

AGROMETEOROLOGICAL BULLETIN

November 2012
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



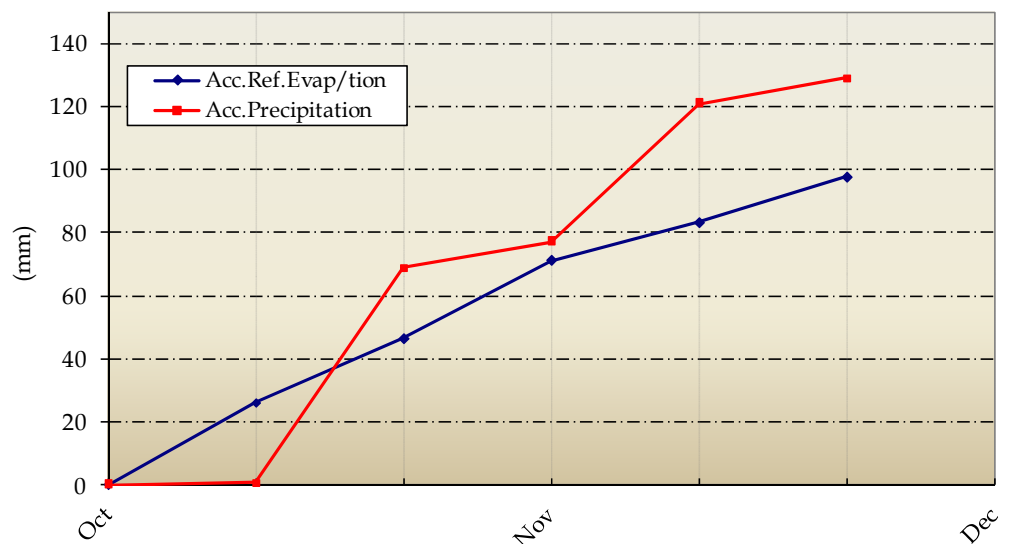
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2nd 10-day period (11-20/11/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.6	17.6	20.8	21.6	20.6	21.4	22.4	20.6	18.8	20.4	20.5	17.0	18.6
	Min	6.2	5.6	5.0	3.2	8.6	8.8	10.0	7.0	12.0	14.2	8.1	2.6	7.7
Relative Humidity	Max	85	94	97	97	92	87	81	91	91	95	91	79	-
	Min	39	52	38	47	56	51	50	55	59	69	52	36	-
Soil Temperature at 10 cm	06 UTC	13.2	13.2	13.2	12.4	13.0	13.0	13.6	13.4	12.4	15.2	13.3	11.2	12.0
	12 UTC	14.6	14.4	14.4	13.8	13.6	14.6	15.0	14.6	15.0	17.0	14.7	12.9	14.1
Sunshine Duration		9.0	2.3	8.2	8.7	7.5	7.5	9.0	5.4	0.0	0.6	5.8	8.0	4.4
Precipitation										5.0	3.1	8.1		53.7
Evaporation		1.8	1.1	1.2	2.8	3.5	3.0	1.4	2.6	3.9	2.0	23.3	-	17.2
Growing Degrees	5	8.4	6.6	7.9	7.4	9.6	10.1	11.2	8.8	10.4	12.3	92.7	48.1	81.2
	10	3.4	1.6	2.9	2.4	4.6	5.1	6.2	3.8	5.4	7.3	42.7	7.9	33.0

2nd 10-day period (11-20/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.4	11.0	11.3
Precipitation - Reference Evapotranspiration	-6.3	-11.0	42.4
Number of Rainy Days	2.0	0.0	4.4
Number of Dry Days	10.0	35.0	-

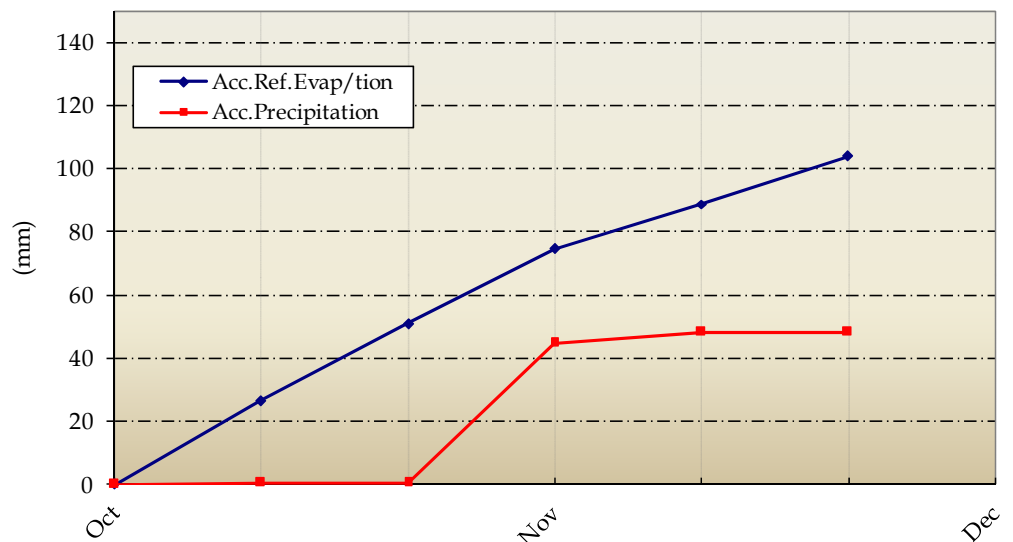
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/11/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.0	17.6	17.4	15.8	15.4	16.4	16.4	17.0	17.0	17.0	16.9	10.3	14.4
	Min	7.8	5.2	5.8	7.0	8.6	10.6	11.6	9.6	9.0	10.5	8.6	2.3	6.2
Relative Humidity	Max	92	91	91	92	81	78	81	88	80	80	85	77	-
	Min	41	49	50	49	54	50	53	50	53	66	52	42	-
Soil Temperature at 10 cm	06 UTC	13.0	12.6	12.2	12.2	12.6	13.0	13.6	13.0	13.0	14.4	13.0	8.7	9.7
	12 UTC	15.0	14.2	14.0	13.6	14.2	14.4	14.8	14.4	14.2	14.6	14.3	9.9	11.5
Sunshine Duration		8.3	7.3	5.1	4.7	8.5	6.6	7.3	8.3	6.3	0.0	6.2	5.3	3.9
Precipitation													0.0	29.1
Evaporation		2.3	3.5	0.6	3.1	3.3	1.4	3.9	3.7	2.5	1.1	25.4	14.1	18.6
Growing Degrees	5	8.4	6.4	6.6	6.4	7.0	8.5	9.0	8.3	8.0	8.8	77.4	15.4	54.2
	10	3.4	1.4	1.6	1.4	2.0	3.5	4.0	3.3	3.0	3.8	27.4	0.0	17.6

2nd 10-day period (11-20/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.0	14.9	11.3
Precipitation - Reference Evapotranspiration	-15.0	-14.9	17.8
Number of Rainy Days	0.0	0.0	2.9
Number of Dry Days	18.0	34.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

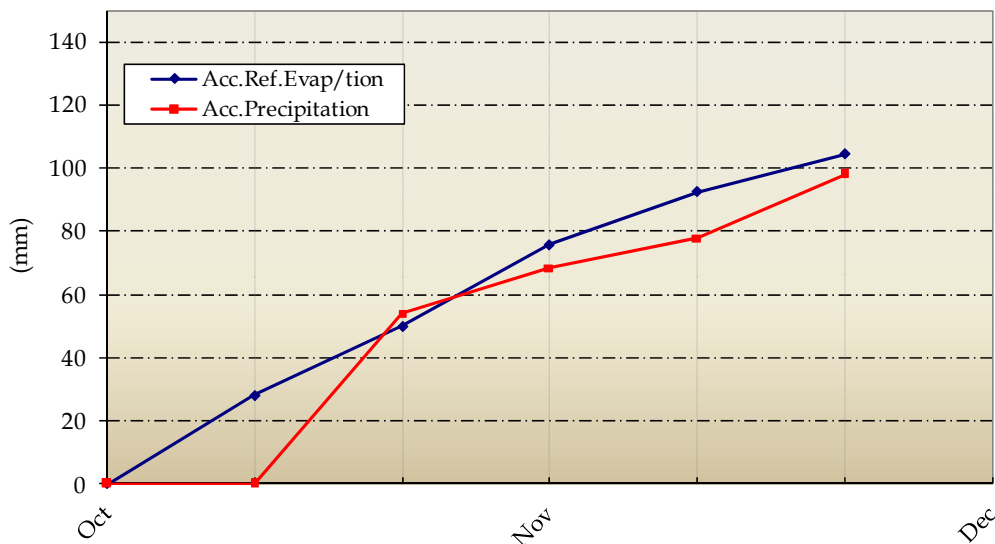


Andravida

2nd 10-day period (11-20/11/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.6	18.4	20.2	21.4	22.0	21.4	22.8	21.2	19.6	19.5	20.8	16.3	18.6
	Min	7.4	7.0	7.7	7.4	7.3	7.8	7.0	7.0	12.2	12.8	8.4	5.2	9.7
Relative Humidity	Max	87	91	89	91	91	87	90	91	88	90	90	85	-
	Min	42	53	47	47	39	39	39	49	54	66	48	39	-
Soil Temperature at 10 cm	06 UTC	14.4	14.4	14.2	13.8	14.2	14.4	13.8	14.0	15.4	15.8	14.4	10.5	13.2
	12 UTC	17.8	16.6	17.6	17.0	17.4	17.2	17.2	16.4	16.8	16.4	17.0	14.6	15.2
Sunshine Duration		8.0	1.3	8.5	9.0	6.7	1.0	8.6	4.4	0.0	0.7	4.8	7.0	4.9
Precipitation										8.9	11.4	20.3		50.9
Evaporation		1.0	2.0	1.5	1.2	0.9	0.9	0.6	0.9	0.0	0.0	9.0	22.8	21.4
Growing Degrees	5	9.5	7.7	9.0	9.4	9.7	9.6	9.9	9.1	10.9	11.2	95.9	57.8	91.7
	10	4.5	2.7	4.0	4.4	4.7	4.6	4.9	4.1	5.9	6.2	45.9	11.9	42.4

2nd 10-day period (11-20/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.1	13.5	11.8
Precipitation - Reference Evapotranspiration	8.2	-13.5	39.1
Number of Rainy Days	2.0	0.0	4.2
Number of Dry Days	10.0	28.0	-

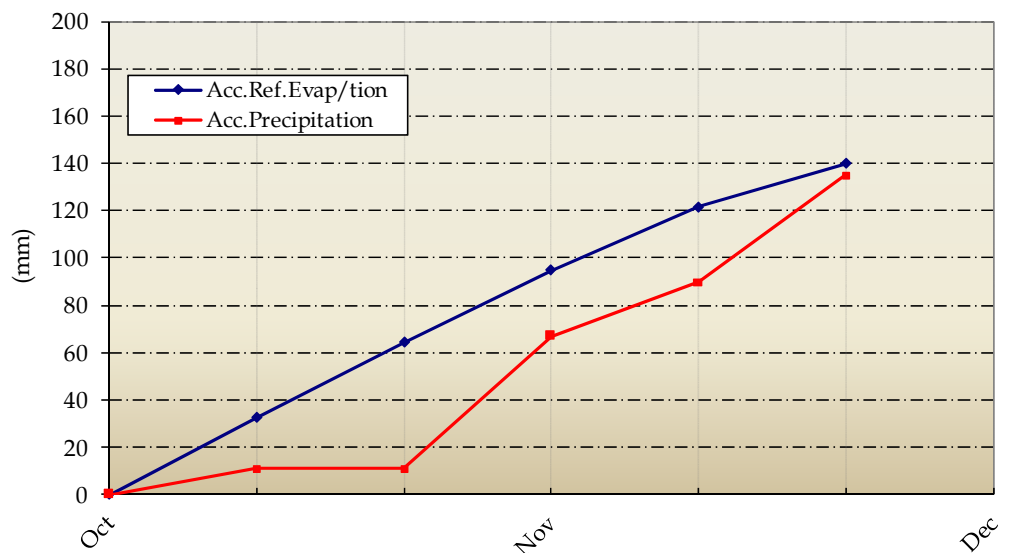
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/11/2012)		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	19.4	20.4	20.2	19.8	21.0	20.8	20.0	21.6	22.0	20.4	-	19.7
	Min	15.4	17.2	17.4	16.8	15.6	13.8	15.2	15.2	13.8	18.0	15.8	-	13.2
Relative Humidity	Max	74	76	78	74	79	87	96	96	91	90	84	-	-
	Min	61	62	64	62	60	68	71	78	64	67	66	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		7.1	1.9	6.0	6.2	5.1	1.8	6.1	2.0	1.9	2.1	4.0	-	4.9
Precipitation								26.6	10.6		7.9	45.1	-	22.2
Evaporation		4.7	-	2.3	2.5	6.0	7.5	0.0	0.3	2.3	0.2	-	-	33.6
Growing Degrees	5	12.3	13.3	13.9	13.5	12.7	12.4	13.0	12.6	12.7	15.0	131.4	-	114.3
	10	7.3	8.3	8.9	8.5	7.7	7.4	8.0	7.6	7.7	10.0	81.4	-	64.3

2nd 10-day period (11-20/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.2	-	-
Precipitation - Reference Evapotranspiration	26.9	-	22.2
Number of Rainy Days	3.0	-	2.7
Number of Dry Days	7.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

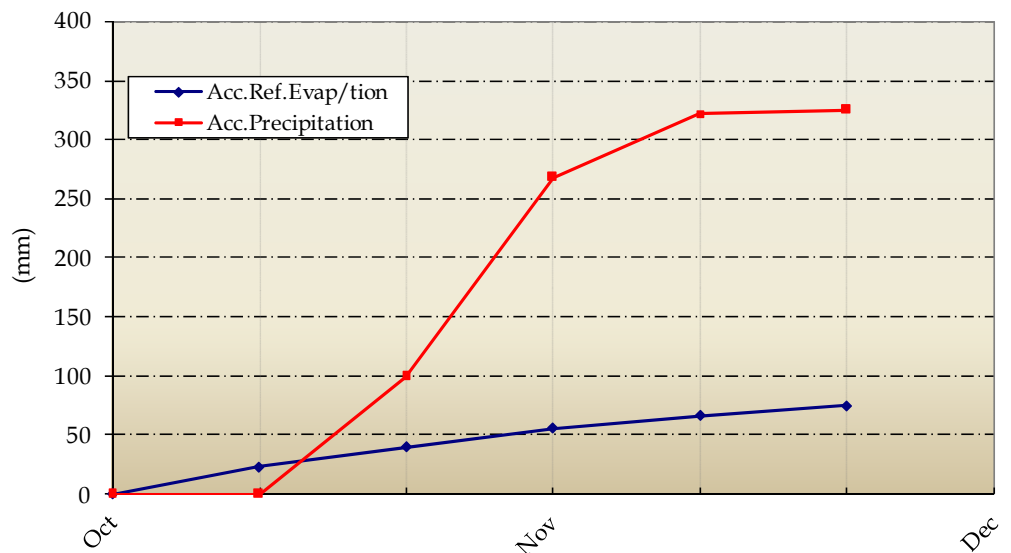


Ioannina

2nd 10-day period (11-20/11/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.8	13.8	17.2	18.0	16.6	18.6	19.0	16.8	13.8	16.8	16.7	11.9	13.9
	Min	1.0	2.4	3.8	3.8	5.2	5.4	2.4	3.0	5.2	11.0	4.3	-0.2	4.6
Relative Humidity	Max	96	97	97	97	94	88	93	100	90	95	95	82	-
	Min	39	62	62	53	52	38	31	44	67	63	51	35	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	8.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.1
Sunshine Duration		6.4	3.0	3.0	4.7	2.6	6.2	6.3	4.6	0.0	0.5	3.7	5.4	3.0
Precipitation										2.6	0.8	3.4		63.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	13.4
Growing Degrees	5	3.9	3.1	5.5	5.9	5.9	7.0	5.7	4.9	4.5	8.9	55.3	16.4	44.8
	10	0.0	0.0	0.5	0.9	0.9	2.0	0.7	0.0	0.0	3.9	8.9	3.1	8.8

2nd 10-day period (11-20/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.8	15.4	7.9
Precipitation - Reference Evapotranspiration	-5.4	-15.4	55.7
Number of Rainy Days	2.0	0.0	4.4
Number of Dry Days	11.0	10.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

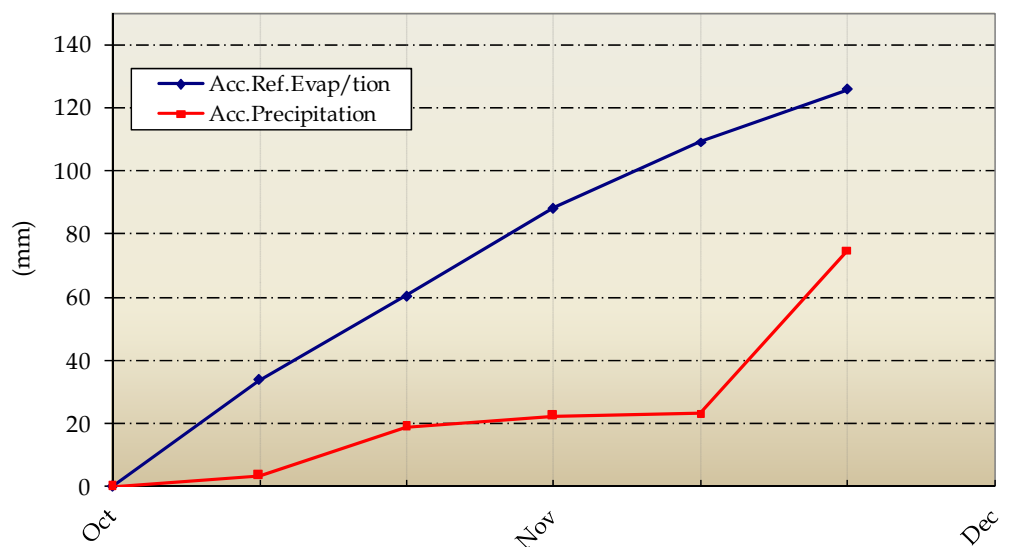


Kalamata

2nd 10-day period (11-20/11/2012)		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	20.6	21.4	22.4	21.8	22.0	23.6	21.7	21.6	17.0	21.4	17.2	19.5
	Min	10.7	8.1	8.2	7.8	9.8	11.4	13.2	10.5	12.6	13.7	10.6	7.1	9.3
Relative Humidity	Max	70	88	91	92	80	74	79	84	95	95	85	83	-
	Min	33	41	42	46	37	38	37	46	48	88	46	42	-
Soil Temperature at 10 cm	06 UTC	16.4	16.2	15.4	15.4	15.4	16.0	16.0	16.0	16.0	16.5	15.9	13.5	14.0
	12 UTC	17.4	17.2	16.6	16.4	16.8	17.0	17.0	17.0	17.0	15.2	16.8	14.6	15.4
Sunshine Duration		8.6	2.5	8.2	8.4	8.2	1.1	8.3	1.7	1.1	0.0	4.8	6.1	4.6
Precipitation										14.6	37.2	51.8	0.1	55.3
Evaporation		6.8	3.1	0.1	2.8	0.6	3.4	2.6	3.8	4.6	1.0	28.8	24.1	22.8
Growing Degrees	5	11.6	9.4	9.8	10.1	10.8	11.7	13.4	11.1	12.1	10.4	110.3	71.6	93.9
	10	6.6	4.4	4.8	5.1	5.8	6.7	8.4	6.1	7.1	5.4	60.3	21.7	44.2

2nd 10-day period (11-20/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.6	17.0	13.4
Precipitation - Reference Evapotranspiration	35.2	-16.9	41.9
Number of Rainy Days	2.0	1.0	3.8
Number of Dry Days	11.0	24.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

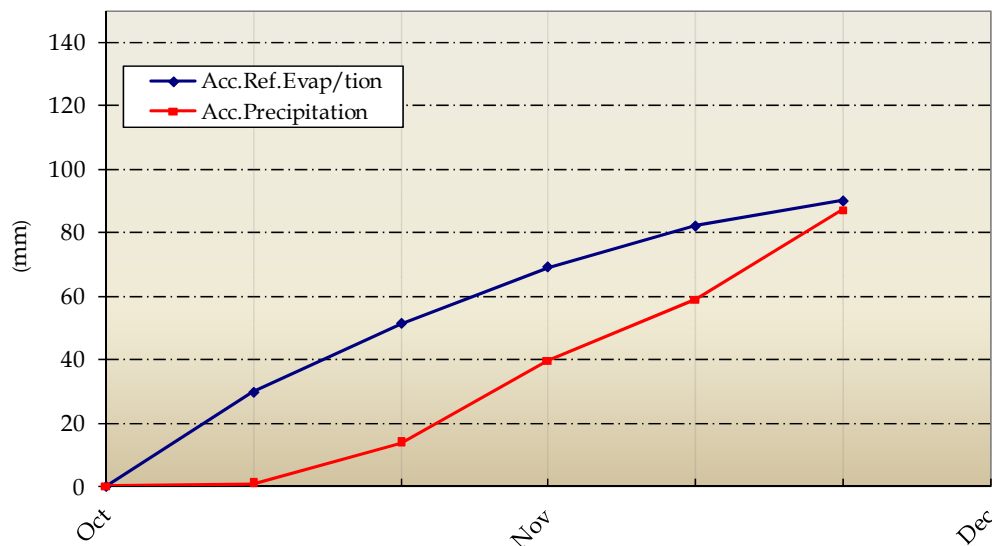


Larisa

2nd 10-day period (11-20/11/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.2	17.4	18.4	12.8	14.6	14.2	15.4	16.8	13.4	14.8	15.5	12.1	15.3
	Min	4.2	2.4	4.4	3.2	11.4	11.2	11.6	11.4	10.2	12.0	8.2	2.0	5.5
Relative Humidity	Max	94	99	99	98	88	95	97	97	98	100	96	83	-
	Min	48	47	43	74	72	74	68	64	83	92	66	46	-
Soil Temperature at 10 cm	06 UTC	13.0	12.4	12.4	12.0	13.2	13.8	13.8	14.0	14.0	14.2	13.3	9.9	10.9
	12 UTC	13.6	13.4	13.6	12.6	13.4	13.8	14.2	14.8	14.2	14.6	13.8	10.9	11.6
Sunshine Duration		4.7	6.9	7.2	0.7	0.0	0.0	0.0	0.9	0.0	0.0	2.0	4.2	3.5
Precipitation						0.0	0.0			0.0	28.3	28.3	0.9	21.2
Evaporation		1.0	2.4	1.7	0.2	0.2	0.4	1.7	0.4	0.6	10.3	18.9	18.3	13.7
Growing Degrees	5	5.7	4.9	6.4	3.0	8.0	7.7	8.5	9.1	6.8	8.4	68.5	21.3	54.7
	10	0.7	0.0	1.4	0.0	3.0	2.7	3.5	4.1	1.8	3.4	20.6	2.5	14.5

2nd 10-day period (11-20/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.0	11.8	8.8
Precipitation - Reference Evapotranspiration	20.3	-10.9	12.4
Number of Rainy Days	1.0	2.0	3.4
Number of Dry Days	11.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

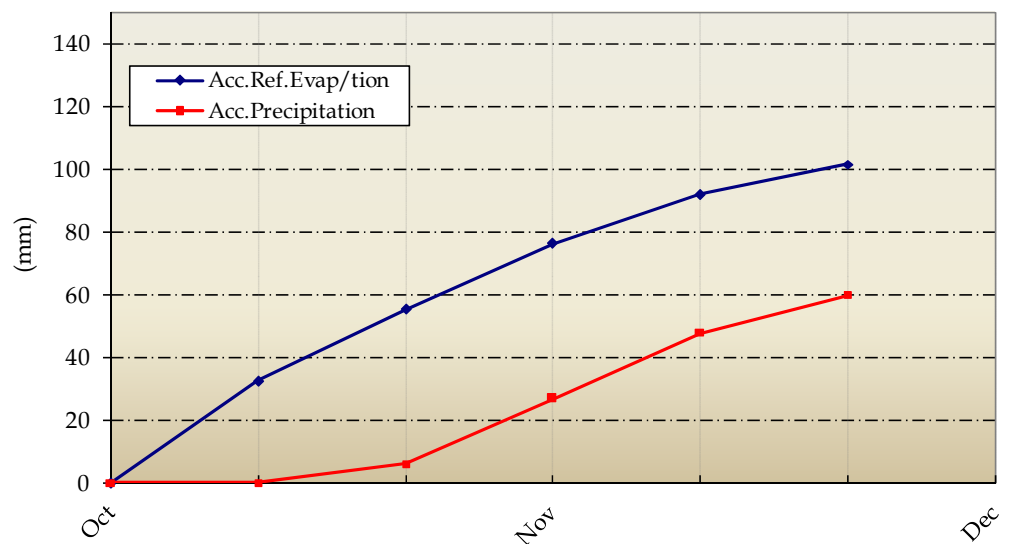


Mikra

2nd 10-day period (11-20/11/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.2	16.6	18.4	16.4	16.8	16.0	16.8	16.6	16.0	15.6	16.6	10.8	14.7
	Min	5.0	5.4	8.0	6.8	10.4	12.3	12.0	10.6	9.1	12.0	9.2	1.8	6.8
Relative Humidity	Max	88	90	90	87	90	82	84	87	88	91	88	85	-
	Min	46	53	51	61	50	58	53	58	67	71	57	46	-
Soil Temperature at 10 cm	06 UTC	11.2	11.6	12.6	12.2	13.8	14.2	14.4	14.2	14.0	14.6	13.3	8.3	10.3
	12 UTC	13.8	14.2	14.4	14.0	14.4	15.4	15.4	15.4	15.2	15.0	14.7	10.7	12.2
Sunshine Duration		8.4	7.3	7.0	2.1	2.7	0.0	1.1	3.1	0.5	0.0	3.2	4.8	3.5
Precipitation											12.0	12.0	7.7	21.1
Evaporation		3.0	1.2	2.0	0.6	1.0	0.1	2.1	0.8	1.3	-	-	10.8	18.7
Growing Degrees	5	6.1	6.0	8.2	6.6	8.6	9.2	9.4	8.6	7.6	8.8	79.0	13.9	57.6
	10	1.1	1.0	3.2	1.6	3.6	4.2	4.4	3.6	2.6	3.8	29.0	1.9	17.1

2nd 10-day period (11-20/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.6	9.7	11.2
Precipitation - Reference Evapotranspiration	2.4	-2.0	9.9
Number of Rainy Days	1.0	2.0	3.0
Number of Dry Days	11.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

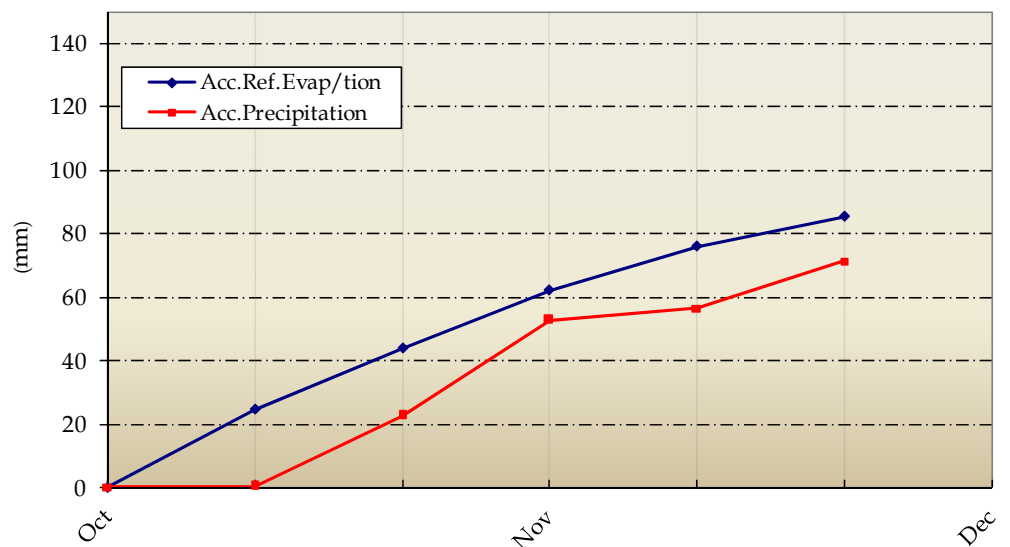


Tripoli

2nd 10-day period (11-20/11/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	15.4	20.7	17.2	13.2	16.0	14.6	14.7	12.6	14.0	15.5	11.1	14.9
	Min	-0.8	-0.7	0.0	-1.9	7.5	5.1	6.2	3.1	6.3	8.4	3.3	1.9	4.4
Relative Humidity	Max	95	96	99	95	82	94	86	98	95	98	94	88	-
	Min	75	48	23	44	59	49	66	86	75	91	62	49	-
Soil Temperature at 10 cm	06 UTC	7.8	7.8	8.2	7.2	9.6	9.4	9.8	9.6	11.0	11.0	9.1	7.4	9.7
	12 UTC	-	12.8	12.8	11.8	11.4	13.6	12.0	-	12.0	12.6	12.4	9.7	10.8
Sunshine Duration		8.0	4.6	7.9	7.9	0.4	4.4	0.8	1.5	0.0	0.0	3.6	4.6	4.5
Precipitation										6.1	8.8	14.9	1.0	45.7
Evaporation		0.4	1.7	0.9	1.2	1.0	0.9	0.2	1.6	0.2	0.6	8.7	12.3	15.6
Growing Degrees	5	2.7	2.4	5.4	2.7	5.4	5.6	5.4	3.9	4.5	6.2	43.9	15.7	46.8
	10	0.0	0.0	0.4	0.0	0.4	0.6	0.4	0.0	0.0	1.2	2.9	3.6	10.1

2nd 10-day period (11-20/11/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.4	11.6	10.5
Precipitation - Reference Evapotranspiration	5.5	-10.6	35.2
Number of Rainy Days	2.0	2.0	4.0
Number of Dry Days	10.0	26.0	-

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.

Measurements 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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