



AGROMETEOROLOGICAL BULLETIN

July 2019
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



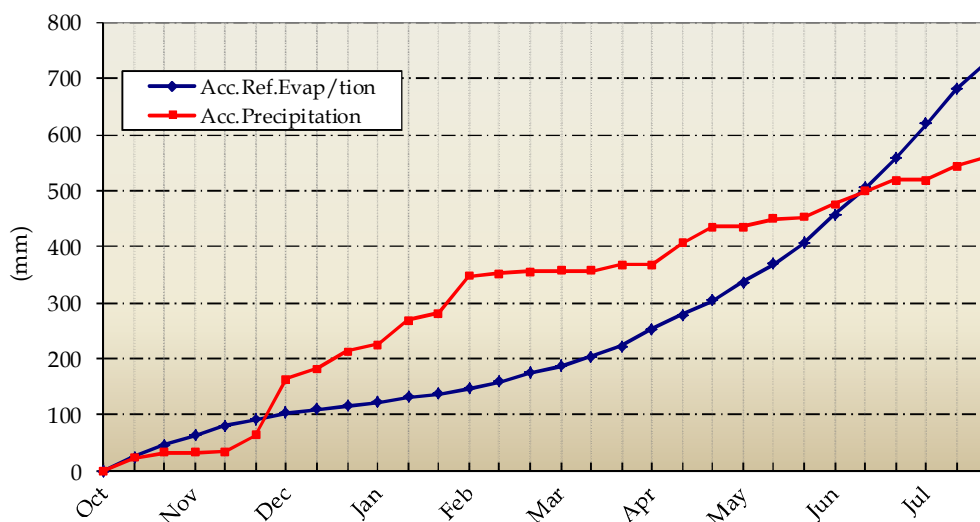
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2nd 10-day period (11-20/07/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.0	26.8	27.8	24.6	25.0	28.2	29.4	31.0	32.0	32.6	28.4	31.3	30.5
	Min	16.2	15.6	16.4	18.4	14.8	15.6	20.2	16.2	15.6	20.0	16.9	19.5	17.5
Relative Humidity	Max	92	91	92	98	97	94	71	91	91	91	91	88	-
	Min	35	34	48	59	48	33	28	33	29	29	38	41	-
Soil Temperature at 10 cm	06 UTC	22.0	21.6	21.6	22.8	20.8	21.6	23.0	23.0	24.0	24.4	22.5	26.6	24.2
	12 UTC	24.6	24.6	24.2	23.6	23.8	24.6	26.0	26.6	17.6	28.4	24.4	29.6	28.8
Sunshine Duration		8.9	9.0	7.9	1.6	9.6	12.5	13.3	13.5	13.5	13.7	10.4	11.0	11.2
Precipitation		11.0	0.4		6.3							17.7	2.8	5.1
Evaporation		4.0	4.4	1.9	3.4	5.7	9.2	5.4	6.0	10.0	8.0	58.0	75.3	98.7
Growing Degrees	5	16.6	16.2	17.1	16.5	14.9	16.9	19.8	18.6	18.8	21.3	176.7	203.9	190.1
	10	11.6	11.2	12.1	11.5	9.9	11.9	14.8	13.6	13.8	16.3	126.7	153.9	140.1

2nd 10-day period (11-20/07/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.4	53.3	60.3
Precipitation - Reference Evapotranspiration	-32.7	-50.5	-55.2
Number of Rainy Days	3.0	2.0	0.9
Number of Dry Days	0.0	8.0	-

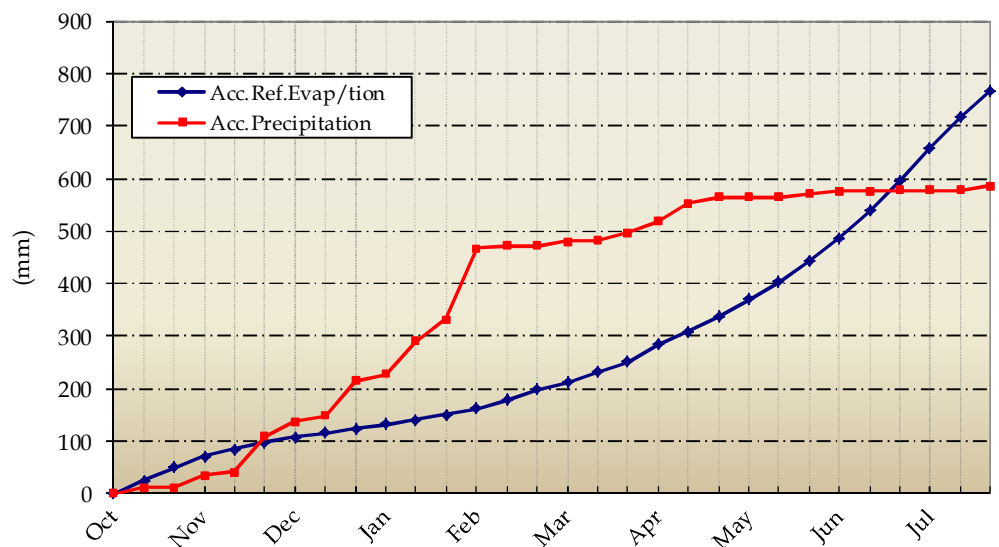
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/07/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.0	28.5	31.0	29.0	25.1	28.6	29.5	30.7	28.8	31.1	29.2	30.4	30.4
	Min	24.1	19.1	18.7	21.7	18.0	18.3	18.0	15.9	17.7	17.3	18.9	19.1	18.1
Relative Humidity	Max	80	88	92	98	83	100	100	90	89	95	92	88	-
	Min	45	43	32	49	45	48	33	30	38	25	39	40	-
Soil Temperature at 10 cm	06 UTC	30.3	28.2	28.8	29.8	28.4	26.6	25.0	24.4	25.2	25.2	27.2	26.9	27.1
	12 UTC	32.0	33.0	31.4	30.9	28.6	28.0	25.0	30.6	28.0	28.0	29.6	28.8	31.8
Sunshine Duration		13.3	12.2	12.9	12.2	2.9	3.8	8.2	13.4	12.2	13.2	10.4	12.8	12.3
Precipitation						1.1	7.2					8.3		0.8
Evaporation		8.5	8.2	3.0	8.0	2.6	0.8	8.1	7.0	9.0	10.5	65.7	68.3	77.4
Growing Degrees	5	22.1	18.8	19.9	20.4	16.6	18.5	18.8	18.3	18.3	19.2	190.6	198.0	192.4
	10	17.1	13.8	14.9	15.4	11.6	13.5	13.8	13.3	13.3	14.2	140.6	148.0	142.4

2nd 10-day period (11-20/07/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.2	57.5	55.3
Precipitation - Reference Evapotranspiration	-41.9	-57.5	-54.5
Number of Rainy Days	2.0	0.0	0.1
Number of Dry Days	28.0	21.0	-

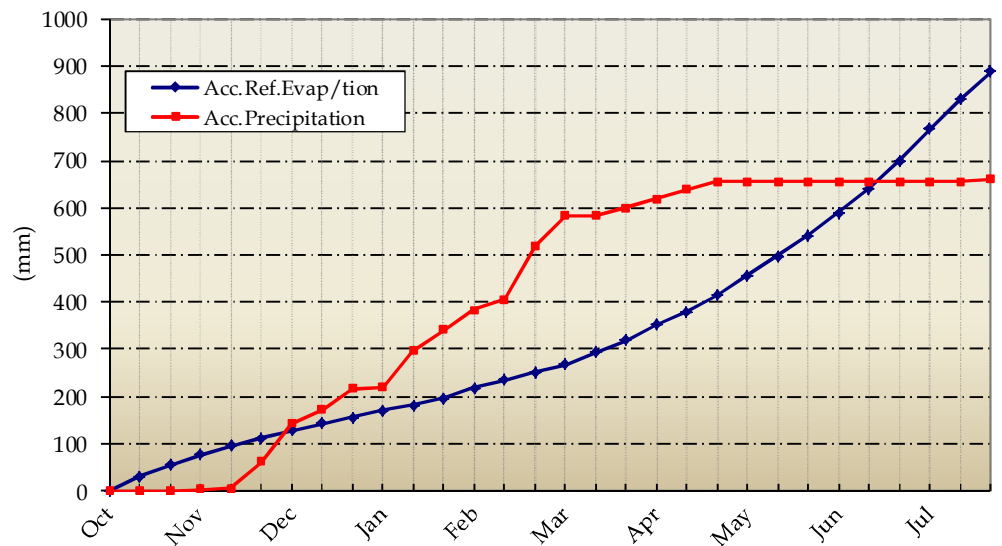
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/07/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.4	26.6	28.0	30.0	27.8	28.4	26.6	28.0	28.6	28.4	28.6	29.9	28.5
	Min	26.6	24.0	19.4	21.4	25.4	23.4	20.4	24.0	20.0	23.6	22.8	23.9	22.1
Relative Humidity	Max	72	73	82	75	89	86	90	72	67	74	78	81	-
	Min	32	51	58	49	57	57	63	46	44	54	51	53	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		12.2	11.8	13.0	12.9	10.9	11.2	7.8	12.7	12.9	12.6	11.8	12.6	12.1
Precipitation								4.6				4.6		0.0
Evaporation		12.0	6.8	4.7	6.8	5.4	5.7	11.2	7.8	5.9	7.9	74.2	80.1	93.8
Growing Degrees	5	25.0	20.3	18.7	20.7	21.6	20.9	18.5	21.0	19.3	21.0	207.0	219.3	203.0
	10	20.0	15.3	13.7	15.7	16.6	15.9	13.5	16.0	14.3	16.0	157.0	169.3	153.0

2nd 10-day period (11-20/07/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	59.7	63.7	-
Precipitation - Reference Evapotranspiration	-55.1	-63.7	0.0
Number of Rainy Days	1.0	0.0	0.0
Number of Dry Days	62.0	33.0	-

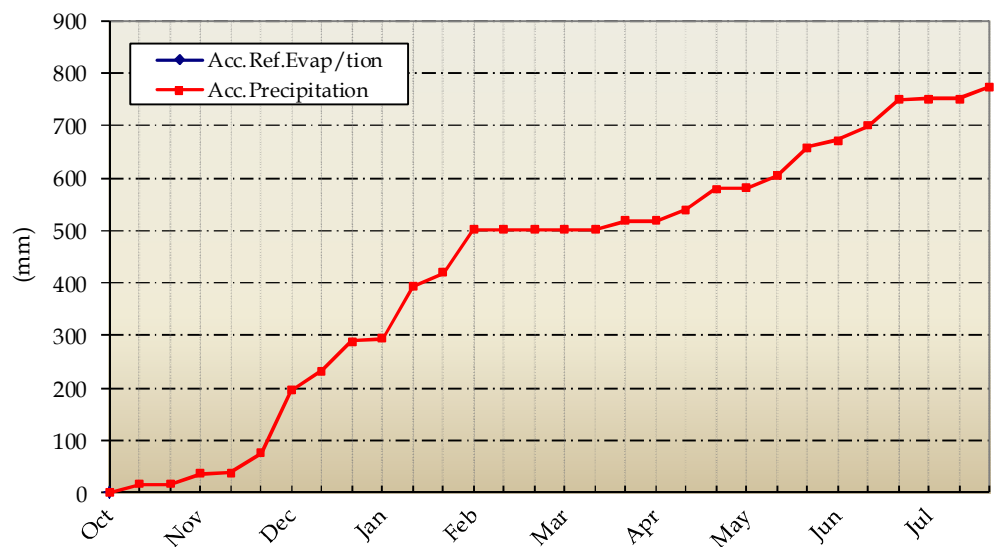
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/07/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.4	30.0	29.6	29.0	28.0	21.4	26.8	28.4	27.4	31.2	28.1	32.3	31.4
	Min	15.0	16.0	14.0	15.8	13.4	16.0	15.4	15.2	15.6	13.4	15.0	16.0	15.3
Relative Humidity	Max	100	88	100	92	100	100	100	92	100	94	97	97	-
	Min	37	36	35	33	49	81	41	37	44	36	43	35	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	23.4
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	27.8
Sunshine Duration		11.6	10.6	11.8	12.8	5.6	0.0	7.8	11.7	6.6	10.1	8.9	12.5	10.3
Precipitation		3.8			0.4	0.2	13.8	4.4		0.1		22.7		13.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	83.3
Growing Degrees	5	17.2	18.0	16.8	17.4	15.7	13.7	16.1	16.8	16.5	17.3	165.5	191.2	178.2
	10	12.2	13.0	11.8	12.4	10.7	8.7	11.1	11.8	11.5	12.3	115.5	141.2	129.5

2nd 10-day period (11-20/07/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	50.5
Precipitation - Reference Evapotranspiration	-	-	-37.2
Number of Rainy Days	6.0	0.0	1.6
Number of Dry Days	11.0	11.0	-

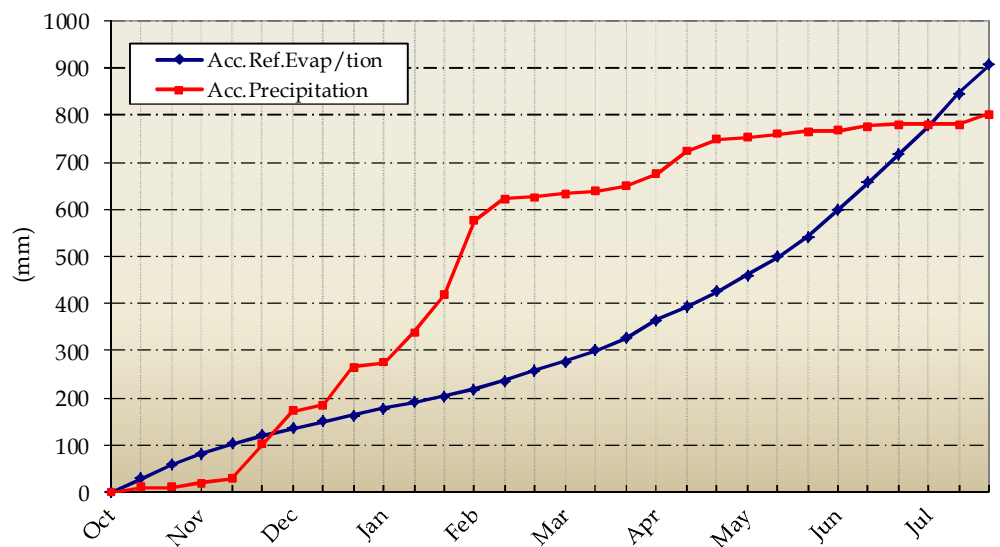
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/07/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.6	28.6	31.6	33.0	27.4	30.3	30.4	30.2	30.4	31.2	30.7	32.7	31.2
	Min	21.4	19.3	17.3	20.1	16.4	19.4	18.7	16.8	17.2	18.6	18.5	19.8	17.8
Relative Humidity	Max	74	85	83	86	81	92	81	76	76	79	81	83	-
	Min	30	46	29	30	39	39	29	26	28	29	32	32	-
Soil Temperature at 10 cm	06 UTC	29.4	29.2	28.2	28.4	28.0	26.2	25.0	24.4	25.2	25.5	27.0	26.8	25.6
	12 UTC	33.0	32.4	32.0	33.8	29.0	30.4	26.5	28.4	29.0	32.8	30.7	28.9	30.0
Sunshine Duration		12.4	11.9	12.6	12.3	3.0	7.3	9.3	12.4	11.2	12.1	10.4	12.7	11.5
Precipitation						0.5	21.0					21.5		3.4
Evaporation		9.8	8.2	6.0	10.7	2.6	1.2	4.6	9.1	9.8	5.4	67.4	92.0	87.7
Growing Degrees	5	22.5	19.0	19.5	21.6	16.9	19.9	19.6	18.5	18.8	19.9	196.0	212.7	195.0
	10	17.5	14.0	14.5	16.6	11.9	14.9	14.6	13.5	13.8	14.9	146.0	162.7	145.0

2nd 10-day period (11-20/07/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	59.5	67.0	57.1
Precipitation - Reference Evapotranspiration	-38.0	-67.0	-53.7
Number of Rainy Days	2.0	0.0	0.4
Number of Dry Days	29.0	22.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

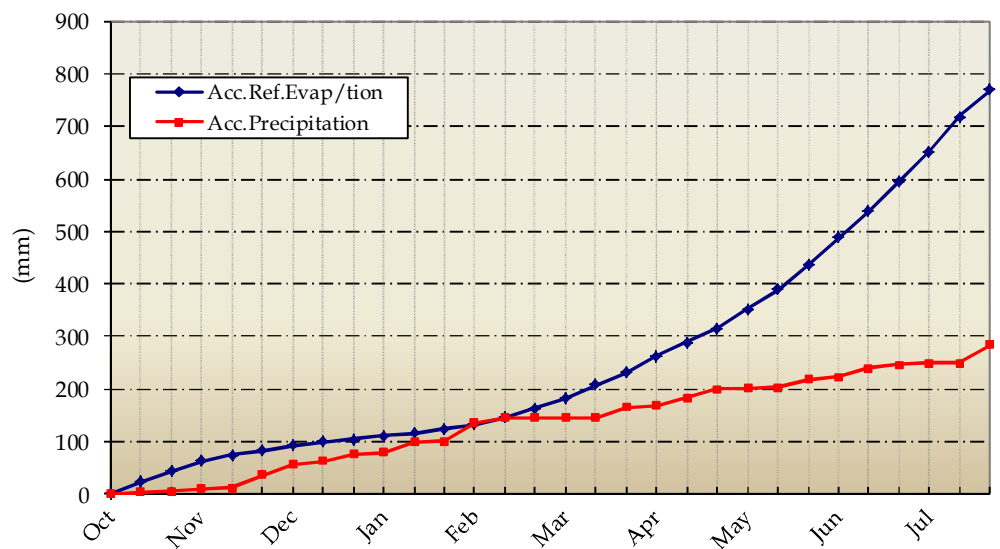


Larisa

2nd 10-day period (11-20/07/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.0	30.6	31.0	28.4	28.8	29.0	28.8	32.4	32.1	32.6	30.2	34.4	33.3
	Min	18.6	17.0	17.6	20.8	19.0	19.0	17.6	17.4	18.0	16.2	18.1	20.1	17.9
Relative Humidity	Max	94	99	97	85	78	98	96	94	90	92	92	78	-
	Min	33	33	34	43	36	63	39	27	33	28	37	27	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	26.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	29.2
Sunshine Duration		11.0	10.8	11.0	11.2	7.3	0.2	9.5	10.7	9.9	12.1	9.4	11.4	11.0
Precipitation		6.3		10.2			17.5	1.3				35.3		9.9
Evaporation		8.4	10.6	6.5	6.9	7.3	1.0	2.4	9.3	8.6	11.7	72.7	105.2	96.3
Growing Degrees	5	18.3	18.8	19.3	19.6	18.9	19.0	18.2	19.9	20.1	19.4	191.5	222.1	205.9
	10	13.3	13.8	14.3	14.6	13.9	14.0	13.2	14.9	15.1	14.4	141.5	172.1	155.9

2nd 10-day period (11-20/07/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	51.1	60.8	62.2
Precipitation - Reference Evapotranspiration	-15.8	-60.8	-52.3
Number of Rainy Days	4.0	0.0	1.2
Number of Dry Days	10.0	11.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

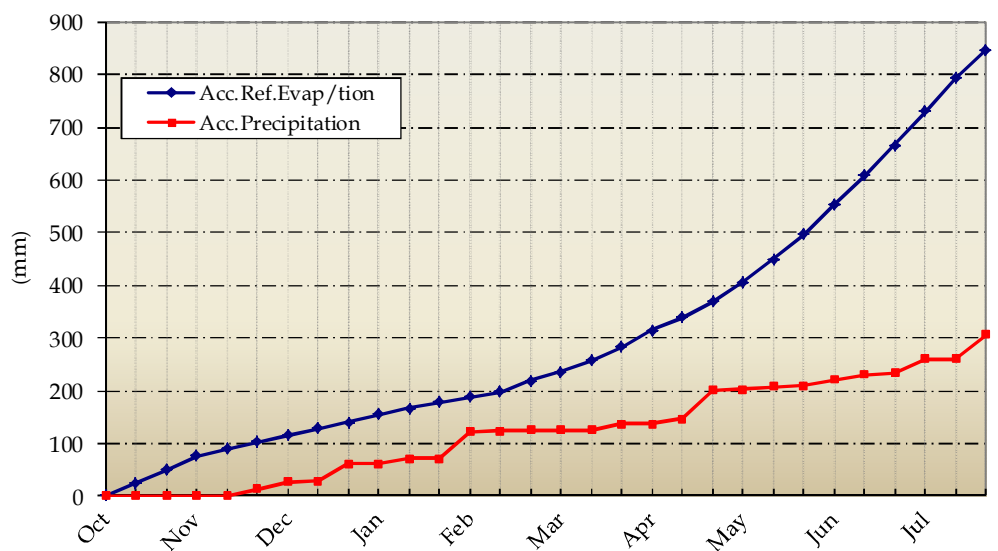


Mikra

2nd 10-day period (11-20/07/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.8	29.2	30.3	28.3	28.1	24.8	29.0	31.0	31.0	32.2	29.3	32.9	31.7
	Min	18.2	17.8	20.0	18.4	19.7	19.8	21.2	19.0	18.3	18.7	19.1	22.1	18.9
Relative Humidity	Max	92	88	94	94	86	94	83	85	85	89	89	65	-
	Min	37	28	31	38	41	67	10	33	38	34	36	29	-
Soil Temperature at 10 cm	06 UTC	25.0	24.6	27.0	25.0	23.8	25.0	23.2	24.0	24.6	25.6	24.8	27.0	26.6
	12 UTC	27.8	27.8	31.0	27.8	27.4	25.4	26.6	29.0	29.0	29.6	28.1	30.2	31.5
Sunshine Duration		10.7	11.6	10.8	7.8	12.6	0.0	9.2	13.3	11.6	13.0	10.1	12.6	10.8
Precipitation		18.2			21.0		8.2					47.4		4.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	99.2	94.9
Growing Degrees	5	18.5	18.5	20.2	18.4	18.9	17.3	20.1	20.0	19.7	20.5	191.9	225.0	203.4
	10	13.5	13.5	15.2	13.4	13.9	12.3	15.1	15.0	14.7	15.5	141.9	175.0	153.4

2nd 10-day period (11-20/07/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	55.0	74.4	60.5
Precipitation - Reference Evapotranspiration	-7.6	-74.4	-56.2
Number of Rainy Days	3.0	0.0	1.4
Number of Dry Days	11.0	11.0	-

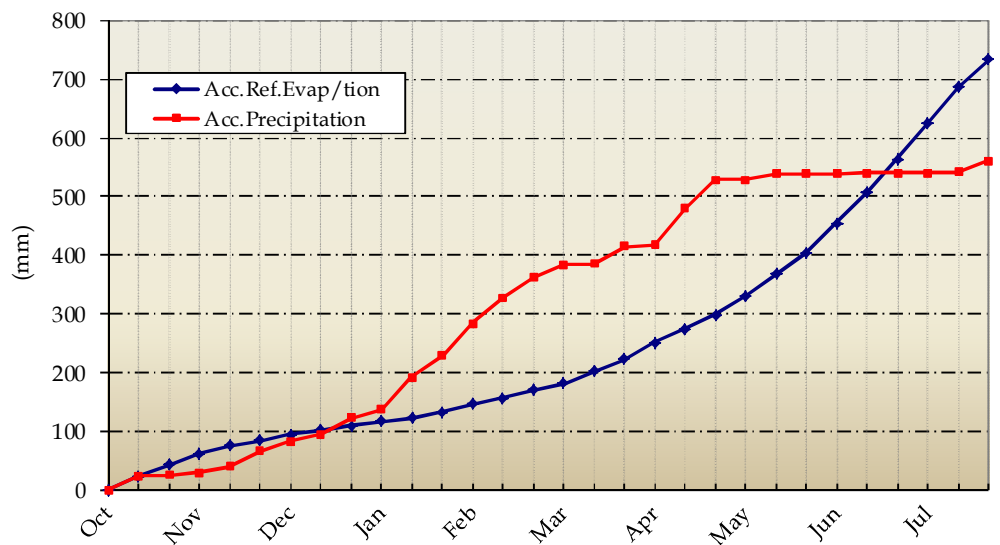
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/07/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.9	30.2	30.4	30.0	27.6	27.8	26.6	30.6	30.2	30.4	28.8	33.8	32.1
	Min	20.7	15.2	17.4	19.9	18.3	17.5	18.6	16.1	16.6	18.4	17.9	20.4	18.3
Relative Humidity	Max	91	81	79	93	100	100	95	92	74	66	87	66	-
	Min	47	27	32	41	40	34	38	24	23	23	33	21	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		3.2	11.4	12.4	7.6	7.3	3.5	6.9	13.0	13.2	13.3	9.2	12.6	
Precipitation		3.2			12.9	1.4	0.4	1.9				19.8		2.0
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	17.3	17.7	18.9	20.0	18.0	17.7	17.6	18.4	18.4	19.4	183.2	221.3	
	10	12.3	12.7	13.9	15.0	13.0	12.7	12.6	13.4	13.4	14.4	133.2	171.3	

2nd 10-day period (11-20/07/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	47.5	60.5	
Precipitation - Reference Evapotranspiration	-27.7	-60.5	2.0
Number of Rainy Days	5.0	0.0	0.4
Number of Dry Days	0.0	23.0	-

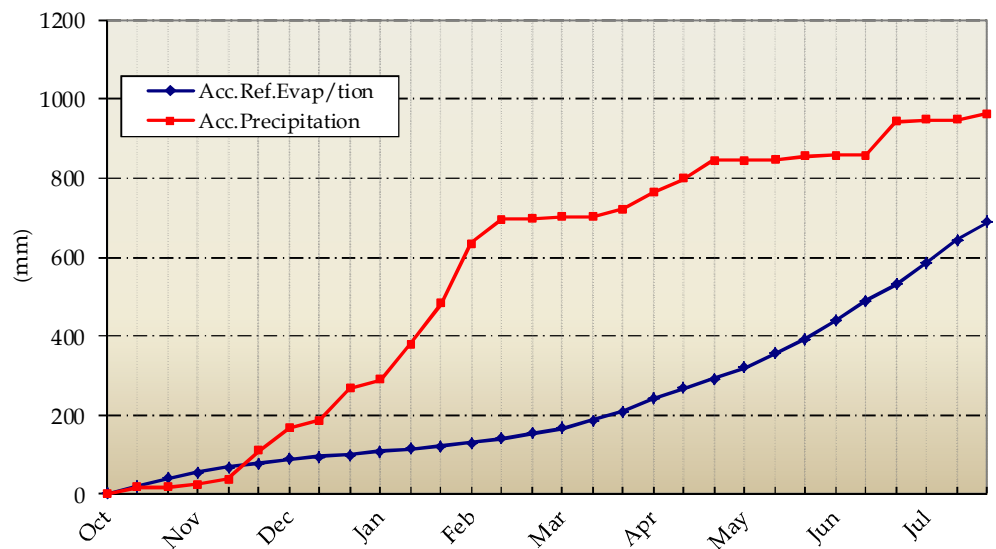
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/07/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.3	27.8	29.0	29.3	23.2	25.3	23.8	27.5	28.5	28.9	27.3	31.0	30.6
	Min	20.2	17.8	12.1	17.4	13.3	16.5	14.5	10.7	12.7	12.0	14.7	15.1	14.1
Relative Humidity	Max	81	88	82	88	92	98	95	93	94	94	90	92	-
	Min	32	31	27	24	48	44	43	26	22	24	32	28	-
Soil Temperature at 10 cm	06 UTC	28.0	27.2	24.8	26.2	25.8	23.2	21.2	19.8	21.2	-	24.2	26.9	25.3
	12 UTC	35.2	31.8	33.4	-	27.6	29.0	23.5	27.4	27.6	-	29.4	32.4	28.3
Sunshine Duration		9.7	10.1	12.6	12.5	1.8	4.3	6.4	9.4	11.5	13.1	9.1	10.8	10.5
Precipitation						1.8	11.1	2.1				15.0	5.9	9.1
Evaporation		7.2	7.9	7.4	9.5	2.6	2.4	3.1	7.1	-	-	-	70.0	63.7
Growing Degrees	5	19.8	17.8	15.6	18.4	13.3	15.9	14.2	14.1	15.6	15.5	159.9	180.5	173.2
	10	14.8	12.8	10.6	13.4	8.3	10.9	9.2	9.1	10.6	10.5	109.9	130.5	123.2

2nd 10-day period (11-20/07/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	46.6	49.5	53.3
Precipitation - Reference Evapotranspiration	-31.6	-43.6	-44.2
Number of Rainy Days	3.0	1.0	1.4
Number of Dry Days	23.0	20.0	-

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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