

# AGROMETEOROLOGICAL BULLETIN

*December 2010*  
*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



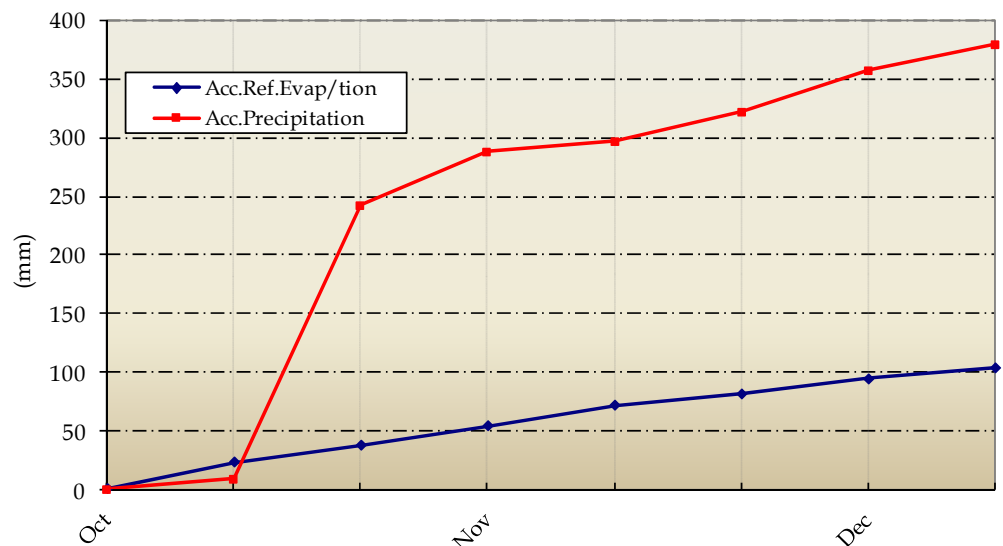
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1st 10-day period (1-10/12/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.0	22.5	22.4	20.8	14.4	16.0	19.6	20.4	19.4	20.0	19.8	-	15.5
	Min	18.0	15.2	12.2	12.2	5.2	4.5	8.0	7.4	7.5	6.6	9.7	-	5.0
Relative Humidity	Max	90	98	100	95	97	97	95	98	98	98	97	-	-
	Min	58	70	58	48	45	58	63	68	72	37	58	-	-
Soil Temperature at 10 cm	06 UTC	16.4	17.0	16.2	16.4	13.6	12.0	13.4	13.0	13.8	14.6	14.6	-	9.1
	12 UTC	17.2	17.0	16.8	16.4	14.2	12.6	14.4	14.2	14.8	14.4	15.2	-	10.9
Sunshine Duration		0.0	0.0	2.6	0.8	10.6	5.5	5.7	5.7	3.7	4.3	3.9	-	4.0
Precipitation		0.2	7.5	1.7	11.3	1.3						22.0	-	44.2
Evaporation		1.7	0.8	0.7	3.3	0.5	1.2	1.4	0.6	1.2	0.6	12.0	-	14.2
Growing Degrees	5	15.0	13.9	12.3	11.5	4.8	5.3	8.8	8.9	8.5	8.3	97.2	-	53.0
	10	10.0	8.9	7.3	6.5	0.0	0.3	3.8	3.9	3.5	3.3	47.4	-	12.3

1st 10-day period (1-10/12/2010)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.5	8.7
Precipitation - Reference Evapotranspiration	12.5	35.5
Number of Rainy Days	5.0	4.5
Number of Dry Days	3.0	-

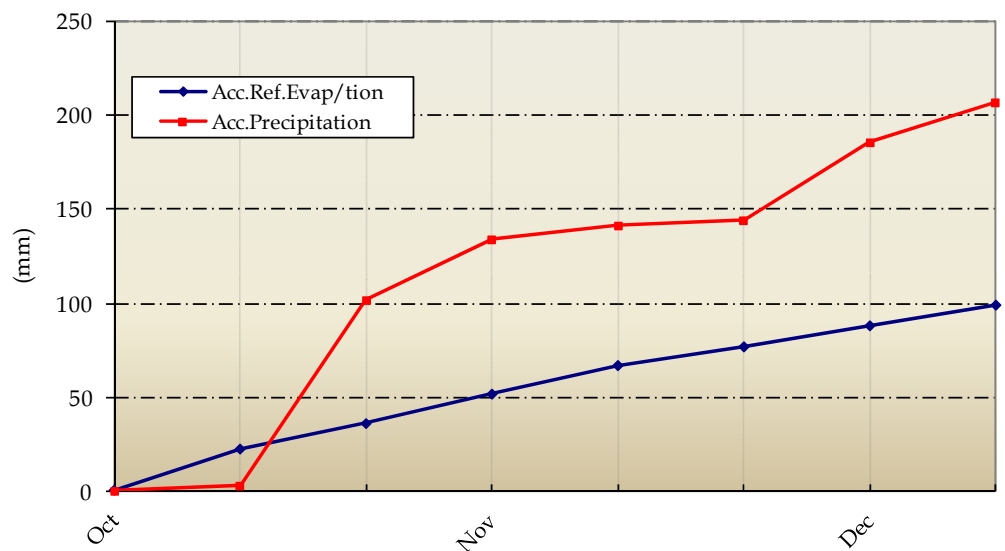
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/12/2010)		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	21.2	21.8	19.8	19.4	11.0	15.4	16.8	18.2	16.0	17.9	14.4	11.0
	Min	17.6	19.4	18.0	18.2	6.2	1.0	7.0	10.6	13.6	4.4	11.6	8.7	3.3
Relative Humidity	Max	92	83	83	96	79	92	93	93	91	100	90	93	-
	Min	76	70	52	69	56	61	66	74	77	39	64	68	-
Soil Temperature at 10 cm	06 UTC	15.2	16.0	15.6	16.0	14.6	10.0	10.6	11.8	13.0	13.0	13.6	11.7	7.1
	12 UTC	15.8	16.6	16.6	16.2	13.4	10.8	12.0	12.5	13.6	11.8	13.9	12.4	8.4
Sunshine Duration		0.0	0.0	4.9	0.0	4.0	6.7	5.9	0.7	2.1	0.0	2.4	1.5	2.7
Precipitation						6.0				0.0	15.0	21.0	1.9	30.2
Evaporation		2.2	3.0	2.5	2.2	0.8	2.2	1.9	0.6	0.0	2.8	18.2	9.7	14.9
Growing Degrees	5	13.7	15.3	14.9	14.0	7.8	1.0	6.2	8.7	10.9	5.2	97.7	65.7	28.2
	10	8.7	10.3	9.9	9.0	2.8	0.0	1.2	3.7	5.9	0.2	51.7	21.1	5.3

1st 10-day period (1-10/12/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.0	8.2	9.7
Precipitation - Reference Evapotranspiration	10.0	-6.3	20.5
Number of Rainy Days	2.0	3.0	3.2
Number of Dry Days	6.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

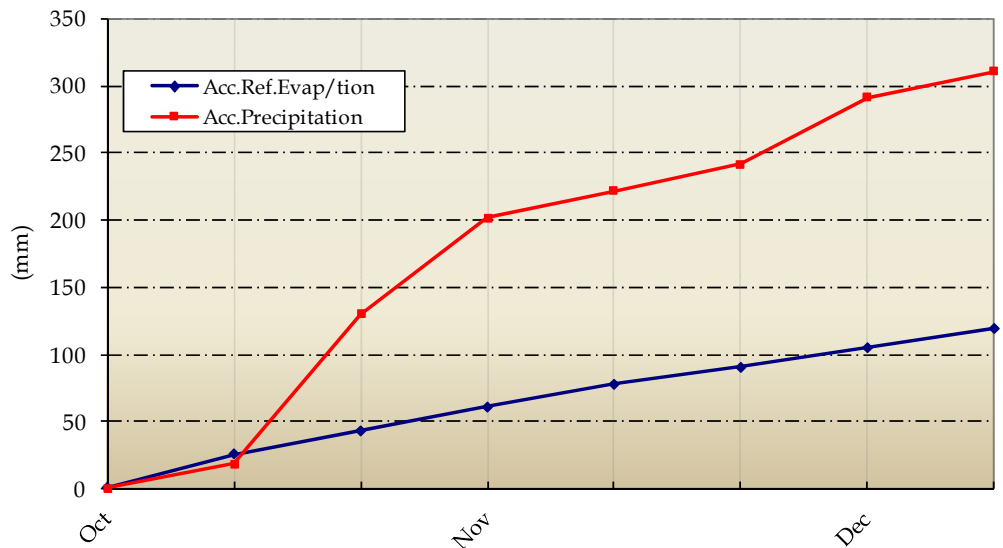


Andravida

1st 10-day period (1-10/12/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.8	22.4	22.4	20.4	14.8	16.4	19.4	21.2	20.0	17.2	19.7	16.8	15.9
	Min	17.6	19.2	17.4	14.6	8.4	7.8	10.2	11.4	12.4	11.0	13.0	9.9	7.3
Relative Humidity	Max	84	79	87	89	89	89	91	93	96	93	89	96	-
	Min	58	58	47	50	57	52	66	65	74	50	58	65	-
Soil Temperature at 10 cm	06 UTC	17.2	17.6	16.4	16.4	13.0	12.2	13.6	13.2	14.4	15.2	14.9	13.4	10.4
	12 UTC	18.2	18.4	18.0	17.0	14.4	14.8	15.8	16.4	16.4	15.8	16.5	15.1	12.0
Sunshine Duration		0.8	0.7	4.1	0.4	5.0	6.0	4.6	7.5	4.3	2.5	3.6	3.8	4.3
Precipitation		0.0	0.2	0.3	19.0	0.4						19.9	39.1	41.8
Evaporation		3.6	3.6	0.7	0.9	0.8	0.4	3.3	1.0	0.8	0.4	15.5	22.0	19.4
Growing Degrees	5	15.2	15.8	14.9	12.5	6.6	7.1	9.8	11.3	11.2	9.1	113.5	83.3	66.0
	10	10.2	10.8	9.9	7.5	1.6	2.1	4.8	6.3	6.2	4.1	63.5	33.3	20.7

1st 10-day period (1-10/12/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.4	9.2	9.1
Precipitation - Reference Evapotranspiration	5.5	29.9	32.7
Number of Rainy Days	4.0	6.0	4.6
Number of Dry Days	4.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

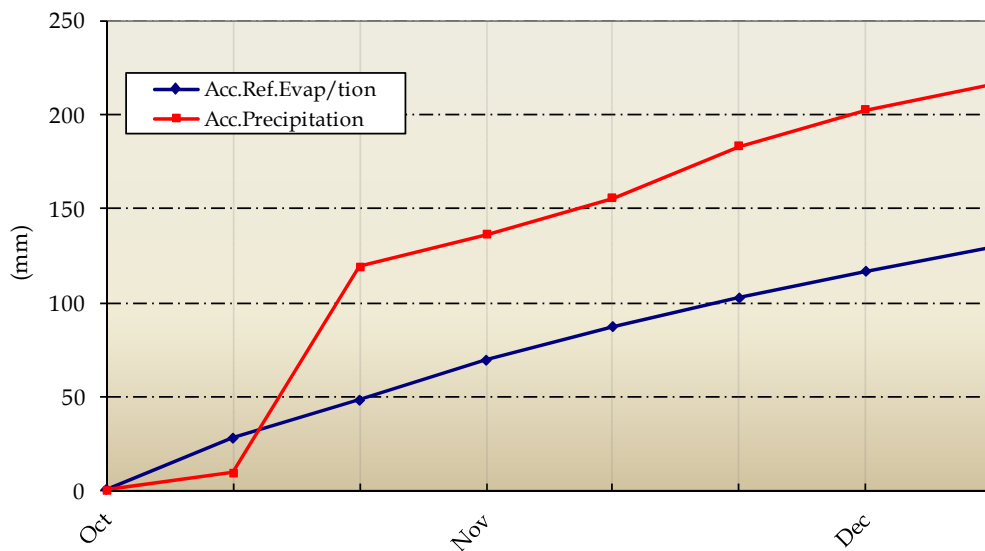


Kalamata

1st 10-day period (1-10/12/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.8	22.8	21.2	20.6	15.4	16.4	19.2	22.8	21.0	19.4	20.2	17.5	16.9
	Min	12.8	15.4	11.6	13.2	7.4	4.2	6.6	8.4	7.8	8.6	9.6	9.1	7.2
Relative Humidity	Max	96	96	93	95	94	97	97	97	100	100	96	96	-
	Min	71	56	73	76	47	50	66	61	71	49	62	64	-
Soil Temperature at 10 cm	06 UTC	16.8	16.4	16.8	16.8	15.4	14.0	13.8	14.0	14.6	14.4	15.3	13.8	11.5
	12 UTC	17.4	18.0	17.6	17.4	15.6	14.6	14.8	15.0	15.0	15.0	16.0	14.4	12.5
Sunshine Duration		2.6	2.9	4.2	2.9	7.4	7.3	1.9	8.1	4.9	9.4	5.2	3.6	4.0
Precipitation			0.3		9.0	4.8						14.1	40.3	45.8
Evaporation		0.2	1.1	1.3	1.7	1.2	0.8	0.8	1.2	1.0	3.7	13.0	16.0	26.7
Growing Degrees	5	12.8	14.1	11.4	11.9	6.4	5.3	7.9	10.6	9.4	9.0	98.8	83.3	70.4
	10	7.8	9.1	6.4	6.9	1.4	0.3	2.9	5.6	4.4	4.0	48.8	33.6	22.7

1st 10-day period (1-10/12/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.8	11.0	10.9
Precipitation - Reference Evapotranspiration	1.3	29.3	34.9
Number of Rainy Days	3.0	6.0	4.7
Number of Dry Days	5.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

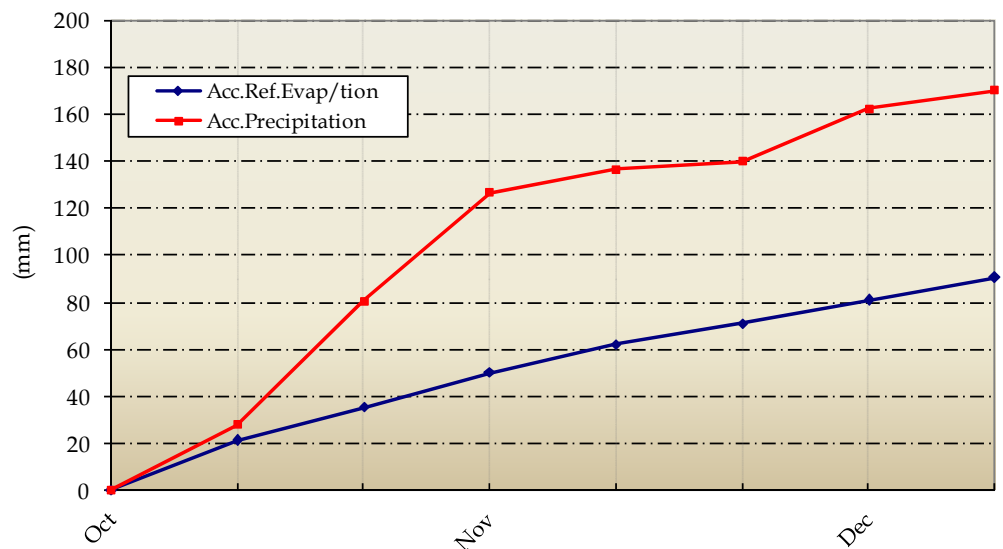


Larisa

1st 10-day period (1-10/12/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.6	23.0	23.0	18.2	15.4	13.8	15.2	16.6	18.6	13.4	17.7	14.7	11.5
	Min	9.6	12.6	8.8	11.0	3.6	0.8	2.2	3.4	5.6	5.4	6.3	6.9	2.7
Relative Humidity	Max	88	95	97	95	93	94	97	97	97	95	95	98	-
	Min	68	51	56	52	53	55	60	64	66	23	55	68	-
Soil Temperature at 10 cm	06 UTC	12.8	13.6	13.2	14.0	12.0	10.4	9.8	9.8	9.4	11.0	11.6	11.0	8.1
	12 UTC	13.8	14.4	14.2	14.6	15.0	11.0	10.8	10.8	11.0	6.8	12.2	11.6	8.8
Sunshine Duration		0.0	3.8	5.3	2.0	7.5	7.3	4.9	6.4	6.2	1.7	4.5	1.9	2.9
Precipitation			4.8	0.2	2.0						0.5	7.5	47.5	18.5
Evaporation		0.2	0.9	2.1	0.6	1.1	0.7	1.0	0.7	0.9	4.3	12.5	7.7	7.8
Growing Degrees	5	9.6	12.8	10.9	9.6	4.5	2.3	3.7	5.0	7.1	4.4	69.9	58.1	25.6
	10	4.6	7.8	5.9	4.6	0.0	0.0	0.0	0.0	2.1	0.0	25.0	11.5	2.3

1st 10-day period (1-10/12/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.6	8.0	6.7
Precipitation - Reference Evapotranspiration	-2.1	39.5	11.8
Number of Rainy Days	4.0	6.0	3.6
Number of Dry Days	4.0	20.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

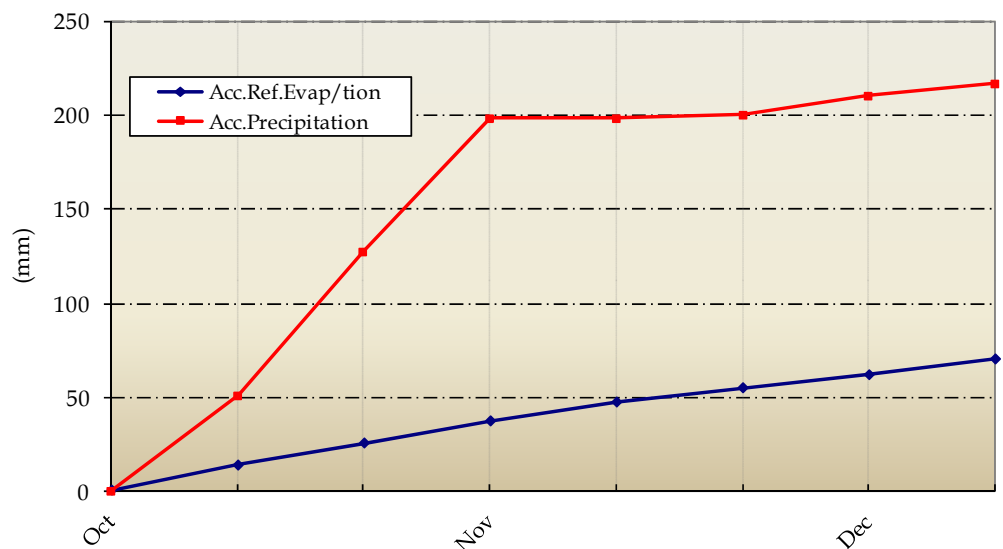


Series

1st 10-day period (1-10/12/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.4	22.8	21.2	18.4	14.2	11.6	13.6	15.6	15.6	9.6	15.7	14.0	9.8
	Min	8.2	12.6	12.0	12.6	6.8	0.8	1.8	2.6	6.2	3.8	6.7	7.0	1.6
Relative Humidity	Max	95	95	95	93	96	96	97	97	97	50	91	94	-
	Min	62	50	47	39	35	58	56	57	38	25	47	72	-
Soil Temperature at 10 cm	06 UTC	11.4	12.6	13.4	14.2	12.0	9.2	8.0	8.0	8.2	9.2	10.6	9.8	6.2
	12 UTC	12.2	13.4	13.8	13.8	11.6	9.6	8.6	8.2	9.2	8.4	10.9	10.3	6.9
Sunshine Duration		0.0	0.9	2.5	0.0	5.2	2.0	2.6	4.4	3.8	4.6	2.6	0.7	2.9
Precipitation			1.0		3.2						2.4	6.6	76.8	19.3
Evaporation		0.3	0.2	0.5	2.0	2.2	0.8	0.3	0.1	1.4	0.0	7.8	4.1	5.2
Growing Degrees	5	6.3	12.7	11.6	10.5	5.5	1.2	2.7	4.1	5.9	1.7	62.2	54.7	16.0
	10	1.3	7.7	6.6	5.5	0.5	0.0	0.0	0.0	0.9	0.0	22.5	10.7	1.1

1st 10-day period (1-10/12/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.4	5.5	4.2
Precipitation - Reference Evapotranspiration	-1.8	71.3	15.1
Number of Rainy Days	3.0	4.0	3.2
Number of Dry Days	4.0	21.0	-

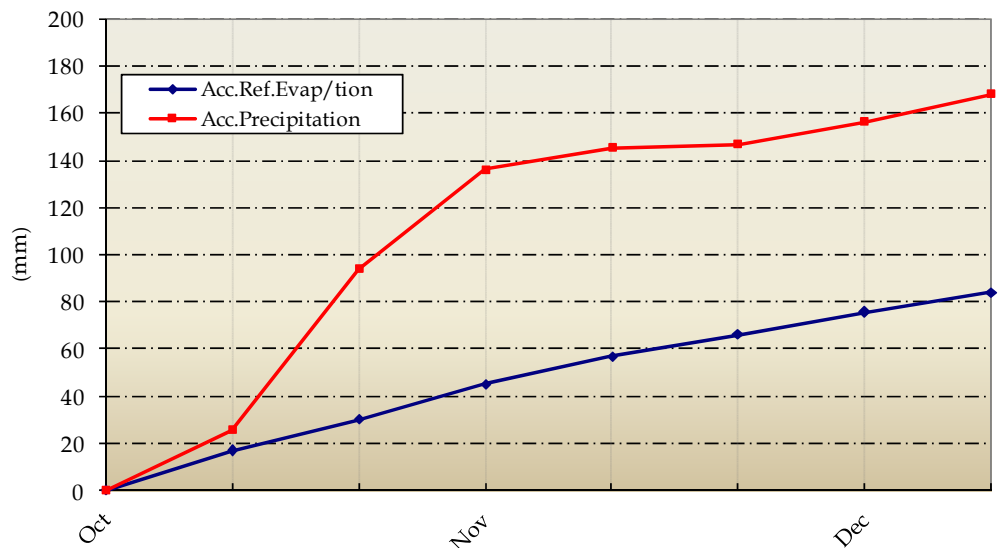
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/12/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.4	24.6	24.0	16.4	11.4	14.0	14.6	17.0	13.6	11.8	16.4	14.5	10.6
	Min	9.4	12.8	13.0	11.0	3.4	0.8	3.0	4.4	6.4	2.4	6.7	8.6	2.3
Relative Humidity	Max	95	99	98	95	99	93	100	95	97	58	93	96	-
	Min	42	39	53	68	48	49	66	68	55	34	52	72	-
Soil Temperature at 10 cm	06 UTC	12.4	13.6	14.6	14.8	12.0	4.4	9.0	9.2	10.2	10.6	11.1	10.6	7.8
	12 UTC	12.8	14.4	14.6	15.0	12.0	10.2	10.0	10.2	10.8	10.4	12.0	11.7	8.0
Sunshine Duration		0.0	1.2	5.8	1.6	8.3	7.8	4.7	6.7	0.1	1.7	3.8	1.4	3.4
Precipitation					7.0						4.7	11.7	96.3	32.7
Evaporation		1.6	0.6	1.5	1.5	0.8	1.2	0.8	0.8	0.4	0.6	9.8	7.9	6.5
Growing Degrees	5	7.9	13.7	13.5	8.7	2.4	2.4	3.8	5.7	5.0	2.1	65.2	65.5	20.1
	10	2.9	8.7	8.5	3.7	0.0	0.0	0.0	0.7	0.0	0.0	24.5	17.4	1.5

1st 10-day period (1-10/12/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.5	6.6	5.9
Precipitation - Reference Evapotranspiration	3.2	89.7	26.8
Number of Rainy Days	2.0	5.0	3.0
Number of Dry Days	4.0	21.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



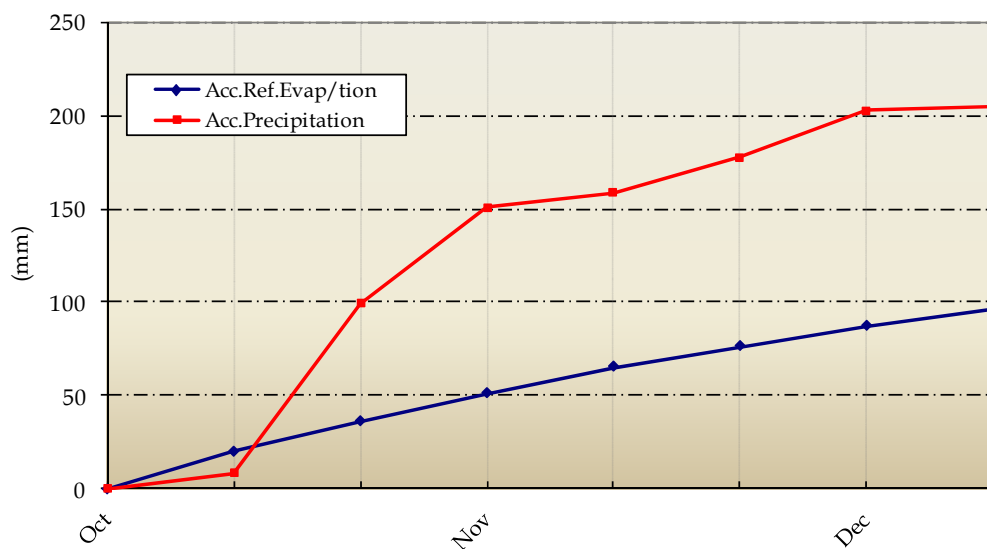


Tripoli

1st 10-day period (1-10/12/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.6	20.6	20.0	17.4	12.4	13.0	16.6	18.4	18.6	16.2	17.3	-	11.6
	Min	12.0	12.8	12.0	10.4	4.2	-1.8	2.8	2.2	4.4	6.2	6.5	-	2.8
Relative Humidity	Max	95	95	90	95	84	100	93	100	100	78	93	-	-
	Min	61	51	59	59	38	54	58	59	57	40	54	-	-
Soil Temperature at 10 cm	06 UTC	11.4	12.2	11.2	11.2	8.0	6.2	6.6	7.4	8.0	9.2	9.1	-	7.1
	12 UTC	13.4	14.4	14.2	13.8	9.8	9.0	10.0	10.4	10.4	11.4	11.7	-	7.9
Sunshine Duration		3.0	5.4	6.8	3.8	8.3	7.0	7.0	7.6	4.6	7.0	6.0	-	3.7
Precipitation			0.0		1.7							1.7	-	38.8
Evaporation		0.0	1.0	1.0	0.7	0.0	3.0	0.0	1.0	1.0	0.0	7.7	-	9.1
Growing Degrees	5	10.8	11.7	11.0	8.9	3.3	0.6	4.7	5.3	6.5	6.2	69.0	-	26.1
	10	5.8	6.7	6.0	3.9	0.0	0.0	0.0	0.3	1.5	1.2	25.4	-	2.6

1st 10-day period (1-10/12/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.4	-	8.4
Precipitation - Reference Evapotranspiration	-7.7	-	30.4
Number of Rainy Days	1.0	-	4.3
Number of Dry Days	7.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

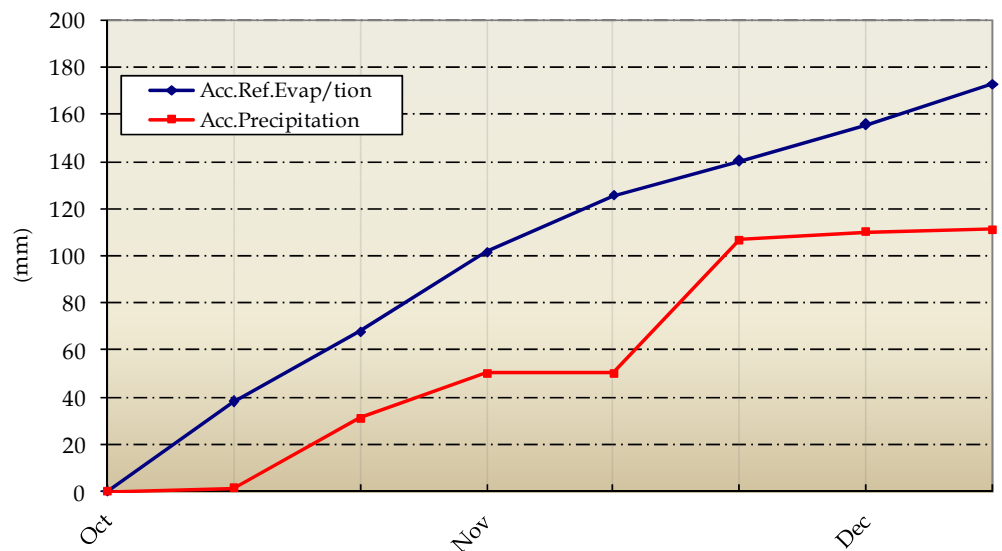


Tympaki

1st 10-day period (1-10/12/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.6	25.0	23.0	23.0	18.6	19.0	20.6	21.6	21.6	22.8	22.3	19.4	17.9
	Min	12.0	12.8	12.6	13.6	14.0	8.6	9.8	12.0	13.6	12.4	12.1	10.6	9.7
Relative Humidity	Max	88	91	97	96	96	81	93	97	98	98	94	98	-
	Min	17	27	54	51	23	34	50	64	73	30	42	52	-
Soil Temperature at 10 cm	06 UTC	16.4	16.8	16.4	17.0	17.2	14.4	14.0	15.6	16.8	17.4	16.2	14.1	13.2
	12 UTC	20.2	20.6	20.2	20.8	19.2	17.4	18.2	19.4	19.0	19.6	19.5	16.3	15.3
Sunshine Duration		7.5	5.4	5.7	5.7	8.0	7.6	7.6	5.2	3.9	3.9	6.0	4.1	4.4
Precipitation											0.8	0.8	97.3	32.3
Evaporation		3.3	1.7	3.1	2.0	5.4	4.9	3.0	2.3	1.9	5.1	32.7	22.8	28.9
Growing Degrees	5	14.8	13.9	12.8	13.3	11.3	8.8	10.2	11.8	12.6	12.6	122.1	100.4	88.1
	10	9.8	8.9	7.8	8.3	6.3	3.8	5.2	6.8	7.6	7.6	72.1	50.4	38.8

1st 10-day period (1-10/12/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.4	14.4	14.0
Precipitation - Reference Evapotranspiration	-16.6	82.9	18.3
Number of Rainy Days	1.0	7.0	3.6
Number of Dry Days	14.0	2.0	-

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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