



AGROMETEOROLOGICAL BULLETIN

November 2010
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



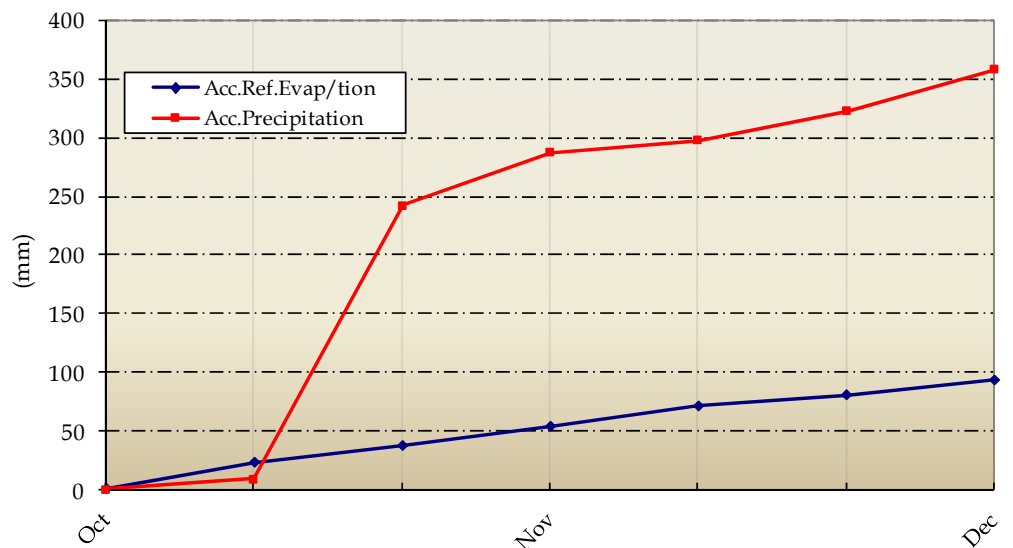
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www.hnms.gr
www.emy.gov.gr
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3rd 10-day period (21-30/11/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.3	21.2	20.6	17.0	17.0	19.5	19.2	21.0	22.4	20.4	20.1	-	16.7
	Min	9.6	11.2	13.2	10.4	8.5	11.2	15.0	12.4	15.0	10.0	11.6	-	6.4
Relative Humidity	Max	97	93	84	95	97	93	96	98	91	100	94	-	-
	Min	53	56	58	68	70	79	83	65	57	57	65	-	-
Soil Temperature at 10 cm	06 UTC	14.6	14.6	16.0	14.0	13.8	14.2	16.0	15.2	16.8	15.4	15.1	-	10.6
	12 UTC	16.0	15.4	16.0	14.8	14.8	15.0	16.2	16.4	17.6	16.4	15.9	-	12.7
Sunshine Duration		6.5	0.7	1.3	1.2	2.1	0.0	1.1	2.6	0.2	1.6	1.7	-	4.2
Precipitation				6.5	13.8	10.4	3.8	0.7				35.2	-	63.5
Evaporation		1.0	1.5	2.9	1.6	0.6	1.2	1.0	1.8	1.8	1.4	14.8	-	15.9
Growing Degrees	5	11.0	11.2	11.9	8.7	7.8	10.4	12.1	11.7	13.7	10.2	108.6	-	65.9
	10	6.0	6.2	6.9	3.7	2.8	5.4	7.1	6.7	8.7	5.2	58.6	-	21.3

3rd 10-day period (21-30/11/2010)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.8	- 9.9
Precipitation - Reference Evapotranspiration	22.4	- 53.6
Number of Rainy Days	5.0	- 4.9
Number of Dry Days	4.0	- -

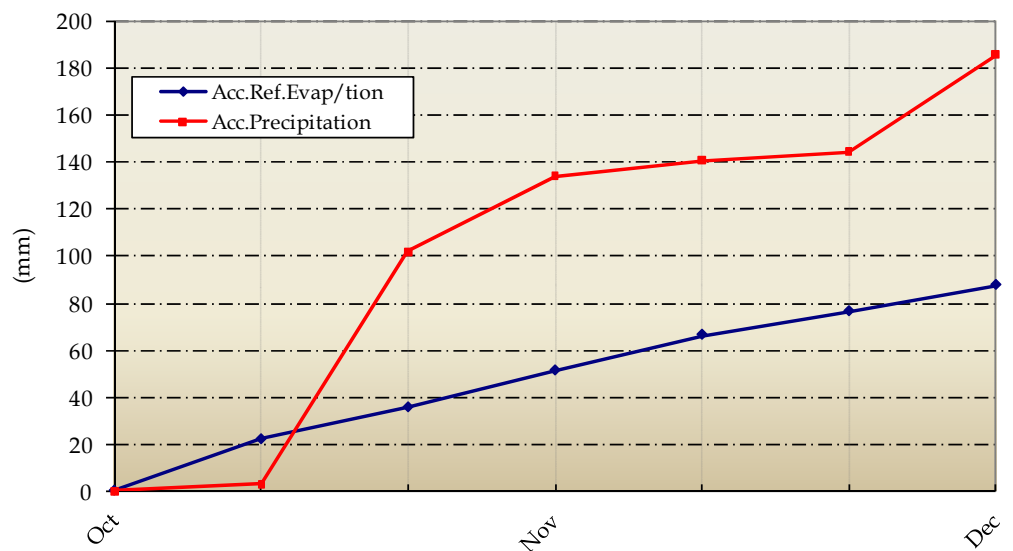
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/11/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.0	14.0	19.4	18.2	16.4	17.0	20.0	16.2	21.0	19.6	17.9	16.1	12.8
	Min	9.0	8.4	10.4	14.6	10.0	7.8	13.0	13.0	13.4	16.8	11.6	5.2	5.0
Relative Humidity	Max	97	97	91	89	94	95	95	95	88	90	93	97	-
	Min	68	83	66	52	60	76	67	83	64	69	69	71	-
Soil Temperature at 10 cm	06 UTC	13.0	12.4	13.0	13.4	12.4	11.5	14.0	13.8	14.2	14.6	13.2	10.4	8.6
	12 UTC	14.4	13.6	14.2	14.0	13.4	14.4	14.6	14.2	15.4	15.0	14.3	12.0	10.3
Sunshine Duration		6.1	0.0	0.9	7.7	7.6	4.4	0.1	0.0	0.0	0.0	2.7	6.5	3.2
Precipitation				17.9	0.4	7.3	2.1	10.0	3.8			41.5		32.9
Evaporation		0.4	3.9	0.4	6.3	1.2	0.1	1.6	2.0	1.6	0.2	17.7	8.9	16.3
Growing Degrees	5	8.0	6.2	9.9	11.4	8.2	7.4	11.5	9.6	12.2	13.2	97.6	56.6	42.5
	10	3.0	1.2	4.9	6.4	3.2	2.4	6.5	4.6	7.2	8.2	47.6	9.1	11.5

3rd 10-day period (21-30/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.2	6.5	9.6
Precipitation - Reference Evapotranspiration	30.3	-6.5	23.3
Number of Rainy Days	6.0	0.0	3.3
Number of Dry Days	4.0	17.0	-

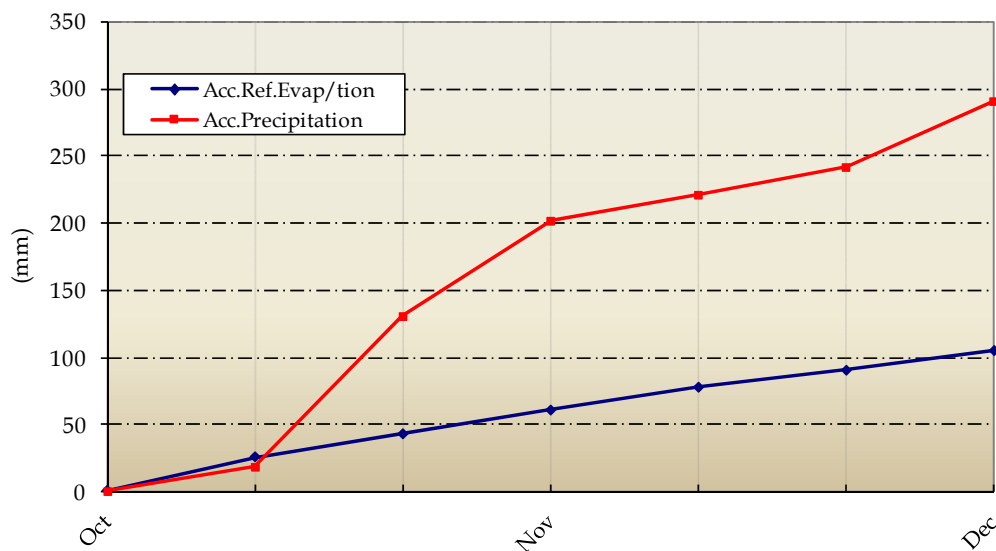
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/11/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.0	21.2	20.4	18.6	18.2	19.6	22.6	25.0	22.2	20.2	21.0	18.9	17.0
	Min	11.8	11.0	13.2	12.0	10.8	13.0	18.2	13.2	15.6	12.8	13.2	9.0	8.6
Relative Humidity	Max	98	93	92	93	93	98	90	91	90	88	93	97	-
	Min	56	48	63	55	60	79	67	41	65	61	60	65	-
Soil Temperature at 10 cm	06 UTC	14.4	14.6	15.8	14.0	13.8	14.4	16.8	16.0	17.2	15.6	15.3	13.5	11.7
	12 UTC	17.8	16.2	17.2	16.6	16.4	16.0	19.0	19.0	19.4	17.2	17.5	16.0	13.4
Sunshine Duration		7.0	1.0	3.4	2.8	5.5	0.0	2.9	4.8	0.7	2.9	3.1	5.7	4.6
Precipitation				6.5	2.6	3.9	36.0	0.2				49.2		62.9
Evaporation		2.5	0.4	1.2	0.4	0.6	1.7	4.1	4.3	1.1	2.0	18.3	9.2	20.2
Growing Degrees	5	11.9	11.1	11.8	10.3	9.5	11.3	15.4	14.1	13.9	11.5	120.8	89.6	78.3
	10	6.9	6.1	6.8	5.3	4.5	6.3	10.4	9.1	8.9	6.5	70.8	39.6	31.1

3rd 10-day period (21-30/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.7	9.3	10.9
Precipitation - Reference Evapotranspiration	34.5	-9.3	52.0
Number of Rainy Days	5.0	0.0	5.0
Number of Dry Days	4.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

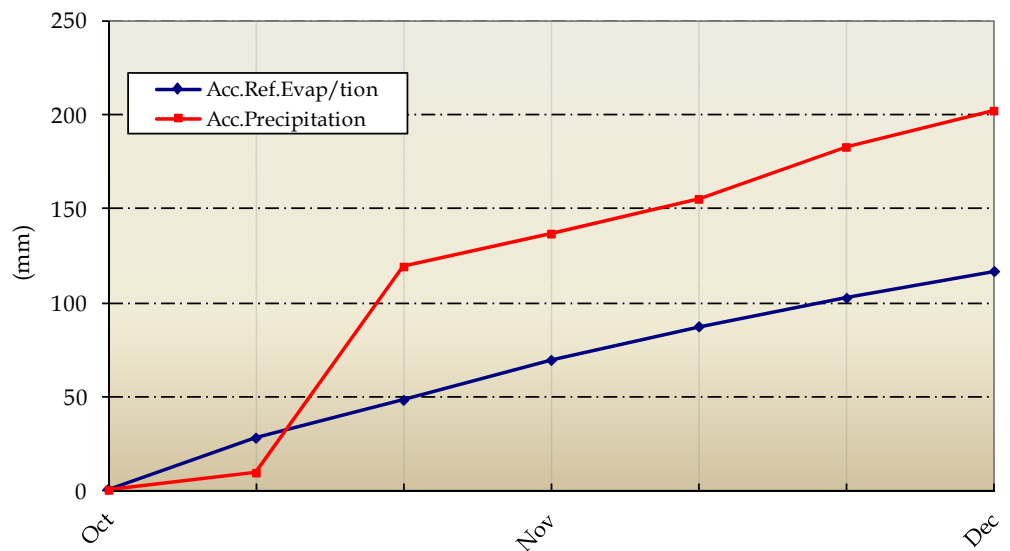


Kalamata

3rd 10-day period (21-30/11/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.4	23.4	21.0	19.0	19.4	20.8	22.6	22.0	22.8	20.0	21.3	20.1	18.0
	Min	7.8	10.0	12.8	10.0	10.0	11.4	17.0	14.4	14.8	8.4	11.7	7.6	8.3
Relative Humidity	Max	98	97	98	97	100	98	94	98	92	97	97	95	-
	Min	57	43	53	53	57	67	65	60	64	66	58	56	-
Soil Temperature at 10 cm	06 UTC	15.4	15.8	16.6	16.0	16.0	15.4	16.6	17.0	17.6	16.2	16.3	13.3	12.7
	12 UTC	16.6	16.4	17.2	16.4	16.4	16.2	17.2	17.4	17.8	16.6	16.8	14.4	13.9
Sunshine Duration		8.7	2.6	3.6	2.6	5.9	2.0	4.4	0.6	0.0	5.8	3.6	7.1	4.3
Precipitation				3.1	8.6	4.5	2.8					19.0		54.0
Evaporation		4.1	0.1	1.5	1.5	0.8	0.3	2.1	2.3	1.6	0.8	15.1	18.5	26.0
Growing Degrees	5	10.1	11.7	11.9	9.5	9.7	11.1	14.8	13.2	13.8	9.2	115.0	88.7	81.4
	10	5.1	6.7	6.9	4.5	4.7	6.1	9.8	8.2	8.8	4.2	65.0	38.7	33.0

3rd 10-day period (21-30/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.3	13.2	12.1
Precipitation - Reference Evapotranspiration	4.7	-13.2	41.9
Number of Rainy Days	4.0	0.0	4.8
Number of Dry Days	5.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

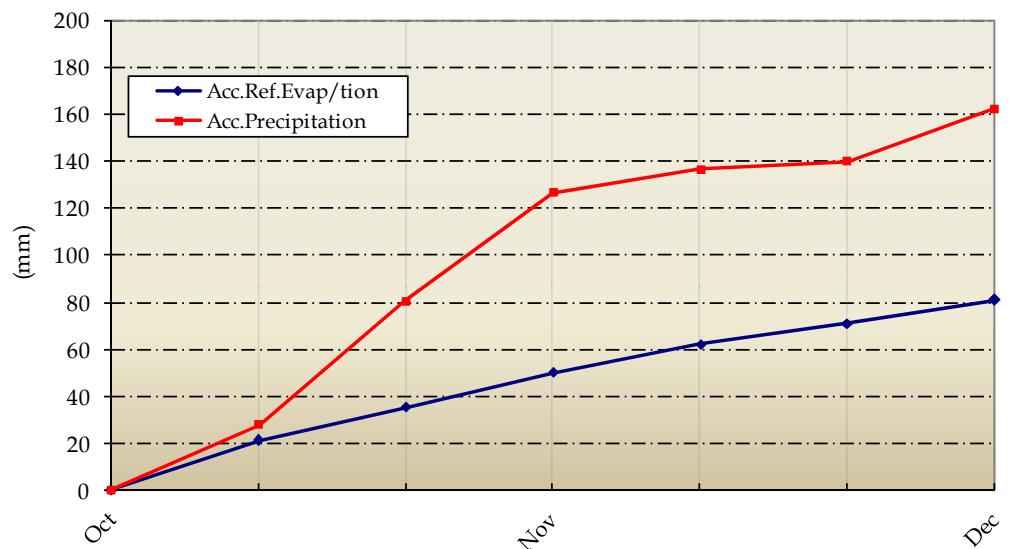


Larisa

3rd 10-day period (21-30/11/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.4	18.2	18.4	17.6	15.4	10.4	20.0	18.4	21.8	18.0	17.9	17.9	13.6
	Min	6.0	8.6	10.4	6.6	3.8	5.0	9.2	5.8	10.2	9.0	7.5	2.9	4.1
Relative Humidity	Max	97	95	92	94	97	97	97	100	95	92	96	97	-
	Min	55	68	45	50	62	72	43	68	48	63	57	50	-
Soil Temperature at 10 cm	06 UTC	10.2	13.0	14.0	13.2	12.4	12.2	12.0	11.8	12.4	12.6	12.4	10.0	9.5
	12 UTC	13.8	13.6	14.6	13.4	13.6	12.0	13.0	13.0	13.4	13.4	13.4	11.0	10.2
Sunshine Duration		7.7	4.1	4.1	5.0	5.1	0.3	6.7	7.0	1.4	0.0	4.1	6.6	3.5
Precipitation				0.2	1.3	0.1	14.5	6.5		0.0		22.6		21.8
Evaporation		0.9	1.6	2.2	0.1	0.0	1.2	1.6	2.6	0.9	0.0	11.1	11.9	10.2
Growing Degrees	5	8.2	8.4	9.4	7.1	4.6	2.7	9.6	7.1	11.0	8.5	76.6	54.0	40.6
	10	3.2	3.4	4.4	2.1	0.0	0.0	4.6	2.1	6.0	3.5	29.3	5.4	8.0

3rd 10-day period (21-30/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.0	6.7	7.3
Precipitation - Reference Evapotranspiration	12.6	-6.7	14.5
Number of Rainy Days	5.0	0.0	3.5
Number of Dry Days	5.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

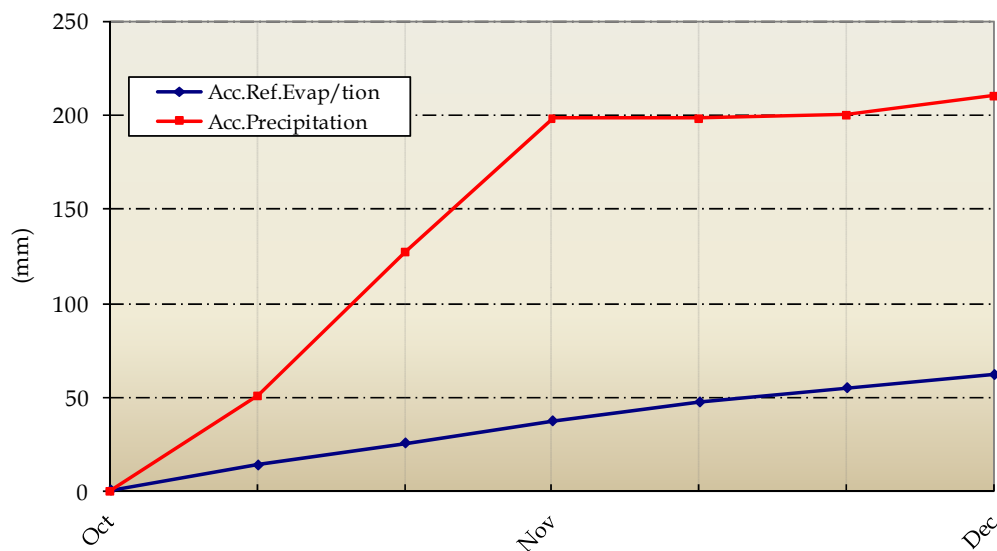


Series

3rd 10-day period (21-30/11/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.8	17.4	20.0	19.8	17.2	10.8	11.4	16.2	24.2	16.4	17.1	17.0	12.0
	Min	5.0	9.8	14.6	6.4	4.4	7.0	7.2	5.0	12.2	7.6	7.9	2.3	3.6
Relative Humidity	Max	96	95	91	97	97	97	98	97	92	95	96	94	-
	Min	50	53	40	30	40	80	97	75	47	63	58	51	-
Soil Temperature at 10 cm	06 UTC	10.8	11.6	13.6	12.0	11.0	10.4	11.0	10.4	12.4	12.0	11.5	7.6	7.5
	12 UTC	11.8	12.4	14.4	12.4	11.0	10.6	11.2	10.6	13.4	10.8	11.9	8.8	8.5
Sunshine Duration		5.2	0.0	3.5	4.8	5.3	0.0	0.0	2.4	2.8	0.7	2.5	4.5	3.3
Precipitation					0.2	0.8	6.7	2.6				10.3		18.2
Evaporation		0.7	1.2	2.2	0.4	1.5	0.4	0.0	0.6	0.7	0.3	8.0	7.0	7.3
Growing Degrees	5	6.4	8.6	12.3	8.1	5.8	3.9	4.3	5.6	13.2	7.0	75.2	46.6	32.8
	10	1.4	3.6	7.3	3.1	0.8	0.0	0.0	0.6	8.2	2.0	27.0	2.5	5.9

3rd 10-day period (21-30/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.0	5.6	5.6
Precipitation - Reference Evapotranspiration	3.3	-5.6	12.6
Number of Rainy Days	4.0	0.0	3.3
Number of Dry Days	6.0	20.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

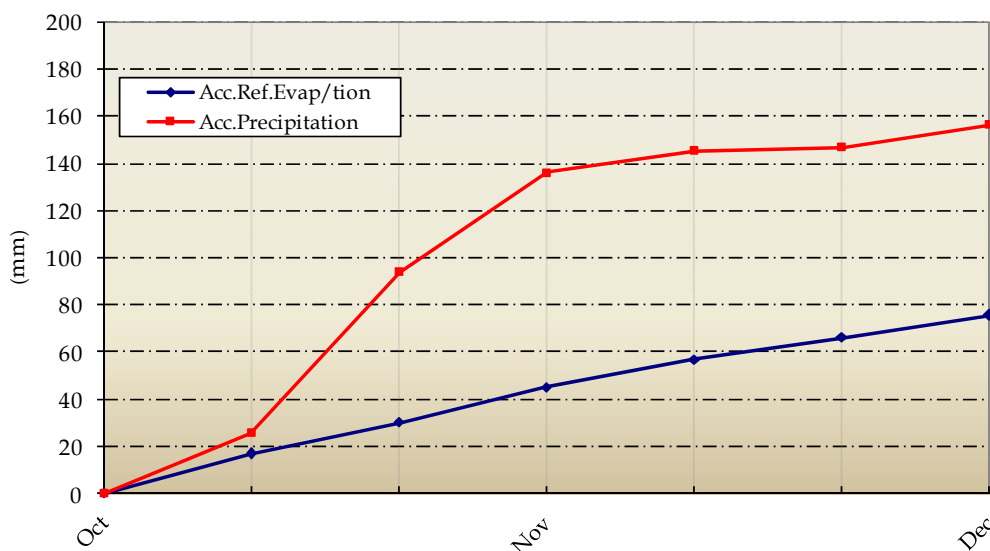


Trikala Imathias

3rd 10-day period (21-30/11/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.0	18.0	22.0	20.2	17.8	11.8	20.2	17.2	23.8	19.2	18.9	18.8	12.8
	Min	6.6	12.0	11.6	11.6	3.0	6.2	6.0	6.8	10.6	9.0	8.3	4.0	4.4
Relative Humidity	Max	95	93	95	99	94	99	95	100	95	99	96	98	-
	Min	60	88	30	31	42	90	32	68	40	75	56	50	-
Soil Temperature at 10 cm	06 UTC	12.8	14.0	14.6	14.0	11.8	12.0	11.4	11.8	12.6	13.0	12.8	9.3	9.2
	12 UTC	13.2	14.0	15.2	14.0	12.6	12.0	12.2	12.2	13.4	13.0	13.2	11.2	9.5
Sunshine Duration		5.9	0.0	5.8	5.0	6.1	0.0	3.2	2.9	3.7	0.1	3.3	6.4	3.6
Precipitation				0.2			5.8	3.2		0.4		9.6		30.6
Evaporation		0.9	0.4	3.6	0.3	2.1	0.4	0.8	0.3	1.1	0.6	10.5	12.8	7.1
Growing Degrees	5	7.8	10.0	11.8	10.9	5.4	4.0	8.1	7.0	12.2	9.1	86.3	63.8	39.1
	10	2.8	5.0	6.8	5.9	0.4	0.0	3.1	2.0	7.2	4.1	37.3	14.2	7.8

3rd 10-day period (21-30/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.5	6.9	6.9
Precipitation - Reference Evapotranspiration	0.1	-6.9	23.7
Number of Rainy Days	4.0	0.0	3.4
Number of Dry Days	5.0	20.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

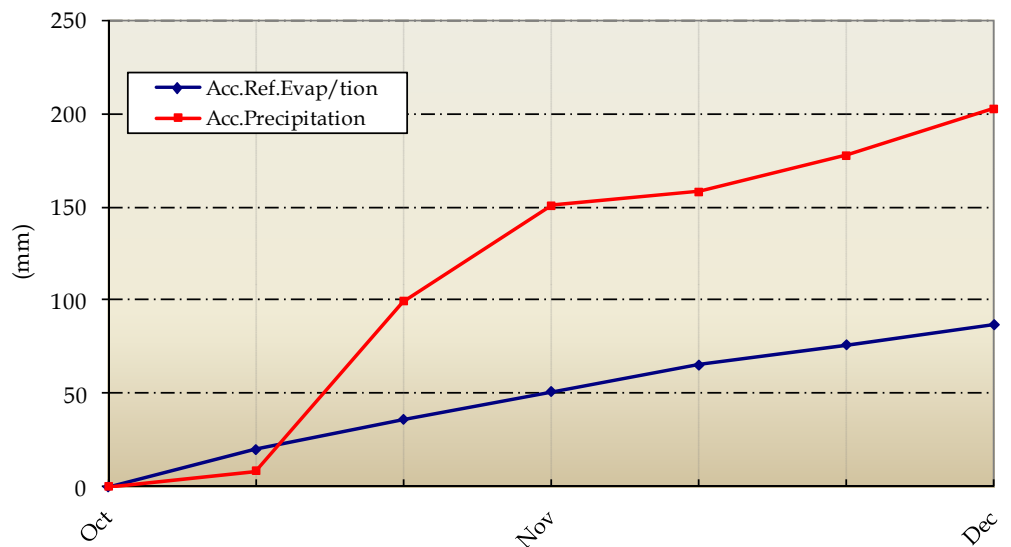


Tripoli

3rd 10-day period (21-30/11/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	17.4	17.0	13.8	14.0	14.6	18.4	20.0	19.6	19.6	17.3	-	12.9
	Min	2.4	4.4	9.8	8.6	7.6	9.2	13.4	7.4	13.8	7.4	8.4	-	3.6
Relative Humidity	Max	96	97	82	89	94	95	89	97	80	89	91	-	-
	Min	55	61	43	64	59	74	62	55	62	25	56	-	-
Soil Temperature at 10 cm	06 UTC	8.8	9.4	11.8	9.8	9.6	10.2	12.4	10.8	12.4	10.8	10.6	-	8.3
	12 UTC	12.6	12.2	14.2	12.0	11.4	12.4	14.0	13.8	14.6	13.2	13.0	-	9.4
Sunshine Duration		6.9	3.8	5.1	5.9	5.5	1.4	6.2	4.0	5.4	6.5	5.1	-	4.2
Precipitation				13.3	1.8	3.7	6.1					24.9	-	45.1
Evaporation		1.0	1.0	1.7	1.0	0.7	0.5	1.0	1.0	2.0	2.0	11.9	-	13.0
Growing Degrees	5	5.3	5.9	8.4	6.2	5.8	6.9	10.9	8.7	11.7	8.5	78.3	-	35.8
	10	0.3	0.9	3.4	1.2	0.8	1.9	5.9	3.7	6.7	3.5	28.3	-	5.3

3rd 10-day period (21-30/11/2010)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.8	9.3
Precipitation - Reference Evapotranspiration	14.1	35.8
Number of Rainy Days	4.0	4.7
Number of Dry Days	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

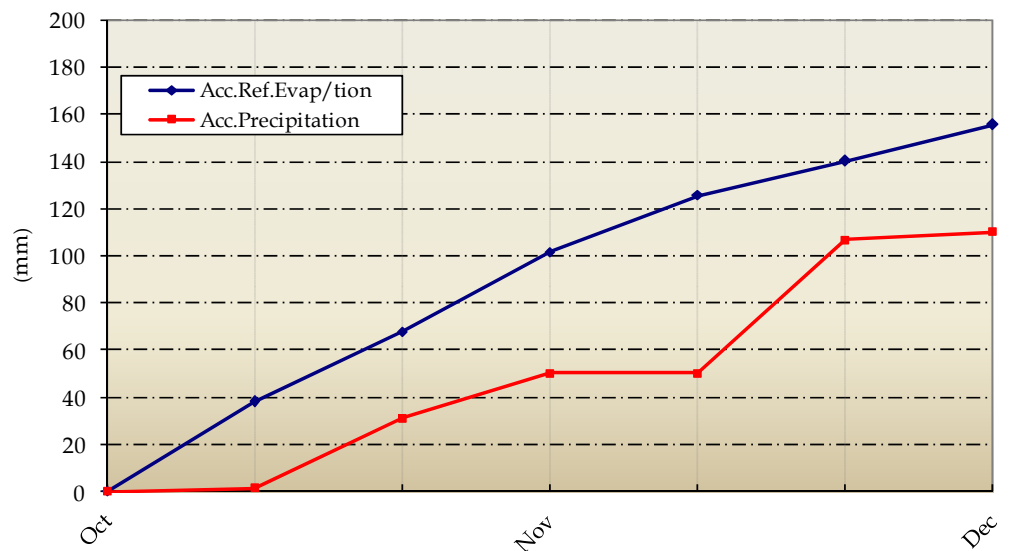


Tympaki

3rd 10-day period (21-30/11/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.8	21.6	23.2	22.0	22.8	21.8	25.0	26.8	26.0	22.2	23.3	21.5	19.5
	Min	12.2	11.0	13.8	17.0	15.0	13.6	11.2	15.6	15.8	12.2	13.7	11.1	11.0
Relative Humidity	Max	97	97	95	96	98	99	98	88	96	98	96	98	-
	Min	55	54	55	40	59	59	27	33	32	64	48	50	-
Soil Temperature at 10 cm	06 UTC	16.0	15.6	16.6	18.0	18.0	17.0	15.6	16.4	17.2	16.6	16.7	15.2	14.6
	12 UTC	20.0	19.8	19.8	20.4	21.0	20.2	19.8	20.0	21.6	20.2	20.3	18.9	16.9
Sunshine Duration		9.1	8.1	3.7	4.3	5.3	7.3	4.7	4.5	6.6	3.8	5.7	4.4	5.0
Precipitation					0.4	2.9						3.3	6.3	38.6
Evaporation		2.9	3.4	3.4	3.4	3.5	2.2	2.5	3.5	1.4	1.0	27.2	22.0	30.7
Growing Degrees	5	12.0	11.3	13.5	14.5	13.9	12.7	13.1	16.2	15.9	12.2	135.3	113.0	102.1
	10	7.0	6.3	8.5	9.5	8.9	7.7	8.1	11.2	10.9	7.2	85.3	63.0	52.3

3rd 10-day period (21-30/11/2010)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	15.4	17.7	15.8
Precipitation - Reference Evapotranspiration	-12.1	-11.4	22.8
Number of Rainy Days	2.0	2.0	3.4
Number of Dry Days	8.0	15.0	-

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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ΥΠΗΡΕΣΙΑ

HELLENIC NATIONAL METEOROLOGICAL SERVICE

Division of Climatology-Applications

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The present bulletin was designed and implemented under the support of Water Resources Management Division of Agriculture University of Athens (Professor A. Liakatas)