



# AGROMETEOROLOGICAL BULLETIN

*February 2020*  
*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

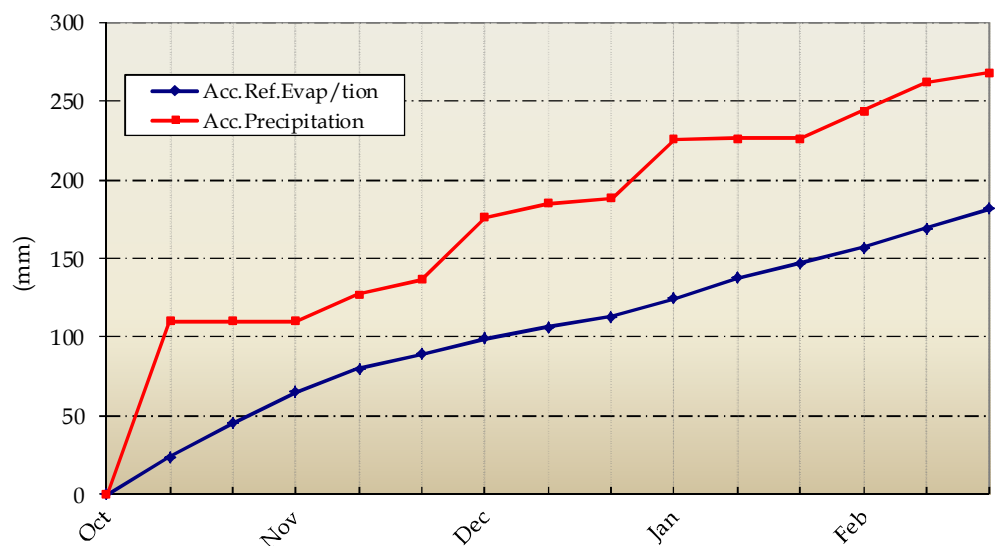
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Alexandroupoli

2nd 10-day period (11-20/02/2020)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.8	13.4	13.6	12.4	13.4	12.8	13.8	15.0	14.4	12.2	13.7	11.9	10.0
	Min	4.4	5.4	1.4	-1.6	6.4	4.0	1.4	-2.6	0.6	2.6	2.2	2.2	2.2
Relative Humidity	Max	91	94	89	96	94	83	89	92	88	97	91	81	-
	Min	61	70	48	61	48	42	50	39	54	60	53	46	-
Soil Temperature at 10 cm	06 UTC	7.2	8.8	6.8	5.6	8.8	6.8	5.6	5.8	6.4	6.8	6.9	5.9	4.8
	12 UTC	10.4	9.4	10.2	7.8	9.4	9.6	8.6	9.4	9.4	9.0	9.3	8.3	6.1
Sunshine Duration		7.7	0.4	9.3	0.9	1.3	9.1	9.5	8.8	3.3	2.4	5.3	5.3	3.7
Precipitation			0.0		0.0	6.1						6.1	2.9	18.4
Evaporation		0.9	1.5	0.0	0.0	1.3	0.0	0.0	0.0	1.8	6.0	11.5	16.6	10.5
Growing Degrees	5	5.1	4.4	2.5	0.4	4.9	3.4	2.6	1.2	2.5	2.4	29.4	21.0	23.6
	10	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	4.0

2nd 10-day period (11-20/02/2020)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.9	15.3	12.3
Precipitation - Reference Evapotranspiration	-6.8	-12.4	6.1
Number of Rainy Days	1.0	1.0	2.7
Number of Dry Days	8.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

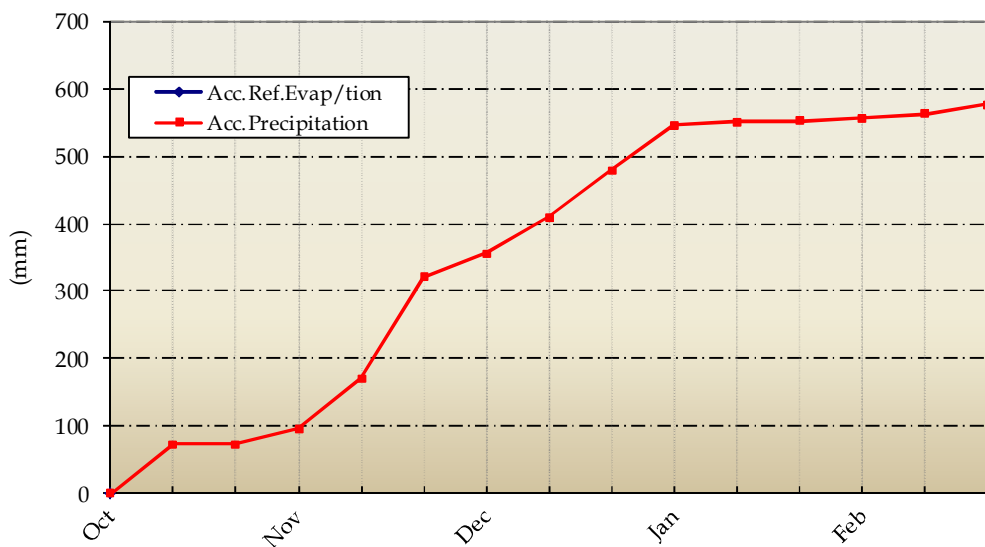


2nd 10-day period (11-20/02/2020)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	18.6	21.0	16.3	17.9	18.2	16.4	16.8	16.6	14.0	17.4	14.4	14.5
	Min	8.3	10.8	5.6	10.4	7.1	1.8	-0.7	3.0	7.0	10.6	6.4	4.0	6.2
Relative Humidity	Max	100	100	98	94	98	95	94	95	91	90	96	83	-
	Min	67	65	45	70	46	32	36	56	57	58	53	40	-
Soil Temperature at 10 cm	06 UTC	11.0	12.0	12.0	13.0	10.6	11.2	10.0	10.2	11.6	12.8	11.4	9.2	9.1
	12 UTC	12.0	13.2	13.2	13.2	13.2	12.4	11.2	11.6	12.8	13.2	12.6	10.6	11.0
Sunshine Duration		5.8	5.0	7.0	0.1	8.5	9.3	9.4	7.1	4.6	5.7	6.2	6.8	4.8
Precipitation		0.4			1.7	1.9					9.5	13.5	0.5	37.6
Evaporation		2.0	2.6	2.0	0.6	2.4	3.6	2.7	2.5	1.8	0.4	20.6	32.4	21.3
Growing Degrees	5	8.3	9.7	8.3	8.4	7.5	5.0	2.9	4.9	6.8	7.3	69.0	41.8	54.0
	10	3.3	4.7	3.3	3.4	2.5	0.0	0.0	0.0	1.8	2.3	21.2	4.9	13.3

2nd 10-day period (11-20/02/2020)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	18.4	14.2
Precipitation - Reference Evapotranspiration	-	-17.9	23.4
Number of Rainy Days	4.0	1.0	5.1
Number of Dry Days	0.0	5.0	-

The missing info in the tables and the graph are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



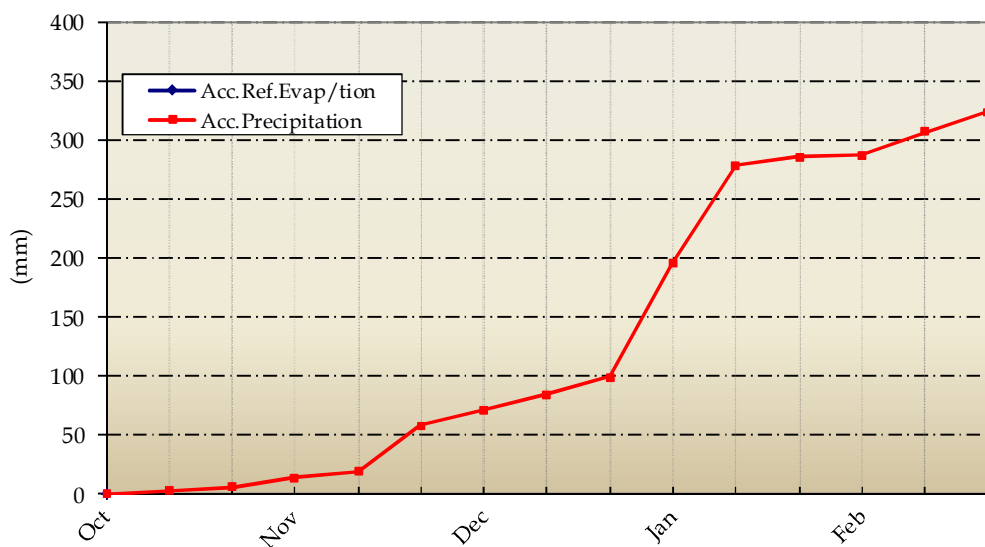
Iraklio

2nd 10-day period (11-20/02/2020)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	19.0	17.0	16.6	16.4	14.6	14.8	15.0	16.0	18.0	16.6	14.0	15.9
	Min	9.0	12.8	11.8	10.0	13.2	13.6	12.8	11.2	6.4	11.0	11.2	9.1	9.3
Relative Humidity	Max	87	89	95	89	93	80	75	87	88	88	87	90	-
	Min	57	61	77	43	73	66	64	60	68	54	62	60	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		7.5	9.1	2.7	1.3	2.0	0.0	5.5	5.2	8.6	2.9	4.5	3.3	4.8
Precipitation						16.4	0.8					17.2	112.2	20.7
Evaporation		3.7	0.4	2.5	0.9	2.6	1.6	4.7	1.2	2.6	1.0	21.2	34.1	30.3
Growing Degrees	5	8.6	10.9	9.4	8.3	9.8	9.1	8.8	8.1	6.2	9.5	88.7	65.5	75.8
	10	3.6	5.9	4.4	3.3	4.8	4.1	3.8	3.1	1.2	4.5	38.7	16.0	27.6

2nd 10-day period (11-20/02/2020)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	17.3	-
Precipitation - Reference Evapotranspiration	-	94.9	20.7
Number of Rainy Days	2.0	5.0	4.0
Number of Dry Days	6.0	3.0	-

The missing info in the tables and the graph are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



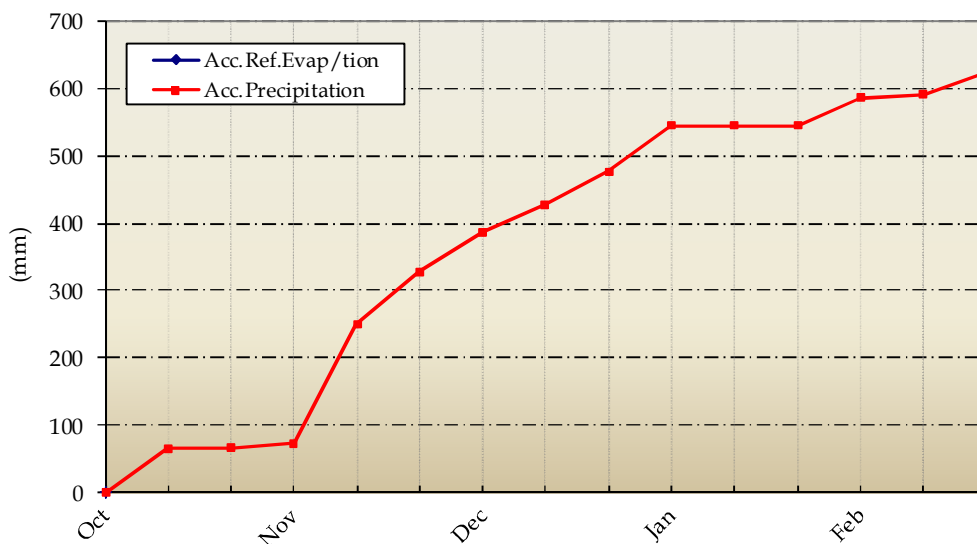
Ioannina

2nd 10-day period (11-20/02/2020)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.5	15.2	15.2	9.2	13.8	15.5	14.0	17.7	12.5	9.5	13.9	10.6	10.3
	Min	6.2	3.8	2.8	4.0	5.4	0.8	-3.8	-2.8	1.3	4.8	2.2	1.1	1.8
Relative Humidity	Max	91	94	100	97	60	79	92	100	100	100	91	80	-
	Min	62	66	38	87	44	33	37	49	79	69	56	41	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	4.4
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	5.4
Sunshine Duration		3.4	1.9	3.8	0.0	7.9	7.7	7.6	5.8	1.2	0.0	3.9	5.8	3.3
Precipitation					18.5	0.6					14.2	33.3	0.0	46.4
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	11.3
Growing Degrees	5	6.4	4.5	4.0	1.6	4.6	3.2	0.1	2.5	1.9	2.2	30.8	10.7	18.2
	10	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	1.8

2nd 10-day period (11-20/02/2020)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	11.4
Precipitation - Reference Evapotranspiration	-	-	35.0
Number of Rainy Days	3.0	0.0	5.0
Number of Dry Days	5.0	19.0	-

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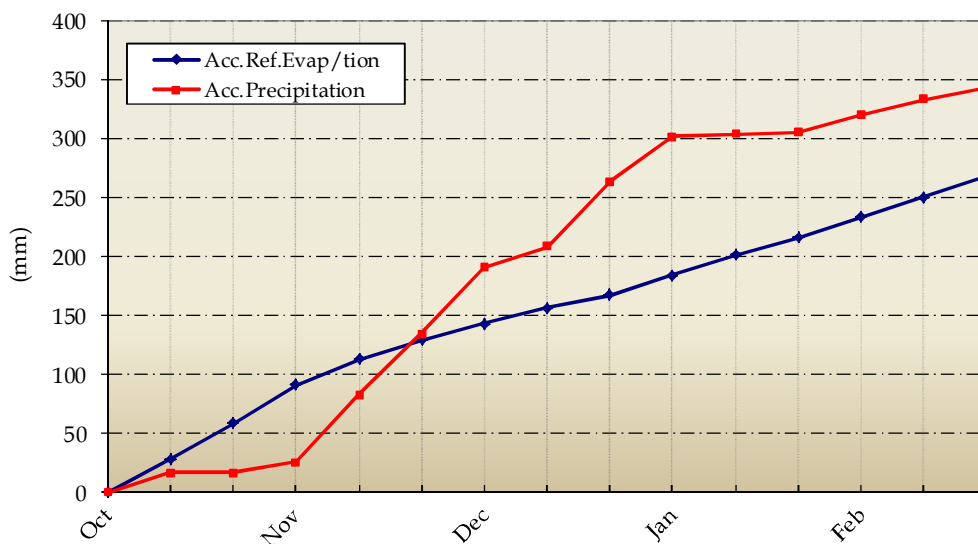
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/02/2020)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	19.1	19.0	16.1	19.1	18.0	16.7	17.7	16.4	16.6	17.7	14.8	15.1
	Min	9.2	6.6	8.2	10.4	7.8	7.8	6.5	2.4	4.0	0.0	6.3	5.6	5.9
Relative Humidity	Max	95	96	93	88	95	69	67	90	96	93	88	78	-
	Min	55	58	54	58	41	35	33	42	55	51	48	40	-
Soil Temperature at 10 cm	06 UTC	11.2	11.0	12.0	13.0	13.0	12.0	11.2	11.0	11.0	12.2	11.8	8.7	9.6
	12 UTC	12.0	12.5	13.0	13.4	13.0	12.5	13.6	11.5	12.0	12.4	12.6	9.9	10.9
Sunshine Duration		5.0	7.3	8.5	1.4	5.6	8.7	7.8	7.9	8.0	3.2	6.3	6.1	4.5
Precipitation		0.2				6.0					4.7	10.9	3.5	43.8
Evaporation		2.8	1.7	2.6	0.8	1.0	5.1	1.3	0.8	0.0	4.1	20.2	25.4	26.5
Growing Degrees	5	8.7	7.9	8.6	8.3	8.5	7.9	6.6	5.1	5.2	3.3	69.9	52.2	55.5
	10	3.7	2.9	3.6	3.3	3.5	2.9	1.6	0.1	0.2	0.0	21.6	6.8	12.8

2nd 10-day period (11-20/02/2020)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.9	21.5	15.6
Precipitation - Reference Evapotranspiration	-8.0	-18.0	28.2
Number of Rainy Days	3.0	1.0	5.2
Number of Dry Days	0.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



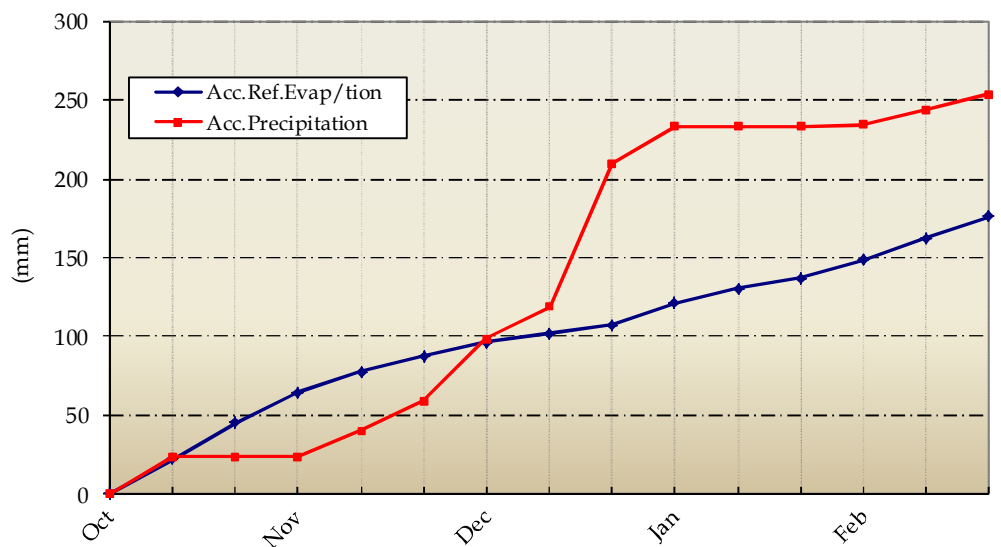
Larisa

2nd 10-day period (11-20/02/2020)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.6	15.4	15.6	11.8	13.4	12.2	14.8	16.6	14.0	10.2	14.4	14.2	12.1
	Min	2.5	4.0	6.2	4.6	9.2	6.2	-2.2	-2.0	0.6	3.8	3.3	1.0	1.9
Relative Humidity	Max	90	97	92	97	91	93	96	96	97	97	95	85	-
	Min	42	62	46	75	45	58	43	48	58	62	54	36	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	6.7
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	7.2
Sunshine Duration		6.7	5.1	7.7	0.0	0.2	1.7	8.5	8.3	3.5	0.0	4.2	5.8	4.0
Precipitation					0.4	1.6	0.1				7.7	9.8	0.6	12.7
Evaporation		0.6	2.5	2.7	1.6	4.0	0.0	0.0	2.4	2.1	2.4	18.3	20.1	10.0
Growing Degrees	5	6.1	4.7	5.9	3.2	6.3	4.2	1.3	2.3	2.3	2.0	38.3	26.8	25.9
	10	1.1	0.0	0.9	0.0	1.3	0.0	0.0	0.0	0.0	0.0	3.3	0.0	3.3

2nd 10-day period (11-20/02/2020)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.8	18.8	12.0
Precipitation - Reference Evapotranspiration	-4.0	-18.2	0.7
Number of Rainy Days	4.0	2.0	3.6
Number of Dry Days	7.0	8.0	-

The missing info in the tables are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



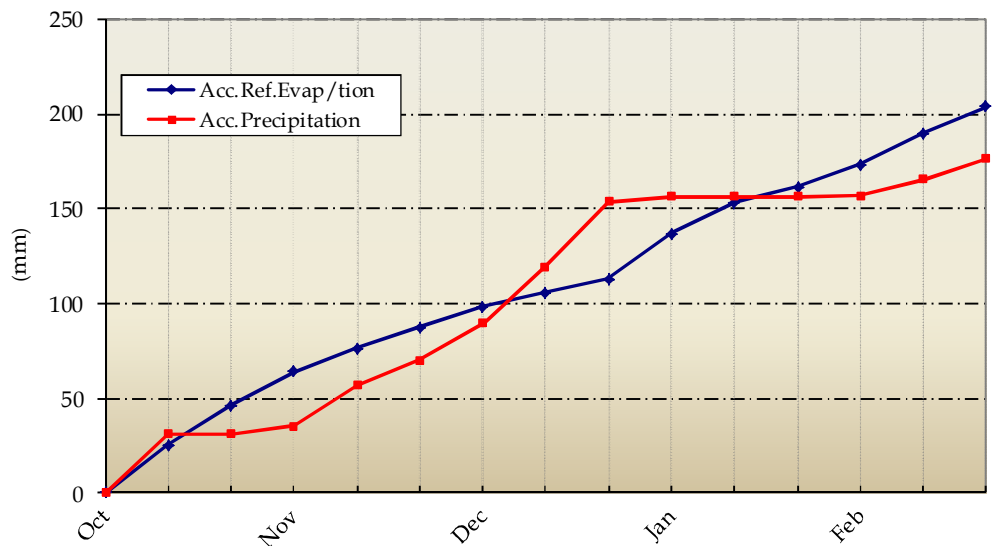
Mikra

2nd 10-day period (11-20/02/2020)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.7	13.2	14.0	12.5	14.0	13.3	13.4	14.8	14.9	10.5	14.0	13.2	11.2
	Min	0.8	4.8	6.4	6.8	9.8	6.6	1.8	2.2	2.6	6.2	4.8	3.2	2.9
Relative Humidity	Max	91	94	88	98	85	88	91	92	95	93	92	80	-
	Min	38	70	45	72	53	56	54	50	53	56	55	40	-
Soil Temperature at 10 cm	06 UTC	5.4	8.2	8.6	9.2	9.8	8.8	8.5	8.2	8.2	9.4	8.4	6.5	5.9
	12 UTC	9.0	9.2	10.0	10.0	10.2	10.8	10.2	10.0	10.0	9.8	9.9	8.6	7.7
Sunshine Duration		8.8	0.0	9.2	0.1	0.7	9.3	9.0	8.8	4.8	0.0	5.1	6.6	3.8
Precipitation			0.6	0.1	3.9	4.3					2.0	10.9	1.0	15.0
Evaporation		-	-	-	-	-	-	-	-	-	-	-	33.4	14.7
Growing Degrees	5	5.3	4.0	5.2	4.7	6.9	5.0	2.6	3.5	3.8	3.4	44.2	32.2	26.4
	10	0.3	0.0	0.2	0.0	1.9	0.0	0.0	0.0	0.0	0.0	2.4	1.1	3.8

2nd 10-day period (11-20/02/2020)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.9	21.4	13.1
Precipitation - Reference Evapotranspiration	-3.0	-20.4	1.9
Number of Rainy Days	5.0	1.0	3.4
Number of Dry Days	5.0	3.0	-

The missing info in the tables are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





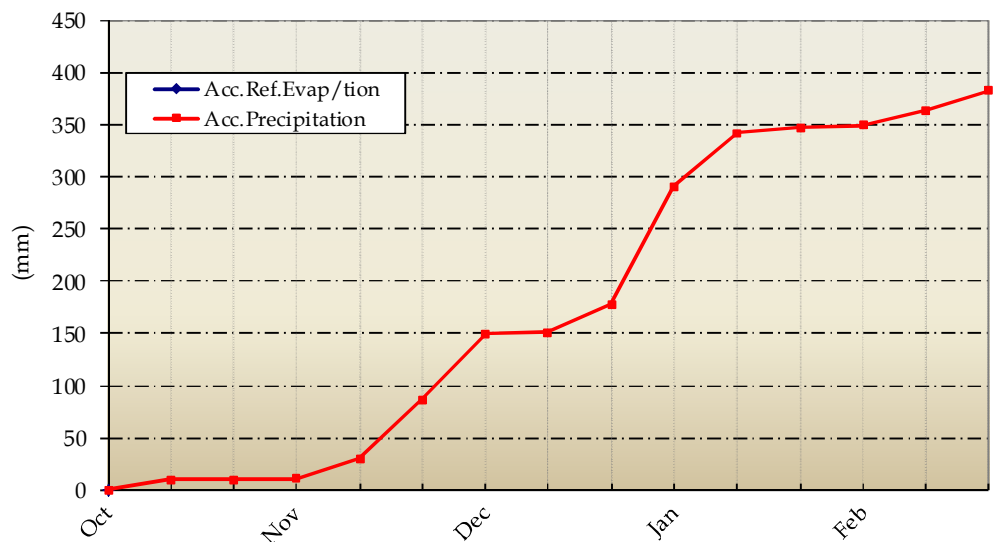
Tanagra

2nd 10-day period (11-20/02/2020)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.8	19.2	14.7	14.6	11.1	13.0	13.5	16.2	15.2	14.2	15.0	11.9	13.2
	Min	2.8	8.0	8.3	4.4	10.0	7.7	5.3	1.2	0.8	5.7	5.4	3.8	4.1
Relative Humidity	Max	93	95	97	98	100	81	93	100	100	98	96	92	-
	Min	42	47	53	63	67	43	48	36	49	58	51	46	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		6.5	6.1	8.1	0.0	0.0	8.3	6.0	8.5	7.4	2.6	5.4	4.1	
Precipitation					0.2	7.1					11.4	18.7	33.2	15.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	5.8	8.6	6.5	4.5	5.6	5.4	4.4	3.7	3.0	5.0	52.4	29.1	
	10	0.8	3.6	1.5	0.0	0.6	0.4	0.0	0.0	0.0	0.0	6.8	2.1	

2nd 10-day period (11-20/02/2020)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	13.9	
Precipitation - Reference Evapotranspiration	-	19.3	15.6
Number of Rainy Days	3.0	4.0	4.8
Number of Dry Days	5.0	4.0	-

The missing info in the tables and the graph are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

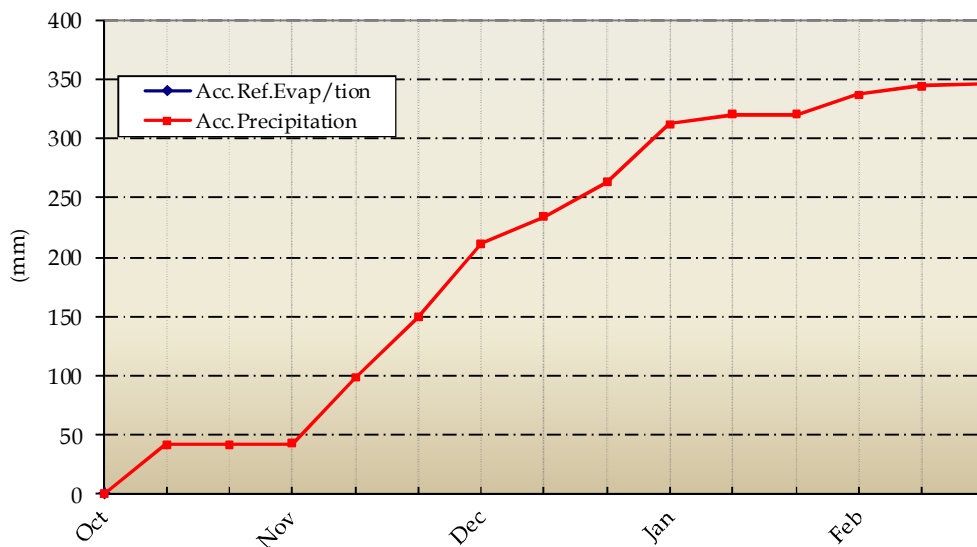


2nd 10-day period (11-20/02/2020)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.7	18.1	-	-	-	-	14.7	18.0	16.2	-	16.5	10.4	10.2
	Min	7.5	5.4	0.7	-	-	-	-1.8	-3.4	-2.7	4.4	1.4	-0.1	1.7
Relative Humidity	Max	95	97	100	-	-	83	95	99	99	94	95	95	-
	Min	45	43	82	-	-	40	31	15	34	64	44	42	-
Soil Temperature at 10 cm	06 UTC	6.4	6.6	6.2	-	-	-	4.6	4.2	-	-	5.6	3.9	4.8
	12 UTC	9.4	9.8	-	-	-	-	8.2	-	-	-	9.1	7.8	5.7
Sunshine Duration		7.6	8.6	7.0	0.2	2.4	8.3	8.6	6.8	8.3	5.6	6.3	5.6	4.3
Precipitation		0.0	0.0								1.7	1.7	3.4	39.0
Evaporation		2.1	1.7	-	-	-	0.0	1.1	-	-	-	-	-	11.0
Growing Degrees	5	6.6	6.8	-	-	-	-	1.5	2.3	1.8	-	-	7.9	17.8
	10	1.6	1.8	-	-	-	-	0.0	0.0	0.0	-	-	0.0	1.6

2nd 10-day period (11-20/02/2020)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	14.9	12.8
Precipitation - Reference Evapotranspiration	-	-11.5	26.2
Number of Rainy Days	1.0	4.0	4.9
Number of Dry Days	13.0	4.0	-

The missing info in the tables and the graph are due to the absence of data.

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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