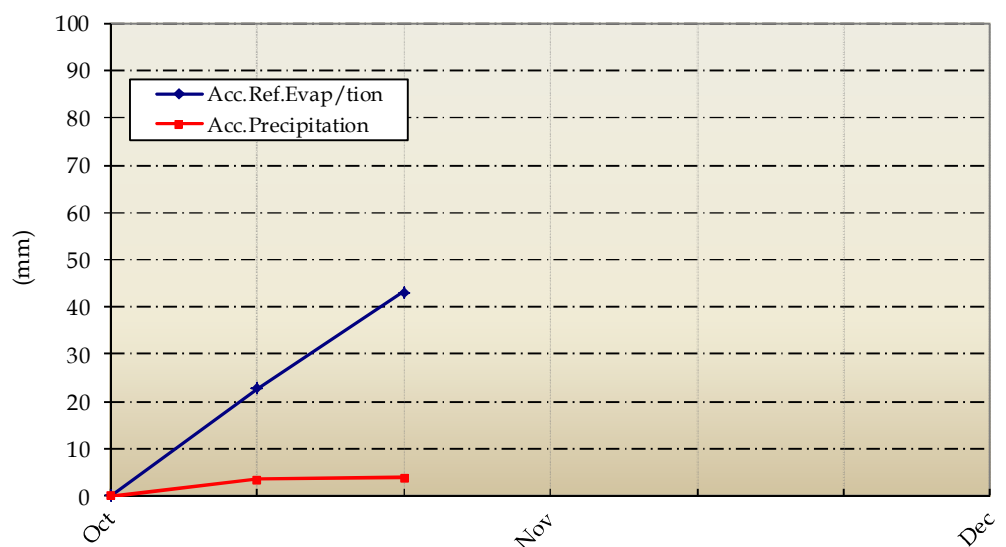


Larisa

2nd 10-day period (11-20/10/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.6	21.6	23.0	20.0	21.9	23.8	25.0	24.8	24.8	24.8	23.3	26.7	23.0
	Min	7.4	9.4	13.0	11.2	15.0	12.4	8.2	10.9	9.7	9.8	10.7	7.8	10.1
Relative Humidity	Max	74	95	93	90	89	88	93	92	93	92	90	85	-
	Min	36	45	37	57	50	47	38	43	44	37	43	26	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	17.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	18.6
Sunshine Duration		7.8	1.3	6.9	0.0	1.3	6.3	7.2	7.2	6.7	6.3	5.1	7.2	5.6
Precipitation			0.2		0.1							0.3		14.1
Evaporation		3.6	2.5	4.6	2.4	1.8	3.6	4.0	4.8	5.5	2.9	35.7	63.6	31.3
Growing Degrees	5	10.5	10.5	13.0	10.6	13.5	13.1	11.6	12.9	12.3	12.3	120.2	122.8	115.6
	10	5.5	5.5	8.0	5.6	8.5	8.1	6.6	7.9	7.3	7.3	70.2	72.8	65.8

2nd 10-day period (11-20/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.4	24.2	20.6
Precipitation - Reference Evapotranspiration	-20.1	-24.2	-6.5
Number of Rainy Days	2.0	0.0	2.4
Number of Dry Days	7.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

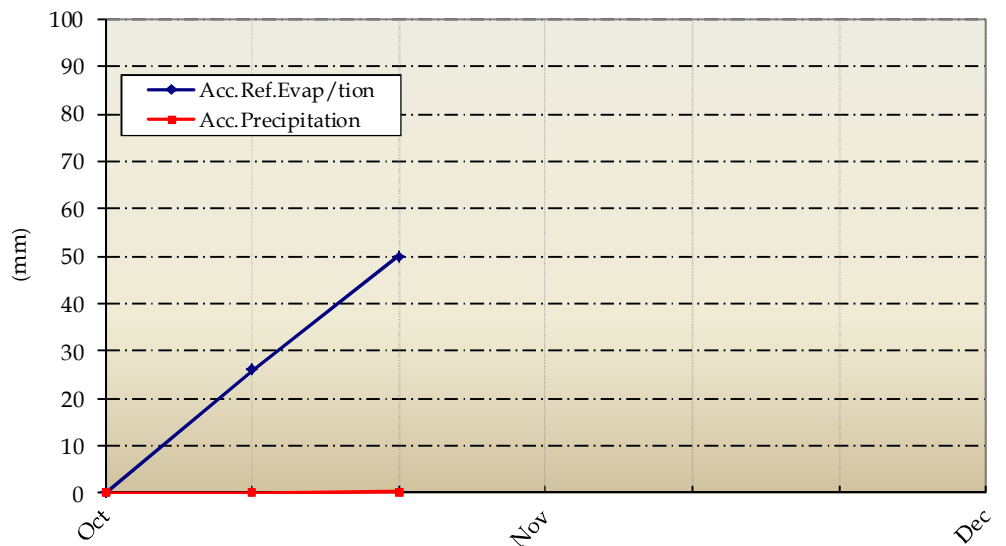


Mikra

2nd 10-day period (11-20/10/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.6	22.2	23.8	21.3	22.8	23.9	24.6	23.4	22.8	22.6	23.1	24.9	21.6
	Min	10.1	14.8	13.6	14.2	14.7	13.1	11.3	11.8	12.5	11.9	12.8	10.6	11.6
Relative Humidity	Max	76	68	75	69	76	77	77	77	81	84	76	75	-
	Min	34	37	33	47	39	42	32	39	50	45	40	30	-
Soil Temperature at 10 cm	06 UTC	18.4	20.0	19.4	20.0	20.2	19.8	19.0	19.0	19.0	18.5	19.3	18.2	16.5
	12 UTC	22.0	21.0	22.5	21.4	23.0	22.8	22.8	23.4	22.0	21.0	22.2	20.6	19.4
Sunshine Duration		9.4	2.2	7.5	4.2	7.2	8.0	8.6	8.8	8.0	6.3	7.0	9.4	5.3
Precipitation			0.1								0.0	0.1		13.0
Evaporation		3.3	2.2	6.6	3.0	5.0	3.3	4.0	4.0	2.4	5.5	39.3	41.5	31.8
Growing Degrees	5	11.9	13.5	13.7	12.8	13.8	13.5	13.0	12.6	12.7	12.3	129.5	127.9	116.2
	10	6.9	8.5	8.7	7.8	8.8	8.5	8.0	7.6	7.7	7.3	79.5	77.9	66.2

2nd 10-day period (11-20/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	23.9	23.1	20.4
Precipitation - Reference Evapotranspiration	-23.8	-23.1	-7.4
Number of Rainy Days	1.0	0.0	2.0
Number of Dry Days	10.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



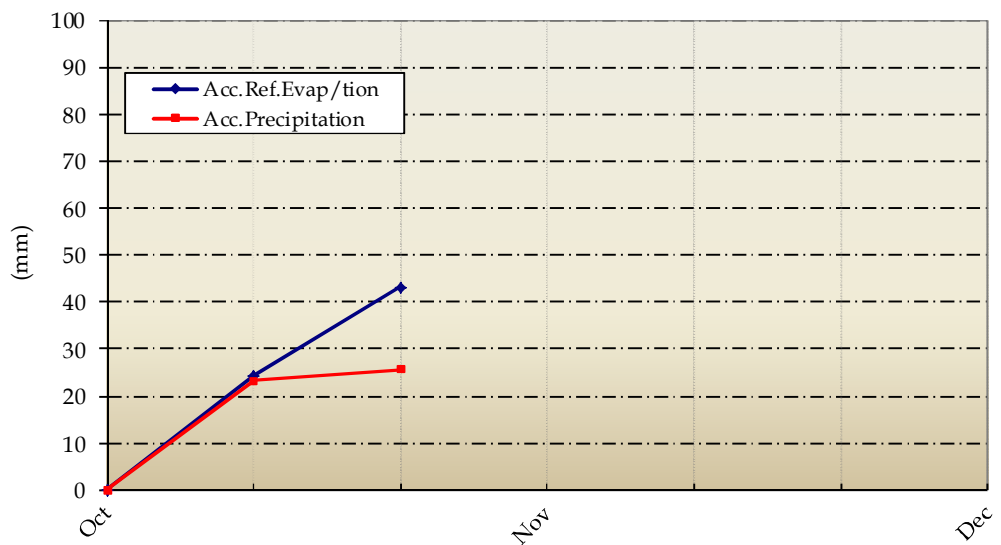


Tanagra

2nd 10-day period (11-20/10/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.6	18.7	19.0	18.2	17.6	21.3	21.8	21.5	21.8	23.3	20.5	24.5	22.8
	Min	13.2	16.3	14.8	15.0	15.2	15.8	12.1	12.7	11.5	12.3	13.9	9.7	12.0
Relative Humidity	Max	78	99	95	84	96	95	98	97	100	100	94	82	-
	Min	33	57	63	64	69	55	46	55	59	51	55	28	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		9.3	0.0	0.2	0.0	0.0	5.8	10.5	5.2	4.2	7.5	4.3	8.8	
Precipitation			0.7	1.4	0.2	0.1						2.4	0.0	11.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	12.4	12.5	11.9	11.6	11.4	13.6	12.0	12.1	11.7	12.8	121.9	121.2	
	10	7.4	7.5	6.9	6.6	6.4	8.6	7.0	7.1	6.7	7.8	71.9	71.2	

2nd 10-day period (11-20/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.8	22.6	
Precipitation - Reference Evapotranspiration	-16.4	-22.6	11.3
Number of Rainy Days	4.0	0.0	2.5
Number of Dry Days	10.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

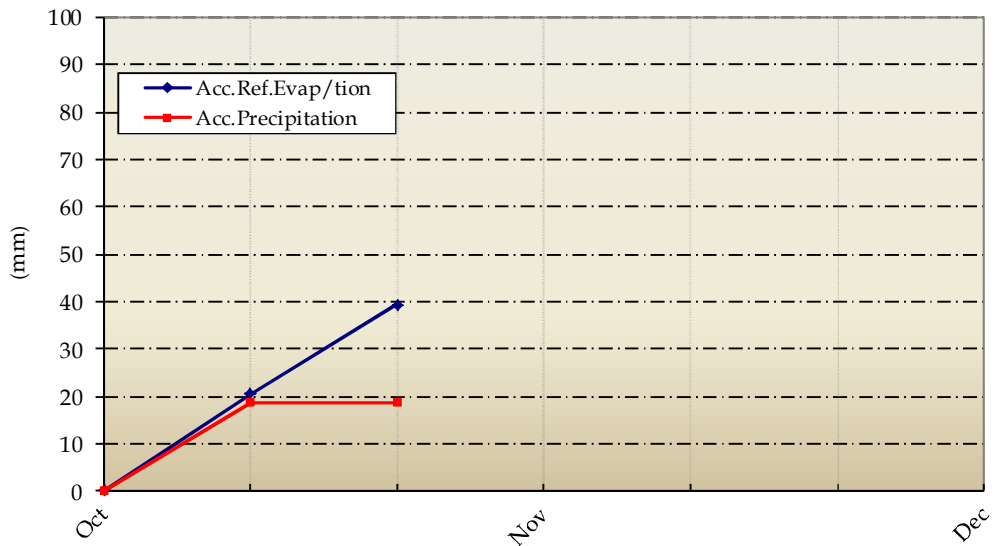


Tripoli

2nd 10-day period (11-20/10/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.7	19.5	20.1	18.5	18.7	20.2	21.9	20.6	21.1	23.8	20.5	23.6	21.3
	Min	5.7	7.3	13.1	7.9	9.1	6.2	4.9	5.6	8.2	7.9	7.6	5.0	8.2
Relative Humidity	Max	98	93	96	98	98	100	100	99	100	100	98	94	-
	Min	34	47	48	51	60	50	40	51	49	30	46	24	-
Soil Temperature at 10 cm	06 UTC	14.0	14.2	16.0	14.0	14.6	13.8	13.4	13.6	14.2	-	14.2	15.0	15.5
	12 UTC	17.8	17.8	-	-	16.8	17.8	17.6	17.8	17.8	-	17.6	18.0	17.2
Sunshine Duration		9.2	7.8	5.3	2.1	2.3	8.2	9.6	8.4	8.4	8.4	7.0	9.1	6.8
Precipitation											0.0	0.0		15.9
Evaporation		2.0	3.0	2.3	2.1	1.1	2.1	1.8	2.8	2.2	2.1	21.5	34.8	28.1
Growing Degrees	5	8.2	8.4	11.6	8.2	8.9	8.2	8.4	8.1	9.7	10.9	90.5	93.0	97.5
	10	3.2	3.4	6.6	3.2	3.9	3.2	3.4	3.1	4.7	5.9	40.5	43.0	48.2

2nd 10-day period (11-20/10/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.8	22.5	21.4
Precipitation - Reference Evapotranspiration	-18.8	-22.5	-5.5
Number of Rainy Days	0.0	0.0	2.7
Number of Dry Days	12.0	13.0	-

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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