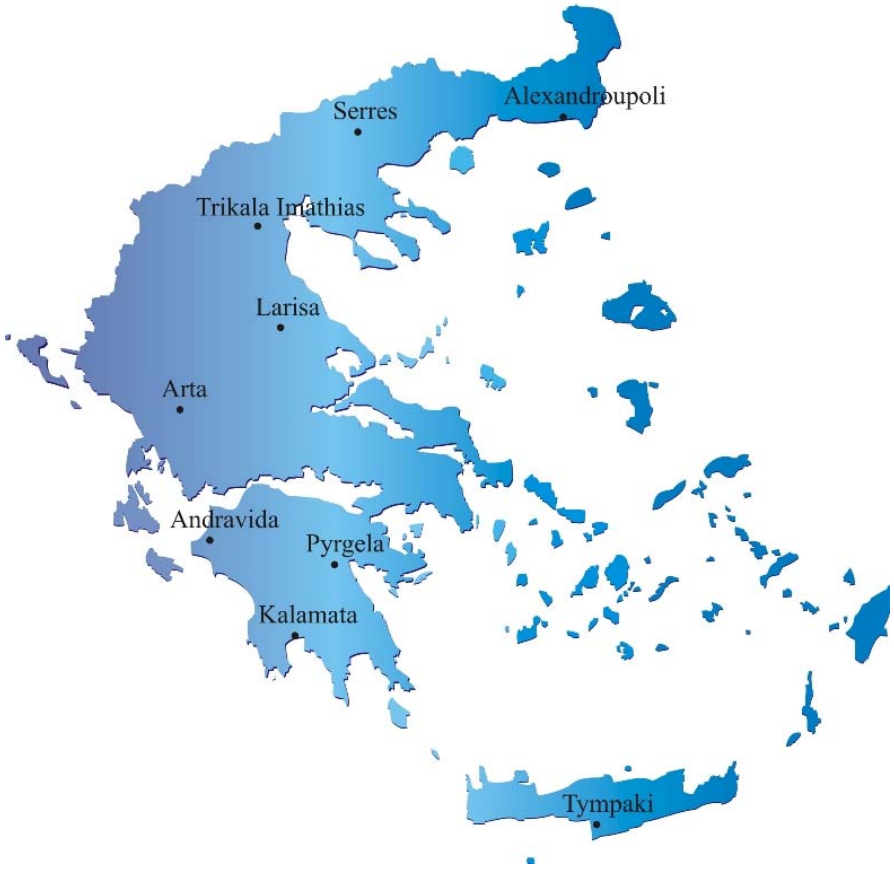
AGROMETEOROLOGICAL BULLETIN

November 2009
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
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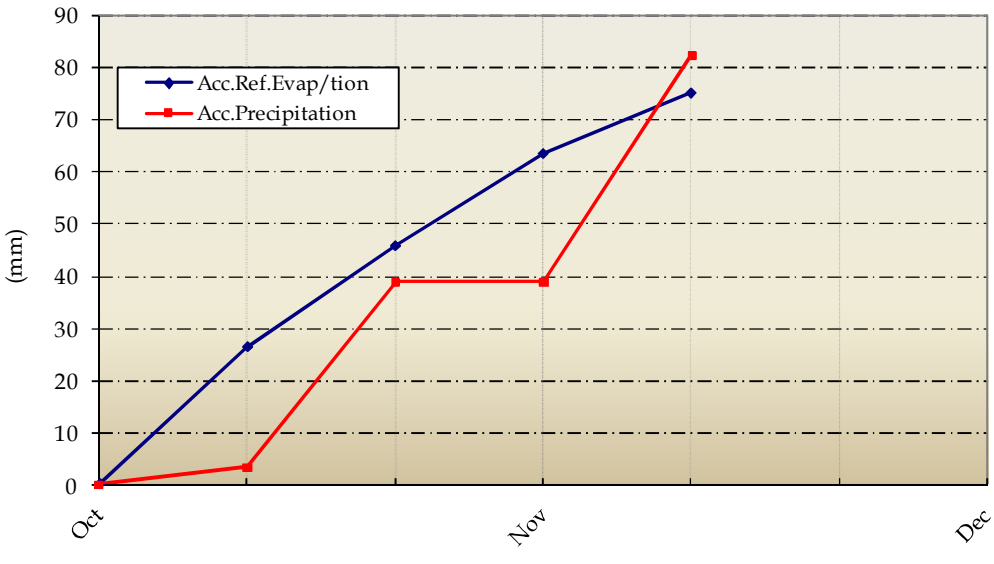
www.meteohellas.gr

Alexandroupoli

1st 10-day period (1-10/11/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.0	10.0	9.4	11.2	19.0	19.8	22.0	22.4	20.4	20.0	16.6	-	15.8
	Min	6.2	3.0	-1.8	6.8	5.0	13.8	14.0	12.0	14.0	13.6	8.7	-	7.1
Relative Humidity	Max	77	92	94	100	100	98	98	93	91	98	94	-	-
	Min	31	35	59	82	68	79	57	51	74	60	60	-	-
Soil Temperature at 10 cm	06 UTC	12.0	10.0	9.2	10.4	9.4	13.0	14.6	14.2	15.2	16.2	12.4	-	11.0
	12 UTC	13.0	12.0	10.0	11.0	12.2	15.8	16.2	16.0	16.8	15.8	13.9	-	12.9
Sunshine Duration		7.5	8.7	0.1	0.2	8.4	4.0	8.8	4.2	7.2	1.9	5.1	-	4.1
Precipitation				4.1	6.2		2.5		0.0		30.6	43.4	-	19.0
Evaporation		2.4	0.5	0.0	0.1	0.5	2.6	0.2	1.0	3.9	0.6	11.8	-	25.4
Growing Degrees	5	4.1	1.5	0.0	4.0	7.0	11.8	13.0	12.2	12.2	11.8	77.6	-	64.9
	10	0.0	0.0	0.0	0.0	2.0	6.8	8.0	7.2	7.2	6.8	38.0	-	23.3

1st 10-day period (1-10/11/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.6	-	14.9
Precipitation - Reference Evapotranspiration	31.8	-	4.1
Number of Rainy Days	4.0	-	1.9
Number of Dry Days	15.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



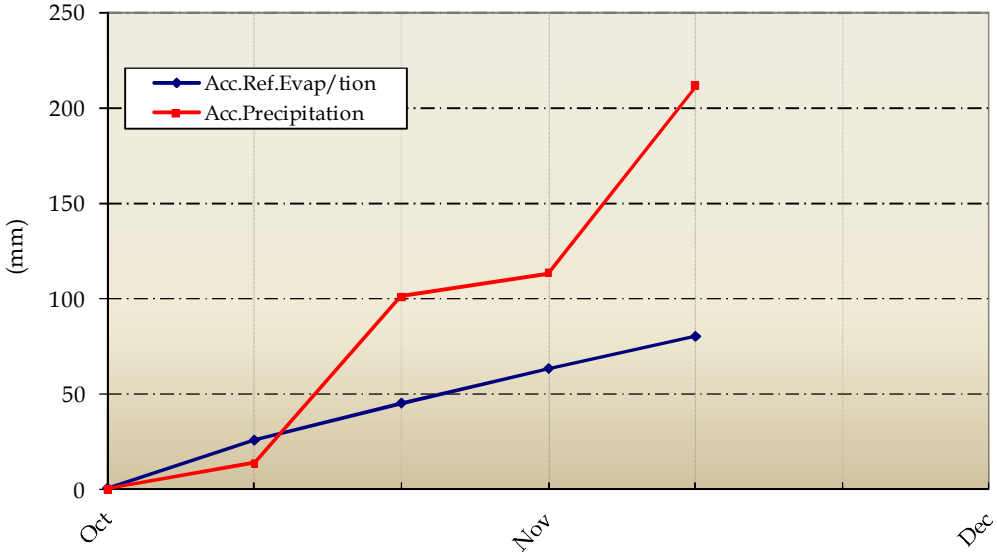
Agrometeorological Data — November 2009

Andravida

1st 10-day period (1-10/11/2009)		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	14.8	18.0	17.6	20.8	24.4	23.8	20.6	21.0	19.4	19.7	-	20.0
	Min	8.4	3.2	9.6	12.0	10.2	14.4	18.2	14.0	14.6	12.8	11.7	-	10.4
Relative Humidity	Max	82	93	98	93	90	87	98	98	93	98	93	-	-
	Min	42	49	70	58	70	54	54	68	67	63	60	-	-
Soil Temperature at 10 cm	06 UTC	14.0	12.4	13.8	14.4	13.4	15.4	17.0	16.6	15.6	16.2	14.9	-	14.3
	12 UTC	18.0	14.8	14.8	16.2	16.4	19.2	18.6	18.0	18.4	17.2	17.2	-	16.6
Sunshine Duration		8.6	2.7	0.0	5.4	5.4	8.2	1.3	2.2	6.1	3.7	4.4	-	6.0
Precipitation				40.5	5.4			0.2	19.6	3.7	28.9	98.3	-	45.1
Evaporation		2.4	1.2	0.3	4.0	1.0	4.0	0.3	2.1	0.3	1.4	17.0	-	25.9
Growing Degrees	5	7.7	4.0	8.8	9.8	10.5	14.4	16.0	12.3	12.8	11.1	107.4	-	101.6
	10	2.7	0.0	3.8	4.8	5.5	9.4	11.0	7.3	7.8	6.1	58.4	-	52.1

1st 10-day period (1-10/11/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.0	-	14.3
Precipitation - Reference Evapotranspiration	81.3	-	30.8
Number of Rainy Days	6.0	-	3.2
Number of Dry Days	8.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



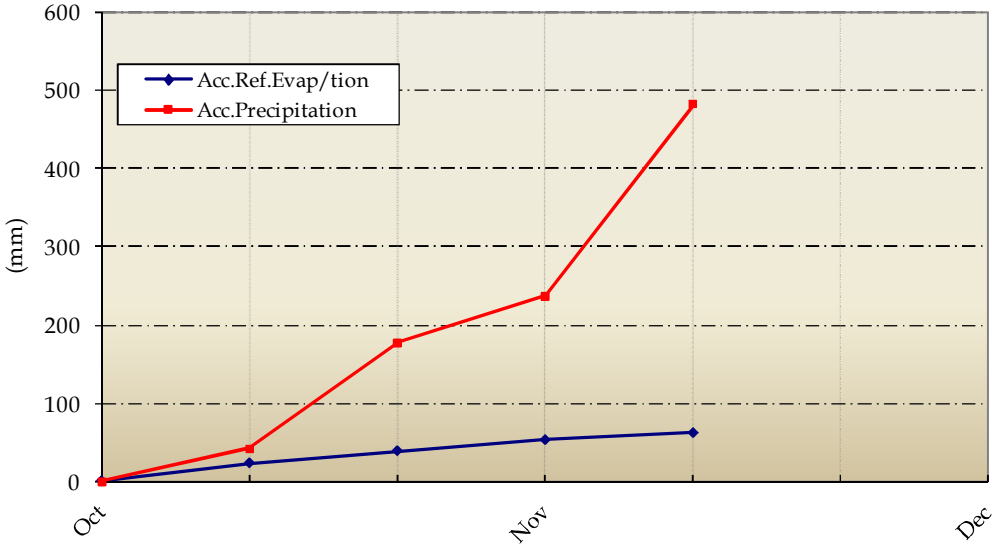
Agrometeorological Data — November 2009

Arta

1st 10-day period (1-10/11/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.6	16.6	16.8	18.2	17.0	24.6	18.2	18.0	17.0	16.8	18.2	-	20.4
	Min	7.0	4.6	9.4	8.8	11.4	14.0	16.0	14.4	13.6	10.8	11.0	-	8.9
Relative Humidity	Max	86	85	100	93	98	98	96	98	100	98	95	-	-
	Min	23	45	71	66	81	54	92	88	80	87	69	-	-
Soil Temperature at 10 cm	06 UTC	14.8	13.0	11.6	13.4	13.6	14.8	16.4	16.2	15.2	15.2	14.4	-	13.1
	12 UTC	15.8	15.0	13.2	14.0	14.0	16.0	16.4	16.8	15.8	15.0	15.2	-	15.6
Sunshine Duration		9.0	3.0	0.6	3.8	1.1	4.7	0.0	1.6	0.0	1.2	2.5	-	5.4
Precipitation				42.3	25.8	2.3	3.2	4.0	10.3	49.8	106.4	244.1	-	50.3
Evaporation		2.7	0.4	1.5	1.4	1.5	2.0	0.8	2.8	0.8	0.9	14.8	-	-
Growing Degrees	5	7.8	5.6	8.1	8.5	9.2	14.3	12.1	11.2	10.3	8.8	95.9	-	96.5
	10	2.8	0.6	3.1	3.5	4.2	9.3	7.1	6.2	5.3	3.8	45.9	-	47.5

1st 10-day period (1-10/11/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.2	-	11.4
Precipitation - Reference Evapotranspiration	234.9	-	38.9
Number of Rainy Days	8.0	-	3.2
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

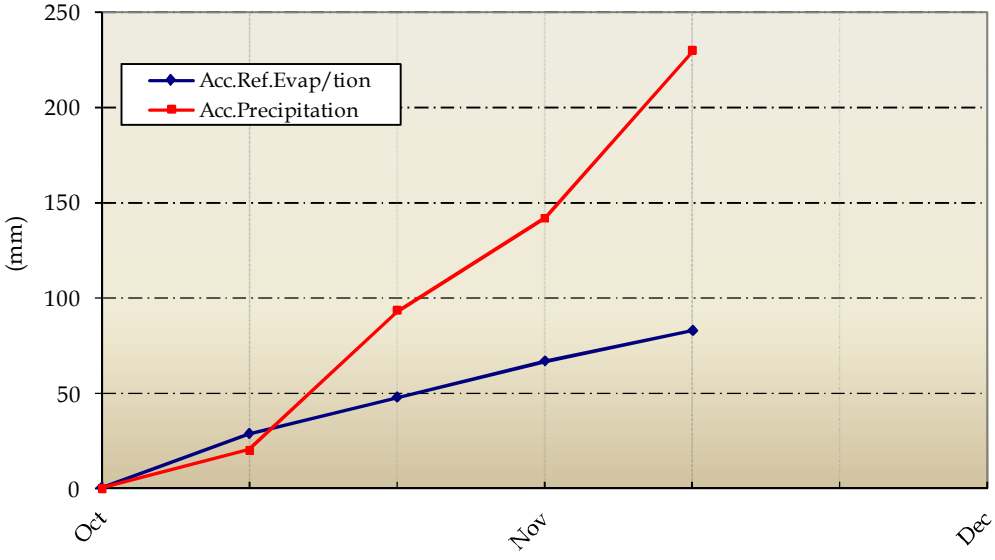


Kalamata

1st 10-day period (1-10/11/2009)		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	17.4	16.8	19.2	20.2	23.2	23.4	20.2	21.8	20.4	20.1	-	21.0
	Min	9.2	7.0	6.4	10.8	7.8	11.8	17.2	12.8	11.0	15.4	10.9	-	10.2
Relative Humidity	Max	76	97	98	97	98	98	92	98	98	93	94	-	-
	Min	42	46	85	51	57	67	63	74	57	66	61	-	-
Soil Temperature at 10 cm	06 UTC	15.8	15.0	14.6	15.4	14.6	14.4	17.2	17.2	16.4	17.8	15.8	-	15.1
	12 UTC	16.0	15.4	15.2	16.2	15.6	16.0	17.8	18.0	17.4	17.8	16.5	-	16.9
Sunshine Duration		9.4	4.0	0.0	7.3	4.9	4.3	5.5	2.1	7.5	1.3	4.6	-	5.6
Precipitation				46.9	9.1	0.0		0.0	26.1	0.3	5.5	87.9	-	35.3
Evaporation		4.0	2.0	3.0	6.0	1.0	2.0	2.3	1.1	2.0	1.7	25.1	-	30.4
Growing Degrees	5	8.6	7.2	6.6	10.0	9.0	12.5	15.3	11.5	11.4	12.9	105.0	-	105.8
	10	3.6	2.2	1.6	5.0	4.0	7.5	10.3	6.5	6.4	7.9	55.0	-	55.9

1st 10-day period (1-10/11/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.1	-	16.4
Precipitation - Reference Evapotranspiration	71.8	-	18.9
Number of Rainy Days	5.0	-	3.1
Number of Dry Days	2.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

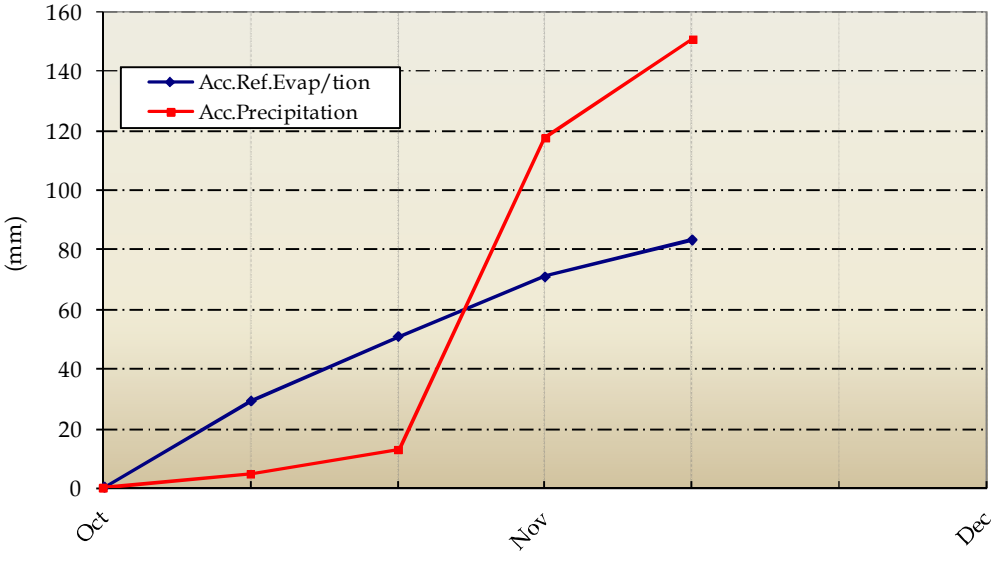


Larisa

1st 10-day period (1-10/11/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.2	13.0	11.0	18.2	19.2	22.2	22.6	21.0	19.0	16.2	17.6	-	17.2
	Min	7.0	2.4	6.8	8.0	5.0	10.0	13.0	15.2	11.2	11.0	9.0	-	6.7
Relative Humidity	Max	87	89	97	97	94	97	93	96	95	97	94	-	-
	Min	42	45	83	44	46	58	65	67	74	65	59	-	-
Soil Temperature at 10 cm	06 UTC	12.8	12.2	12.4	12.0	12.2	13.0	14.8	15.8	15.6	15.0	13.6	-	12.3
	12 UTC	14.0	13.4	12.4	13.6	13.6	15.2	16.4	16.6	15.8	15.6	14.7	-	13.2
Sunshine Duration		8.3	7.6	0.0	8.5	5.8	6.9	3.8	2.9	1.6	6.1	5.2	-	4.1
Precipitation		0.6		13.4	6.2				4.6	1.9	6.3	33.0	-	20.6
Evaporation		2.8	0.4	2.3	1.0	1.8	1.5	3.0	2.6	0.6	0.9	16.9	-	17.6
Growing Degrees	5	5.1	2.7	3.9	8.1	7.1	11.1	12.8	13.1	10.1	8.6	82.6	-	69.6
	10	0.1	0.0	0.0	3.1	2.1	6.1	7.8	8.1	5.1	3.6	36.0	-	25.7

1st 10-day period (1-10/11/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.5	-	11.7
Precipitation - Reference Evapotranspiration	20.5	-	8.9
Number of Rainy Days	6.0	-	2.7
Number of Dry Days	0.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

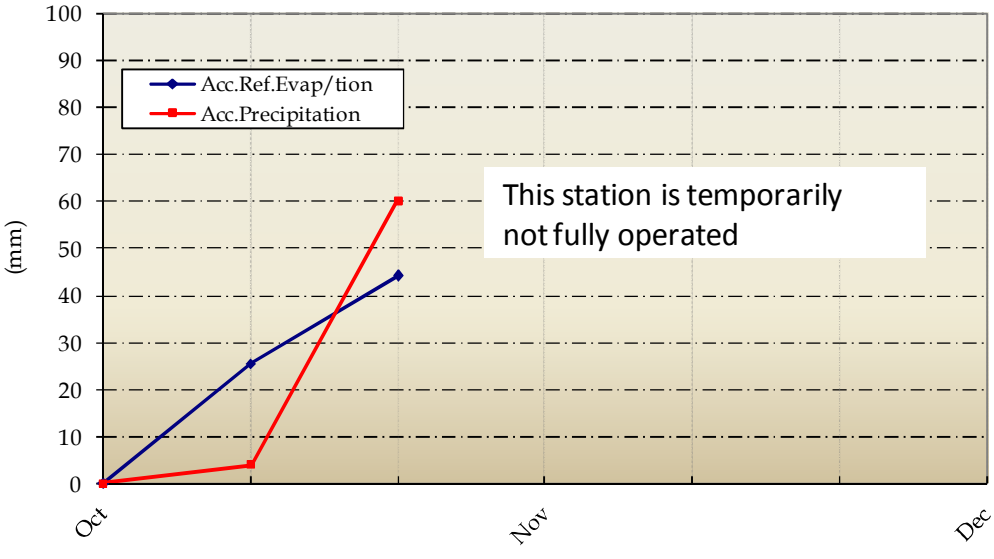


Pyrgela

1st 10-day period (1-10/11/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-	-	-	20.8
	Min	-	-	-	-	-	-	-	-	9.0	11.0	10.0	-	8.6
Relative Humidity	Max	-	-	-	-	-	-	-	-	93	84	91	-	-
	Min	-	-	-	-	-	-	-	-	58	53	63	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	13.8	14.6	14.2	-	13.0
	12 UTC	-	-	-	-	-	-	-	-	20.6	16.4	18.5	-	17.0
Sunshine Duration		-	-	-	-	-	-	-	-	5.6	5.8	5.7	-	4.9
Precipitation		-	-	-	-	-	-	-	-		3.1	-	-	21.4
Evaporation		-	-	-	-	-	-	-	-	1.2	2.8	-	-	16.6
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	-	97.0
	10	-	-	-	-	-	-	-	-	-	-	-	-	47.8

1st 10-day period (1-10/11/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	12.4
Precipitation - Reference Evapotranspiration	-	-	9.0
Number of Rainy Days	-	-	2.5
Number of Dry Days	-	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

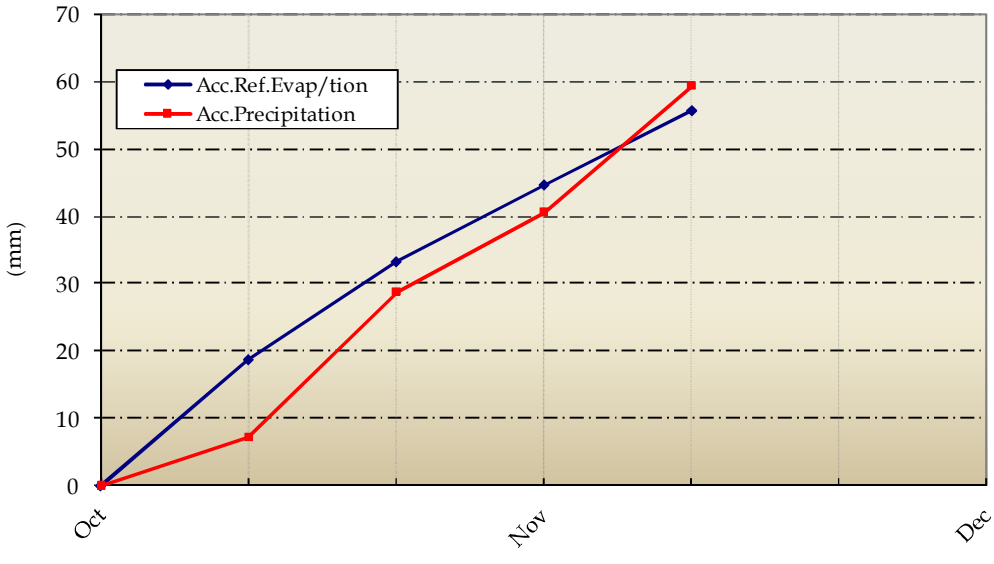


Serres

1st 10-day period (1-10/11/2009)		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	12.8	6.8	18.4	18.0	21.6	22.4	20.8	20.6	18.4	17.4	-	16.1
	Min	1.2	1.8	4.0	4.0	3.4	11.0	11.4	17.2	13.8	12.0	8.0	-	5.9
Relative Humidity	Max	96	86	94	94	94	93	74	80	91	87	89	-	-
	Min	40	38	90	52	53	57	62	72	58	71	59	-	-
Soil Temperature at 10 cm	06 UTC	11.4	11.4	11.4	11.0	10.0	12.4	15.0	15.6	15.2	15.6	12.9	-	10.3
	12 UTC	12.8	12.6	11.2	12.2	12.4	14.2	-	16.0	-	15.8	13.4	-	12.2
Sunshine Duration		6.9	5.7	0.0	6.6	6.1	4.2	0.5	0.7	1.1	0.2	3.2	-	4.1
Precipitation				8.2	2.2		0.0	0.0	1.4	0.1	6.8	18.7	-	15.2
Evaporation		2.0	1.4	0.8	2.0	1.8	3.4	2.2	1.0	2.1	5.5	22.2	-	12.8
Growing Degrees	5	2.8	2.3	0.4	6.2	5.7	11.3	11.9	14.0	12.2	10.2	77.0	-	60.7
	10	0.0	0.0	0.0	1.2	0.7	6.3	6.9	9.0	7.2	5.2	36.5	-	20.7

1st 10-day period (1-10/11/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.0	-	8.3
Precipitation - Reference Evapotranspiration	7.7	-	6.9
Number of Rainy Days	5.0	-	2.2
Number of Dry Days	2.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

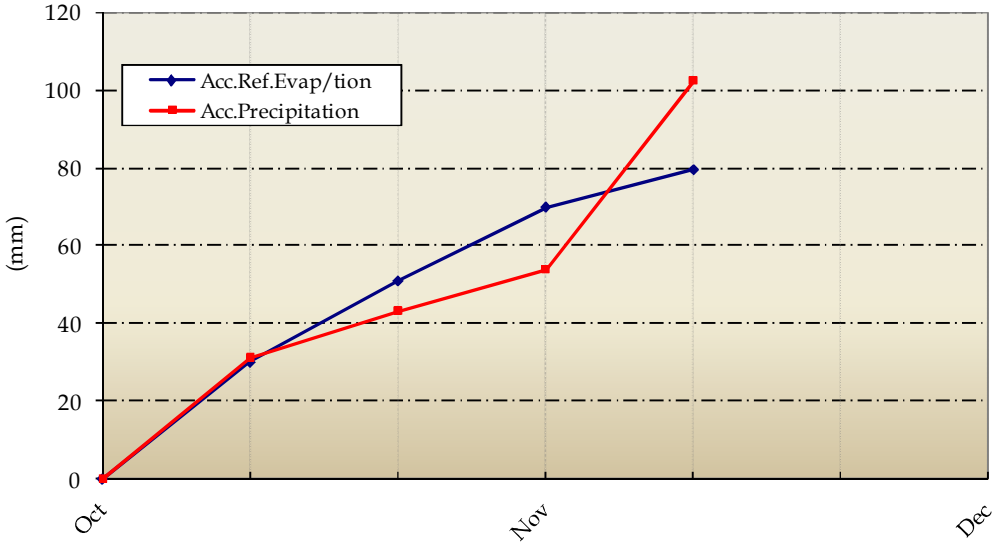


Trikala Imathias

1st 10-day period (1-10/11/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.0	14.8	7.4	16.6	19.8	21.4	20.8	20.6	17.0	18.8	17.1	-	16.8
	Min	3.6	1.0	5.8	7.2	6.4	12.4	14.8	16.8	13.8	12.6	9.4	-	6.7
Relative Humidity	Max	96	95	100	97	99	95	98	96	99	95	97	-	-
	Min	34	30	94	50	56	79	90	79	92	46	65	-	-
Soil Temperature at 10 cm	06 UTC	12.8	11.0	11.8	10.8	10.8	13.2	15.0	15.6	15.4	15.2	13.2	-	12.2
	12 UTC	14.2	13.0	10.4	13.4	13.0	15.2	16.0	17.2	16.0	15.2	14.4	-	12.7
Sunshine Duration		8.7	5.4	0.0	7.8	6.4	2.8	0.4	1.1	0.0	1.6	3.4	-	4.3
Precipitation				36.9	4.5		1.5		0.5	0.9	4.4	48.7	-	20.3
Evaporation		1.7	1.1	1.0	2.0	1.0	2.9	0.8	1.5	0.6	1.9	14.5	-	13.4
Growing Degrees	5	3.8	2.9	1.6	6.9	8.1	11.9	12.8	13.7	10.4	10.7	82.8	-	68.4
	10	0.0	0.0	0.0	1.9	3.1	6.9	7.8	8.7	5.4	5.7	39.5	-	26.6

1st 10-day period (1-10/11/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.6	-	10.5
Precipitation - Reference Evapotranspiration	39.1	-	9.8
Number of Rainy Days	6.0	-	2.8
Number of Dry Days	7.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

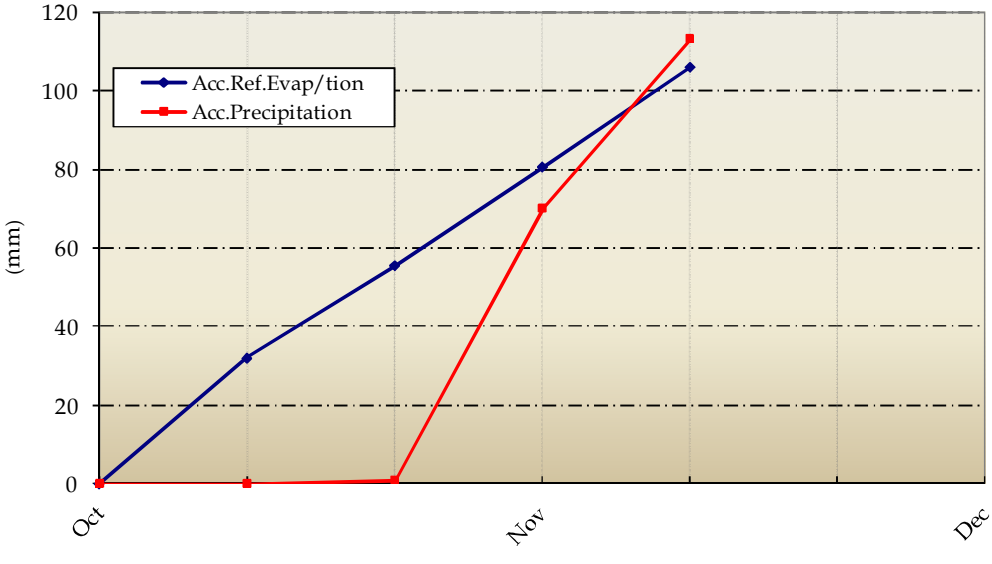


Tympaki

1st 10-day period (1-10/11/2009)		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	14.2	21.0	21.2	22.6	25.0	24.8	21.0	22.6	23.8	21.4	-	21.8
	Min	13.4	11.6	8.4	15.6	11.6	15.4	15.8	15.0	14.0	12.8	13.4	-	12.3
Relative Humidity	Max	71	78	100	92	97	97	100	100	96	98	93	-	-
	Min	42	34	52	45	67	59	56	62	48	46	51	-	-
Soil Temperature at 10 cm	06 UTC	16.4	14.8	13.6	17.4	15.2	17.6	18.4	19.6	17.2	16.6	16.7	-	17.8
	12 UTC	18.4	17.2	17.6	18.8	20.2	20.4	22.2	21.0	21.2	21.0	19.8	-	20.8
Sunshine Duration		7.7	6.2	2.8	5.0	7.0	3.0	5.9	4.9	6.9	6.1	5.6	-	6.1
Precipitation				5.3	21.1				16.6			43.0	-	25.0
Evaporation		6.0	5.2	8.8	6.6	2.3	2.8	5.8	0.7	3.3	4.9	46.4	-	39.7
Growing Degrees	5	10.7	7.9	9.7	13.4	12.1	15.2	15.3	13.0	13.3	13.3	123.9	-	120.3
	10	5.7	2.9	4.7	8.4	7.1	10.2	10.3	8.0	8.3	8.3	73.9	-	70.3

1st 10-day period (1-10/11/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	25.4	-	20.6
Precipitation - Reference Evapotranspiration	17.6	-	4.4
Number of Rainy Days	3.0	-	2.1
Number of Dry Days	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_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 ^{o}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 : ^{o}C
- Relative Humidity : %
- Soil Temperature : ^{o}C
- Sunshine Duration : Hours
- Precipitation : mm
- Evaporation (Pan) : mm
- Growing Degrees : ^{o}C

UTC (Universal Time coordinates) in Greece

- Winter : Time(UTC) = Local time - 2
- Summer : Time(UTC) = Local time - 3

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ΕΘΝΙΚΗ ΜΕΤΕΩΡΟΛΟΓΙΚΗ ΥΠΗΡΕΣΙΑ
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