

AGROMETEOROLOGICAL BULLETIN

*October 2011
2nd 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
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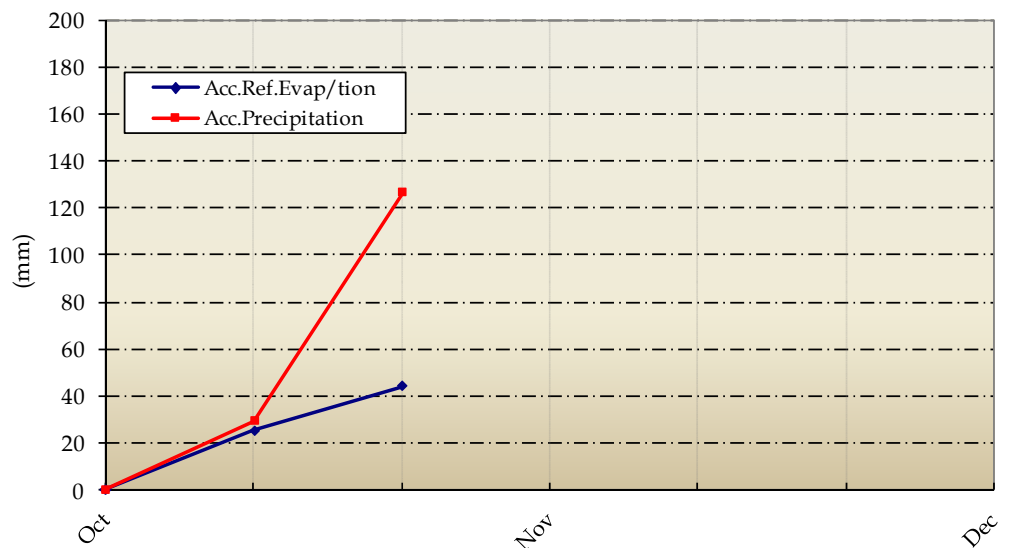
*Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
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www.meteohellas.gr*

Agrinio

2nd 10-day period (11-20/10/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.2	24.5	26.0	26.0	16.0	16.6	15.6	18.0	20.6	23.0	20.8	21.7	24.9
	Min	7.4	8.8	9.8	11.8	12.0	11.5	8.6	2.0	2.4	4.6	7.9	14.6	11.5
Relative Humidity	Max	90	90	95	98	95	81	56	93	96	97	89	97	-
	Min	35	43	51	46	87	54	30	37	43	47	47	73	-
Soil Temperature at 10 cm	06 UTC	16.6	17.0	17.6	18.6	18.0	15.2	14.6	12.6	12.8	13.6	15.7	19.0	17.3
	12 UTC	19.0	19.6	20.4	21.0	17.6	16.4	15.6	14.8	15.4	16.0	17.6	19.8	20.9
Sunshine Duration		7.6	9.9	9.9	7.6	0.0	2.2	10.2	10.0	9.9	9.7	7.7	1.9	6.5
Precipitation					2.6	65.9	29.1					97.6	232.6	29.2
Evaporation		2.8	2.9	3.9	3.8	1.9	2.4	4.4	2.4	1.5	1.6	27.6	-	33.7
Growing Degrees	5	9.3	11.7	12.9	13.9	9.0	9.1	7.1	5.0	6.5	8.8	93.2	131.4	131.9
	10	4.3	6.7	7.9	8.9	4.0	4.1	2.1	0.0	1.5	3.8	43.2	81.4	81.9

2nd 10-day period (11-20/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	19.0	14.4	21.9
Precipitation - Reference Evapotranspiration	78.6	218.2	7.3
Number of Rainy Days	3.0	10.0	2.7
Number of Dry Days	3.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

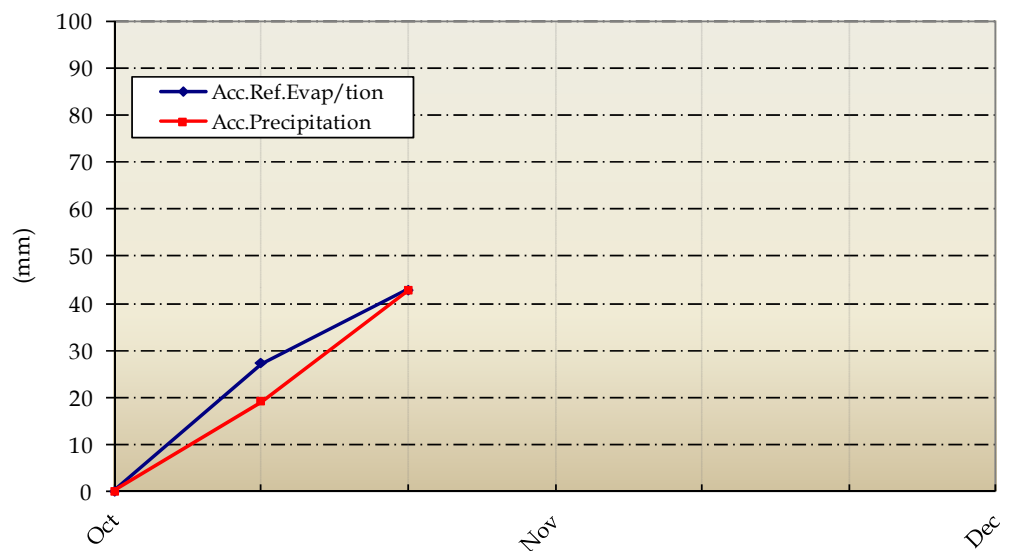


Alexandroupoli

2nd 10-day period (11-20/10/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.0	19.8	21.6	16.2	14.0	11.0	7.2	13.0	18.0	18.8	15.6	18.5	20.8
	Min	9.8	7.6	14.4	12.6	9.4	6.8	4.4	6.4	7.0	5.0	8.3	13.8	10.8
Relative Humidity	Max	87	92	96	95	95	87	93	83	86	91	90	98	-
	Min	58	46	60	57	68	53	60	48	48	53	55	77	-
Soil Temperature at 10 cm	06 UTC	14.6	14.0	16.4	16.2	14.8	13.2	10.8	10.0	10.2	11.2	13.1	15.9	15.2
	12 UTC	15.6	16.2	18.6	16.8	14.6	13.0	10.6	10.2	12.8	13.2	14.2	16.9	18.0
Sunshine Duration		0.6	5.5	6.5	0.0	0.0	0.3	0.0	5.5	10.3	9.6	3.8	2.8	5.9
Precipitation		5.8			11.8	4.9		1.0				23.5	99.1	15.0
Evaporation		0.2	4.3	11.8	2.2	0.5	2.2	-	0.5	0.1	3.0	-	13.6	42.1
Growing Degrees	5	7.9	8.7	13.0	9.4	6.7	3.9	0.8	4.7	7.5	6.9	69.5	111.6	107.7
	10	2.9	3.7	8.0	4.4	1.7	0.0	0.0	0.0	2.5	1.9	25.1	61.6	58.4

2nd 10-day period (11-20/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.7	13.6	22.7
Precipitation - Reference Evapotranspiration	7.8	85.5	-7.7
Number of Rainy Days	4.0	8.0	1.9
Number of Dry Days	0.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

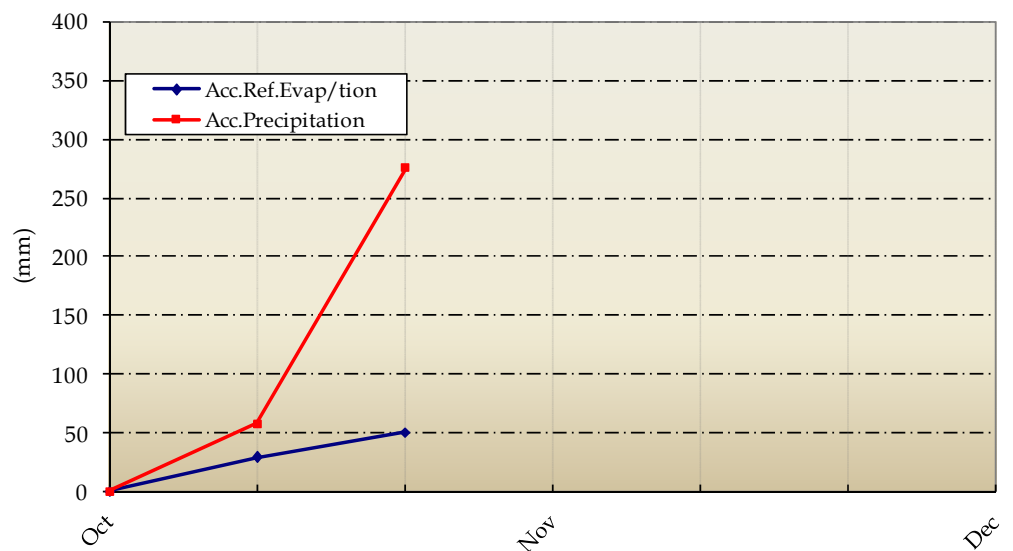


Andravida

2nd 10-day period (11-20/10/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.8	23.2	25.0	25.4	20.4	16.0	16.0	18.0	18.6	21.4	20.6	23.3	24.1
	Min	9.6	9.0	14.2	15.2	11.0	13.0	9.0	4.4	8.6	8.4	10.2	16.4	13.2
Relative Humidity	Max	90	87	92	95	96	95	88	84	82	95	90	95	-
	Min	37	31	54	52	83	66	37	31	44	49	48	66	-
Soil Temperature at 10 cm	06 UTC	14.5	15.0	16.8	18.4	16.4	16.0	13.0	10.8	12.0	12.8	14.6	18.7	18.6
	12 UTC	20.0	20.8	23.0	23.4	16.4	15.6	16.8	16.8	17.6	18.6	18.9	20.9	21.5
Sunshine Duration		6.4	8.8	8.0	8.6	0.0	0.0	9.2	9.6	9.2	8.9	6.9	2.7	7.1
Precipitation						195.2	22.8					218.0	112.1	23.9
Evaporation		3.0	4.2	1.2	4.5	0.8	1.5	2.0	5.0	1.0	2.0	25.2	34.2	36.4
Growing Degrees	5	10.7	11.1	14.6	15.3	10.7	9.5	7.5	6.2	8.6	9.9	104.1	148.2	136.6
	10	5.7	6.1	9.6	10.3	5.7	4.5	2.5	1.2	3.6	4.9	54.1	98.2	86.6

2nd 10-day period (11-20/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	21.3	17.2	22.5
Precipitation - Reference Evapotranspiration	196.7	94.9	1.4
Number of Rainy Days	2.0	9.0	2.6
Number of Dry Days	4.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

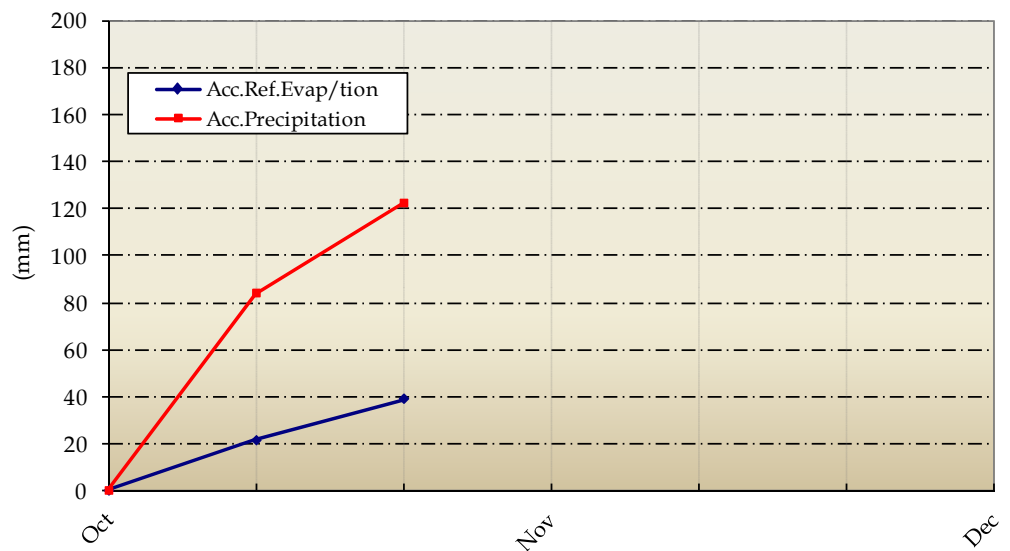


Ioannina

2nd 10-day period (11-20/10/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.4	21.8	23.2	21.6	13.0	14.4	13.4	13.8	16.0	18.0	17.4	-	20.6
	Min	7.8	6.2	6.8	9.2	9.0	8.6	5.0	-2.4	-1.4	0.0	4.9	-	8.9
Relative Humidity	Max	92	89	80	93	97	80	69	92	93	100	88	-	-
	Min	40	44	46	60	85	38	28	24	38	45	45	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	14.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	16.3
Sunshine Duration		7.3	7.9	6.8	4.9	0.0	4.5	7.4	7.0	6.6	5.9	5.8	-	5.3
Precipitation					15.8	23.0						38.8	-	37.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	30.1
Growing Degrees	5	8.1	9.0	10.0	10.4	6.0	6.5	4.2	0.7	2.3	4.0	61.2	-	98.7
	10	3.1	4.0	5.0	5.4	1.0	1.5	0.0	0.0	0.0	0.0	20.0	-	49.1

2nd 10-day period (11-20/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.5	-	17.6
Precipitation - Reference Evapotranspiration	21.3	-	19.5
Number of Rainy Days	2.0	-	3.4
Number of Dry Days	4.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

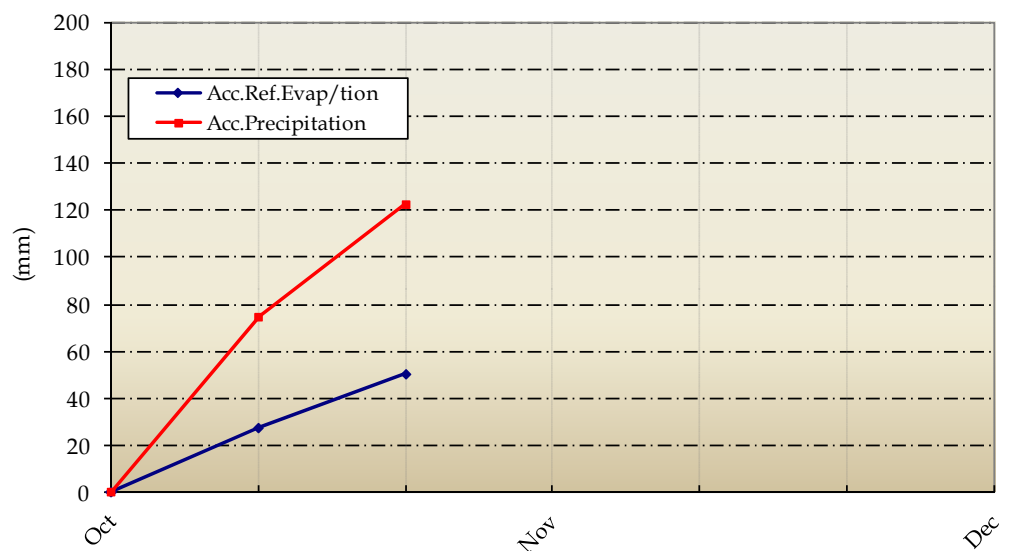


Kalamata

2nd 10-day period (11-20/10/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	22.4	25.4	24.0	23.0	17.8	18.2	19.0	20.8	22.0	21.3	24.6	24.7
	Min	9.2	10.6	10.8	12.0	14.4	10.6	9.4	5.0	5.0	7.8	9.5	15.5	13.1
Relative Humidity	Max	95	92	93	98	96	98	82	86	88	95	92	97	-
	Min	49	47	43	60	58	84	46	41	35	45	51	62	-
Soil Temperature at 10 cm	06 UTC	18.0	17.8	17.8	18.6	19.4	18.8	17.0	15.6	15.0	16.0	17.4	20.0	18.6
	12 UTC	19.2	19.4	19.6	19.8	20.4	19.0	19.0	18.0	16.6	17.2	18.8	21.0	20.9
Sunshine Duration		4.4	10.2	10.0	8.8	3.3	0.0	7.2	9.4	10.0	10.0	7.3	4.6	6.8
Precipitation						15.4	32.7					48.1	109.4	24.4
Evaporation		1.7	2.9	4.2	2.6	0.7	-	1.8	3.1	3.9	2.7	-	32.8	39.0
Growing Degrees	5	9.6	11.5	13.1	13.0	13.7	9.2	8.8	7.0	7.9	9.9	103.7	150.6	138.6
	10	4.6	6.5	8.1	8.0	8.7	4.2	3.8	2.0	2.9	4.9	53.7	100.6	88.6

2nd 10-day period (11-20/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.8	20.3	24.3
Precipitation - Reference Evapotranspiration	25.3	89.1	0.1
Number of Rainy Days	2.0	7.0	2.7
Number of Dry Days	4.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

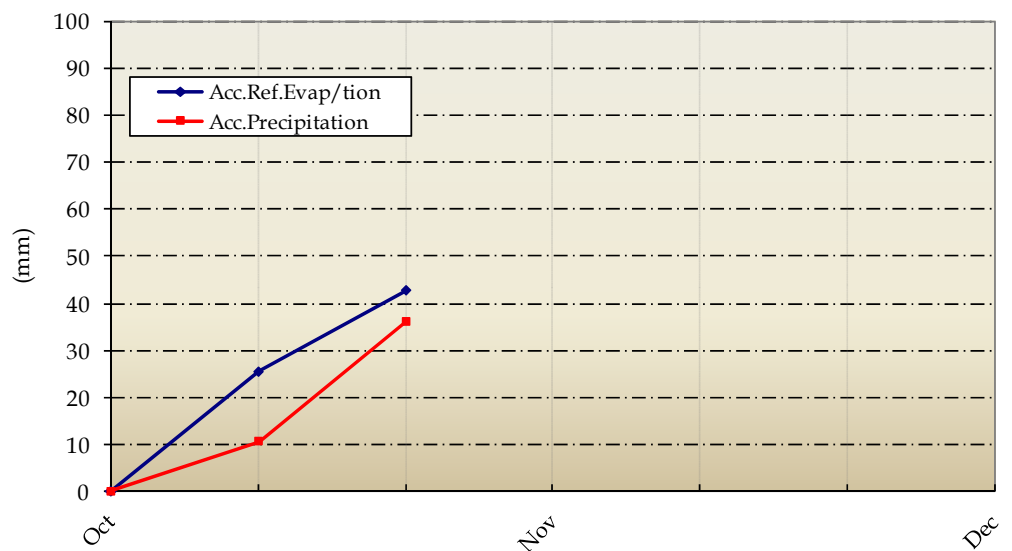


Larisa

2nd 10-day period (11-20/10/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.2	24.0	27.6	18.6	11.8	12.4	14.2	16.4	20.0	22.0	18.6	20.1	23.0
	Min	10.0	10.2	9.0	11.4	10.0	9.0	4.6	0.6	0.0	2.6	6.7	13.6	10.1
Relative Humidity	Max	87	90	92	97	97	90	78	88	93	94	91	98	-
	Min	40	32	32	44	81	46	31	29	23	23	38	70	-
Soil Temperature at 10 cm	06 UTC	16.4	18.0	17.4	18.4	17.0	15.4	13.6	12.6	12.0	13.0	15.4	16.8	17.2
	12 UTC	18.2	18.6	19.4	18.6	16.2	16.0	16.0	13.8	-	14.0	16.8	18.3	18.6
Sunshine Duration		2.8	7.6	8.2	0.0	0.0	0.0	0.0	0.0	8.0	8.5	3.5	2.7	5.6
Precipitation					2.0	20.3	3.2					25.5	52.7	14.1
Evaporation		1.4	2.0	2.4	0.0	0.7	1.2	4.6	2.2	2.2	8.0	24.7	-	31.3
Growing Degrees	5	9.6	12.1	13.3	10.0	5.9	5.7	4.4	3.5	5.0	7.3	76.8	118.1	115.6
	10	4.6	7.1	8.3	5.0	0.9	0.7	0.0	0.0	0.0	2.3	28.9	68.1	65.8

2nd 10-day period (11-20/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.2	14.3	20.6
Precipitation - Reference Evapotranspiration	8.3	38.4	-6.5
Number of Rainy Days	3.0	9.0	2.4
Number of Dry Days	3.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

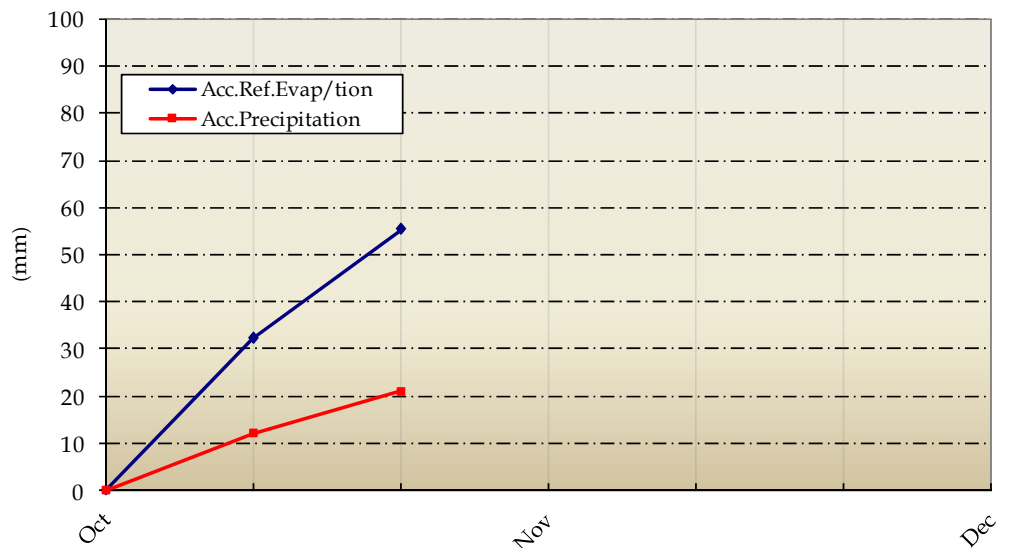


Mikra

2nd 10-day period (11-20/10/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.6	22.8	24.4	20.0	13.0	14.0	13.0	15.4	17.0	17.4	17.5	-	21.6
	Min	11.6	10.8	11.6	12.0	10.8	9.0	4.4	7.0	2.6	4.8	8.5	-	11.6
Relative Humidity	Max	73	82	93	93	85	56	56	73	77	87	78	-	-
	Min	41	48	45	53	56	34	34	24	35	62	43	-	-
Soil Temperature at 10 cm	06 UTC	14.6	14.2	16.8	17.8	15.0	13.4	12.2	10.8	10.6	11.8	13.7	-	16.5
	12 UTC	16.5	19.0	20.0	17.6	16.0	14.8	13.0	12.8	13.0	14.8	15.8	-	19.4
Sunshine Duration		4.3	5.4	9.0	0.0	0.0	2.3	3.8	9.6	9.6	9.3	5.3	-	5.3
Precipitation		0.0		0.0	1.8	7.1						8.9	-	13.0
Evaporation		3.1	2.6	3.4	1.8	0.4	4.6	4.3	2.8	1.8	2.2	27.0	-	31.8
Growing Degrees	5	9.6	11.8	13.0	11.0	6.9	6.5	3.7	6.2	4.8	6.1	79.6	-	116.2
	10	4.6	6.8	8.0	6.0	1.9	1.5	0.0	1.2	0.0	1.1	31.1	-	66.2

2nd 10-day period (11-20/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	23.2	-	20.4
Precipitation - Reference Evapotranspiration	-14.3	-	-7.4
Number of Rainy Days	2.0	-	2.0
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

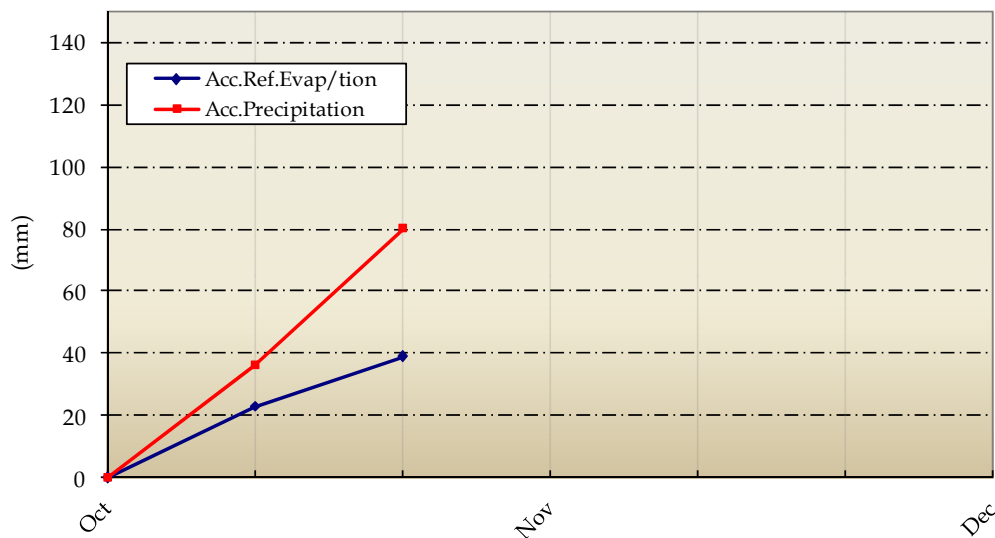


Tripoli

2nd 10-day period (11-20/10/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.8	20.8	23.6	22.8	15.6	12.2	9.2	14.8	19.0	20.0	17.3	20.8	21.3
	Min	3.4	7.0	5.6	7.2	11.8	5.8	4.6	-1.4	-1.4	0.0	4.3	12.2	8.2
Relative Humidity	Max	97	94	97	94	95	97	87	96	100	100	96	96	-
	Min	57	40	37	47	78	88	56	34	30	26	49	64	-
Soil Temperature at 10 cm	06 UTC	11.0	11.6	12.2	13.2	15.8	13.4	9.4	6.4	7.0	7.6	10.8	15.8	15.5
	12 UTC	15.0	17.2	18.4	18.4	16.6	13.0	10.0	12.2	12.8	13.4	14.7	18.7	17.2
Sunshine Duration		1.6	9.5	9.4	6.7	0.0	0.0	3.6	9.0	9.0	8.4	5.7	4.1	6.8
Precipitation		0.1			0.1	7.2	32.7	3.8				43.9	91.1	15.9
Evaporation		1.3	2.9	2.2	1.0	2.4	-	1.6	0.7	2.5	2.2	-	14.5	28.1
Growing Degrees	5	4.1	8.9	9.6	10.0	8.7	4.0	1.9	1.7	3.8	5.0	57.7	115.1	97.5
	10	0.0	3.9	4.6	5.0	3.7	0.0	0.0	0.0	0.0	0.0	17.2	65.1	48.2

2nd 10-day period (11-20/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.0	16.3	21.4
Precipitation - Reference Evapotranspiration	27.9	74.8	-5.5
Number of Rainy Days	5.0	9.0	2.7
Number of Dry Days	0.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

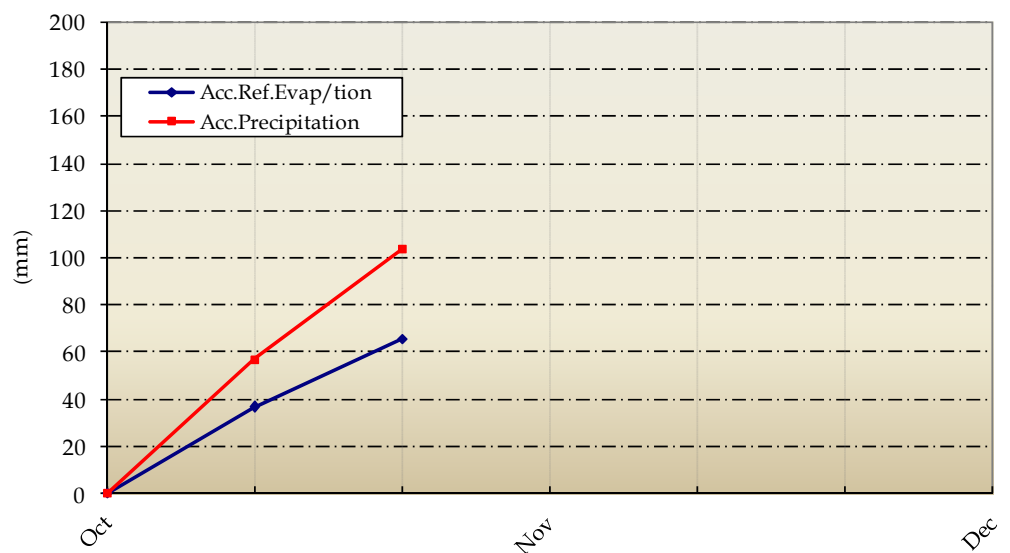


Tympaki

2nd 10-day period (11-20/10/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.4	22.4	24.8	25.0	24.2	23.4	18.4	20.0	20.2	21.4	22.2	27.4	25.4
	Min	13.6	13.2	12.2	13.0	13.6	14.6	12.0	12.6	7.6	9.8	12.2	19.5	15.2
Relative Humidity	Max	96	96	96	97	99	100	94	74	100	100	95	86	-
	Min	41	30	25	31	50	54	54	27	23	40	38	43	-
Soil Temperature at 10 cm	06 UTC	18.4	18.0	17.6	18.4	18.8	20.0	18.8	15.4	14.2	15.2	17.5	23.5	21.8
	12 UTC	21.0	22.0	22.0	23.0	24.0	23.0	19.8	19.6	18.4	19.6	21.2	26.8	25.4
Sunshine Duration		7.2	5.2	9.2	10.2	9.7	6.3	3.4	10.1	10.5	10.4	8.2	4.5	7.7
Precipitation		9.7					18.1	19.5				47.3	30.0	5.8
Evaporation		5.4	3.9	2.4	4.9	3.3	-	-	4.7	3.7	2.9	-	44.5	54.1
Growing Degrees	5	13.0	12.8	13.5	14.0	13.9	14.0	10.2	11.3	8.9	10.6	122.2	184.7	152.5
	10	8.0	7.8	8.5	9.0	8.9	9.0	5.2	6.3	3.9	5.6	72.2	134.7	102.5

2nd 10-day period (11-20/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	29.2	29.8	29.5
Precipitation - Reference Evapotranspiration	18.1	0.2	-23.7
Number of Rainy Days	3.0	6.0	1.2
Number of Dry Days	0.0	6.0	-

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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