



AGROMETEOROLOGICAL BULLETIN

November 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



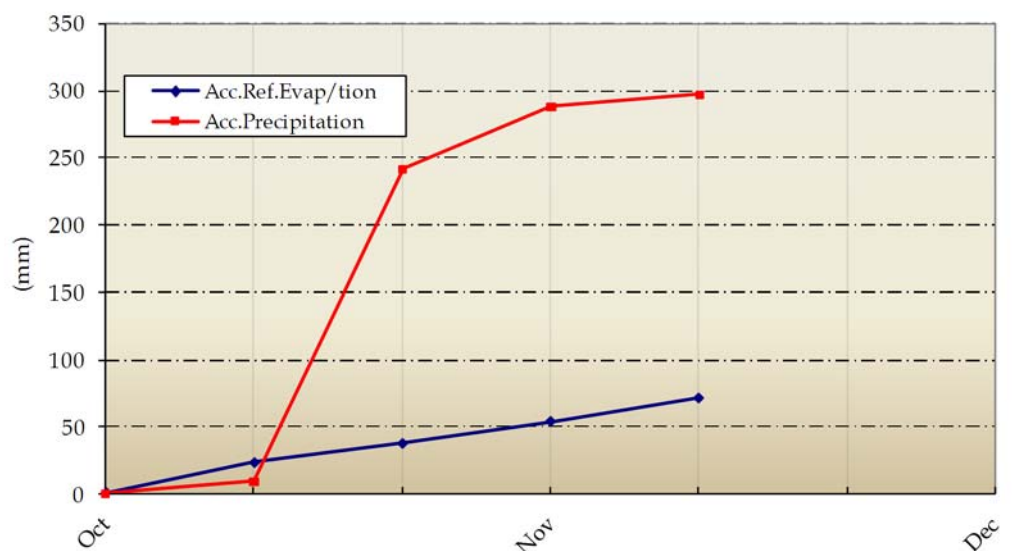
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www.hnms.gr
www.emy.gov.gr
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1st 10-day period (1-10/11/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.6	21.4	22.4	24.0	26.4	24.6	22.4	22.4	22.4	24.4	23.2	-	20.1
	Min	4.8	6.4	11.0	9.5	8.2	7.6	7.2	13.0	18.8	18.8	10.5	-	8.3
Relative Humidity	Max	97	95	89	95	97	97	97	91	82	82	92	-	-
	Min	48	48	56	52	35	45	65	73	65	63	55	-	-
Soil Temperature at 10 cm	06 UTC	12.4	12.8	14.6	15.0	14.4	14.2	14.2	15.6	17.2	18.2	14.9	-	13.0
	12 UTC	15.4	15.2	16.4	16.0	16.8	16.6	16.2	16.6	17.6	19.0	16.6	-	15.7
Sunshine Duration		9.0	8.5	4.0	8.1	8.2	8.1	7.6	1.6	0.0	3.8	5.9	-	5.5
Precipitation									5.5	4.0		9.5	-	44.3
Evaporation		0.9	2.8	1.3	1.0	2.8	1.0	1.3	2.8	1.0	3.4	18.3	-	20.9
Growing Degrees	5	8.2	8.9	11.7	11.8	12.3	11.1	9.8	12.7	15.6	16.6	118.7	-	92.0
	10	3.2	3.9	6.7	6.8	7.3	6.1	4.8	7.7	10.6	11.6	68.7	-	43.1

1st 10-day period (1-10/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.6	-	13.9
Precipitation - Reference Evapotranspiration	-8.1	-	30.4
Number of Rainy Days	2.0	-	3.0
Number of Dry Days	10.0	-	-

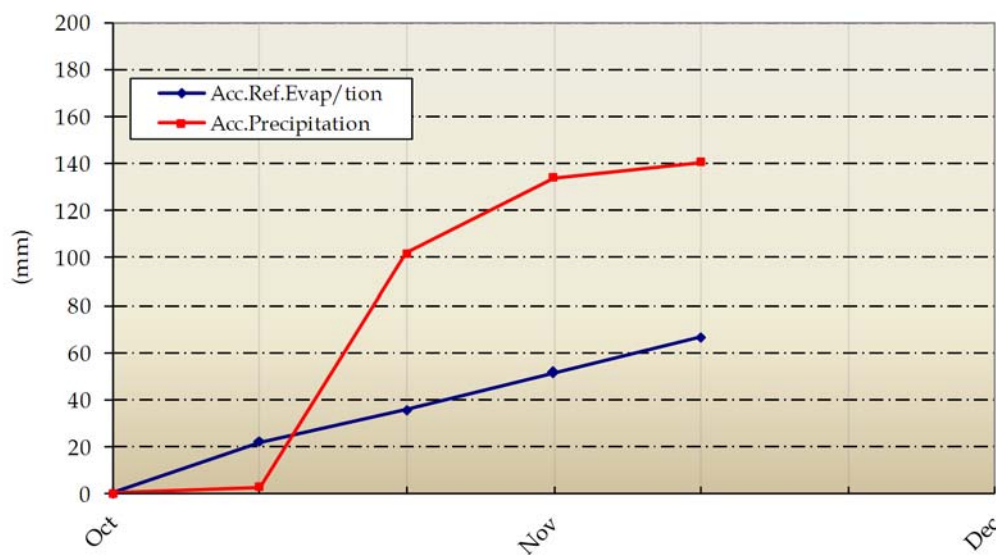
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.4	16.8	14.0	16.8	22.4	22.6	18.6	20.0	20.6	21.2	19.0	16.6	15.8
	Min	4.8	4.2	3.4	7.0	6.4	7.0	7.0	10.8	19.0	19.0	8.9	8.7	7.1
Relative Humidity	Max	94	97	100	94	94	94	98	97	81	81	93	94	-
	Min	55	58	91	70	48	48	79	69	71	67	66	60	-
Soil Temperature at 10 cm	06 UTC	9.6	11.0	10.0	11.0	11.2	11.6	11.6	12.6	15.0	15.6	11.9	12.4	11.0
	12 UTC	12.0	11.6	11.6	12.6	13.0	14.0	13.8	13.6	15.6	16.6	13.4	13.9	12.9
Sunshine Duration		9.0	8.8	8.0	7.7	8.5	8.6	8.1	1.4	4.1	7.8	7.2	5.1	4.1
Precipitation									0.8	5.8		6.6	43.4	19.0
Evaporation		0.7	3.2	0.2	1.6	1.3	0.8	0.6	1.7	4.7	2.9	17.7	11.8	25.4
Growing Degrees	5	6.1	5.5	3.7	6.9	9.4	9.8	7.8	10.4	14.8	15.1	89.5	77.6	64.9
	10	1.1	0.5	0.0	1.9	4.4	4.8	2.8	5.4	9.8	10.1	40.8	38.0	23.3

1st 10-day period (1-10/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.2	11.6	14.9
Precipitation - Reference Evapotranspiration	-8.6	31.8	4.1
Number of Rainy Days	2.0	4.0	1.9
Number of Dry Days	9.0	15.0	-

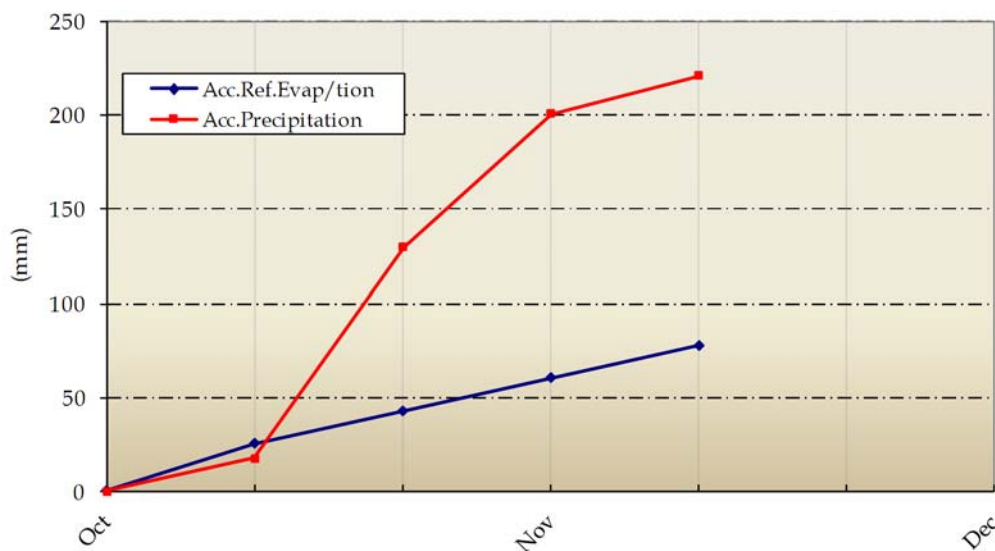
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.2	23.0	23.0	21.8	24.0	22.2	21.6	23.4	23.6	24.2	22.9	19.7	20.0
	Min	6.8	11.4	11.8	12.4	11.2	12.2	13.4	15.4	17.8	20.2	13.3	11.7	10.4
Relative Humidity	Max	94	93	95	95	95	96	98	92	84	86	93	93	-
	Min	48	47	52	61	41	73	67	45	64	66	56	60	-
Soil Temperature at 10 cm	06 UTC	13.4	14.6	15.4	15.4	15.2	15.6	16.4	17.2	17.8	18.6	16.0	14.9	14.3
	12 UTC	18.4	19.2	18.0	20.2	19.8	20.0	19.6	17.6	19.6	20.8	19.3	17.2	16.6
Sunshine Duration		8.7	8.2	4.6	7.6	7.8	7.8	5.9	1.0	3.9	3.5	5.9	4.4	6.0
Precipitation									19.9			19.9	98.3	45.1
Evaporation		2.0	3.0	1.4	1.9	1.7	0.4	1.7	0.9	1.8	1.2	16.0	17.0	25.9
Growing Degrees	5	9.5	12.2	12.4	12.1	12.6	12.2	12.5	14.4	15.7	17.2	130.8	107.4	101.6
	10	4.5	7.2	7.4	7.1	7.6	7.2	7.5	9.4	10.7	12.2	80.8	58.4	52.1

1st 10-day period (1-10/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.1	17.0	14.3
Precipitation - Reference Evapotranspiration	2.8	81.3	30.8
Number of Rainy Days	1.0	6.0	3.2
Number of Dry Days	10.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

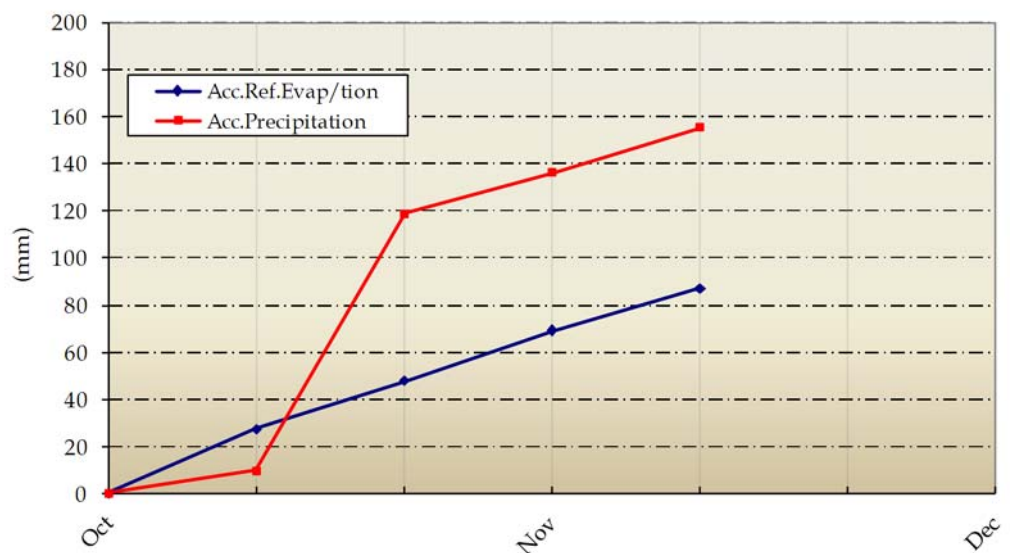


Kalamata

1st 10-day period (1-10/11/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.2	22.0	21.6	23.6	22.2	23.2	23.4	21.8	22.6	24.2	22.6	20.1	21.0
	Min	9.2	9.8	10.6	9.6	7.8	9.4	9.2	13.0	18.0	17.0	11.4	10.9	10.2
Relative Humidity	Max	95	95	95	97	98	97	95	95	88	92	95	94	-
	Min	60	53	62	53	63	58	56	74	69	60	61	61	-
Soil Temperature at 10 cm	06 UTC	16.4	17.0	16.8	16.6	16.6	16.4	16.4	17.0	18.0	18.6	17.0	15.8	15.1
	12 UTC	18.6	17.6	17.6	17.6	17.4	17.4	17.4	17.4	18.4	18.4	17.8	16.5	16.9
Sunshine Duration		9.0	9.0	3.1	8.8	8.6	8.7	8.6	1.0	3.2	7.0	6.7	4.6	5.6
Precipitation									0.1	19.0		19.1	87.9	35.3
Evaporation		2.3	2.3	1.5	1.7	1.6	2.1	5.4	3.4	2.2	4.2	26.7	25.1	30.4
Growing Degrees	5	10.2	10.9	11.1	11.6	10.0	11.3	11.3	12.4	15.3	15.6	119.7	105.0	105.8
	10	5.2	5.9	6.1	6.6	5.0	6.3	6.3	7.4	10.3	10.6	69.7	55.0	55.9

1st 10-day period (1-10/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.0	16.1	16.4
Precipitation - Reference Evapotranspiration	1.1	71.8	18.9
Number of Rainy Days	2.0	5.0	3.1
Number of Dry Days	10.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

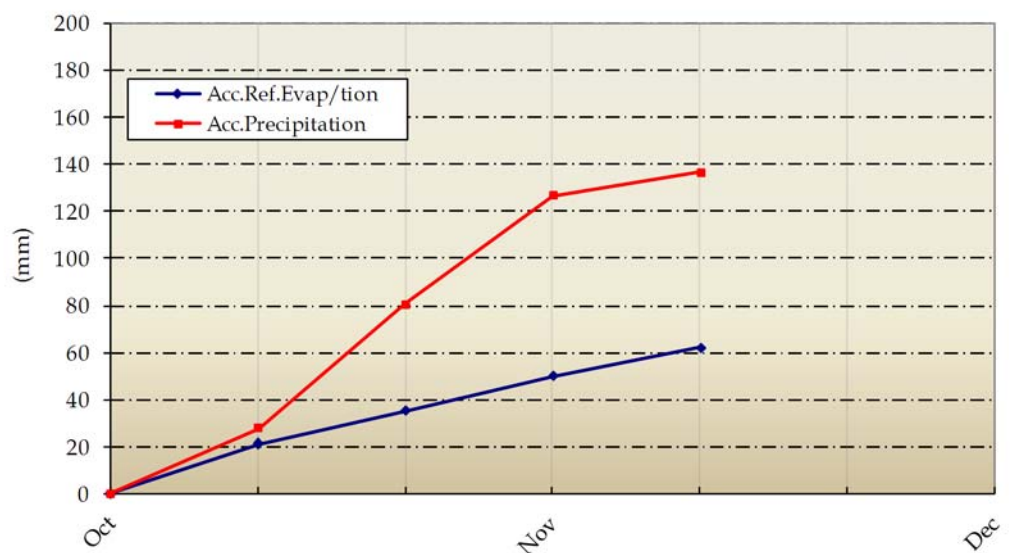


Larisa

1st 10-day period (1-10/11/2010)		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	16.6	18.0	21.6	22.6	23.0	22.2	17.4	18.0	25.2	20.1	17.6	17.2
	Min	2.0	5.0	9.0	6.6	6.4	6.2	5.8	9.4	12.2	15.2	7.8	9.0	6.7
Relative Humidity	Max	97	97	95	100	97	97	100	98	98	81	96	94	-
	Min	63	55	61	54	59	52	48	77	65	35	57	59	-
Soil Temperature at 10 cm	06 UTC	10.4	12.4	13.2	13.0	13.2	12.8	13.0	13.8	14.8	14.6	13.1	13.6	12.3
	12 UTC	11.6	19.4	14.2	14.4	14.8	14.6	14.6	15.0	15.2	16.0	15.0	14.7	13.2
Sunshine Duration		7.0	3.8	3.1	8.1	7.0	7.2	7.4	1.5	0.6	6.2	5.2	5.2	4.1
Precipitation									6.1	3.6		9.7	33.0	20.6
Evaporation		2.2	0.2	1.0	2.8	1.2	2.8	1.0	0.2	0.2	3.6	15.2	16.9	17.6
Growing Degrees	5	4.2	5.8	8.5	9.1	9.5	9.6	9.0	8.4	10.1	15.2	89.4	82.6	69.6
	10	0.0	0.8	3.5	4.1	4.5	4.6	4.0	3.4	5.1	10.2	40.2	36.0	25.7

1st 10-day period (1-10/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.0	12.5	11.7
Precipitation - Reference Evapotranspiration	-2.3	20.5	8.9
Number of Rainy Days	2.0	6.0	2.7
Number of Dry Days	10.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

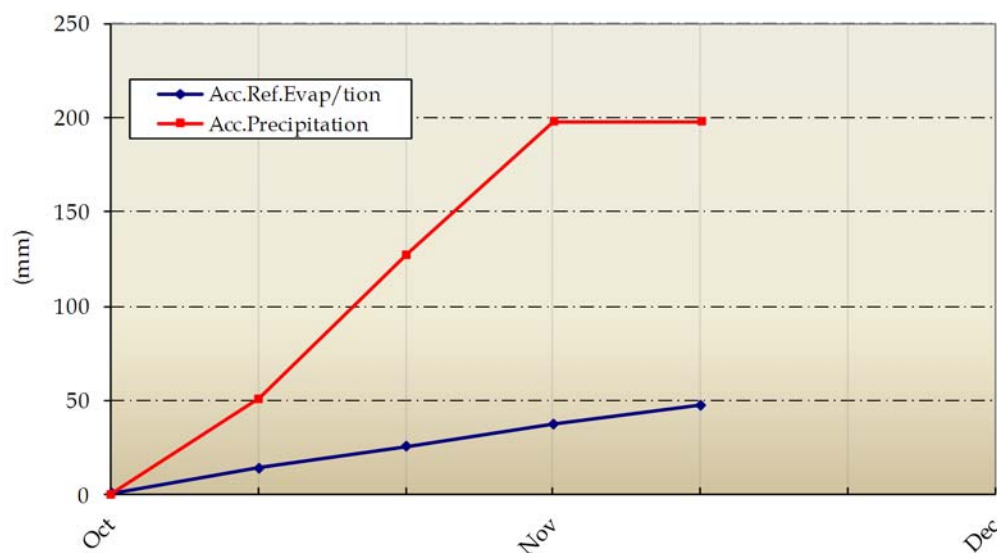


Series

1st 10-day period (1-10/11/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.0	18.4	20.0	21.4	24.0	24.0	20.8	19.8	19.8	25.6	21.2	17.4	16.1
	Min	0.8	2.6	3.0	7.4	6.0	6.0	5.5	10.7	17.2	18.2	7.7	8.0	5.9
Relative Humidity	Max	96	97	97	95	97	96	96	90	75	92	93	89	-
	Min	49	49	47	49	43	40	47	65	58	34	48	59	-
Soil Temperature at 10 cm	06 UTC	8.6	8.8	9.2	10.2	10.2	10.4	-	-	13.6	14.4	10.7	12.9	10.3
	12 UTC	10.2	10.4	11.0	11.8	12.2	11.8	-	-	14.2	15.4	12.1	13.4	12.2
Sunshine Duration		7.1	6.0	5.6	5.8	6.0	-	-	1.3	0.0	4.7	4.6	3.2	4.1
Precipitation										0.0		0.0	18.7	15.2
Evaporation		0.8	0.6	0.9	0.7	0.8	-	-	0.4	0.8	0.9	-	22.2	12.8
Growing Degrees	5	4.4	5.5	6.5	9.4	10.0	10.0	8.2	10.3	13.5	16.9	94.6	77.0	60.7
	10	0.0	0.5	1.5	4.4	5.0	5.0	3.2	5.3	8.5	11.9	45.2	36.5	20.7

1st 10-day period (1-10/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.1	11.0	8.3
Precipitation - Reference Evapotranspiration	-10.1	7.7	6.9
Number of Rainy Days	0.0	5.0	2.2
Number of Dry Days	13.0	2.0	-

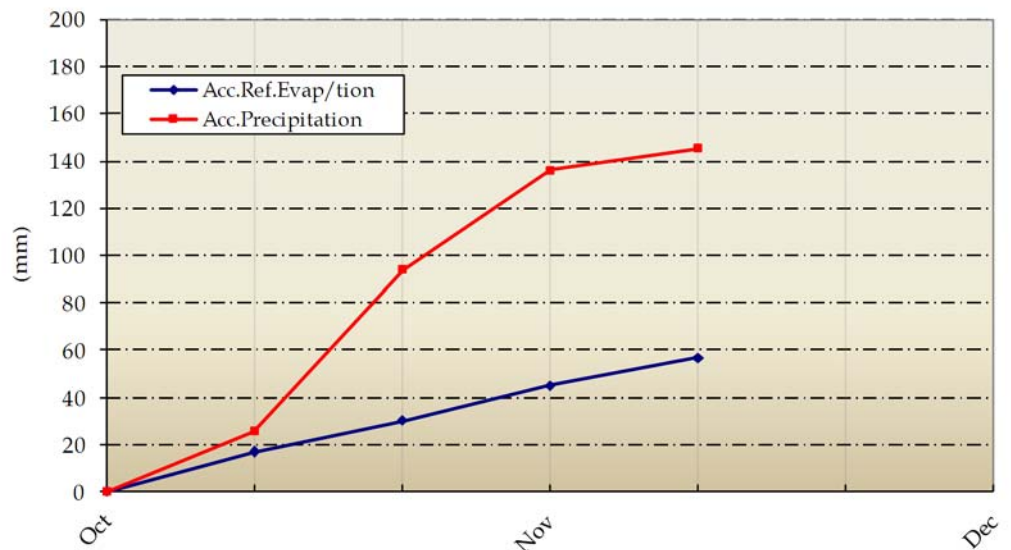
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.2	19.6	20.0	23.0	25.0	27.2	-	17.6	19.6	24.6	21.9	17.1	16.8
	Min	3.2	4.0	6.4	9.0	7.4	9.2	-	13.0	10.4	11.0	8.2	9.4	6.7
Relative Humidity	Max	94	95	95	95	95	-	95	95	95	95	95	97	-
	Min	28	35	36	33	25	-	33	75	56	35	40	65	-
Soil Temperature at 10 cm	06 UTC	11.0	11.8	12.0	12.8	12.8	13.2	-	14.4	14.0	14.0	12.9	13.2	12.2
	12 UTC	12.4	12.8	12.8	14.0	14.0	14.2	-	14.8	14.0	15.2	13.8	14.4	12.7
Sunshine Duration		8.8	8.5	5.7	7.6	8.3	-	7.6	1.7	0.6	6.4	6.1	3.4	4.3
Precipitation									8.6	0.6	0.1	9.3	48.7	20.3
Evaporation		2.1	1.0	0.8	0.8	1.0	-	1.0	0.6	0.3	1.2	-	14.5	13.4
Growing Degrees	5	6.7	6.8	8.2	11.0	11.2	13.2	-	10.3	10.0	12.8	-	82.8	68.4
	10	1.7	1.8	3.2	6.0	6.2	8.2	-	5.3	5.0	7.8	-	39.5	26.6

1st 10-day period (1-10/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.9	9.6	10.5
Precipitation - Reference Evapotranspiration	-2.6	39.1	9.8
Number of Rainy Days	3.0	6.0	2.8
Number of Dry Days	9.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

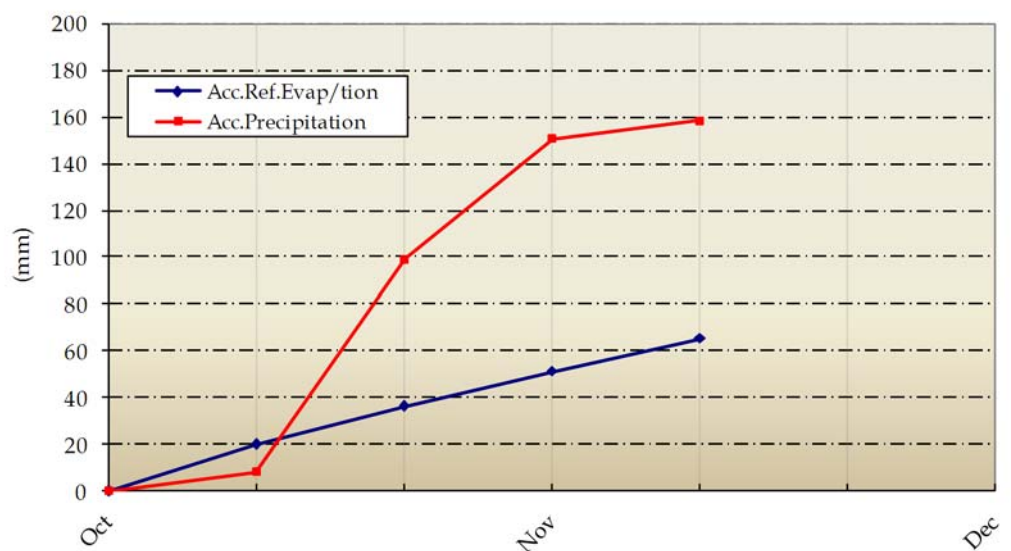


Tripoli

1st 10-day period (1-10/11/2010)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.6	18.0	17.0	21.0	24.6	25.0	25.4	19.0	20.0	21.2	20.9	-	16.5
	Min	1.4	3.2	10.0	7.4	3.0	4.0	4.0	6.2	13.8	14.4	6.7	-	5.2
Relative Humidity	Max	100	100	93	100	97	93	93	92	84	79	93	-	-
	Min	45	62	68	47	27	29	27	60	49	54	47	-	-
Soil Temperature at 10 cm	06 UTC	8.8	9.4	12.0	10.8	9.8	10.2	10.2	11.2	13.0	13.2	10.9	-	11.0
	12 UTC	13.2	13.0	14.6	15.4	15.2	15.4	14.8	14.6	16.0	16.0	14.8	-	12.3
Sunshine Duration		7.1	5.8	2.4	5.9	7.0	8.5	9.0	2.7	7.9	7.0	6.3	-	5.1
Precipitation									0.0	7.9		7.9	-	28.3
Evaporation		1.0	1.0	1.0	1.0	1.0	1.0	3.0	3.1	1.0	2.0	15.1	-	18.0
Growing Degrees	5	4.5	5.6	8.5	9.2	8.8	9.5	9.7	7.6	11.9	12.8	88.1	-	58.6
	10	0.0	0.6	3.5	4.2	3.8	4.5	4.7	2.6	6.9	7.8	38.6	-	17.0

1st 10-day period (1-10/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.2	-	13.6
Precipitation - Reference Evapotranspiration	-6.3	-	14.7
Number of Rainy Days	1.0	-	2.6
Number of Dry Days	10.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

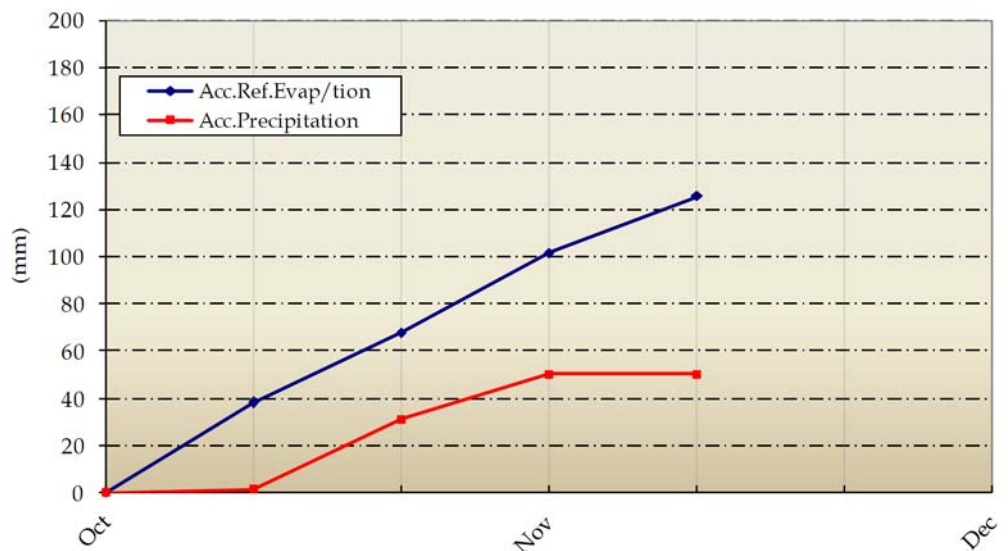


Tympaki

1st 10-day period (1-10/11/2010)		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	21.8	23.8	23.0	24.6	23.0	23.4	24.8	26.0	27.0	24.0	21.4	21.8
	Min	9.6	10.2	11.0	11.8	12.4	10.6	12.0	13.6	14.6	15.8	12.2	13.4	12.3
Relative Humidity	Max	90	100	95	99	98	97	100	100	96	97	97	93	-
	Min	25	46	37	42	30	54	68	59	36	34	43	51	-
Soil Temperature at 10 cm	06 UTC	15.4	15.6	16.4	17.0	17.0	16.8	17.6	18.4	19.0	19.4	17.3	16.7	17.8
	12 UTC	21.0	21.4	22.0	22.0	22.4	22.0	22.0	22.6	23.6	24.2	22.3	19.8	20.8
Sunshine Duration		9.5	9.8	9.4	9.7	9.2	8.7	8.0	7.1	7.2	8.9	8.8	5.6	6.1
Precipitation													43.0	25.0
Evaporation		3.2	2.8	3.4	3.5	3.1	2.3	3.7	1.7	4.6	5.2	33.5	46.4	39.7
Growing Degrees	5	11.2	11.0	12.4	12.4	13.5	11.8	12.7	14.2	15.3	16.4	130.9	123.9	120.3
	10	6.2	6.0	7.4	7.4	8.5	6.8	7.7	9.2	10.3	11.4	80.9	73.9	70.3

1st 10-day period (1-10/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	23.8	25.4	20.6
Precipitation - Reference Evapotranspiration	-23.8	17.6	4.4
Number of Rainy Days	0.0	3.0	2.1
Number of Dry Days	12.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





◆ List of Symbols and Abbreviations

Reference Evapotranspiration ET_0 (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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