

AGROMETEOROLOGICAL BULLETIN

October 2011
3rd 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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Division of Climatology-Applications
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Helliniko, Athens

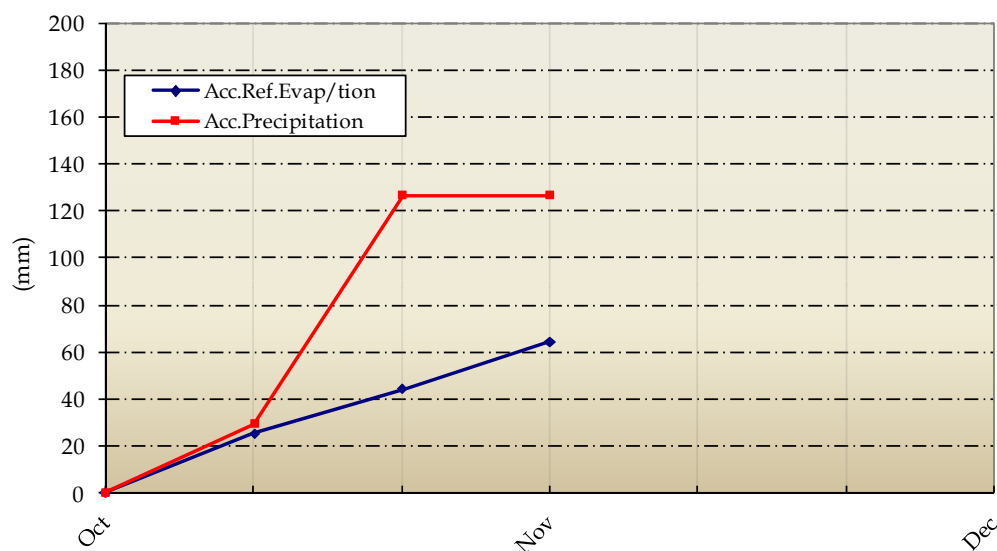
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

Agrinio

3rd 10-day period (21-31/10/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.0	23.6	21.6	22.8	22.2	21.6	20.4	20.4	20.2	20.2	20.0	21.5	20.9	21.8
	Min	6.4	8.2	9.4	11.2	13.2	8.0	7.0	4.6	4.4	6.6	4.0	7.5	10.0	9.7
Relative Humidity	Max	97	97	95	86	73	85	92	80	72	70	87	85	96	-
	Min	47	52	47	43	46	45	40	37	38	36	32	42	56	-
Soil Temperature at 10 cm	06 UTC	14.4	15.2	15.6	16.4	17.0	15.8	15.2	14.4	14.0	14.0	13.2	15.0	16.0	14.8
	12 UTC	16.8	17.0	17.6	18.4	18.6	17.6	16.8	16.0	15.8	15.6	15.0	16.8	17.7	17.8
Sunshine Duration		9.2	7.6	4.3	8.4	8.8	6.1	8.0	8.4	9.6	9.2	8.4	8.0	6.2	5.7
Precipitation														45.6	42.6
Evaporation		2.7	2.7	3.4	6.6	4.8	2.7	3.5	2.5	4.0	3.9	1.2	38.0	21.6	29.5
Growing Degrees	5	9.7	10.9	10.5	12.0	12.7	9.8	8.7	7.5	7.3	8.4	7.0	104.5	115.3	118.3
	10	4.7	5.9	5.5	7.0	7.7	4.8	3.7	2.5	2.3	3.4	2.0	49.5	60.3	63.4

3rd 10-day period (21-31/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.2	16.6	18.5
Precipitation - Reference Evapotranspiration	-20.2	29.0	24.1
Number of Rainy Days	0.0	4.0	3.7
Number of Dry Days	15.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

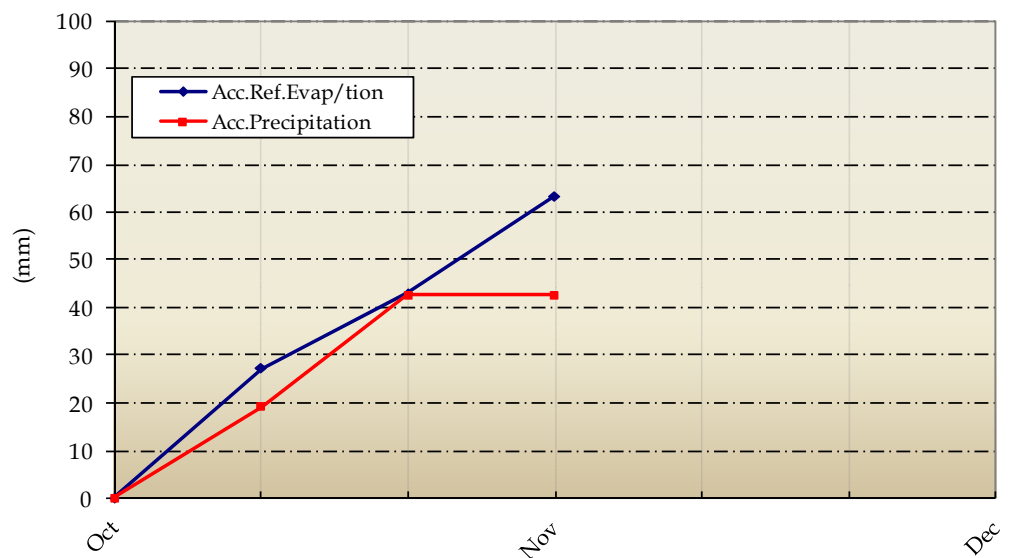


Alexandroupoli

3rd 10-day period (21-31/10/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.4	18.4	17.0	18.4	17.8	15.4	15.0	15.4	14.4	13.8	15.2	16.5	16.9	17.4
	Min	5.0	9.4	11.2	12.8	12.4	10.0	10.0	7.0	10.2	10.0	7.6	9.6	8.4	8.0
Relative Humidity	Max	88	90	83	79	81	75	75	77	75	75	80	80	91	-
	Min	45	55	50	52	53	57	41	46	50	48	39	49	54	-
Soil Temperature at 10 cm	06 UTC	12.0	12.0	13.4	14.4	14.2	14.4	13.4	13.0	13.4	13.6	13.2	13.4	13.2	12.7
	12 UTC	14.2	15.0	15.0	15.6	15.8	15.6	15.0	14.6	14.4	14.6	14.6	14.9	14.8	15.2
Sunshine Duration		9.7	9.8	4.9	6.1	9.0	2.1	7.2	9.4	0.6	0.4	6.9	6.0	5.9	5.2
Precipitation														32.3	22.3
Evaporation		1.2	6.7	4.5	2.5	3.5	0.2	3.4	1.9	4.0	5.5	1.0	34.4	-	41.1
Growing Degrees	5	7.7	8.9	9.1	10.6	10.1	7.7	7.5	6.2	7.3	6.9	6.4	88.4	84.1	85.3
	10	2.7	3.9	4.1	5.6	5.1	2.7	2.5	1.2	2.3	1.9	1.4	33.4	33.8	34.4

3rd 10-day period (21-31/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.4	15.7	20.4
Precipitation - Reference Evapotranspiration	-20.4	16.6	1.9
Number of Rainy Days	0.0	3.0	2.2
Number of Dry Days	14.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

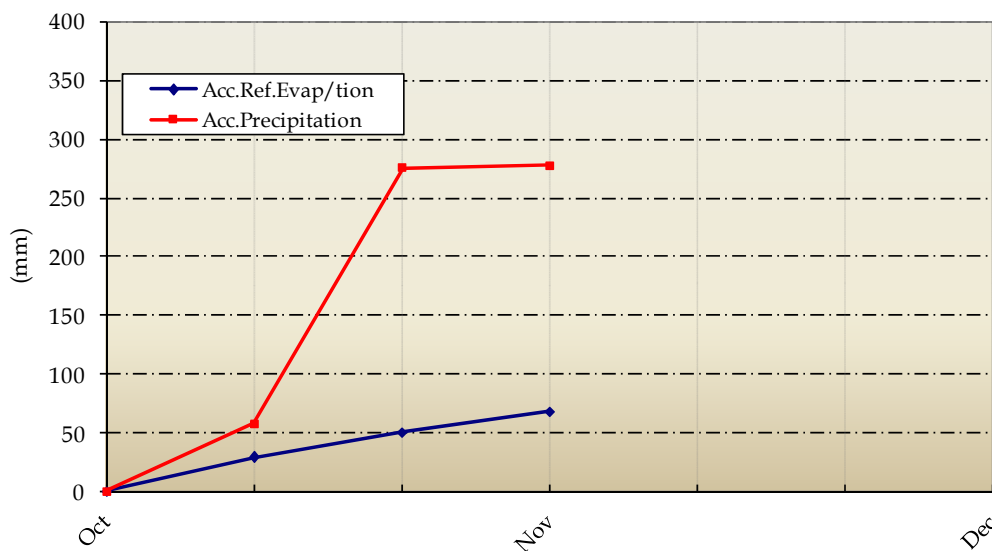


Andravida

3rd 10-day period (21-31/10/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.2	22.4	21.6	21.2	23.6	22.4	21.8	20.6	20.8	20.2	19.6	21.5	21.1	21.5
	Min	11.4	12.0	10.4	13.8	13.0	9.2	11.0	6.8	6.6	5.2	5.0	9.5	11.6	11.4
Relative Humidity	Max	87	95	96	98	89	90	88	89	100	94	90	92	95	-
	Min	45	57	51	56	44	42	35	38	35	39	33	43	57	-
Soil Temperature at 10 cm	06 UTC	14.0	15.0	15.0	16.8	16.4	14.8	14.8	13.0	12.6	12.2	12.0	14.2	15.9	16.1
	12 UTC	19.0	20.0	19.4	20.4	21.0	20.5	18.6	18.4	17.8	18.0	17.4	19.1	19.6	18.7
Sunshine Duration		8.8	6.7	2.4	3.9	7.2	7.5	5.2	8.8	9.0	8.2	7.2	6.8	6.1	6.3
Precipitation				2.3									2.3	71.3	50.1
Evaporation		2.8	1.2	2.1	2.5	1.7	1.0	0.2	2.8	3.0	1.2	3.8	22.3	21.9	31.6
Growing Degrees	5	11.8	12.2	11.0	12.5	13.3	10.8	11.4	8.7	8.7	7.7	7.3	115.4	124.9	126.2
	10	6.8	7.2	6.0	7.5	8.3	5.8	6.4	3.7	3.7	2.7	2.3	60.4	69.9	71.3

3rd 10-day period (21-31/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.9	17.8	18.7
Precipitation - Reference Evapotranspiration	-15.6	53.5	31.4
Number of Rainy Days	1.0	4.0	3.7
Number of Dry Days	6.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

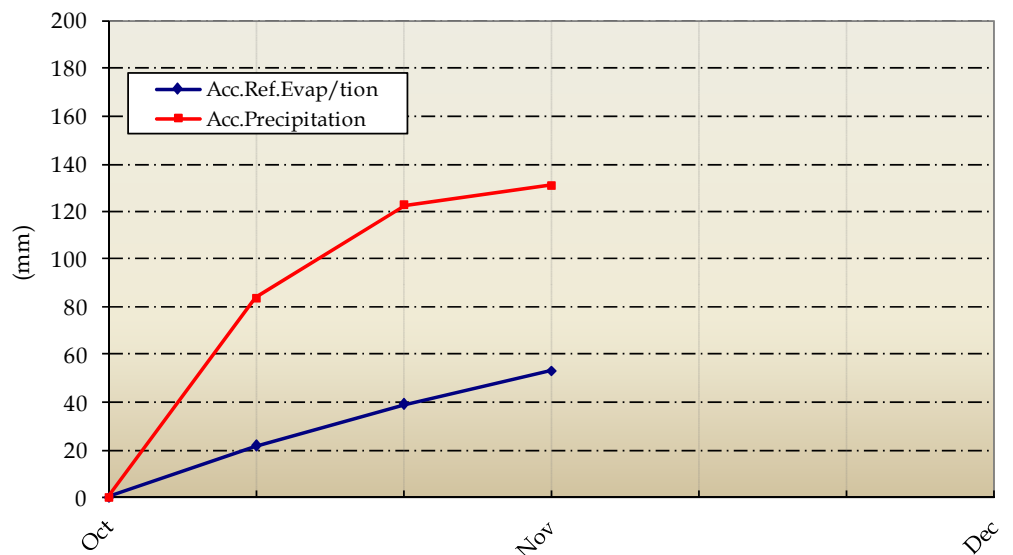


Ioannina

3rd 10-day period (21-31/10/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.0	19.0	13.8	16.6	19.2	18.0	17.2	15.4	18.0	17.0	16.2	17.2	-	17.6
	Min	3.0	9.0	8.6	10.8	9.0	4.4	5.0	1.6	-0.4	-0.4	-2.2	4.4	-	7.0
Relative Humidity	Max	100	97	98	97	95	97	94	92	92	88	89	94	-	-
	Min	51	55	90	61	42	44	36	39	35	39	31	48	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	11.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	13.8
Sunshine Duration		4.8	5.9	0.0	1.2	6.0	7.0	6.5	5.1	6.8	6.7	6.2	5.1	-	4.6
Precipitation				6.9	1.5								8.4	-	37.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	18.9
Growing Degrees	5	6.0	9.0	6.2	8.7	9.1	6.2	6.1	3.5	3.8	3.3	2.0	63.9	-	81.3
	10	1.0	4.0	1.2	3.7	4.1	1.2	1.1	0.0	0.0	0.0	0.0	16.3	-	30.0

3rd 10-day period (21-31/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.4	-	14.7
Precipitation - Reference Evapotranspiration	-6.0	-	22.9
Number of Rainy Days	2.0	-	3.8
Number of Dry Days	7.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

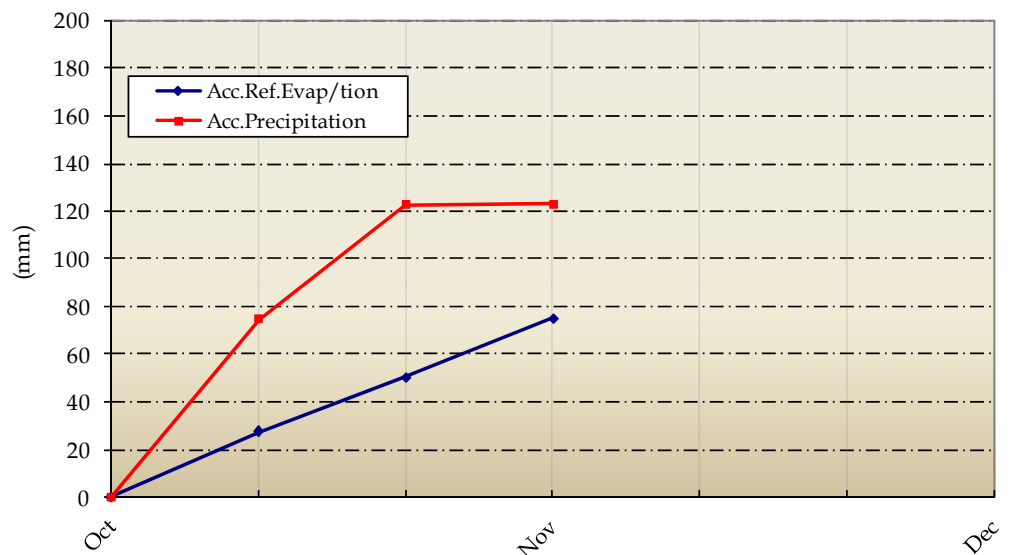


Kalamata

3rd 10-day period (21-31/10/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.0	23.4	22.0	22.2	22.6	23.2	21.6	22.2	21.8	21.4	20.6	22.1	22.2	22.3
	Min	8.4	9.0	12.0	13.6	12.2	11.4	14.4	9.6	8.8	9.0	8.6	10.6	11.6	11.5
Relative Humidity	Max	95	95	95	86	83	81	74	85	82	72	90	85	97	-
	Min	45	45	61	51	47	41	39	41	40	33	45	44	56	-
Soil Temperature at 10 cm	06 UTC	16.0	16.2	17.0	17.4	17.4	16.6	17.0	16.0	16.0	15.6	15.0	16.4	18.3	16.7
	12 UTC	17.4	17.6	18.0	18.2	18.2	17.8	17.2	17.2	17.0	16.8	16.4	17.4	19.2	18.5
Sunshine Duration		8.8	8.3	2.6	10.5	3.6	10.0	7.2	9.1	9.6	9.5	8.3	8.0	6.5	5.9
Precipitation				0.1									0.1	17.3	43.6
Evaporation		1.9	2.6	1.2	2.9	1.4	3.3	2.1	3.4	4.0	5.8	1.8	30.4	24.5	36.3
Growing Degrees	5	10.2	11.2	12.0	12.9	12.4	12.3	13.0	10.9	10.3	10.2	9.6	125.0	131.0	130.7
	10	5.2	6.2	7.0	7.9	7.4	7.3	8.0	5.9	5.3	5.2	4.6	70.0	76.0	75.7

3rd 10-day period (21-31/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	25.0	21.4	21.6
Precipitation - Reference Evapotranspiration	-24.9	-4.1	22.0
Number of Rainy Days	1.0	3.0	3.7
Number of Dry Days	6.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

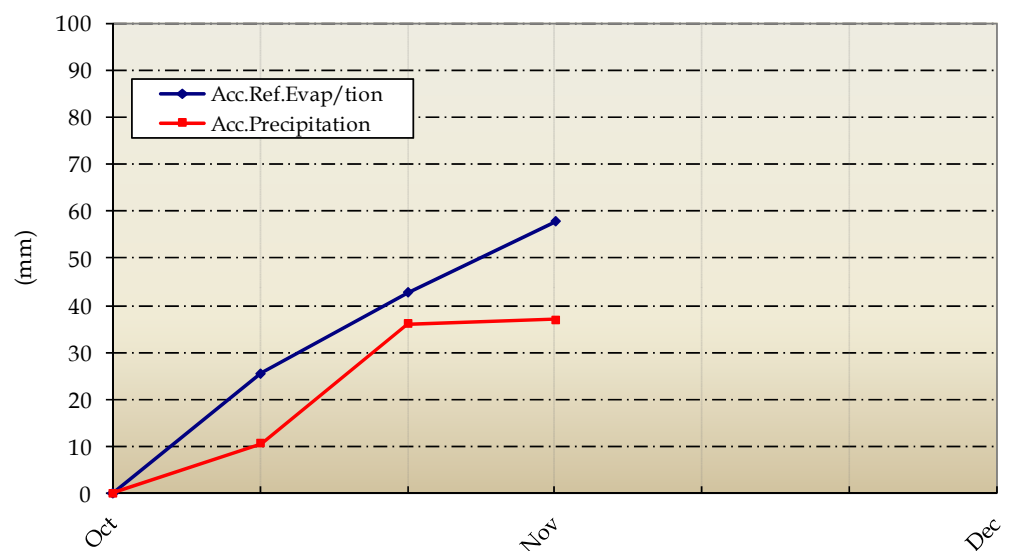


Larisa

3rd 10-day period (21-31/10/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.4	21.2	16.0	17.2	16.6	16.0	14.8	16.2	14.8	16.0	16.0	16.9	17.8	18.9
	Min	4.4	5.6	9.2	11.8	8.8	12.6	9.6	6.8	4.0	6.8	1.8	7.4	8.2	8.3
Relative Humidity	Max	95	97	98	90	95	91	85	88	91	91	91	92	96	-
	Min	40	48	70	61	61	63	52	47	57	46	44	54	57	-
Soil Temperature at 10 cm	06 UTC	13.2	13.6	14.0	15.0	14.0	15.0	15.0	13.4	12.6	12.6	11.8	13.7	14.8	14.6
	12 UTC	16.0	15.4	15.0	15.8	15.8	15.6	15.0	14.6	13.6	13.8	12.8	14.9	16.2	15.6
Sunshine Duration		8.2	7.5	1.4	0.0	0.4	0.0	1.3	6.4	3.6	4.8	2.5	3.3	4.6	4.4
Precipitation				1.0									1.0	46.3	23.9
Evaporation		4.4	3.6	0.7	1.1	0.5	3.7	2.2	0.6	0.8	1.4	1.4	20.4	21.9	24.8
Growing Degrees	5	7.9	8.4	7.6	9.5	7.7	9.3	7.2	6.5	4.4	6.4	3.9	78.8	87.9	94.1
	10	2.9	3.4	2.6	4.5	2.7	4.3	2.2	1.5	0.0	1.4	0.0	25.5	34.8	41.5

3rd 10-day period (21-31/10/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	15.1	14.8	16.4
Precipitation - Reference Evapotranspiration	-14.1	31.5	7.5
Number of Rainy Days	1.0	5.0	3.5
Number of Dry Days	6.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

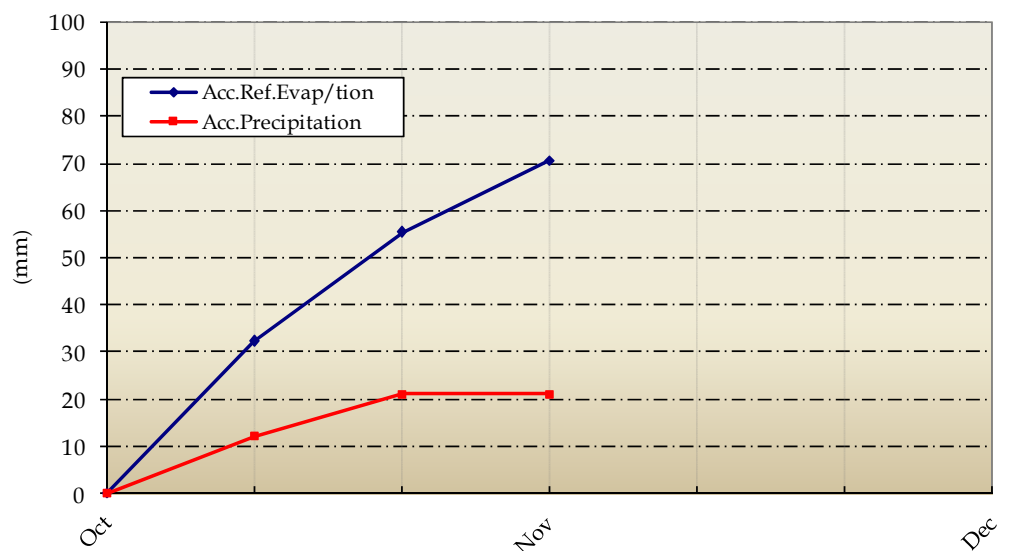


Mikra

3rd 10-day period (21-31/10/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.4	18.6	16.0	16.6	17.0	17.4	15.8	15.2	15.0	15.4	15.2	16.4	-	18.1
	Min	7.2	7.0	9.8	10.4	10.0	10.0	10.6	6.8	6.6	8.0	6.0	8.4	-	9.2
Relative Humidity	Max	100	97	91	95	82	81	70	83	85	82	83	86	-	-
	Min	53	53	68	53	58	41	43	47	52	62	79	55	-	-
Soil Temperature at 10 cm	06 UTC	13.2	13.6	14.6	15.1	14.6	14.2	14.2	13.2	12.6	13.2	12.2	13.7	-	13.8
	12 UTC	16.0	16.0	16.2	16.8	16.0	16.4	16.2	15.4	14.4	15.2	14.8	15.8	-	16.0
Sunshine Duration		7.9	8.9	0.1	1.7	2.6	1.0	4.8	7.6	7.2	6.3	7.1	5.0	-	4.6
Precipitation														-	21.1
Evaporation		6.6	0.6	1.5	1.5	2.3	3.2	2.8	1.9	1.5	2.0	0.9	24.8	-	29.7
Growing Degrees	5	7.8	7.8	7.9	8.5	8.5	8.7	8.2	6.0	5.8	6.7	5.6	81.5	-	95.5
	10	2.8	2.8	2.9	3.5	3.5	3.7	3.2	1.0	0.8	1.7	0.6	26.5	-	42.9

3rd 10-day period (21-31/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.3	-	17.3
Precipitation - Reference Evapotranspiration	-15.3	-	3.8
Number of Rainy Days	0.0	-	3.2
Number of Dry Days	16.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

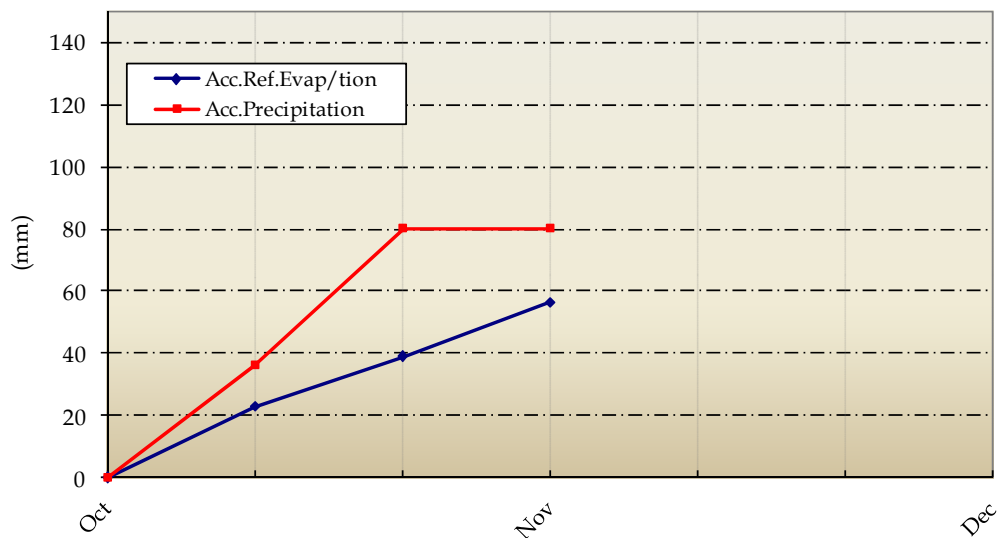


Tripoli

3rd 10-day period (21-31/10/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	20.8	17.0	17.6	13.6	14.6	15.0	17.8	16.0	13.6	15.2	16.5	17.5	17.6
	Min	1.4	2.4	5.8	8.0	8.8	8.0	9.2	2.4	1.4	4.2	-0.2	4.7	6.4	6.5
Relative Humidity	Max	100	96	94	97	89	87	74	93	96	84	96	91	97	-
	Min	34	35	53	55	62	55	49	38	43	48	47	47	56	-
Soil Temperature at 10 cm	06 UTC	9.0	9.4	11.0	12.4	12.4	10.8	12.0	9.4	9.2	9.0	8.2	10.3	12.0	12.8
	12 UTC	14.2	15.0	15.2	16.0	13.4	14.4	14.4	13.8	14.0	13.0	12.6	14.2	15.3	14.2
Sunshine Duration		8.0	8.2	3.8	4.9	0.4	5.2	3.8	6.8	5.9	7.8	8.1	5.7	5.2	5.3
Precipitation														51.3	39.1
Evaporation		0.4	1.0	3.1	2.5	0.5	2.2	2.8	2.7	3.5	0.7	1.0	20.4	16.3	23.9
Growing Degrees	5	5.7	6.6	6.4	7.8	6.2	6.3	7.1	5.1	3.7	3.9	2.5	61.3	76.2	77.8
	10	0.7	1.6	1.4	2.8	1.2	1.3	2.1	0.1	0.0	0.0	0.0	11.2	26.1	27.7

3rd 10-day period (21-31/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.5	15.0	18.0
Precipitation - Reference Evapotranspiration	-17.5	36.3	21.1
Number of Rainy Days	0.0	5.0	3.8
Number of Dry Days	14.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

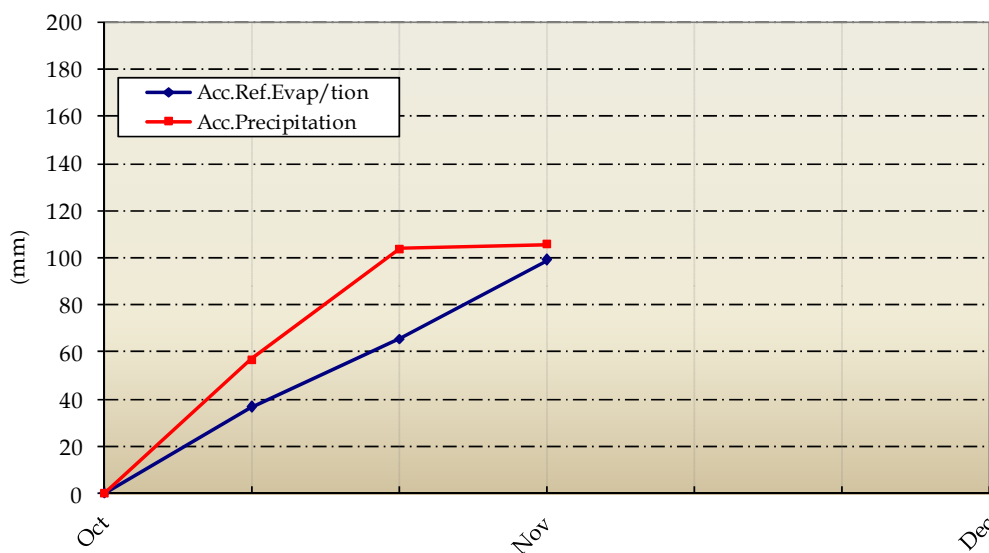


Tympaki

3rd 10-day period (21-31/10/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.6	23.4	22.6	23.2	19.4	21.8	20.6	20.6	20.2	20.2	20.2	21.3	22.8	23.2
	Min	10.4	10.2	11.0	15.4	12.6	13.4	13.4	11.4	11.2	11.6	9.6	11.8	14.9	13.7
Relative Humidity	Max	97	88	87	99	100	74	66	74	81	80	97	86	86	-
	Min	33	23	37	44	63	33	33	32	33	35	44	37	38	-
Soil Temperature at 10 cm	06 UTC	15.8	15.8	16.4	18.6	18.0	17.2	16.8	15.2	15.8	16.2	15.4	16.5	18.9	19.8
	12 UTC	20.4	20.6	20.6	21.2	19.0	21.0	20.0	21.0	19.8	19.6	20.0	20.3	22.6	23.3
Sunshine Duration		10.0	10.4	5.8	2.0	0.2	9.7	7.8	9.4	9.4	9.3	8.8	7.5	7.3	6.9
Precipitation						1.6							1.6	18.9	20.5
Evaporation		5.0	6.1	2.8	4.1	0.5	5.2	6.7	14.0	6.2	4.0	5.3	59.9	51.9	51.4
Growing Degrees	5	11.0	11.8	11.8	14.3	11.0	12.6	12.0	11.0	10.7	10.9	9.9	127.0	152.6	148.0
	10	6.0	6.8	6.8	9.3	6.0	7.6	7.0	6.0	5.7	5.9	4.9	72.0	97.6	93.0

3rd 10-day period (21-31/10/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	33.3	33.9	27.1
Precipitation - Reference Evapotranspiration	-31.7	-15.0	-6.6
Number of Rainy Days	1.0	3.0	2.3
Number of Dry Days	7.0	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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