

AGROMETEOROLOGICAL BULLETIN

*November 2011
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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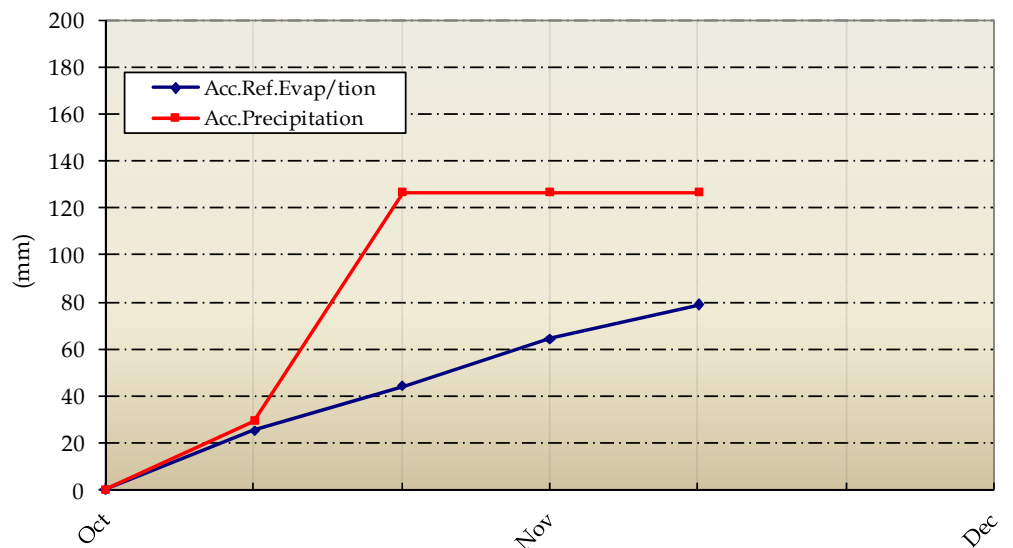
*Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr*

Agrinio

1st 10-day period (1-10/11/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.4	20.4	20.4	20.6	20.5	21.5	21.6	21.4	20.8	23.4	21.1	23.2	20.1
	Min	3.4	3.6	6.4	4.0	3.0	3.8	8.0	10.4	10.2	7.2	6.0	10.5	8.3
Relative Humidity	Max	93	87	78	93	97	93	69	85	95	97	89	92	-
	Min	44	34	40	35	51	43	43	49	57	50	45	55	-
Soil Temperature at 10 cm	06 UTC	12.8	12.6	13.2	12.6	12.4	12.6	14.0	14.8	15.4	14.8	13.5	14.9	13.0
	12 UTC	14.8	14.8	15.2	14.6	14.4	15.0	15.6	16.4	16.6	16.6	15.4	16.6	15.7
Sunshine Duration		9.2	8.9	9.2	8.9	8.2	8.7	3.0	4.4	2.7	8.5	7.2	5.9	5.5
Precipitation													9.5	44.3
Evaporation		3.4	3.2	3.4	1.9	2.3	2.0	3.3	3.6	1.7	2.5	27.3	18.3	20.9
Growing Degrees	5	6.9	7.0	8.4	7.3	6.8	7.7	9.8	10.9	10.5	10.3	85.5	118.7	92.0
	10	1.9	2.0	3.4	2.3	1.8	2.7	4.8	5.9	5.5	5.3	35.5	68.7	43.1

1st 10-day period (1-10/11/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.2	17.6	13.9
Precipitation - Reference Evapotranspiration	-14.2	-8.1	30.4
Number of Rainy Days	0.0	2.0	3.0
Number of Dry Days	25.0	10.0	-

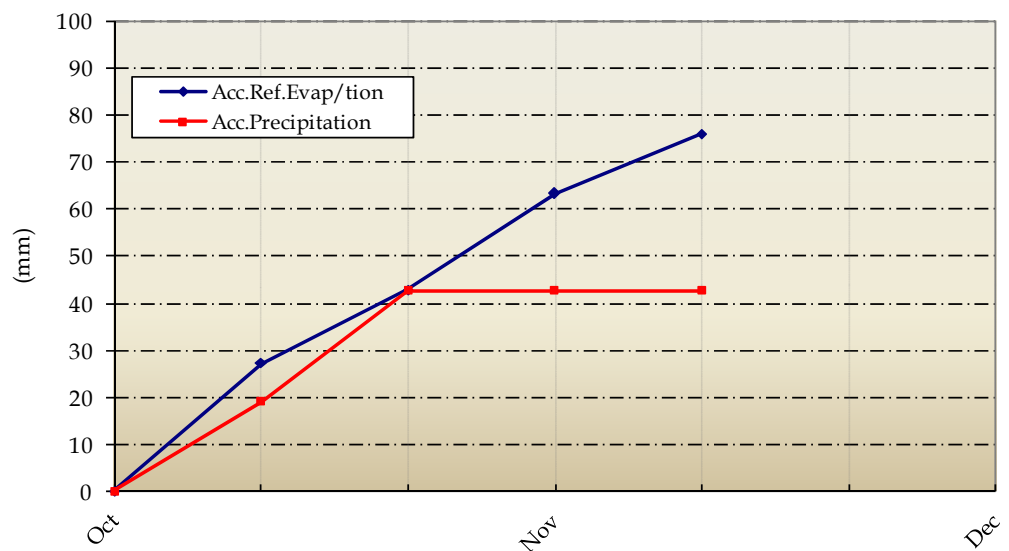
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.8	16.8	16.8	17.0	17.6	16.0	13.8	15.4	15.6	13.8	15.9	19.0	15.8
	Min	1.2	1.8	6.0	2.8	2.6	8.0	9.6	7.0	2.8	6.0	4.8	8.9	7.1
Relative Humidity	Max	87	89	91	84	93	78	72	85	94	95	87	93	-
	Min	49	46	36	40	42	60	54	46	65	67	50	66	-
Soil Temperature at 10 cm	06 UTC	11.2	11.0	11.8	11.0	10.8	11.8	12.4	11.4	10.6	11.2	11.3	11.9	11.0
	12 UTC	14.8	13.2	13.6	13.2	13.2	13.4	13.6	13.0	12.0	12.4	13.2	13.4	12.9
Sunshine Duration		6.9	7.6	7.8	8.8	8.9	6.0	2.1	8.7	5.4	0.0	6.2	7.2	4.1
Precipitation													6.6	19.0
Evaporation		2.7	1.8	1.2	0.8	9.2	0.1	2.9	2.5	1.0	0.1	22.3	17.7	25.4
Growing Degrees	5	3.5	4.3	6.4	4.9	5.1	7.0	6.7	6.2	4.2	4.9	53.2	89.5	64.9
	10	0.0	0.0	1.4	0.0	0.1	2.0	1.7	1.2	0.0	0.0	6.4	40.8	23.3

1st 10-day period (1-10/11/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.8	15.2	14.9
Precipitation - Reference Evapotranspiration	-12.8	-8.6	4.1
Number of Rainy Days	0.0	2.0	1.9
Number of Dry Days	24.0	9.0	-

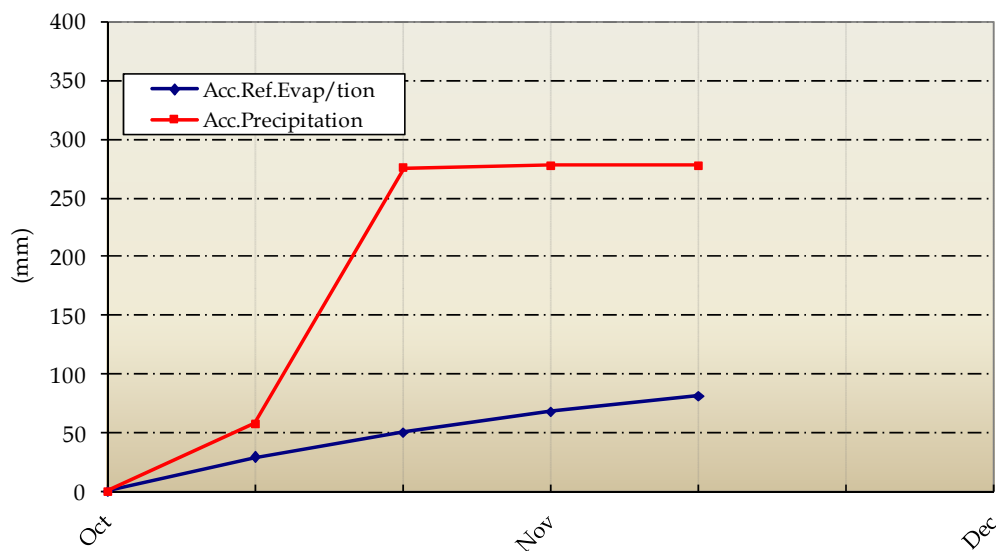
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	21.8	20.6	20.0	19.8	20.8	22.0	20.4	21.2	21.0	20.8	22.9	20.0
	Min	5.4	5.0	5.2	5.0	4.6	8.6	9.8	9.0	12.2	9.6	7.4	13.3	10.4
Relative Humidity	Max	94	100	91	94	94	92	92	95	95	95	94	93	-
	Min	40	25	37	41	48	45	41	56	56	57	45	56	-
Soil Temperature at 10 cm	06 UTC	11.6	11.2	11.2	11.2	11.0	12.2	13.4	13.6	14.6	14.2	12.4	16.0	14.3
	12 UTC	16.6	16.8	16.8	17.0	16.6	17.0	17.0	17.2	17.8	18.6	17.1	19.3	16.6
Sunshine Duration		8.2	8.5	8.5	8.2	7.8	8.6	4.2	1.7	2.6	8.2	6.6	5.9	6.0
Precipitation													19.9	45.1
Evaporation		2.0	2.5	2.5	1.0	1.0	1.8	0.2	2.0	1.5	2.4	16.9	16.0	25.9
Growing Degrees	5	7.7	8.4	7.9	7.5	7.2	9.7	10.9	9.7	11.7	10.3	91.0	130.8	101.6
	10	2.7	3.4	2.9	2.5	2.2	4.7	5.9	4.7	6.7	5.3	41.0	80.8	52.1

1st 10-day period (1-10/11/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.2	17.1	14.3
Precipitation - Reference Evapotranspiration	-13.2	2.8	30.8
Number of Rainy Days	0.0	1.0	3.2
Number of Dry Days	18.0	10.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

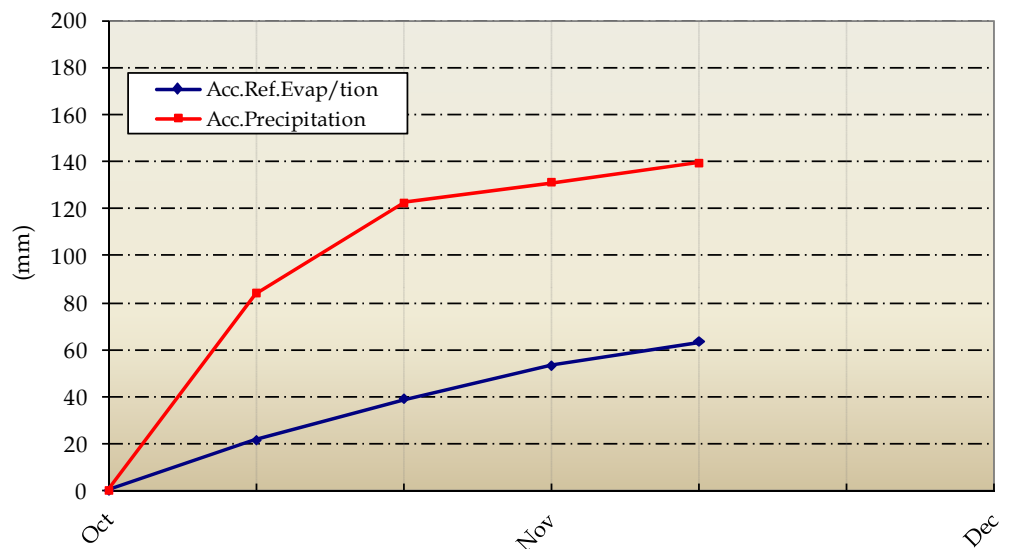


Ioannina

1st 10-day period (1-10/11/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.0	17.8	17.2	17.0	16.4	19.4	11.6	14.8	16.2	18.0	16.5	-	16.0
	Min	-1.8	-0.4	0.4	-0.4	0.0	-0.4	5.8	9.0	8.8	10.0	3.1	-	5.4
Relative Humidity	Max	100	97	86	100	100	93	95	97	100	100	97	-	-
	Min	33	26	33	38	50	22	82	82	68	59	49	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.8
Sunshine Duration		5.8	5.1	6.9	5.7	4.1	5.0	0.0	1.0	2.7	4.0	4.0	-	4.1
Precipitation								6.7	1.6		0.3	8.6	-	40.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	16.8
Growing Degrees	5	2.6	3.7	3.8	3.3	3.2	4.5	3.7	6.9	7.5	9.0	48.2	-	57.3
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	2.5	4.0	8.4	-	16.4

1st 10-day period (1-10/11/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.0	-	10.7
Precipitation - Reference Evapotranspiration	-1.4	-	29.4
Number of Rainy Days	3.0	-	3.4
Number of Dry Days	13.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

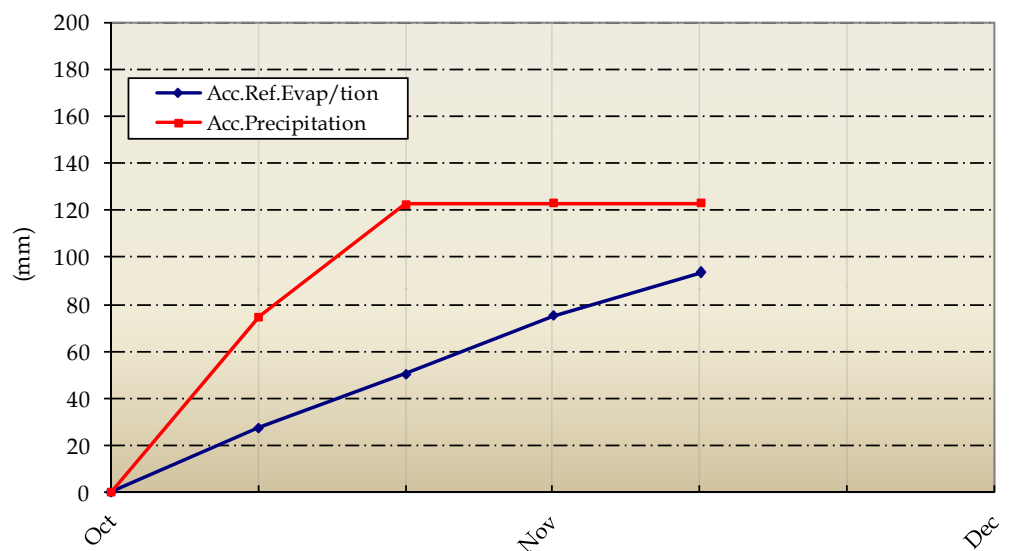


Kalamata

1st 10-day period (1-10/11/2011)		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	21.2	21.4	21.4	20.6	22.0	21.4	21.6	21.8	21.3	22.6	21.0
	Min	11.0	10.6	9.0	7.6	7.4	7.4	8.4	11.0	10.8	10.6	9.4	11.4	10.2
Relative Humidity	Max	95	90	83	97	93	97	94	93	93	98	93	95	-
	Min	57	42	37	36	46	45	40	53	54	58	47	61	-
Soil Temperature at 10 cm	06 UTC	15.6	15.6	15.0	14.8	14.4	15.0	15.0	15.0	15.6	15.6	15.2	17.0	15.1
	12 UTC	16.6	17.0	16.2	16.0	16.0	16.0	16.0	16.2	16.8	16.8	16.4	17.8	16.9
Sunshine Duration		3.9	5.9	9.2	8.3	8.3	8.4	6.0	9.1	5.4	7.4	7.2	6.7	5.6
Precipitation													19.1	35.3
Evaporation		0.2	3.8	4.4	1.6	0.8	3.4	0.6	1.0	2.0	2.0	19.8	26.7	30.4
Growing Degrees	5	10.4	11.1	10.1	9.5	9.4	9.0	10.2	11.2	11.2	11.2	103.3	119.7	105.8
	10	5.4	6.1	5.1	4.5	4.4	4.0	5.2	6.2	6.2	6.2	53.3	69.7	55.9

1st 10-day period (1-10/11/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.2	18.0	16.4
Precipitation - Reference Evapotranspiration	-18.2	1.1	18.9
Number of Rainy Days	0.0	2.0	3.1
Number of Dry Days	18.0	10.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

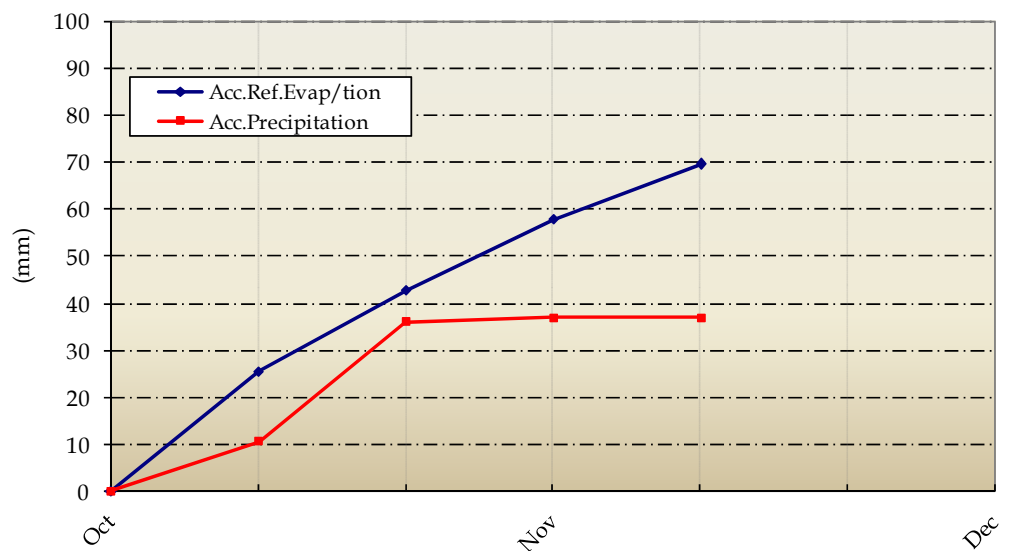


Larisa

1st 10-day period (1-10/11/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.2	17.6	17.4	17.4	15.8	16.6	16.4	15.2	16.0	20.2	17.0	20.1	17.2
	Min	0.0	1.8	1.4	2.2	2.2	2.2	9.2	11.8	11.8	8.6	5.1	7.8	6.7
Relative Humidity	Max	93	93	96	96	97	93	86	95	93	95	94	96	-
	Min	40	40	50	47	47	50	66	75	63	52	53	57	-
Soil Temperature at 10 cm	06 UTC	8.4	11.0	11.2	11.0	11.2	11.0	12.6	13.6	14.0	13.4	11.7	13.1	12.3
	12 UTC	13.2	12.2	12.6	12.2	12.2	12.2	13.4	14.2	14.8	14.6	13.2	15.0	13.2
Sunshine Duration		7.1	7.0	6.5	8.4	3.7	5.1	1.3	0.0	3.9	5.2	4.8	5.2	4.1
Precipitation											0.0	0.0	9.7	20.6
Evaporation		2.0	1.0	3.0	0.6	0.4	6.5	2.2	1.0	0.8	1.2	18.7	15.2	17.6
Growing Degrees	5	3.6	4.7	4.4	4.8	4.0	4.4	7.8	8.5	8.9	9.4	60.5	89.4	69.6
	10	0.0	0.0	0.0	0.0	0.0	0.0	2.8	3.5	3.9	4.4	14.6	40.2	25.7

1st 10-day period (1-10/11/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.8	12.0	11.7
Precipitation - Reference Evapotranspiration	-11.8	-2.3	8.9
Number of Rainy Days	0.0	2.0	2.7
Number of Dry Days	18.0	10.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

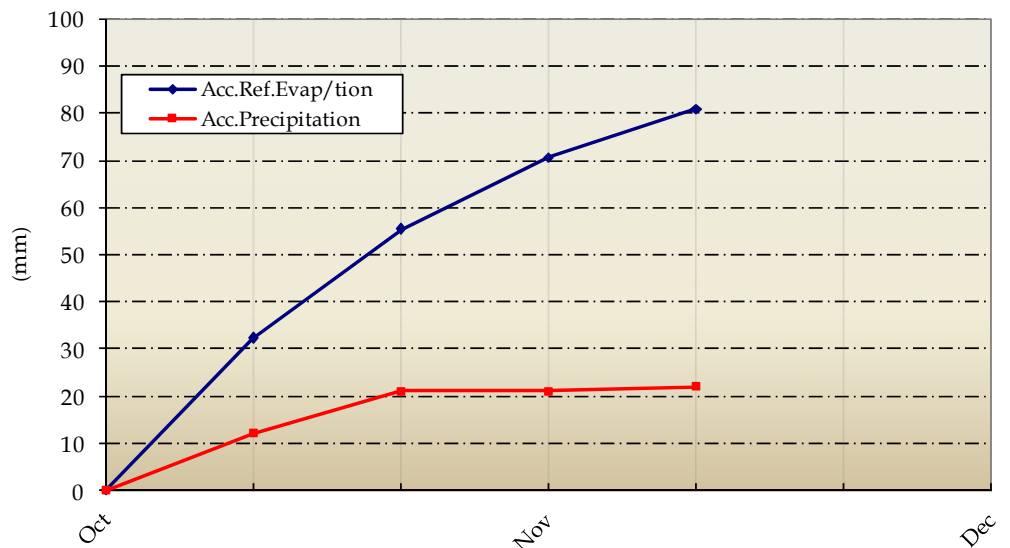


Mikra

1st 10-day period (1-10/11/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.0	16.0	15.4	15.8	15.2	15.6	13.6	13.8	15.8	16.6	15.3	-	16.5
	Min	4.0	5.0	5.0	7.6	7.0	4.8	7.6	11.2	11.4	8.4	7.2	-	7.9
Relative Humidity	Max	88	94	94	88	85	91	93	93	90	95	91	-	-
	Min	55	44	55	58	57	58	73	80	63	64	61	-	-
Soil Temperature at 10 cm	06 UTC	11.8	11.4	11.6	12.6	13.2	13.0	12.6	13.0	14.2	13.8	12.7	-	11.5
	12 UTC	14.8	13.8	13.6	14.2	14.2	13.8	13.8	14.6	15.7	15.2	14.4	-	13.8
Sunshine Duration		8.1	8.2	8.0	3.3	3.7	6.3	0.0	0.0	5.9	0.0	4.4	-	4.0
Precipitation											0.9	0.9	-	18.1
Evaporation		1.6	2.0	2.0	1.5	0.6	0.3	2.5	0.3	3.0	0.8	14.6	-	22.5
Growing Degrees	5	4.5	5.5	5.2	6.7	6.1	5.2	5.6	7.5	8.6	7.5	62.4	-	72.4
	10	0.0	0.5	0.2	1.7	1.1	0.2	0.6	2.5	3.6	2.5	12.9	-	27.9

1st 10-day period (1-10/11/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.3	-	13.6
Precipitation - Reference Evapotranspiration	-9.4	-	4.5
Number of Rainy Days	1.0	-	2.5
Number of Dry Days	25.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

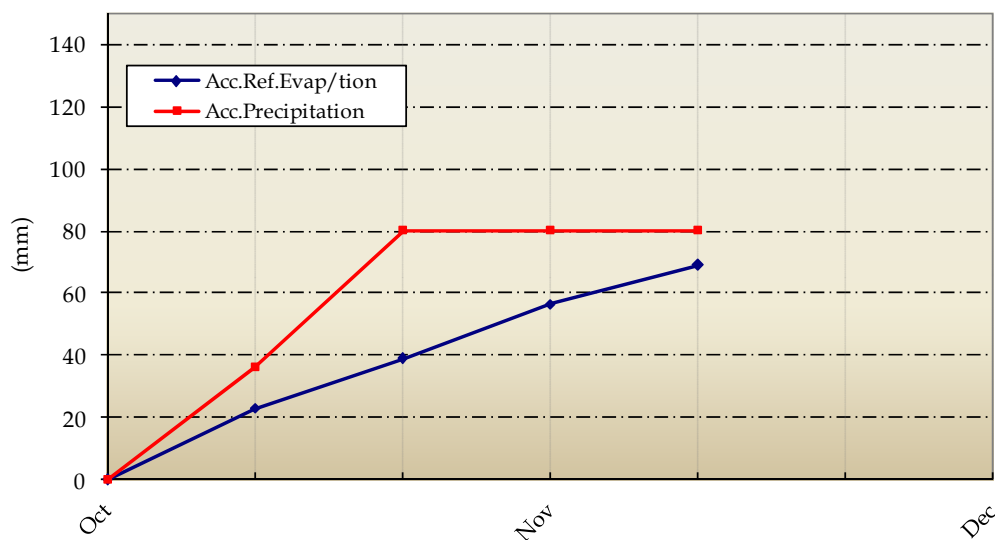


Tripoli

1st 10-day period (1-10/11/2011)		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	15.4	14.0	15.8	16.4	17.4	18.4	18.0	18.8	21.6	17.0	20.9	16.5
	Min	3.4	0.8	4.6	1.4	-0.4	-1.4	1.8	3.8	5.6	6.8	2.6	6.7	5.2
Relative Humidity	Max	97	100	87	96	100	100	96	93	100	88	96	93	-
	Min	59	41	47	44	45	37	35	55	56	26	44	47	-
Soil Temperature at 10 cm	06 UTC	9.2	8.8	8.8	7.8	7.6	7.4	8.2	9.4	10.2	10.4	8.8	10.9	11.0
	12 UTC	12.4	13.2	12.4	12.2	12.0	12.0	12.4	13.0	13.2	14.4	12.7	14.8	12.3
Sunshine Duration		3.0	7.5	8.7	8.9	8.4	7.5	7.4	4.5	3.5	8.0	6.7	6.3	5.1
Precipitation													7.9	28.3
Evaporation		2.6	0.5	0.6	3.6	0.8	1.5	0.0	1.7	3.3	1.2	15.8	15.1	18.0
Growing Degrees	5	3.9	3.1	4.3	3.6	3.0	3.0	5.1	5.9	7.2	9.2	48.3	88.1	58.6
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	2.2	4.2	7.4	38.6	17.0

1st 10-day period (1-10/11/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.6	14.2	13.6
Precipitation - Reference Evapotranspiration	-12.6	-6.3	14.7
Number of Rainy Days	0.0	1.0	2.6
Number of Dry Days	24.0	10.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

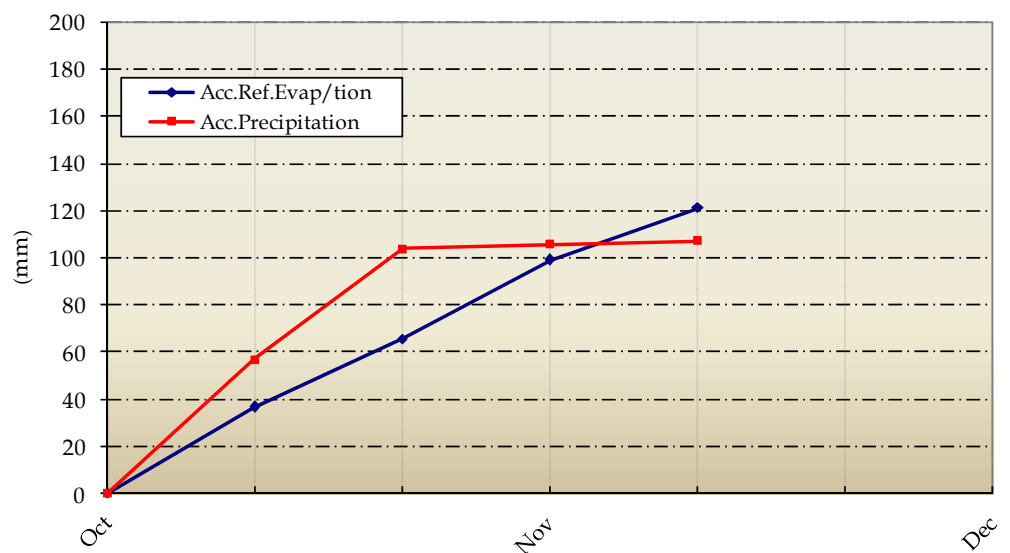


Tympaki

1st 10-day period (1-10/11/2011)		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	17.4	19.2	19.4	21.2	20.8	21.2	24.4	22.2	21.6	20.9	24.0	21.8
	Min	10.8	13.6	10.6	7.6	7.4	7.6	8.4	9.6	12.8	13.0	10.1	12.2	12.3
Relative Humidity	Max	100	100	93	99	100	100	99	100	100	100	99	97	-
	Min	48	60	37	35	36	46	45	45	43	41	44	43	-
Soil Temperature at 10 cm	06 UTC	16.2	17.8	15.2	14.6	14.0	14.2	14.6	15.4	17.0	17.6	15.7	17.3	17.8
	12 UTC	20.8	18.6	18.6	18.4	19.0	19.4	19.4	20.4	20.4	21.4	19.6	22.3	20.8
Sunshine Duration		7.4	0.6	9.6	9.1	9.0	9.0	9.3	7.1	5.3	7.6	7.4	8.8	6.1
Precipitation			1.4									1.4		25.0
Evaporation		2.7	2.9	5.9	4.5	3.8	2.1	3.8	3.0	3.1	3.5	35.3	33.5	39.7
Growing Degrees	5	11.0	10.5	9.9	8.5	9.3	9.2	9.8	12.0	12.5	12.3	105.0	130.9	120.3
	10	6.0	5.5	4.9	3.5	4.3	4.2	4.8	7.0	7.5	7.3	55.0	80.9	70.3

1st 10-day period (1-10/11/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.2	23.8	20.6
Precipitation - Reference Evapotranspiration	-20.8	-23.8	4.4
Number of Rainy Days	1.0	0.0	2.1
Number of Dry Days	7.0	12.0	-

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_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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