



# AGROMETEOROLOGICAL BULLETIN

*February 2013*  
*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  
El. Venizelou Street 14, 16777  
Helliniko, Athens

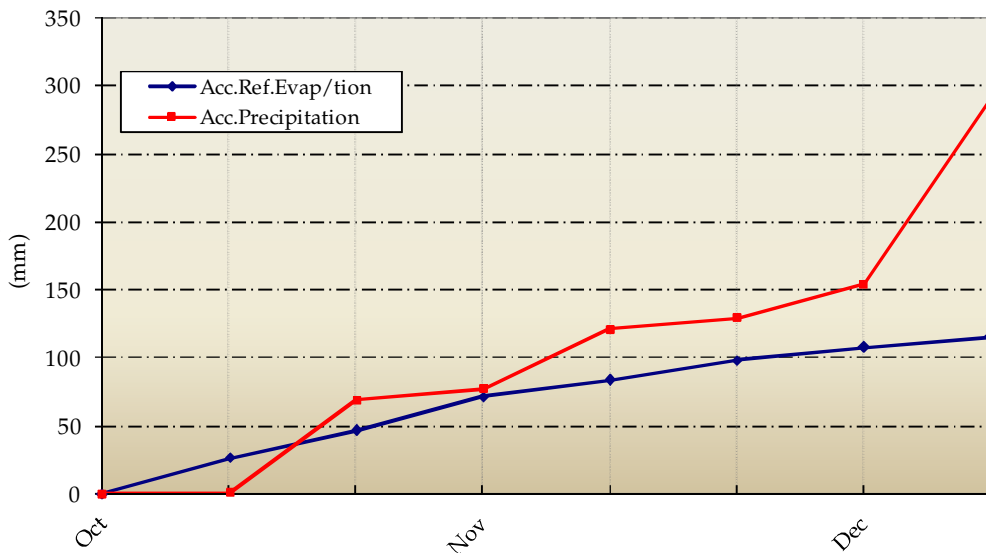
*Web addresses of HNMS*  
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Agrinio

2nd 10-day period (11-20/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-		11.5	14.1
	Min	3.0	4.0	7.4	3.0	7.4	-	-	7.0	7.6	1.8	5.2	1.7	4.4
Relative Humidity	Max	97	94	94	97	-	-	93	88	94	96	94	95	-
	Min	48	65	71	83	-	-	52	59	80	54	64	61	-
Soil Temperature at 10 cm	06 UTC	8.2	8.2	9.8	8.4	9.2	-	-	9.2	9.6	8.2	8.8	6.5	7.5
	12 UTC	9.2	9.4	9.8	9.0	10.0	-	-	10.2	10.0	9.6	9.6	7.3	9.9
Sunshine Duration		9.5	0.3	2.4	0.0	-	-	-	0.6	0.0	10.0	3.3	4.2	4.3
Precipitation			1.3	23.3		0.9			3.9	30.0		-	63.6	44.0
Evaporation		2.3	1.0	1.8	0.5	-	-	1.4	2.6	0.9	3.0	-	-	16.7
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	18.1	43.7
	10	-	-	-	-	-	-	-	-	-	-	-	1.2	9.0

2nd 10-day period (11-20/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	11.2	13.8
Precipitation - Reference Evapotranspiration	-	52.4	30.2
Number of Rainy Days	5.0	7.0	5.0
Number of Dry Days	3.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



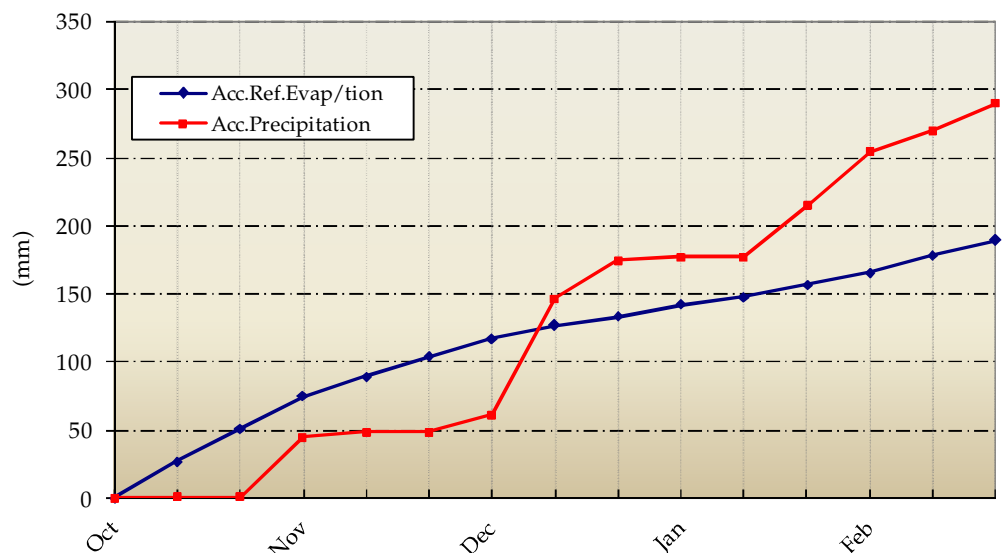
This station is not fully operated

Alexandroupoli

2nd 10-day period (11-20/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	8.8	11.4	11.2	10.8	9.0	7.8	7.6	10.0	8.2	10.2	9.5	6.5	10.0
	Min	4.0	2.8	4.6	7.4	4.8	2.6	0.4	1.5	0.8	2.0	3.1	-0.3	2.2
Relative Humidity	Max	93	93	97	94	80	80	86	85	97	93	90	92	-
	Min	61	56	64	66	57	46	60	55	62	61	59	60	-
Soil Temperature at 10 cm	06 UTC	7.8	6.2	6.0	7.4	8.0	6.4	5.4	5.4	5.4	5.6	6.4	2.9	4.8
	12 UTC	8.4	7.8	8.2	8.8	8.2	7.8	6.6	7.4	6.6	7.2	7.7	4.2	6.1
Sunshine Duration		0.9	4.0	0.0	0.0	0.0	6.3	3.2	6.6	0.0	8.8	3.0	4.2	3.7
Precipitation				12.6	4.7					1.8	0.2	19.3	16.6	18.4
Evaporation		0.1	2.0	0.6	4.2	0.9	3.3	0.7	1.3	0.7	0.5	14.3	3.9	10.5
Growing Degrees	5	1.4	2.1	2.9	4.1	1.9	0.2	0.0	0.8	0.0	1.1	14.5	0.3	23.6
	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	4.0

2nd 10-day period (11-20/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.8	9.6	12.3
Precipitation - Reference Evapotranspiration	8.5	7.0	6.1
Number of Rainy Days	4.0	3.0	2.7
Number of Dry Days	2.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

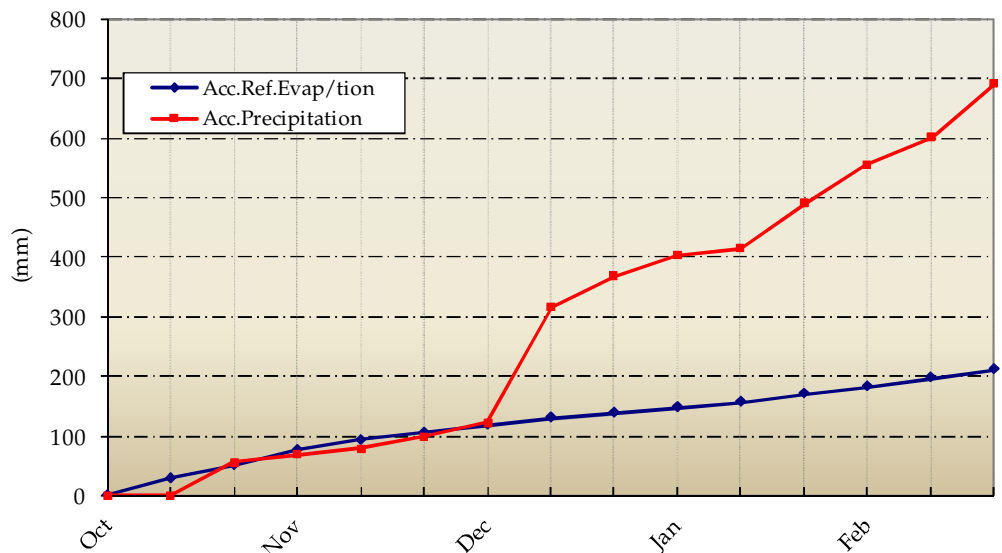


Andravida

2nd 10-day period (11-20/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.8	14.6	15.0	11.6	14.6	12.9	13.4	13.2	14.6	14.5	13.6	12.6	14.5
	Min	4.0	5.4	6.8	5.3	8.4	6.9	7.9	5.7	8.5	6.4	6.5	4.5	6.2
Relative Humidity	Max	90	88	92	89	91	90	91	91	92	88	90	89	-
	Min	36	64	56	72	48	72	58	60	59	45	57	52	-
Soil Temperature at 10 cm	06 UTC	8.6	9.6	10.2	9.6	10.2	10.4	10.4	10.2	10.4	10.2	10.0	7.7	9.1
	12 UTC	11.0	11.6	12.0	12.0	12.4	11.6	12.6	11.2	12.0	12.2	11.9	9.7	11.0
Sunshine Duration		7.2	2.1	5.8	0.0	2.3	1.9	3.3	3.1	3.4	9.2	3.8	5.0	4.8
Precipitation		6.1	9.1	12.7	2.2	6.8	14.0	2.0	6.3	30.9	1.3	91.4	46.8	37.6
Evaporation		1.7	0.3	1.5	-	1.3	2.9	-	2.1	0.1	1.5	-	12.3	21.3
Growing Degrees	5	2.9	5.0	5.9	3.5	6.5	4.9	5.7	4.5	6.6	5.5	50.8	35.4	54.0
	10	0.0	0.0	0.9	0.0	1.5	0.0	0.7	0.0	1.6	0.5	5.1	3.5	13.3

2nd 10-day period (11-20/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.6	14.2	14.2
Precipitation - Reference Evapotranspiration	77.8	32.6	23.4
Number of Rainy Days	10.0	7.0	5.1
Number of Dry Days	0.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

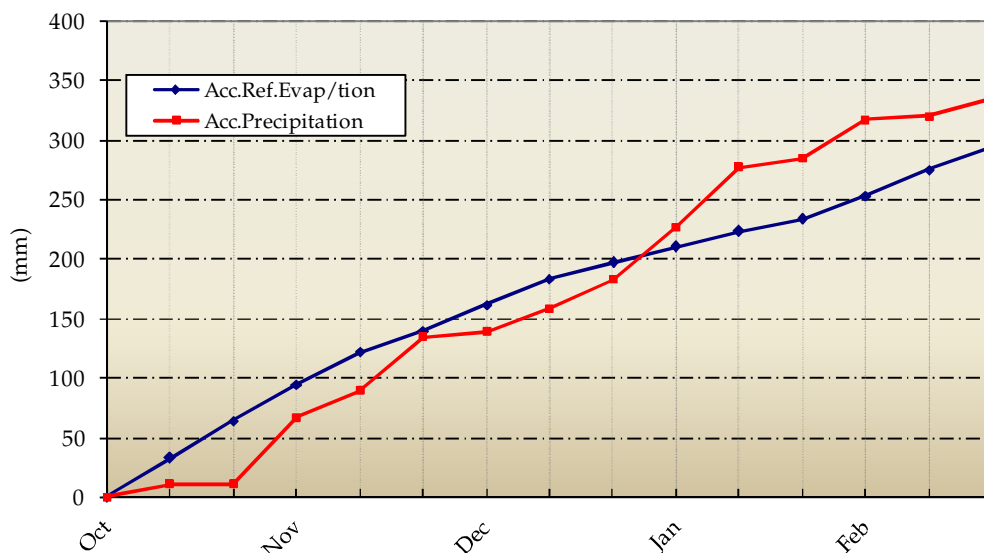


Iraklio

2nd 10-day period (11-20/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.6	15.2	17.6	14.6	16.4	15.0	15.4	13.4	17.4	16.0	15.5	-	15.9
	Min	7.4	6.4	9.2	10.4	8.0	8.6	8.8	10.0	7.4	12.6	8.9	-	9.3
Relative Humidity	Max	85	84	82	90	90	93	90	90	89	89	88	-	-
	Min	57	58	52	62	58	64	66	66	52	57	59	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		7.4	8.7	7.3	2.3	7.1	6.8	6.5	1.8	4.4	9.0	6.1	-	4.8
Precipitation		0.5			9.6	0.5	1.3	2.7	0.3			14.9	-	20.7
Evaporation		1.5	0.0	2.3	0.2	3.0	1.9	0.8	2.5	4.3	1.0	17.5	-	30.3
Growing Degrees	5	5.5	5.8	8.4	7.5	7.2	6.8	7.1	6.7	7.4	9.3	71.7	-	75.8
	10	0.5	0.8	3.4	2.5	2.2	1.8	2.1	1.7	2.4	4.3	21.7	-	27.6

2nd 10-day period (11-20/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.8	-	-
Precipitation - Reference Evapotranspiration	-3.9	-	20.7
Number of Rainy Days	6.0	-	4.0
Number of Dry Days	2.0	-	-

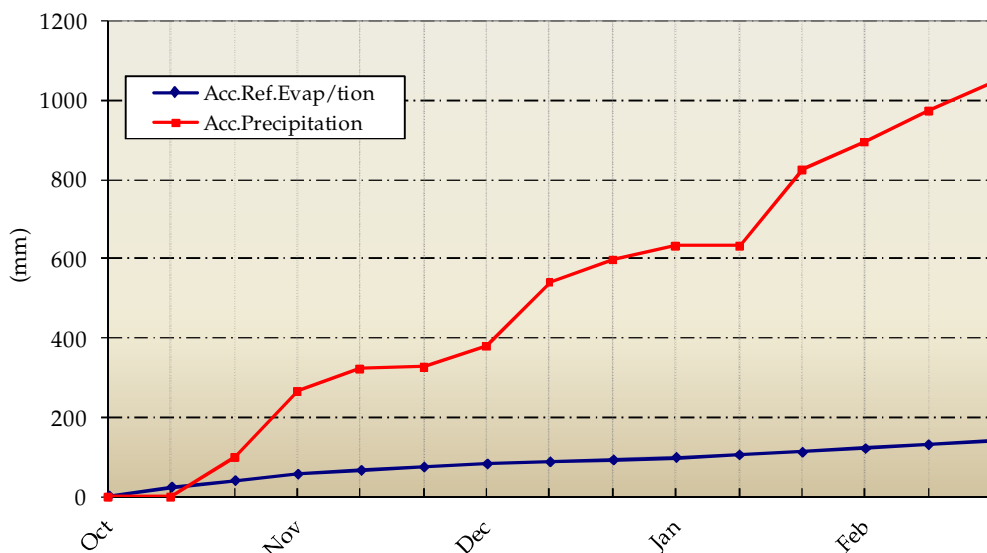
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.4	9.2	8.6	10.8	12.4	8.2	9.4	6.2	7.0	11.1	9.0	7.0	10.3
	Min	-1.2	3.3	1.0	1.2	4.7	1.9	2.2	1.7	2.2	-0.6	1.6	-0.5	1.8
Relative Humidity	Max	96	91	96	98	94	97	98	95	98	98	96	94	-
	Min	34	59	66	43	37	63	48	72	69	39	53	56	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	4.4
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	5.4
Sunshine Duration		6.7	1.0	0.5	-	4.0	0.0	0.8	0.0	0.2	4.2	1.9	2.2	3.3
Precipitation		0.4	2.2	38.1	1.9	0.0	4.6	0.5	7.5	15.2	0.3	70.7	61.2	46.4
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	11.3
Growing Degrees	5	0.0	1.3	0.0	1.0	3.6	0.1	0.8	0.0	0.0	0.3	6.9	5.2	18.2
	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	1.8

2nd 10-day period (11-20/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.0	9.3	11.4
Precipitation - Reference Evapotranspiration	60.7	51.9	35.0
Number of Rainy Days	9.0	7.0	5.0
Number of Dry Days	0.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

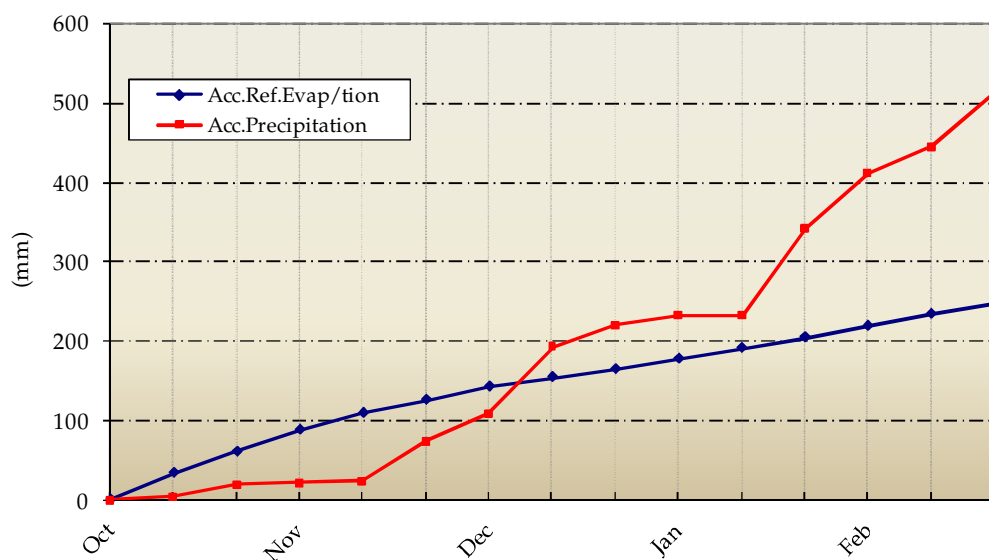


Kalamata

2nd 10-day period (11-20/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.5	15.6	16.4	10.3	13.5	13.0	15.2	11.0	16.0	16.7	14.0	12.5	15.1
	Min	4.7	2.0	9.2	7.5	7.8	3.8	5.4	6.6	7.4	4.0	5.8	3.1	5.9
Relative Humidity	Max	93	92	94	94	93	95	95	94	95	94	94	97	-
	Min	34	59	48	82	62	66	59	72	64	36	58	57	-
Soil Temperature at 10 cm	06 UTC	10.2	9.4	11.0	11.0	11.0	10.4	10.6	11.0	10.8	10.2	10.6	8.3	9.6
	12 UTC	10.6	10.4	11.2	11.2	11.4	11.0	11.4	11.2	11.0	11.2	11.1	9.4	10.9
Sunshine Duration		8.3	2.9	1.7	0.0	0.6	2.2	5.9	0.0	1.6	9.2	3.2	4.9	4.5
Precipitation		2.5	2.0	12.8	7.4	0.7	14.3	9.2	4.3	15.7		68.9	62.6	43.8
Evaporation		0.9	3.2	0.5	0.4	8.4	0.0	1.7	0.0	5.3	9.2	29.6	16.1	26.5
Growing Degrees	5	3.6	3.8	7.8	3.9	5.7	3.4	5.3	3.8	6.7	5.4	49.3	28.4	55.5
	10	0.0	0.0	2.8	0.0	0.7	0.0	0.3	0.0	1.7	0.4	5.8	1.4	12.8

2nd 10-day period (11-20/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.9	13.6	15.6
Precipitation - Reference Evapotranspiration	55.0	49.0	28.2
Number of Rainy Days	9.0	7.0	5.2
Number of Dry Days	0.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



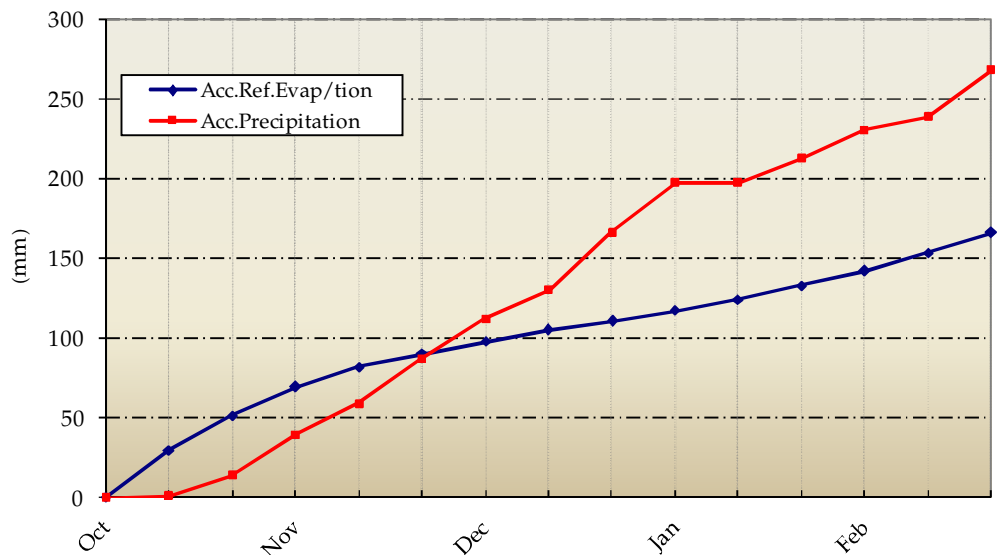


Larisa

2nd 10-day period (11-20/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.0	12.4	14.7	10.2	12.6	12.4	9.6	9.4	11.0	12.8	11.8	9.4	12.1
	Min	2.6	1.0	7.0	2.7	7.3	0.8	6.3	5.2	6.2	-0.8	3.8	0.3	1.9
Relative Humidity	Max	82	87	98	100	96	100	92	99	100	100	95	91	-
	Min	24	44	55	68	60	64	63	69	61	42	55	54	-
Soil Temperature at 10 cm	06 UTC	6.8	6.6	8.0	7.6	8.6	8.0	8.8	8.6	8.6	6.4	7.8	3.9	6.7
	12 UTC	8.0	9.0	9.0	8.6	9.2	9.6	9.0	9.2	9.0	8.8	8.9	5.5	7.2
Sunshine Duration		8.0	0.9	3.6	0.0	0.9	3.2	0.1	0.0	3.7	7.8	2.8	4.0	4.0
Precipitation				3.8	3.8	0.0		4.8	0.0	16.8		29.2	16.9	12.7
Evaporation		3.6	3.0	0.1	0.0	1.0	0.8	0.2	0.0	2.5	1.8	13.0	20.2	10.0
Growing Degrees	5	2.8	1.7	5.9	1.5	5.0	1.6	3.0	2.3	3.6	1.0	28.2	6.1	25.9
	10	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	3.3

2nd 10-day period (11-20/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.2	10.2	12.0
Precipitation - Reference Evapotranspiration	17.0	6.7	0.7
Number of Rainy Days	4.0	4.0	3.6
Number of Dry Days	5.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



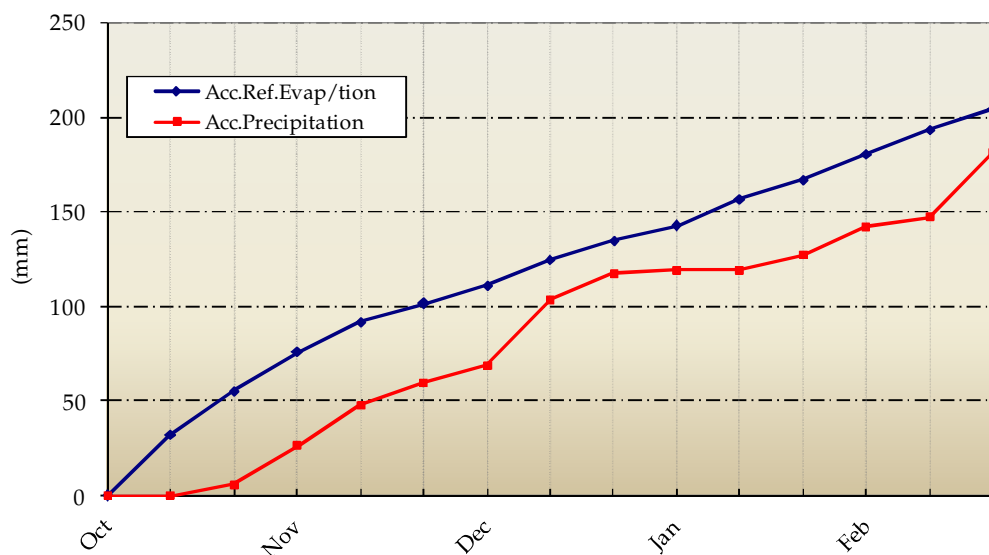


Mikra

2nd 10-day period (11-20/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.6	11.6	13.3	12.0	12.5	9.6	10.0	8.1	7.7	10.6	10.7	6.8	11.2
	Min	1.6	1.8	6.2	5.6	7.8	7.0	5.8	2.8	5.8	2.4	4.7	-0.1	2.9
Relative Humidity	Max	80	83	86	90	90	90	88	86	90	93	88	87	-
	Min	32	59	64	63	51	78	57	52	71	60	59	58	-
Soil Temperature at 10 cm	06 UTC	6.8	6.4	8.4	8.0	8.8	9.2	8.8	7.4	8.2	7.0	7.9	3.5	5.9
	12 UTC	8.2	8.4	8.8	9.0	10.0	9.8	9.8	9.6	9.6	9.0	9.2	5.1	7.7
Sunshine Duration		9.0	0.5	0.5	0.0	2.7	0.0	3.8	0.0	0.0	8.9	2.5	4.3	3.8
Precipitation				14.5	0.9		7.6	0.0	0.9	10.3		34.2	5.9	15.0
Evaporation		2.1	0.3	2.7	-	2.3	0.4	0.2	-	-	0.9	-	17.7	14.7
Growing Degrees	5	1.6	1.7	4.8	3.8	5.2	3.3	2.9	0.5	1.8	1.5	26.9	1.1	26.4
	10	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	3.8

2nd 10-day period (11-20/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.8	12.1	13.1
Precipitation - Reference Evapotranspiration	23.4	-6.2	1.9
Number of Rainy Days	5.0	3.0	3.4
Number of Dry Days	5.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

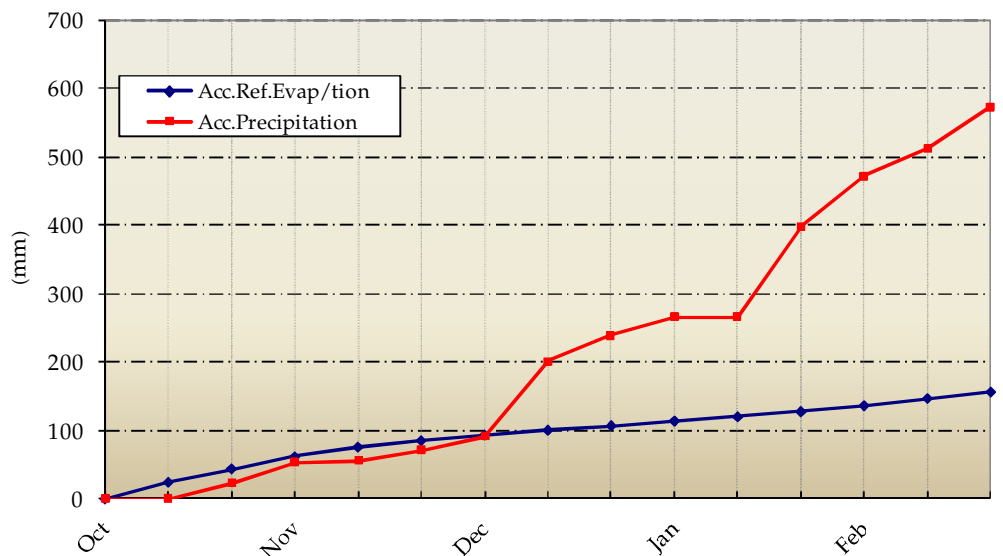


Tripoli

2nd 10-day period (11-20/02/2013)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.2	9.0	10.6	7.1	9.4	9.4	6.9	6.7	9.1	12.5	8.8	7.6	10.2
	Min	0.3	-2.3	3.8	2.8	3.7	-1.1	3.9	0.7	3.7	-1.0	1.4	-1.4	1.7
Relative Humidity	Max	77	93	99	98	92	100	93	98	99	82	93	92	-
	Min	46	70	80	79	76	66	81	64	76	31	67	74	-
Soil Temperature at 10 cm	06 UTC	3.8	2.6	5.4	5.4	5.4	4.2	6.2	4.8	5.8	3.6	4.7	2.6	4.8
	12 UTC	6.6	5.2	6.8	6.4	6.4	-	-	7.0	6.2	7.8	6.6	-	5.7
Sunshine Duration		8.3	1.0	2.8	0.0	0.3	2.8	0.0	1.5	0.9	9.1	2.7	4.4	4.3
Precipitation		5.1	2.6	15.5	3.5	2.3	0.1	3.2	0.0	29.4		61.7	26.3	39.0
Evaporation		0.7	-	0.1	1.1	1.1	0.0	0.8	0.7	0.3	1.7	-	-	11.0
Growing Degrees	5	0.0	0.0	2.2	0.0	1.6	0.0	0.4	0.0	1.4	0.8	6.3	1.1	17.8
	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	1.6

2nd 10-day period (11-20/02/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.5	9.3	12.8
Precipitation - Reference Evapotranspiration	52.2	17.0	26.2
Number of Rainy Days	8.0	7.0	4.9
Number of Dry Days	0.0	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<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.

**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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