



AGROMETEOROLOGICAL BULLETIN

December 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



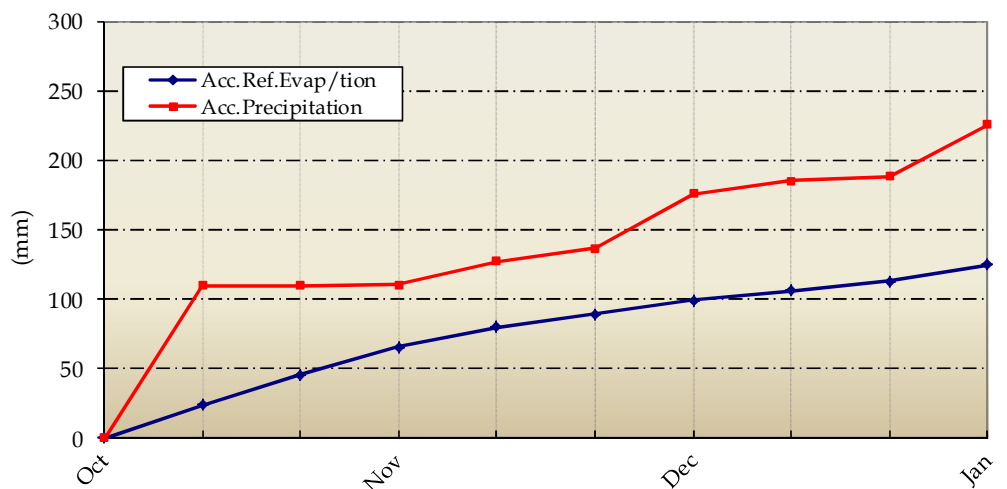
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3rd 10-day period (21-31/12/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.4	18.0	17.4	13.8	10.4	9.8	8.8	9.6	7.6	7.0	9.6	11.8	10.9	9.8
	Min	12.2	15.0	10.8	7.8	5.4	5.4	1.8	2.0	2.6	2.8	-0.8	5.9	-0.1	2.4
Relative Humidity	Max	95	94	95	91	91	90	93	86	69	67	88	87	89	-
	Min	80	73	61	49	66	59	59	44	40	51	32	56	56	-
Soil Temperature at 10 cm	06 UTC	12.6	13.8	13.4	11.8	10.0	9.4	7.2	7.2	5.2	5.8	5.0	9.2	4.9	6.0
	12 UTC	13.8	14.8	14.6	13.0	10.8	10.0	8.8	8.4	7.0	5.6	7.0	10.3	6.5	7.2
Sunshine Duration		2.5	2.9	5.4	5.0	0.3	0.0	1.4	4.5	5.1	1.4	6.9	3.2	3.8	2.6
Precipitation		3.1	2.8	30.7	0.8								37.4	11.7	24.7
Evaporation		0.5	2.9	1.2	3.0	0.8	0.5	0.5	0.7	1.1	2.4	0.0	13.6	3.1	12.0
Growing Degrees	5	9.8	11.5	9.1	5.8	2.9	2.6	0.3	0.8	0.1	0.0	0.0	42.9	13.5	24.9
	10	4.8	6.5	4.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.2	0.0	4.2

3rd 10-day period (21-31/12/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.7	6.4	8.4
Precipitation - Reference Evapotranspiration	25.7	5.3	16.3
Number of Rainy Days	4.0	2.0	2.9
Number of Dry Days	6.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

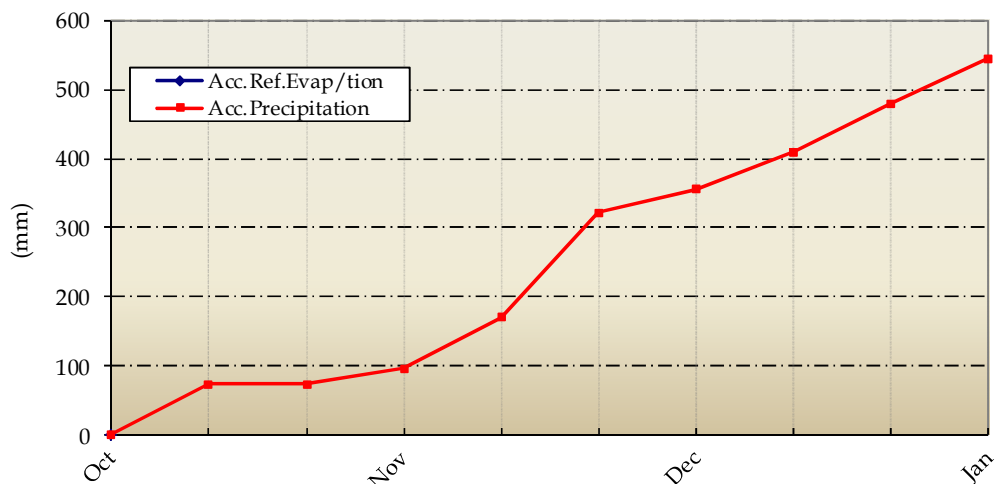


3rd 10-day period (21-31/12/2019)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.2	17.7	17.0	16.2	15.4	15.4	15.0	12.5	10.9	12.0	14.4	15.1	14.5	14.4
	Min	11.7	11.8	10.0	9.8	8.1	3.3	3.2	2.8	4.5	2.0	3.4	6.4	4.5	6.0
Relative Humidity	Max	90	93	94	85	82	89	89	95	68	71	88	86	94	-
	Min	61	61	55	39	41	40	49	31	37	40	38	45	52	-
Soil Temperature at 10 cm	06 UTC	14.4	15.0	14.0	13.2	12.4	9.6	11.2	11.2	10.0	7.0	8.8	11.5	9.9	9.0
	12 UTC	14.6	14.6	14.2	15.0	15.0	11.6	11.4	11.2	9.8	9.0	9.8	12.4	10.9	10.5
Sunshine Duration		2.2	0.0	0.2	5.9	5.4	6.1	3.9	6.0	3.8	4.4	6.2	4.0	4.1	4.0
Precipitation		0.1	17.1	40.3	8.6			0.1					66.2	13.7	44.5
Evaporation		1.8	0.7	0.4	1.2	1.6	2.8	1.4	1.1	1.4	5.0	3.4	20.8	19.1	21.9
Growing Degrees	5	10.5	9.8	8.5	8.0	6.8	4.4	4.1	2.7	2.7	2.0	3.9	63.2	49.6	57.7
	10	5.5	4.8	3.5	3.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	18.5	9.5	13.8

3rd 10-day period (21-31/12/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	8.3	9.5
Precipitation - Reference Evapotranspiration	-	5.4	35.0
Number of Rainy Days	5.0	2.0	4.8
Number of Dry Days	0.0	6.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

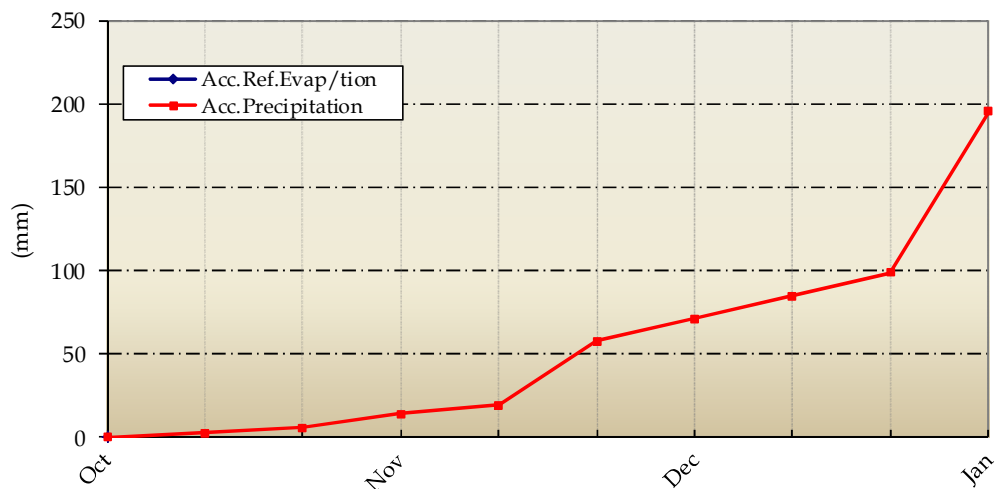


3rd 10-day period (21-31/12/2019)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.2	19.0	21.6	15.0	16.4	14.6	15.4	11.8	9.6	12.6	13.6	15.5	15.2	15.9
	Min	12.8	14.0	15.6	12.6	10.0	12.0	11.8	8.6	8.0	8.8	10.2	11.3	10.0	10.0
Relative Humidity	Max	88	78	89	92	90	87	82	94	94	92	95	89	91	-
	Min	56	55	48	57	42	50	52	82	77	68	71	60	69	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		7.7	0.6	4.9	0.2	4.0	1.8	4.1	0.2	0.0	0.7	3.2	2.5	3.8	3.8
Precipitation				5.6	18.9	7.9	9.0		5.1	8.5	28.1	13.2	96.3	15.1	34.5
Evaporation		2.1	0.7	4.5	0.1	7.1	3.7	2.8	0.5	6.4	8.3	0.1	36.3	27.3	28.1
Growing Degrees	5	12.0	11.5	13.6	8.8	8.2	8.3	8.6	5.2	3.8	5.7	6.9	92.6	83.8	87.3
	10	7.0	6.5	8.6	3.8	3.2	3.3	3.6	0.2	0.0	0.7	1.9	38.8	28.8	33.4

3rd 10-day period (21-31/12/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	13.4	-
Precipitation - Reference Evapotranspiration	-	1.7	34.5
Number of Rainy Days	8.0	4.0	4.5
Number of Dry Days	7.0	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

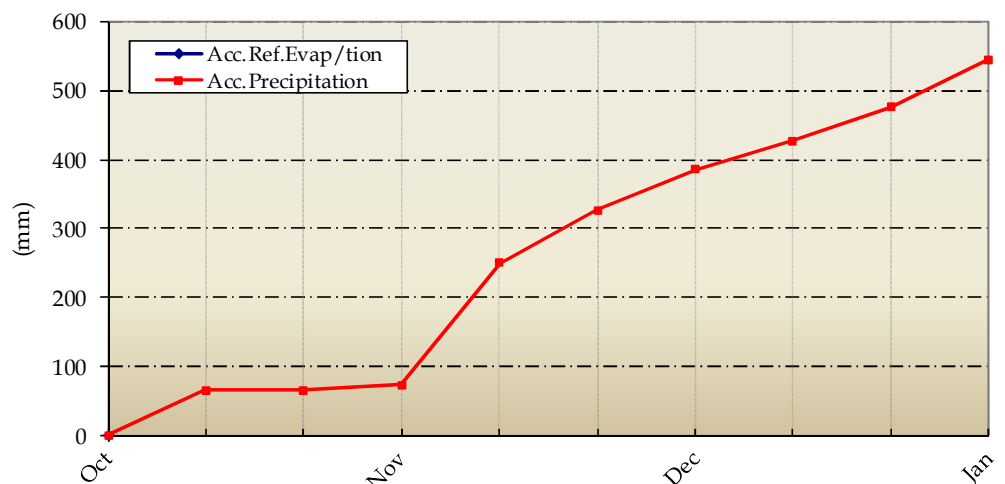


3rd 10-day period (21-31/12/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.6	14.8	12.0	12.0	11.6	11.0	8.8	-	6.2	5.0	11.0	10.6	8.5	8.8
	Min	9.5	8.0	7.0	7.6	2.5	-1.2	-2.2	-3.4	1.5	1.4	-2.2	2.6	-0.8	0.9
Relative Humidity	Max	100	100	100	95	100	100	96	100	51	46	62	86	97	-
	Min	79	80	77	50	43	58	55	35	30	36	29	52	59	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	4.7
Sunshine Duration		0.5	0.0	1.5	2.9	5.5	4.4	3.6	5.2	6.0	1.0	6.1	3.3	3.2	2.4
Precipitation		1.1	41.9	25.2									68.2	5.7	50.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	9.0
Growing Degrees	5	6.6	6.4	4.5	4.8	2.1	0.0	0.0	-	0.0	0.0	0.0	-	4.8	14.1
	10	1.6	1.4	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.9

3rd 10-day period (21-31/12/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	6.2
Precipitation - Reference Evapotranspiration	-	-	44.4
Number of Rainy Days	3.0	3.0	4.3
Number of Dry Days	0.0	2.0	-

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

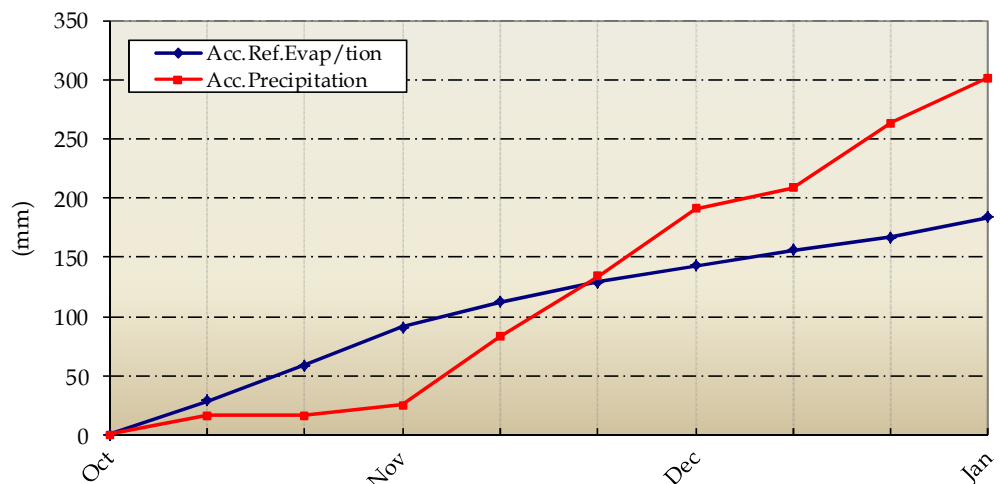
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/12/2019)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	18.7	16.1	15.8	15.6	16.6	13.5	12.9	11.7	13.0	17.4	15.4	16.0	15.2
	Min	9.8	14.0	10.2	7.5	5.8	2.8	2.8	1.9	5.4	6.7	5.4	6.6	5.1	6.1
Relative Humidity	Max	93	90	92	88	88	82	87	94	46	52	81	81	87	-
	Min	68	59	68	40	36	25	51	42	35	31	25	44	46	-
Soil Temperature at 10 cm	06 UTC	13.8	14.0	14.2	12.6	11.0	10.0	9.6	9.0	9.0	8.2	9.0	10.9	10.7	10.0
	12 UTC	14.0	14.4	14.2	13.0	12.0	11.0	10.0	10.4	9.4	9.5	10.0	11.6	11.4	10.9
Sunshine Duration		0.0	0.3	0.0	6.0	5.9	7.6	3.3	5.5	8.3	4.1	7.9	4.4	5.8	3.9
Precipitation		0.0	12.3	25.8									38.1	9.1	41.5
Evaporation		1.0	0.3	0.1	4.0	2.0	0.6	1.4	1.0	4.8	2.0	2.2	19.4	18.6	22.7
Growing Degrees	5	9.0	11.4	8.2	6.7	5.7	4.7	3.2	2.4	3.6	4.9	6.4	65.9	61.0	62.1
	10	4.0	6.4	3.2	1.7	0.7	0.0	0.0	0.0	0.0	0.0	1.4	17.3	11.7	14.5

3rd 10-day period (21-31/12/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.7	14.6	11.8
Precipitation - Reference Evapotranspiration	21.4	-5.5	29.7
Number of Rainy Days	2.0	5.0	4.8
Number of Dry Days	7.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



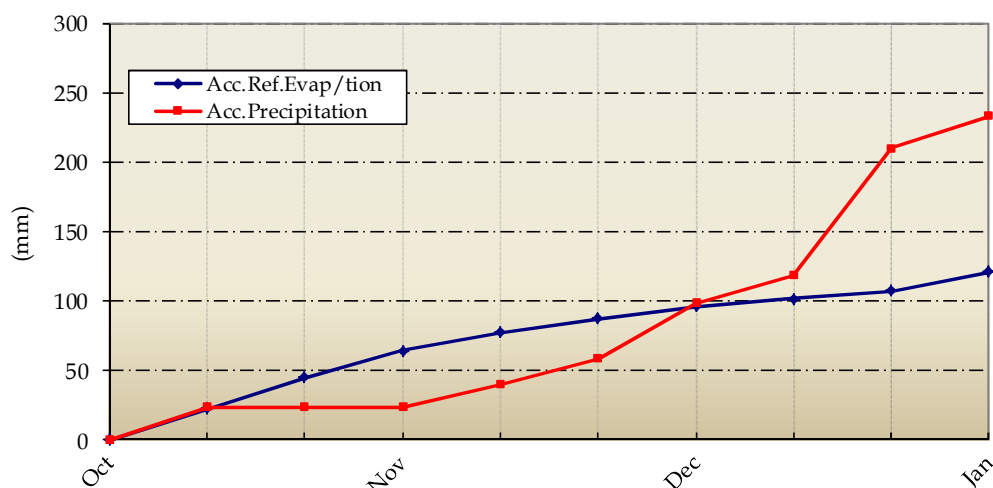
Larisa

3rd 10-day period (21-31/12/2019)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.8	17.6	14.0	14.4	12.2	14.6	10.8	9.0	7.2	6.8	9.3	11.5	10.6	10.0
	Min	7.6	8.0	6.5	6.0	3.0	5.6	0.0	2.4	3.0	4.0	-0.4	4.2	-0.8	1.1
Relative Humidity	Max	99	97	99	85	91	70	88	78	59	70	90	84	94	-
	Min	76	65	50	46	42	36	39	40	40	40	37	46	52	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	5.7
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	6.1
Sunshine Duration		0.0	0.0	2.2	3.3	2.8	5.1	0.0	5.7	6.6	0.0	6.4	2.9	4.0	3.0
Precipitation			3.6	19.9									23.5	2.4	14.0
Evaporation		0.2	0.0	0.8	0.2	0.7	2.2	1.3	3.1	7.0	0.0	0.0	15.5	9.9	7.2
Growing Degrees	5	4.2	7.8	5.3	5.2	2.6	5.1	0.4	0.7	0.1	0.4	0.0	31.8	8.1	18.9
	10	0.0	2.8	0.3	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	3.4	0.0	2.2

3rd 10-day period (21-31/12/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.8	7.8	6.4
Precipitation - Reference Evapotranspiration	9.7	-5.4	7.6
Number of Rainy Days	2.0	2.0	3.0
Number of Dry Days	3.0	6.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



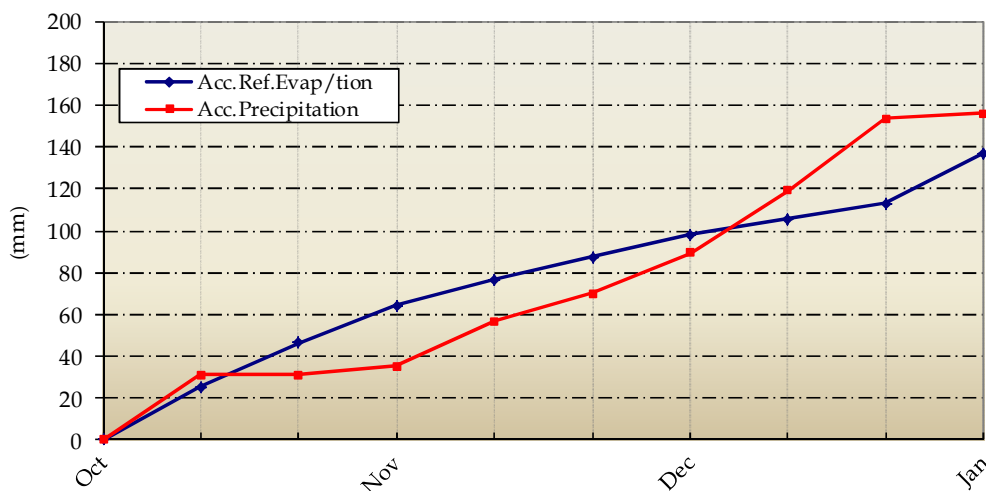
Mikra

3rd 10-day period (21-31/12/2019)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.6	19.4	16.1	12.6	12.4	13.0	10.6	9.1	7.8	8.2	9.0	12.2	10.9	10.2
	Min	8.0	12.8	9.5	10.8	9.8	8.2	6.6	5.3	2.6	2.6	-0.8	6.9	1.3	2.2
Relative Humidity	Max	98	84	90	65	64	67	65	62	63	63	74	72	79	-
	Min	61	59	51	54	46	50	44	41	49	49	38	49	46	-
Soil Temperature at 10 cm	06 UTC	11.6	12.6	12.4	11.0	9.8	9.2	8.6	7.6	5.6	5.6	5.0	9.0	5.1	5.3
	12 UTC	12.2	13.6	13.0	11.0	9.8	9.2	9.4	9.2	9.2	8.8	6.0	10.1	6.4	6.8
Sunshine Duration		0.1	1.0	2.0	1.7	2.9	6.2	5.9	4.6	7.4	0.0	7.8	3.6	5.2	3.0
Precipitation			2.5	0.1									2.6	0.1	14.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	11.7	13.5
Growing Degrees	5	6.8	11.1	7.8	6.7	6.1	5.6	3.6	2.2	0.2	0.4	0.0	50.5	15.5	22.3
	10	1.8	6.1	2.8	1.7	1.1	0.6	0.0	0.0	0.0	0.0	0.0	14.1	0.0	3.0

3rd 10-day period (21-31/12/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	23.9	15.5	8.7
Precipitation - Reference Evapotranspiration	-21.3	-15.4	6.2
Number of Rainy Days	2.0	1.0	3.0
Number of Dry Days	7.0	5.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



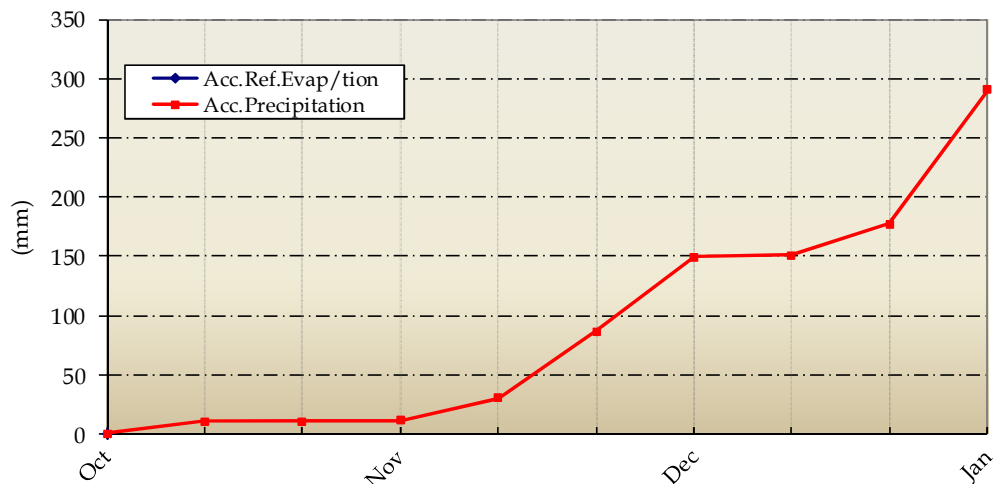
Tanagra

3rd 10-day period (21-31/12/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.0	19.2	15.2	13.6	12.0	11.1	11.6	8.9	6.0	4.6	7.9	11.6	11.8	13.1
	Min	9.6	14.2	12.3	5.6	5.6	4.5	3.2	6.2	1.4	3.0	2.8	6.2	3.2	4.6
Relative Humidity	Max	94	75	82	75	75	94	82	100	100	100	96	88	94	-
	Min	50	47	50	43	37	54	46	45	79	87	53	54	53	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		2.7	0.6	0.7	2.8	3.7	1.7	5.1	2.2	0.0	0.0	1.4	1.9	4.4	
Precipitation				3.1			1.6		1.0	25.6	71.2	10.7	113.2	14.8	24.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	8.8	11.7	8.8	4.6	3.8	2.8	2.4	2.6	0.0	0.0	0.4	45.8	28.0	
	10	3.8	6.7	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	1.3	

3rd 10-day period (21-31/12/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	7.6	
Precipitation - Reference Evapotranspiration	-	7.2	24.3
Number of Rainy Days	6.0	2.0	
Number of Dry Days	7.0	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



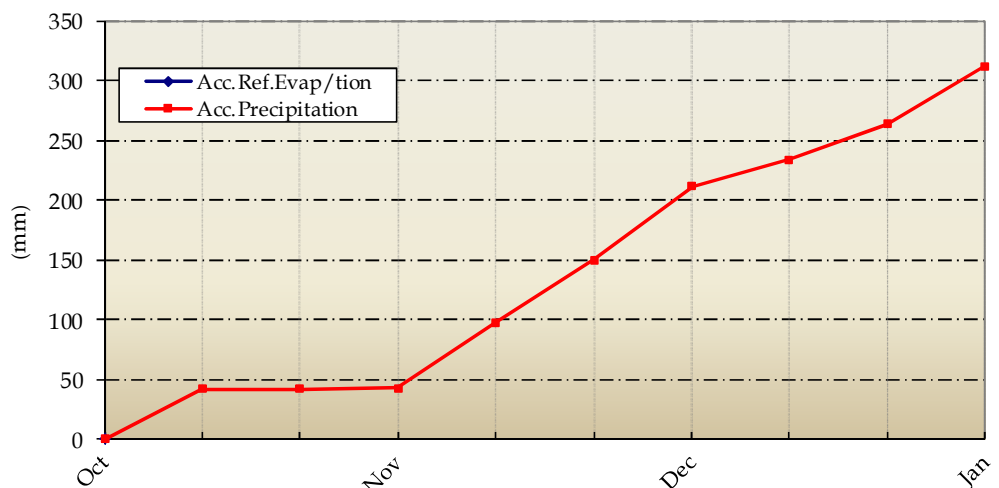
Tripoli

3rd 10-day period (21-31/12/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.0	15.2	10.8	11.1	10.8	11.1	10.2	6.8	2.8	4.2	7.8	9.6	10.7	9.8
	Min	8.8	11.2	5.9	3.5	-1.4	-3.3	-4.5	-1.1	0.0	0.0	0.3	1.8	-1.3	1.5
Relative Humidity	Max	88	97	95	95	97	-	98	98	97	97	-	96	100	-
	Min	56	49	66	39	31	27	50	62	67	58	46	50	54	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	4.3	5.3
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	3.8	6.0
Sunshine Duration		2.5	1.6	0.0	6.1	6.1	6.6	5.5	1.6	0.9	0.3	4.1	3.2	4.4	3.7
Precipitation			14.9	31.5					0.5	1.7	0.0	0.0	48.6	21.9	36.8
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	9.0
Growing Degrees	5	6.9	8.2	3.4	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.8	8.7	18.6
	10	1.9	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	1.8

3rd 10-day period (21-31/12/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	7.2	8.4
Precipitation - Reference Evapotranspiration	-	14.7	28.4
Number of Rainy Days	4.0	5.0	4.5
Number of Dry Days	7.0	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





◆ **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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Division of Climatology-Applications

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The present bulletin was designed and implemented under the support of Water Resources Management Division of Agriculture University of Athens