

AGROMETEOROLOGICAL BULLETIN

*January 2011
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



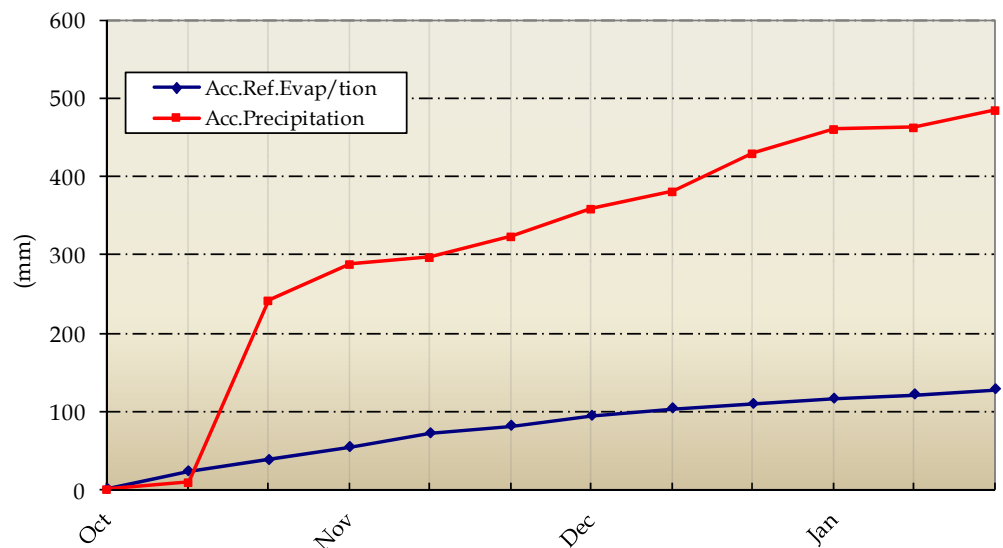
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2nd 10-day period (11-20/01/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.8	13.2	17.8	18.0	18.0	17.4	17.0	18.6	17.4	12.4	16.6	-	13.5
	Min	2.0	9.2	5.0	2.4	1.4	2.4	6.4	0.4	0.0	3.8	3.3	-	2.5
Relative Humidity	Max	100	100	100	100	100	97	79	96	97	97	97	-	-
	Min	66	81	55	49	50	25	35	37	42	67	51	-	-
Soil Temperature at 10 cm	06 UTC	7.8	9.6	8.6	8.2	7.8	9.0	8.2	7.2	6.6	9.0	8.2	-	6.8
	12 UTC	9.0	10.4	12.8	10.4	8.8	8.6	10.0	10.4	7.8	8.6	9.7	-	8.7
Sunshine Duration		5.8	0.5	5.9	7.1	7.6	7.0	8.9	8.8	8.3	0.0	6.0	-	4.2
Precipitation			21.5									21.5	-	31.5
Evaporation		1.3	0.4	0.8	1.1	0.9	0.4	1.9	1.5	0.8	0.2	9.3	-	12.8
Growing Degrees	5	3.9	6.2	6.4	5.2	4.7	4.9	6.7	4.5	3.7	3.1	49.3	-	31.3
	10	0.0	1.2	1.4	0.2	0.0	0.0	1.7	0.0	0.0	0.0	4.5	-	3.9

2nd 10-day period (11-20/01/2011)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.7	- 9.4
Precipitation - Reference Evapotranspiration	14.8	- 22.1
Number of Rainy Days	1.0	- 3.1
Number of Dry Days	8.0	- -

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

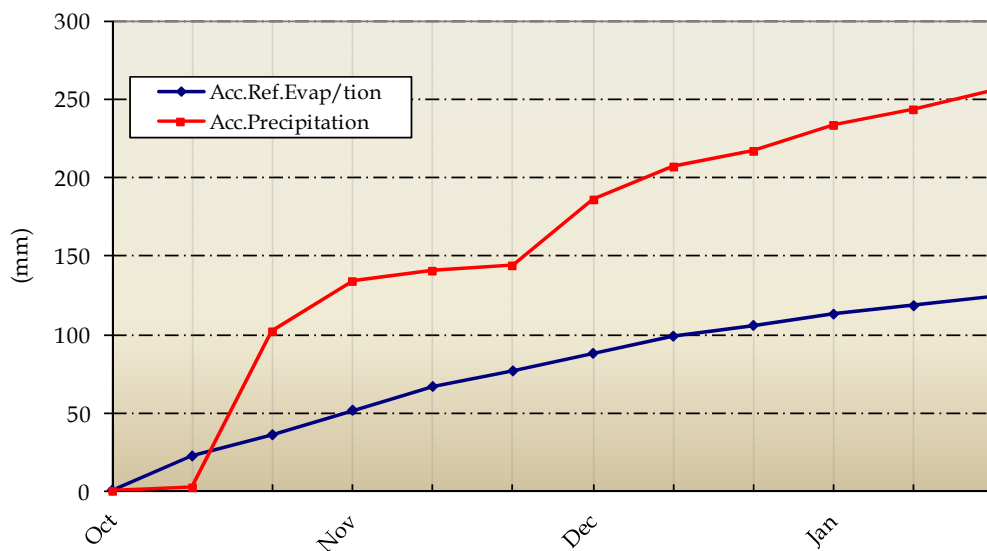


Alexandroupoli

2nd 10-day period (11-20/01/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	8.2	10.2	8.8	9.2	12.8	10.4	10.0	10.4	9.6	7.2	9.7	7.7	8.0
	Min	1.6	3.6	4.6	4.6	1.6	7.0	4.6	0.2	-0.6	-1.0	2.6	2.6	0.2
Relative Humidity	Max	96	93	97	97	97	100	96	96	96	100	97	93	-
	Min	80	74	76	81	81	70	60	68	76	85	75	65	-
Soil Temperature at 10 cm	06 UTC	5.0	5.4	6.0	6.0	5.6	7.0	5.6	5.2	3.6	4.0	5.3	7.0	4.2
	12 UTC	5.6	6.0	7.0	6.0	6.6	7.4	6.6	5.5	5.4	5.2	6.1	7.5	5.1
Sunshine Duration		8.6	1.9	6.1	1.0	7.0	1.2	8.4	7.9	7.9	4.9	5.5	0.5	3.1
Precipitation							11.9					11.9	11.1	11.4
Evaporation		0.8	0.7	0.6	0.4	0.7	1.7	0.0	0.0	0.0	0.1	5.0	6.2	6.6
Growing Degrees	5	0.0	1.9	1.7	1.9	2.2	3.7	2.3	0.3	0.0	0.0	14.0	11.3	9.4
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9

2nd 10-day period (11-20/01/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	5.9	7.1	8.8
Precipitation - Reference Evapotranspiration	6.0	4.0	2.6
Number of Rainy Days	1.0	5.0	2.2
Number of Dry Days	12.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

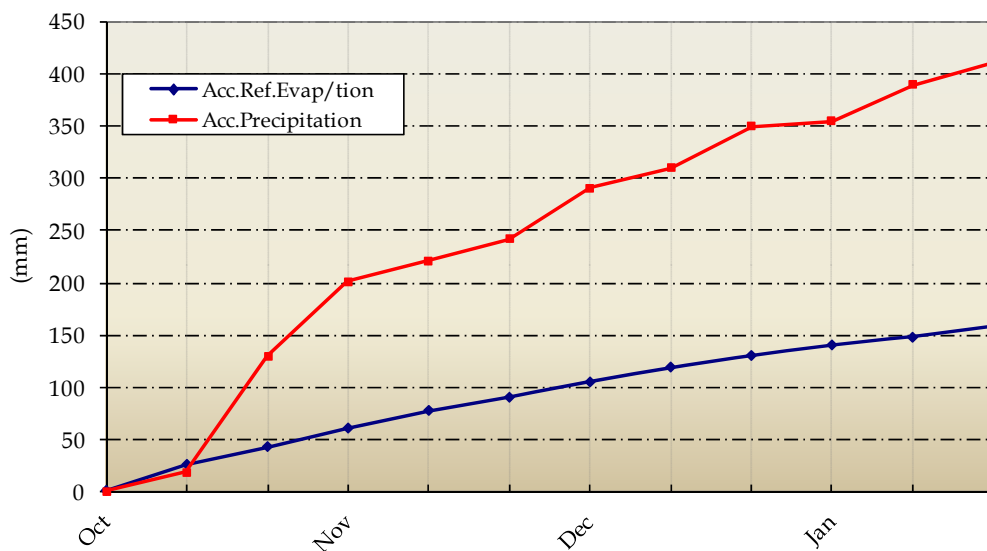


Andravida

2nd 10-day period (11-20/01/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.6	15.0	16.8	16.0	18.0	16.4	16.4	16.2	15.8	15.6	16.4	13.2	13.6
	Min	8.8	10.0	5.8	3.8	4.6	7.6	7.0	2.6	4.8	7.2	6.2	6.0	4.8
Relative Humidity	Max	93	95	97	94	95	100	87	89	94	94	94	97	-
	Min	64	68	58	60	56	39	41	44	55	60	54	64	-
Soil Temperature at 10 cm	06 UTC	10.4	11.2	9.6	9.0	8.8	10.2	9.2	8.0	8.2	9.4	9.4	11.0	8.3
	12 UTC	12.2	12.4	11.8	11.8	12.0	12.0	11.4	11.4	11.2	11.2	11.7	12.0	9.8
Sunshine Duration		4.1	2.8	7.3	7.1	7.9	7.5	8.7	8.6	8.0	2.0	6.4	2.4	4.4
Precipitation			21.2				0.4					21.6	28.0	33.0
Evaporation		4.6	1.5	0.7	4.1	0.4	2.7	1.0	3.7	1.2	0.9	20.8	10.4	18.1
Growing Degrees	5	8.2	7.5	6.3	4.9	6.3	7.0	6.7	4.4	5.3	6.4	63.0	45.7	42.4
	10	3.2	2.5	1.3	0.0	1.3	2.0	1.7	0.0	0.3	1.4	13.7	3.1	7.2

2nd 10-day period (11-20/01/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.6	8.2	9.4
Precipitation - Reference Evapotranspiration	11.0	19.8	23.6
Number of Rainy Days	2.0	8.0	3.7
Number of Dry Days	7.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

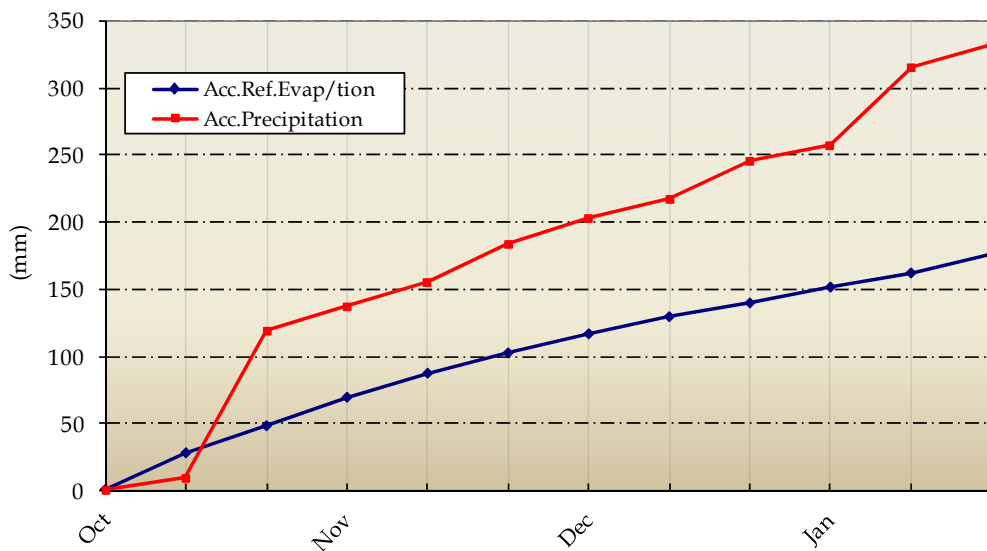


Kalamata

2nd 10-day period (11-20/01/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.0	16.2	18.0	17.8	19.0	19.2	18.2	18.4	18.2	16.6	18.0	13.8	14.6
	Min	5.4	7.8	5.4	5.4	4.2	7.4	9.2	3.0	2.4	2.2	5.2	6.5	4.9
Relative Humidity	Max	97	97	97	94	97	94	78	94	97	100	94	95	-
	Min	62	64	52	48	52	38	38	42	44	53	49	63	-
Soil Temperature at 10 cm	06 UTC	11.2	11.0	11.2	11.0	10.6	11.0	11.4	10.6	10.4	10.4	10.9	11.6	9.0
	12 UTC	12.0	12.0	11.6	11.6	11.8	11.6	11.8	11.4	11.6	11.0	11.6	12.0	10.1
Sunshine Duration		7.6	3.8	5.6	7.2	7.8	5.9	8.6	8.3	8.2	6.6	7.0	2.6	4.2
Precipitation			16.8									16.8	32.1	33.9
Evaporation		3.0	2.1	2.3	0.8	1.2	3.4	3.0	2.7	0.9	2.3	21.7	14.5	23.4
Growing Degrees	5	6.7	7.0	6.7	6.6	6.6	8.3	8.7	5.7	5.3	4.4	66.0	51.4	47.5
	10	1.7	2.0	1.7	1.6	1.6	3.3	3.7	0.7	0.3	0.0	16.6	8.6	8.1

2nd 10-day period (11-20/01/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.0	9.8	11.1
Precipitation - Reference Evapotranspiration	2.8	22.3	22.8
Number of Rainy Days	1.0	7.0	3.8
Number of Dry Days	8.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

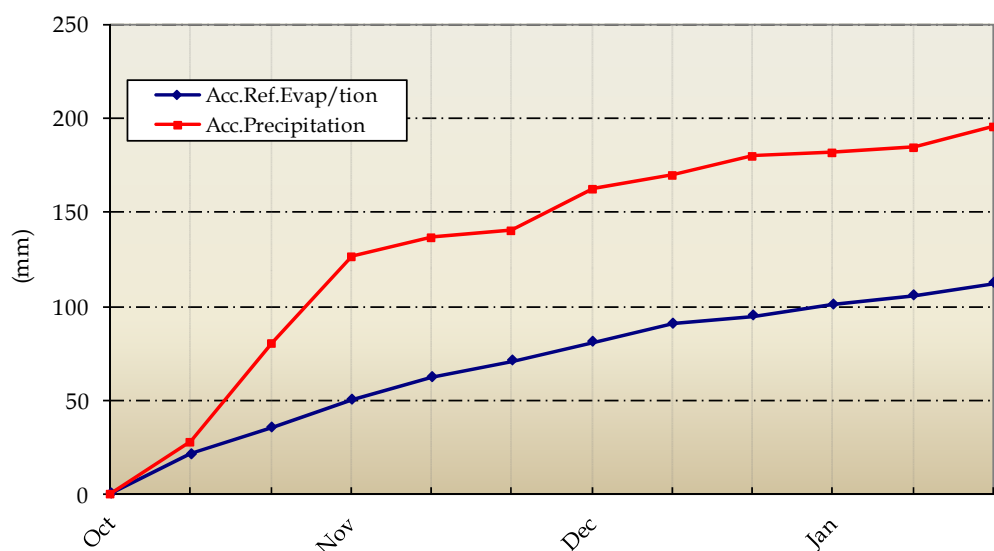


Larisa

2nd 10-day period (11-20/01/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.6	9.6	13.0	11.6	13.0	14.4	14.4	13.6	13.6	12.0	12.7	9.8	9.3
	Min	6.8	7.6	7.0	4.0	1.4	7.4	0.6	-1.2	-1.0	2.0	3.5	4.1	0.0
Relative Humidity	Max	94	97	97	100	100	95	92	96	100	97	97	93	-
	Min	71	89	68	85	79	41	42	55	54	69	65	64	-
Soil Temperature at 10 cm	06 UTC	6.4	8.4	8.2	5.8	2.6	7.4	8.0	6.4	6.2	6.4	6.6	8.4	5.0
	12 UTC	7.6	8.6	9.8	9.0	9.2	8.8	8.6	7.6	7.4	7.8	8.4	8.8	5.5
Sunshine Duration		0.0	0.0	0.4	3.7	3.9	2.8	7.8	7.3	7.4	1.2	3.4	2.3	3.6
Precipitation			1.5	0.1			9.6					11.2	6.0	8.6
Evaporation		0.4	0.9	0.9	0.5	1.7	0.6	1.0	1.0	0.4	2.4	9.8	5.4	5.9
Growing Degrees	5	4.2	3.6	5.0	2.8	2.2	5.9	2.5	1.2	1.3	2.0	30.7	19.3	9.7
	10	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.9	0.0	0.4

2nd 10-day period (11-20/01/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.7	6.8	6.4
Precipitation - Reference Evapotranspiration	4.5	-0.8	2.2
Number of Rainy Days	3.0	5.0	2.6
Number of Dry Days	8.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

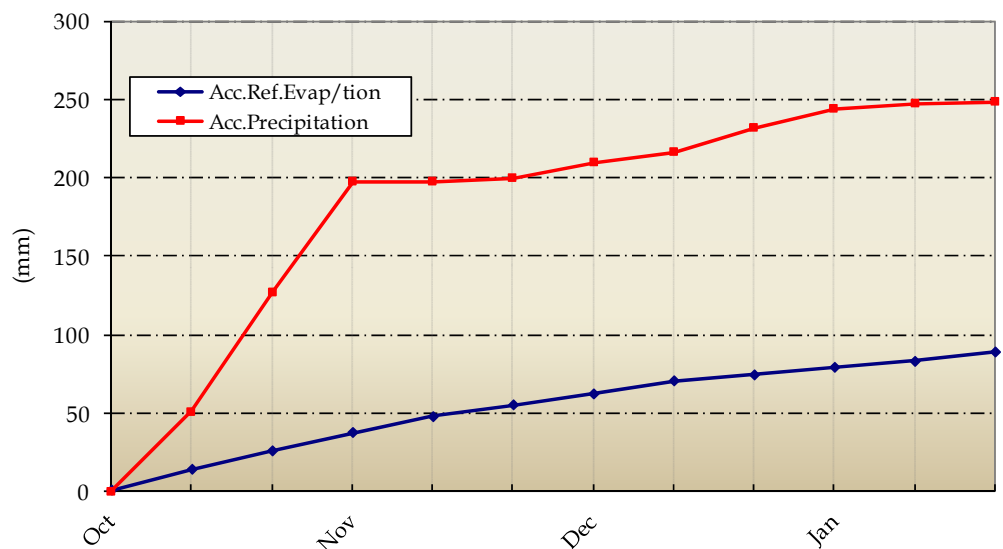


Series

2nd 10-day period (11-20/01/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.8	10.2	14.6	13.6	14.6	15.6	14.2	12.8	12.6	12.8	13.2	9.3	7.4
	Min	5.0	7.4	6.0	1.6	0.8	10.0	0.4	-2.0	-1.0	4.8	3.3	2.6	-0.8
Relative Humidity	Max	94	97	97	97	96	89	96	96	97	94	95	92	-
	Min	74	80	66	66	48	34	36	53	55	71	58	64	-
Soil Temperature at 10 cm	06 UTC	4.6	6.6	7.0	5.8	5.2	7.4	5.6	3.8	4.2	5.2	5.5	6.9	3.1
	12 UTC	5.4	6.8	7.4	6.4	5.6	7.6	6.0	6.2	4.2	6.2	6.2	7.5	3.6
Sunshine Duration		0.0	0.0	1.5	2.6	4.7	4.8	4.9	4.6	3.1	0.2	2.6	1.3	3.0
Precipitation			0.0	0.0		0.1	1.1					1.2	7.6	9.4
Evaporation		0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.9	2.6	2.1
Growing Degrees	5	2.9	3.8	5.3	2.6	2.7	7.8	2.3	0.4	0.8	3.8	32.4	12.3	6.0
	10	0.0	0.0	0.3	0.0	0.0	2.8	0.0	0.0	0.0	0.0	3.1	0.0	0.4

2nd 10-day period (11-20/01/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.0	5.6	5.2
Precipitation - Reference Evapotranspiration	-4.8	2.0	4.2
Number of Rainy Days	2.0	4.0	2.3
Number of Dry Days	9.0	6.0	-

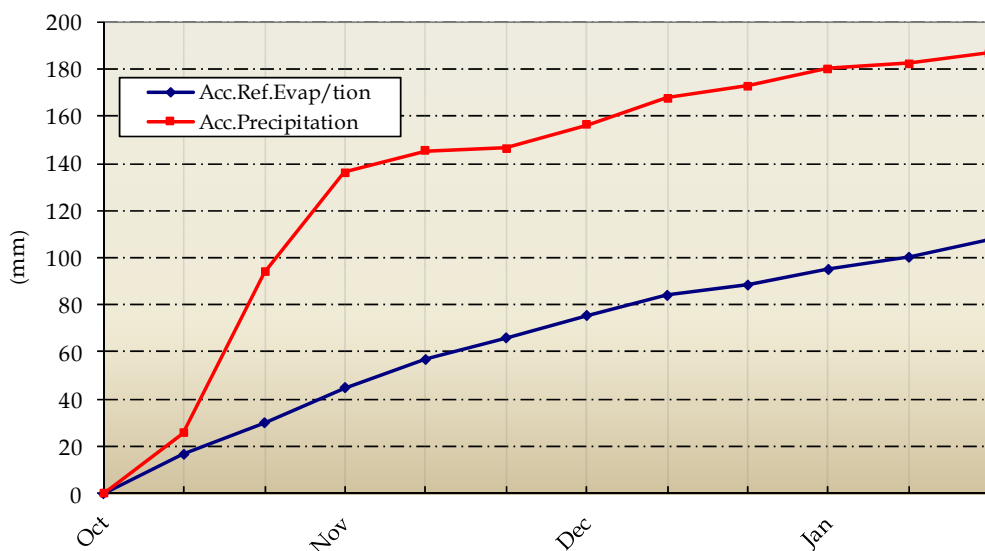
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.2	10.2	14.0	18.0	18.6	15.6	15.0	16.0	16.2	14.6	15.3	9.2	9.1
	Min	5.4	7.4	8.4	2.6	2.6	8.0	0.6	0.2	0.4	5.0	4.1	4.1	0.2
Relative Humidity	Max	96	95	100	93	95	95	92	100	94	99	96	92	-
	Min	57	90	59	44	45	28	37	35	43	66	50	63	-
Soil Temperature at 10 cm	06 UTC	6.4	6.6	8.2	8.0	7.0	8.2	6.2	6.0	5.4	7.0	6.9	7.6	4.9
	12 UTC	7.2	7.0	9.0	8.2	8.2	9.0	7.4	7.0	6.2	7.8	7.7	8.5	5.0
Sunshine Duration		2.6	0.0	3.7	5.1	7.0	8.2	8.8	8.7	7.9	1.0	5.3	2.2	3.9
Precipitation			0.7	1.2	0.1	0.2	2.4					4.6	7.4	11.7
Evaporation		0.4	0.3	0.4	0.7	1.0	0.8	1.6	1.3	0.9	1.1	8.5	8.8	2.7
Growing Degrees	5	5.3	3.8	6.2	5.3	5.6	6.8	2.8	3.1	3.3	4.8	47.0	18.6	10.8
	10	0.3	0.0	1.2	0.3	0.6	1.8	0.0	0.0	0.0	0.0	4.2	0.4	0.3

2nd 10-day period (11-20/01/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.4	6.3	6.4
Precipitation - Reference Evapotranspiration	-2.8	1.1	5.3
Number of Rainy Days	5.0	6.0	2.3
Number of Dry Days	8.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

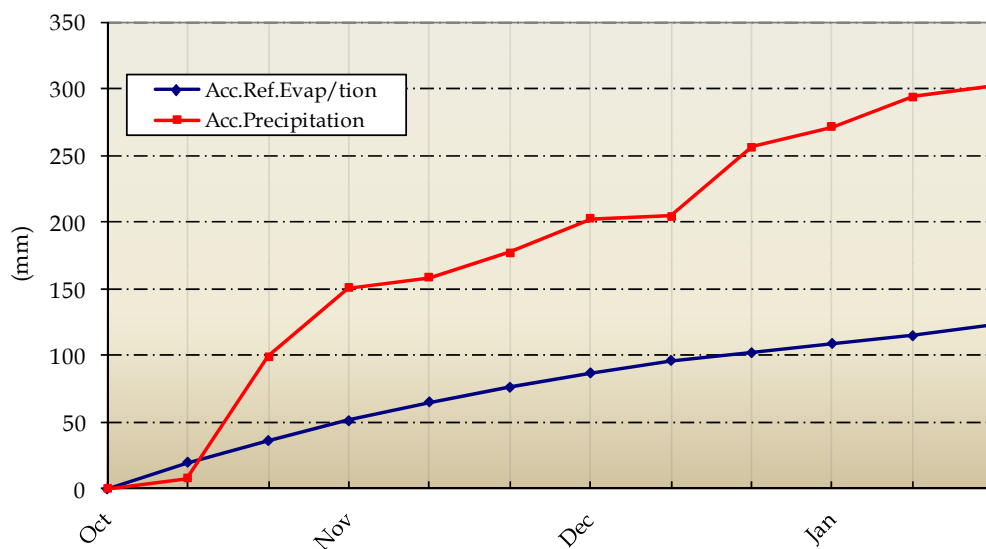


Tripoli

2nd 10-day period (11-20/01/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.6	9.6	11.0	12.0	12.6	12.6	10.6	14.8	16.4	12.8	12.6	-	9.4
	Min	0.6	4.6	2.2	-1.0	-1.4	3.0	5.4	-3.8	-3.4	-3.8	0.2	-	0.1
Relative Humidity	Max	100	97	100	100	100	93	78	96	96	100	96	-	-
	Min	82	78	68	63	61	45	54	38	38	54	58	-	-
Soil Temperature at 10 cm	06 UTC	5.4	6.8	6.4	4.0	4.0	5.4	6.2	3.4	3.0	3.2	4.8	-	4.3
	12 UTC	7.4	7.8	8.4	7.2	7.6	8.2	8.0	6.6	6.4	6.2	7.4	-	5.0
Sunshine Duration		4.8	0.4	3.9	2.6	6.7	7.1	7.7	7.6	7.7	6.3	5.5	-	4.1
Precipitation			8.4				0.0					8.4	-	31.6
Evaporation		0.0	0.4	1.0	0.0	1.0	2.0	0.0	0.0	0.0	0.7	5.1	-	5.6
Growing Degrees	5	2.1	2.1	1.6	0.5	0.6	2.8	3.0	0.5	1.5	0.0	14.7	-	10.8
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5

2nd 10-day period (11-20/01/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.1	-	8.5
Precipitation - Reference Evapotranspiration	0.3	-	23.1
Number of Rainy Days	1.0	-	3.7
Number of Dry Days	8.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

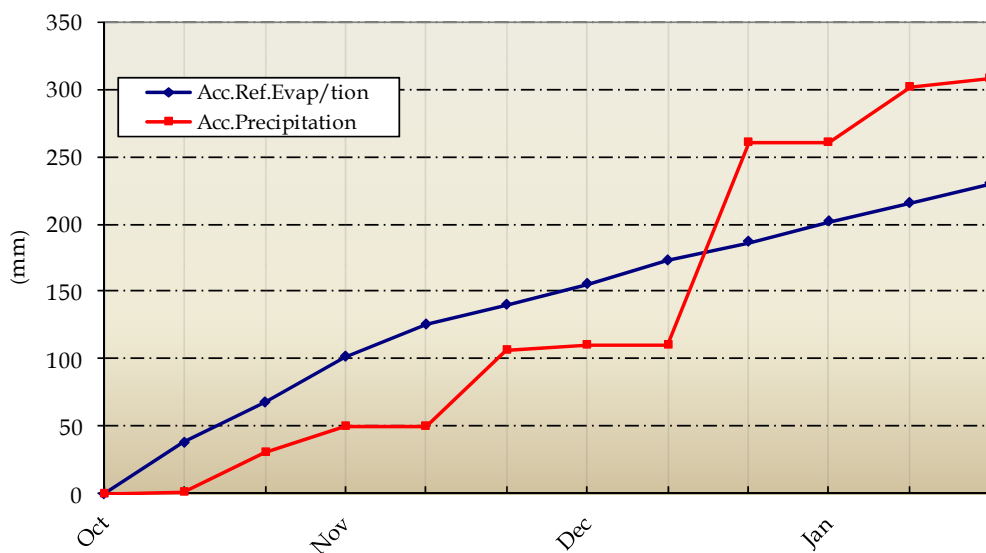


Tympaki

2nd 10-day period (11-20/01/2011)		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	17.8	18.2	18.8	17.8	16.2	17.6	16.4	17.6	16.8	17.5	16.7	15.6
	Min	9.6	8.2	7.6	7.0	8.4	8.0	11.4	10.0	6.6	6.2	8.3	9.6	7.0
Relative Humidity	Max	99	99	99	96	96	99	92	90	96	96	96	97	-
	Min	65	59	50	44	38	44	36	38	50	39	46	55	-
Soil Temperature at 10 cm	06 UTC	11.8	11.8	11.6	11.4	12.4	11.4	12.2	11.6	10.4	10.4	11.5	12.6	10.8
	12 UTC	14.2	14.6	14.8	14.8	15.2	13.4	14.4	14.0	14.0	14.2	14.4	14.7	12.6
Sunshine Duration		5.3	8.7	7.6	7.8	9.2	2.8	7.7	9.2	7.1	9.2	7.5	3.9	5.0
Precipitation							3.0	3.4				6.4	80.4	31.7
Evaporation		0.5	2.3	2.1	2.0	3.1	2.0	3.2	3.7	1.1	2.8	22.8	22.4	28.6
Growing Degrees	5	8.9	8.0	7.9	7.9	8.1	7.1	9.5	8.2	7.1	6.5	79.2	81.4	62.9
	10	3.9	3.0	2.9	2.9	3.1	2.1	4.5	3.2	2.1	1.5	29.2	31.4	16.1

2nd 10-day period (11-20/01/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.6	13.6	14.8
Precipitation - Reference Evapotranspiration	-8.2	66.8	16.9
Number of Rainy Days	2.0	9.0	3.2
Number of Dry Days	9.0	0.0	-

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.

Mesurements 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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