



AGROMETEOROLOGICAL BULLETIN

September 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



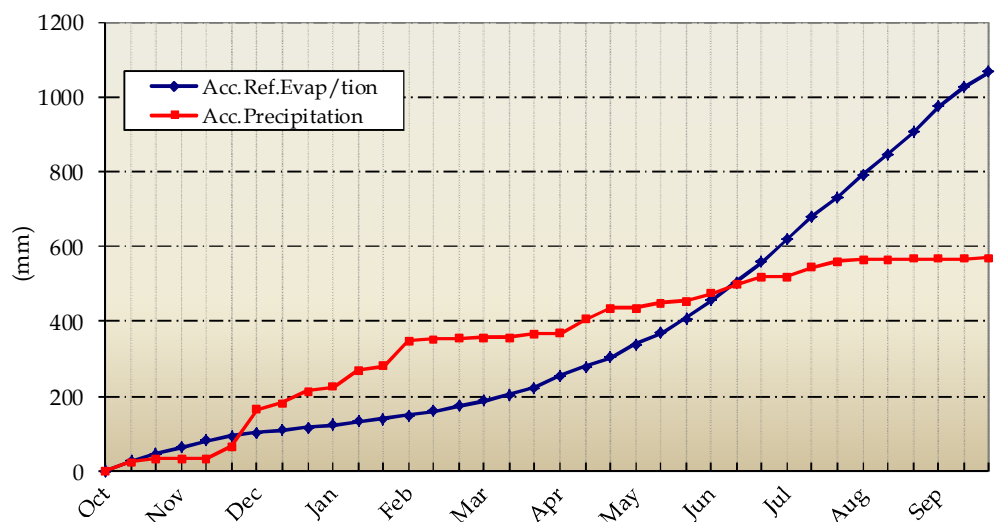
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 El. Venizelou Street 14, 16777
 Helliniko, Athens

Web adresses of HNMS
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2nd 10-day period (11-20/09/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.8	29.4	29.0	31.6	30.0	27.0	27.2	29.4	28.8	23.4	28.7	28.0	26.5
	Min	20.6	17.4	20.8	13.0	16.0	14.4	13.8	14.0	20.8	14.6	16.5	16.4	13.8
Relative Humidity	Max	90	73	52	71	69	77	87	89	67	79	75	78	-
	Min	31	33	30	17	31	38	46	39	44	57	37	39	-
Soil Temperature at 10 cm	06 UTC	25.8	25.4	25.6	23.6	24.4	23.6	23.6	23.0	25.0	24.0	24.4	23.2	19.9
	12 UTC	30.6	30.0	29.0	29.6	29.4	29.0	29.0	29.4	28.4	22.0	28.6	27.3	23.7
Sunshine Duration		11.2	7.3	6.7	11.3	10.3	10.1	10.5	10.7	9.4	0.7	8.8	8.9	8.5
Precipitation											1.8	1.8	0.5	5.2
Evaporation		13.3	6.9	7.2	11.6	4.9	6.3	5.0	9.0	7.2	1.6	73.0	61.4	66.6
Growing Degrees	5	20.7	18.4	19.9	17.3	18.0	15.7	15.5	16.7	19.8	14.0	176.0	171.6	151.3
	10	15.7	13.4	14.9	12.3	13.0	10.7	10.5	11.7	14.8	9.0	126.0	121.6	101.3

2nd 10-day period (11-20/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	40.7	38.0	37.1
Precipitation - Reference Evapotranspiration	-38.9	-37.5	-31.9
Number of Rainy Days	1.0	1.0	0.9
Number of Dry Days	33.0	7.0	-

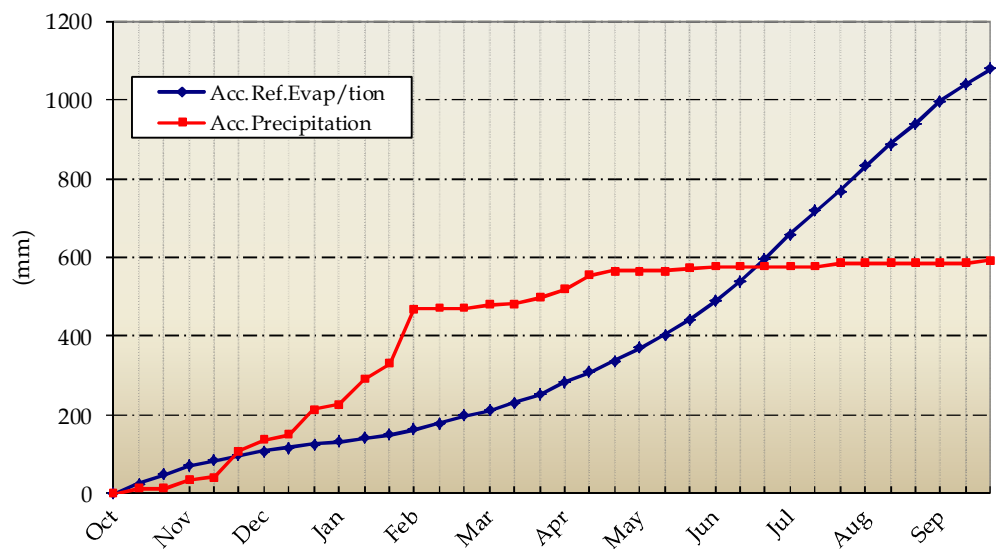
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/09/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.0	30.3	30.8	30.7	33.4	29.9	29.0	29.2	29.0	27.7	30.1	30.2	28.2
	Min	19.2	16.6	18.6	14.8	15.8	15.1	17.1	17.6	17.5	18.4	17.1	16.4	16.5
Relative Humidity	Max	92	100	82	66	64	92	99	100	94	100	89	84	-
	Min	26	30	19	16	20	29	46	33	49	53	32	31	-
Soil Temperature at 10 cm	06 UTC	27.0	26.8	27.2	25.4	25.6	25.2	25.8	26.2	25.6	26.2	26.1	25.5	23.4
	12 UTC	29.6	28.6	28.2	27.3	27.4	29.2	27.6	27.4	28.4	27.2	28.1	28.8	26.9
Sunshine Duration		5.5	9.8	10.5	10.6	10.5	11.2	9.9	10.2	10.4	8.2	9.7	10.0	9.1
Precipitation											5.9	5.9		7.0
Evaporation		3.0	5.0	6.0	6.3	7.0	7.0	6.4	7.0	0.0	4.0	51.7	75.6	56.3
Growing Degrees	5	20.1	18.5	19.7	17.8	19.6	17.5	18.1	18.4	18.3	18.1	185.9	183.1	173.6
	10	15.1	13.5	14.7	12.8	14.6	12.5	13.1	13.4	13.3	13.1	135.9	133.1	123.6

2nd 10-day period (11-20/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	40.0	39.6	36.2
Precipitation - Reference Evapotranspiration	-34.1	-39.6	-29.2
Number of Rainy Days	1.0	0.0	1.1
Number of Dry Days	65.0	24.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

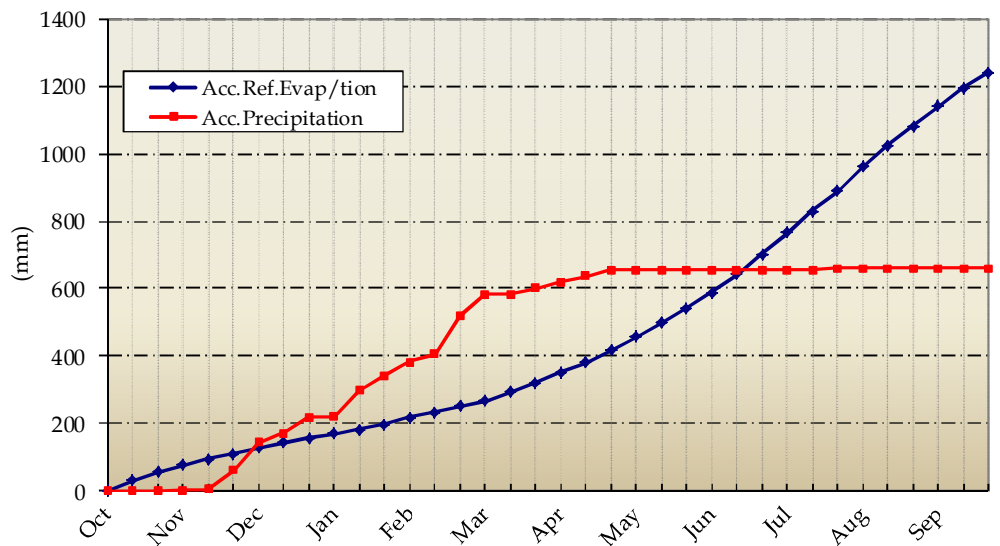


Iraklio

2nd 10-day period (11-20/09/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.2	27.4	25.2	25.4	26.4	26.2	27.6	27.2	28.4	27.2	26.8	26.6	26.4
	Min	23.2	20.0	23.4	23.0	23.2	22.0	16.8	17.2	18.6	19.2	20.7	21.6	19.5
Relative Humidity	Max	85	74	73	66	73	75	81	79	90	90	79	86	-
	Min	61	54	53	56	47	43	42	41	59	64	52	68	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		11.2	10.8	7.6	9.7	10.2	10.0	11.0	10.7	10.0	9.6	10.1	9.4	9.4
Precipitation													12.7	6.0
Evaporation		4.6	6.7	7.6	8.0	5.9	6.9	1.7	4.7	2.7	3.8	52.6	52.5	64.4
Growing Degrees	5	20.2	18.7	19.3	19.2	19.8	19.1	17.2	17.2	18.5	18.2	187.4	190.9	179.8
	10	15.2	13.7	14.3	14.2	14.8	14.1	12.2	12.2	13.5	13.2	137.4	140.9	129.8

2nd 10-day period (11-20/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	46.7	40.2	-
Precipitation - Reference Evapotranspiration	-46.7	-27.5	6.0
Number of Rainy Days	0.0	2.0	0.5
Number of Dry Days	65.0	14.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

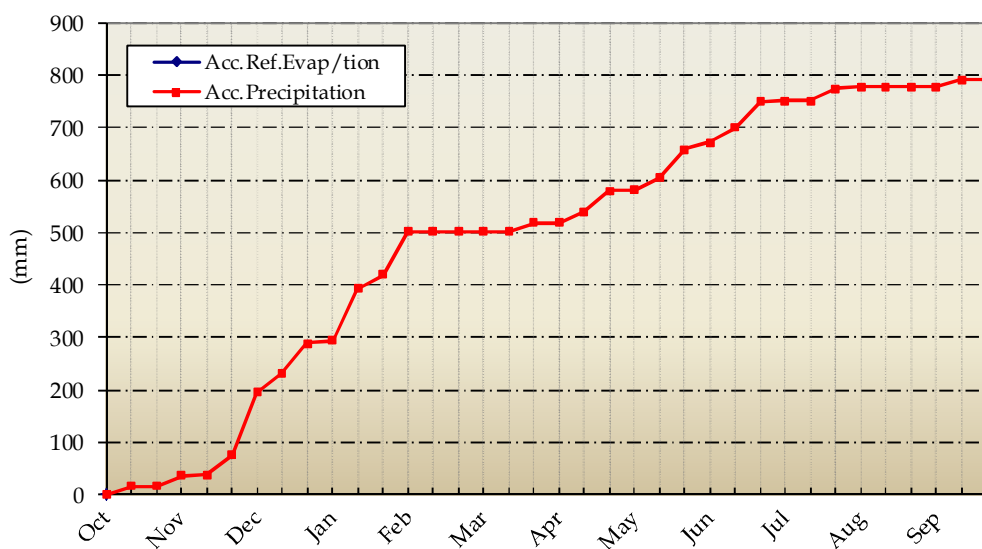


Ioannina

2nd 10-day period (11-20/09/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.2	30.0	29.0	30.2	30.6	30.6	30.4	30.2	29.6	25.4	29.4	29.0	26.5
	Min	14.2	15.4	16.4	17.6	16.4	9.6	10.0	9.2	14.0	16.4	13.9	13.2	12.2
Relative Humidity	Max	94	100	36	55	56	97	85	100	98	100	82	99	-
	Min	37	34	23	20	23	26	30	28	44	43	31	33	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	18.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	21.1
Sunshine Duration		4.4	8.2	9.7	9.4	9.0	8.8	9.0	8.8	5.4	6.5	7.9	8.6	6.9
Precipitation		0.0									1.8	1.8		16.4
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	43.6
Growing Degrees	5	16.2	17.7	17.7	18.9	18.5	15.1	15.2	14.7	16.8	15.9	166.7	161.2	143.6
	10	11.2	12.7	12.7	13.9	13.5	10.1	10.2	9.7	11.8	10.9	116.7	111.2	93.6

2nd 10-day period (11-20/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	28.7
Precipitation - Reference Evapotranspiration	-	-	-12.3
Number of Rainy Days	1.0	0.0	2.1
Number of Dry Days	12.0	12.0	-

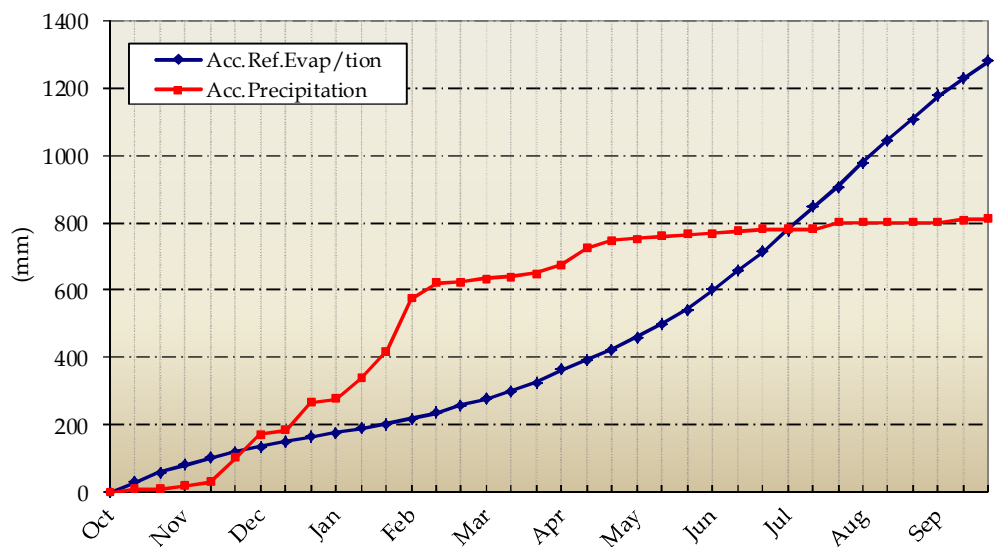
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/09/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.8	29.4	32.0	33.4	32.5	30.2	29.7	32.8	29.8	30.4	31.1	30.5	28.6
	Min	18.6	17.6	20.0	18.8	19.2	19.5	16.1	16.0	17.0	18.2	18.1	17.5	15.9
Relative Humidity	Max	89	88	73	40	41	76	83	85	86	88	75	79	-
	Min	31	41	22	15	17	27	32	14	38	33	27	29	-
Soil Temperature at 10 cm	06 UTC	25.8	24.8	25.2	24.2	24.4	24.4	23.0	24.6	25.0	25.2	24.7	25.0	22.6
	12 UTC	29.6	27.2	26.6	28.6	26.4	26.8	29.8	27.4	27.8	27.2	27.7	27.3	25.8
Sunshine Duration		7.6	11.2	9.4	11.0	11.1	10.9	10.7	11.2	10.9	7.5	10.2	9.3	8.7
Precipitation		2.6									0.8	3.4	0.0	6.3
Evaporation		3.8	5.0	10.5	8.8	8.8	8.2	5.4	6.5	6.3	6.0	69.3	69.6	60.4
Growing Degrees	5	19.7	18.5	21.0	21.1	20.9	19.9	17.9	19.4	18.4	19.3	196.0	190.0	172.4
	10	14.7	13.5	16.0	16.1	15.9	14.9	12.9	14.4	13.4	14.3	146.0	140.0	122.4

2nd 10-day period (11-20/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.7	47.5	38.1
Precipitation - Reference Evapotranspiration	-47.3	-47.5	-31.8
Number of Rainy Days	2.0	0.0	1.0
Number of Dry Days	3.0	24.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

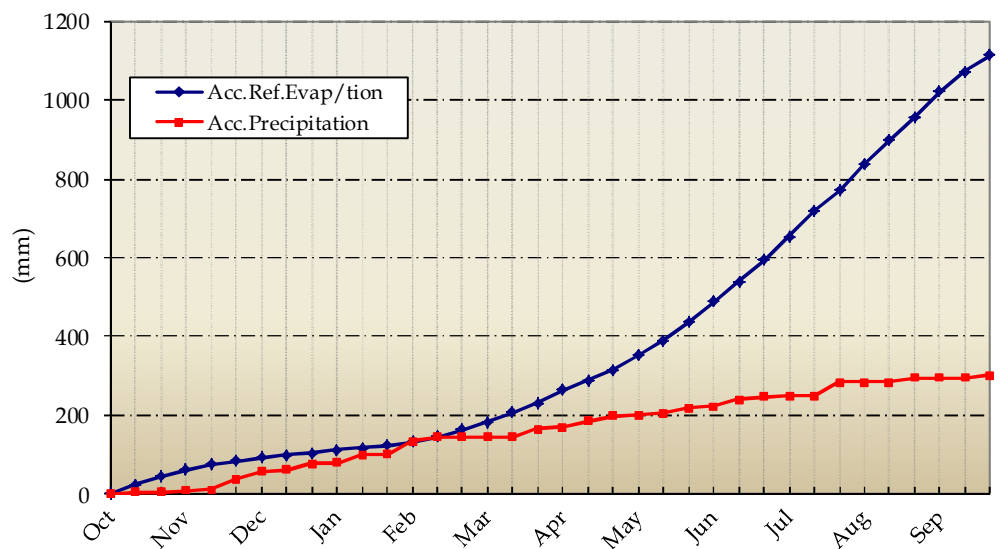


Larisa

2nd 10-day period (11-20/09/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.8	30.6	30.2	31.0	30.0	31.4	34.2	34.4	29.4	23.4	30.4	29.2	29.0
	Min	19.0	16.0	19.2	16.2	14.7	12.6	13.6	14.8	15.0	15.8	15.7	15.1	14.0
Relative Humidity	Max	81	83	77	59	68	78	79	79	97	92	79	87	-
	Min	35	32	20	16	28	27	19	20	42	58	30	35	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	22.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	24.1
Sunshine Duration		5.7	8.2	8.2	8.9	8.9	8.6	9.3	9.0	8.4	1.7	7.7	7.7	8.3
Precipitation											6.3	6.3	1.8	12.0
Evaporation		8.2	8.9	9.0	9.1	10.6	5.3	11.8	9.6	6.2	3.7	82.4	70.0	61.4
Growing Degrees	5	19.4	18.3	19.7	18.6	17.4	17.0	18.9	19.6	17.2	14.6	180.7	172.0	165.0
	10	14.4	13.3	14.7	13.6	12.4	12.0	13.9	14.6	12.2	9.6	130.7	122.0	115.0

2nd 10-day period (11-20/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	41.7	37.1	38.0
Precipitation - Reference Evapotranspiration	-35.4	-35.3	-26.0
Number of Rainy Days	1.0	1.0	1.2
Number of Dry Days	33.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

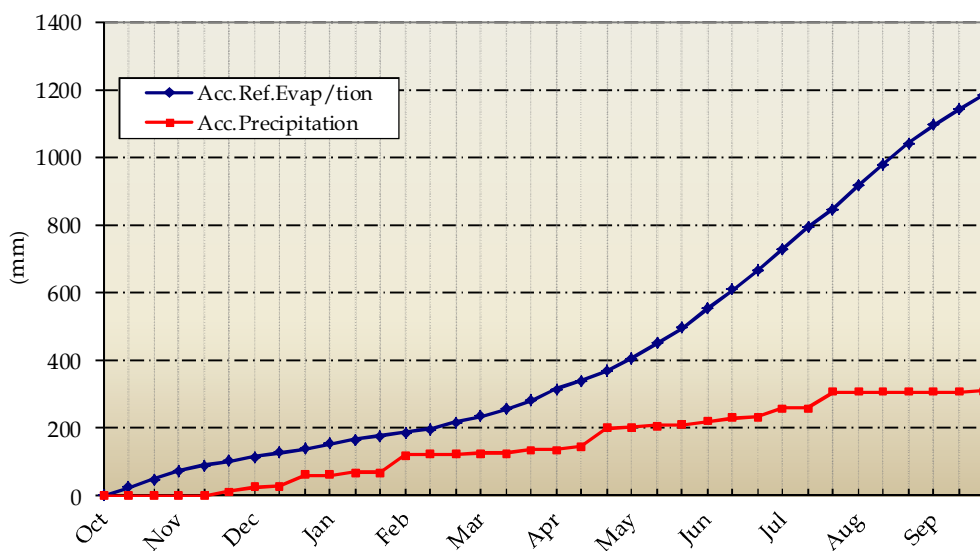


Mikra

2nd 10-day period (11-20/09/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.6	30.2	31.9	31.0	29.9	29.4	31.3	32.0	27.2	24.4	29.7	29.1	27.5
	Min	19.2	18.8	19.4	14.9	17.2	16.8	16.2	17.4	18.2	14.8	17.3	17.4	15.2
Relative Humidity	Max	84	84	85	65	68	77	76	74	83	81	78	72	-
	Min	37	42	18	28	29	49	36	36	45	38	36	32	-
Soil Temperature at 10 cm	06 UTC	26.4	25.5	26.2	25.4	25.4	25.4	25.0	24.0	26.0	23.3	25.3	25.0	21.4
	12 UTC	29.5	29.2	28.4	28.4	29.2	28.5	29.0	28.6	27.6	23.6	28.2	28.2	25.2
Sunshine Duration		9.7	9.8	9.9	10.6	9.8	10.4	11.4	10.5	5.9	0.7	8.9	9.7	8.1
Precipitation				0.4							1.5	1.9	0.3	7.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	73.7	62.1
Growing Degrees	5	19.4	19.5	20.7	18.0	18.6	18.1	18.8	19.7	17.7	14.6	184.9	182.3	163.4
	10	14.4	14.5	15.7	13.0	13.6	13.1	13.8	14.7	12.7	9.6	134.9	132.3	113.4

2nd 10-day period (11-20/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	44.1	41.9	37.4
Precipitation - Reference Evapotranspiration	-42.2	-41.6	-29.8
Number of Rainy Days	2.0	2.0	1.4
Number of Dry Days	28.0	14.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

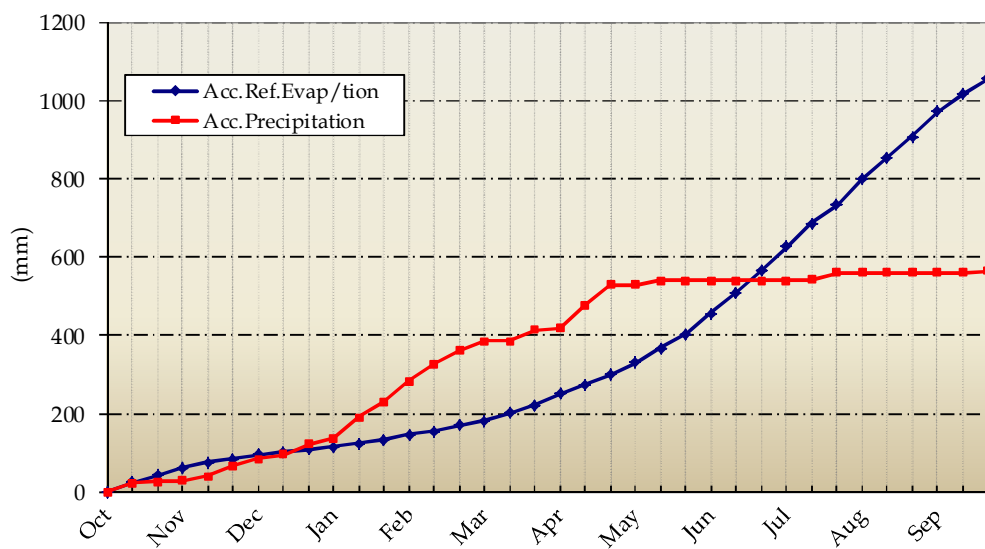


Tanagra

2nd 10-day period (11-20/09/2019)		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	28.7	26.6	28.0	27.3	28.6	31.6	32.6	29.8	21.9	28.3	27.6	28.3
	Min	17.9	18.1	18.2	16.8	16.1	16.0	13.1	16.2	16.0	17.5	16.6	16.9	15.0
Relative Humidity	Max	70	67	83	52	66	76	75	78	90	79	74	75	-
	Min	32	30	28	19	28	25	19	18	34	37	27	33	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		11.2	10.2	7.1	11.1	10.2	11.1	12.2	10.1	9.7	1.4	9.4	9.8	
Precipitation				3.9								3.9	1.9	3.2
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	18.0	18.4	17.4	17.4	16.7	17.3	17.4	19.4	17.9	14.7	174.5	172.6	
	10	13.0	13.4	12.4	12.4	11.7	12.3	12.4	14.4	12.9	9.7	124.5	122.6	

2nd 10-day period (11-20/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	40.7	39.5	
Precipitation - Reference Evapotranspiration	-36.8	-37.6	3.2
Number of Rainy Days	1.0	1.0	1.0
Number of Dry Days	57.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

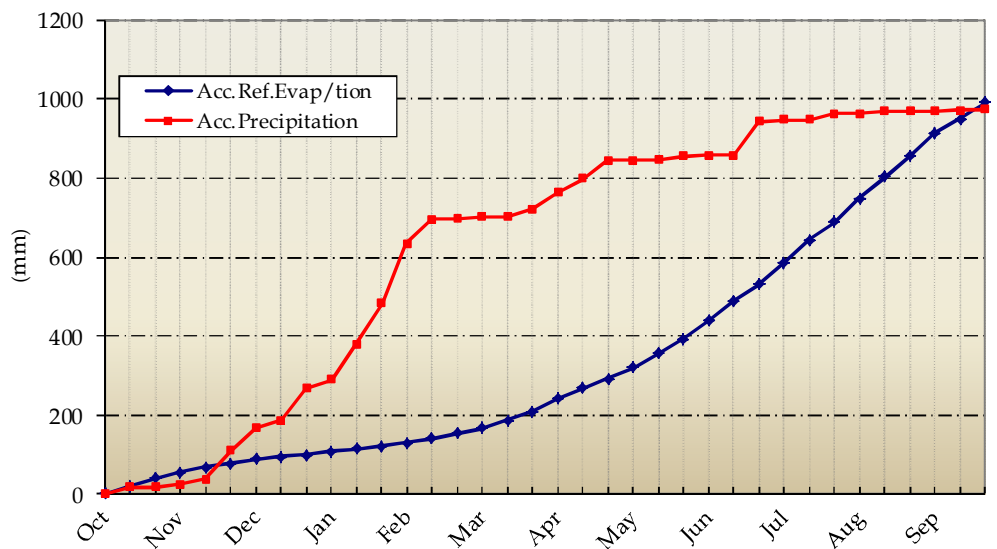


Tripoli

2nd 10-day period (11-20/09/2019)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.6	28.2	24.5	26.2	25.8	28.1	30.0	29.6	29.6	26.6	27.5	26.6	26.9
	Min	12.5	11.2	16.3	18.9	18.8	15.4	9.6	9.9	10.0	13.7	13.6	11.2	11.2
Relative Humidity	Max	97	99	81	45	54	85	91	92	94	95	83	95	-
	Min	35	28	30	20	27	20	20	13	23	37	25	30	-
Soil Temperature at 10 cm	06 UTC	22.2	21.6	-	-	-	21.8	21.2	21.8	21.8	-	21.7	19.7	20.2
	12 UTC	28.4	-	-	-	-	-	-	28.4	28.2	-	28.3	24.6	22.5
Sunshine Duration		6.4	7.7	9.2	10.6	10.9	10.4	10.4	10.2	10.4	5.0	9.1	9.4	8.5
Precipitation		0.4		0.1							1.7	2.2	20.9	5.9
Evaporation		4.0	-	-	-	-	2.8	6.5	6.3	-	-	-	45.3	40.3
Growing Degrees	5	14.6	14.7	15.4	17.6	17.3	16.8	14.8	14.8	14.8	15.2	155.8	139.0	140.2
	10	9.6	9.7	10.4	12.6	12.3	11.8	9.8	9.8	9.8	10.2	105.8	89.0	90.2

2nd 10-day period (11-20/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	40.0	33.7	34.4
Precipitation - Reference Evapotranspiration	-37.8	-12.8	-28.5
Number of Rainy Days	3.0	3.0	1.0
Number of Dry Days	1.0	1.0	-

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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