



# AGROMETEOROLOGICAL BULLETIN

*November 2012*  
*1st 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



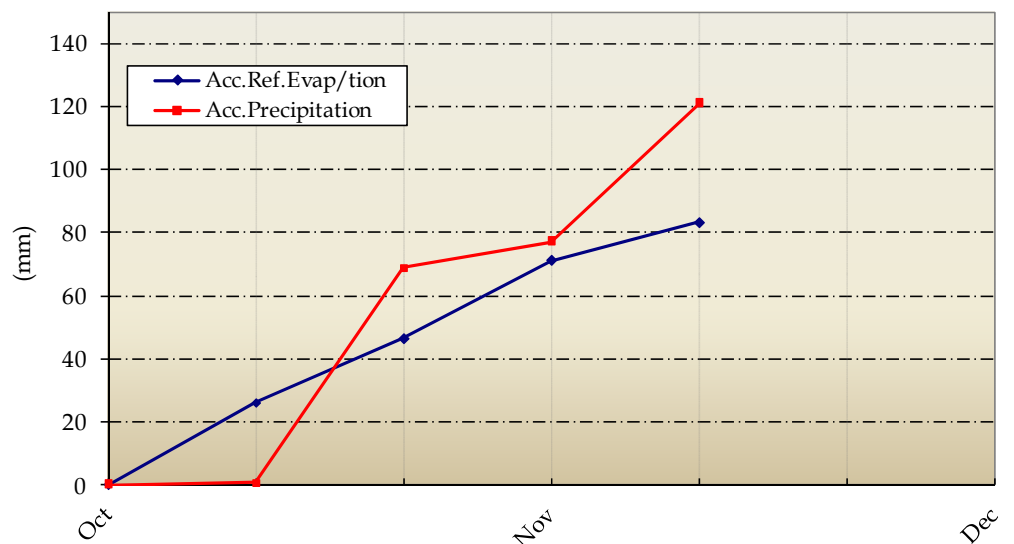
Hellenic National Meteorological Service  
Division of Climatology-Applications  
El. Venizelou Street 14, 16777  
Helliniko, Athens

*Web addresses of HNMS*  
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1st 10-day period (1-10/11/2012)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.0	23.2	23.4	22.4	17.8	25.6	18.8	20.4	19.8	21.4	21.4	21.1	20.1
	Min	16.0	12.6	9.2	10.0	10.0	15.8	10.6	8.6	3.4	5.0	10.1	6.0	8.3
Relative Humidity	Max	94	100	95	97	97	91	98	87	97	94	95	89	-
	Min	65	69	58	62	82	69	77	41	40	37	60	45	-
Soil Temperature at 10 cm	06 UTC	17.8	16.6	16.4	16.2	16.0	18.4	17.1	16.0	13.6	13.4	16.2	13.5	13.0
	12 UTC	18.2	18.0	18.0	17.4	17.0	19.6	17.8	16.6	15.2	14.8	17.3	15.4	15.7
Sunshine Duration		0.0	5.8	8.8	6.4	0.3	8.2	0.1	9.3	9.1	9.0	5.7	7.2	5.5
Precipitation		41.7					1.0	0.8	0.3			43.8		44.3
Evaporation		-	2.0	2.0	0.6	0.4	2.6	0.5	1.2	1.2	3.2	-	27.3	20.9
Growing Degrees	5	13.5	12.9	11.3	11.2	8.9	15.7	9.7	9.5	6.6	8.2	107.5	85.5	92.0
	10	8.5	7.9	6.3	6.2	3.9	10.7	4.7	4.5	1.6	3.2	57.5	35.5	43.1

1st 10-day period (1-10/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.2	14.2	13.9
Precipitation - Reference Evapotranspiration	31.6	-14.2	30.4
Number of Rainy Days	4.0	0.0	3.0
Number of Dry Days	1.0	25.0	-

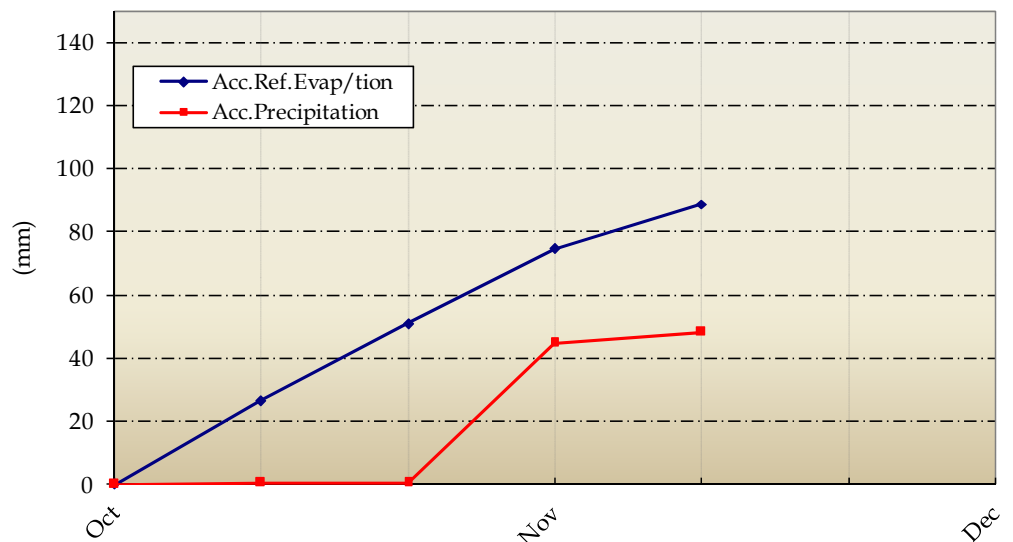
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2012)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	23.2	22.2	19.0	22.0	23.0	19.0	16.4	16.0	17.0	19.6	15.9	15.8
	Min	10.8	15.0	14.2	11.0	12.6	17.4	14.2	10.4	4.4	7.8	11.8	4.8	7.1
Relative Humidity	Max	94	96	96	95	93	94	81	80	80	76	88	87	-
	Min	69	73	62	74	69	67	54	22	35	40	56	50	-
Soil Temperature at 10 cm	06 UTC	14.4	17.0	17.4	16.4	16.0	18.0	18.2	15.6	12.8	13.6	15.9	11.3	11.0
	12 UTC	15.8	19.6	19.4	18.2	18.2	19.8	18.6	16.6	14.6	15.4	17.6	13.2	12.9
Sunshine Duration		0.0	6.0	8.8	1.9	7.5	5.8	0.7	8.7	8.2	6.9	5.4	6.2	4.1
Precipitation		0.6	2.9					0.0	0.0			3.5		19.0
Evaporation		0.7	1.1	0.4	2.0	1.5	5.5	3.7	3.9	1.9	1.7	22.4	22.3	25.4
Growing Degrees	5	9.5	14.1	13.2	10.0	12.3	15.2	11.6	8.4	5.2	7.4	106.9	53.2	64.9
	10	4.5	9.1	8.2	5.0	7.3	10.2	6.6	3.4	0.2	2.4	56.9	6.4	23.3

1st 10-day period (1-10/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.3	12.8	14.9
Precipitation - Reference Evapotranspiration	-10.8	-12.8	4.1
Number of Rainy Days	2.0	0.0	1.9
Number of Dry Days	1.0	24.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

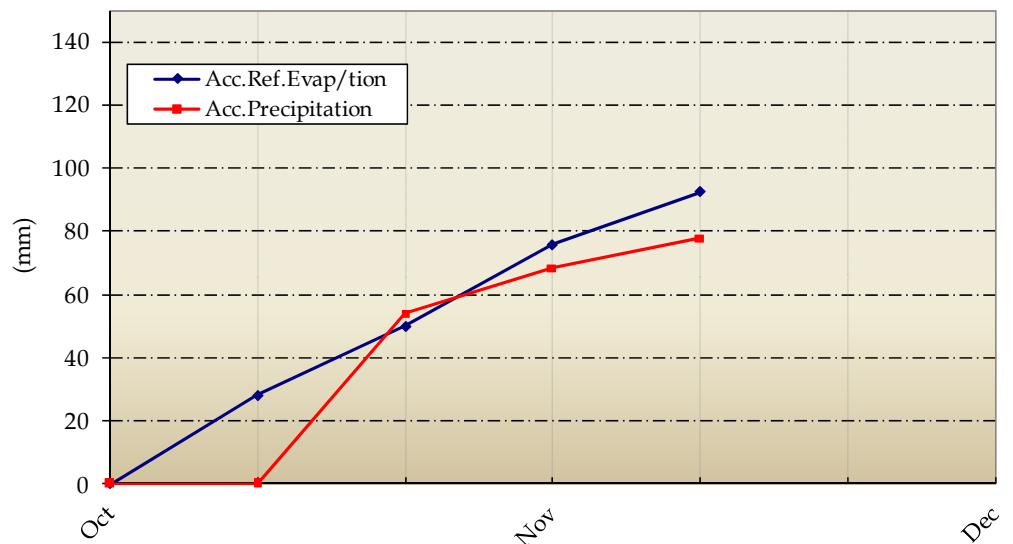


Andravida

1st 10-day period (1-10/11/2012)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.5	23.0	22.3	22.6	21.5	25.1	20.5	19.2	19.3	21.0	21.9	20.8	20.0
	Min	17.4	14.0	12.2	13.3	13.1	18.6	14.9	12.0	5.2	8.5	12.9	7.4	10.4
Relative Humidity	Max	92	93	91	86	87	90	90	89	88	91	90	94	-
	Min	56	52	50	58	64	54	68	47	41	37	53	45	-
Soil Temperature at 10 cm	06 UTC	18.8	18.4	17.4	17.4	17.4	19.4	18.6	17.2	14.4	15.0	17.4	12.4	14.3
	12 UTC	19.8	19.6	21.0	21.0	19.2	22.4	19.8	19.0	18.2	18.4	19.8	17.1	16.6
Sunshine Duration		0.0	7.0	9.0	6.0	1.4	8.2	0.9	9.2	9.1	8.4	5.9	6.6	6.0
Precipitation		0.7						3.8	4.8			9.3		45.1
Evaporation		0.8	2.0	0.5	3.3	0.2	1.8	6.6	1.9	1.2	1.0	19.3	16.9	25.9
Growing Degrees	5	16.0	13.5	12.3	13.0	12.3	16.9	12.7	10.6	7.3	9.8	124.1	91.0	101.6
	10	11.0	8.5	7.3	8.0	7.3	11.9	7.7	5.6	2.3	4.8	74.1	41.0	52.1

1st 10-day period (1-10/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.7	13.2	14.3
Precipitation - Reference Evapotranspiration	-7.4	-13.2	30.8
Number of Rainy Days	3.0	0.0	3.2
Number of Dry Days	2.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

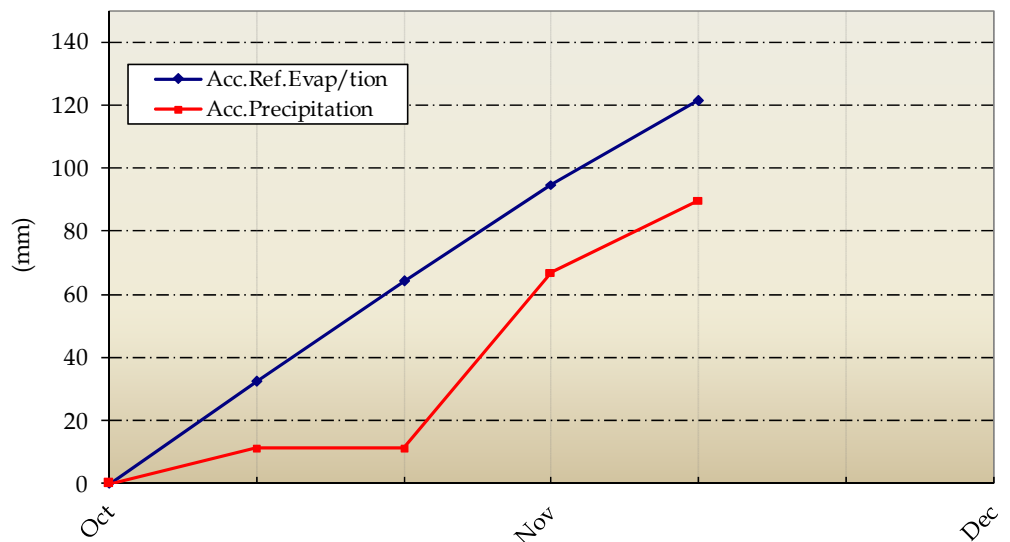


Iraklio

1st 10-day period (1-10/11/2012)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.6	31.4	24.4	23.6	23.2	25.4	26.2	18.8	19.0	19.4	23.6	-	20.4
	Min	17.2	23.4	19.2	17.6	17.0	16.8	19.4	18.0	16.8	14.2	18.0	-	14.3
Relative Humidity	Max	88	91	92	94	90	87	84	90	80	70	87	-	-
	Min	54	36	63	53	66	66	56	66	58	57	58	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		0.0	6.7	8.1	6.1	5.5	7.0	7.8	0.9	7.2	5.0	5.4	-	5.0
Precipitation		0.3							22.5	0.1		22.9	-	20.0
Evaporation		3.5	3.1	2.8	3.0	-	2.2	4.1	3.2	6.8	3.6	-	-	39.9
Growing Degrees	5	15.9	22.4	16.8	15.6	15.1	16.1	17.8	13.4	12.9	11.8	157.8	-	123.4
	10	10.9	17.4	11.8	10.6	10.1	11.1	12.8	8.4	7.9	6.8	107.8	-	73.4

1st 10-day period (1-10/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	26.8	-	-
Precipitation - Reference Evapotranspiration	-3.9	-	20.0
Number of Rainy Days	3.0	-	2.6
Number of Dry Days	1.0	-	-

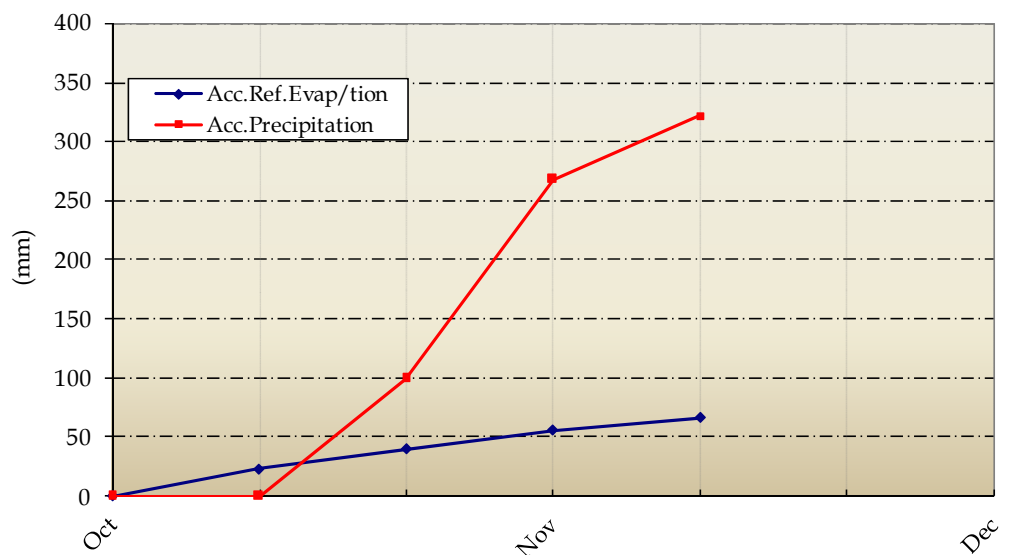
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2012)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.8	18.6	18.0	19.0	14.6	21.4	13.4	15.6	15.4	17.2	17.0	16.5	16.0
	Min	12.6	11.8	8.0	7.0	10.0	13.4	10.4	5.8	0.6	1.0	8.1	3.1	5.4
Relative Humidity	Max	98	98	97	97	98	96	-	90	93	97	96	97	-
	Min	75	66	55	49	71	57	-	35	47	42	55	49	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.8
Sunshine Duration		0.0	2.7	2.4	4.2	0.0	5.2	0.0	6.6	7.1	5.2	3.3	4.0	4.1
Precipitation		18.2				6.0	25.5	4.3				54.0	8.6	40.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	16.8
Growing Degrees	5	9.7	10.2	8.0	8.0	7.3	12.4	6.9	5.7	3.0	4.1	75.3	48.2	57.3
	10	4.7	5.2	3.0	3.0	2.3	7.4	1.9	0.7	0.0	0.0	28.2	8.4	16.4

1st 10-day period (1-10/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.4	10.0	10.7
Precipitation - Reference Evapotranspiration	43.6	-1.4	29.4
Number of Rainy Days	4.0	3.0	3.4
Number of Dry Days	1.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

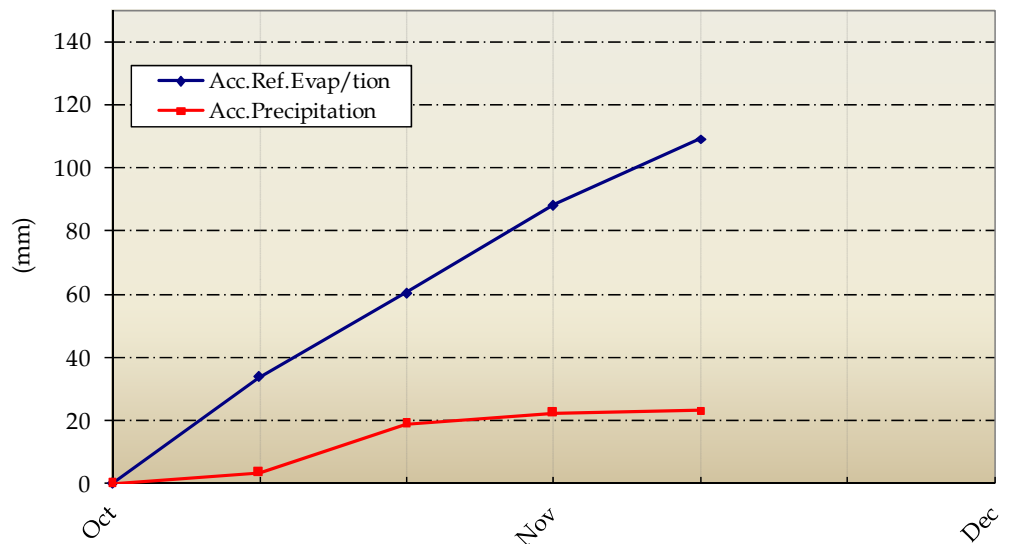


Kalamata

1st 10-day period (1-10/11/2012)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.8	26.3	25.7	25.0	24.1	27.4	24.2	21.8	21.8	21.4	24.2	21.3	21.0
	Min	14.8	14.8	11.1	11.8	10.8	14.9	15.4	11.9	7.7	9.2	12.2	9.4	10.2
Relative Humidity	Max	91	93	90	90	93	94	90	76	74	84	88	93	-
	Min	62	43	29	39	50	53	55	36	23	44	43	47	-
Soil Temperature at 10 cm	06 UTC	19.2	19.6	18.4	18.0	17.8	18.6	18.6	18.6	17.0	16.4	18.2	15.2	15.1
	12 UTC	19.4	20.2	19.4	19.2	19.0	19.6	19.8	19.0	17.6	17.6	19.1	16.4	16.9
Sunshine Duration		0.0	8.5	8.8	7.6	3.8	7.6	4.3	9.0	9.0	9.1	6.8	7.2	5.6
Precipitation		0.6						0.1				0.7		35.3
Evaporation		0.6	4.8	2.0	2.6	4.8	5.0	2.6	0.8	2.8	5.0	31.0	19.8	30.4
Growing Degrees	5	14.8	15.6	13.4	13.4	12.5	16.2	14.8	11.9	9.8	10.3	132.5	103.3	105.8
	10	9.8	10.6	8.4	8.4	7.5	11.2	9.8	6.9	4.8	5.3	82.5	53.3	55.9

1st 10-day period (1-10/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	21.0	18.2	16.4
Precipitation - Reference Evapotranspiration	-20.3	-18.2	18.9
Number of Rainy Days	2.0	0.0	3.1
Number of Dry Days	1.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

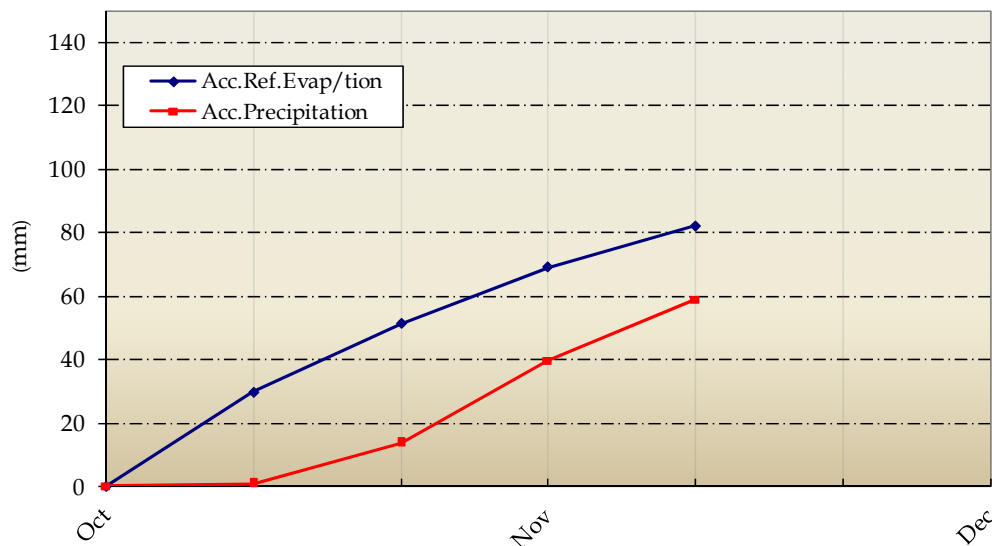


Larisa

1st 10-day period (1-10/11/2012)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.8	21.8	22.8	21.0	23.0	27.2	23.0	17.2	17.6	18.8	21.0	17.0	17.2
	Min	12.2	10.6	7.8	8.8	9.0	14.6	9.6	9.4	1.8	1.8	8.6	5.1	6.7
Relative Humidity	Max	100	100	100	100	100	93	84	94	99	98	97	94	-
	Min	74	66	45	54	49	34	37	34	33	31	46	53	-
Soil Temperature at 10 cm	06 UTC	16.6	15.8	15.8	15.6	15.6	16.8	16.6	15.0	13.6	13.0	15.4	11.7	12.3
	12 UTC	17.0	16.4	18.4	16.8	17.0	18.4	17.2	16.0	14.4	14.2	16.6	13.2	13.2
Sunshine Duration		0.0	4.5	7.5	5.6	6.4	6.8	1.4	8.2	7.8	7.2	5.5	4.8	4.1
Precipitation		13.8						0.0	5.5			19.3	0.0	20.6
Evaporation		0.1	0.2	1.6	1.0	3.0	6.0	7.5	4.6	6.2	2.4	32.6	18.7	17.6
Growing Degrees	5	10.0	11.2	10.3	9.9	11.0	15.9	11.3	8.3	4.7	5.3	97.9	60.5	69.6
	10	5.0	6.2	5.3	4.9	6.0	10.9	6.3	3.3	0.0	0.3	48.2	14.6	25.7

1st 10-day period (1-10/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.9	11.8	11.7
Precipitation - Reference Evapotranspiration	6.4	-11.8	8.9
Number of Rainy Days	2.0	0.0	2.7
Number of Dry Days	1.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



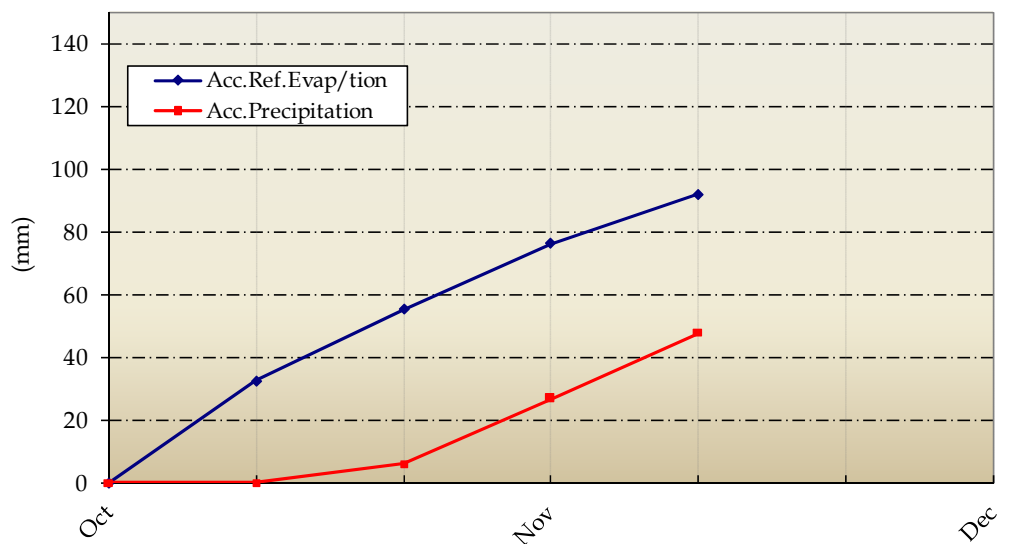


Mikra

1st 10-day period (1-10/11/2012)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.2	21.7	22.0	20.4	20.7	22.4	19.4	16.6	16.0	17.8	19.6	15.3	16.5
	Min	14.0	14.8	10.6	11.3	12.6	15.4	11.1	9.2	3.0	4.5	10.6	7.2	7.9
Relative Humidity	Max	92	94	93	91	90	90	91	84	87	84	90	91	-
	Min	60	69	45	69	60	66	50	31	40	33	52	61	-
Soil Temperature at 10 cm	06 UTC	17.6	17.2	16.4	16.0	16.4	17.4	16.8	13.4	11.8	12.0	15.5	12.7	11.5
	12 UTC	17.8	19.6	19.0	18.4	19.4	19.6	19.4	19.8	14.0	13.8	18.1	14.4	13.8
Sunshine Duration		0.0	6.1	8.4	5.4	8.4	7.3	0.0	8.7	7.0	8.7	6.0	4.4	4.0
Precipitation		12.9						2.2	6.1			21.2	0.9	18.1
Evaporation		-	8.7	1.5	2.8	0.4	1.6	8.7	3.2	1.8	1.4	-	14.6	22.5
Growing Degrees	5	11.6	13.3	11.3	10.9	11.7	13.9	10.3	7.9	4.5	6.2	101.4	62.4	72.4
	10	6.6	8.3	6.3	5.9	6.7	8.9	5.3	2.9	0.0	1.2	51.9	12.9	27.9

1st 10-day period (1-10/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.8	10.3	13.6
Precipitation - Reference Evapotranspiration	5.4	-9.4	4.5
Number of Rainy Days	3.0	1.0	2.5
Number of Dry Days	1.0	25.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

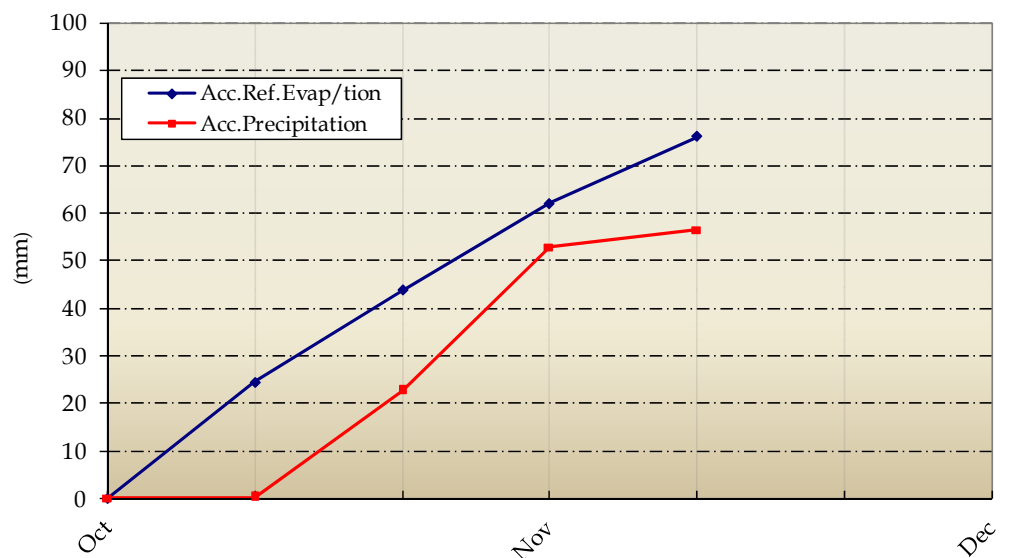


Tripoli

1st 10-day period (1-10/11/2012)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.8	21.6	21.0	19.8	21.8	22.8	20.3	16.0	18.4	16.3	19.8	17.0	16.5
	Min	10.0	12.5	4.5	4.3	4.0	15.0	9.4	6.9	-1.3	0.3	6.6	2.6	5.2
Relative Humidity	Max	94	89	94	97	97	78	92	78	99	96	91	96	-
	Min	66	41	36	44	51	46	52	75	28	35	47	44	-
Soil Temperature at 10 cm	06 UTC	13.6	14.4	12.0	11.4	11.4	15.2	13.6	13.0	8.8	8.4	12.2	8.8	11.0
	12 UTC	16.0	17.8	16.2	15.0	15.0	15.0	17.0	-	13.0	13.0	15.3	12.7	12.3
Sunshine Duration		0.7	8.8	8.2	6.7	4.8	5.2	5.4	6.3	8.2	8.0	6.2	6.7	5.1
Precipitation		0.8				0.0		0.0	2.8			3.6		28.3
Evaporation		0.2	3.0	1.6	1.3	0.0	2.6	1.8	1.2	2.4	0.9	15.0	15.8	18.0
Growing Degrees	5	9.9	12.1	7.8	7.1	7.9	13.9	9.9	6.5	3.6	3.3	81.7	48.3	58.6
	10	4.9	7.1	2.8	2.1	2.9	8.9	4.9	1.5	0.0	0.0	34.9	7.4	17.0

1st 10-day period (1-10/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.9	12.6	13.6
Precipitation - Reference Evapotranspiration	-10.3	-12.6	14.7
Number of Rainy Days	2.0	0.0	2.6
Number of Dry Days	2.0	24.0	-

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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Issue Editors :

Charalabopoulos Christos

Filiou Anna

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