

# AGROMETEOROLOGICAL BULLETIN

*January 2012  
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

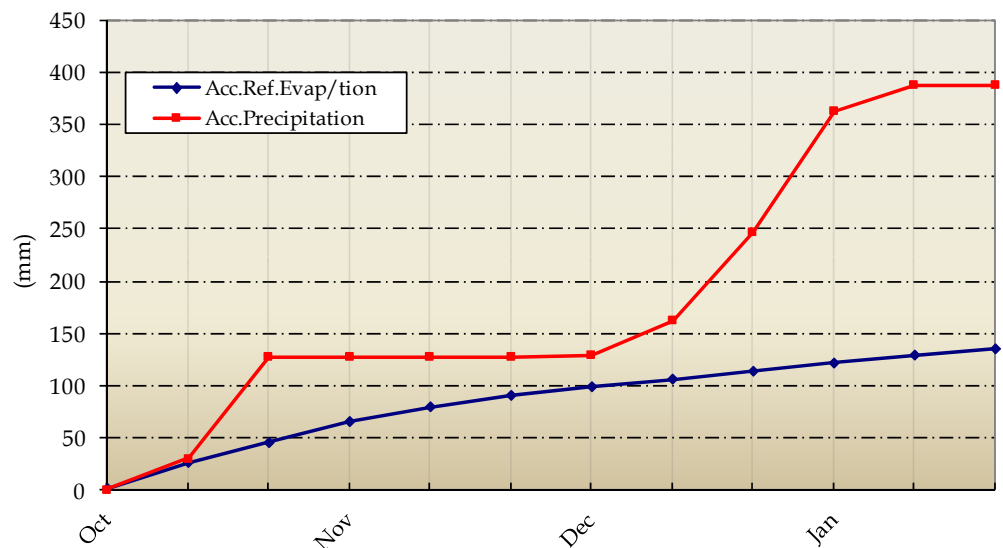
*Web addresses of HNMS  
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Agrinio

2nd 10-day period (11-20/01/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.4	13.0	14.0	11.8	10.0	9.0	9.5	10.8	12.8	8.0	11.0	16.6	13.5
	Min	-2.8	-4.0	-2.6	1.8	3.0	-5.0	-6.6	-5.6	-4.2	-3.6	-3.0	3.3	2.5
Relative Humidity	Max	92	91	96	96	71	88	-	96	96	97	91	97	-
	Min	30	30	56	87	29	25	-	32	30	85	45	51	-
Soil Temperature at 10 cm	06 UTC	4.8	4.2	4.2	5.4	6.8	4.2	3.0	-	2.8	3.2	4.3	8.2	6.8
	12 UTC	6.0	5.6	5.4	6.4	7.0	4.2	5.0	3.6	3.8	4.0	5.1	9.7	8.7
Sunshine Duration		7.7	7.6	7.7	1.2	8.2	8.3	8.9	8.4	7.9	0.7	6.7	6.0	4.2
Precipitation					0.3						0.2	0.5	21.5	31.5
Evaporation		0.6	1.0	2.2	1.1	2.0	2.0	1.4	1.6	1.5	0.7	14.1	9.3	12.8
Growing Degrees	5	0.0	0.0	0.7	1.8	1.5	0.0	0.0	0.0	0.0	0.0	4.0	49.3	31.3
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	3.9

2nd 10-day period (11-20/01/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.0	6.7	9.4
Precipitation - Reference Evapotranspiration	-5.5	14.8	22.1
Number of Rainy Days	2.0	1.0	3.1
Number of Dry Days	6.0	8.0	-

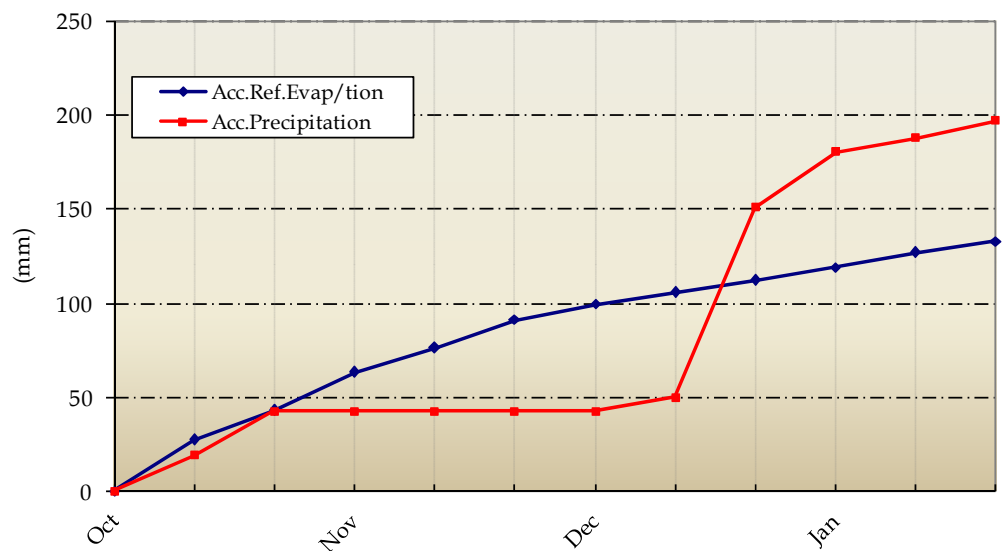
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	6.0	7.4	10.4	5.6	2.8	2.6	3.4	4.0	5.6	10.2	5.8	9.7	8.0
	Min	4.0	-2.6	-3.6	0.0	-5.0	-3.4	-7.2	-4.4	-5.2	1.0	-2.6	2.6	0.2
Relative Humidity	Max	77	87	84	-	-	88	95	86	95	88	88	97	-
	Min	44	48	52	-	-	69	48	57	46	60	53	75	-
Soil Temperature at 10 cm	06 UTC	4.4	3.8	2.4	4.4	-	-	1.8	2.2	1.8	2.6	2.9	5.3	4.2
	12 UTC	5.2	4.6	4.0	4.4	2.4	2.2	1.8	1.8	2.0	4.2	3.3	6.1	5.1
Sunshine Duration		0.4	5.2	7.0	0.0	2.2	4.7	4.6	6.8	5.6	0.3	3.7	5.5	3.1
Precipitation					9.1							9.1	11.9	11.4
Evaporation		3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	5.0	6.6
Growing Degrees	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	14.0	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 (11-20/01/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.0	5.9	8.8
Precipitation - Reference Evapotranspiration	3.1	6.0	2.6
Number of Rainy Days	1.0	1.0	2.2
Number of Dry Days	6.0	12.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

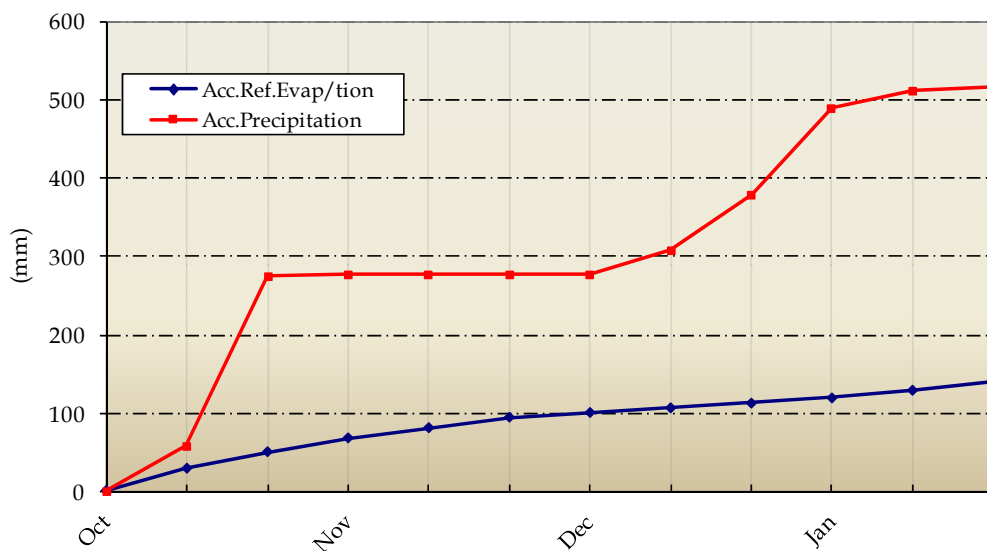


Andravida

2nd 10-day period (11-20/01/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.0	11.0	14.8	14.0	10.8	8.4	8.6	10.0	11.2	14.6	11.4	16.4	13.6
	Min	0.6	0.0	-1.0	6.6	8.2	0.4	-4.8	-2.6	-3.4	3.0	0.7	6.2	4.8
Relative Humidity	Max	75	85	89	92	73	81	95	-	87	92	85	94	-
	Min	39	34	49	65	30	34	34	-	32	54	41	54	-
Soil Temperature at 10 cm	06 UTC	4.6	4.2	4.6	7.4	8.4	4.8	3.8	3.4	-	4.8	5.1	9.4	8.3
	12 UTC	7.4	7.2	8.4	9.4	9.4	7.2	6.0	5.8	6.4	7.2	7.4	11.7	9.8
Sunshine Duration		8.0	8.2	7.8	2.4	5.0	7.9	7.5	8.5	8.7	2.3	6.6	6.4	4.4
Precipitation					3.3						0.4	3.7	21.6	33.0
Evaporation		1.0	1.5	1.2	0.6	2.5	-	4.5	0.0	4.4	-	-	20.8	18.1
Growing Degrees	5	0.8	0.5	1.9	5.3	4.5	0.0	0.0	0.0	0.0	3.8	16.8	63.0	42.4
	10	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	13.7	7.2

2nd 10-day period (11-20/01/2012)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	11.0	10.6	9.4
Precipitation - Reference Evapotranspiration	-7.3	11.0	23.6
Number of Rainy Days	2.0	2.0	3.7
Number of Dry Days	4.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

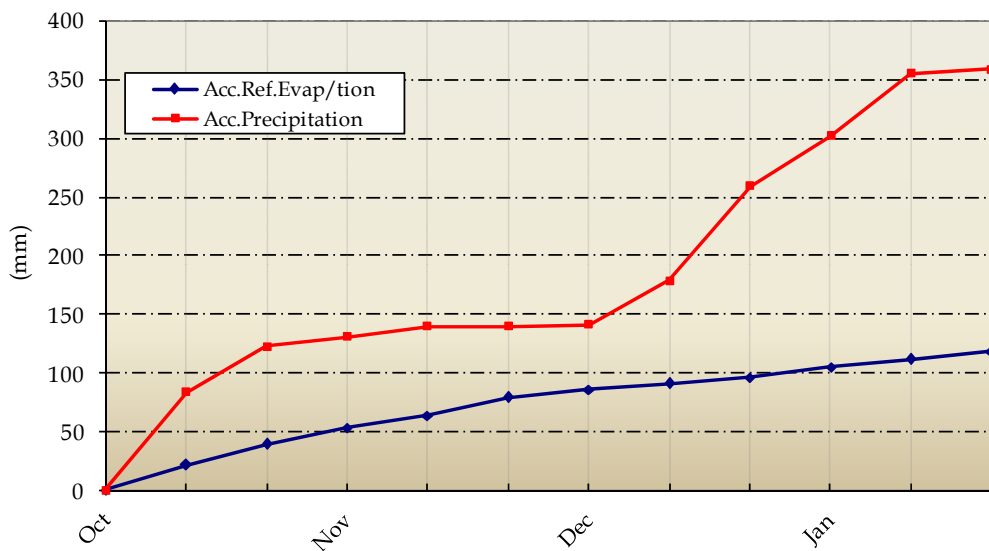


Ioannina

2nd 10-day period (11-20/01/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.4	7.6	8.8	8.4	4.8	2.8	3.2	5.4	7.0	7.4	6.3	-	8.7
	Min	0.5	-4.2	-6.0	2.4	-6.4	-8.0	-11.4	-10.0	-8.4	-8.0	-6.0	-	-0.4
Relative Humidity	Max	63	85	95	97	95	79	87	94	95	95	88	-	-
	Min	27	37	30	61	27	31	36	39	26	46	36	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	3.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	3.8
Sunshine Duration		5.7	6.5	5.0	0.5	5.4	6.8	6.6	6.1	6.2	2.9	5.2	-	3.0
Precipitation					4.1						0.0	4.1	-	26.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	4.4
Growing Degrees	5	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	-	9.3
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.3

2nd 10-day period (11-20/01/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.1	-	6.6
Precipitation - Reference Evapotranspiration	-3.0	-	20.3
Number of Rainy Days	1.0	-	2.9
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

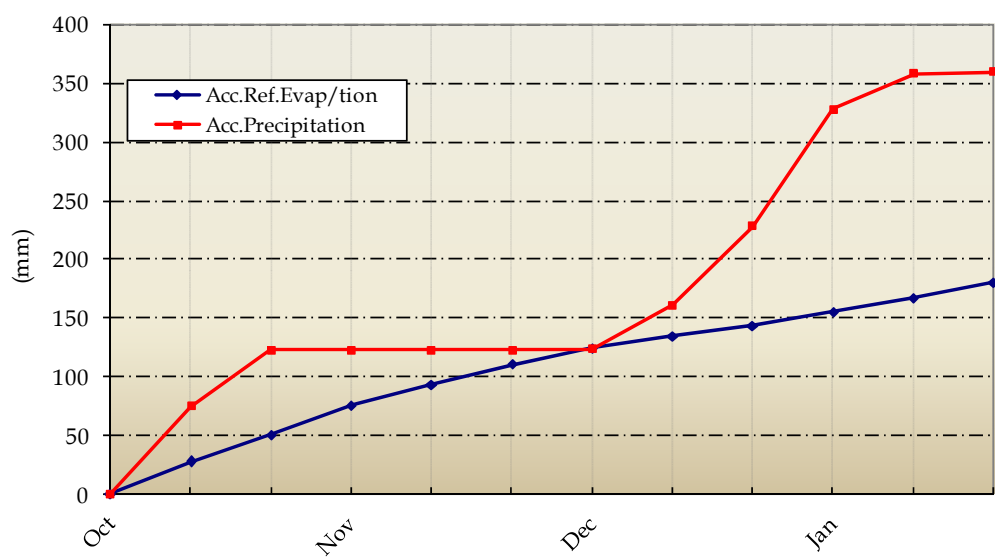


Kalamata

2nd 10-day period (11-20/01/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.2	13.8	14.0	15.6	11.6	10.6	10.4	11.8	13.6	14.2	12.8	18.0	14.6
	Min	2.6	0.4	-1.0	2.2	4.2	-3.2	1.2	-0.6	0.6	-0.6	0.6	5.2	4.9
Relative Humidity	Max	97	79	100	97	97	84	79	85	92	93	90	94	-
	Min	34	34	50	57	36	21	35	31	33	50	38	49	-
Soil Temperature at 10 cm	06 UTC	7.8	7.2	7.0	7.4	9.0	6.8	6.6	6.4	6.6	6.4	7.1	10.9	9.0
	12 UTC	8.6	8.6	8.0	8.8	9.0	7.4	7.6	7.6	7.6	7.6	8.1	11.6	10.1
Sunshine Duration		7.7	8.1	7.1	4.4	3.6	7.4	7.2	10.7	9.2	4.9	7.0	7.0	4.2
Precipitation					1.1	0.1					0.0	1.2	16.8	33.9
Evaporation		2.6	2.2	1.4	0.2	1.6	2.6	2.4	3.0	-	0.4	-	21.7	23.4
Growing Degrees	5	2.4	2.1	1.5	3.9	2.9	0.0	0.8	0.6	2.1	1.8	18.1	66.0	47.5
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.6	8.1

2nd 10-day period (11-20/01/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.2	14.0	11.1
Precipitation - Reference Evapotranspiration	-12.0	2.8	22.8
Number of Rainy Days	2.0	1.0	3.8
Number of Dry Days	4.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

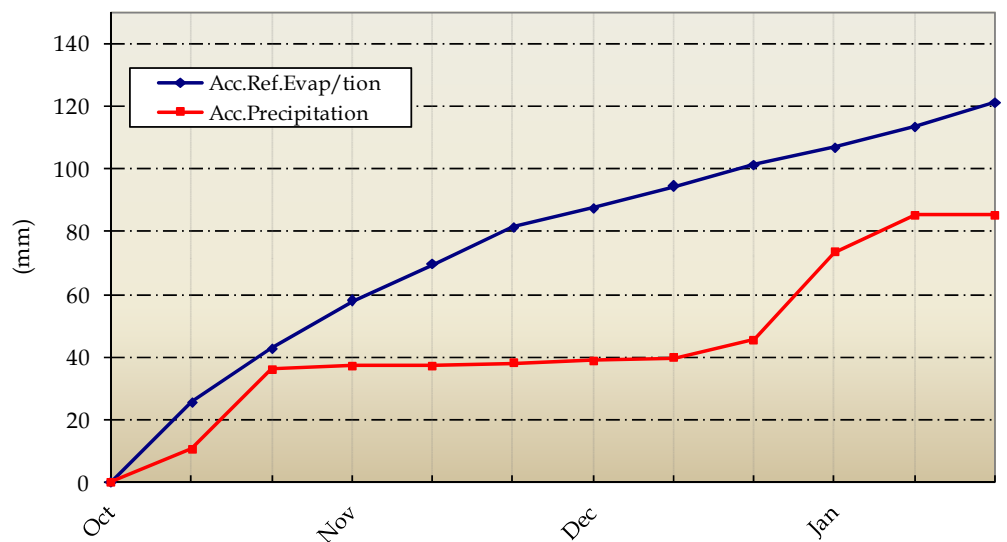


Larisa

2nd 10-day period (11-20/01/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.2	9.6	10.4	7.0	8.4	5.8	4.6	6.4	8.2	14.6	8.4	12.7	9.3
	Min	1.0	-4.0	-5.2	-1.0	-2.0	-7.0	-9.2	-9.2	-8.4	-6.0	-5.1	3.5	0.0
Relative Humidity	Max	72	86	95	96	96	85	81	88	89	85	87	97	-
	Min	38	35	34	60	30	32	34	32	36	39	37	65	-
Soil Temperature at 10 cm	06 UTC	6.0	5.4	3.2	4.4	5.8	4.6	2.0	1.0	3.2	3.0	3.9	6.6	5.0
	12 UTC	8.2	8.0	3.8	7.2	4.4	6.4	5.0	5.4	4.6	6.0	5.9	8.4	5.5
Sunshine Duration		6.6	7.5	7.0	0.0	7.7	7.6	7.6	7.7	7.8	4.7	6.4	3.4	3.6
Precipitation													11.2	8.6
Evaporation		1.0	0.8	1.2	1.6	0.4	0.4	0.4	0.4	0.2	4.6	11.0	9.8	5.9
Growing Degrees	5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	30.7	9.7
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.4

2nd 10-day period (11-20/01/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.5	6.7	6.4
Precipitation - Reference Evapotranspiration	-7.5	4.5	2.2
Number of Rainy Days	0.0	3.0	2.6
Number of Dry Days	13.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



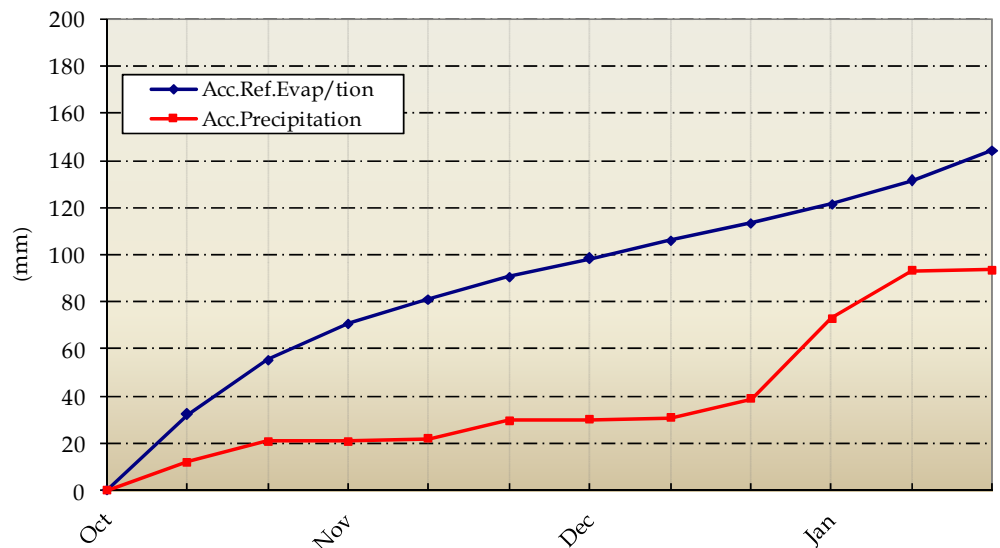


Mikra

2nd 10-day period (11-20/01/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	8.0	8.0	8.4	6.6	5.4	3.6	3.4	6.4	6.0	6.8	6.3	-	8.8
	Min	2.8	-4.2	-3.0	-0.2	1.4	0.0	-2.8	-6.4	-4.6	-3.0	-2.0	-	1.1
Relative Humidity	Max	63	88	92	89	66	58	67	76	77	88	76	-	-
	Min	44	49	57	42	32	41	28	37	42	57	43	-	-
Soil Temperature at 10 cm	06 UTC	4.2	3.4	3.2	4.2	3.0	2.4	1.6	1.0	1.4	2.0	2.6	-	4.3
	12 UTC	5.0	4.6	4.2	5.2	5.0	3.0	2.0	2.0	2.6	3.8	3.7	-	5.7
Sunshine Duration		7.6	6.2	8.4	1.0	8.0	8.0	9.1	7.5	8.1	4.1	6.8	-	3.6
Precipitation					0.2							0.2	-	6.6
Evaporation		0.9	2.6	1.1	3.0	1.5	0.0	0.0	0.0	0.0	0.0	9.1	-	10.5
Growing Degrees	5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	-	11.4
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.9

2nd 10-day period (11-20/01/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.0	-	8.8
Precipitation - Reference Evapotranspiration	-12.8	-	-2.2
Number of Rainy Days	1.0	-	2.2
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



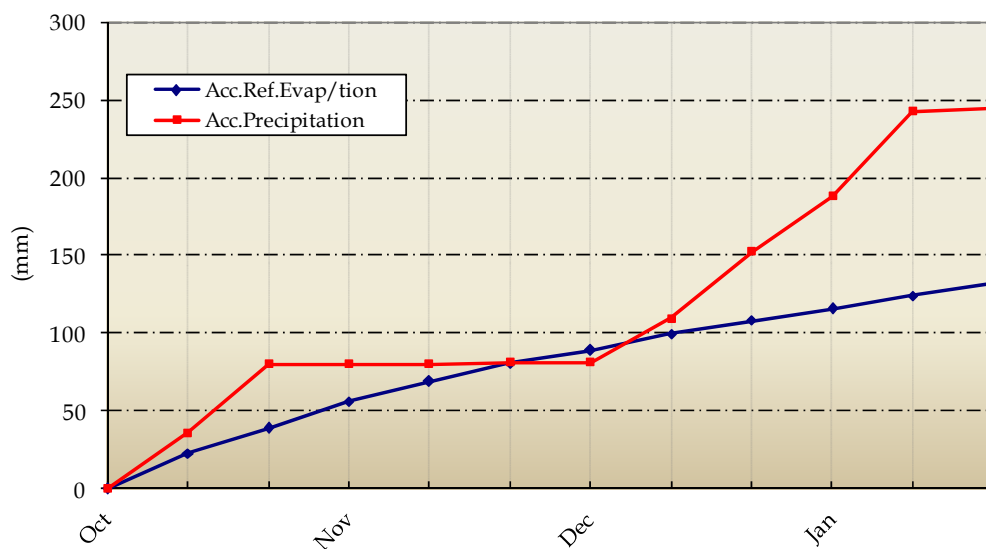


Tripoli

2nd 10-day period (11-20/01/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.0	7.5	11.0	11.3	7.2	3.8	3.4	6.2	8.5	10.6	7.6	12.6	9.4
	Min	-0.6	-3.7	-7.5	5.7	-0.4	-9.0	-8.2	-9.0	-9.0	-5.1	-4.7	0.2	0.1
Relative Humidity	Max	73	78	92	81	84	86	86	89	43	83	80	96	-
	Min	42	41	43	57	41	24	31	26	34	43	38	58	-
Soil Temperature at 10 cm	06 UTC	1.6	1.6	1.2	3.4	4.6	1.6	1.0	0.8	-	0.6	1.8	4.8	4.3
	12 UTC	2.8	2.8	2.4	5.4	5.4	2.0	1.4	1.0	0.6	1.4	2.5	7.4	5.0
Sunshine Duration		5.7	7.9	6.9	2.5	5.6	7.9	8.1	-	8.1	6.3	6.6	5.5	4.1
Precipitation					2.1						0.0	2.1	8.4	31.6
Evaporation		0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-	5.1	5.6
Growing Degrees	5	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	3.5	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	0.0	0.5

2nd 10-day period (11-20/01/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.1	8.1	8.5
Precipitation - Reference Evapotranspiration	-6.0	0.3	23.1
Number of Rainy Days	1.0	1.0	3.7
Number of Dry Days	6.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

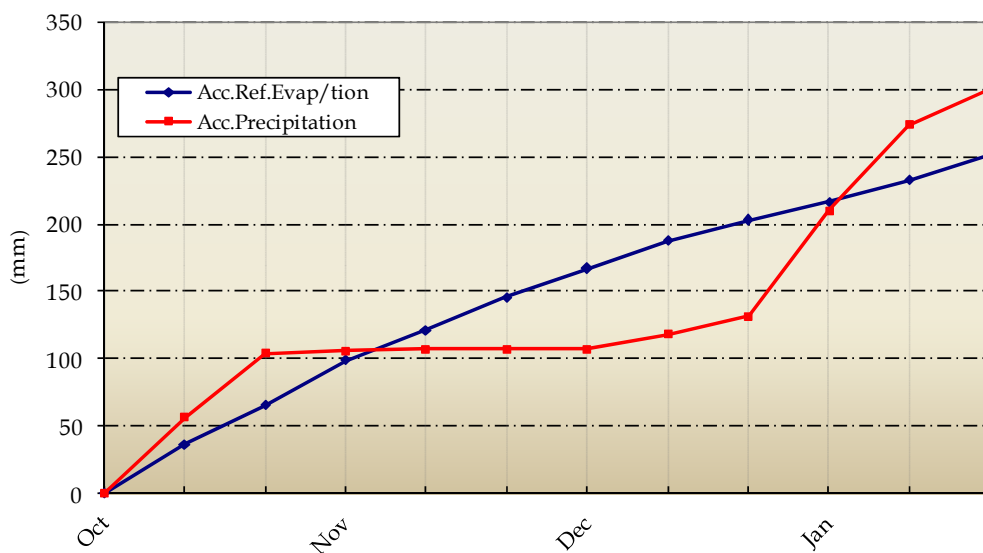


Tympaki

2nd 10-day period (11-20/01/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.0	12.4	14.4	16.4	15.6	12.2	11.8	12.6	15.6	15.6	13.7	17.5	15.6
	Min	5.8	5.8	5.4	3.6	10.6	5.8	4.6	2.2	2.2	1.6	4.8	8.3	7.0
Relative Humidity	Max	99	97	100	97	99	92	89	97	94	99	96	96	-
	Min	48	33	36	62	67	41	36	34	17	46	42	46	-
Soil Temperature at 10 cm	06 UTC	8.4	8.0	7.8	8.2	11.6	9.4	8.6	6.8	6.8	6.0	8.2	11.5	10.8
	12 UTC	9.2	9.4	10.2	10.6	12.4	10.0	9.8	9.6	9.2	9.4	10.0	14.4	12.6
Sunshine Duration		3.3	5.2	10.2	1.7	1.1	7.7	4.0	8.4	9.8	8.2	6.0	7.5	5.0
Precipitation		4.8	14.2		0.5	6.4						25.9	6.4	31.7
Evaporation		0.1	0.4	1.6	2.6	2.4	2.2	1.7	2.3	2.6	1.8	17.7	22.8	28.6
Growing Degrees	5	2.9	4.1	4.9	5.0	8.1	4.0	3.2	2.4	3.9	3.6	42.1	79.2	62.9
	10	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	3.1	29.2	16.1

2nd 10-day period (11-20/01/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.7	14.6	14.8
Precipitation - Reference Evapotranspiration	7.2	-8.2	16.9
Number of Rainy Days	4.0	2.0	3.2
Number of Dry Days	0.0	9.0	-

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<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.

**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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