



ปริมาณการใช้น้ำของพืชอ้างอิง

โดยวิธี Penman-Monteith (Reference Evapotranspiration by Penman – Monteith)



ส่วนการใช้น้ำชลประทาน สำนักบริหารจัดการน้ำและอุทกวิทยา



กรมชลประทาน
กระทรวงเกษตรและสหกรณ์



ปริมาณการใช้น้ำของพืชอ้างอิงโดยวิธีของ Penman Monteith
(Reference Crop Evapotranspiration by Penman Monteith)

ฉบับปรับปรุง



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ส่วนการใช้น้ำชลประทาน
สำนักอุทกวิทยาและบริหารน้ำ
พฤษภาคม 2554

เอกสารวิชาการ

เรื่อง

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คำนำ

เอกสารเผยแพร่เรื่อง “ ปริมาณการใช้น้ำของพืชอ้างอิงโดยวิธี Penman-Monteith (Reference Evapotranspiration by Penman – Monteith)” เป็นเอกสารที่จัดทำเป็นครั้งที่ 2 ซึ่งการจัดทำครั้งแรกได้นำข้อมูลอุตุนิยมนิยามวิทยาตั้งแต่ พ.ศ. 2494-2538 (ระยะเวลา 45 ปี) มาดำเนินการจัดทำซึ่งข้อมูลขณะนั้น กรมอุตุนิยมนิยามวิทยาได้รวบรวมข้อมูลสภาพทางอากาศ จาก 48 จังหวัด จำนวน 64 สถานีตรวจวัดอากาศมาจัดทำและได้พิมพ์เผยแพร่ปริมาณการใช้น้ำของพืชอ้างอิงตั้งแต่ปี พ.ศ. 2539 ปัจจุบันกรมอุตุนิยามวิทยาได้เพิ่มจำนวนสถานีตรวจวัดสภาพอากาศมากขึ้น เป็นจำนวนทั้งสิ้น 120 สถานีครอบคลุมพื้นที่ 64 จังหวัด ข้อมูลสภาพอากาศที่รวบรวมเผยแพร่ล่าสุดเป็นช่วงระยะ 30 ปี ระหว่าง พ.ศ. 2524-2553 (ค.ศ. 1981-2010) โดยกรมอุตุนิยามวิทยาจะนำมาเผยแพร่ทุก ๆ 10 ปี

ข้อมูลสภาพอากาศดังกล่าว ฝ่ายเผยแพร่การใช้น้ำชลประทาน นำมาคำนวณเป็นปริมาณการใช้น้ำของพืชอ้างอิง โดยวิธีการ Penman-Monteith ซึ่งเป็นวิธีการที่องค์การอาหารและเกษตรแห่งสหประชาชาติ (FAO) ให้การยอมรับและมีความเชื่อถือในระดับสูง ปริมาณการใช้น้ำของพืชอ้างอิงจะเป็นข้อมูลที่เป็นประโยชน์ในด้าน

1. เป็นข้อมูลพื้นฐานสำหรับใช้ในการคำนวณหาปริมาณการใช้น้ำของพืชจริง (Crop Evapotranspiration ; ET crop) ร่วมกับค่าสัมประสิทธิ์พืชโดยวิธี Penman-Monteith (Crop Coefficient by Penman-Monteith ; Kc – Penman Monteith) โดยอาศัยความสัมพันธ์ของ $Kc = ET / ETo$ หรือ $ET = Kc * ETo$

2. ใช้เป็นข้อมูลพื้นฐานสำหรับงานชลประทานต่าง ๆ อาคารชลประทาน ปริมาณน้ำชลประทานที่จัดส่งให้แก่พื้นที่ความรับผิดชอบของโครงการชลประทานต่าง ๆ

คณะผู้จัดทำหวังว่าเอกสารเผยแพร่ฉบับนี้จะเป็นประโยชน์ต่อหน่วยงานต่าง ๆ ภาคเอกชนหรือผู้ที่สนใจนำไปประยุกต์ใช้งานด้านการคำนวณหาปริมาณความต้องการน้ำชลประทานของโครงการชลประทาน การปรับปรุงประสิทธิภาพการส่งน้ำ การศึกษาและพัฒนาแหล่งน้ำทางการเกษตร การพิจารณาวางโครงการ การพิจารณาความเหมาะสมของโครงการและประโยชน์อื่น ๆ

ฝ่ายเผยแพร่การใช้น้ำชลประทาน
ส่วนการใช้น้ำชลประทาน
สำนักอุทกวิทยาและบริหารน้ำ

พฤษภาคม 2554

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ปริมาณการใช้น้ำของพืชอ้างอิงโดยวิธี Penman-Monteith รายเดือน

ภาคเหนือ

ม.ม./วัน

จังหวัด	เดือน											
	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
แม่ฮ่องสอน	2.83	3.55	4.51	5.22	4.46	3.59	2.93	3.32	3.11	3.32	3.02	2.68
-แม่สะเรียง	2.89	3.86	4.78	5.11	4.35	2.92	2.82	2.72	3.07	3.09	2.93	2.84
เชียงราย	2.83	3.50	4.40	5.05	4.35	4.00	3.53	3.38	3.45	3.43	3.17	2.63
-สถานีเกษตร เชียงราย	2.79	3.42	4.26	4.77	4.13	3.85	3.40	3.27	3.71	3.38	3.14	2.64
พะเยา	2.83	3.53	4.45	4.91	4.40	3.69	3.58	3.38	3.40	3.23	2.92	2.58
เชียงใหม่	3.21	4.09	5.26	6.12	4.97	4.30	3.80	3.62	3.67	3.74	3.35	3.03
-ดอยอ่างขาง	3.16	4.36	5.30	5.18	3.95	3.50	3.27	3.06	3.23	2.92	2.98	2.65
-สถานีเกษตร แม่ใจ	3.07	3.71	4.59	4.85	3.86	3.92	2.94	3.37	3.09	3.68	3.38	3.03
ลำปาง	3.07	3.73	4.69	4.98	4.44	4.06	3.61	3.46	3.51	3.42	3.13	2.84
-เถิน	3.64	4.54	5.60	5.77	4.39	4.27	3.86	3.67	3.73	3.64	3.77	3.45
-สถานีเกษตร ลำปาง	2.77	3.26	4.06	4.22	3.78	3.45	3.37	3.28	3.06	3.29	3.11	2.70
ลำพูน	2.94	3.79	4.73	5.46	4.56	3.78	3.68	3.47	3.47	3.35	3.06	2.74
แพร่	2.98	3.70	4.48	4.91	4.57	3.73	3.59	3.44	3.50	3.41	3.17	2.68
น่าน	2.88	3.49	4.39	4.63	4.25	3.88	3.43	3.33	3.43	3.47	3.04	2.70
-สถานีเกษตร น่าน	2.88	3.54	4.37	4.83	4.14	3.78	3.37	3.27	3.72	3.74	3.32	2.81
-ท่าวังผา	2.88	3.56	4.55	4.67	4.28	3.56	3.46	2.78	3.41	3.40	3.11	2.65
-ทุ่งช้าง	3.14	3.81	4.76	4.91	4.39	4.22	3.76	3.29	3.73	3.92	3.29	2.90
อุตรดิตถ์	3.25	3.88	4.77	4.91	4.43	3.59	3.50	3.40	3.52	3.59	3.48	2.99
ตาก	3.20	4.16	5.25	5.80	4.94	3.86	3.93	3.84	3.33	3.39	3.21	2.94
-แม่สอด	3.32	4.08	4.96	5.41	4.21	3.00	2.88	2.79	3.15	3.52	3.48	3.31
-เขื่อนภูมิพล	3.23	4.12	5.14	5.67	4.59	3.81	3.80	3.74	3.26	3.41	3.16	3.01
-อุ้มผาง	3.12	3.71	4.30	4.51	3.70	2.75	2.69	2.64	2.52	2.99	3.33	2.98

ปริมาณการใช้น้ำของพืชอ้างอิงโดยวิธี Penman-Monteith รายเดือน

ภาคตะวันออกเฉียงเหนือ

ม.ม./วัน

จังหวัด	เดือน											
	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
หนองคาย	3.11	3.78	4.62	4.62	4.03	3.56	3.51	3.41	3.51	3.63	3.31	3.04
เลย	3.28	4.06	4.81	5.06	4.43	4.07	3.66	3.55	3.55	3.55	3.23	3.04
-สถานีเกษตร เลย	3.19	3.95	4.73	4.76	4.20	3.89	3.87	3.39	3.84	3.50	3.42	3.00
อุดรธานี	3.32	4.07	4.85	5.21	4.56	4.08	3.71	3.55	3.61	3.73	3.70	3.22
สกลนคร	3.44	4.09	4.87	5.02	4.40	3.99	3.57	3.44	3.86	3.90	3.64	3.25
-สถานีเกษตร สกลนคร	3.14	3.75	4.48	5.00	4.36	4.26	3.86	3.69	3.98	3.77	3.38	3.09
นครพนม	3.33	3.86	4.30	4.50	3.95	3.47	3.42	3.33	3.48	3.60	3.60	3.16
-สถานีเกษตร นครพนม	3.52	4.03	4.48	4.96	4.28	4.25	3.81	3.32	3.83	3.57	3.59	3.25
ขอนแก่น	3.65	4.18	5.09	4.97	4.67	4.29	3.88	3.68	3.61	3.79	3.83	3.63
-สถานีเกษตร ท่าพระ	3.20	3.81	4.48	4.76	4.25	3.91	3.88	3.36	3.48	3.59	3.48	3.18
มุกดาหาร	3.65	4.18	5.00	5.15	4.11	3.64	3.56	3.43	3.57	3.80	3.95	3.53
มหาสารคาม	3.57	4.19	4.71	5.22	4.62	4.22	3.84	3.64	3.62	3.76	3.83	3.58
กาฬสินธุ์	4.15	4.89	5.40	5.45	4.80	4.32	4.22	3.65	3.71	4.06	4.30	4.10
ชัยภูมิ	3.60	4.20	5.00	5.12	4.47	4.13	3.77	3.61	3.60	3.78	3.89	3.51
ร้อยเอ็ด	3.49	4.13	4.66	4.83	4.22	3.90	3.84	3.64	3.61	3.63	3.68	3.51
-สถานีเกษตร ร้อยเอ็ด	4.04	4.44	4.92	5.25	4.59	4.62	4.21	3.90	3.60	3.78	4.10	3.90
อุบลราชธานี	4.00	4.53	4.93	5.03	4.45	3.96	3.87	3.71	3.43	3.71	4.23	4.22
-สถานีเกษตรอุบลราชธานี	3.63	3.68	4.23	4.13	3.65	3.64	3.56	2.87	3.22	3.34	3.64	3.42
ศรีสะเกษ	-	-	-	-	-	-	-	-	-	-	-	-
-สถานีเกษตร ศรีสะเกษ	3.40	3.92	4.56	4.75	4.42	4.43	4.19	3.71	3.85	3.62	3.79	3.45
นครราชสีมา	3.37	3.95	4.39	4.64	4.20	3.95	3.89	3.79	3.36	3.42	3.51	3.41
-สถานีเกษตร ปากช่อง	4.71	4.71	5.01	4.81	4.20	4.54	4.26	4.04	3.38	3.50	4.44	4.52

ปริมาณการใช้น้ำของพืชอ้างอิงโดยวิธี Penman-Monteith รายเดือน

ภาคกลางและตะวันตก

ม.ม./วัน

จังหวัด	เดือน											
	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
นครสวรรค์	3.71	4.87	6.06	6.06	4.55	4.10	3.92	3.71	3.32	3.57	3.51	3.37
-สถานีเกษตร ตากฟ้า	3.94	4.35	4.88	4.93	4.46	4.02	3.89	3.48	3.57	3.54	3.86	3.81
ชัยนาท	.-	.-	.-	.-	.-	.-	.-	.-	.-	.-	.-	.-
-สถานีเกษตร ชัยนาท	3.30	3.68	4.34	4.56	4.31	4.27	3.84	3.47	3.42	3.26	3.31	3.21
อยุธยา	3.95	4.20	4.58	4.58	4.02	4.10	3.73	3.68	3.36	3.46	3.92	3.94
ปทุมธานี	3.54	3.85	4.44	4.64	4.05	4.15	3.62	3.59	3.26	2.90	3.83	3.54
ราชบุรี	4.04	4.61	5.27	5.15	4.00	3.96	3.57	3.63	3.44	3.39	3.86	4.01
สุพรรณบุรี	3.45	4.11	4.83	5.01	4.36	3.99	3.89	3.32	3.45	3.45	3.58	3.50
-สถานีเกษตร คู่งทอง	3.46	4.12	4.74	4.87	3.89	3.90	3.52	3.51	3.25	3.54	3.47	3.41
ลพบุรี	3.76	4.32	4.78	5.09	4.11	3.67	3.59	3.56	3.27	3.65	3.86	3.82
-บัวชุม	4.03	4.89	5.48	5.03	4.22	3.82	3.73	3.05	3.25	3.65	3.85	3.93
กาญจนบุรี	3.60	4.36	4.80	5.30	4.19	3.72	3.71	3.72	3.44	3.33	3.42	3.51
-ทองผาภูมิ	3.44	4.08	4.71	5.14	3.81	3.31	2.73	2.69	2.61	3.16	3.39	3.33
กรุงเทพมหานคร	3.52	4.17	4.78	4.69	4.10	4.07	3.98	3.46	3.07	3.23	3.62	3.49
-ท่าเรือคลองเตย	4.51	4.57	5.18	5.04	4.56	4.61	4.47	4.46	4.27	3.97	4.96	4.77
-ท่าอากาศยานดอนเมือง	4.14	4.80	5.37	5.54	4.94	4.63	4.60	4.43	3.95	3.87	4.11	4.04
สมุทรปราการ	.-	.-	.-	.-	.-	.-	.-	.-	.-	.-	.-	.-
-สถานีเกษตร บางนา	1.14	2.03	3.25	3.75	3.74	3.96	3.74	3.36	2.60	1.79	1.46	0.99
เพชรบุรี	3.59	4.23	4.87	4.89	4.22	3.74	3.66	3.17	3.38	3.08	3.39	3.49
ประจวบคีรีขันธ์	3.82	4.19	4.38	4.77	4.22	3.93	3.90	3.89	3.68	3.49	3.84	4.18
-หัวหิน	3.93	4.49	5.06	5.07	4.51	4.18	3.79	3.81	3.49	3.45	3.74	4.02
-สถานีเกษตร หนองพลับ	3.77	4.25	4.49	4.65	3.84	3.82	3.40	2.92	3.26	3.32	3.40	3.43
นครปฐม	3.70	4.35	5.15	5.12	4.02	4.00	3.63	3.16	3.44	3.69	3.92	3.66

ปริมาณการใช้น้ำของพืชอ้างอิงโดยวิธี Penman-Monteith รายเดือน

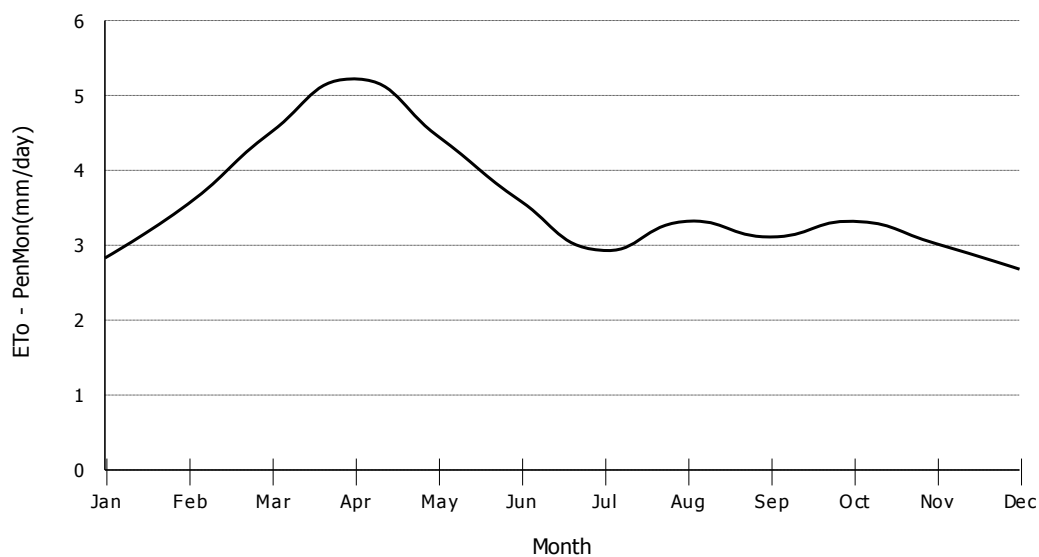
ภาคใต้

ม.ม./วัน

จังหวัด	เดือน											
	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
ชุมพร	3.45	4.10	4.55	4.50	3.89	3.54	3.49	3.53	3.39	3.38	3.40	3.44
-สถานีเกษตร สวี	3.34	3.61	4.13	4.15	3.74	4.12	3.68	3.83	3.67	3.36	3.08	3.27
ระนอง	3.84	4.21	4.29	4.27	3.76	3.34	3.27	3.30	3.20	3.31	3.41	3.52
สุราษฎร์ธานี	3.55	4.24	4.34	4.28	3.80	3.47	3.42	3.49	3.36	3.07	3.10	3.27
-ท่าอากาศยาน สุราษฎร์ธานี	3.65	4.06	4.42	4.42	3.90	3.51	3.49	3.53	3.41	3.13	3.15	3.08
-เกาะสมุย	3.65	4.24	4.56	4.42	4.26	3.97	3.97	4.05	3.89	3.43	3.43	3.38
-สถานีเกษตร สุราษฎร์ธานี	3.32	4.04	4.37	4.24	3.65	3.60	3.61	3.68	3.61	3.34	2.99	3.11
-พระแสง	3.49	4.00	4.20	4.24	3.41	3.62	3.28	3.35	3.30	3.08	2.89	3.10
นครศรีธรรมราช	3.19	3.79	4.14	4.15	3.77	3.75	3.76	3.55	3.35	3.09	2.83	2.95
-สถานีเกษตรนครศรีธรรมราช	3.31	3.72	4.04	4.21	3.67	3.67	3.68	3.80	3.70	3.44	3.08	2.94
-ฉวาง	3.45	3.81	4.11	4.10	3.64	3.52	3.16	3.57	3.54	3.01	3.07	2.93
พัทลุง	-	-	-	-	-	-	-	-	-	-	-	-
-สถานีเกษตรพัทลุง	3.46	4.00	4.11	4.26	3.77	4.04	3.74	3.88	3.86	3.59	3.17	3.07
-ตะกั่วป่า	3.83	4.17	4.14	4.13	3.70	3.31	3.28	3.36	3.22	3.03	3.42	3.48
ภูเก็ต	4.29	4.62	4.55	4.34	3.84	3.81	3.78	3.98	3.43	3.53	3.65	3.83
-ท่าอากาศยานภูเก็ต	4.04	4.37	4.58	4.36	3.93	3.93	3.92	3.78	3.52	3.19	3.32	3.67
-เกาะลันตา	4.23	4.51	4.47	4.11	3.61	3.58	3.58	3.72	3.58	3.34	3.06	3.68
กระบี่	4.08	4.73	4.42	4.21	3.73	3.58	3.54	3.63	3.57	3.07	3.27	3.50
ตรัง	-	-	-	-	-	-	-	-	-	-	-	-
-ท่าอากาศยานตรัง	4.21	4.86	4.67	4.30	3.71	3.60	3.24	3.35	3.26	3.12	3.27	3.64
สงขลา	3.94	4.34	4.48	4.51	3.91	3.90	3.91	4.09	3.92	3.36	3.09	3.37
-สถานีเกษตร คอหงส์	3.71	4.24	4.24	4.26	3.75	3.67	3.68	3.83	3.49	3.58	2.97	3.26

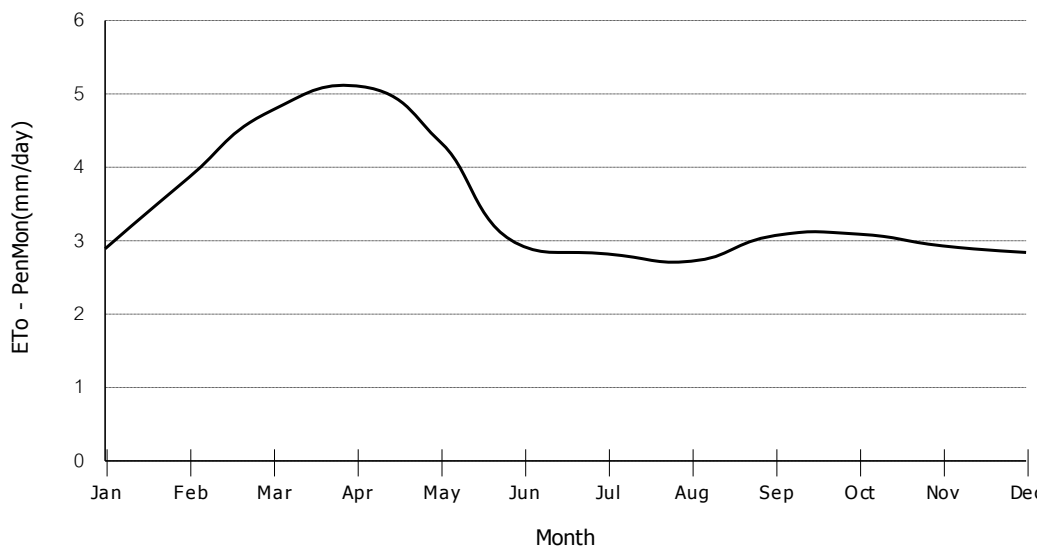
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: MAE HONG SON		(30 Yrs)	
Altitude : 267 meter		Coordinates		: 19 - 18 N.L.		97 - 50 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	13.8	30.1	75.0	13.0	8.8	17.8	2.83
February	14.3	33.4	65.0	22.0	9.7	20.9	3.55
March	17.7	36.8	55.0	36.0	10.1	23.6	4.51
April	22.5	38.7	55.0	49.0	9.3	23.7	5.22
May	23.6	35.9	71.0	40.0	6.4	19.5	4.46
June	23.7	33.2	80.0	31.0	4.0	15.8	3.59
July	23.4	32.2	82.0	27.0	2.0	12.8	2.93
August	23.2	32.0	83.0	22.0	3.8	15.3	3.32
September	23.0	32.8	83.0	18.0	3.6	14.3	3.11
October	22.0	32.6	81.0	18.0	5.8	16.0	3.32
November	19.0	30.9	80.0	13.0	7.2	16.1	3.02
December	15.4	29.0	78.0	13.0	8.1	16.3	2.68
Average	20.1	33.1	74.0	25.0	6.6	17.7	3.54

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



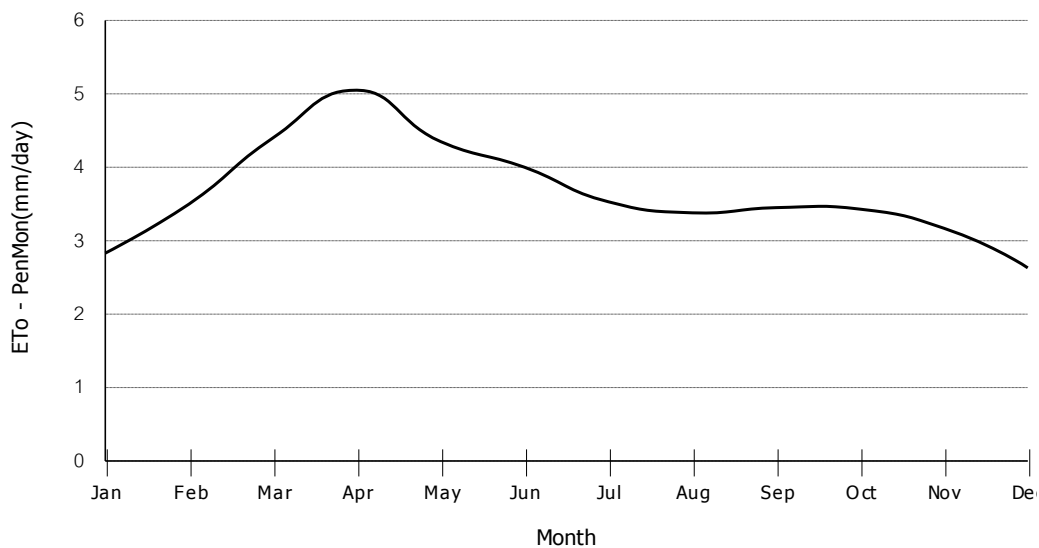
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: MAE SARIANG		(30 Yrs)	
Altitude : 212 meter		Coordinates		: 18 - 10 N.L.		97 - 56 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	13.6	31.4	78.0	9.0	8.3	17.5	2.89
February	13.8	34.0	69.0	18.0	10.8	22.7	3.86
March	17.5	36.5	62.0	27.0	11.3	25.5	4.78
April	22.3	37.9	62.0	40.0	9.3	23.7	5.11
May	23.9	34.9	75.0	31.0	6.4	19.5	4.35
June	23.6	31.6	84.0	22.0	2.0	12.7	2.92
July	23.2	30.7	86.0	22.0	1.9	12.7	2.82
August	23.1	30.7	86.0	18.0	1.9	12.4	2.72
September	23.0	32.1	85.0	13.0	3.6	14.4	3.07
October	22.3	32.8	84.0	13.0	4.7	14.7	3.09
November	19.2	32.0	82.0	13.0	6.1	15.0	2.93
December	15.3	30.5	80.0	13.0	8.2	16.7	2.84
Average	20.1	32.9	78.0	20.0	6.2	17.3	3.45

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



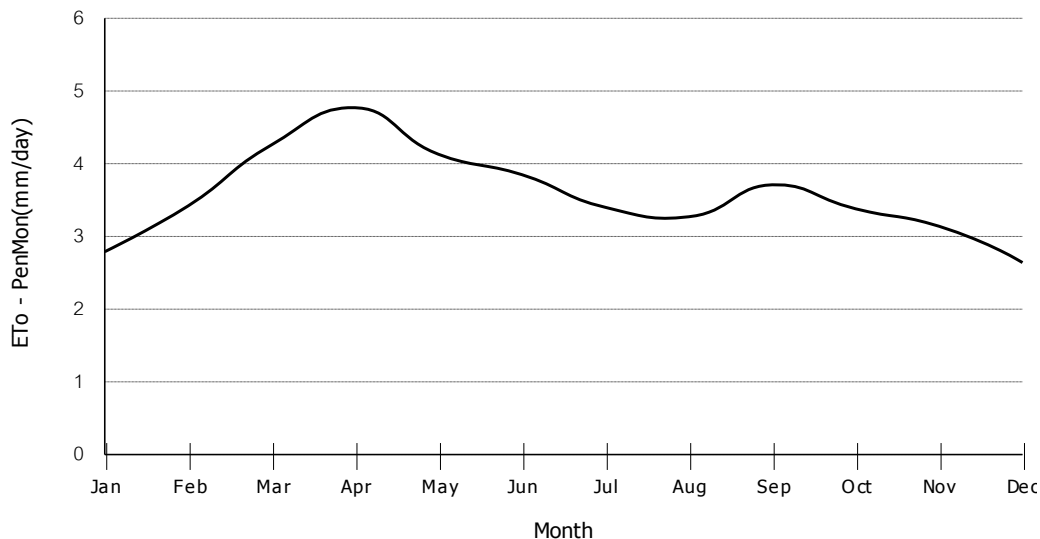
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: CHIANG RAI		(30 Yrs)	
Altitude : 394 meter		Coordinates		: 19 - 55 N.L.		99 - 50 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	12.8	28.6	75.0	36.0	8.8	17.7	2.83
February	13.7	31.3	67.0	44.0	9.1	20.0	3.50
March	16.9	33.8	62.0	53.0	9.5	22.6	4.40
April	20.6	34.8	66.0	67.0	9.3	23.6	5.05
May	22.5	33.1	76.0	71.0	6.4	19.5	4.35
June	23.6	32.1	80.0	71.0	5.3	17.8	4.00
July	23.4	31.1	82.0	67.0	3.9	15.6	3.53
August	23.3	30.9	84.0	58.0	3.8	15.3	3.38
September	22.7	31.1	83.0	49.0	4.8	16.0	3.45
October	21.1	30.5	82.0	49.0	6.4	16.8	3.43
November	17.3	28.8	79.0	49.0	8.3	17.4	3.17
December	13.5	27.2	77.0	40.0	8.1	16.2	2.63
Average	19.3	31.1	76.0	54.0	7.0	18.2	3.64

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



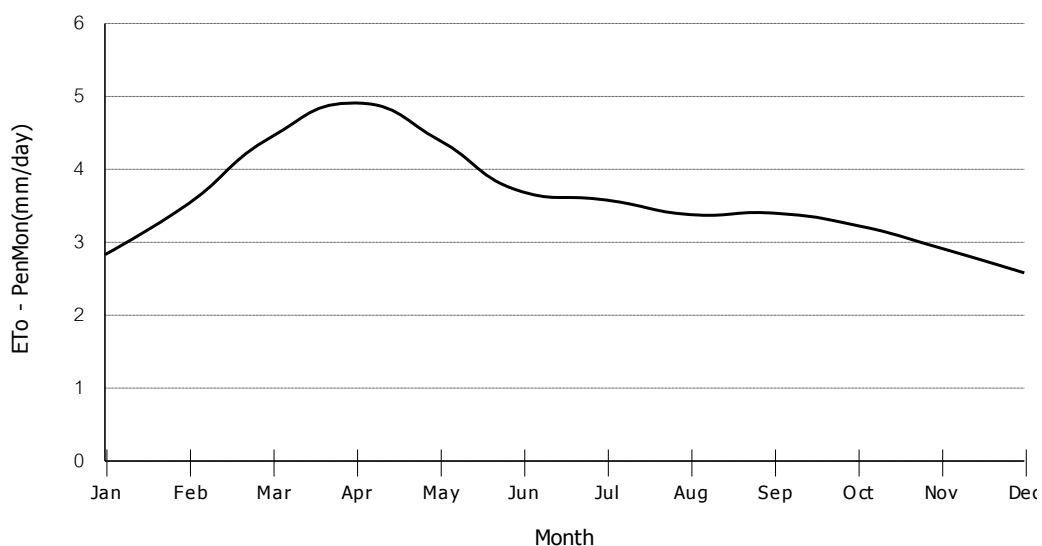
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: CHIANG RAI AGROMET.		(5 Yrs)	
Altitude : 397 meter		Coordinates		: 19 - 52 N.L.		99 - 46 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	13.5	28.7	77.0	4.0	9.3	18.4	2.79
February	14.5	31.3	73.0	9.0	9.6	20.7	3.42
March	17.3	33.3	70.0	13.0	10.1	23.5	4.26
April	21.5	34.4	71.0	18.0	9.3	23.6	4.77
May	22.9	32.5	79.0	18.0	6.4	19.5	4.13
June	23.7	32.3	80.0	18.0	5.3	17.8	3.85
July	23.7	31.1	83.0	13.0	3.9	15.6	3.40
August	23.5	30.8	85.0	4.0	3.8	15.3	3.27
September	22.9	31.3	84.0	9.0	6.1	17.9	3.71
October	21.8	30.5	84.0	13.0	6.4	16.8	3.38
November	17.0	28.9	79.0	18.0	8.8	18.1	3.14
December	14.3	27.9	79.0	9.0	8.7	16.9	2.64
Average	19.7	31.1	79.0	12.0	7.3	18.7	3.56

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



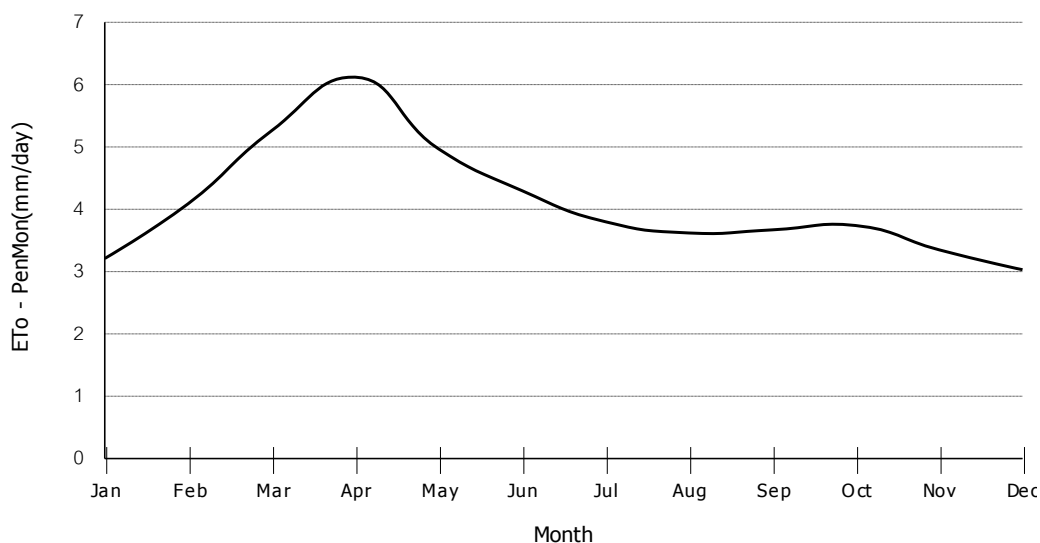
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PHAYAO		(30 Yrs)	
Altitude : 397 meter		Coordinates		: 19 - 08 N.L.		97 - 54 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	13.7	29.3	75.0	31.0	8.8	17.6	2.83
February	15.4	32.2	66.0	40.0	9.1	19.9	3.53
March	19.5	35.0	58.0	58.0	8.9	21.7	4.45
April	22.9	36.0	62.0	62.0	8.1	21.8	4.91
May	23.6	33.5	74.0	58.0	6.4	19.5	4.40
June	24.0	32.4	78.0	71.0	3.9	15.7	3.69
July	23.7	31.6	80.0	62.0	3.9	15.7	3.58
August	23.5	31.3	83.0	44.0	3.8	15.3	3.38
September	23.0	31.4	84.0	22.0	4.8	16.0	3.40
October	21.7	30.7	84.0	18.0	5.8	15.9	3.23
November	18.0	29.2	81.0	22.0	7.2	16.0	2.92
December	14.0	27.8	79.0	22.0	8.1	16.1	2.58
Average	20.3	31.7	75.0	43.0	6.6	17.6	3.58

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



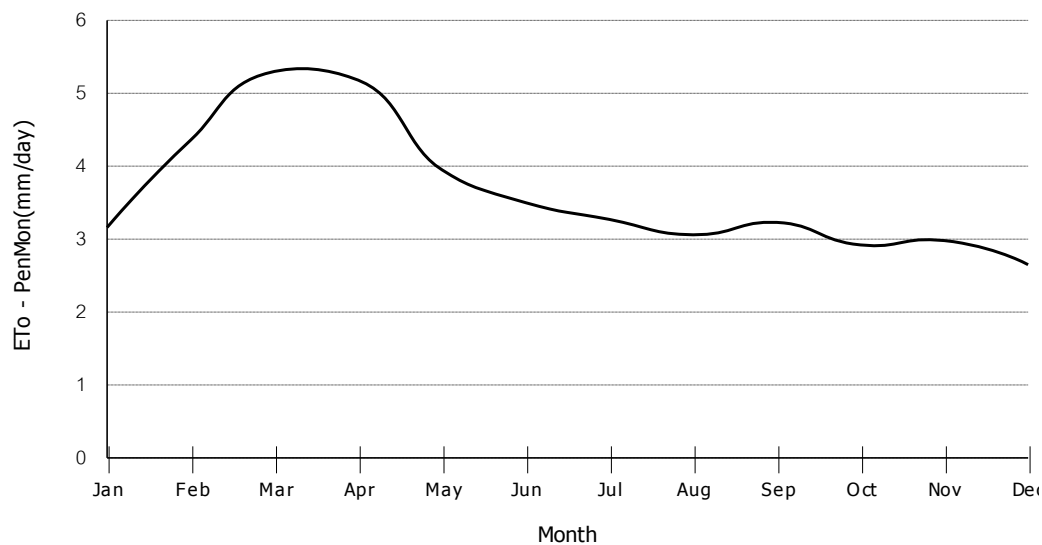
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: CHIANG MAI		(30 Yrs)	
Altitude : 313 meter		Coordinates		: 18 - 47 N.L.		99 - 58 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	14.9	29.8	68.0	67.0	8.8	18.0	3.21
February	16.2	32.6	58.0	89.0	9.1	20.3	4.09
March	19.5	35.2	52.0	116.0	9.5	22.8	5.26
April	22.9	36.5	57.0	156.0	9.3	23.7	6.12
May	23.8	34.2	71.0	156.0	6.4	19.5	4.97
June	24.0	32.7	77.0	142.0	5.2	17.6	4.30
July	23.9	31.8	79.0	129.0	3.9	15.6	3.80
August	23.7	31.5	81.0	120.0	3.8	15.3	3.62
September	23.2	31.7	81.0	107.0	4.8	16.1	3.67
October	22.2	31.4	79.0	102.0	6.5	17.1	3.74
November	19.2	30.1	75.0	89.0	7.2	16.3	3.35
December	15.7	28.6	73.0	76.0	8.2	16.6	3.03
Average	20.8	32.2	71.0	112.0	6.9	18.2	4.10

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



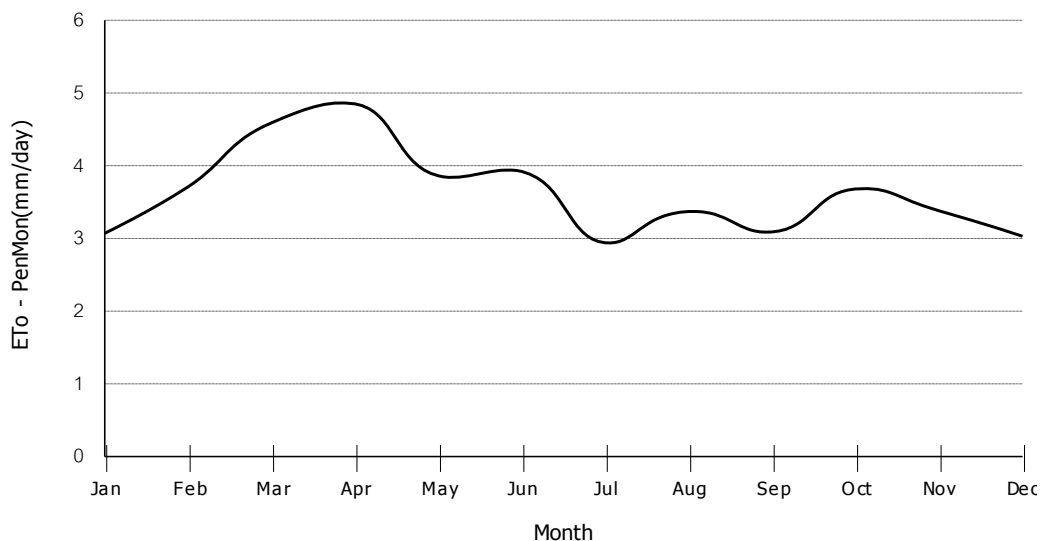
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: DOI ANG KANG		(5 Yrs)	
Altitude :1,529 m.		Coordinates		: 19 - 55 N.L.		97 - 02 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	13.0	20.0	64.0	187.0	8.8	17.8	3.16
February	15.0	23.0	47.0	218.0	8.5	19.3	4.36
March	17.5	26.2	46.0	222.0	8.9	21.8	5.30
April	18.6	27.4	59.0	209.0	8.1	21.8	5.18
May	17.6	24.3	80.0	222.0	6.4	19.5	3.95
June	17.8	24.0	85.0	204.0	5.3	17.8	3.50
July	17.7	22.9	88.0	249.0	5.2	17.6	3.27
August	17.7	22.4	91.0	218.0	5.1	17.2	3.06
September	17.5	22.6	88.0	191.0	6.1	18.0	3.23
October	16.8	21.6	88.0	191.0	6.4	16.8	2.92
November	14.3	19.8	77.0	196.0	8.3	17.5	2.98
December	12.6	18.7	73.0	160.0	8.1	16.3	2.65
Average	16.3	22.7	74.0	206.0	7.1	18.5	3.63

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



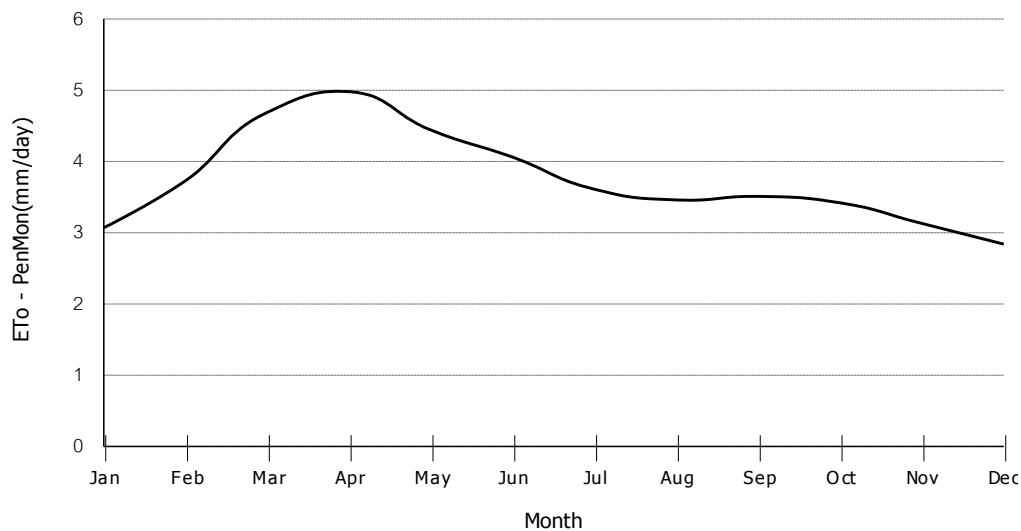
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: MAE JO AGROMET.		(5 Yrs)	
Altitude : 317 meter		Coordinates		: 18 - 55 N.L.		99 - 00 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	14.7	29.4	71.0	49.0	8.8	18.0	3.07
February	15.2	32.8	64.0	36.0	9.7	21.1	3.71
March	17.6	36.1	61.0	36.0	10.1	23.7	4.59
April	21.3	36.1	65.0	58.0	8.1	21.9	4.85
May	22.5	32.3	79.0	53.0	5.1	17.5	3.86
June	23.7	33.5	78.0	40.0	5.2	17.6	3.92
July	23.5	31.9	81.0	31.0	2.0	12.8	2.94
August	23.2	32.3	83.0	22.0	3.8	15.3	3.37
September	22.2	31.1	82.0	31.0	3.6	14.3	3.09
October	21.5	32.0	75.0	71.0	6.5	17.1	3.68
November	17.7	30.7	71.0	58.0	8.3	17.7	3.38
December	15.4	30.2	67.0	49.0	8.7	17.2	3.03
Average	19.9	32.4	73.0	45.0	6.7	17.8	3.62

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



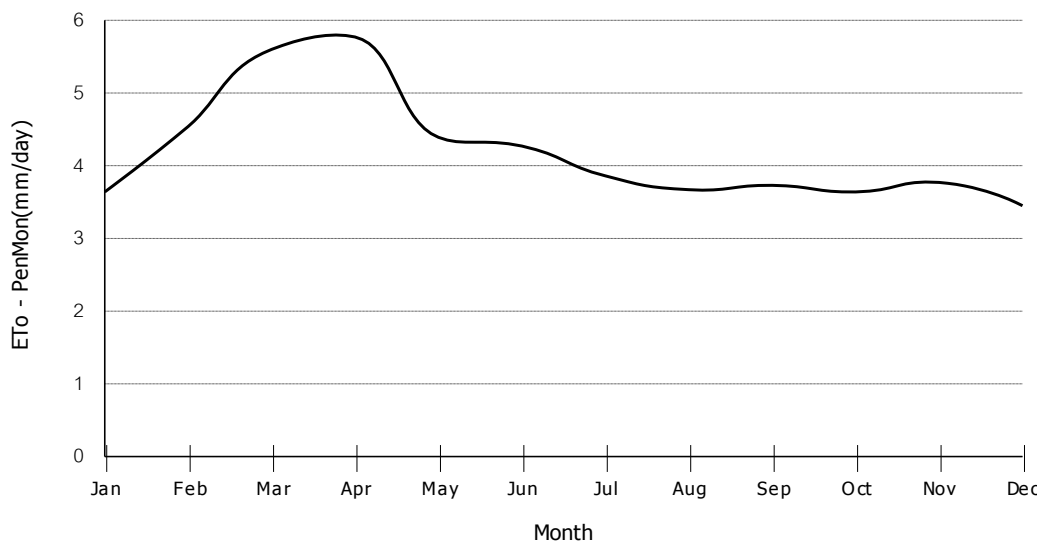
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: LAMPANG		(30 Yrs)	
Altitude : 313 meter		Coordinates		: 18 - 47 N.L.		99 - 58 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	15.0	31.6	70.0	22.0	8.8	18.4	3.07
February	16.6	34.4	62.0	31.0	9.1	20.6	3.73
March	20.1	37.2	57.0	44.0	9.5	23.0	4.69
April	23.4	38.3	60.0	49.0	8.1	21.9	4.98
May	24.2	35.5	72.0	44.0	6.4	19.4	4.44
June	24.4	34.0	76.0	58.0	5.2	17.5	4.06
July	24.1	33.3	78.0	53.0	3.9	15.5	3.61
August	23.9	33.0	81.0	40.0	3.8	15.3	3.46
September	23.5	32.8	83.0	22.0	4.8	16.2	3.51
October	22.3	32.3	82.0	18.0	5.9	16.5	3.42
November	19.1	31.3	78.0	13.0	7.2	16.6	3.13
December	15.3	30.2	75.0	13.0	8.2	17.0	2.84
Average	21.0	33.7	73.0	34.0	6.7	18.2	3.74

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



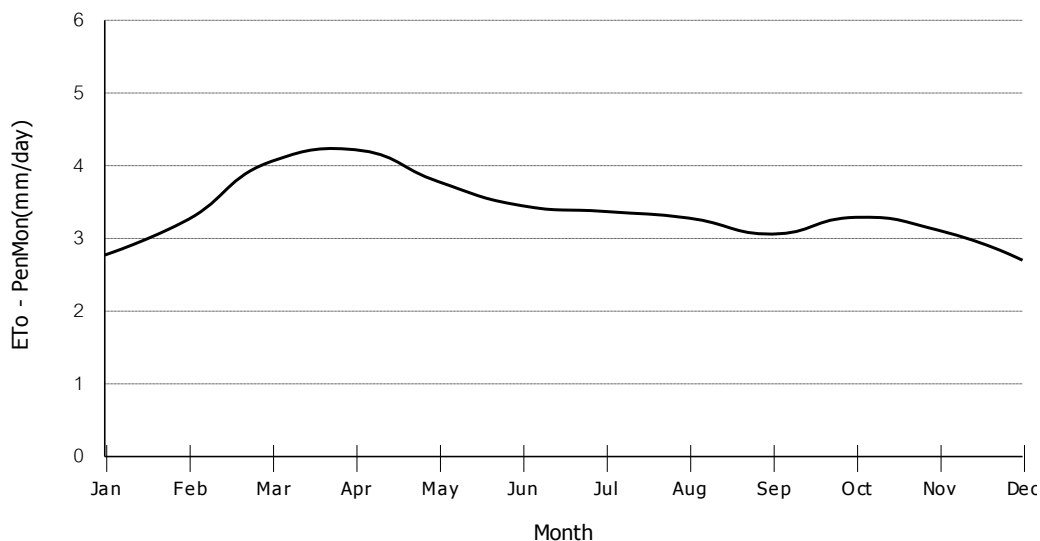
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: THOEN		(7 Yrs)	
Altitude : 191 meter		Coordinates		: 17 - 38 N.L.		99 - 14 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	15.7	32.1	65.0	93.0	8.8	18.3	3.64
February	18.1	35.1	56.0	102.0	9.2	20.6	4.54
March	21.3	37.6	52.0	129.0	8.9	22.1	5.60
April	24.4	37.9	59.0	129.0	8.1	21.9	5.77
May	24.4	34.3	73.0	111.0	5.1	17.5	4.39
June	24.3	33.3	76.0	120.0	5.2	17.5	4.27
July	24.0	32.7	77.0	120.0	3.9	15.5	3.86
August	23.7	32.4	79.0	107.0	3.8	15.3	3.67
September	23.4	32.5	81.0	102.0	4.8	16.2	3.73
October	22.4	31.8	80.0	98.0	5.9	16.4	3.64
November	19.1	31.3	74.0	107.0	8.4	18.1	3.77
December	16.1	30.3	69.0	111.0	8.3	17.1	3.45
Average	21.4	33.4	70.0	111.0	6.7	18.0	4.19

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



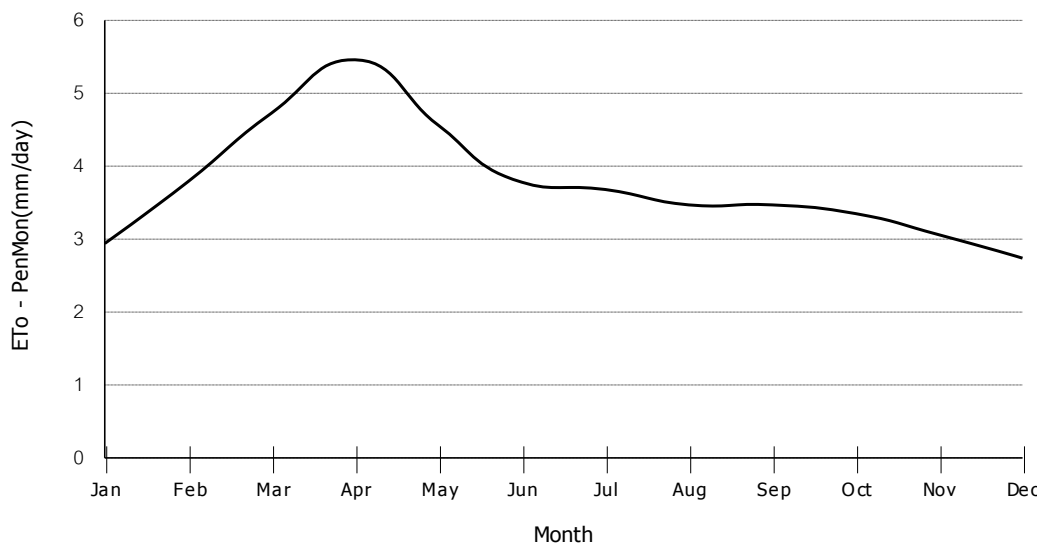
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: LAMPANG AGROMET.		(5 Yrs)	
Altitude : 315 meter		Coordinates		: 18 - 19 N.L.		99 - 17 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	15.3	31.0	69.0	4.0	8.3	17.5	2.77
February	16.7	34.1	55.0	9.0	8.6	19.6	3.26
March	20.5	37.0	49.0	13.0	8.9	22.0	4.06
April	23.4	37.8	57.0	13.0	6.8	19.9	4.22
May	23.7	33.9	74.0	4.0	5.1	17.5	3.78
June	23.8	33.9	77.0	4.0	3.9	15.6	3.45
July	23.3	31.8	81.0	4.0	3.9	15.6	3.37
August	23.4	31.8	83.0	4.0	3.8	15.3	3.28
September	23.1	31.9	83.0	0.0	3.6	14.3	3.06
October	22.1	31.2	82.0	4.0	5.9	16.3	3.29
November	17.9	30.5	75.0	4.0	8.3	17.8	3.11
December	15.9	29.8	72.0	9.0	8.2	16.7	2.70
Average	20.8	32.9	71.0	6.0	6.3	17.3	3.36

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



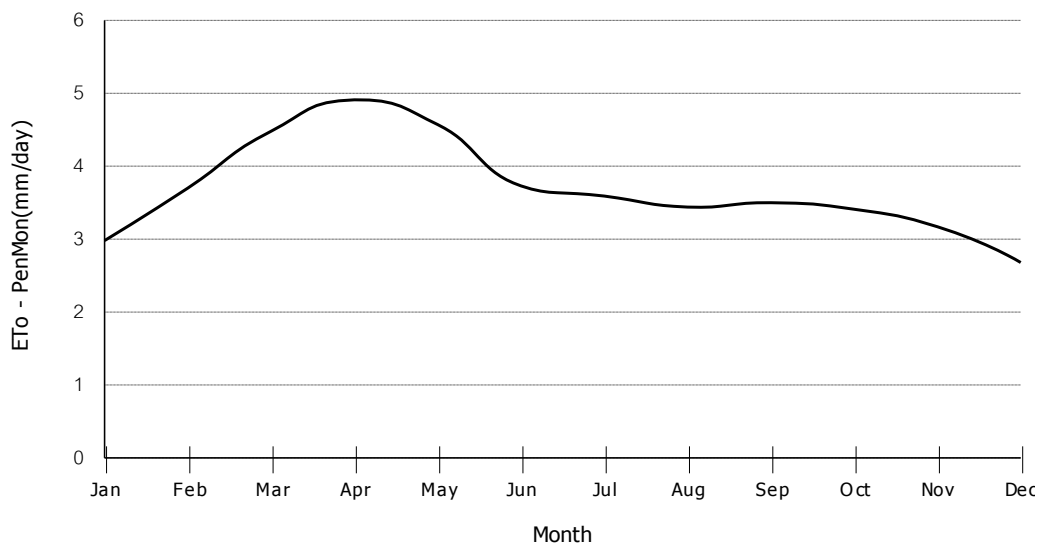
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: LAMPHUN		(30 Yrs)	
Altitude : 296 meter		Coordinates		: 18 - 34 N.L.		99 - 02 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	14.3	30.8	70.0	22.0	8.8	18.1	2.94
February	15.7	33.8	59.0	40.0	9.7	21.1	3.79
March	19.4	36.7	54.0	58.0	9.5	22.8	4.73
April	23.2	37.9	57.0	71.0	9.3	23.7	5.46
May	24.0	35.0	72.0	67.0	6.4	19.5	4.56
June	24.3	33.4	76.0	76.0	3.9	15.6	3.78
July	24.0	32.8	77.0	71.0	3.9	15.6	3.68
August	23.8	32.4	80.0	49.0	3.8	15.3	3.47
September	23.4	32.1	83.0	27.0	4.8	16.1	3.47
October	22.3	31.5	83.0	18.0	5.9	16.3	3.35
November	19.0	30.4	80.0	18.0	7.2	16.3	3.06
December	15.1	29.2	75.0	18.0	8.2	16.7	2.74
Average	20.7	33.0	72.0	45.0	6.8	18.1	3.75

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



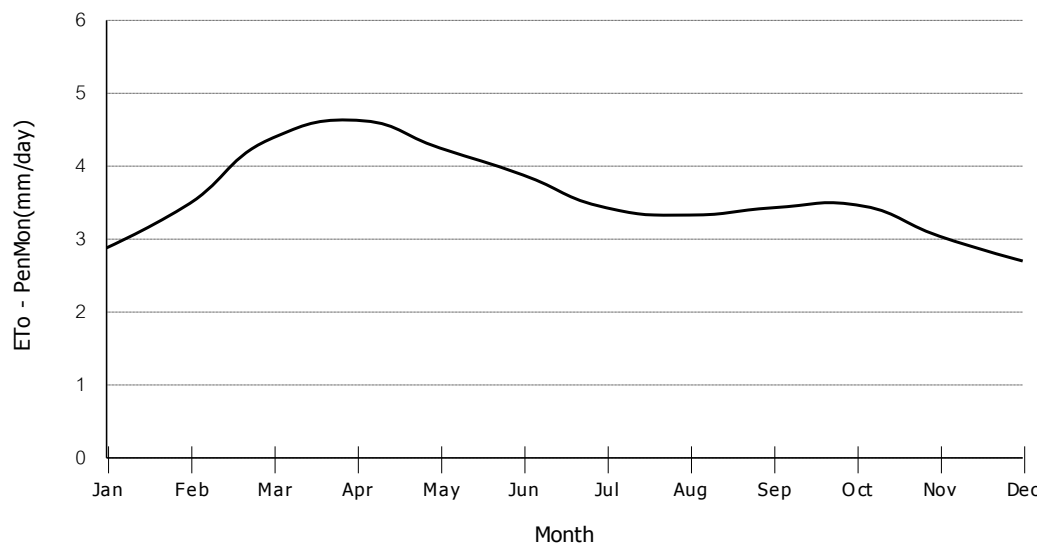
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PHRAE		(30 Yrs)	
Altitude : 161 meter		Coordinates		: 18 - 10 N.L.		100 - 10 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	15.7	31.2	74.0	27.0	8.3	17.5	2.98
February	17.6	33.7	68.0	44.0	8.6	19.7	3.70
March	21.2	36.3	62.0	71.0	7.7	20.2	4.48
April	24.3	37.6	64.0	84.0	6.8	19.9	4.91
May	24.7	35.3	74.0	67.0	6.4	19.5	4.57
June	24.7	33.6	79.0	71.0	3.9	15.6	3.73
July	24.4	32.6	81.0	62.0	3.9	15.6	3.59
August	24.3	32.3	83.0	49.0	3.8	15.3	3.44
September	24.0	32.4	84.0	31.0	4.8	16.1	3.50
October	23.0	32.1	83.0	27.0	5.9	16.3	3.41
November	19.7	31.2	79.0	31.0	7.2	16.4	3.17
December	15.9	29.9	76.0	27.0	7.1	15.4	2.68
Average	21.6	33.2	76.0	49.0	6.2	17.3	3.68

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



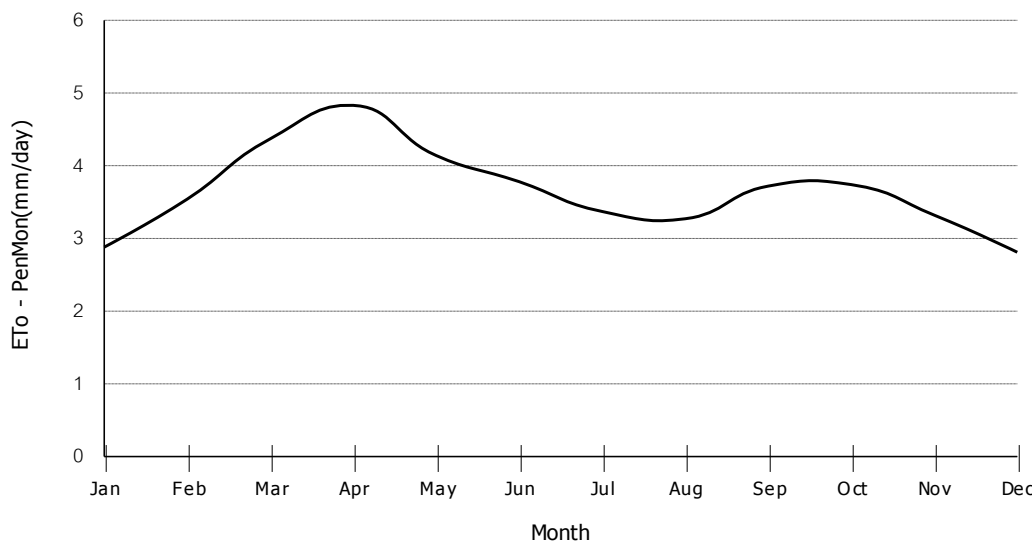
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NAN		(30 Yrs)	
Altitude : 200 meter		Coordinates		: 18 - 46 N.L.		100 - 46 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	14.2	30.8	76.0	9.0	8.8	18.0	2.88
February	15.6	33.4	70.0	13.0	9.1	20.3	3.49
March	18.9	36.2	65.0	22.0	9.5	22.8	4.39
April	22.3	37.0	68.0	22.0	8.1	21.9	4.63
May	23.5	35.0	76.0	18.0	6.4	19.5	4.25
June	24.0	33.5	79.0	22.0	5.2	17.6	3.88
July	23.8	32.4	82.0	18.0	3.9	15.6	3.43
August	23.6	32.2	84.0	18.0	3.8	15.3	3.33
September	23.3	32.7	84.0	9.0	4.8	16.1	3.43
October	21.9	32.5	82.0	9.0	6.5	17.1	3.47
November	18.5	31.2	80.0	9.0	7.2	16.3	3.04
December	14.5	29.6	78.0	9.0	8.2	16.6	2.70
Average	20.3	33.0	77.0	15.0	6.8	18.1	3.58

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



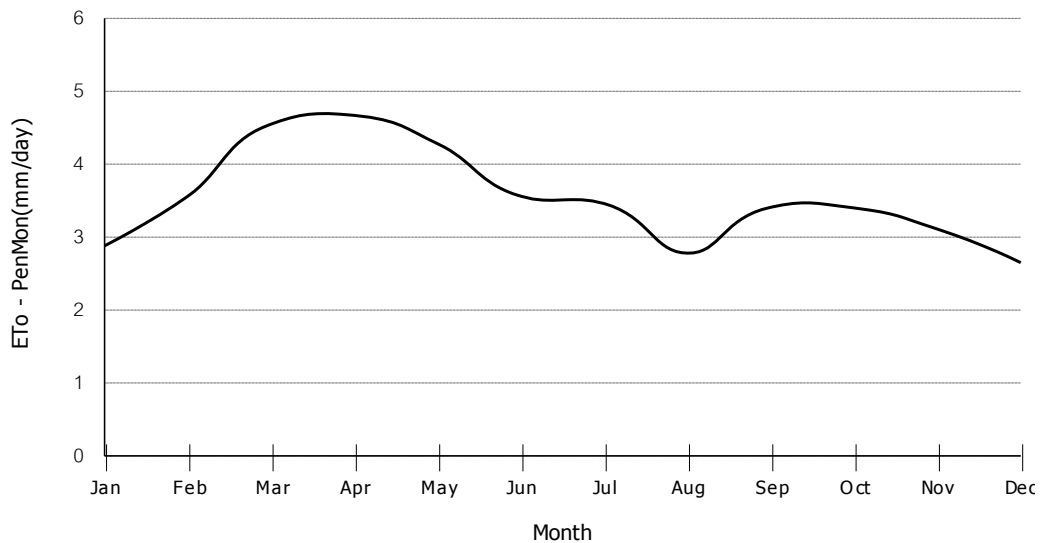
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NAN AGROMET.		(5 Yrs)	
Altitude : 246 meter		Coordinates		: 18 - 52 N.L.		100 - 45 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	13.0	30.3	74.0	4.0	9.4	18.8	2.88
February	15.3	32.9	70.0	9.0	9.7	21.1	3.54
March	18.2	35.2	67.0	9.0	10.1	23.7	4.37
April	22.0	35.8	69.0	13.0	9.3	23.7	4.83
May	23.3	33.5	78.0	9.0	6.4	19.5	4.14
June	23.8	32.9	80.0	4.0	5.2	17.6	3.78
July	23.7	31.6	83.0	4.0	3.9	15.6	3.37
August	23.4	31.4	85.0	0.0	3.8	15.3	3.27
September	23.0	32.0	84.0	0.0	6.1	18.0	3.72
October	21.8	31.9	83.0	4.0	7.7	18.7	3.74
November	16.9	30.9	78.0	4.0	9.4	19.1	3.32
December	14.2	29.7	77.0	0.0	9.3	18.0	2.81
Average	19.9	32.3	77.0	5.0	7.5	19.1	3.65

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



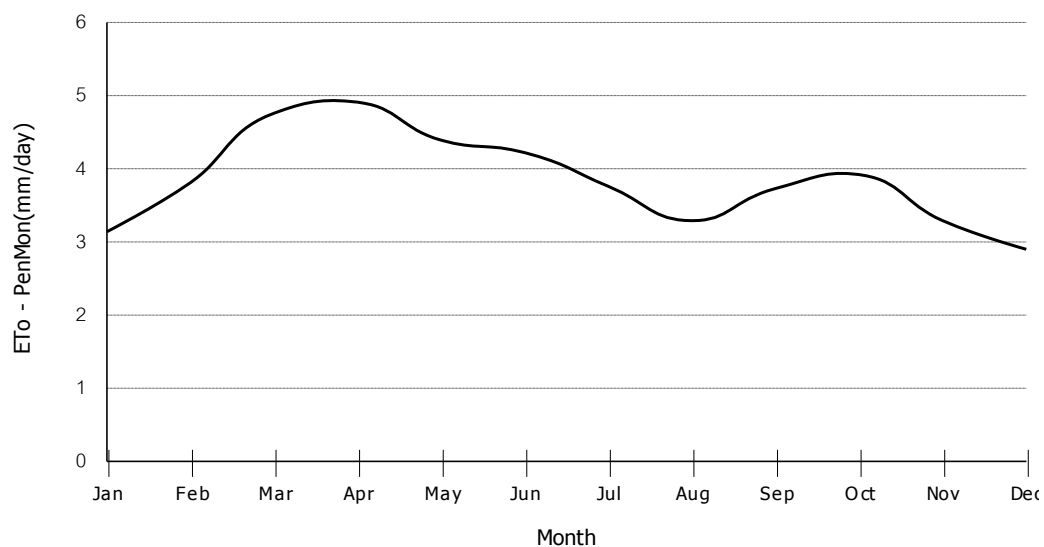
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: THA WANGPHA		(30 Yrs)	
Altitude : 235 meter		Coordinates		: 19 - 46 N.L.		100 - 48 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	13.4	29.4	78.0	22.0	9.3	18.3	2.88
February	14.7	32.4	73.0	27.0	9.6	20.7	3.56
March	18.3	35.3	68.0	36.0	10.1	23.5	4.55
April	21.9	36.2	70.0	36.0	8.1	21.8	4.67
May	23.6	34.0	78.0	31.0	6.4	19.5	4.28
June	24.2	32.4	82.0	40.0	3.9	15.8	3.56
July	23.9	31.3	84.0	36.0	3.9	15.7	3.46
August	23.7	31.1	86.0	27.0	1.9	12.4	2.78
September	23.3	31.9	85.0	18.0	4.8	16.1	3.41
October	21.7	31.5	84.0	18.0	6.4	16.8	3.40
November	17.9	29.9	81.0	13.0	8.3	17.4	3.11
December	13.9	28.3	80.0	13.0	8.7	16.9	2.65
Average	20.0	32.0	79.0	26.0	6.8	17.9	3.53

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



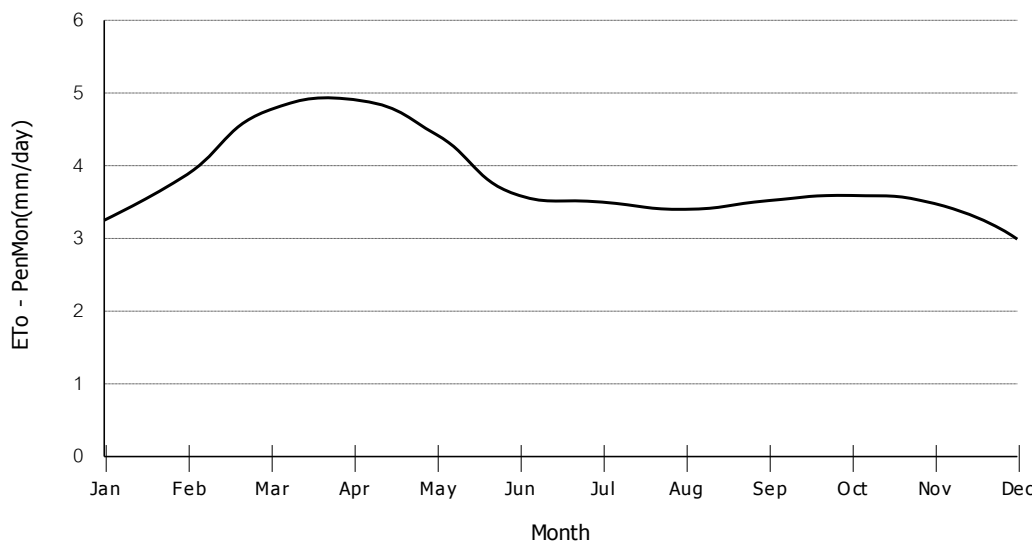
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: THUNG CHANG		(13 Yrs)	
Altitude : 333 meter		Coordinates		: 19 - 42 N.L.		100 - 53 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	13.5	29.7	79.0	27.0	10.4	19.8	3.14
February	14.8	32.0	74.0	27.0	10.8	22.3	3.81
March	17.4	34.1	71.0	36.0	11.3	25.3	4.76
April	21.2	34.9	75.0	36.0	9.3	23.6	4.91
May	22.9	32.8	82.0	31.0	7.1	20.6	4.39
June	23.8	31.8	85.0	27.0	6.6	19.7	4.22
July	23.6	30.7	87.0	27.0	5.2	17.6	3.76
August	23.5	30.6	89.0	22.0	3.8	15.3	3.29
September	22.8	31.2	87.0	18.0	6.1	17.9	3.73
October	21.1	31.3	84.0	22.0	8.7	20.0	3.92
November	17.1	30.2	80.0	40.0	8.8	18.1	3.29
December	14.4	28.8	79.0	40.0	9.2	17.6	2.90
Average	19.7	31.5	81.0	29.0	8.1	19.8	3.84

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



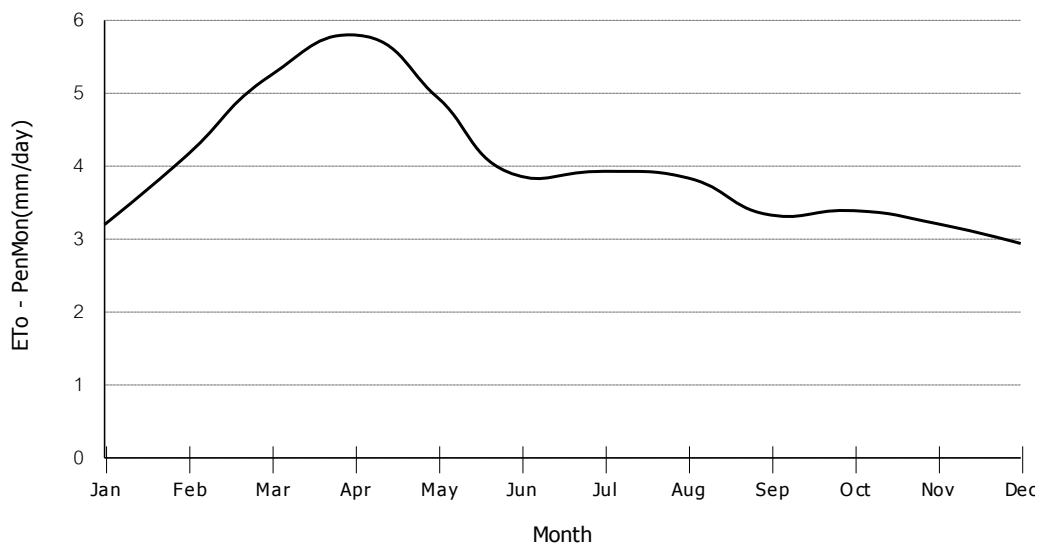
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: UTTARADIT		(30 Yrs)	
Altitude : 63 meter		Coordinates		: 17 - 37 N.L.		100 - 06 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.8	32.2	68.0	22.0	9.4	19.1	3.25
February	19.4	34.5	65.0	22.0	9.7	21.3	3.88
March	22.1	36.5	62.0	31.0	10.1	23.9	4.77
April	24.7	37.9	64.0	40.0	8.1	21.9	4.91
May	25.1	35.9	73.0	36.0	6.4	19.4	4.43
June	25.0	34.2	78.0	31.0	3.9	15.6	3.59
July	24.8	33.3	80.0	27.0	3.9	15.5	3.50
August	24.5	32.9	83.0	27.0	3.8	15.3	3.40
September	24.3	33.3	82.0	22.0	4.8	16.2	3.52
October	23.5	33.3	80.0	22.0	6.4	17.1	3.59
November	21.0	32.4	74.0	27.0	8.4	18.1	3.48
December	18.0	31.1	70.0	27.0	8.3	17.1	2.99
Average	22.5	34.0	73.0	28.0	6.9	18.4	3.77

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



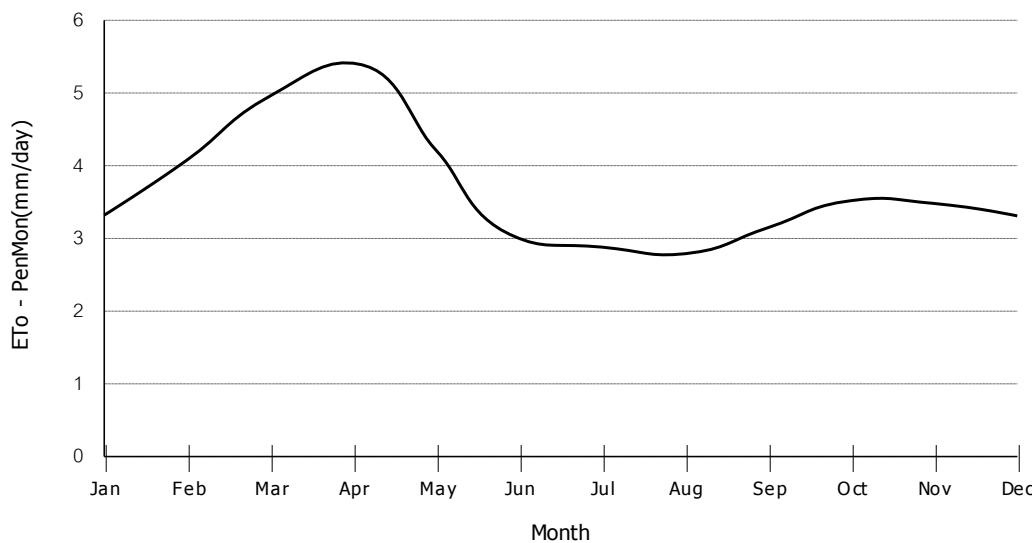
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: TAK		(30 Yrs)	
Altitude : 125 meter		Coordinates		: 16 - 52 N.L.		99 - 08 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.0	32.4	65.0	27.0	8.9	18.7	3.20
February	19.8	35.3	54.0	58.0	9.2	20.8	4.16
March	23.9	37.6	49.0	89.0	8.9	22.2	5.25
April	26.2	38.5	54.0	111.0	8.1	21.9	5.80
May	25.6	35.2	69.0	89.0	7.0	20.3	4.94
June	25.3	33.0	74.0	93.0	3.9	15.5	3.86
July	25.1	32.5	73.0	116.0	3.9	15.5	3.93
August	24.8	32.3	74.0	116.0	3.8	15.3	3.84
September	24.2	32.6	78.0	53.0	3.6	14.4	3.33
October	23.0	31.7	82.0	18.0	5.8	16.4	3.39
November	20.5	31.1	78.0	18.0	7.3	16.9	3.21
December	17.0	30.5	72.0	18.0	8.3	17.3	2.94
Average	22.7	33.6	69.0	67.0	6.6	17.9	3.99

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



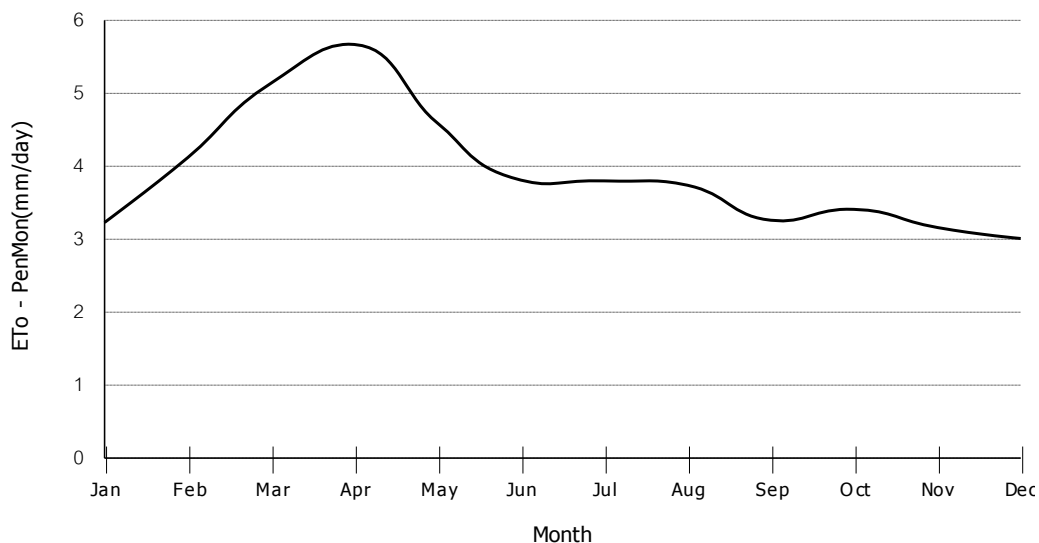
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: MAE SOT		(30 Yrs)	
Altitude : 196 meter		Coordinates		: 16 - 39 N.L.		98 - 33 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	15.3	31.6	72.0	44.0	8.9	18.7	3.32
February	16.7	34.0	64.0	62.0	9.2	20.9	4.08
March	19.8	35.8	61.0	93.0	8.9	22.2	4.96
April	23.1	36.8	64.0	116.0	8.1	21.9	5.41
May	23.9	34.1	76.0	93.0	5.1	17.4	4.21
June	23.6	31.4	84.0	76.0	1.9	12.5	3.00
July	23.2	30.5	86.0	71.0	1.9	12.5	2.88
August	23.1	30.3	87.0	67.0	1.9	12.4	2.79
September	23.2	31.5	85.0	49.0	3.6	14.5	3.15
October	22.3	32.2	82.0	58.0	5.8	16.5	3.52
November	19.2	31.5	77.0	76.0	7.3	16.9	3.48
December	15.5	30.4	74.0	67.0	8.9	18.1	3.31
Average	20.7	32.5	76.0	73.0	6.0	17.0	3.68

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



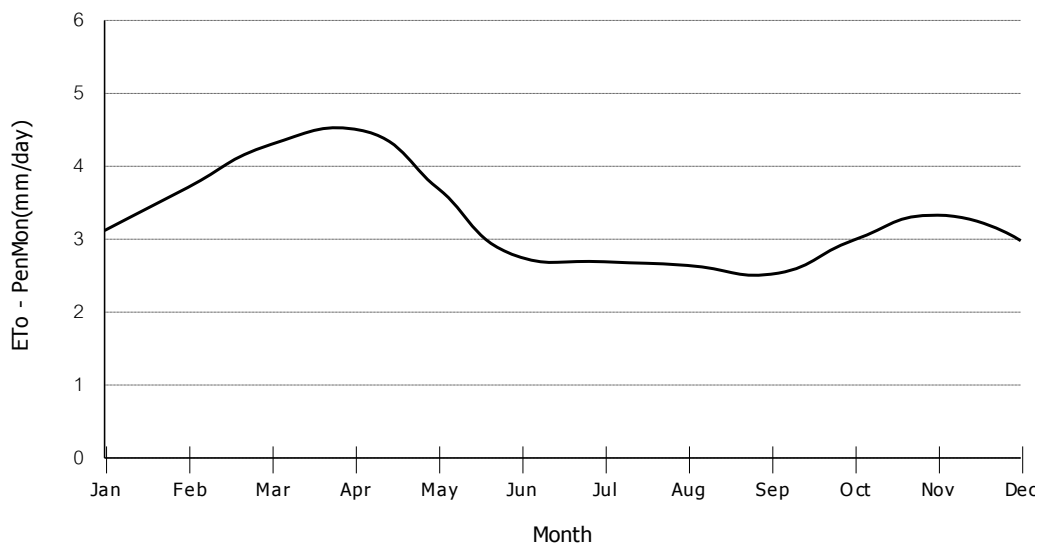
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: BHUMIBOL DAM		(30 Yrs)	
Altitude : 144 meter		Coordinates		: 17 - 14 N.L.		99 - 03 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.5	31.9	69.0	36.0	8.8	18.4	3.23
February	19.9	34.9	57.0	58.0	9.2	20.7	4.12
March	23.0	37.2	54.0	76.0	9.5	23.0	5.14
April	25.2	38.2	59.0	80.0	9.3	23.8	5.67
May	25.0	35.2	72.0	67.0	6.4	19.4	4.59
June	24.8	33.4	74.0	80.0	3.9	15.6	3.81
July	24.6	33.0	73.0	85.0	3.9	15.5	3.80
August	24.4	33.0	74.0	89.0	3.8	15.3	3.74
September	23.7	33.0	80.0	40.0	3.6	14.4	3.26
October	22.6	32.1	83.0	18.0	5.9	16.5	3.41
November	20.2	31.2	79.0	18.0	7.2	16.6	3.16
December	17.2	30.2	75.0	22.0	8.8	17.8	3.01
Average	22.3	33.6	71.0	56.0	6.7	18.1	3.91

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



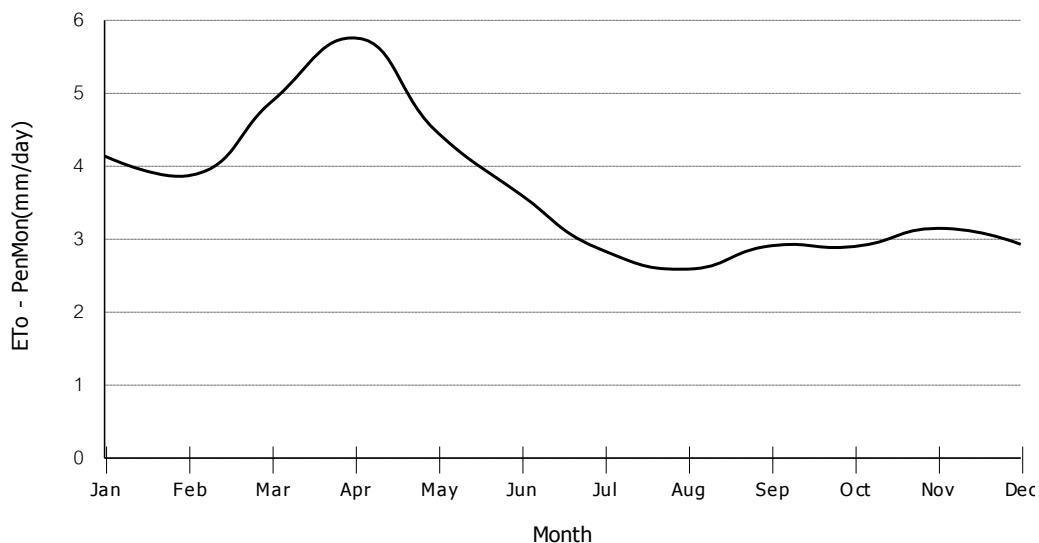
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: UMPHANG		(30 Yrs)	
Altitude : 454 meter		Coordinates		: 16 - 00 N.L.		98 - 51 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	12.3	30.5	75.0	22.0	8.9	18.9	3.12
February	12.7	32.8	68.0	31.0	9.2	21.0	3.71
March	15.9	34.5	66.0	36.0	8.9	22.3	4.30
April	19.4	34.8	71.0	27.0	8.1	21.9	4.51
May	21.3	32.0	81.0	18.0	5.1	17.4	3.70
June	21.8	29.7	85.0	13.0	1.9	12.5	2.75
July	21.4	28.9	87.0	9.0	1.9	12.5	2.69
August	21.5	28.6	88.0	9.0	1.9	12.4	2.64
September	21.2	29.6	87.0	9.0	1.8	11.8	2.52
October	20.0	30.0	85.0	13.0	4.6	14.8	2.99
November	16.7	29.5	81.0	22.0	8.4	18.5	3.33
December	12.9	28.8	78.0	22.0	8.9	18.2	2.98
Average	18.1	30.8	79.0	19.0	5.8	16.8	3.27

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



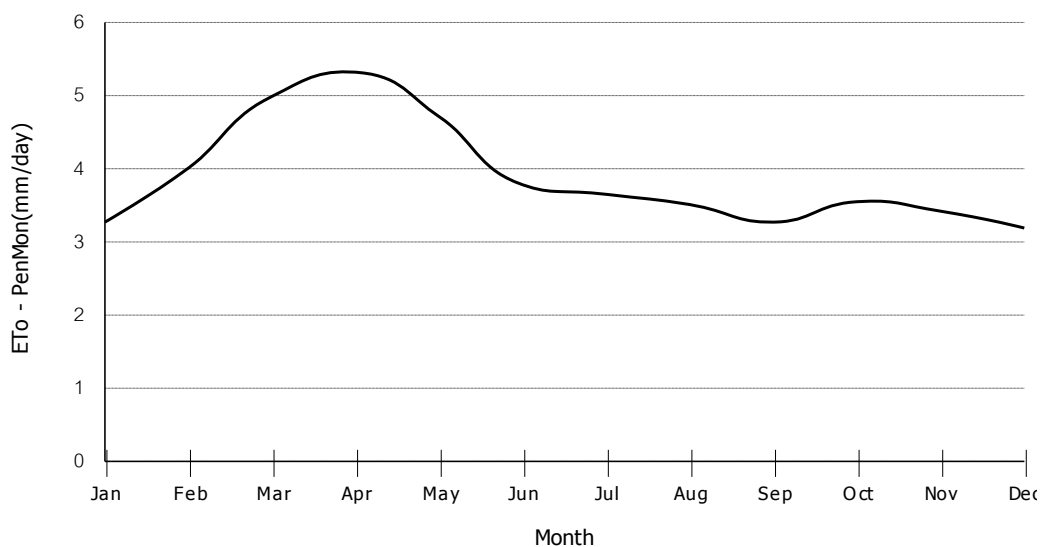
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: DOI MU SOE AGROMET.		(5 Yrs)	
Altitude : 863 meter		Coordinates		: 16 - 45 N.L.		98 - 56 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	12.4	26.0	5.0	129.0	8.9	18.7	4.14
February	15.2	29.4	74.0	116.0	8.6	20.0	3.87
March	16.8	31.1	71.0	187.0	8.9	22.2	4.88
April	19.4	32.2	60.0	187.0	9.3	23.8	5.76
May	20.1	28.2	65.0	191.0	5.1	17.4	4.46
June	20.2	27.3	81.0	240.0	3.9	15.5	3.61
July	19.7	25.2	86.0	267.0	1.9	12.5	2.84
August	19.5	25.4	90.0	240.0	1.9	12.4	2.59
September	19.6	26.5	90.0	151.0	3.6	14.4	2.91
October	18.4	25.8	88.0	125.0	4.6	14.7	2.90
November	15.0	25.1	87.0	133.0	8.4	18.4	3.15
December	12.6	24.6	81.0	125.0	8.3	17.3	2.93
Average	17.4	27.2	73.0	174.0	6.1	17.3	3.67

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



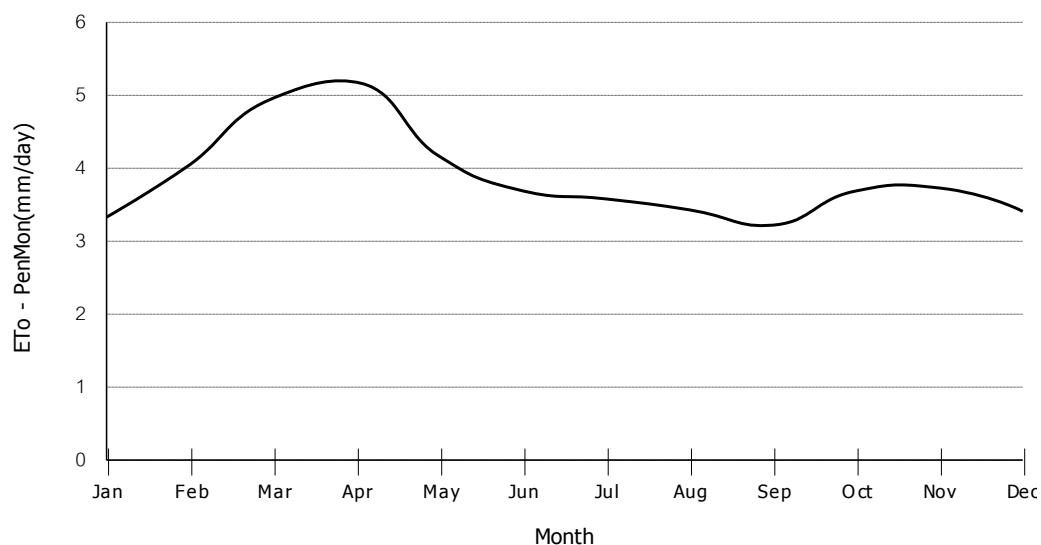
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PHITSANULOK		(30 Yrs)	
Altitude : 44 meter		Coordinates		: 16 - 47 N.L.		100 - 16 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	18.7	31.6	67.0	44.0	8.3	17.9	3.27
February	21.1	33.8	64.0	58.0	8.6	20.0	4.01
March	23.6	35.8	62.0	85.0	8.9	22.2	4.99
April	25.4	37.2	63.0	89.0	8.1	21.9	5.32
May	25.2	35.6	71.0	85.0	6.4	19.4	4.71
June	25.0	34.0	76.0	76.0	3.9	15.5	3.78
July	24.8	33.2	78.0	67.0	3.9	15.5	3.65
August	24.7	32.5	80.0	62.0	3.8	15.3	3.51
September	24.7	32.5	81.0	49.0	3.6	14.4	3.27
October	24.1	32.4	78.0	49.0	5.8	16.4	3.55
November	21.7	31.7	72.0	49.0	7.3	16.9	3.42
December	18.6	30.7	67.0	49.0	8.3	17.3	3.19
Average	23.1	33.4	72.0	63.0	6.4	17.7	3.89

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



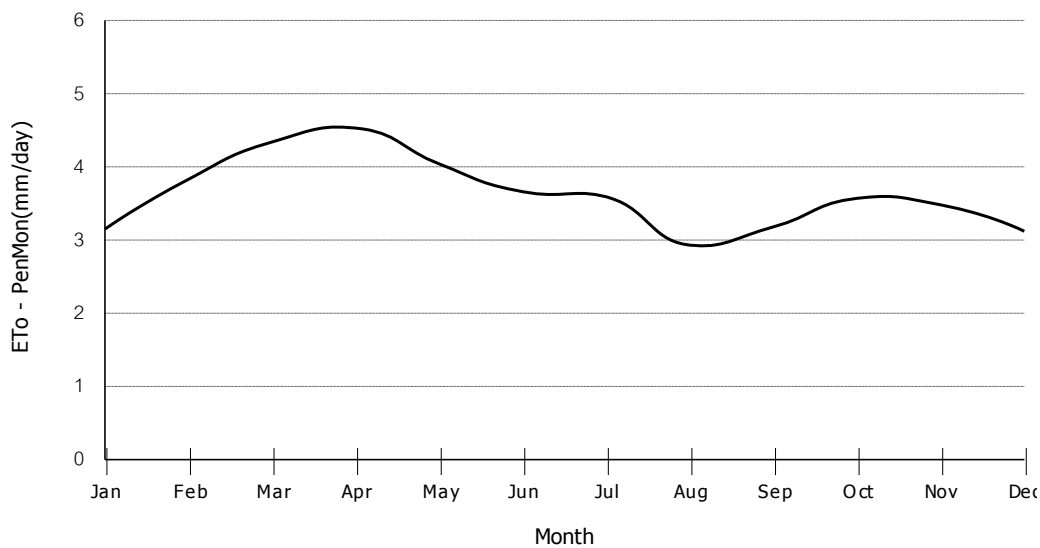
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PHETCHABUN		(30 Yrs)	
Altitude : 114 meter		Coordinates		: 16 - 26 N.L.		100 - 09 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.6	32.3	66.0	49.0	8.3	18.0	3.33
February	19.9	34.7	63.0	58.0	8.6	20.1	4.05
March	22.5	36.6	63.0	76.0	8.9	22.2	4.96
April	24.6	37.3	67.0	76.0	8.1	21.9	5.18
May	24.8	35.0	77.0	71.0	5.1	17.4	4.16
June	24.7	33.5	80.0	76.0	3.9	15.5	3.69
July	24.3	32.7	82.0	71.0	3.9	15.5	3.58
August	24.2	32.1	85.0	62.0	3.8	15.3	3.43
September	24.0	32.3	85.0	44.0	3.6	14.5	3.22
October	23.1	32.2	80.0	58.0	6.4	17.3	3.69
November	20.4	31.9	73.0	71.0	8.4	18.4	3.73
December	17.3	31.0	68.0	67.0	8.9	18.2	3.41
Average	22.3	33.5	74.0	65.0	6.5	17.9	3.87

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



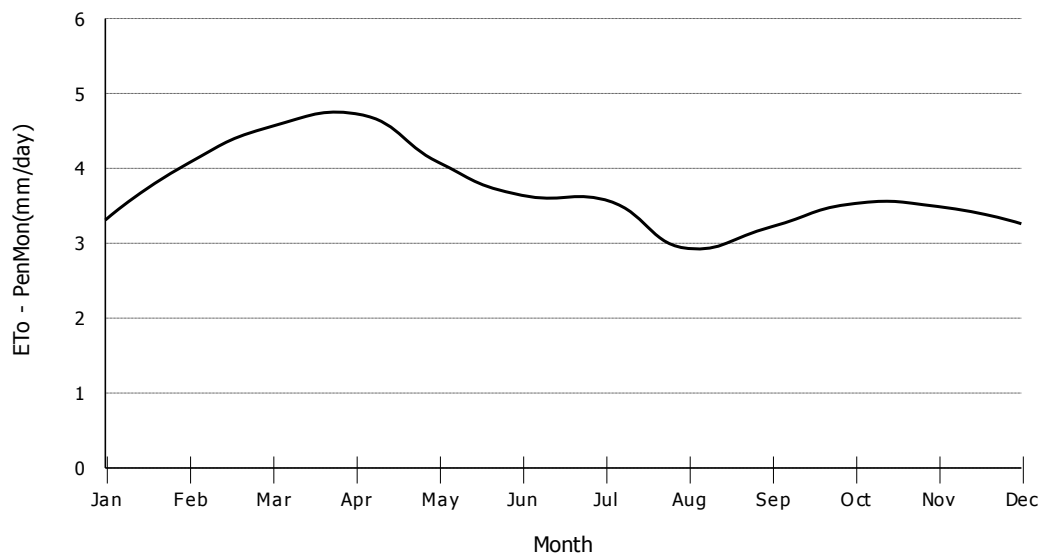
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: LOM SAK		(30 Yrs)	
Altitude : 143 meter		Coordinates		: 16 - 46 N.L.		101 - 14 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.4	32.0	63.0	31.0	8.3	17.9	3.15
February	19.3	34.1	61.0	40.0	8.6	20.0	3.83
March	21.7	35.7	63.0	49.0	7.7	20.4	4.34
April	23.8	36.6	67.0	49.0	6.8	19.9	4.53
May	24.4	34.9	76.0	49.0	5.1	17.4	4.04
June	24.5	33.4	79.0	67.0	3.9	15.5	3.66
July	24.2	32.5	80.0	67.0	3.9	15.5	3.59
August	24.1	31.9	83.0	62.0	1.9	12.4	2.93
September	23.8	32.3	83.0	31.0	3.6	14.4	3.18
October	22.8	32.3	78.0	27.0	6.4	17.3	3.57
November	20.0	31.9	70.0	31.0	8.4	18.4	3.48
December	17.1	30.9	65.0	31.0	8.9	18.1	3.12
Average	21.9	33.2	72.0	44.0	6.1	17.3	3.62

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



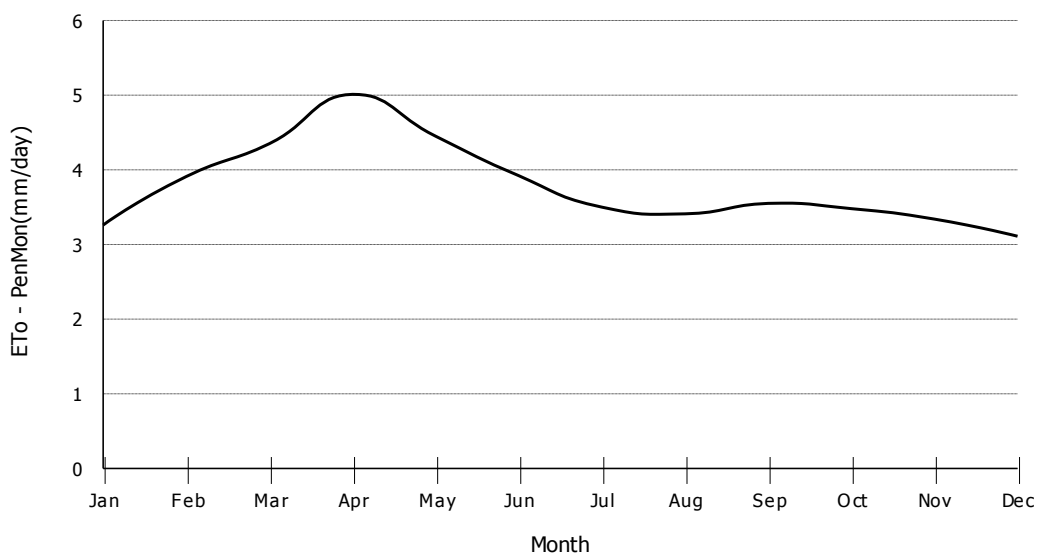
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: WICHIAN BURI		(30 Yrs)	
Altitude : 68 meter		Coordinates		: 15 - 39 N.L.		101 - 06 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	18.1	32.5	64.0	36.0	8.4	18.4	3.31
February	20.9	34.8	61.0	49.0	8.7	20.4	4.07
March	23.2	36.6	62.0	58.0	7.7	20.5	4.56
April	24.9	37.2	66.0	62.0	6.8	20.0	4.73
May	25.1	35.3	74.0	49.0	5.1	17.4	4.08
June	24.9	34.3	76.0	49.0	3.9	15.4	3.64
July	24.6	33.5	77.0	49.0	3.9	15.4	3.58
August	24.5	32.9	80.0	40.0	1.9	12.4	2.93
September	24.4	32.5	82.0	31.0	3.6	14.5	3.22
October	23.7	32.5	78.0	36.0	5.8	16.6	3.53
November	20.9	32.2	70.0	49.0	7.3	17.2	3.49
December	17.9	31.4	65.0	44.0	8.4	17.8	3.26
Average	22.8	33.8	71.0	46.0	6.0	17.2	3.70

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



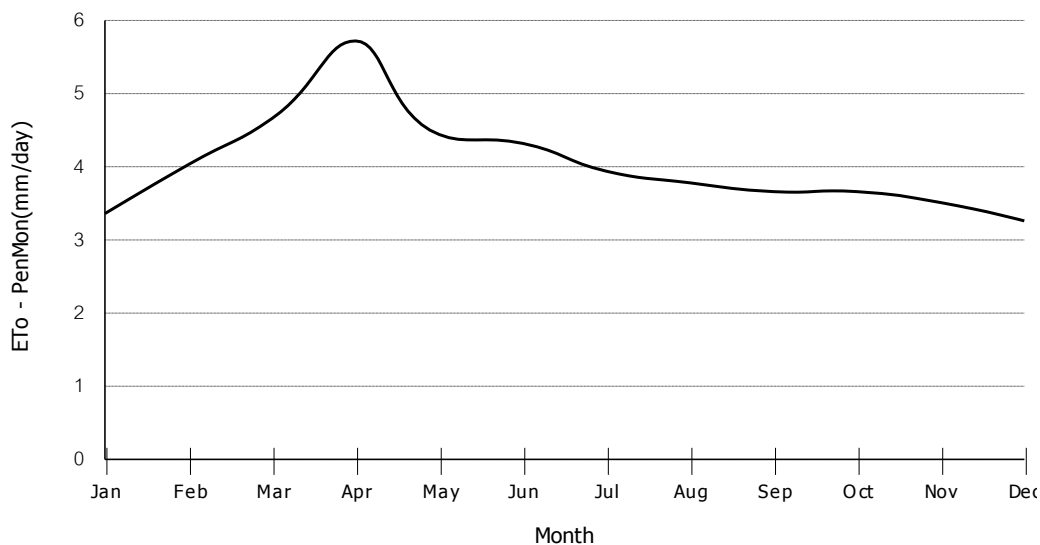
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: KAMPHAENG PHET		(30 Yrs)	
Altitude : 80 meter		Coordinates		: 16 - 29 N.L.		99 - 32 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	18.5	32.1	71.0	36.0	8.3	18.0	3.26
February	20.3	34.4	66.0	40.0	8.6	20.1	3.91
March	22.7	36.0	66.0	44.0	7.7	20.4	4.35
April	24.9	37.3	66.0	53.0	8.1	21.9	5.01
May	25.2	35.2	77.0	49.0	6.4	19.4	4.45
June	25.1	33.6	82.0	36.0	5.2	17.4	3.92
July	24.8	33.0	82.0	36.0	3.9	15.5	3.50
August	24.7	32.6	84.0	36.0	3.8	15.3	3.41
September	24.4	32.7	85.0	36.0	4.8	16.3	3.55
October	23.8	32.2	84.0	31.0	5.8	16.5	3.48
November	21.5	31.6	79.0	31.0	7.3	17.0	3.34
December	18.5	30.8	74.0	31.0	8.3	17.4	3.11
Average	22.9	33.5	76.0	38.0	6.5	17.9	3.77

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



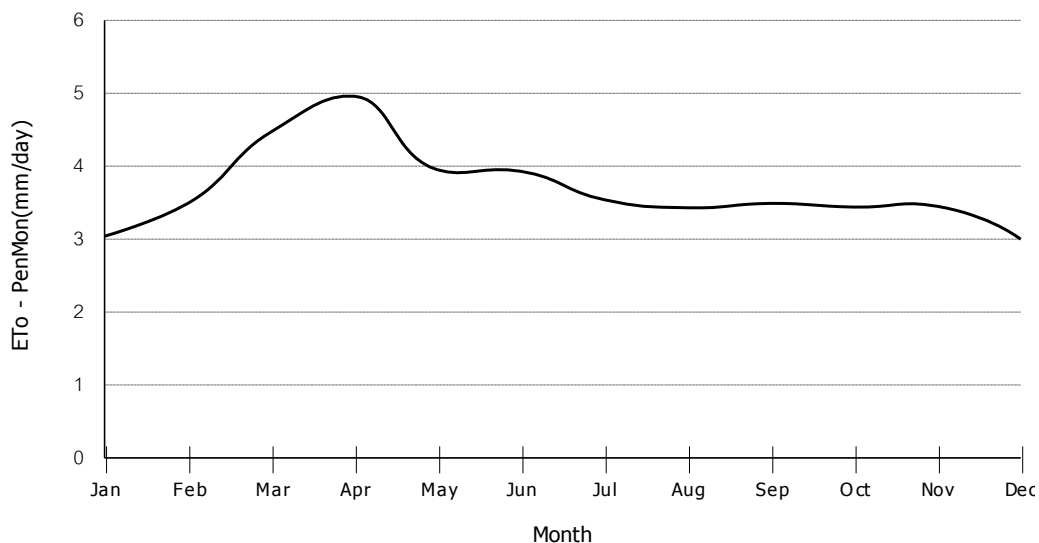
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SUKHOTHAI		(11 Yrs)	
Altitude : 48 meter		Coordinates		: 17 - 06 N.L.		99 - 48 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	18.2	31.6	76.0	67.0	8.3	17.8	3.36
February	20.0	33.4	75.0	80.0	8.6	19.9	4.03
March	22.3	35.6	70.0	102.0	7.7	20.3	4.66
April	24.7	37.9	67.0	147.0	8.1	21.9	5.72
May	24.7	34.9	77.0	138.0	5.1	17.5	4.44
June	24.9	33.8	80.0	160.0	5.2	17.5	4.32
July	24.8	33.2	80.0	160.0	3.9	15.5	3.94
August	24.5	32.9	81.0	147.0	3.8	15.3	3.78
September	24.3	32.7	84.0	93.0	4.8	16.2	3.66
October	24.0	32.8	82.0	85.0	5.9	16.5	3.66
November	21.3	31.9	77.0	85.0	7.2	16.6	3.51
December	18.8	31.0	76.0	67.0	8.3	17.2	3.26
Average	22.7	33.5	77.0	111.0	6.4	17.7	4.03

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



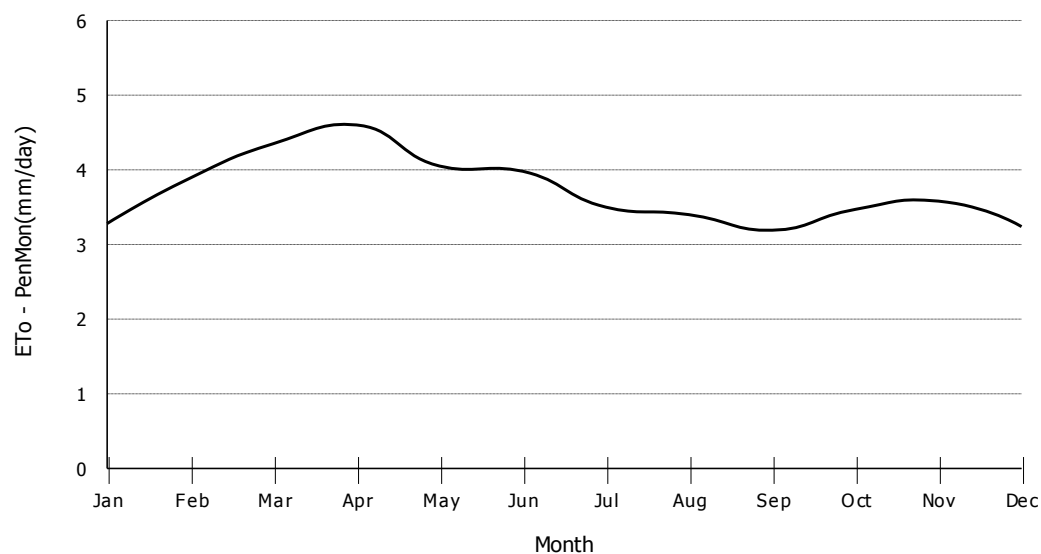
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SI SAMRONG AGROMET.		(5 Yrs)	
Altitude : 54 meter		Coordinates		: 17 - 10 N.L.		99 - 52 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	18.2	31.5	73.0	13.0	8.3	17.8	3.04
February	21.0	33.3	77.0	22.0	7.4	18.2	3.49
March	22.5	35.9	66.0	27.0	8.9	22.1	4.47
April	24.5	37.3	66.0	49.0	8.1	21.9	4.96
May	24.9	34.4	76.0	31.0	5.1	17.5	3.95
June	24.8	33.6	76.0	40.0	5.2	17.5	3.93
July	25.1	32.8	79.0	44.0	3.9	15.5	3.54
August	24.8	32.8	81.0	36.0	3.8	15.3	3.43
September	24.5	32.8	81.0	18.0	4.8	16.2	3.49
October	24.3	32.3	81.0	18.0	5.9	16.5	3.44
November	21.4	31.9	72.0	27.0	8.4	18.2	3.45
December	19.4	30.9	72.0	18.0	8.3	17.2	3.00
Average	22.9	33.3	75.0	29.0	6.5	17.8	3.68

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



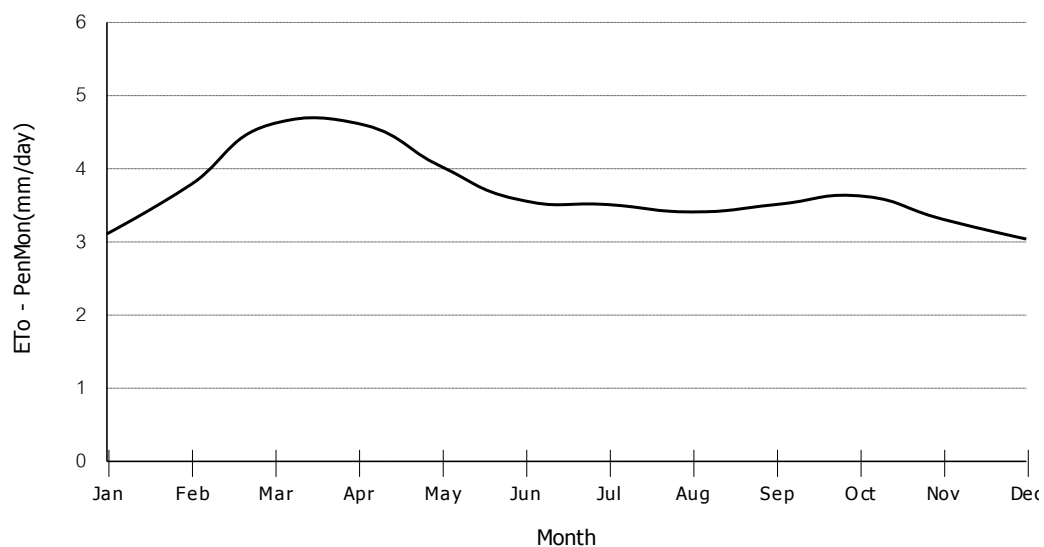
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PICHIT AGROMET.		(5 Yrs)	
Altitude : 36 meter		Coordinates		: 16 - 23 N.L.		100 - 17 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	18.5	31.0	77.0	27.0	8.9	18.8	3.28
February	21.7	33.0	76.0	40.0	8.6	20.1	3.89
March	23.8	35.1	72.0	44.0	7.7	20.4	4.35
April	25.3	36.4	70.0	53.0	6.8	19.9	4.60
May	25.2	34.3	77.0	58.0	5.1	17.4	4.05
June	25.1	34.1	79.0	49.0	5.2	17.4	3.98
July	24.8	33.1	82.0	36.0	3.9	15.5	3.50
August	24.7	32.6	84.0	31.0	3.8	15.3	3.40
September	24.7	32.4	85.0	27.0	3.6	14.5	3.19
October	24.4	32.1	84.0	22.0	5.8	16.5	3.47
November	21.4	31.8	78.0	36.0	8.4	18.4	3.58
December	19.1	30.8	78.0	27.0	8.9	18.2	3.24
Average	23.2	33.1	79.0	37.0	6.4	17.7	3.71

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



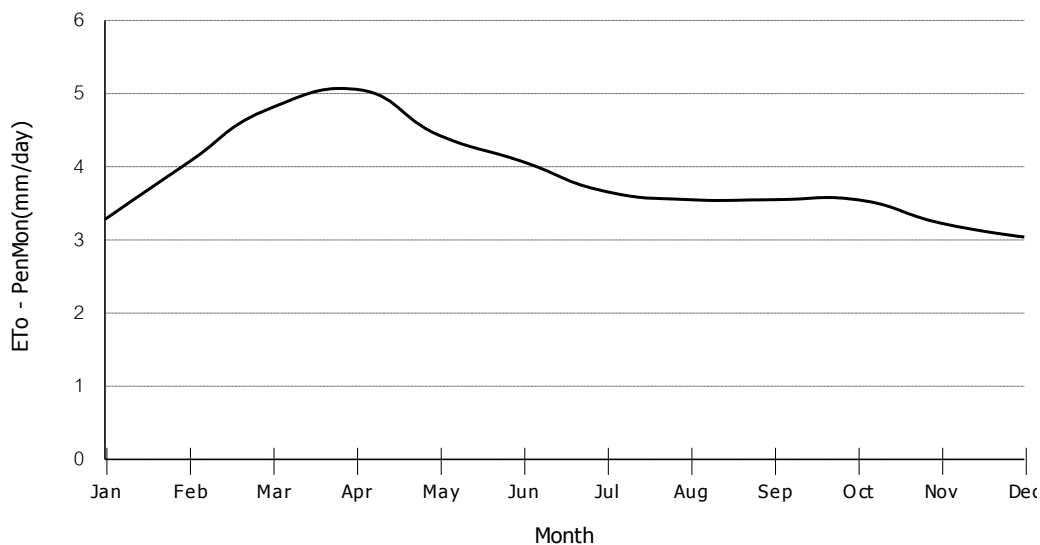
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NONG KHAI		(30 Yrs)	
Altitude : 173 meter		Coordinates		: 17 - 52 N.L.		102 - 43 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	16.8	29.7	69.0	53.0	8.3	17.7	3.11
February	19.1	32.1	66.0	58.0	8.6	19.8	3.78
March	21.9	34.7	64.0	62.0	8.9	22.1	4.62
April	24.3	36.2	67.0	62.0	6.8	19.9	4.62
May	24.7	34.2	78.0	53.0	5.1	17.5	4.03
June	24.9	33.0	83.0	44.0	3.9	15.6	3.56
July	24.7	32.4	84.0	44.0	3.9	15.6	3.51
August	24.5	31.9	85.0	44.0	3.8	15.3	3.41
September	24.1	31.9	83.0	40.0	4.8	16.2	3.51
October	22.9	31.8	78.0	53.0	6.4	17.1	3.63
November	19.8	30.6	71.0	58.0	7.2	16.5	3.31
December	16.5	28.9	69.0	58.0	8.3	17.0	3.04
Average	22.0	32.3	75.0	53.0	6.3	17.5	3.68

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



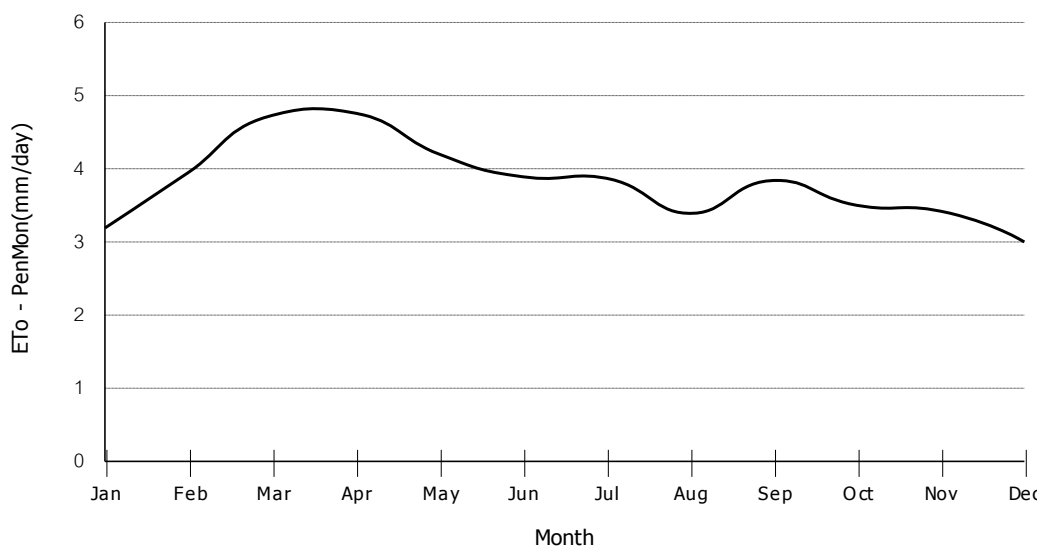
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: LOEI		(30 Yrs)	
Altitude : 253 meter		Coordinates		: 17 - 27 N.L.		101 - 44 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	14.9	30.1	68.0	67.0	8.8	18.4	3.28
February	17.0	32.9	63.0	76.0	9.2	20.7	4.06
March	20.0	35.1	61.0	85.0	8.9	22.1	4.81
April	22.7	35.9	67.0	85.0	8.1	21.9	5.06
May	23.7	33.8	77.0	76.0	6.4	19.4	4.43
June	24.3	33.0	77.0	80.0	5.2	17.5	4.07
July	24.0	32.3	78.0	80.0	3.9	15.5	3.66
August	23.8	32.0	80.0	80.0	3.8	15.3	3.55
September	23.1	31.6	83.0	62.0	4.8	16.2	3.55
October	21.8	31.0	81.0	53.0	6.4	17.2	3.55
November	18.5	30.2	75.0	53.0	7.2	16.6	3.23
December	14.9	28.9	71.0	62.0	8.3	17.1	3.04
Average	20.7	32.2	73.0	71.0	6.8	18.2	3.86

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



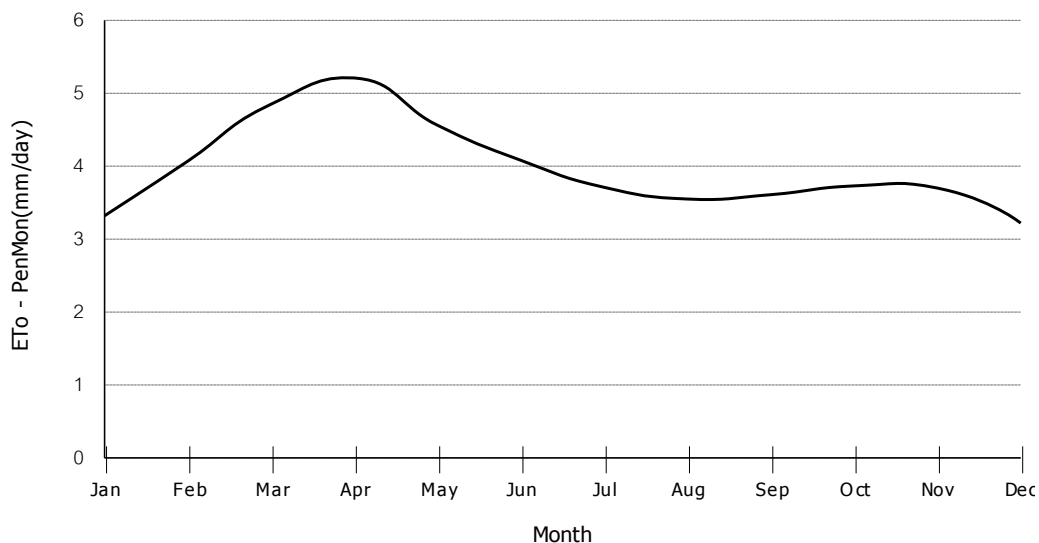
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: LOEI AGROMET.		(5 Yrs)	
Altitude : 260 meter		Coordinates		: 17 - 24 N.L.		101 - 44 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	15.1	29.5	74.0	40.0	9.4	19.1	3.19
February	17.7	32.3	70.0	53.0	9.7	21.4	3.95
March	20.6	34.8	68.0	58.0	9.5	23.0	4.73
April	23.0	34.9	75.0	49.0	8.1	21.9	4.76
May	23.6	32.7	84.0	40.0	6.4	19.4	4.20
June	24.2	33.4	83.0	40.0	5.2	17.5	3.89
July	24.1	32.7	83.0	40.0	5.2	17.5	3.87
August	23.8	32.1	86.0	36.0	3.8	15.3	3.39
September	23.3	31.8	88.0	31.0	6.1	18.1	3.84
October	22.2	30.7	87.0	27.0	6.4	17.2	3.50
November	18.1	30.1	80.0	31.0	8.9	18.8	3.42
December	16.0	29.0	79.0	31.0	8.8	17.7	3.00
Average	21.0	32.0	80.0	40.0	7.3	18.9	3.81

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



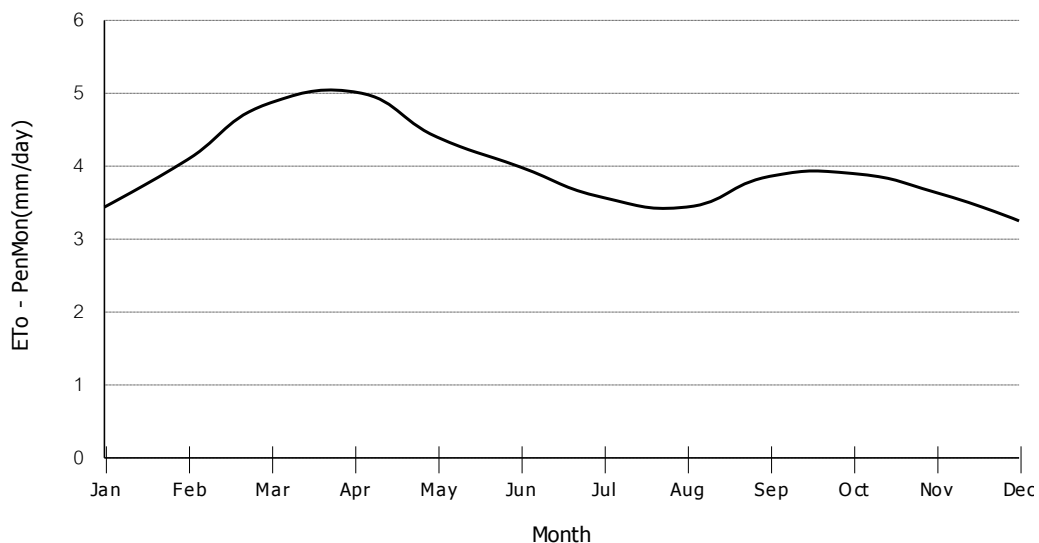
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: UDON THANI		(30 Yrs)	
Altitude : 177 meter		Coordinates		: 17 - 23 N.L.		102 - 48 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	16.5	30.0	65.0	67.0	8.8	18.4	3.32
February	18.9	32.4	63.0	76.0	9.2	20.7	4.07
March	21.9	34.9	60.0	85.0	8.9	22.1	4.85
April	24.4	36.3	63.0	89.0	8.1	21.9	5.21
May	24.8	34.4	74.0	80.0	6.4	19.4	4.56
June	25.0	33.2	78.0	80.0	5.2	17.5	4.08
July	24.9	32.6	78.0	85.0	3.9	15.5	3.71
August	24.6	32.0	81.0	80.0	3.8	15.3	3.55
September	24.2	31.9	81.0	67.0	4.8	16.2	3.61
October	22.9	31.6	76.0	76.0	6.4	17.2	3.73
November	19.7	30.7	69.0	85.0	8.4	18.2	3.70
December	16.4	29.1	67.0	80.0	8.3	17.1	3.22
Average	22.0	32.4	71.0	79.0	6.9	18.3	3.97

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



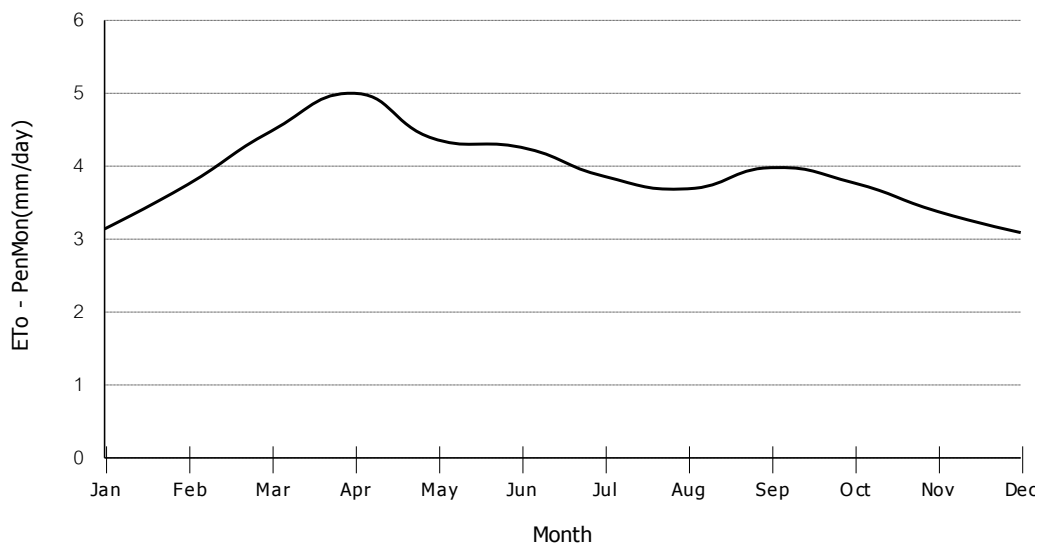
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SAKON NAKHON		(30 Yrs)	
Altitude : 171 meter		Coordinates		: 17 - 09 N.L.		104 - 08 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	16.3	29.2	67.0	93.0	8.8	18.4	3.44
February	19.0	31.3	65.0	107.0	8.6	19.9	4.09
March	22.1	33.7	63.0	102.0	8.9	22.1	4.87
April	24.5	35.1	66.0	80.0	8.1	21.9	5.02
May	24.9	33.5	76.0	62.0	6.4	19.4	4.40
June	25.2	32.5	80.0	71.0	5.2	17.5	3.99
July	24.9	31.9	82.0	71.0	3.9	15.5	3.57
August	24.6	31.4	84.0	67.0	3.8	15.3	3.44
September	24.2	31.4	83.0	44.0	6.1	18.1	3.86
October	22.6	31.1	76.0	62.0	7.6	18.9	3.90
November	19.4	30.3	70.0	80.0	8.4	18.2	3.64
December	16.1	28.6	68.0	80.0	8.8	17.8	3.25
Average	22.0	31.7	73.0	77.0	7.0	18.6	3.96

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



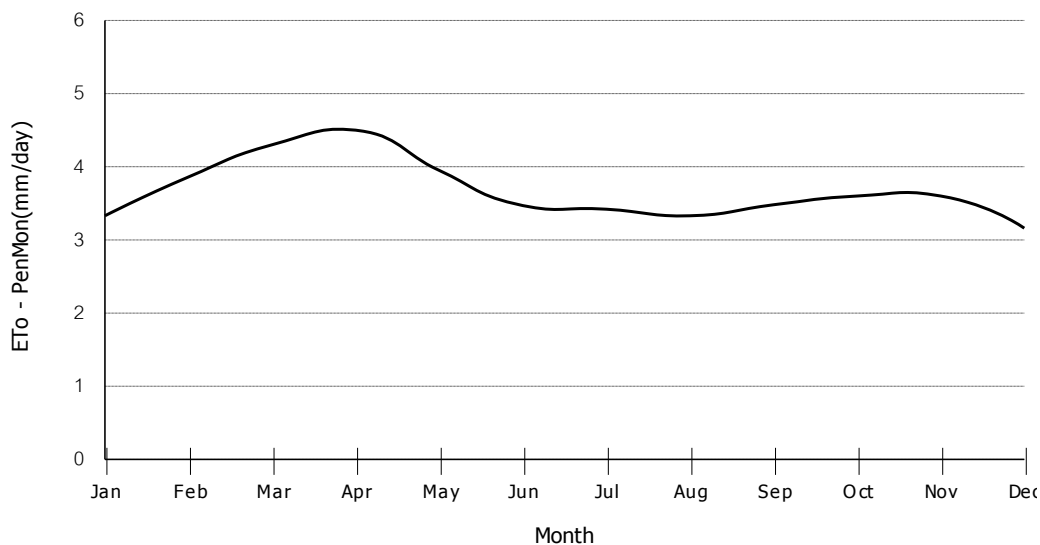
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SAKON NAKHON AGROMET.		(5 Yrs)	
Altitude : 192 meter		Coordinates		: 17 - 07 N.L.		104 - 03 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	14.6	29.8	71.0	31.0	9.4	19.2	3.14
February	17.8	32.0	69.0	40.0	9.2	20.7	3.75
March	21.0	34.3	69.0	27.0	9.5	23.0	4.48
April	23.5	35.5	71.0	27.0	9.3	23.8	5.00
May	24.1	33.8	78.0	18.0	7.0	20.3	4.36
June	24.9	33.6	81.0	27.0	6.5	19.4	4.26
July	24.7	32.3	82.0	36.0	5.2	17.5	3.86
August	24.3	31.8	85.0	22.0	5.0	17.1	3.69
September	23.8	32.0	84.0	13.0	6.7	19.0	3.98
October	22.0	31.4	82.0	13.0	7.6	18.9	3.77
November	18.0	30.6	75.0	22.0	8.9	18.9	3.38
December	15.6	29.9	74.0	27.0	9.4	18.5	3.09
Average	21.2	32.3	77.0	25.0	7.8	19.7	3.90

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



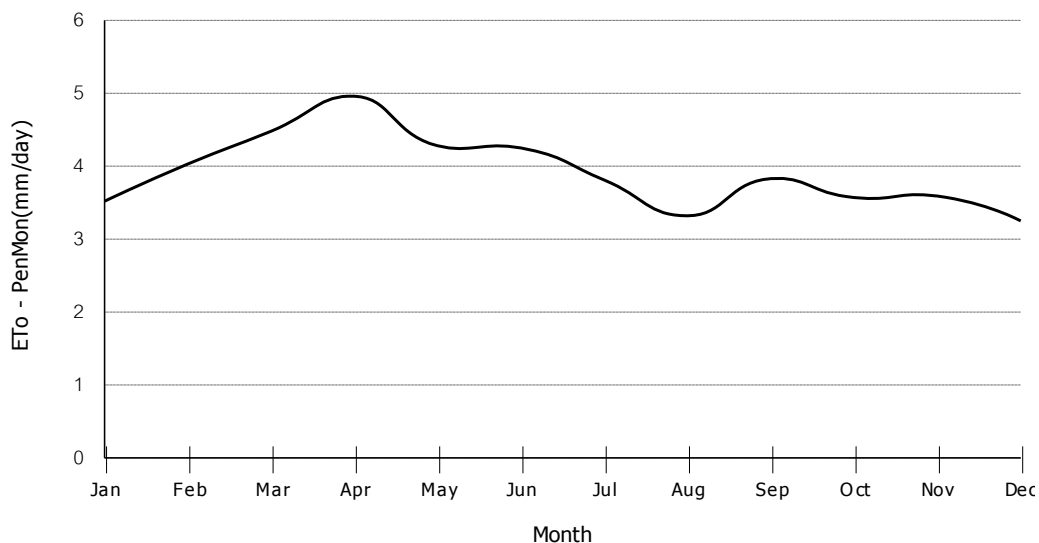
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NAKHON PHANOM		(30 Yrs)	
Altitude : 140 meter		Coordinates		: 17 - 25 N.L.		104 - 47 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	16.3	29.4	67.0	76.0	8.8	18.4	3.33
February	19.0	31.3	67.0	76.0	8.6	19.8	3.86
March	21.8	33.7	66.0	67.0	7.7	20.3	4.30
April	24.3	35.1	69.0	58.0	6.8	19.9	4.50
May	24.7	33.7	78.0	40.0	5.1	17.5	3.95
June	24.7	32.2	84.0	27.0	3.9	15.6	3.47
July	24.5	31.6	86.0	27.0	3.9	15.5	3.42
August	24.3	31.2	88.0	31.0	3.8	15.3	3.33
September	23.9	31.8	84.0	31.0	4.8	16.2	3.48
October	22.4	31.7	76.0	49.0	6.4	17.2	3.60
November	19.4	30.6	70.0	71.0	8.4	18.2	3.60
December	16.2	28.8	68.0	76.0	8.3	17.1	3.16
Average	21.8	31.8	75.0	52.0	6.4	17.6	3.67

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



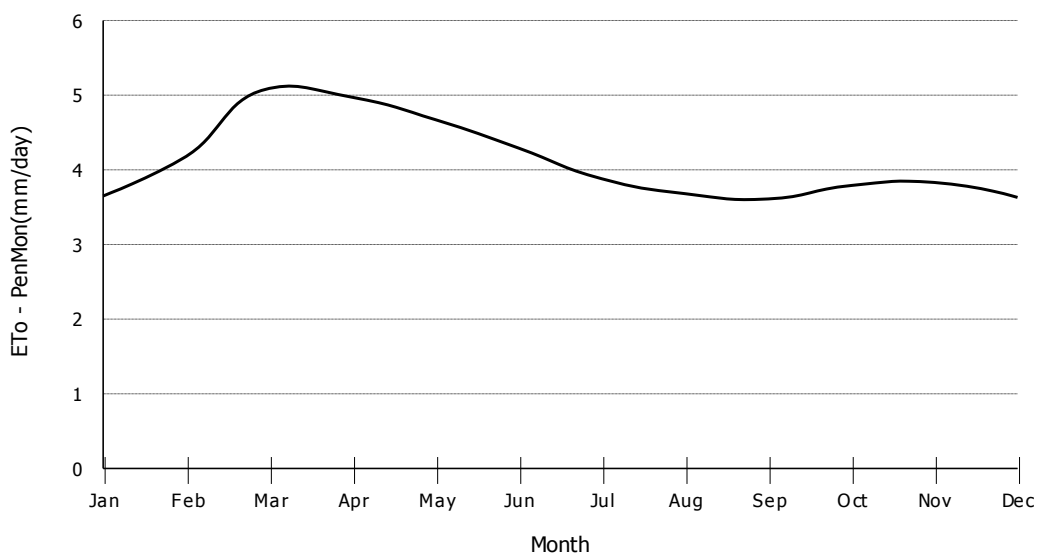
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NAKHON PHANOM AGROMET. (5 Yrs)			
Altitude : 153 meter		Coordinates		: 17 - 26 N.L. 104 - 47 E.L.			
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	14.6	29.1	68.0	116.0	8.8	18.4	3.52
February	18.0	31.4	67.0	107.0	8.6	19.8	4.03
March	21.2	33.9	67.0	93.0	7.7	20.3	4.48
April	23.4	35.1	69.0	80.0	8.1	21.9	4.96
May	24.0	33.3	78.0	49.0	6.4	19.4	4.28
June	24.8	32.8	83.0	40.0	6.5	19.4	4.25
July	24.6	31.6	85.0	36.0	5.2	17.5	3.81
August	24.4	31.1	86.0	22.0	3.8	15.3	3.32
September	23.8	31.6	84.0	31.0	6.1	18.1	3.83
October	21.8	30.9	81.0	58.0	6.4	17.2	3.57
November	17.7	30.0	73.0	93.0	8.4	18.2	3.59
December	15.2	29.2	72.0	85.0	8.8	17.7	3.25
Average	21.1	31.7	76.0	67.0	7.1	18.6	3.91

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



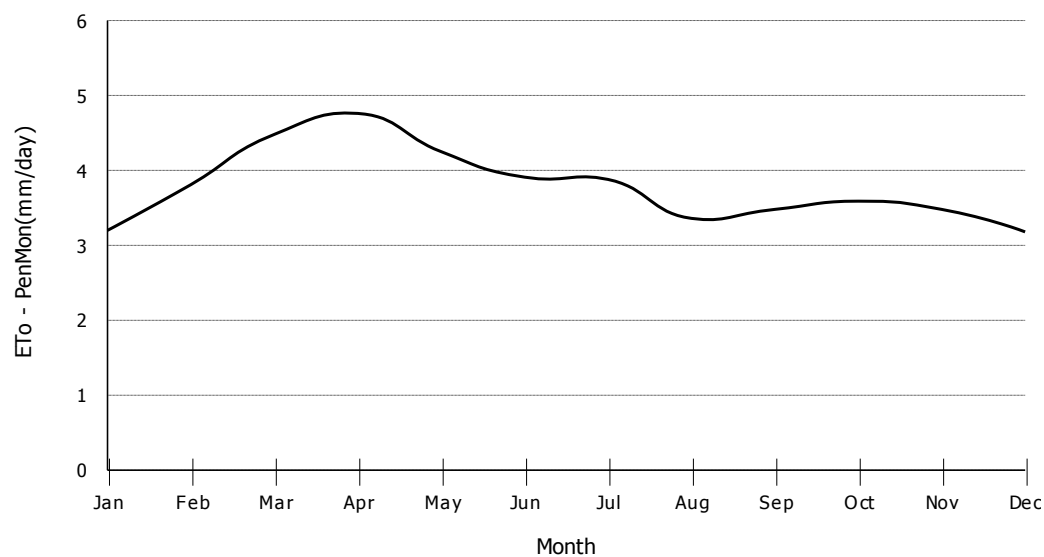
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: KHON KAEN		(30 Yrs)	
Altitude : 187 meter		Coordinates		: 16 - 27 N.L.		102 - 47 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	16.1	30.8	65.0	93.0	8.9	18.8	3.65
February	18.0	33.1	63.0	93.0	8.6	20.1	4.18
March	21.8	35.3	61.0	107.0	8.9	22.2	5.09
April	23.7	36.4	64.0	102.0	6.8	19.9	4.97
May	24.4	34.5	74.0	107.0	6.4	19.4	4.67
June	24.0	33.6	77.0	133.0	5.2	17.4	4.29
July	23.6	33.0	78.0	133.0	3.9	15.5	3.88
August	23.5	32.4	81.0	125.0	3.8	15.3	3.68
September	23.4	31.9	83.0	80.0	4.8	16.3	3.61
October	23.0	31.6	78.0	98.0	6.4	17.3	3.79
November	22.1	31.2	70.0	116.0	7.3	17.0	3.83
December	16.0	30.1	65.0	116.0	8.3	17.4	3.63
Average	21.6	32.8	72.0	109.0	6.6	18.0	4.11

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



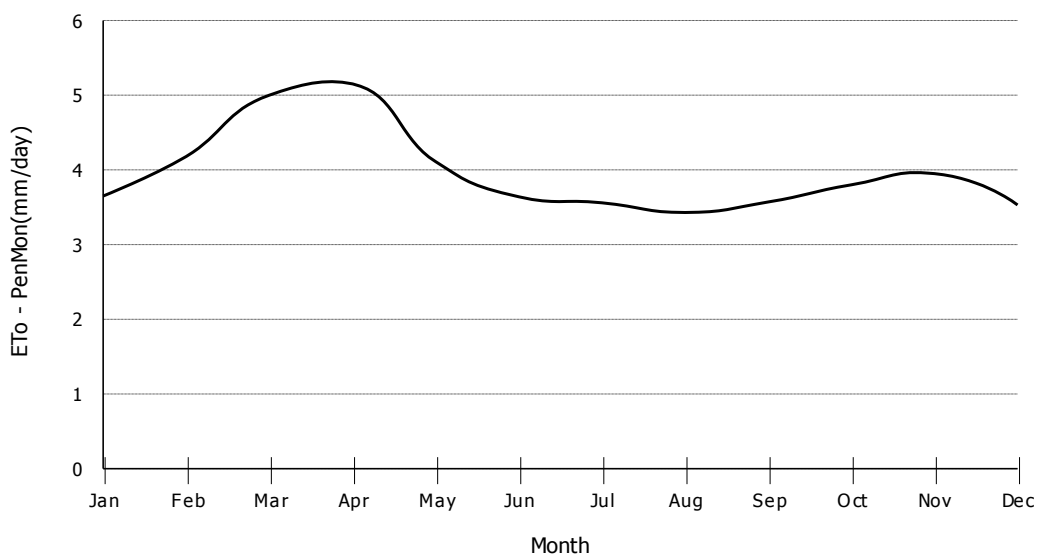
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: THA PHRA AGROMET.		(5 Yrs)	
Altitude : 166 meter		Coordinates		: 16 - 20 N.L.		102 - 49 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	16.4	31.0	71.0	27.0	8.9	18.8	3.20
February	19.5	33.2	69.0	22.0	9.2	20.9	3.81
March	22.4	35.4	67.0	27.0	8.9	22.2	4.48
April	24.4	36.0	71.0	27.0	8.1	21.9	4.76
May	24.3	34.1	79.0	27.0	6.4	19.4	4.25
June	25.0	33.9	79.0	31.0	5.2	17.4	3.91
July	24.6	32.7	81.0	40.0	5.2	17.4	3.88
August	24.2	31.9	85.0	27.0	3.8	15.3	3.36
September	23.8	32.1	87.0	13.0	4.8	16.3	3.48
October	22.9	31.9	84.0	27.0	6.4	17.3	3.59
November	19.5	31.2	75.0	36.0	8.4	18.4	3.48
December	17.2	30.8	73.0	31.0	8.9	18.2	3.18
Average	22.0	32.9	77.0	28.0	7.0	18.6	3.78

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



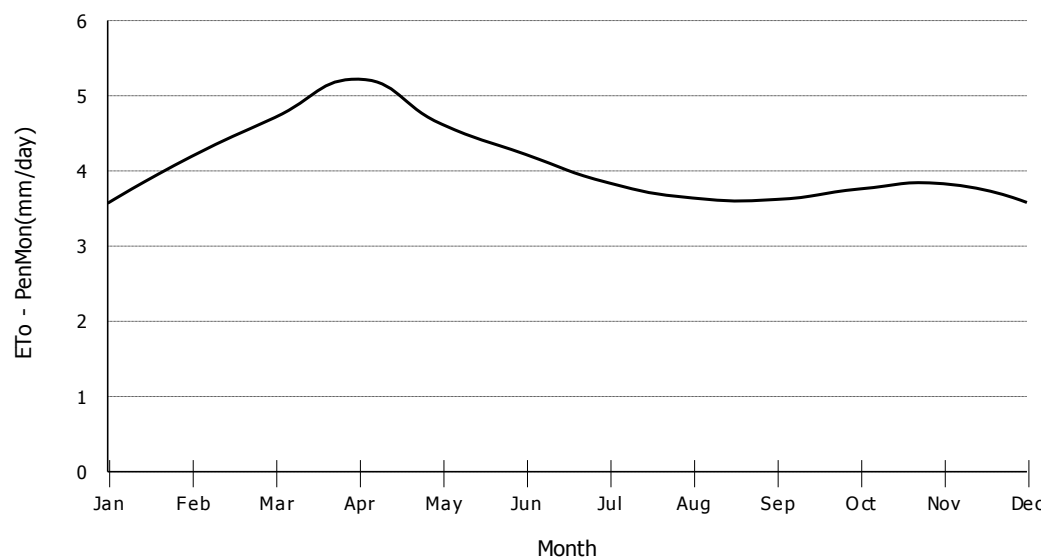
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: MUKDAHAN		(30 Yrs)	
Altitude : 138 meter		Coordinates		: 16 - 32 N.L.		104 - 43 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	16.4	30.4	67.0	102.0	8.9	18.8	3.65
February	19.1	32.7	65.0	98.0	8.6	20.0	4.18
March	22.3	35.1	62.0	98.0	8.9	22.2	5.00
April	24.6	36.1	65.0	85.0	8.1	21.9	5.15
May	24.9	34.5	75.0	62.0	5.1	17.4	4.11
June	25.0	32.9	79.0	67.0	3.9	15.5	3.64
July	24.7	32.4	81.0	62.0	3.9	15.5	3.56
August	24.4	31.8	84.0	58.0	3.8	15.3	3.43
September	24.1	32.0	82.0	49.0	4.8	16.3	3.57
October	22.5	31.7	77.0	89.0	6.4	17.3	3.80
November	19.7	30.7	71.0	129.0	8.4	18.4	3.95
December	16.7	29.2	69.0	125.0	8.3	17.4	3.53
Average	22.0	32.5	73.0	85.0	6.6	18.0	3.96

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



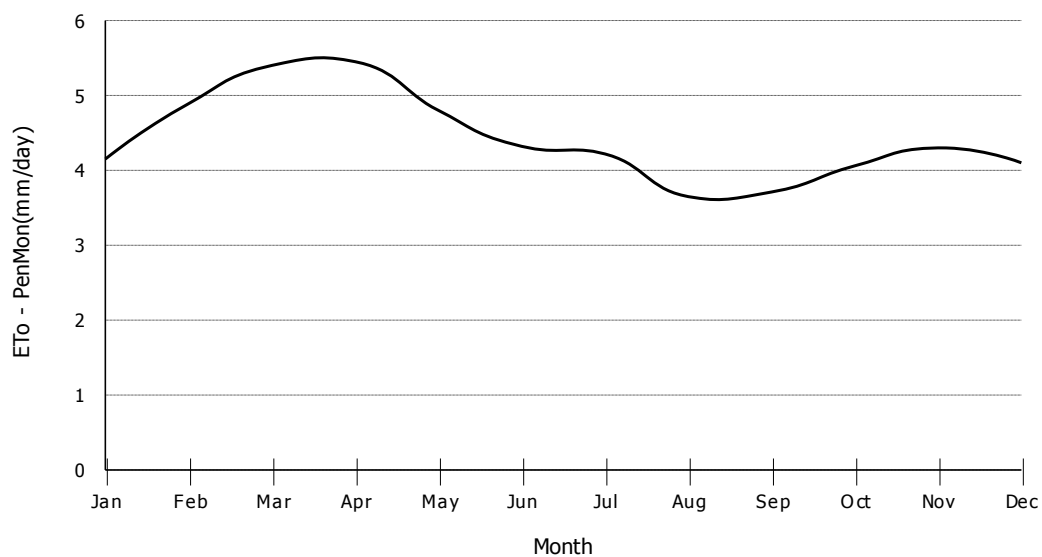
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: MAHASARAKHAM		(30 Yrs)	
Altitude : 153 meter		Coordinates		: 16 - 14 N.L.		103 - 04 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	16.7	31.4	70.0	80.0	8.9	18.8	3.57
February	19.7	33.6	67.0	89.0	8.6	20.1	4.19
March	22.5	35.7	66.0	93.0	7.7	20.4	4.71
April	24.7	36.8	68.0	89.0	8.1	21.9	5.22
May	24.9	35.2	76.0	89.0	6.4	19.4	4.62
June	24.9	34.2	78.0	107.0	5.2	17.4	4.22
July	24.6	33.6	79.0	116.0	3.9	15.5	3.84
August	24.3	33.0	82.0	102.0	3.8	15.3	3.64
September	23.8	32.6	84.0	62.0	4.8	16.3	3.62
October	22.7	32.2	79.0	76.0	6.4	17.3	3.76
November	19.9	31.6	73.0	93.0	8.4	18.4	3.83
December	16.7	30.5	70.0	102.0	8.9	18.2	3.58
Average	22.1	33.4	74.0	91.0	6.8	18.3	4.07

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



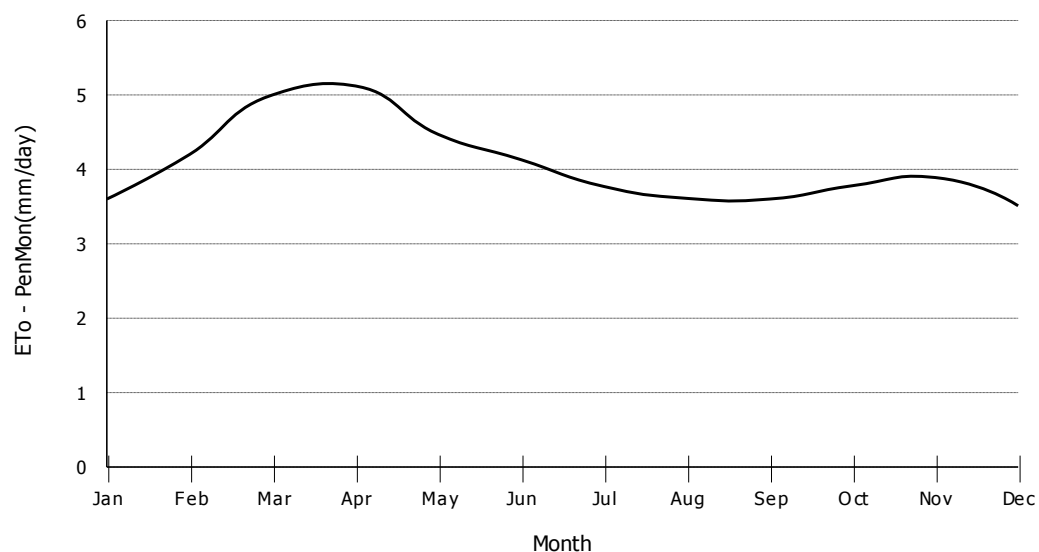
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: KALASIN		(13 Yrs)	
Altitude : 139 meter		Coordinates		: 16 - 19 N.L.		103 - 35 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.3	30.4	66.0	178.0	8.9	18.8	4.15
February	19.8	32.5	65.0	187.0	9.2	20.9	4.89
March	22.4	34.6	65.0	165.0	8.9	22.2	5.40
April	24.3	35.7	69.0	147.0	8.1	21.9	5.45
May	24.8	34.1	76.0	160.0	6.4	19.4	4.80
June	25.1	33.2	78.0	156.0	5.2	17.4	4.32
July	24.9	32.5	80.0	165.0	5.2	17.4	4.22
August	24.7	31.8	83.0	142.0	3.8	15.3	3.65
September	24.3	31.5	83.0	125.0	4.8	16.3	3.71
October	23.0	31.6	77.0	160.0	6.4	17.3	4.06
November	19.7	30.6	70.0	196.0	8.4	18.4	4.30
December	17.2	29.4	67.0	218.0	8.3	17.4	4.10
Average	22.3	32.3	73.0	166.0	7.0	18.6	4.42

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



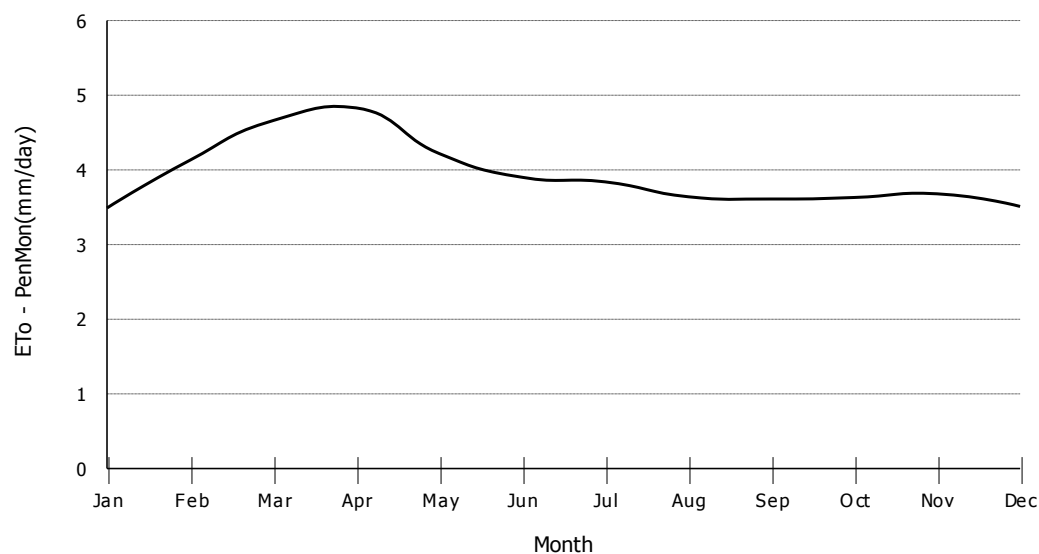
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: CHAIYAPHUM		(30 Yrs)	
Altitude : 182 meter		Coordinates		: 15 - 48 N.L.		102 - 02 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	18.5	31.0	61.0	67.0	9.0	19.1	3.60
February	20.9	33.6	60.0	71.0	8.7	20.4	4.20
March	23.1	35.7	59.0	80.0	8.9	22.3	5.00
April	24.9	36.4	64.0	76.0	8.0	21.8	5.12
May	25.0	34.6	74.0	67.0	6.3	19.2	4.47
June	24.9	33.5	75.0	89.0	5.1	17.2	4.13
July	24.5	32.9	76.0	93.0	3.9	15.4	3.77
August	24.3	32.3	79.0	89.0	3.8	15.3	3.61
September	24.1	32.0	81.0	53.0	4.8	16.3	3.60
October	23.4	31.6	76.0	71.0	6.4	17.4	3.78
November	21.2	30.9	67.0	89.0	8.4	18.6	3.89
December	18.5	29.9	63.0	85.0	8.4	17.7	3.51
Average	22.8	32.9	70.0	77.0	6.8	18.4	4.05

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



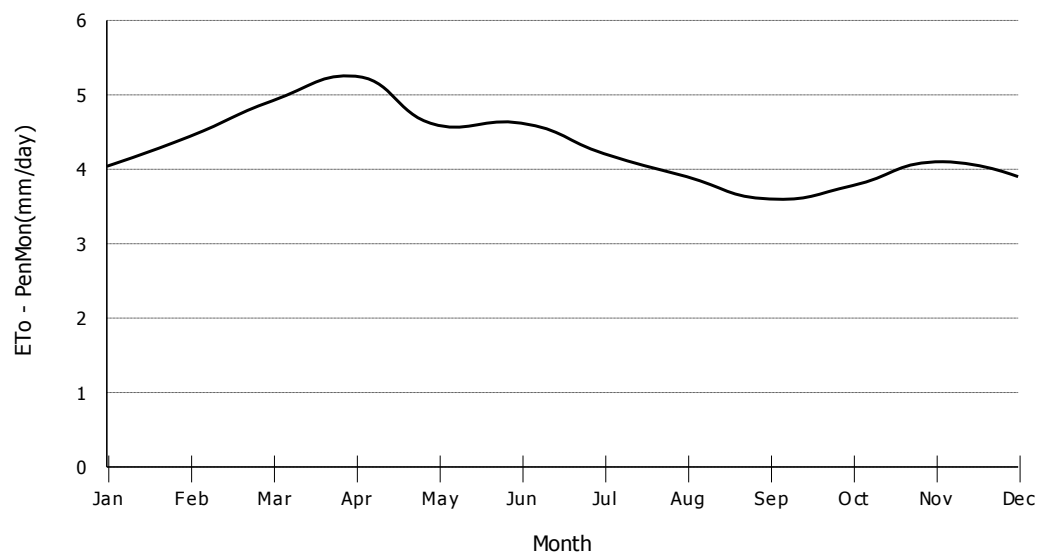
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: ROI ET		(30 Yrs)	
Altitude : 140 meter		Coordinates		: 16 - 03 N.L.		103 - 41 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.2	30.3	65.0	84.5	8.3	18.1	3.49
February	19.8	32.6	63.0	84.5	8.6	20.1	4.13
March	22.7	34.7	61.0	88.9	7.7	20.5	4.66
April	24.8	35.7	65.0	88.9	6.8	20.0	4.83
May	25.0	34.2	73.0	84.5	5.1	17.4	4.22
June	25.2	33.1	76.0	115.6	3.9	15.5	3.90
July	25.0	32.4	77.0	120.0	3.9	15.5	3.84
August	24.8	31.7	80.0	111.1	3.8	15.3	3.64
September	24.5	31.4	81.0	66.7	4.8	16.3	3.61
October	23.0	31.1	77.0	84.5	5.8	16.5	3.63
November	20.1	30.5	70.0	106.7	7.3	17.0	3.68
December	17.3	29.3	66.0	106.7	8.3	17.5	3.51
Average	22.4	32.3	71.0	95.0	6.2	17.5	3.93

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



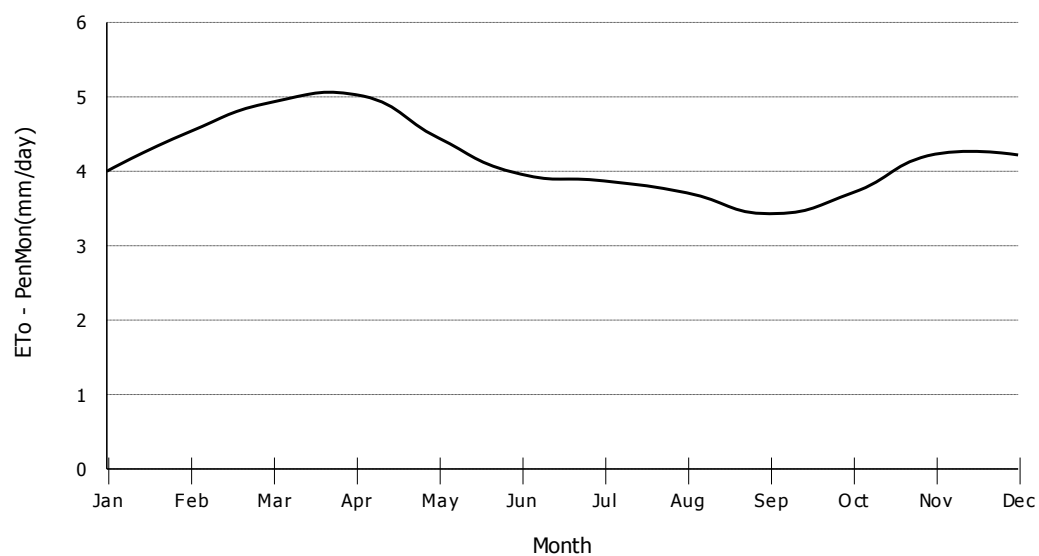
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: ROI ET AGROMET.		(5 Yrs)	
Altitude : 153 meter		Coordinates		: 16 - 04 N.L.		103 - 37 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	16.9	30.2	68.0	169.0	8.9	18.8	4.04
February	19.8	32.6	67.0	138.0	8.6	20.1	4.44
March	22.5	35.0	67.0	133.0	7.7	20.5	4.92
April	24.4	35.5	70.0	116.0	8.1	21.9	5.25
May	24.6	33.8	77.0	120.0	6.4	19.4	4.59
June	25.3	33.5	79.0	147.0	6.5	19.4	4.62
July	24.9	32.4	80.0	160.0	5.2	17.4	4.21
August	24.9	31.6	84.0	133.0	5.0	17.1	3.90
September	24.5	31.5	85.0	80.0	4.8	16.3	3.60
October	23.3	30.9	82.0	120.0	6.4	17.4	3.78
November	19.7	30.3	73.0	182.0	8.4	18.5	4.10
December	17.9	30.1	71.0	169.0	8.9	18.2	3.90
Average	22.4	32.3	75.0	139.0	7.1	18.7	4.28

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



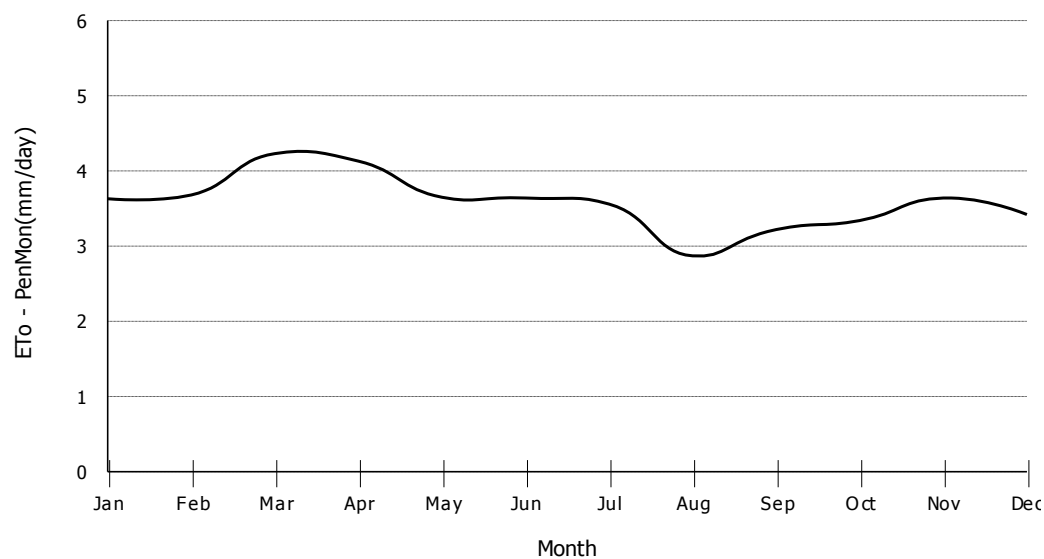
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: UBON RATCHATHANI		(30 Yrs)	
Altitude : 122 meter		Coordinates		: 15 - 15 N.L.		104 - 52 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.5	31.7	65.0	156.0	7.3	17.0	4.00
February	19.9	34.0	63.0	142.0	7.5	18.7	4.53
March	22.5	35.8	62.0	142.0	6.5	18.8	4.93
April	24.4	36.4	66.0	133.0	6.2	19.0	5.03
May	24.5	34.7	75.0	138.0	5.1	17.4	4.45
June	24.4	33.3	79.0	160.0	3.9	15.4	3.96
July	24.2	32.6	80.0	160.0	3.9	15.4	3.87
August	23.9	31.9	82.0	165.0	3.8	15.3	3.71
September	23.7	31.8	82.0	116.0	3.6	14.5	3.43
October	22.5	31.8	78.0	165.0	4.7	15.1	3.71
November	20.3	31.4	71.0	240.0	6.2	15.8	4.23
December	17.8	30.6	68.0	240.0	7.2	16.3	4.22
Average	22.1	33.0	73.0	163.0	5.5	16.6	4.17

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



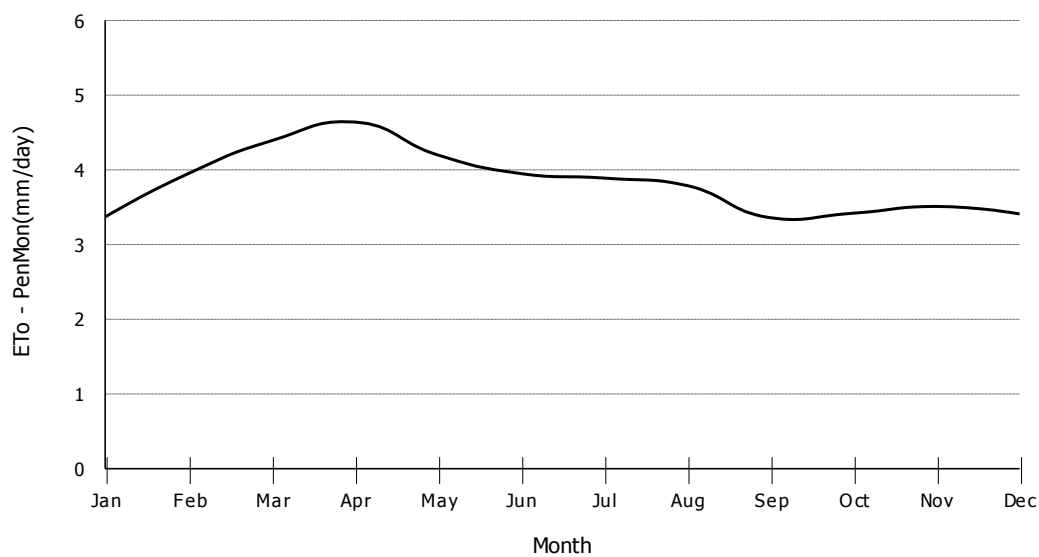
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: UBON RATCHATHANI AGROMET (5 Yrs)			
Altitude : 130 meter		Coordinates		: 15 - 23 N.L. 105 - 03 E.L.			
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.1	31.9	66.0	102.0	7.3	17.0	3.63
February	19.4	34.1	65.0	67.0	6.4	17.2	3.68
March	22.3	36.0	64.0	76.0	6.0	18.0	4.23
April	24.2	36.4	69.0	62.0	4.9	17.0	4.13
May	24.2	34.0	78.0	62.0	3.8	15.4	3.65
June	24.6	34.0	79.0	62.0	3.9	15.4	3.64
July	24.1	32.7	81.0	62.0	3.9	15.4	3.56
August	24.0	31.7	85.0	53.0	1.9	12.4	2.87
September	23.8	32.0	84.0	44.0	3.6	14.5	3.22
October	22.8	31.7	81.0	76.0	4.7	15.1	3.34
November	20.2	31.5	72.0	147.0	5.6	14.9	3.64
December	18.2	31.7	69.0	116.0	6.1	14.9	3.42
Average	22.1	33.1	74.0	77.0	4.8	15.6	3.59

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



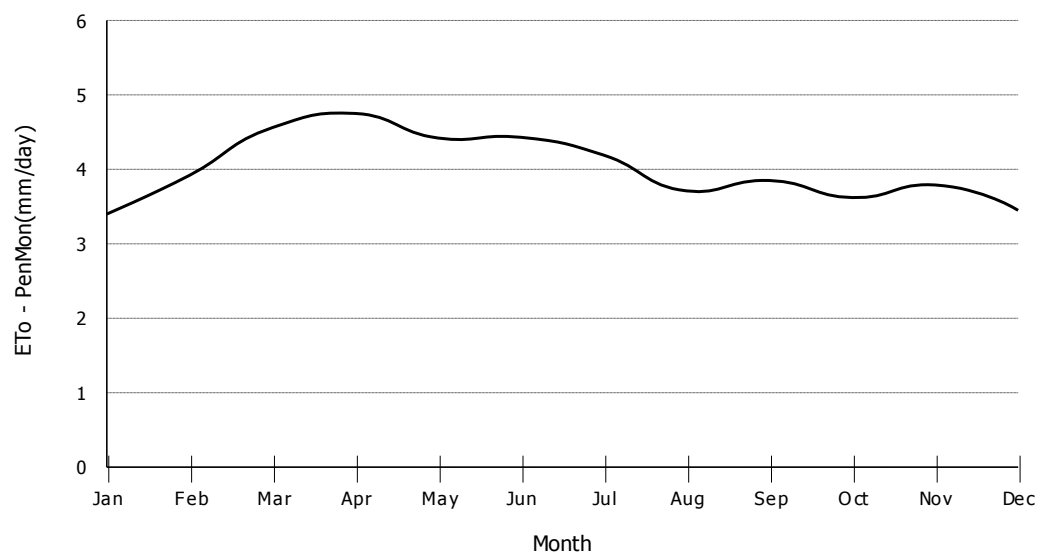
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NAKHON RATCHASIMA		(30 Yrs)	
Altitude : 187 meter		Coordinates		: 14 - 57 N.L.		102 - 04 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	18.5	30.7	64.0	71.0	7.3	17.1	3.37
February	21.0	33.6	62.0	67.0	7.5	18.9	3.95
March	23.2	35.6	61.0	76.0	6.5	18.8	4.39
April	24.9	36.5	65.0	76.0	6.2	19.1	4.64
May	25.0	35.0	73.0	80.0	5.0	17.2	4.20
June	25.1	34.4	72.0	102.0	3.8	15.2	3.95
July	24.7	33.8	73.0	102.0	3.8	15.2	3.89
August	24.5	33.2	75.0	98.0	3.8	15.3	3.79
September	24.0	32.2	80.0	62.0	3.6	14.6	3.36
October	23.2	31.0	78.0	85.0	4.7	15.1	3.42
November	21.1	30.1	71.0	102.0	6.2	15.9	3.51
December	18.3	29.3	66.0	98.0	7.3	16.6	3.41
Average	22.8	33.0	70.0	85.0	5.5	16.6	3.82

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



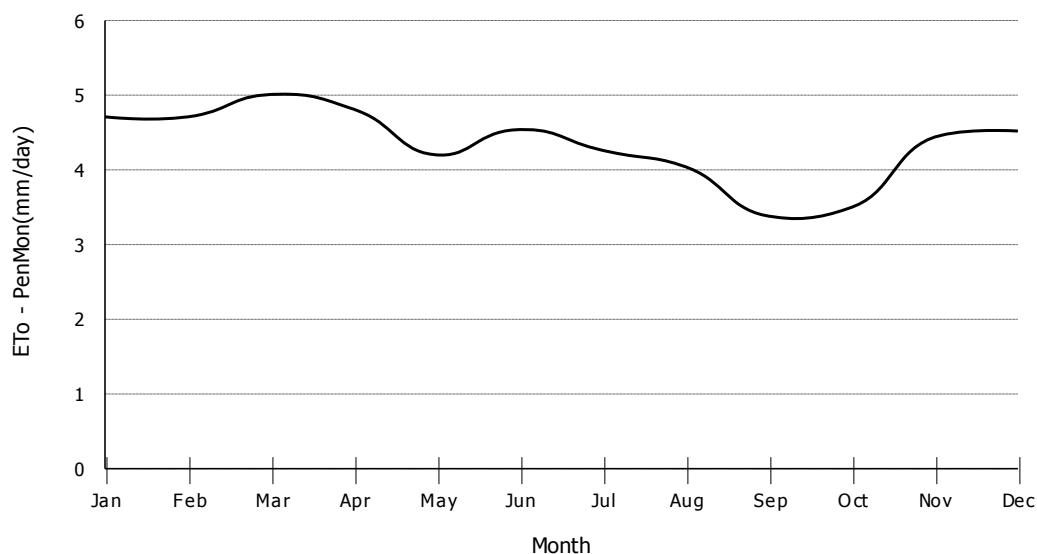
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SI SAKET AGROMET.		(5 Yrs)	
Altitude : 123 meter		Coordinates		: 15 - 02 N.L.		104 - 15 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.2	30.9	69.0	40.0	9.0	19.2	3.40
February	19.8	33.4	68.0	27.0	9.2	21.2	3.92
March	22.6	35.5	67.0	31.0	8.9	22.4	4.56
April	24.7	36.2	71.0	27.0	8.0	21.8	4.75
May	24.9	34.1	78.0	27.0	7.0	20.2	4.42
June	25.4	34.0	79.0	31.0	7.1	20.2	4.43
July	24.9	32.9	81.0	36.0	6.4	19.2	4.19
August	24.8	31.9	84.0	27.0	5.0	17.1	3.71
September	24.3	31.7	85.0	13.0	6.1	18.3	3.85
October	23.8	31.1	81.0	31.0	6.4	17.5	3.62
November	20.8	30.7	73.0	85.0	8.4	18.7	3.79
December	18.5	30.7	71.0	58.0	8.9	18.5	3.45
Average	22.6	32.8	76.0	36.0	7.5	19.5	4.01

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



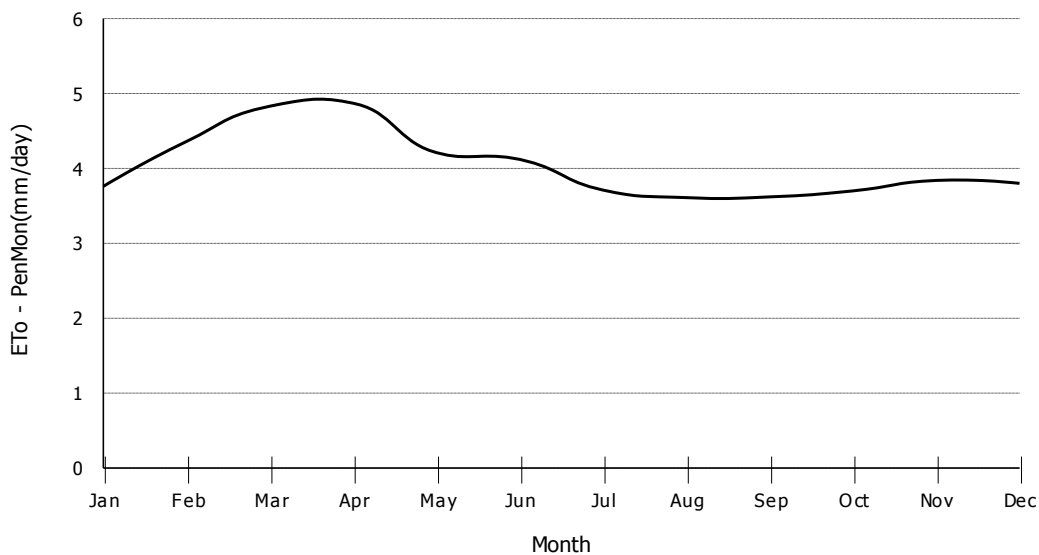
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PAKCHONG AGROMET.		(5 Yrs)	
Altitude : 386 meter		Coordinates		: 14 - 38 N.L.		101 - 19 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.2	29.9	62.0	280.0	7.3	17.2	4.71
February	19.8	32.2	65.0	196.0	7.5	18.9	4.71
March	21.4	33.3	66.0	205.0	6.5	18.8	5.01
April	22.7	33.5	74.0	156.0	6.8	20.0	4.81
May	23.4	31.8	78.0	178.0	5.0	17.2	4.20
June	23.8	32.1	75.0	236.0	5.1	17.1	4.54
July	23.6	31.0	76.0	285.0	3.8	15.2	4.26
August	23.3	30.7	79.0	280.0	3.8	15.3	4.04
September	22.5	30.3	84.0	156.0	3.6	14.6	3.38
October	22.0	29.9	83.0	200.0	4.7	15.2	3.50
November	19.8	29.1	70.0	338.0	6.2	15.9	4.44
December	18.2	29.4	66.0	302.0	7.3	16.6	4.52
Average	21.5	31.1	73.0	234.0	5.6	16.8	4.34

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



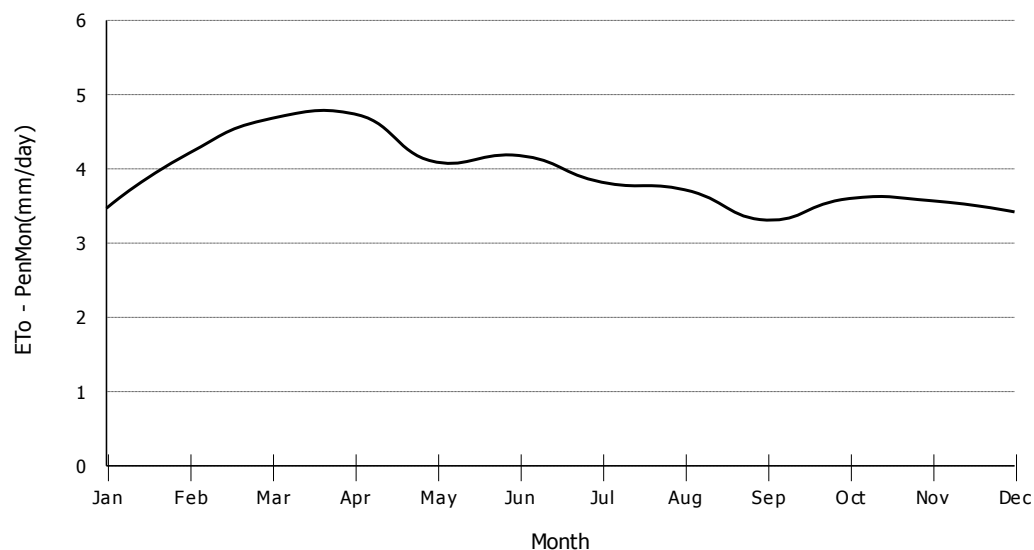
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SURIN		(30 Yrs)	
Altitude : 146 meter		Coordinates		: 14 - 53 N.L.		103 - 30 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	18.1	31.2	65.0	93.0	8.5	18.7	3.76
February	20.6	33.5	63.0	89.0	8.7	20.6	4.36
March	23.0	35.4	63.0	98.0	7.7	20.6	4.83
April	24.9	36.0	67.0	93.0	6.8	20.0	4.87
May	24.9	34.5	76.0	98.0	5.0	17.2	4.21
June	24.9	33.4	79.0	116.0	5.1	17.2	4.12
July	24.6	32.7	80.0	116.0	3.8	15.2	3.71
August	24.4	32.2	82.0	111.0	3.8	15.3	3.61
September	24.2	31.7	84.0	71.0	4.8	16.4	3.62
October	23.3	31.1	81.0	102.0	5.9	16.9	3.70
November	20.8	30.8	73.0	129.0	7.3	17.4	3.84
December	18.1	30.0	68.0	133.0	8.4	18.0	3.80
Average	22.6	32.7	73.0	104.0	6.3	17.8	4.04

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



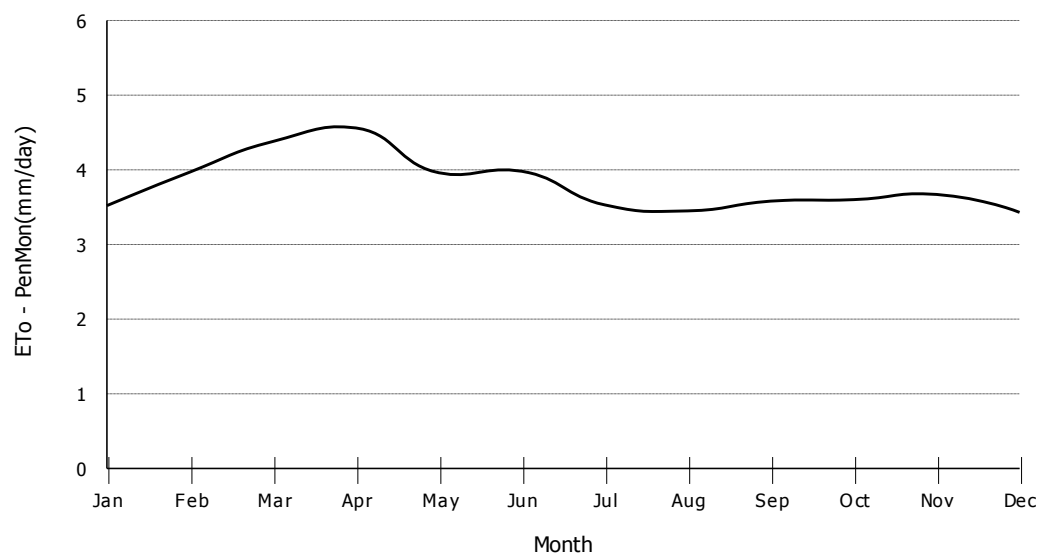
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: CHOK CHAI		(30 Yrs)	
Altitude : 190 meter		Coordinates		: 14 - 43 N.L.		102 - 10 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.6	31.0	67.0	58.0	8.5	18.7	3.47
February	20.2	33.5	64.0	71.0	8.7	20.6	4.21
March	22.6	35.2	65.0	85.0	7.7	20.6	4.68
April	24.4	35.9	68.0	80.0	6.8	20.0	4.74
May	24.8	34.5	75.0	71.0	5.0	17.2	4.09
June	24.9	33.9	74.0	98.0	5.1	17.1	4.18
July	24.5	33.4	75.0	102.0	3.8	15.2	3.82
August	24.3	32.8	77.0	98.0	3.8	15.3	3.72
September	23.9	32.0	82.0	58.0	3.6	14.6	3.31
October	23.0	30.9	81.0	67.0	5.9	16.9	3.60
November	20.5	30.1	75.0	85.0	7.3	17.4	3.57
December	17.5	29.4	70.0	80.0	8.4	18.0	3.42
Average	22.4	32.7	73.0	79.0	6.2	17.6	3.90

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



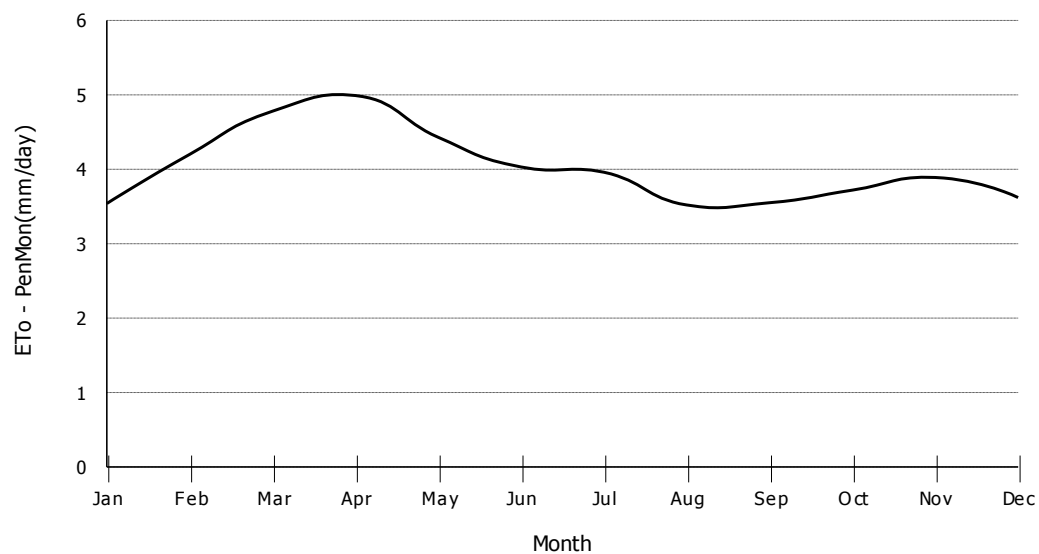
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SURIN AGROMET.		(5 Yrs)	
Altitude : 143 meter		Coordinates		: 14 - 53 N.L.		103 - 27 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.2	31.1	70.0	53.0	9.0	19.4	3.52
February	20.2	33.9	66.0	40.0	8.7	20.6	3.97
March	22.7	36.1	66.0	40.0	7.7	20.6	4.38
April	24.7	36.7	71.0	44.0	6.8	20.0	4.56
May	25.0	34.8	78.0	44.0	5.0	17.2	3.96
June	25.2	34.8	79.0	53.0	5.1	17.2	3.98
July	24.8	33.7	80.0	44.0	3.8	15.2	3.53
August	24.7	33.0	83.0	40.0	3.8	15.3	3.45
September	24.5	32.6	84.0	27.0	4.8	16.4	3.58
October	23.5	31.6	82.0	49.0	5.9	16.9	3.60
November	20.1	31.2	74.0	93.0	7.3	17.4	3.67
December	18.0	31.0	72.0	62.0	8.4	18.0	3.43
Average	22.6	33.4	75.0	49.0	6.4	17.8	3.80

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



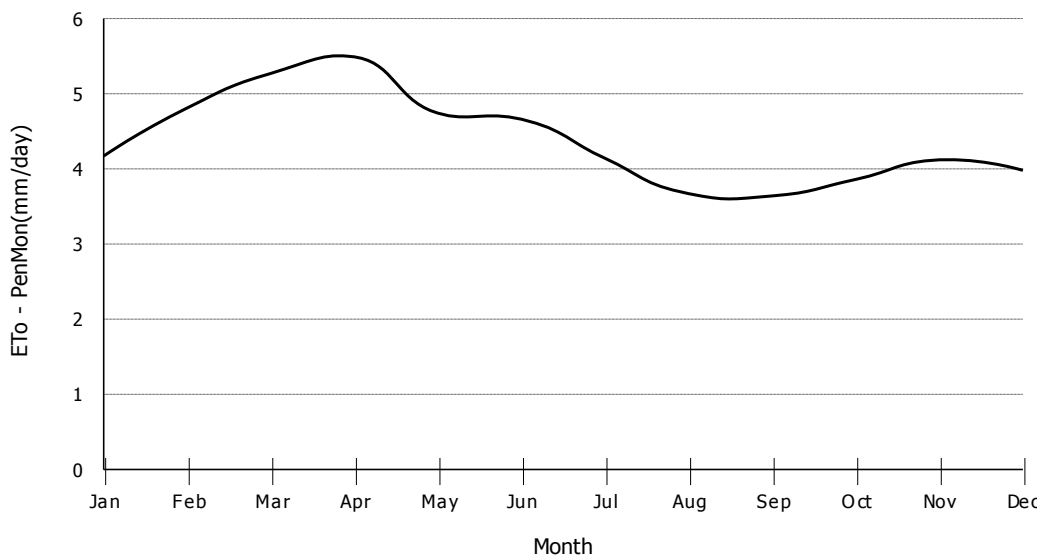
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: THA TUM		(30 Yrs)	
Altitude : 128 meter		Coordinates		: 15 - 19 N.L.		103 - 41 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.6	31.1	68.0	62.0	9.0	19.2	3.54
February	20.3	33.6	65.0	62.0	9.2	21.1	4.20
March	23.0	35.6	63.0	58.0	8.9	22.4	4.78
April	25.1	36.6	66.0	58.0	8.0	21.8	4.99
May	25.1	34.9	75.0	58.0	6.3	19.2	4.43
June	25.1	33.7	77.0	71.0	5.1	17.2	4.03
July	24.8	33.0	79.0	71.0	5.1	17.2	3.96
August	24.6	32.3	81.0	67.0	3.8	15.3	3.52
September	24.2	31.8	84.0	40.0	4.8	16.3	3.55
October	23.2	31.2	80.0	71.0	6.4	17.5	3.72
November	20.7	30.7	73.0	107.0	8.4	18.7	3.89
December	17.8	29.9	70.0	102.0	8.9	18.5	3.62
Average	22.6	32.9	73.0	69.0	7.0	18.7	4.02

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



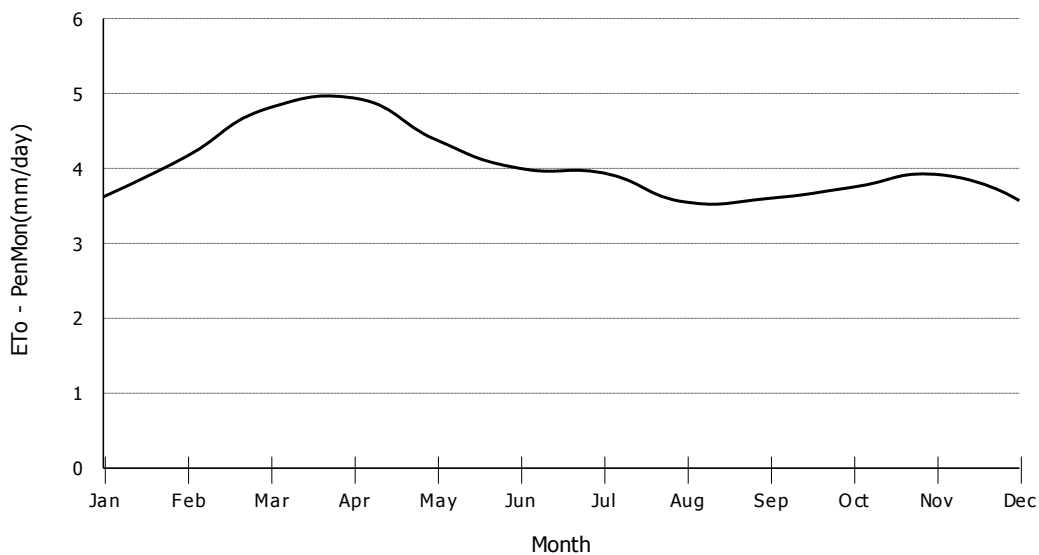
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: BURIRUM		(8 Yrs)	
Altitude : 182 meter		Coordinates		: 15 - 13 N.L.		103 - 14 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.4	30.8	66.0	160.0	9.0	19.2	4.17
February	20.2	33.6	62.0	151.0	8.7	20.4	4.81
March	22.7	35.7	62.0	151.0	7.7	20.6	5.27
April	24.5	36.3	66.0	133.0	8.0	21.8	5.49
May	24.6	34.7	76.0	138.0	6.3	19.2	4.74
June	24.5	33.9	78.0	156.0	6.4	19.1	4.66
July	24.0	33.0	80.0	142.0	5.1	17.2	4.14
August	24.1	32.5	83.0	138.0	3.8	15.3	3.67
September	23.8	31.9	86.0	102.0	4.8	16.3	3.64
October	22.5	31.4	81.0	129.0	6.4	17.5	3.86
November	20.1	31.1	73.0	156.0	8.4	18.7	4.12
December	17.6	30.3	70.0	165.0	8.9	18.5	3.98
Average	22.2	32.9	74.0	143.0	7.0	18.7	4.38

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



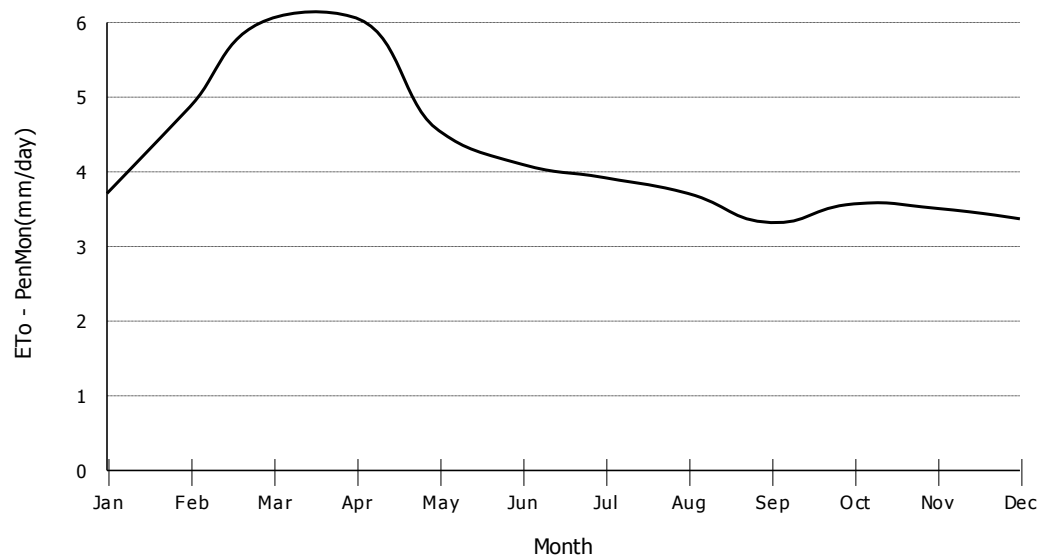
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NANG RONG		(30 Yrs)	
Altitude : 179 meter		Coordinates		: 14 - 35 N.L.		102 - 48 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.5	31.2	69.0	67.0	9.0	19.4	3.62
February	20.1	33.9	66.0	62.0	8.7	20.6	4.16
March	22.4	35.7	67.0	58.0	8.9	22.5	4.81
April	24.1	36.4	70.0	58.0	8.0	21.8	4.94
May	24.5	34.8	77.0	58.0	6.3	19.1	4.38
June	24.5	34.1	77.0	67.0	5.1	17.1	4.00
July	24.2	33.5	79.0	67.0	5.1	17.2	3.94
August	24.0	33.0	80.0	67.0	3.8	15.3	3.55
September	23.7	32.1	84.0	53.0	4.8	16.4	3.60
October	23.0	30.9	82.0	85.0	6.4	17.6	3.75
November	20.5	30.2	75.0	116.0	8.5	19.0	3.92
December	17.6	29.6	71.0	107.0	8.4	18.1	3.57
Average	22.2	33.0	75.0	72.0	6.9	18.7	4.02

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



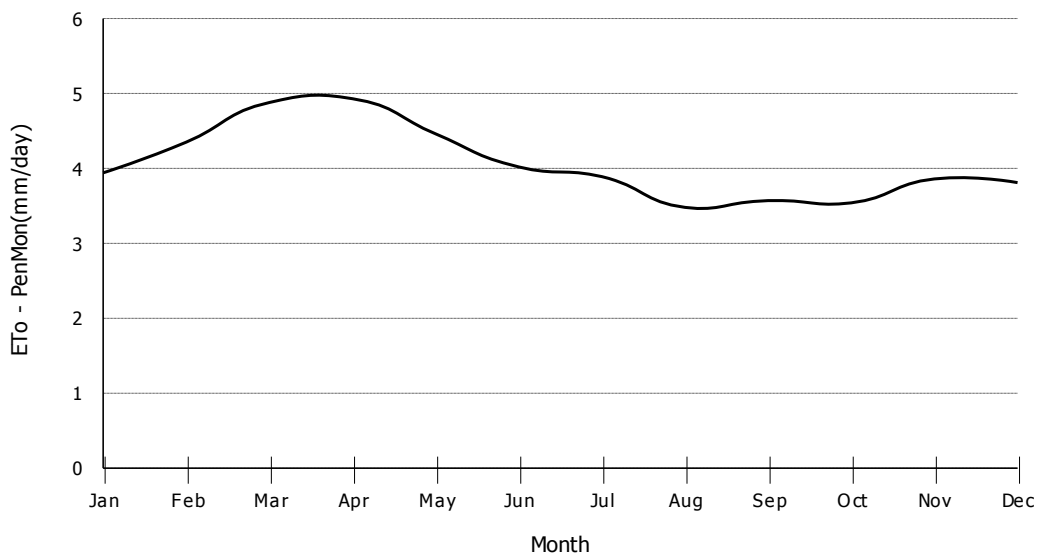
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NAKHON SAWAN		(30 Yrs)	
Altitude : 34 meter		Coordinates		: 15 - 48 N.L.		100 -10 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	19.3	32.9	66.0	67.0	9.0	19.1	3.71
February	22.2	35.2	63.0	138.0	8.7	20.4	4.87
March	24.7	37.0	62.0	196.0	8.9	22.3	6.06
April	26.1	38.1	64.0	173.0	8.0	21.8	6.06
May	25.7	35.9	73.0	120.0	5.1	17.4	4.55
June	25.4	34.8	74.0	125.0	3.9	15.4	4.10
July	25.1	34.1	76.0	111.0	3.9	15.4	3.92
August	24.8	33.6	79.0	93.0	3.8	15.3	3.71
September	24.5	33.1	83.0	53.0	3.6	14.5	3.32
October	24.0	32.5	82.0	49.0	5.8	16.6	3.57
November	21.8	32.1	76.0	53.0	7.3	17.2	3.51
December	18.8	31.4	69.0	58.0	8.4	17.7	3.37
Average	23.5	34.2	72.0	103.0	6.4	17.8	4.23

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



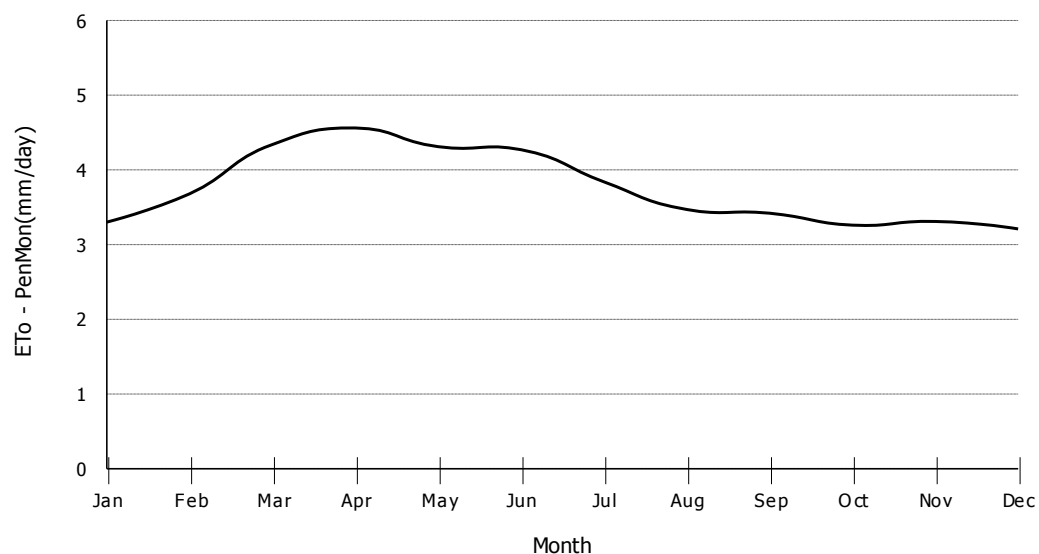
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: TAKFA AGROMET.		(5 Yrs)	
Altitude : 87 meter		Coordinates		: 15 - 21 N.L.		100 - 30 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	20.2	32.2	60.0	89.0	9.0	19.2	3.94
February	23.0	34.3	63.0	76.0	8.7	20.4	4.35
March	24.9	36.1	65.0	93.0	7.7	20.6	4.88
April	25.7	36.8	68.0	89.0	6.8	20.0	4.93
May	25.5	34.7	76.0	67.0	6.3	19.2	4.46
June	25.3	34.3	78.0	62.0	5.1	17.2	4.02
July	24.8	33.1	80.0	53.0	5.1	17.2	3.89
August	24.6	33.0	81.0	49.0	3.8	15.3	3.48
September	24.5	32.7	83.0	31.0	4.8	16.3	3.57
October	24.1	32.1	81.0	40.0	5.8	16.6	3.54
November	21.8	31.8	68.0	76.0	8.4	18.7	3.86
December	20.7	31.7	62.0	89.0	8.9	18.5	3.81
Average	23.8	33.6	72.0	68.0	6.7	18.3	4.06

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



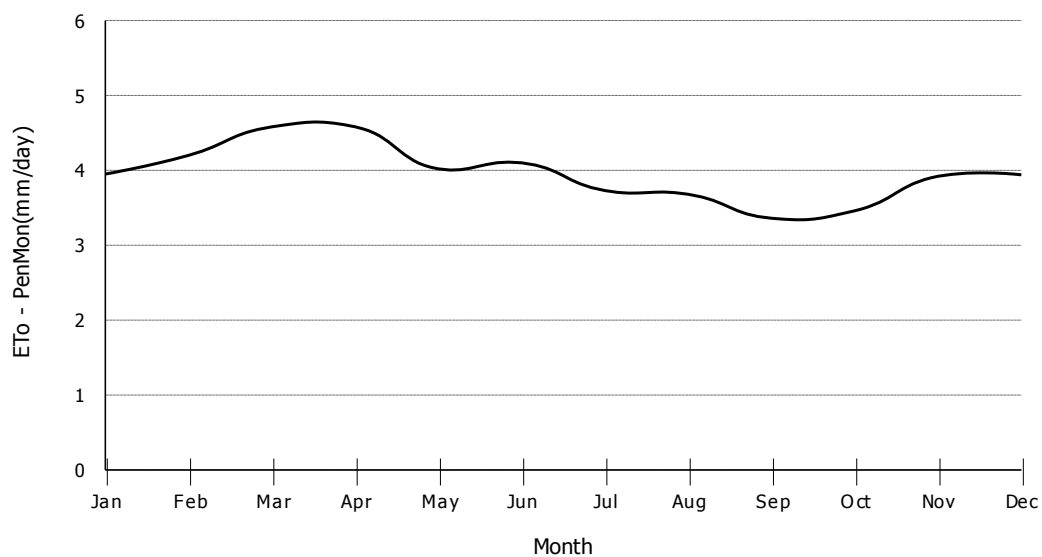
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: CHAINAT AGROMET.		(5 Yrs)	
Altitude : 15 meter		Coordinates		: 15 - 09 N.L.		100 - 11 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	20.2	31.5	71.0	22.0	8.4	18.4	3.30
February	22.8	33.1	74.0	27.0	7.5	18.8	3.68
March	24.3	34.9	72.0	36.0	7.7	20.6	4.34
April	25.7	36.5	70.0	44.0	6.8	20.0	4.56
May	25.8	34.6	75.0	36.0	6.3	19.2	4.31
June	25.6	34.3	76.0	36.0	6.4	19.1	4.27
July	25.2	33.3	77.0	36.0	5.1	17.2	3.84
August	25.1	33.3	78.0	27.0	3.8	15.3	3.47
September	20.2	33.1	81.0	9.0	4.8	16.3	3.42
October	19.9	32.3	81.0	9.0	5.8	16.7	3.26
November	22.6	31.9	72.0	22.0	7.3	17.2	3.31
December	20.5	31.6	71.0	18.0	8.4	17.9	3.21
Average	23.2	33.4	75.0	27.0	6.5	18.1	3.75

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



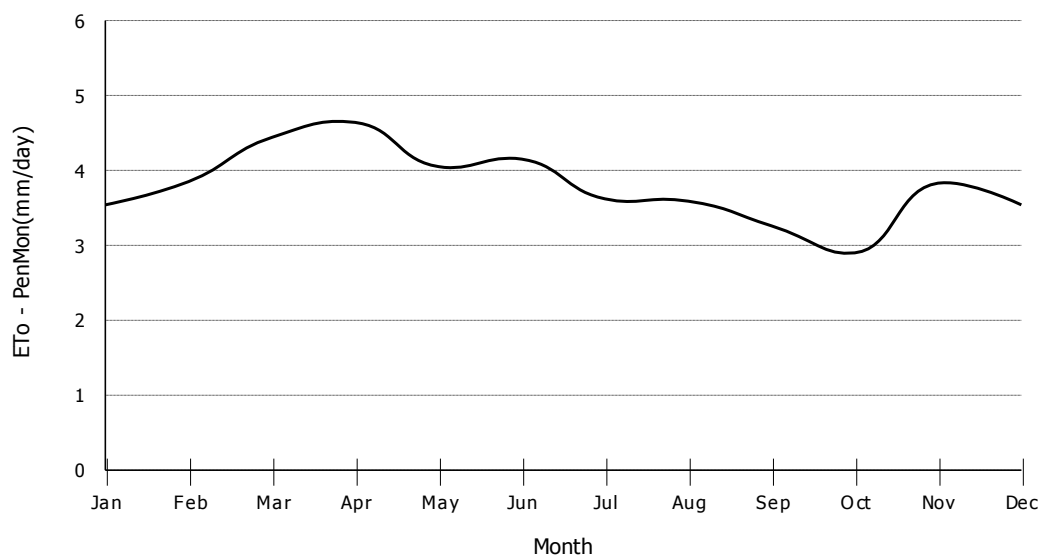
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: AYUTTHAYA		(5 Yrs)	
Altitude : 8 meter		Coordinates		: 14 - 31 N.L.		100 - 43 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	16.5	32.9	67.0	138.0	7.3	17.2	3.95
February	22.5	34.6	70.0	93.0	7.5	18.9	4.20
March	22.8	35.8	71.0	111.0	6.5	18.8	4.58
April	23.5	36.1	75.0	93.0	6.2	19.1	4.58
May	23.0	34.5	80.0	85.0	5.0	17.2	4.02
June	23.2	34.4	79.0	107.0	5.1	17.1	4.10
July	22.6	33.7	79.0	111.0	3.8	15.2	3.73
August	23.1	33.4	80.0	107.0	3.8	15.3	3.68
September	22.7	33.1	83.0	80.0	3.6	14.6	3.36
October	22.7	32.6	82.0	93.0	4.7	15.2	3.46
November	18.5	32.2	72.0	165.0	6.2	15.9	3.92
December	17.2	32.4	69.0	156.0	7.3	16.6	3.94
Average	21.5	33.8	76.0	111.0	5.6	16.8	3.96

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



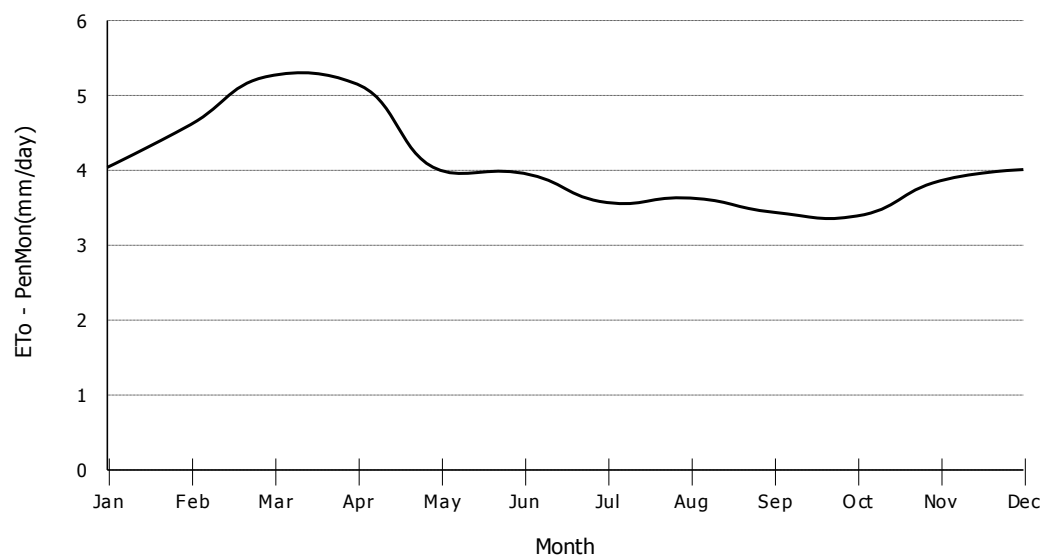
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PATHUMTHANI		(5 Yrs)	
Altitude : 6 meter		Coordinates		: 14 - 06 N.L.		100 - 37 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.4	32.7	68.0	107.0	5.7	15.1	3.54
February	23.5	34.6	70.0	129.0	4.6	14.8	3.85
March	24.9	35.9	70.0	147.0	4.8	16.3	4.44
April	25.7	36.3	73.0	151.0	4.9	17.1	4.64
May	25.9	34.7	78.0	147.0	3.8	15.3	4.05
June	26.0	34.7	77.0	169.0	3.8	15.2	4.15
July	25.5	33.6	77.0	178.0	1.9	12.4	3.62
August	25.5	33.6	77.0	173.0	1.9	12.4	3.59
September	25.2	33.4	80.0	147.0	1.8	11.9	3.26
October	24.9	32.8	80.0	107.0	1.8	11.0	2.90
November	23.2	32.4	69.0	133.0	5.7	15.3	3.83
December	21.8	32.4	67.0	116.0	5.6	14.5	3.54
Average	24.5	33.9	74.0	142.0	3.9	14.3	3.78

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



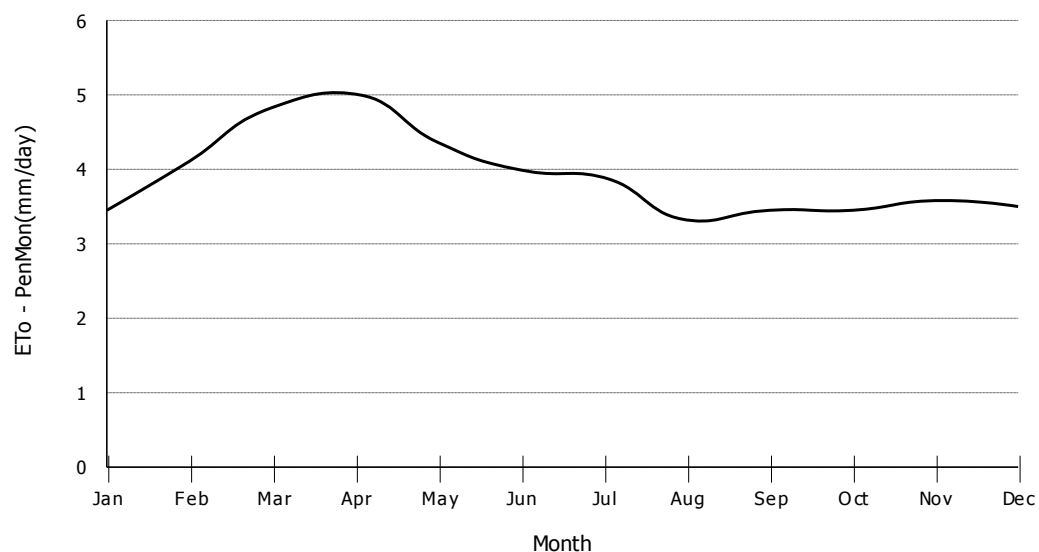
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: RATCHABURI		(5 Yrs)	
Altitude : 5 meter		Coordinates		: 13 - 29 N.L.		99 - 47 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	20.3	32.0	71.0	102.0	9.1	19.8	4.04
February	22.2	34.2	74.0	98.0	9.3	21.7	4.61
March	23.9	35.7	74.0	102.0	9.5	23.5	5.27
April	25.3	36.2	75.0	98.0	8.0	21.9	5.15
May	25.4	34.3	81.0	71.0	5.0	17.1	4.00
June	25.3	34.1	81.0	71.0	5.1	17.0	3.96
July	25.0	33.0	81.0	80.0	3.8	15.2	3.57
August	25.0	33.2	80.0	98.0	3.7	15.1	3.63
September	24.8	32.9	83.0	89.0	3.6	14.6	3.44
October	24.5	31.7	86.0	89.0	4.7	15.3	3.39
November	22.5	30.9	78.0	138.0	7.4	17.8	3.86
December	20.7	31.2	73.0	133.0	9.0	19.1	4.01
Average	23.7	33.3	78.0	97.0	6.5	18.2	4.08

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



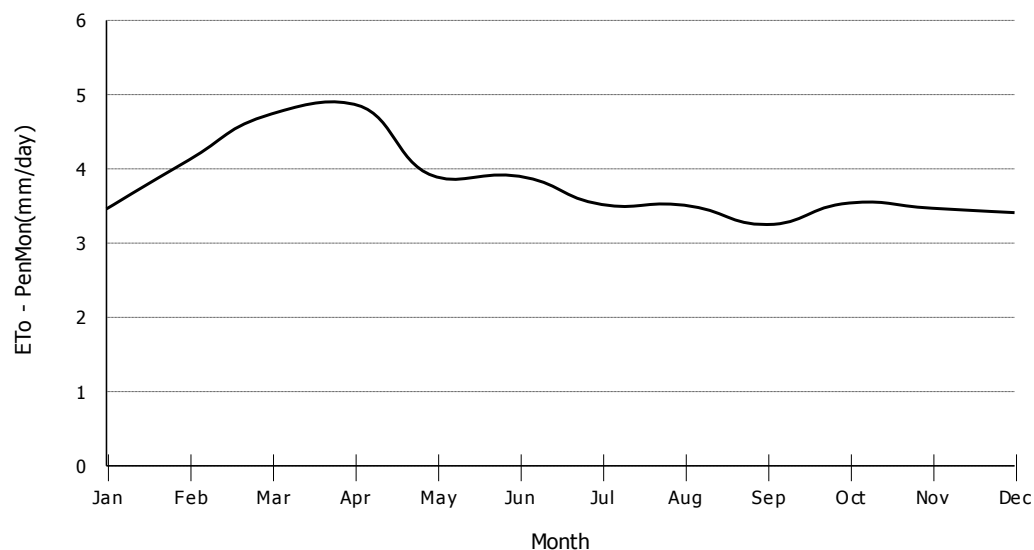
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SUPHANBURI		(30 Yrs)	
Altitude : 7 meter		Coordinates		: 14 - 28 N.L.		100 - 08 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	20.5	32.1	71.0	67.0	7.3	17.2	3.45
February	22.6	33.9	73.0	89.0	7.5	18.9	4.11
March	24.2	35.5	72.0	111.0	7.7	20.7	4.83
April	25.6	37.0	71.0	111.0	6.8	20.0	5.01
May	25.8	35.7	74.0	102.0	5.0	17.2	4.36
June	25.5	34.6	75.0	120.0	3.8	15.2	3.99
July	25.0	34.1	76.0	116.0	3.8	15.2	3.89
August	24.9	34.0	77.0	107.0	1.9	12.4	3.32
September	24.8	33.4	80.0	71.0	3.6	14.6	3.45
October	24.5	32.3	80.0	76.0	4.7	15.2	3.45
November	22.8	31.5	75.0	102.0	6.2	15.9	3.58
December	20.0	30.8	70.0	98.0	7.3	16.7	3.50
Average	23.9	33.7	75.0	97.0	5.5	16.6	3.91

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



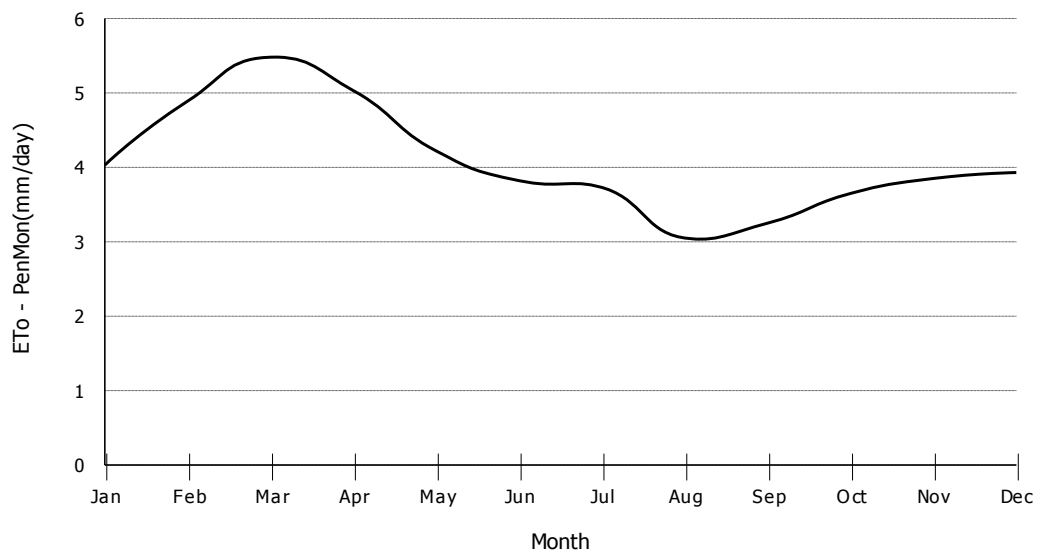
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: U THONG AGROMET.		(5 Yrs)	
Altitude : 6 meter		Coordinates		: 14 - 18 N.L.		99 - 52 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	17.9	31.3	73.0	36.0	9.0	19.5	3.46
February	20.9	34.0	74.0	31.0	9.3	21.5	4.12
March	23.1	36.2	70.0	40.0	8.9	22.5	4.74
April	24.5	36.9	71.0	40.0	8.0	21.8	4.87
May	24.3	34.8	77.0	36.0	5.0	17.2	3.89
June	24.3	34.6	77.0	44.0	5.1	17.1	3.90
July	23.9	33.7	77.0	49.0	3.8	15.2	3.52
August	24.0	33.7	77.0	49.0	3.8	15.3	3.51
September	23.6	33.6	80.0	27.0	3.6	14.6	3.25
October	23.1	32.4	82.0	22.0	5.9	16.9	3.54
November	20.7	31.2	75.0	49.0	7.3	17.5	3.47
December	18.7	31.0	74.0	36.0	9.0	18.9	3.41
Average	22.4	33.6	76.0	38.0	6.6	18.2	3.81

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



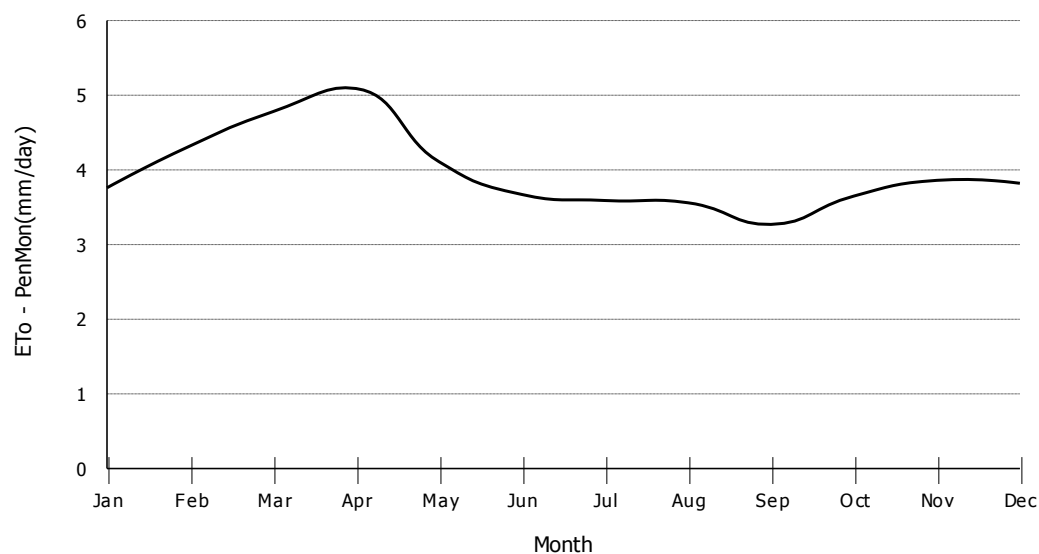
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: BUA CHUM		(30 Yrs)	
Altitude : 49 meter		Coordinates		: 15 - 15 N.L.		101 - 11 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	18.2	32.3	65.0	129.0	8.4	18.4	4.03
February	20.8	35.1	62.0	129.0	9.2	21.1	4.89
March	23.1	36.9	63.0	129.0	8.9	22.4	5.48
April	24.8	37.5	68.0	102.0	6.8	20.0	5.03
May	24.9	35.6	77.0	80.0	5.1	17.4	4.22
June	24.7	34.5	78.0	93.0	3.9	15.4	3.82
July	24.3	33.8	79.0	89.0	3.9	15.4	3.73
August	24.1	33.2	82.0	76.0	1.9	12.4	3.05
September	24.0	32.6	85.0	44.0	3.6	14.5	3.25
October	23.2	32.2	81.0	80.0	5.8	16.6	3.65
November	20.6	31.7	73.0	125.0	7.3	17.2	3.85
December	17.8	30.9	67.0	147.0	8.4	17.8	3.93
Average	22.5	33.9	73.0	102.0	6.1	17.4	4.08

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



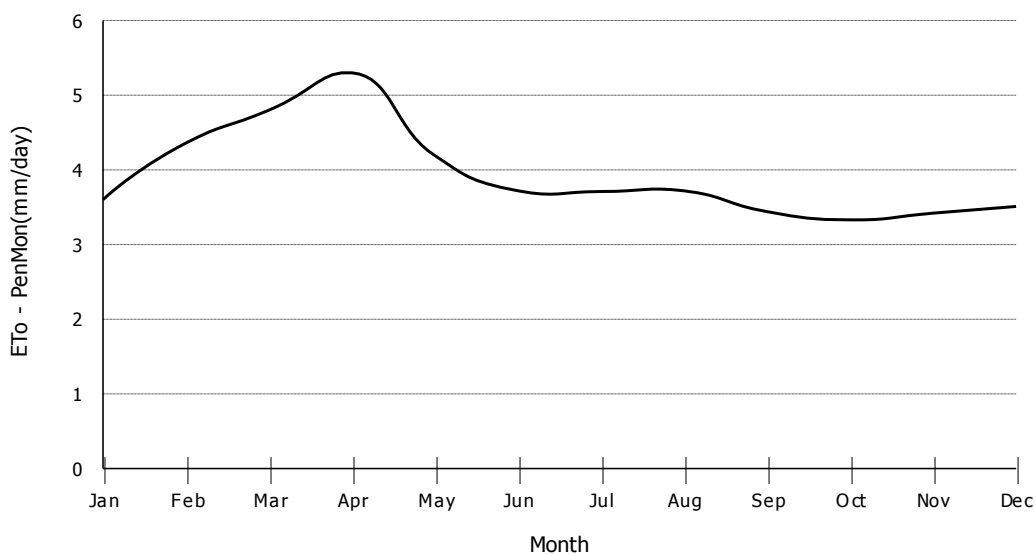
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: LOPBURI		(30 Yrs)	
Altitude : 10 meter		Coordinates		: 14 - 48 N.L.		100 - 37 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.1	32.9	63.0	67.0	8.5	18.7	3.76
February	23.2	34.6	65.0	62.0	8.7	20.6	4.32
March	24.8	36.0	66.0	80.0	7.7	20.6	4.78
April	25.8	36.8	69.0	67.0	8.0	21.8	5.09
May	25.6	35.3	75.0	62.0	5.0	17.2	4.11
June	25.2	34.3	76.0	62.0	3.8	15.2	3.67
July	24.9	33.7	77.0	58.0	3.8	15.2	3.59
August	24.9	33.3	78.0	58.0	3.8	15.3	3.56
September	24.7	32.8	81.0	36.0	3.6	14.6	3.27
October	24.3	32.5	77.0	49.0	5.9	16.9	3.65
November	22.8	32.2	66.0	89.0	7.3	17.4	3.86
December	20.6	31.7	60.0	93.0	8.4	18.0	3.82
Average	24.0	33.8	71.0	65.0	6.2	17.6	3.96

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



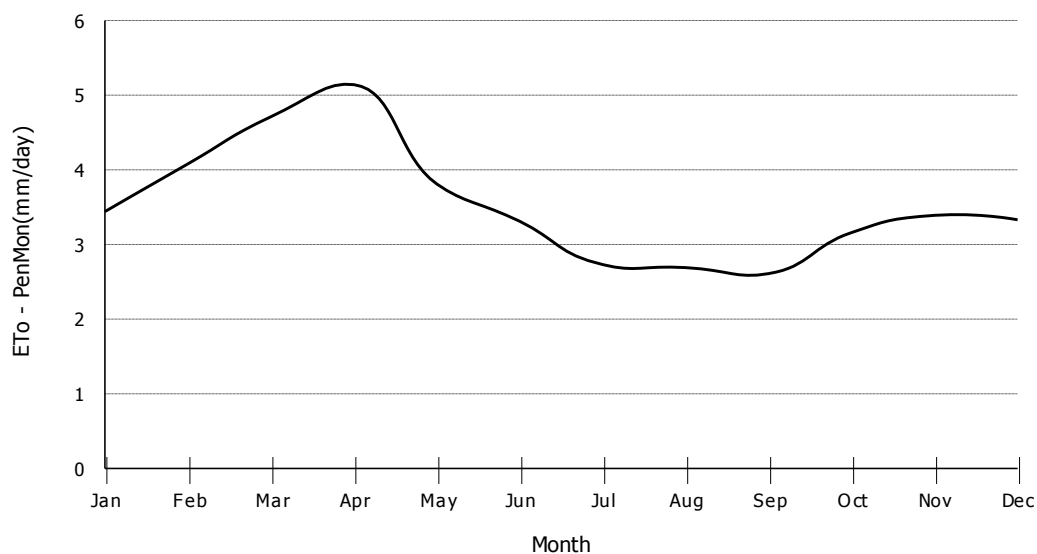
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: KANCHANA BURI		(30 Yrs)	
Altitude : 28 meter		Coordinates		: 14 - 01 N.L.		99 - 32 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	19.9	33.0	64.0	49.0	8.5	18.9	3.60
February	22.1	35.6	62.0	62.0	8.7	20.7	4.36
March	24.2	37.3	61.0	71.0	7.7	20.7	4.80
April	25.9	38.2	63.0	76.0	8.0	21.8	5.30
May	25.8	35.9	71.0	62.0	5.0	17.2	4.19
June	25.5	34.5	72.0	62.0	3.8	15.2	3.72
July	24.9	33.9	73.0	71.0	3.8	15.2	3.71
August	24.9	33.6	74.0	80.0	3.8	15.3	3.72
September	24.6	33.6	77.0	58.0	3.6	14.6	3.44
October	23.9	32.2	80.0	44.0	4.7	15.2	3.33
November	22.2	31.6	73.0	67.0	6.2	16.0	3.42
December	19.6	31.3	66.0	62.0	8.4	18.1	3.51
Average	23.6	34.2	70.0	64.0	6.0	17.4	3.93

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



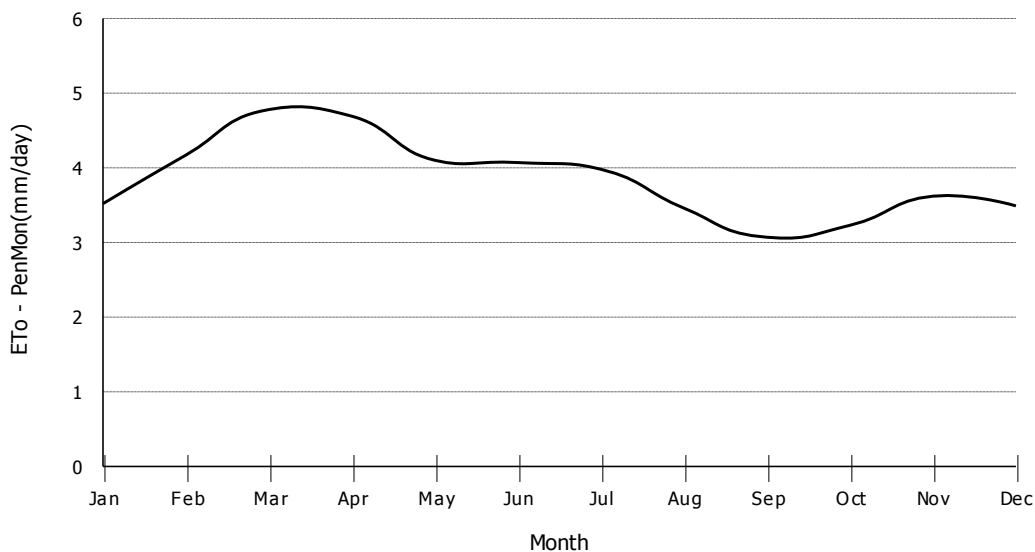
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: THONG PHAPHUM		(30 Yrs)	
Altitude : 97 meter		Coordinates		: 14 - 44 N.L.		98 - 38 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	16.8	33.3	72.0	22.0	9.0	19.4	3.44
February	18.4	35.3	65.0	31.0	9.3	21.4	4.08
March	20.7	36.9	64.0	44.0	8.9	22.5	4.71
April	22.8	37.3	69.0	36.0	9.2	23.7	5.14
May	23.5	34.1	81.0	18.0	5.0	17.2	3.81
June	23.4	31.7	85.0	13.0	3.8	15.2	3.31
July	23.0	30.9	87.0	9.0	1.9	12.4	2.73
August	22.9	30.7	87.0	13.0	1.9	12.4	2.69
September	22.9	31.9	86.0	13.0	1.8	11.8	2.61
October	22.1	32.3	84.0	13.0	4.7	15.2	3.16
November	19.5	32.2	79.0	27.0	7.3	17.4	3.39
December	16.5	31.9	75.0	27.0	9.0	18.8	3.33
Average	21.0	33.2	78.0	22.0	6.0	17.3	3.53

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



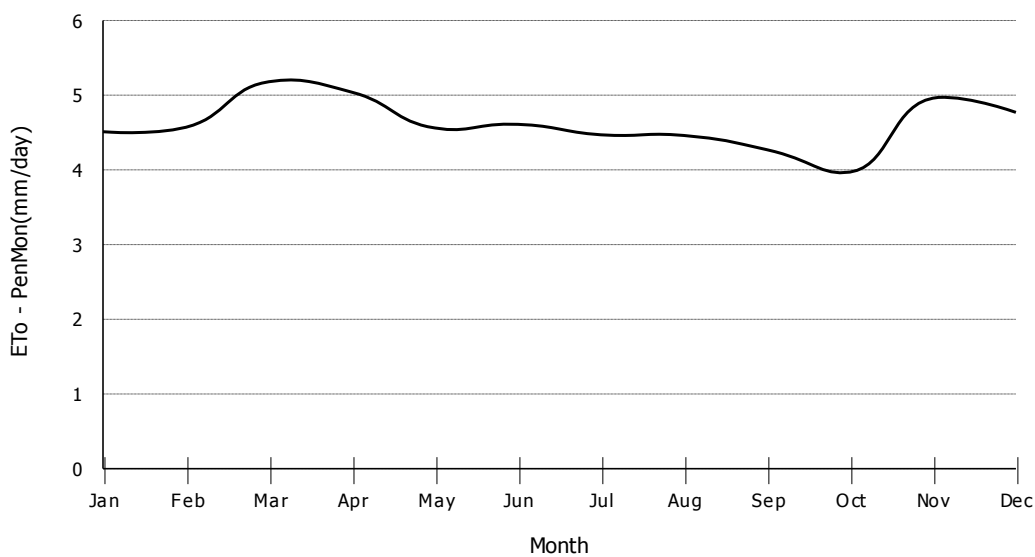
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: BANGKOK METROPOLIS		(30 Yrs)	
Altitude : 3 meter		Coordinates		: 13 - 43 N.L.		100 - 33 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.6	32.5	68.0	98.0	5.7	15.2	3.52
February	24.4	33.3	72.0	156.0	5.8	16.6	4.17
March	25.9	34.3	72.0	187.0	6.0	18.2	4.78
April	26.9	35.4	72.0	165.0	4.9	17.1	4.69
May	26.3	34.4	75.0	138.0	3.8	15.3	4.10
June	26.1	33.6	74.0	147.0	3.8	15.1	4.07
July	25.7	33.2	75.0	142.0	3.8	15.2	3.98
August	25.5	32.9	76.0	142.0	1.9	12.4	3.46
September	25.0	32.8	79.0	98.0	1.8	11.9	3.07
October	24.8	32.6	78.0	80.0	3.5	13.6	3.23
November	23.9	32.4	70.0	93.0	5.7	15.4	3.62
December	22.0	31.7	66.0	93.0	6.2	15.4	3.49
Average	24.9	33.3	73.0	128.0	4.4	15.1	3.85

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



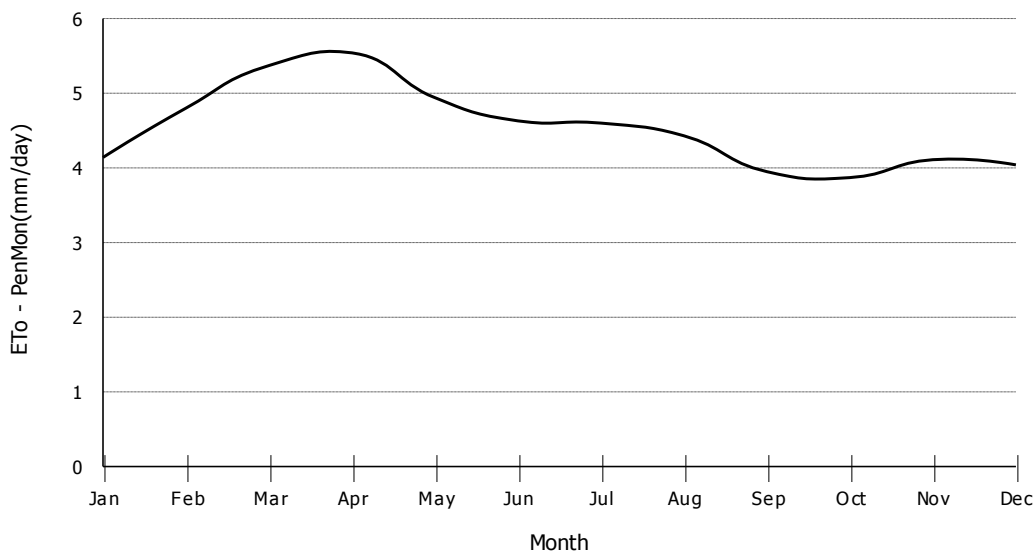
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: BANGKOK PORT (KLONG TOEI) (17 Yrs)			
Altitude : 3 meter		Coordinates		: 13 - 42 N.L. 100 - 34 E.L.			
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	23.9	32.5	58.0	187.0	5.7	15.2	4.51
February	25.3	33.3	64.0	173.0	5.8	16.6	4.57
March	26.6	34.3	64.0	196.0	6.0	18.2	5.18
April	27.4	35.5	66.0	182.0	4.9	17.1	5.04
May	26.7	34.8	69.0	178.0	3.8	15.3	4.56
June	26.7	34.4	68.0	191.0	3.8	15.1	4.61
July	26.5	33.8	70.0	191.0	3.8	15.2	4.47
August	26.2	33.7	69.0	187.0	3.7	15.1	4.46
September	25.6	33.6	70.0	182.0	3.6	14.6	4.27
October	25.7	33.2	70.0	173.0	3.5	13.6	3.97
November	25.1	32.9	58.0	222.0	5.7	15.4	4.96
December	23.7	32.1	55.0	218.0	5.6	14.6	4.77
Average	25.8	33.7	65.0	190.0	4.7	15.5	4.61

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



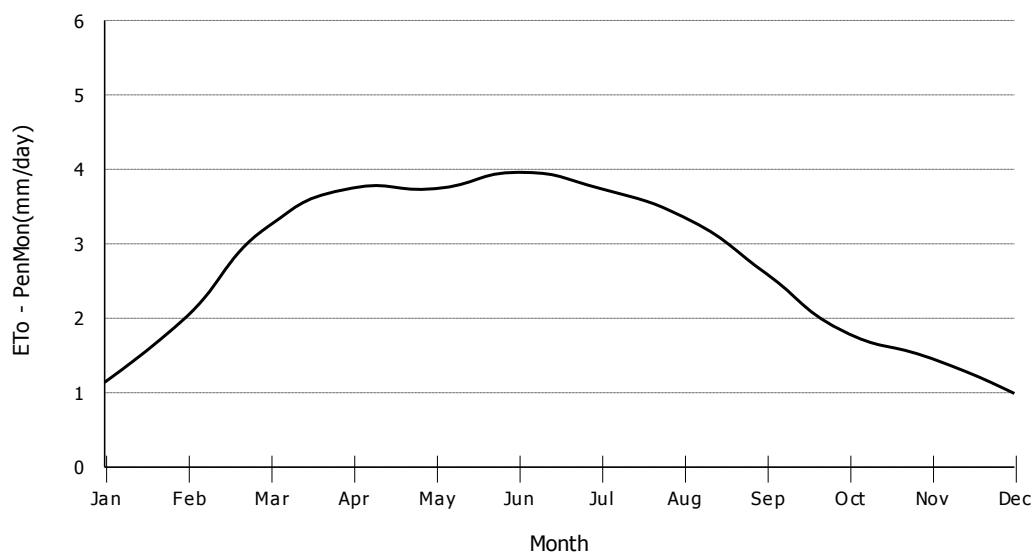
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: DON MUANG AIRPORT		(30 Yrs)	
Altitude : 12 meter		Coordinates		: 13 - 55 N.L.		100 - 36 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.4	32.2	67.0	182.0	6.2	15.9	4.14
February	23.9	33.6	70.0	240.0	6.4	17.5	4.80
March	25.2	34.8	71.0	271.0	6.5	18.9	5.37
April	26.3	35.7	72.0	271.0	6.2	19.1	5.54
May	26.3	34.7	75.0	262.0	5.0	17.1	4.94
June	26.2	33.8	75.0	289.0	3.8	15.1	4.63
July	25.9	33.4	75.0	293.0	3.8	15.2	4.60
August	25.8	33.1	76.0	276.0	3.7	15.1	4.43
September	25.3	32.9	79.0	218.0	3.6	14.6	3.95
October	25.2	32.3	78.0	178.0	4.7	15.3	3.87
November	24.1	31.8	71.0	178.0	6.2	16.1	4.11
December	22.0	31.2	65.0	178.0	6.2	15.4	4.04
Average	24.9	33.3	73.0	236.0	5.2	16.3	4.54

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



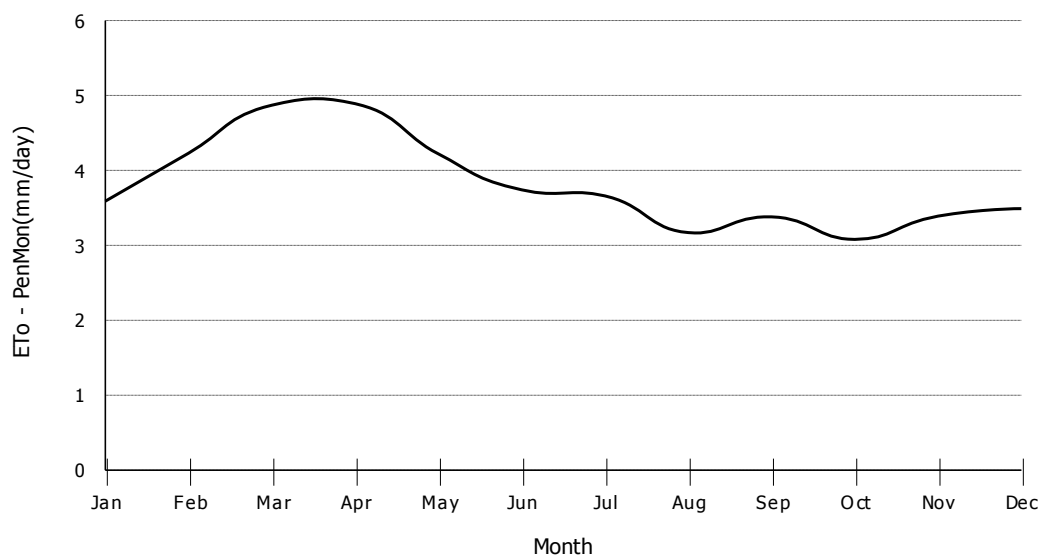
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: BANG NA AGROMET.		(5 Yrs)	
Altitude : 3 meter		Coordinates		: 13 - 40 N.L.		100 - 37 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.3	32.0	68.0	67.0	6.2	6.8	1.14
February	24.6	33.1	72.0	98.0	5.8	8.9	2.03
March	26.4	34.3	71.0	133.0	6.0	12.4	3.25
April	27.1	35.2	72.0	107.0	4.9	14.2	3.75
May	26.5	33.9	76.0	89.0	3.8	14.8	3.74
June	26.4	34.0	76.0	98.0	3.8	15.5	3.96
July	26.2	33.0	77.0	89.0	3.8	15.1	3.74
August	26.0	33.1	76.0	93.0	3.7	13.4	3.36
September	25.6	33.3	78.0	71.0	3.6	10.8	2.60
October	25.3	32.6	78.0	58.0	3.5	7.8	1.79
November	24.2	32.2	67.0	76.0	5.7	7.0	1.46
December	22.8	32.0	67.0	67.0	6.2	6.1	0.99
Average	25.3	33.2	73.0	87.0	4.8	11.1	2.65

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



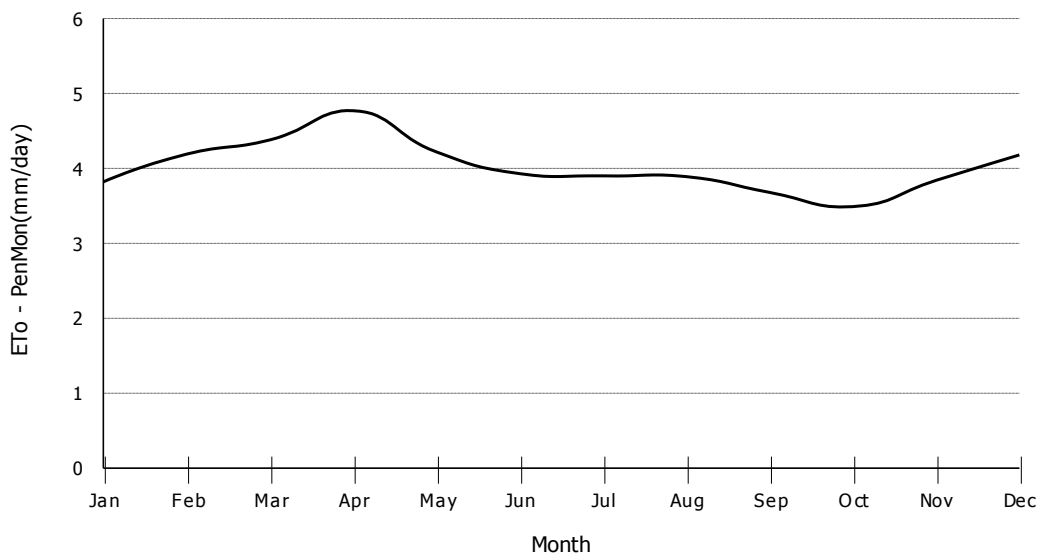
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PHETCHA BURI		(30 Yrs)	
Altitude : 2 meter		Coordinates		: 12 - 59 N.L.		100 - 03 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.2	30.4	74.0	89.0	7.4	17.7	3.59
February	23.1	31.1	77.0	169.0	7.5	19.2	4.23
March	24.8	32.1	77.0	222.0	7.7	20.8	4.87
April	25.8	33.3	76.0	187.0	6.8	20.0	4.89
May	26.0	33.4	76.0	125.0	5.0	17.1	4.22
June	25.9	32.9	76.0	102.0	3.8	15.1	3.74
July	25.6	32.6	76.0	89.0	3.8	15.1	3.66
August	25.6	32.6	76.0	85.0	1.9	12.3	3.17
September	25.1	32.2	80.0	62.0	3.6	14.7	3.38
October	24.6	31.5	82.0	58.0	3.5	13.7	3.08
November	23.3	31.1	77.0	76.0	5.7	15.6	3.39
December	21.0	30.5	72.0	80.0	7.3	17.1	3.49
Average	24.3	32.0	77.0	112.0	5.3	16.5	3.81

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



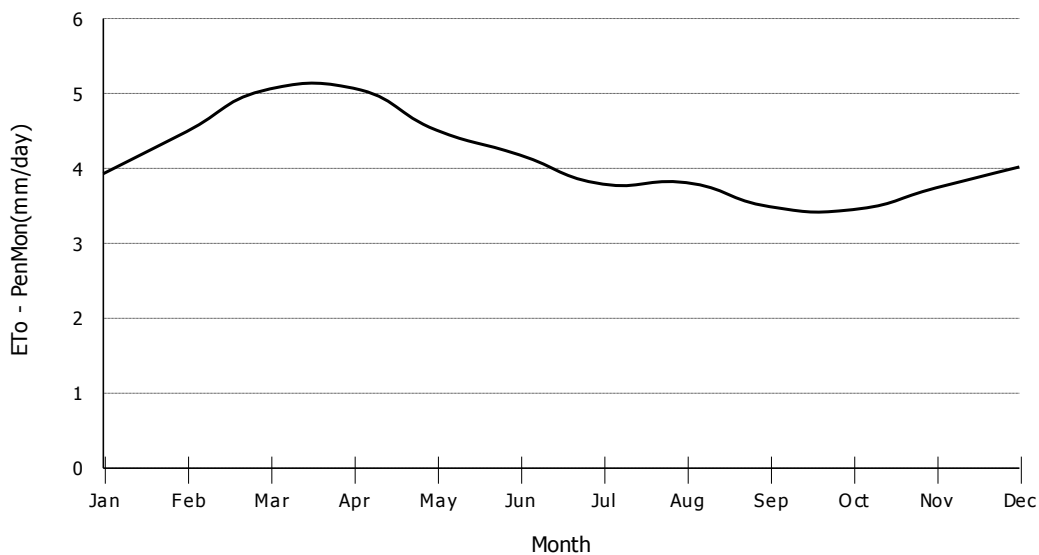
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PRACHUAP KHIRIKHAN		(30 Yrs)	
Altitude : 4 meter		Coordinates		: 11 - 50 N.L.		99 - 50 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	20.6	30.8	75.0	129.0	7.4	18.0	3.82
February	21.7	31.6	77.0	133.0	7.6	19.6	4.19
March	23.4	32.5	77.0	151.0	6.5	19.1	4.38
April	25.0	34.0	76.0	151.0	6.7	19.8	4.77
May	25.3	33.5	77.0	138.0	5.0	17.0	4.22
June	25.3	32.8	76.0	156.0	3.8	15.0	3.93
July	24.9	32.5	77.0	165.0	3.8	15.0	3.90
August	25.0	32.1	77.0	169.0	3.7	15.0	3.89
September	24.6	32.3	78.0	133.0	3.6	14.7	3.68
October	23.8	31.3	82.0	102.0	4.7	15.5	3.49
November	23.0	30.9	75.0	173.0	5.7	15.8	3.84
December	21.2	30.4	70.0	196.0	7.4	17.5	4.18
Average	23.6	32.1	76.0	150.0	5.5	16.8	4.02

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



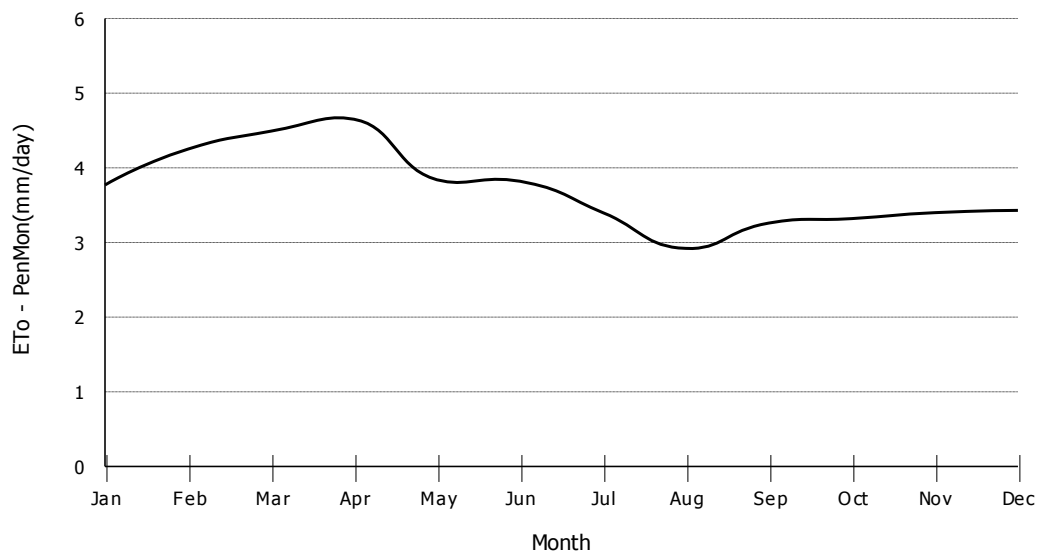
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: HUA HIN		(30 Yrs)	
Altitude : 5 meter		Coordinates		: 12 - 35 N.L.		99 - 57 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.2	29.9	71.0	102.0	8.6	19.4	3.93
February	23.3	31.3	73.0	129.0	8.7	21.0	4.49
March	24.6	32.4	73.0	142.0	8.9	22.7	5.06
April	25.8	33.6	73.0	125.0	8.0	21.9	5.07
May	26.0	33.6	74.0	102.0	6.3	19.0	4.51
June	25.9	33.4	73.0	107.0	5.1	17.0	4.18
July	25.5	33.1	73.0	98.0	3.8	15.1	3.79
August	25.5	33.0	73.0	102.0	3.7	15.1	3.81
September	25.0	32.4	77.0	76.0	3.6	14.7	3.49
October	24.6	31.0	80.0	80.0	4.7	15.4	3.45
November	24.0	30.3	74.0	125.0	6.3	16.5	3.74
December	22.5	29.5	67.0	129.0	8.5	18.7	4.02
Average	24.6	32.0	73.0	110.0	6.3	18.0	4.13

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



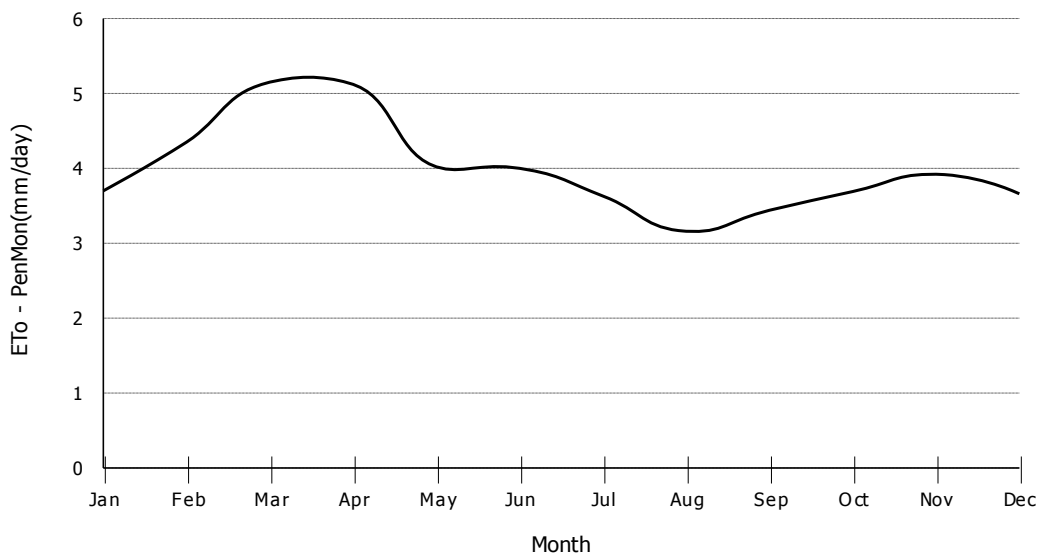
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NONG PHLUB AGROMET.		(5 Yrs)	
Altitude : 106 met		Coordinates		: 12 - 35 N.L.		99 - 44 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	18.9	32.0	71.0	102.0	7.4	17.8	3.77
February	20.8	34.3	72.0	98.0	7.5	19.3	4.25
March	22.3	35.7	72.0	98.0	6.5	19.0	4.49
April	23.5	35.9	76.0	80.0	6.8	20.0	4.65
May	23.9	34.1	82.0	44.0	5.0	17.1	3.84
June	23.9	33.9	81.0	49.0	5.1	17.0	3.82
July	23.6	33.0	82.0	44.0	3.8	15.1	3.40
August	23.7	33.2	80.0	44.0	1.9	12.3	2.92
September	23.4	32.9	83.0	31.0	3.6	14.7	3.26
October	23.2	31.6	86.0	44.0	4.7	15.4	3.32
November	21.3	30.8	78.0	98.0	5.7	15.7	3.40
December	19.5	31.4	73.0	102.0	6.2	15.7	3.43
Average	22.3	33.2	78.0	70.0	5.3	16.6	3.71

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



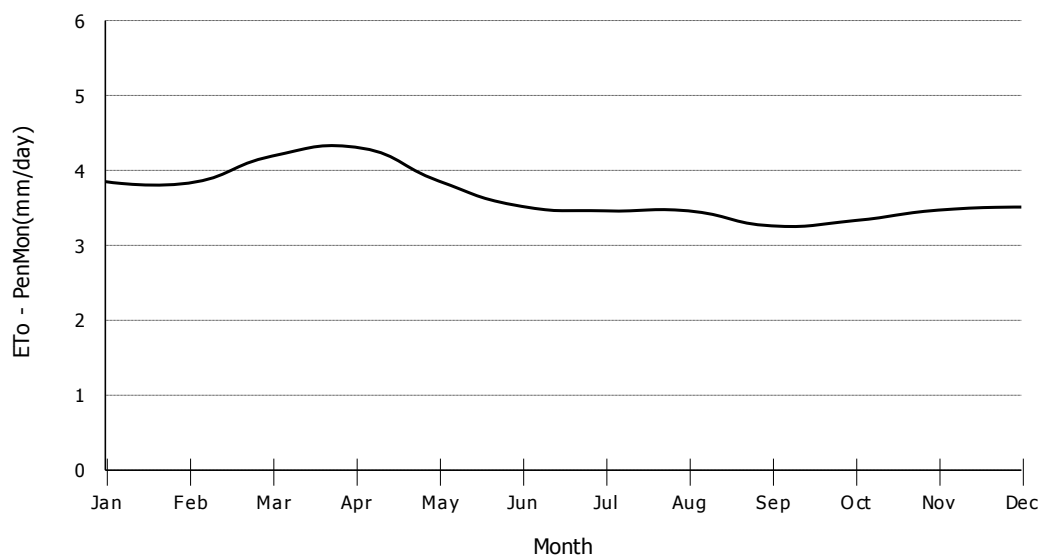
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NAKHONPATHOM		(5 Yrs)	
Altitude : 7 meter		Coordinates		: 14 - 01 N.L.		99 - 58 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	19.4	31.0	74.0	76.0	9.0	19.5	3.70
February	22.3	33.6	75.0	67.0	9.3	21.5	4.35
March	24.0	35.4	73.0	85.0	9.5	23.4	5.15
April	25.0	36.1	74.0	93.0	8.0	21.8	5.12
May	24.7	34.5	79.0	71.0	5.0	17.2	4.02
June	24.8	34.4	80.0	76.0	5.1	17.1	4.00
July	24.7	33.5	80.0	85.0	3.8	15.2	3.63
August	24.4	33.4	80.0	98.0	1.9	12.4	3.16
September	24.4	33.4	82.0	80.0	3.6	14.6	3.44
October	23.9	32.1	83.0	71.0	5.9	17.0	3.69
November	21.6	30.9	77.0	102.0	8.5	19.1	3.92
December	19.9	30.5	76.0	89.0	9.0	18.9	3.66
Average	23.3	33.2	78.0	83.0	6.5	18.1	3.99

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



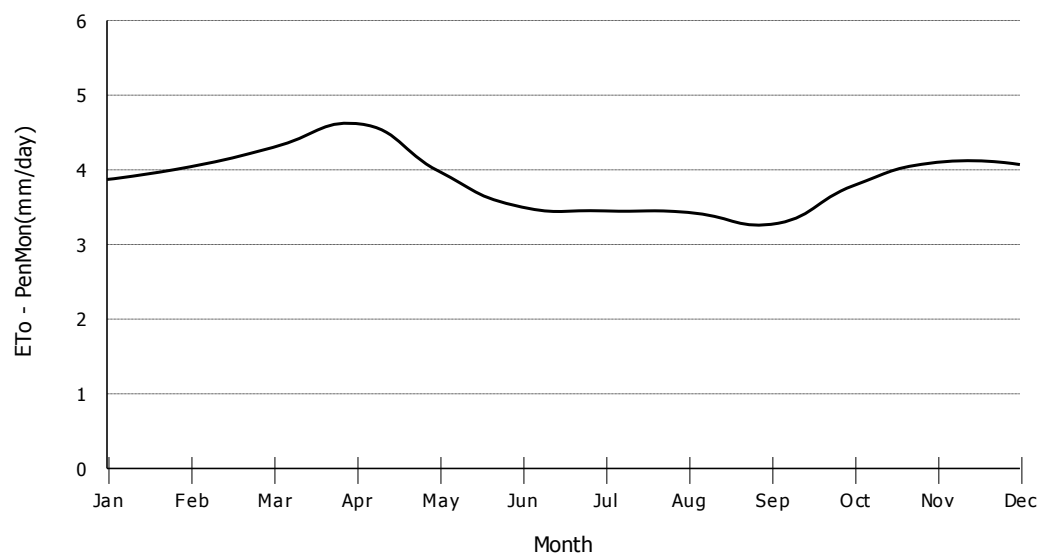
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: CHACHOENGSAO		(5 Yrs)	
Altitude : 70 meter		Coordinates		: 13 - 30 N.L.		101 - 27 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	19.6	32.9	68.0	76.0	8.5	19.0	3.85
February	21.9	34.6	72.0	67.0	6.4	17.5	3.83
March	23.3	35.4	75.0	76.0	6.0	18.2	4.19
April	24.4	35.2	80.0	53.0	6.2	19.1	4.31
May	24.8	33.8	84.0	49.0	5.0	17.1	3.86
June	25.0	33.7	82.0	58.0	3.8	15.1	3.52
July	24.6	32.7	84.0	62.0	3.8	15.2	3.46
August	24.6	32.9	83.0	62.0	3.7	15.1	3.46
September	24.2	32.5	86.0	40.0	3.6	14.6	3.26
October	23.7	32.2	85.0	49.0	4.7	15.3	3.33
November	21.3	32.0	75.0	76.0	6.2	16.2	3.47
December	19.6	32.5	71.0	76.0	7.3	16.9	3.51
Average	23.1	33.4	79.0	62.0	5.4	16.6	3.67

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



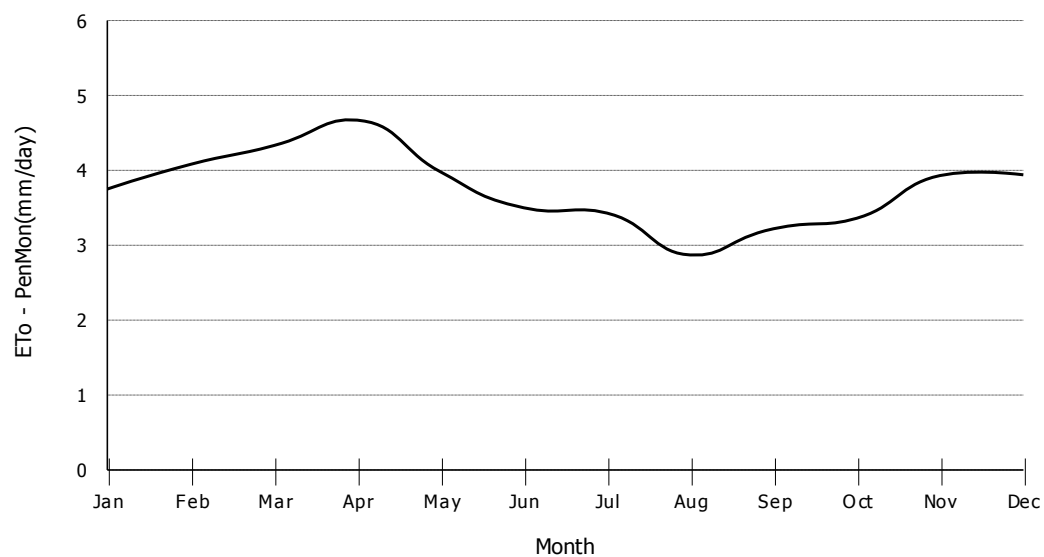
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PRACHINBURI		(30 Yrs)	
Altitude : 5 meter		Coordinates		: 14 - 03 N.L.		101 - 22 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	20.7	33.2	65.0	76.0	8.5	18.8	3.87
February	22.7	34.9	67.0	58.0	7.5	19.0	4.04
March	24.3	36.3	69.0	58.0	6.5	18.9	4.30
April	25.4	36.8	73.0	49.0	6.8	20.0	4.62
May	25.3	35.1	79.0	44.0	5.0	17.2	3.98
June	25.2	33.8	81.0	40.0	3.8	15.2	3.50
July	24.9	33.2	82.0	40.0	3.8	15.2	3.45
August	24.9	32.8	82.0	40.0	3.8	15.3	3.43
September	24.7	32.7	83.0	40.0	3.6	14.6	3.27
October	24.5	32.7	78.0	80.0	5.9	17.0	3.79
November	23.0	32.7	68.0	120.0	7.3	17.5	4.10
December	20.5	32.2	63.0	120.0	8.4	18.1	4.07
Average	23.8	33.9	74.0	64.0	5.9	17.2	3.87

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



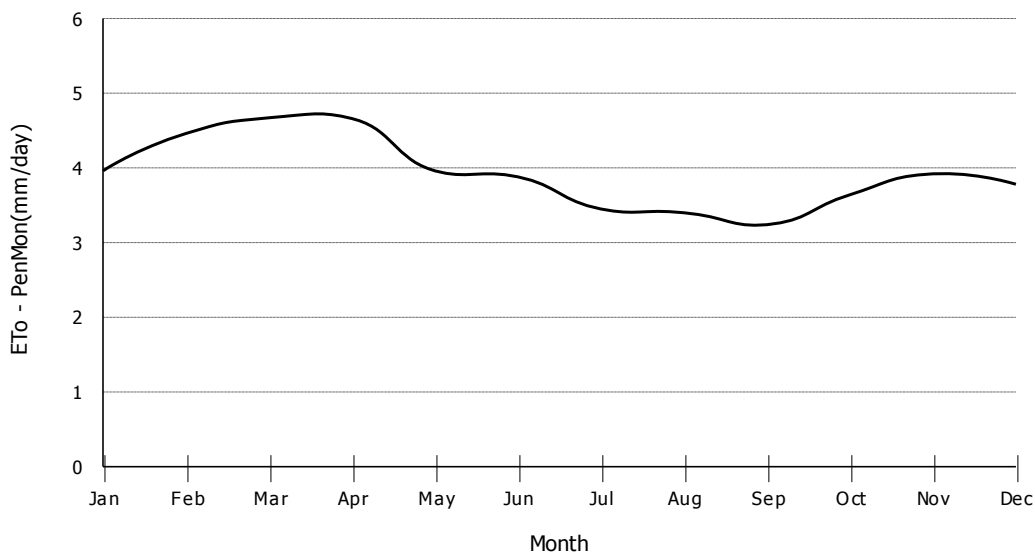
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: KABINBURI		(30 Yrs)	
Altitude : 13 meter		Coordinates		: 13 - 59 N.L.		101 - 42 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	19.9	33.5	68.0	58.0	8.5	19.0	3.75
February	21.9	35.2	68.0	62.0	7.5	19.0	4.08
March	23.7	36.5	70.0	62.0	6.5	18.9	4.33
April	24.9	37.0	73.0	58.0	6.8	20.0	4.67
May	25.0	35.0	80.0	49.0	5.0	17.1	3.98
June	24.8	33.5	82.0	49.0	3.8	15.1	3.50
July	24.5	32.7	84.0	49.0	3.8	15.2	3.43
August	24.4	32.4	85.0	49.0	1.9	12.4	2.87
September	24.3	32.5	85.0	31.0	3.6	14.6	3.22
October	23.9	32.7	81.0	49.0	4.7	15.3	3.36
November	22.2	32.5	72.0	102.0	7.4	17.7	3.93
December	19.8	32.0	68.0	116.0	8.4	18.3	3.94
Average	23.3	33.8	76.0	61.0	5.7	16.9	3.75

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



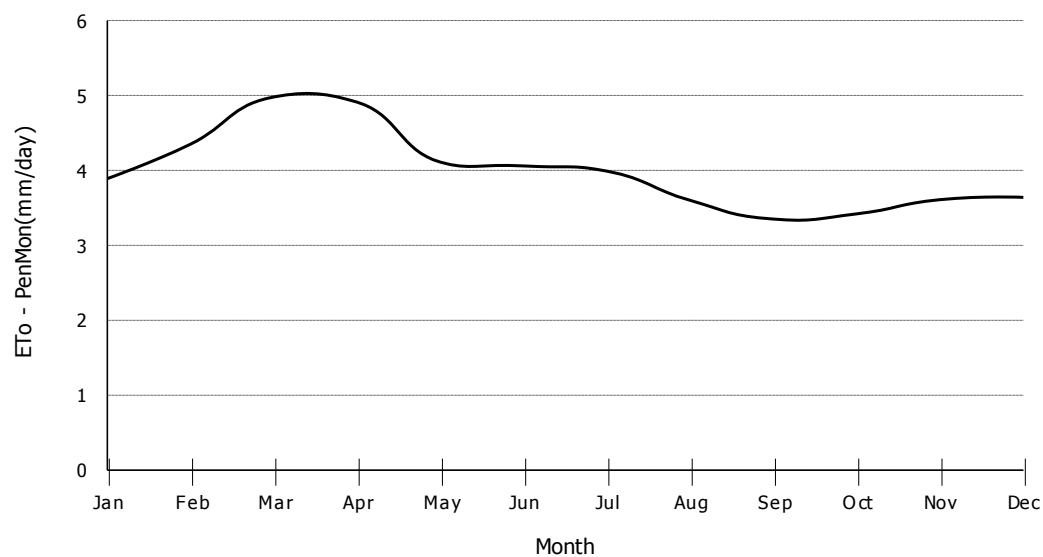
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SA KAEW		(13 Yrs)	
Altitude : 43 meter		Coordinates		: 13 - 47 N.L.		102 - 02 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	20.0	32.6	68.0	80.0	9.1	19.8	3.96
February	22.2	34.4	69.0	85.0	8.7	20.8	4.46
March	24.1	35.5	72.0	76.0	7.7	20.8	4.67
April	25.3	36.2	75.0	67.0	6.8	20.0	4.66
May	25.3	34.5	83.0	58.0	5.0	17.1	3.96
June	25.1	33.6	84.0	62.0	5.1	17.1	3.88
July	24.7	32.8	85.0	58.0	3.8	15.2	3.45
August	24.7	32.5	86.0	58.0	3.7	15.1	3.40
September	24.5	32.3	87.0	44.0	3.6	14.6	3.24
October	24.1	32.2	84.0	49.0	5.9	17.0	3.64
November	22.0	32.1	76.0	67.0	8.5	19.2	3.92
December	19.8	31.7	71.0	80.0	9.0	19.1	3.78
Average	23.5	33.4	78.0	65.0	6.4	18.0	3.92

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



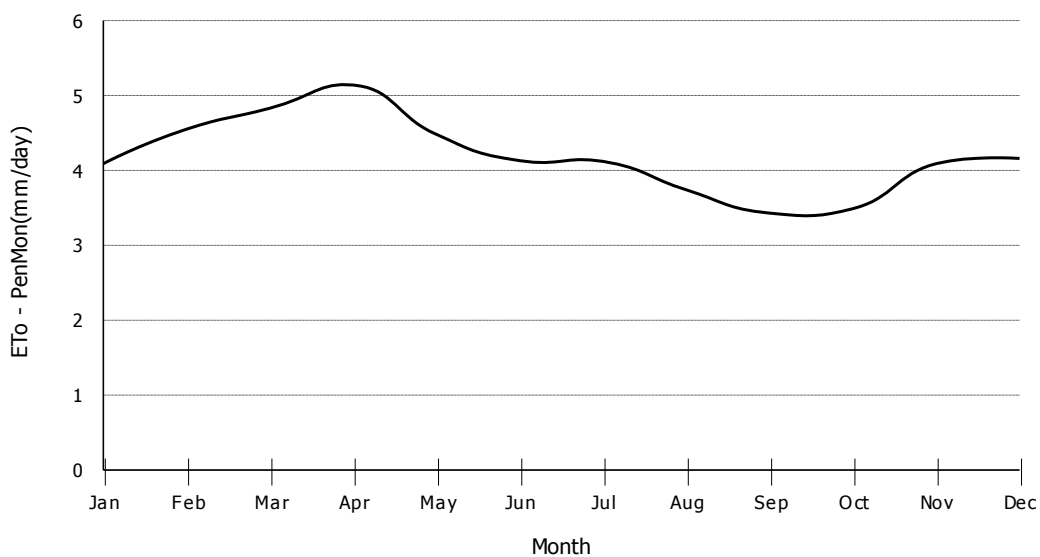
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: ARANYA PRATHET		(30 Yrs)	
Altitude : 47 meter		Coordinates		: 13 - 42 N.L.		102 - 35 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	20.2	32.7	63.0	80.0	8.5	19.0	3.89
February	22.7	34.8	64.0	93.0	7.5	19.1	4.35
March	24.5	36.2	66.0	102.0	7.7	20.8	4.98
April	25.5	36.7	70.0	93.0	6.8	20.0	4.91
May	25.4	35.1	77.0	71.0	5.0	17.1	4.11
June	25.1	33.9	79.0	93.0	5.1	17.1	4.06
July	24.8	33.1	80.0	98.0	5.1	17.1	3.99
August	24.6	32.8	82.0	107.0	3.7	15.1	3.60
September	24.5	32.6	83.0	67.0	3.6	14.6	3.35
October	24.0	32.3	81.0	67.0	4.7	15.3	3.42
November	22.2	31.9	73.0	93.0	6.2	16.1	3.61
December	19.9	31.4	66.0	98.0	7.3	16.9	3.64
Average	23.6	33.6	74.0	89.0	5.9	17.3	3.99

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



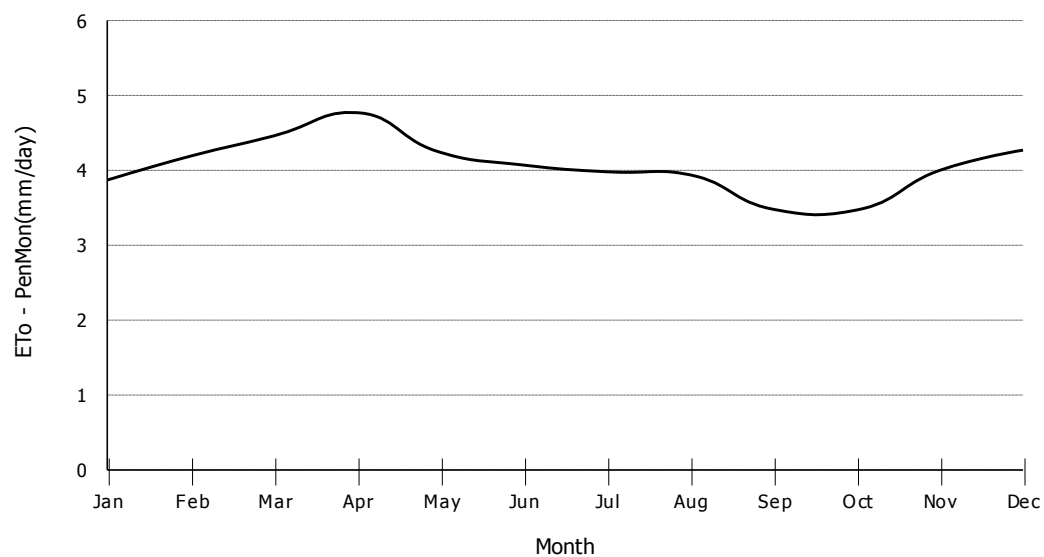
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: CHONBURI		(30 Yrs)	
Altitude : 1 meter		Coordinates		: 13 - 22 N.L.		100 - 59 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.1	32.6	66.0	98.0	8.5	19.1	4.09
February	24.0	33.2	70.0	102.0	8.7	20.8	4.55
March	25.5	34.2	71.0	111.0	7.7	20.8	4.83
April	26.6	35.2	71.0	93.0	8.0	21.9	5.14
May	26.4	34.2	75.0	80.0	6.3	19.1	4.48
June	26.3	33.7	74.0	89.0	5.1	17.0	4.13
July	26.1	33.2	74.0	93.0	5.1	17.1	4.12
August	25.8	33.0	75.0	93.0	3.7	15.1	3.74
September	25.1	32.6	79.0	71.0	3.6	14.6	3.43
October	24.5	32.7	78.0	71.0	4.7	15.3	3.49
November	23.3	32.8	69.0	111.0	7.4	17.8	4.09
December	21.6	32.4	63.0	120.0	8.4	18.4	4.16
Average	24.8	33.3	72.0	94.0	6.4	18.1	4.19

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



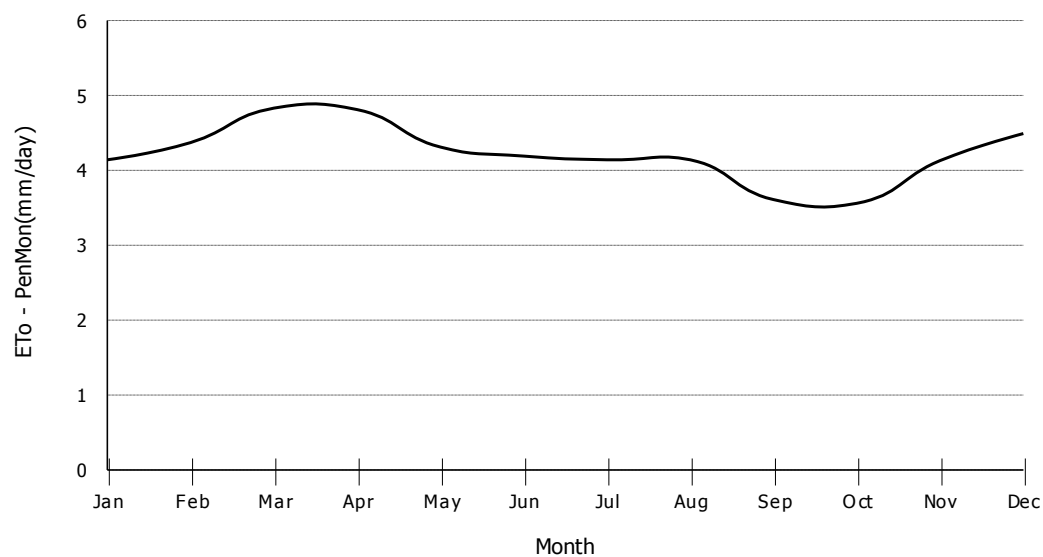
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: KO SICHANG		(30 Yrs)	
Altitude : 25 meter		Coordinates		: 13 - 09 N.L.		100 - 48 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.6	30.3	73.0	147.0	7.4	17.6	3.87
February	24.6	31.0	76.0	138.0	7.5	19.1	4.19
March	26.0	31.9	76.0	160.0	6.5	19.0	4.46
April	27.1	33.0	76.0	142.0	6.8	20.0	4.77
May	26.9	32.5	77.0	142.0	5.0	17.1	4.24
June	26.8	31.9	76.0	191.0	3.8	15.1	4.07
July	26.1	31.5	77.0	191.0	3.8	15.1	3.98
August	26.2	31.3	78.0	196.0	3.7	15.1	3.94
September	25.1	30.9	81.0	125.0	3.6	14.6	3.48
October	24.5	30.9	82.0	120.0	4.7	15.3	3.47
November	24.0	30.6	74.0	200.0	6.2	16.2	4.00
December	22.5	29.9	68.0	222.0	7.3	16.9	4.27
Average	25.2	31.3	76.0	164.0	5.5	16.8	4.06

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



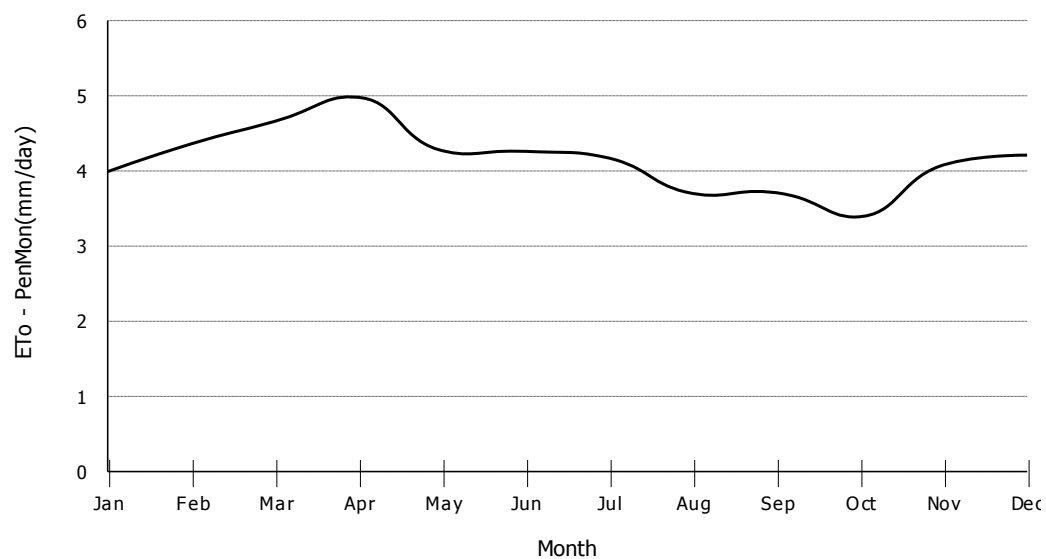
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PHATTHAYA		(30 Yrs)	
Altitude : 1 meter		Coordinates		: 12 - 55 N.L.		100 - 52 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	23.0	30.6	73.0	196.0	7.4	17.7	4.14
February	24.4	31.1	77.0	196.0	7.5	19.2	4.37
March	25.4	31.8	77.0	205.0	7.7	20.8	4.83
April	26.3	32.9	77.0	178.0	6.8	20.0	4.81
May	26.4	32.4	78.0	187.0	5.0	17.1	4.31
June	26.3	31.7	77.0	253.0	3.8	15.1	4.19
July	26.0	31.4	77.0	249.0	3.8	15.1	4.14
August	26.0	31.2	77.0	253.0	3.7	15.1	4.14
September	25.2	31.0	81.0	169.0	3.6	14.7	3.61
October	24.4	30.8	83.0	169.0	4.7	15.4	3.56
November	23.7	30.5	76.0	258.0	6.3	16.4	4.13
December	22.5	30.0	70.0	289.0	7.3	17.1	4.49
Average	25.0	31.3	77.0	217.0	5.6	17.0	4.23

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



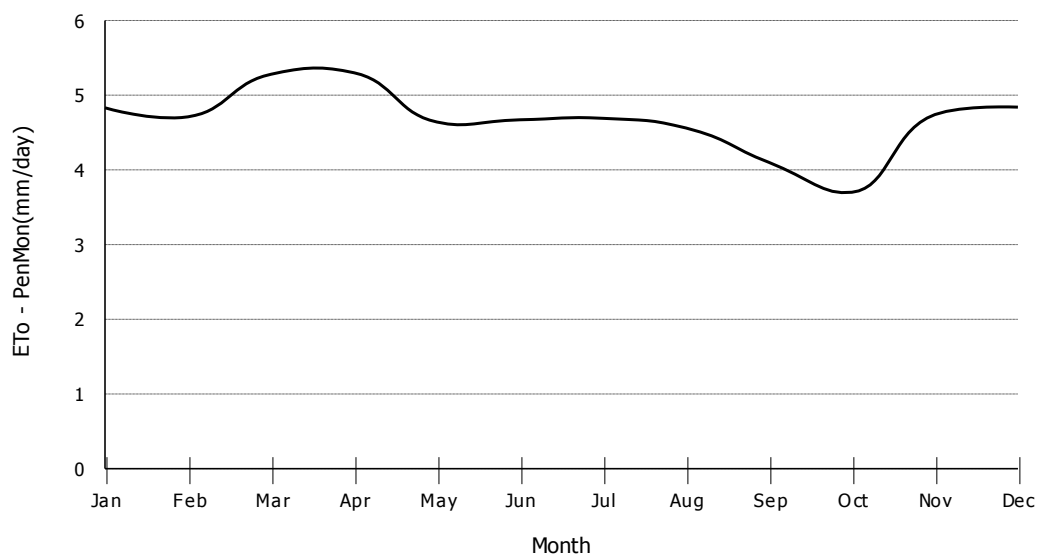
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SATTAHIP		(30 Yrs)	
Altitude : 16 meter		Coordinates		: 12 - 41 N.L.		100 - 59 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.0	32.0	72.0	178.0	6.3	16.3	3.99
February	23.3	32.1	75.0	218.0	6.4	17.7	4.36
March	25.2	32.7	76.0	240.0	6.0	18.3	4.66
April	26.3	33.7	76.0	240.0	6.2	19.1	4.98
May	26.1	33.5	77.0	227.0	3.8	15.3	4.27
June	26.0	33.2	77.0	240.0	3.8	15.0	4.26
July	25.6	32.8	77.0	227.0	3.8	15.1	4.17
August	25.6	32.7	78.0	231.0	1.9	12.3	3.70
September	24.8	32.4	81.0	173.0	3.6	14.7	3.71
October	23.8	32.3	82.0	156.0	3.5	13.7	3.39
November	22.4	32.6	74.0	200.0	5.7	15.6	4.08
December	20.6	32.3	69.0	209.0	6.2	15.7	4.21
Average	24.2	32.7	76.0	211.0	4.8	15.7	4.15

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



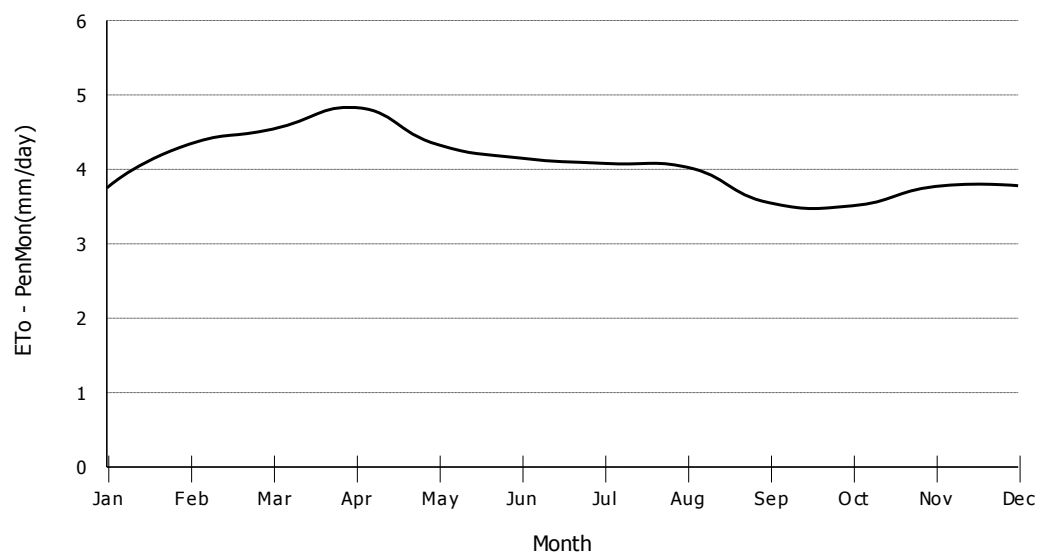
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: LAEM CHABANG		(18 Yrs)	
Altitude : 81 meter		Coordinates		: 13 - 04 N.L.		100 - 52 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.1	31.9	64.0	276.0	6.2	16.0	4.83
February	23.2	32.1	72.0	302.0	5.8	16.7	4.71
March	24.4	32.7	73.0	378.0	6.0	18.2	5.28
April	25.5	33.3	74.0	320.0	6.2	19.1	5.30
May	25.5	32.7	76.0	342.0	3.8	15.3	4.64
June	25.4	31.9	76.0	396.0	3.8	15.1	4.67
July	25.5	31.4	76.0	422.0	3.8	15.1	4.69
August	25.0	31.4	76.0	378.0	3.7	15.1	4.56
September	24.3	31.2	78.0	302.0	3.6	14.6	4.10
October	23.8	31.4	78.0	236.0	3.5	13.6	3.70
November	23.3	31.8	65.0	267.0	5.7	15.5	4.74
December	22.0	31.6	61.0	267.0	6.2	15.5	4.84
Average	24.2	31.9	72.0	324.0	4.9	15.8	4.67

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



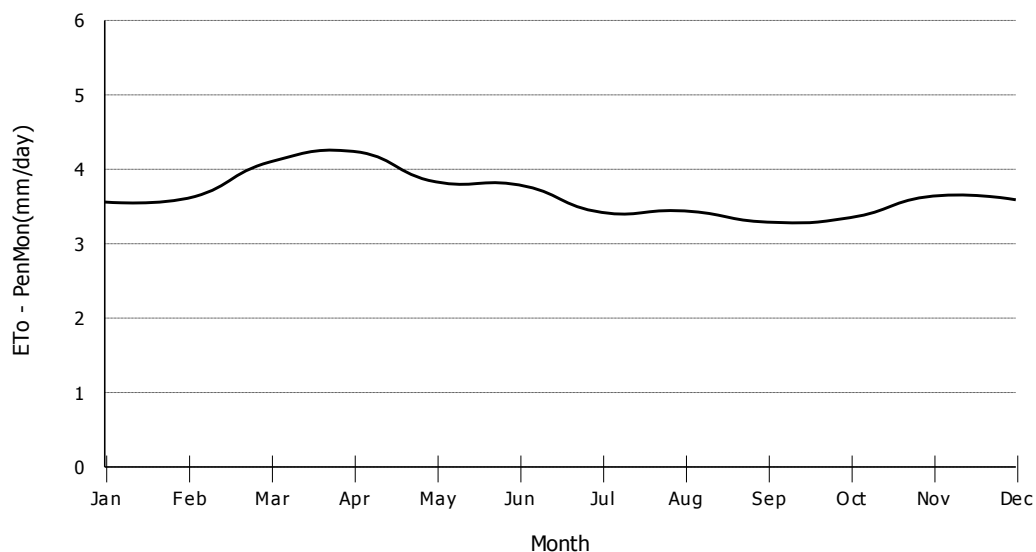
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: RAYONG		(30 Yrs)	
Altitude : 3 meter		Coordinates		: 12 - 37 N.L.		101 - 20 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.5	31.9	74.0	98.0	7.4	17.8	3.75
February	24.5	32.5	76.0	142.0	7.5	19.3	4.34
March	26.2	33.2	77.0	156.0	6.5	19.0	4.54
April	27.1	34.3	77.0	138.0	6.8	20.0	4.83
May	26.9	33.6	79.0	169.0	5.0	17.1	4.33
June	26.8	32.7	79.0	249.0	3.8	15.0	4.15
July	26.5	32.3	79.0	236.0	3.8	15.1	4.08
August	26.4	32.0	80.0	249.0	3.7	15.1	4.03
September	25.4	31.9	82.0	138.0	3.6	14.7	3.55
October	24.5	32.3	82.0	93.0	4.7	15.4	3.51
November	23.3	32.6	74.0	102.0	6.3	16.5	3.77
December	21.3	32.0	70.0	107.0	7.3	17.1	3.78
Average	25.0	32.6	77.0	156.0	5.5	16.8	4.05

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



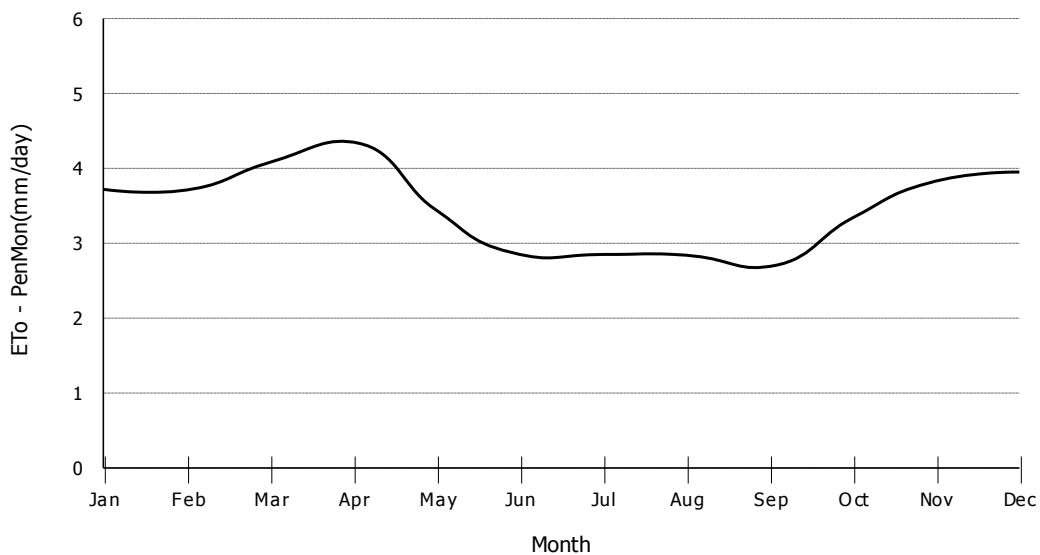
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: HUAI PONG AGROMET.		(5 Yrs)	
Altitude : 43 meter		Coordinates		: 12 - 44 N.L.		101 - 08 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.9	32.3	70.0	49.0	7.4	17.8	3.56
February	23.7	32.8	76.0	31.0	6.4	17.7	3.61
March	25.4	34.0	75.0	36.0	6.5	19.0	4.10
April	26.1	34.6	76.0	31.0	6.2	19.1	4.24
May	25.8	33.6	80.0	31.0	5.0	17.1	3.83
June	25.6	33.3	81.0	36.0	5.1	17.0	3.79
July	25.2	32.6	81.0	44.0	3.8	15.1	3.42
August	25.2	32.8	81.0	49.0	3.7	15.1	3.44
September	24.7	32.3	82.0	40.0	3.6	14.7	3.29
October	24.4	32.0	83.0	44.0	4.7	15.4	3.35
November	23.0	32.2	71.0	80.0	6.3	16.5	3.64
December	22.1	32.5	68.0	67.0	7.3	17.1	3.59
Average	24.4	32.9	77.0	45.0	5.5	16.8	3.66

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



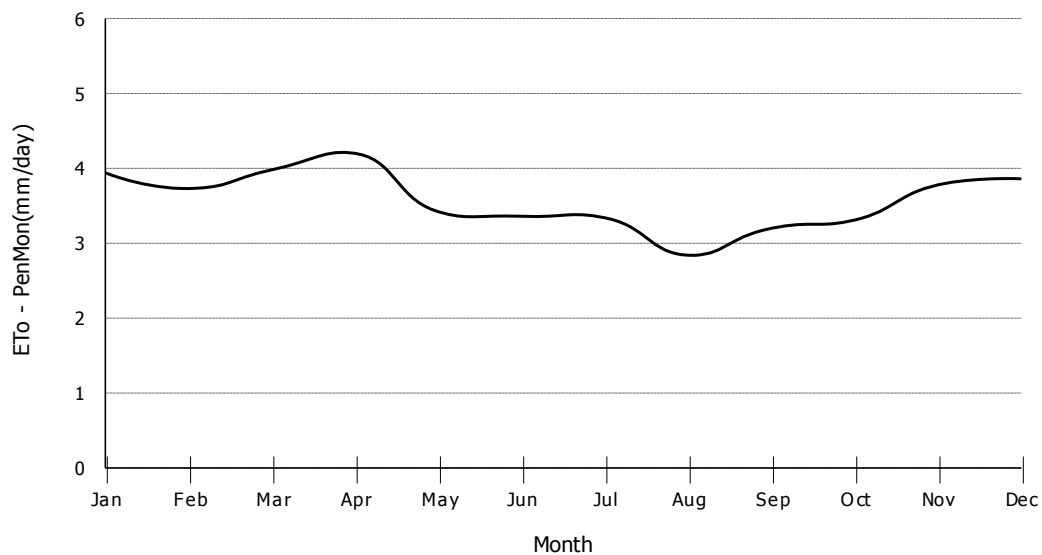
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: CHANTHA BURI		(30 Yrs)	
Altitude : 3 meter		Coordinates		: 12 - 37 N.L.		102 - 06 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.5	32.6	69.0	76.0	7.4	17.7	3.72
February	23.0	32.7	74.0	53.0	6.4	17.6	3.71
March	24.0	33.1	77.0	53.0	6.5	19.0	4.08
April	24.8	33.9	78.0	40.0	6.8	20.0	4.35
May	25.1	32.8	83.0	36.0	3.8	15.3	3.44
June	25.1	31.8	84.0	44.0	1.9	12.3	2.85
July	24.8	31.4	84.0	53.0	1.9	12.3	2.85
August	24.9	31.2	85.0	53.0	1.9	12.3	2.84
September	24.4	31.4	86.0	36.0	1.8	11.9	2.69
October	23.9	32.0	82.0	53.0	4.7	15.4	3.34
November	23.1	32.1	72.0	120.0	6.3	16.4	3.83
December	21.4	31.8	66.0	129.0	7.3	17.0	3.95
Average	23.8	32.2	78.0	62.0	4.7	15.6	3.47

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



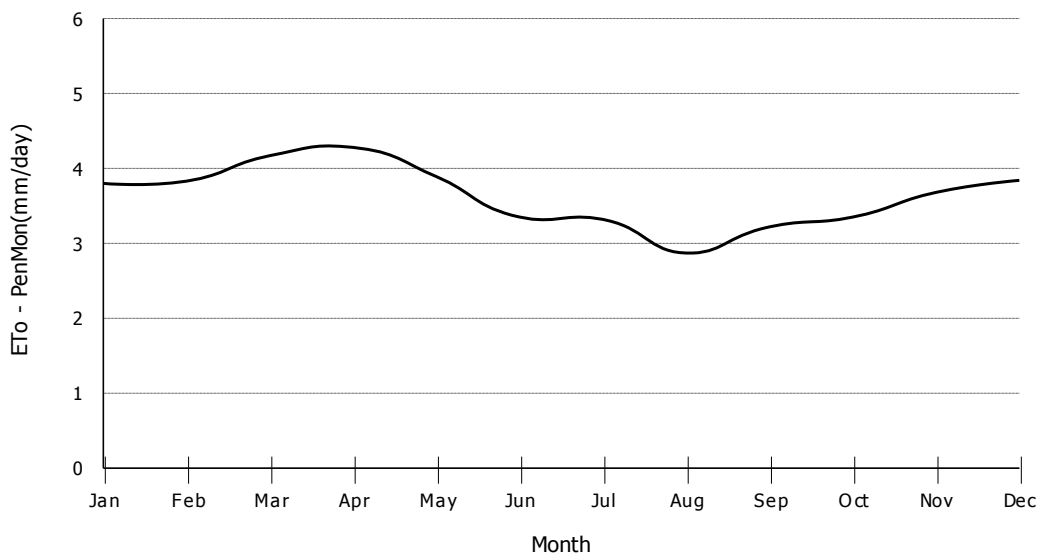
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PHLIU AGROMET.		(5 Yrs)	
Altitude : 24 meter		Coordinates		: 12 - 30 N.L.		102 - 10 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.1	32.4	72.0	76.0	8.6	19.4	3.94
February	23.1	32.3	79.0	67.0	6.4	17.7	3.73
March	24.2	32.7	81.0	71.0	6.0	18.3	3.98
April	24.9	33.2	83.0	62.0	6.2	19.1	4.20
May	25.0	32.2	86.0	53.0	3.8	15.2	3.42
June	25.2	31.7	87.0	62.0	3.8	15.0	3.36
July	24.9	31.0	87.0	76.0	3.8	15.1	3.34
August	24.8	31.1	87.0	71.0	1.9	12.3	2.84
September	24.5	31.1	88.0	53.0	3.6	14.7	3.20
October	23.8	31.6	86.0	53.0	4.7	15.4	3.31
November	22.3	32.4	74.0	71.0	7.4	18.0	3.78
December	21.1	32.9	71.0	76.0	8.5	18.7	3.86
Average	23.7	32.0	82.0	66.0	5.4	16.6	3.58

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



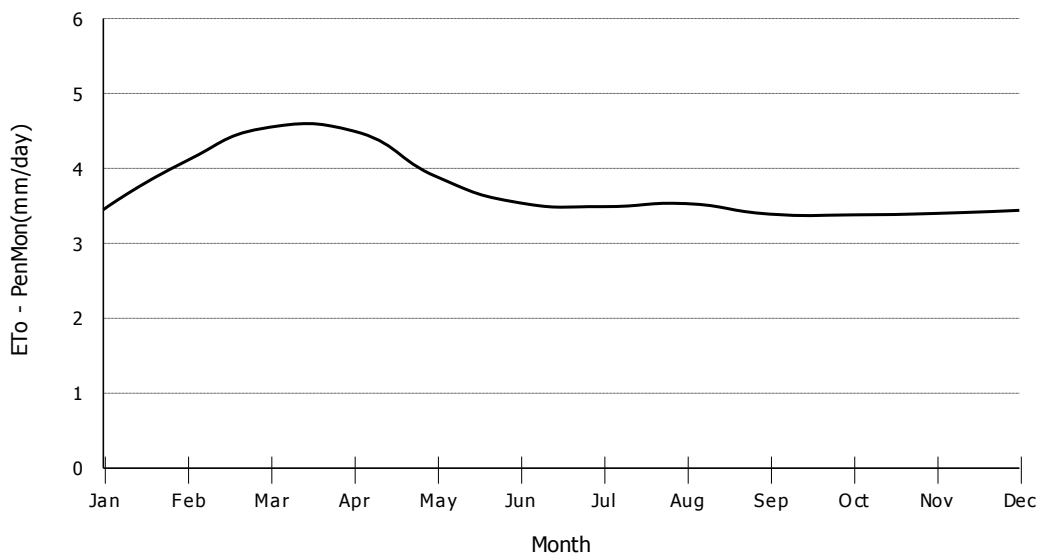
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: TRAD		(30 Yrs)	
Altitude : 2 meter		Coordinates		: 11 - 46 N.L.		102 - 53 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.8	31.5	73.0	93.0	7.4	18.0	3.80
February	23.0	31.7	77.0	89.0	6.4	17.8	3.83
March	24.0	32.4	79.0	89.0	6.5	19.1	4.17
April	24.6	33.2	80.0	98.0	6.1	18.9	4.28
May	24.7	32.6	83.0	98.0	5.0	17.0	3.89
June	24.1	31.3	87.0	93.0	3.8	15.0	3.35
July	23.9	30.7	87.0	107.0	3.8	15.0	3.32
August	24.0	30.5	87.0	120.0	1.9	12.3	2.87
September	23.8	30.9	87.0	85.0	3.6	14.7	3.22
October	23.4	31.5	85.0	76.0	4.7	15.5	3.35
November	23.2	32.2	75.0	89.0	6.3	16.7	3.68
December	22.1	31.7	69.0	102.0	7.4	17.5	3.84
Average	23.6	31.7	81.0	95.0	5.2	16.5	3.63

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



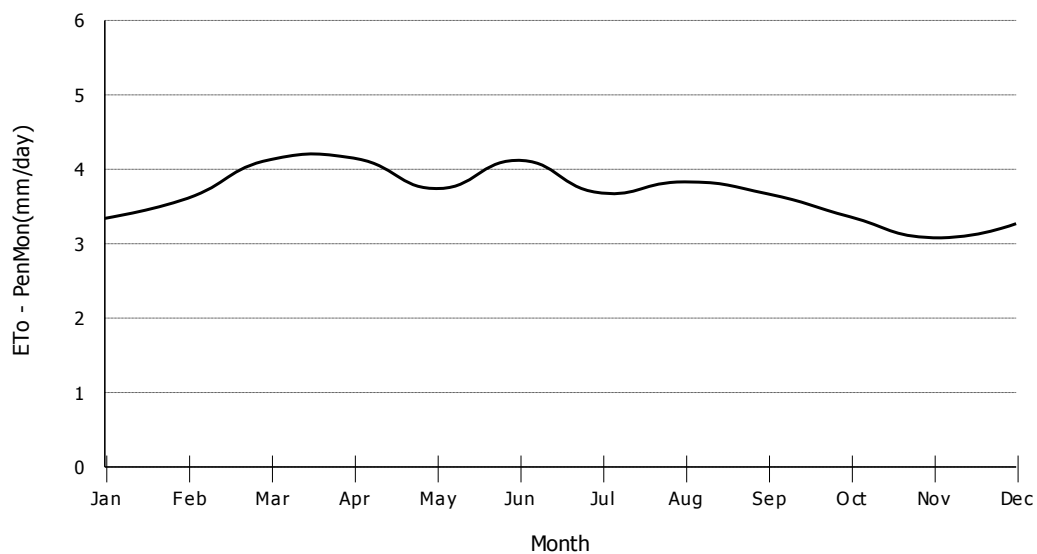
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: CHUMPHON		(30 Yrs)	
Altitude : 4 meter		Coordinates		: 10 - 29 N.L.		99 - 11 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.4	30.9	81.0	93.0	6.3	16.7	3.45
February	22.2	32.1	79.0	85.0	7.6	19.8	4.10
March	23.3	33.4	78.0	89.0	7.7	21.1	4.55
April	24.5	34.5	78.0	80.0	6.7	19.8	4.50
May	24.7	33.3	82.0	85.0	5.0	16.9	3.89
June	24.6	32.3	81.0	107.0	3.8	14.9	3.54
July	24.3	31.9	82.0	107.0	3.8	14.9	3.49
August	24.3	31.6	82.0	120.0	3.7	15.0	3.53
September	24.1	31.6	83.0	98.0	3.6	14.7	3.39
October	23.7	31.2	85.0	62.0	4.7	15.7	3.38
November	23.0	30.3	84.0	93.0	5.8	16.2	3.40
December	21.4	30.1	80.0	125.0	6.3	16.3	3.44
Average	23.5	31.9	81.0	95.0	5.4	16.8	3.72

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



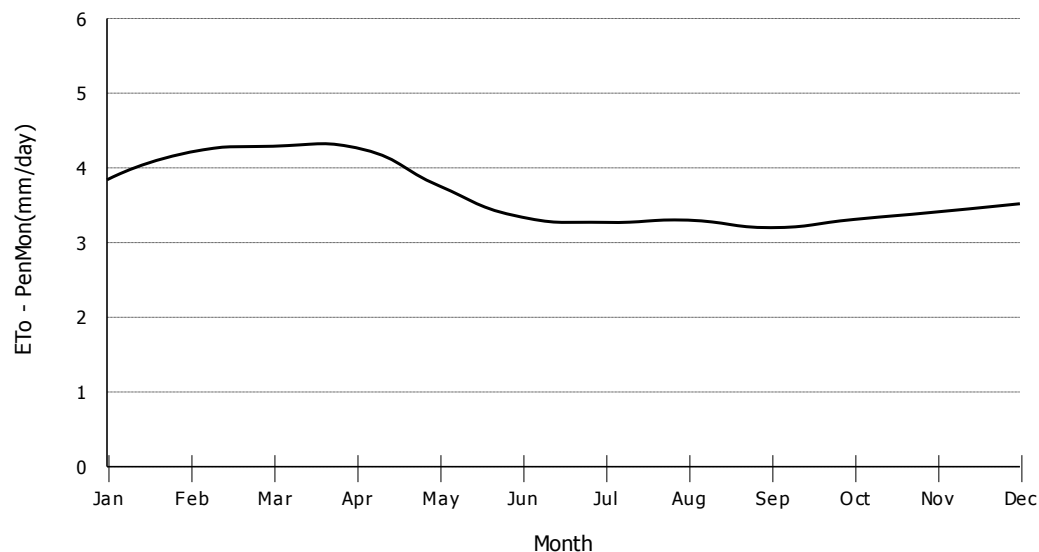
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SAWI AGROMET.		(5 Yrs)	
Altitude : 13 meter		Coordinates		: 10 - 20 N.L.		99 - 06 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	20.9	30.8	80.0	89.0	5.8	16.0	3.34
February	21.4	31.9	79.0	67.0	5.9	17.3	3.61
March	22.6	33.3	78.0	67.0	6.5	19.2	4.13
April	23.8	34.1	79.0	49.0	6.1	18.9	4.15
May	24.2	33.2	82.0	44.0	5.0	16.9	3.74
June	24.3	33.0	80.0	76.0	6.3	18.5	4.12
July	24.1	31.9	82.0	67.0	5.0	16.7	3.68
August	24.2	32.1	80.0	93.0	4.9	16.8	3.83
September	23.9	31.9	81.0	67.0	4.8	16.6	3.67
October	23.5	31.1	84.0	49.0	4.7	15.7	3.36
November	22.6	30.2	83.0	71.0	4.6	14.5	3.08
December	21.4	30.5	81.0	102.0	5.7	15.5	3.27
Average	23.1	32.0	81.0	70.0	5.4	16.9	3.67

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



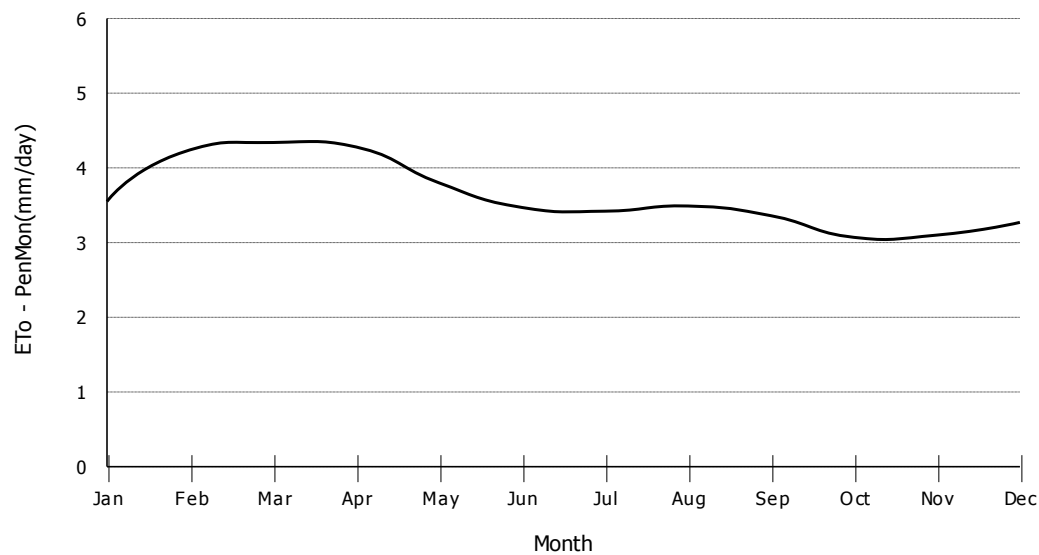
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: RANONG		(30 Yrs)	
Altitude : 7 meter		Coordinates		: 9 - 59 N.L.		98 - 37 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.9	32.8	72.0	62.0	7.5	18.5	3.84
February	22.2	34.1	70.0	58.0	7.6	19.9	4.21
March	23.4	35.0	71.0	58.0	6.5	19.3	4.29
April	24.6	34.6	76.0	53.0	6.1	18.9	4.27
May	24.7	32.4	83.0	58.0	5.0	16.9	3.76
June	24.5	31.2	84.0	85.0	3.8	14.8	3.34
July	24.3	30.9	85.0	76.0	3.7	14.7	3.27
August	24.2	30.5	86.0	85.0	3.7	15.0	3.30
September	23.9	30.5	86.0	58.0	3.6	14.8	3.20
October	23.6	31.0	85.0	40.0	4.7	15.8	3.31
November	23.3	31.4	80.0	53.0	5.8	16.3	3.41
December	22.4	31.7	75.0	80.0	6.3	16.4	3.52
Average	23.6	32.2	79.0	64.0	5.4	16.8	3.64

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



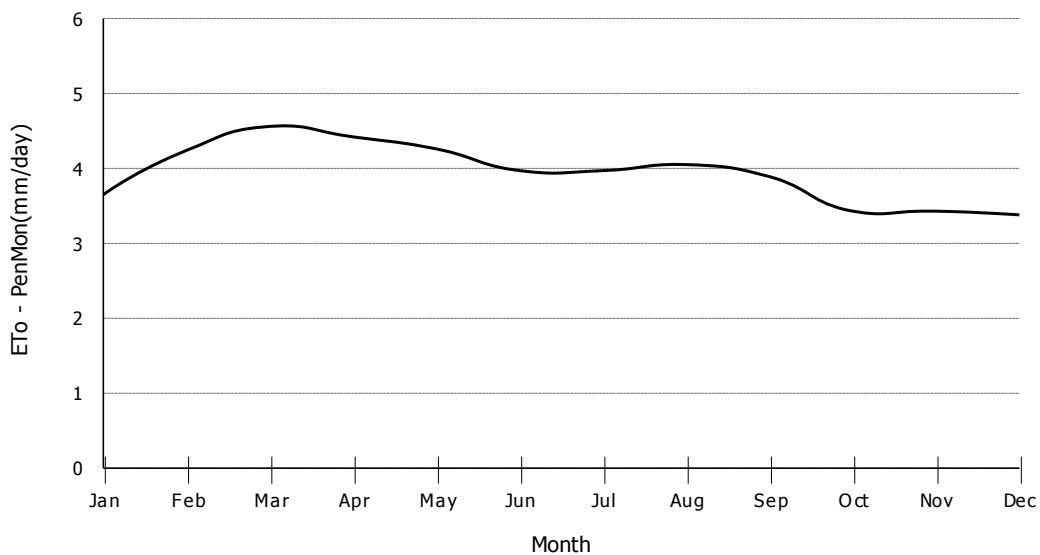
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SURAT THANI		(30 Yrs)	
Altitude : 5 meter		Coordinates		: 9 - 08 N.L.		99 - 09 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.1	31.1	81.0	98.0	6.4	17.1	3.55
February	21.1	32.6	77.0	102.0	7.6	20.0	4.24
March	21.9	34.2	75.0	93.0	6.5	19.3	4.34
April	23.4	35.0	77.0	67.0	6.1	18.9	4.28
May	23.8	34.0	82.0	58.0	5.0	16.8	3.80
June	23.7	33.4	81.0	80.0	3.8	14.7	3.47
July	23.3	32.9	82.0	85.0	3.7	14.7	3.42
August	23.4	32.7	82.0	93.0	3.7	15.0	3.49
September	23.2	32.4	84.0	76.0	3.6	14.8	3.36
October	23.1	31.6	87.0	53.0	3.5	14.0	3.07
November	22.9	30.3	87.0	80.0	4.6	14.7	3.10
December	22.0	29.9	84.0	116.0	5.7	15.7	3.27
Average	22.7	32.5	82.0	83.0	5.0	16.3	3.62

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



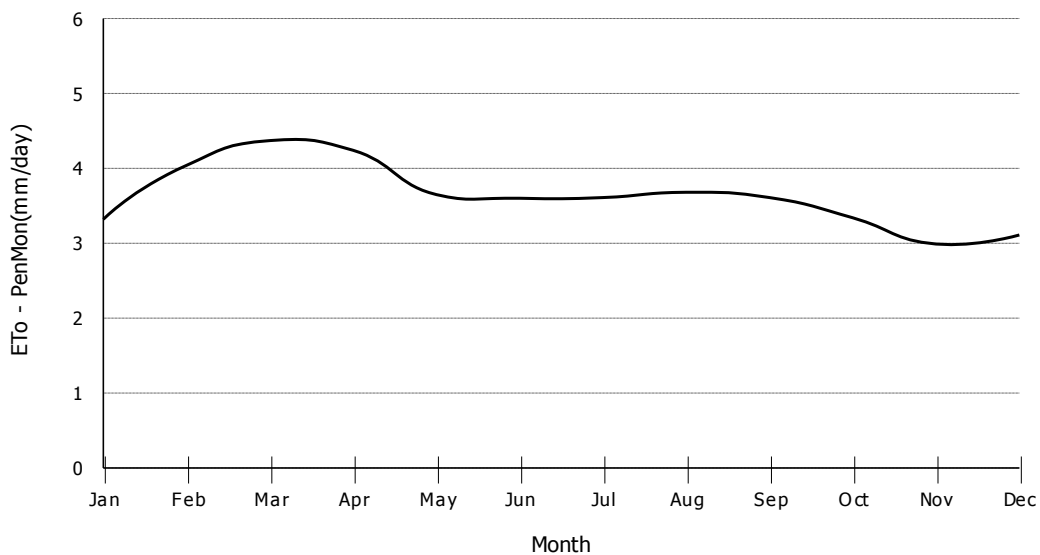
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: KO SAMUI		(30 Yrs)	
Altitude : 4 meter		Coordinates		: 9 - 28 N.L.		100 - 03 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	24.2	29.0	83.0	205.0	6.4	17.1	3.65
February	25.0	29.4	82.0	222.0	7.6	19.9	4.24
March	25.6	30.6	82.0	187.0	7.7	21.1	4.56
April	26.1	32.0	81.0	116.0	6.7	19.8	4.42
May	25.7	32.6	80.0	111.0	6.2	18.7	4.26
June	25.5	32.5	78.0	125.0	5.0	16.5	3.97
July	25.2	32.2	78.0	129.0	5.0	16.6	3.97
August	25.2	32.1	78.0	142.0	4.9	16.8	4.05
September	24.8	31.7	80.0	125.0	4.8	16.6	3.89
October	24.3	30.5	85.0	85.0	4.7	15.8	3.43
November	24.1	29.6	85.0	116.0	5.8	16.4	3.43
December	23.9	29.2	82.0	147.0	5.7	15.7	3.38
Average	25.0	30.9	81.0	142.0	5.9	17.6	3.94

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



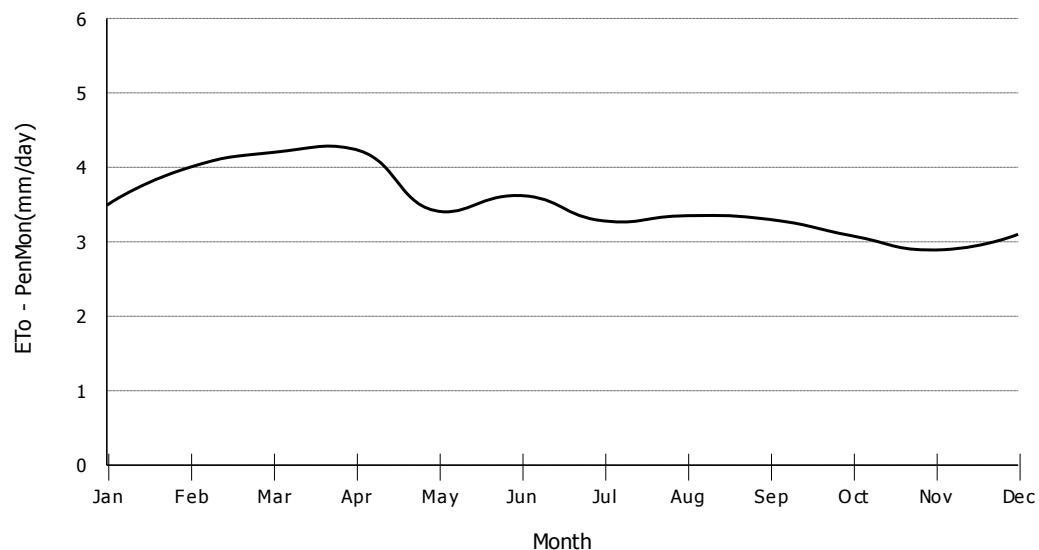
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SURAT THANI AGROMET.		(5 Yrs)	
Altitude : 37 meter		Coordinates		: 9 - 06 N.L.		99 - 38 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.6	30.5	84.0	31.0	6.3	17.0	3.32
February	21.6	32.2	78.0	53.0	7.6	20.0	4.04
March	22.4	33.6	78.0	36.0	7.7	21.2	4.37
April	23.3	34.3	80.0	27.0	6.7	19.8	4.24
May	23.9	33.4	84.0	18.0	5.0	16.8	3.65
June	23.8	33.3	82.0	31.0	5.0	16.5	3.60
July	23.9	32.7	81.0	36.0	5.0	16.6	3.61
August	23.6	32.8	81.0	44.0	4.9	16.8	3.68
September	23.6	32.3	83.0	40.0	4.8	16.6	3.61
October	23.2	31.3	86.0	22.0	4.7	15.8	3.34
November	22.7	30.0	88.0	18.0	4.6	14.7	2.99
December	22.1	30.3	85.0	27.0	5.7	15.7	3.11
Average	23.0	32.2	83.0	32.0	5.7	17.3	3.63

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



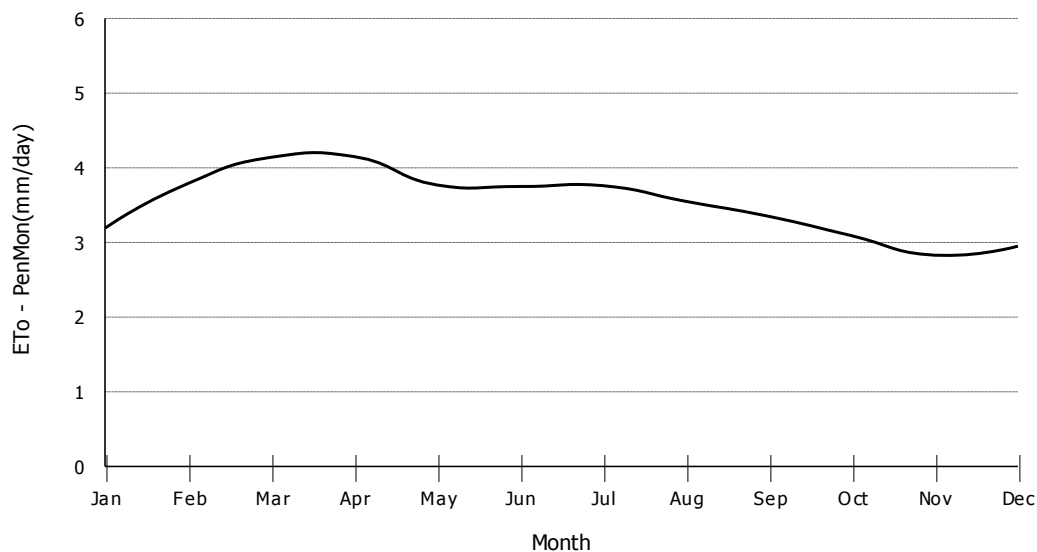
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PHRA SANG		(13 Yrs)	
Altitude : 12 meter		Coordinates		: 8 - 34 N.L.		99 - 16 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.3	32.4	80.0	76.0	5.8	16.4	3.49
February	20.9	34.3	75.0	71.0	6.4	18.3	4.00
March	22.0	35.0	76.0	76.0	6.0	18.6	4.20
April	23.2	35.1	79.0	58.0	6.1	18.9	4.24
May	23.7	33.4	84.0	62.0	3.7	14.8	3.41
June	23.4	32.5	85.0	71.0	5.0	16.4	3.62
July	23.2	32.2	85.0	76.0	3.7	14.6	3.28
August	23.1	32.3	85.0	76.0	3.7	14.9	3.35
September	23.1	32.2	85.0	62.0	3.6	14.8	3.30
October	23.2	31.5	87.0	58.0	3.5	14.1	3.08
November	22.9	31.0	87.0	71.0	3.5	13.3	2.89
December	22.1	31.0	84.0	98.0	4.6	14.3	3.10
Average	22.7	32.7	83.0	71.0	4.6	15.8	3.50

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



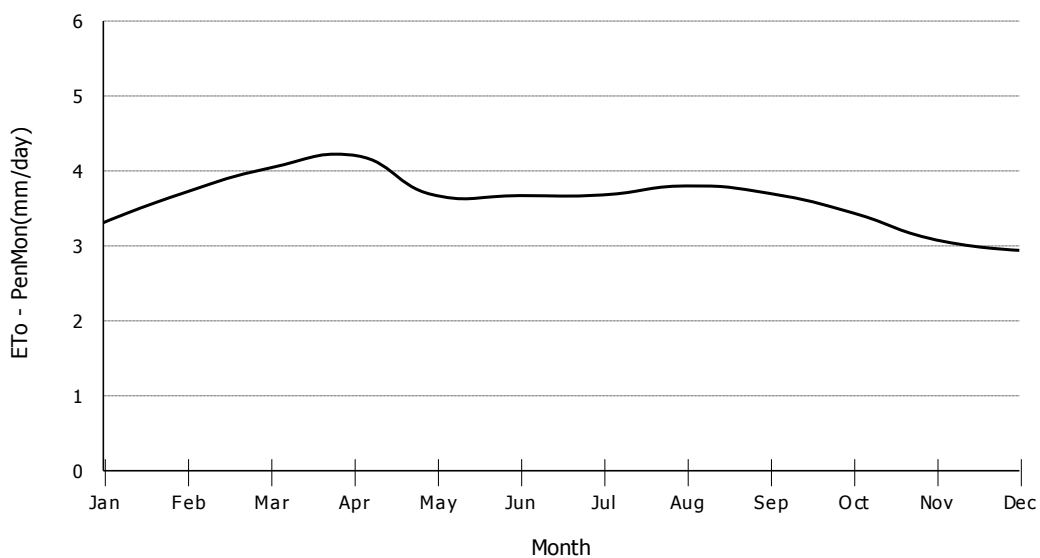
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NAKHONSI THAMMARAT		(30 Yrs)	
Altitude : 3 meter		Coordinates		: 8 - 32 N.L.		99 - 56 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.1	30.4	99.0	62.0	5.8	16.4	3.19
February	22.0	31.5	81.0	71.0	6.4	18.3	3.79
March	22.7	32.9	80.0	71.0	6.5	19.3	4.14
April	23.7	34.0	80.0	58.0	6.1	18.9	4.15
May	24.0	34.0	81.0	53.0	5.0	16.8	3.77
June	24.0	34.0	79.0	62.0	5.0	16.4	3.75
July	23.5	33.8	79.0	67.0	5.0	16.5	3.76
August	23.5	33.7	78.0	76.0	3.7	14.9	3.55
September	23.2	33.1	82.0	49.0	3.6	14.8	3.35
October	23.1	31.8	85.0	40.0	3.5	14.1	3.09
November	23.0	30.2	87.0	53.0	3.5	13.3	2.83
December	22.5	29.6	86.0	71.0	4.6	14.3	2.95
Average	23.1	32.4	83.0	61.0	4.9	16.2	3.53

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



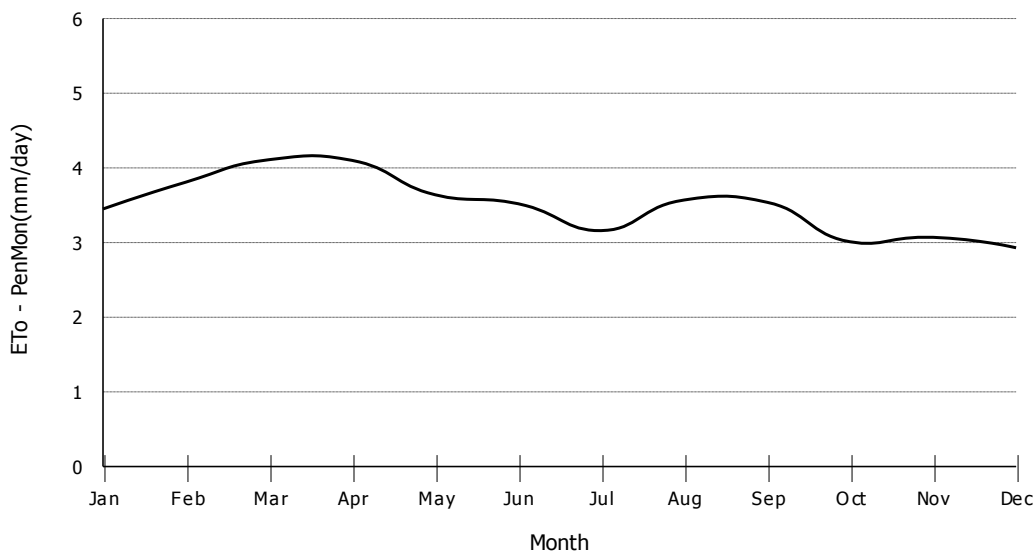
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NAKHONSI THAMMARAT AGROMET.		(5 Yrs)	
Altitude : 2 meter		Coordinates		: 8 - 03 N.L.		100 - 00 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	23.1	30.2	85.0	40.0	5.8	16.5	3.31
February	22.7	31.5	82.0	36.0	6.4	18.3	3.72
March	23.5	32.8	82.0	31.0	6.5	19.4	4.04
April	24.3	33.6	83.0	18.0	6.7	19.8	4.21
May	24.8	33.4	84.0	31.0	5.0	16.7	3.67
June	24.6	33.7	82.0	49.0	5.0	16.4	3.67
July	24.3	33.1	82.0	58.0	5.0	16.5	3.68
August	24.2	33.5	80.0	67.0	4.9	16.7	3.80
September	24.2	32.9	83.0	53.0	4.8	16.7	3.70
October	24.0	31.7	86.0	44.0	4.7	15.9	3.44
November	23.8	29.8	89.0	44.0	4.6	14.9	3.08
December	23.4	29.8	87.0	44.0	4.6	14.4	2.94
Average	23.9	32.2	84.0	43.0	5.3	16.9	3.61

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



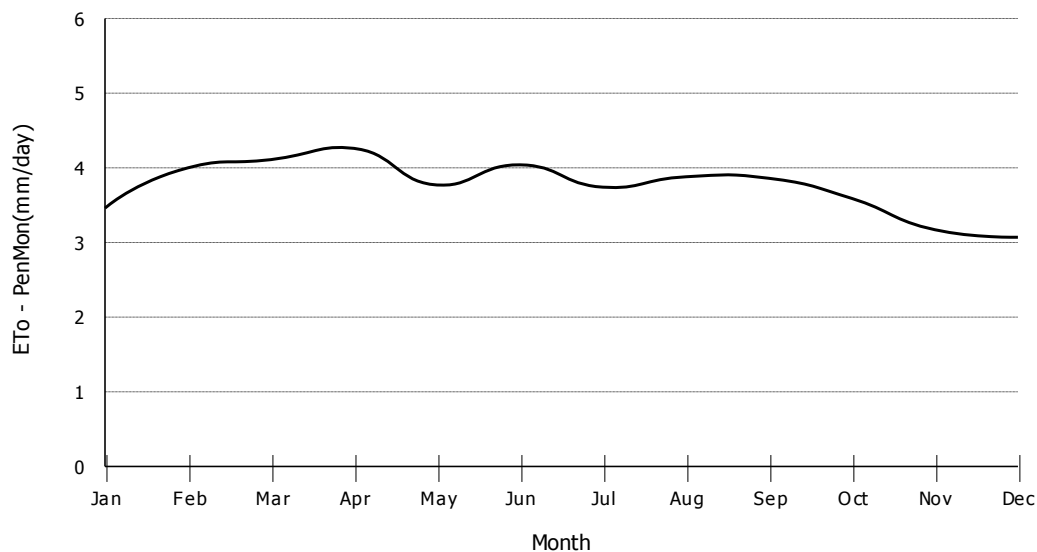
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: CHAWANG		(13 Yrs)	
Altitude : 28 meter		Coordinates		: 8 - 25 N.L.		99 - 30 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	20.7	32.8	80.0	27.0	6.4	17.3	3.45
February	20.3	34.5	75.0	36.0	6.4	18.3	3.81
March	21.2	35.3	76.0	31.0	6.5	19.4	4.11
April	22.1	35.5	79.0	27.0	6.1	18.9	4.10
May	22.8	33.8	84.0	22.0	5.0	16.8	3.64
June	22.7	32.9	85.0	27.0	5.0	16.4	3.52
July	22.5	32.6	86.0	22.0	3.7	14.6	3.16
August	22.5	32.6	85.0	27.0	4.9	16.8	3.57
September	22.6	32.5	86.0	22.0	4.8	16.7	3.54
October	22.7	31.8	87.0	18.0	3.5	14.1	3.01
November	22.4	31.4	87.0	18.0	4.6	14.8	3.07
December	21.5	31.5	84.0	27.0	4.6	14.4	2.93
Average	22.0	33.1	83.0	25.0	5.1	16.5	3.49

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



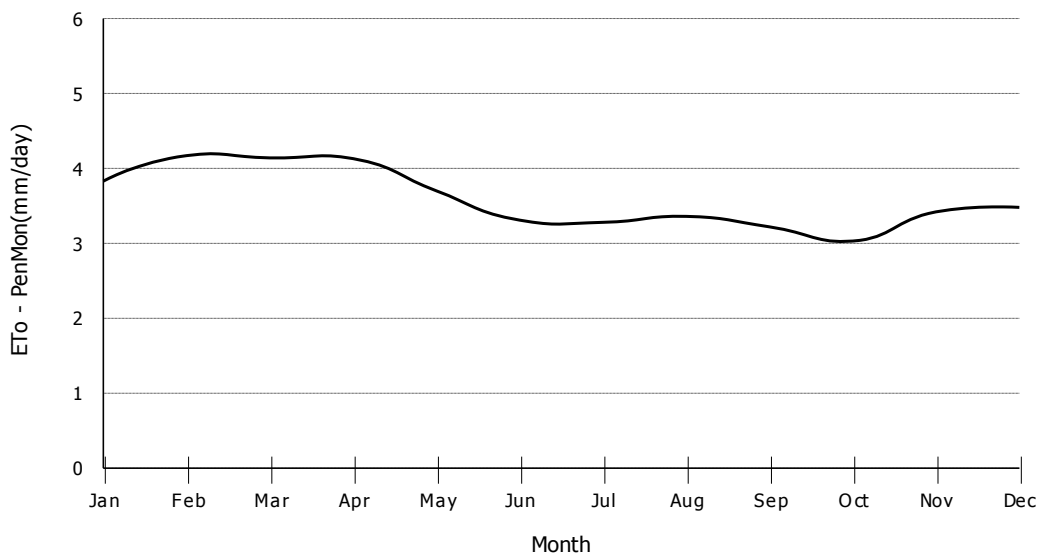
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PHATTHALUNG AGROMET.		(5 Yrs)	
Altitude : 2 meter		Coordinates		: 7 - 35 N.L.		100 - 10 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	23.4	30.7	84.0	85.0	5.8	16.6	3.46
February	23.5	31.8	81.0	102.0	6.5	18.6	4.00
March	24.1	32.9	81.0	89.0	6.0	18.6	4.11
April	24.8	33.7	81.0	89.0	6.1	18.9	4.26
May	24.8	33.5	82.0	71.0	4.9	16.5	3.77
June	24.4	33.4	81.0	80.0	6.2	18.1	4.04
July	24.3	33.1	81.0	89.0	4.9	16.3	3.74
August	24.3	33.2	80.0	98.0	4.9	16.7	3.88
September	24.3	33.0	82.0	107.0	4.8	16.7	3.86
October	24.2	32.1	84.0	89.0	4.7	16.0	3.59
November	24.1	30.0	88.0	58.0	4.7	15.1	3.17
December	24.0	29.8	86.0	93.0	4.6	14.5	3.07
Average	24.2	32.3	83.0	87.0	5.3	16.9	3.75

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



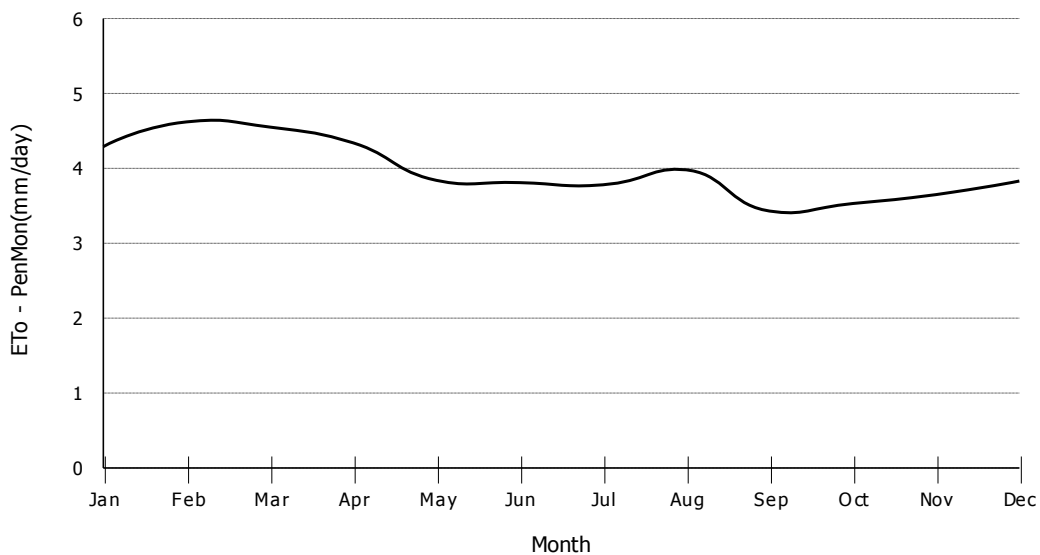
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: TAKUA PA		(30 Yrs)	
Altitude : 6 meter		Coordinates		: 8 - 41 N.L.		98 - 15 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.5	32.8	79.0	53.0	7.5	18.8	3.83
February	21.8	33.5	79.0	53.0	7.6	20.1	4.17
March	22.8	34.0	80.0	44.0	6.5	19.3	4.14
April	23.9	34.0	83.0	44.0	6.1	18.9	4.13
May	24.3	32.7	86.0	62.0	5.0	16.8	3.70
June	24.4	32.0	86.0	85.0	3.8	14.7	3.31
July	24.2	31.7	86.0	80.0	3.7	14.6	3.28
August	24.3	31.4	86.0	98.0	3.7	14.9	3.36
September	23.6	31.0	88.0	62.0	3.6	14.8	3.22
October	23.3	31.2	88.0	49.0	3.5	14.1	3.03
November	22.9	31.8	84.0	40.0	5.8	16.5	3.42
December	22.1	32.1	79.0	62.0	6.3	16.7	3.48
Average	23.3	32.4	84.0	61.0	5.3	16.7	3.59

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



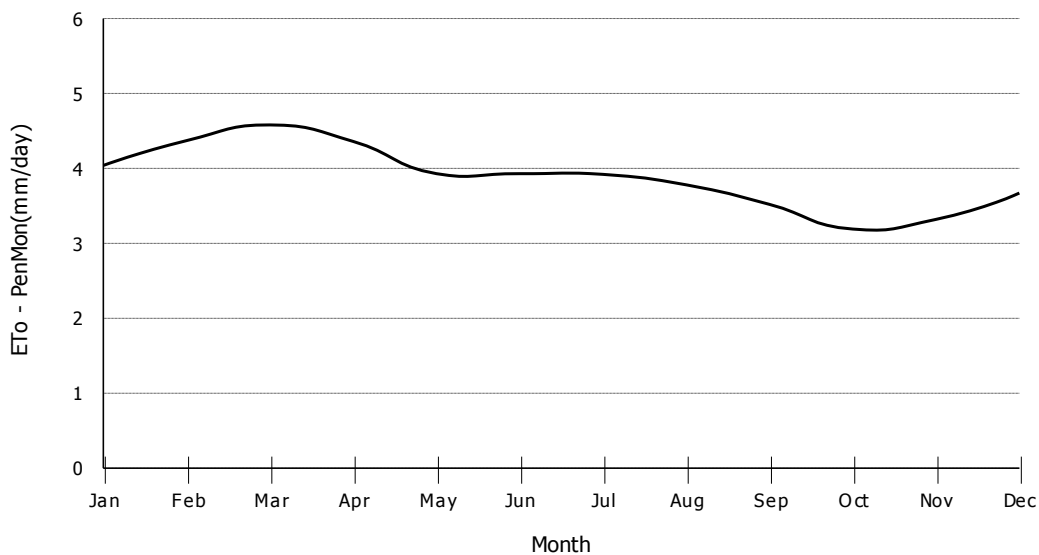
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PHUKET		(30 Yrs)	
Altitude : 2 meter		Coordinates		: 7 - 53 N.L.		98 - 24 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	24.5	32.7	70.0	102.0	7.6	19.1	4.29
February	24.9	33.6	69.0	98.0	7.6	20.2	4.62
March	25.4	34.0	71.0	89.0	6.6	19.6	4.55
April	25.8	33.9	75.0	71.0	6.1	18.9	4.34
May	25.6	32.8	79.0	80.0	4.9	16.6	3.84
June	25.5	32.4	79.0	98.0	5.0	16.3	3.81
July	25.1	32.0	79.0	102.0	4.9	16.3	3.78
August	25.3	32.0	79.0	133.0	4.9	16.7	3.98
September	24.6	31.5	82.0	93.0	3.6	14.8	3.43
October	24.5	31.5	82.0	80.0	4.7	16.0	3.53
November	24.7	31.7	79.0	80.0	5.8	16.7	3.65
December	24.4	31.7	75.0	111.0	6.4	17.0	3.83
Average	25.0	32.5	77.0	95.0	5.7	17.3	3.97

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



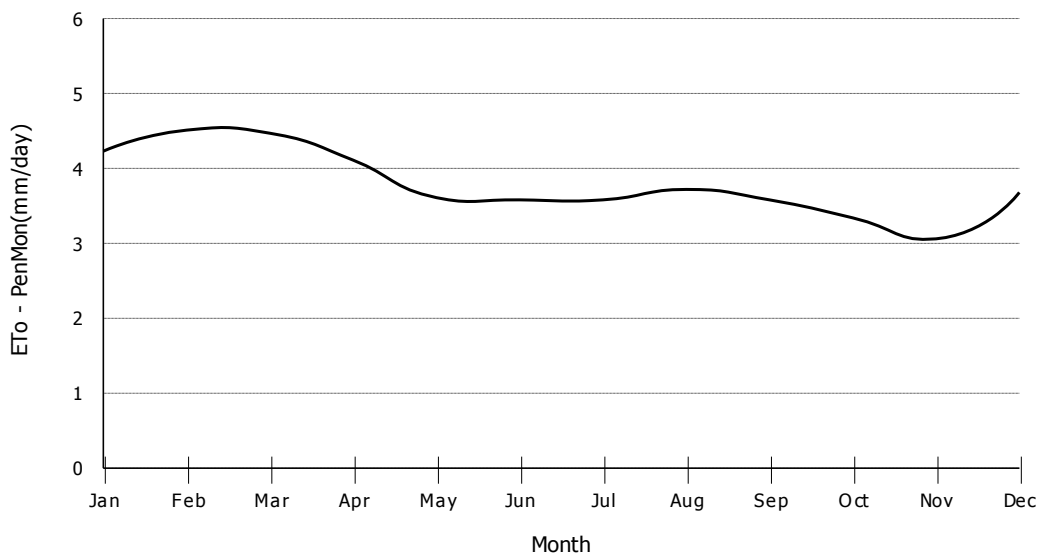
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PHUKET AIRPORT		(30 Yrs)	
Altitude : 6 meter		Coordinates		: 8 - 08 N.L.		98 - 18 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.6	32.1	76.0	160.0	6.4	17.3	4.04
February	22.8	33.1	74.0	151.0	6.4	18.3	4.37
March	23.4	33.6	76.0	147.0	6.5	19.4	4.58
April	24.2	33.4	80.0	125.0	6.1	18.9	4.36
May	24.7	32.2	82.0	151.0	5.0	16.8	3.93
June	24.9	31.7	82.0	200.0	5.0	16.4	3.93
July	24.6	31.3	82.0	205.0	5.0	16.5	3.92
August	24.9	31.2	82.0	245.0	3.7	14.9	3.78
September	24.2	30.7	84.0	191.0	3.6	14.8	3.52
October	23.8	30.8	86.0	129.0	3.5	14.1	3.19
November	23.5	31.1	83.0	116.0	4.6	14.9	3.32
December	22.9	31.2	79.0	156.0	5.8	16.0	3.67
Average	23.9	31.9	81.0	164.0	5.1	16.5	3.88

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



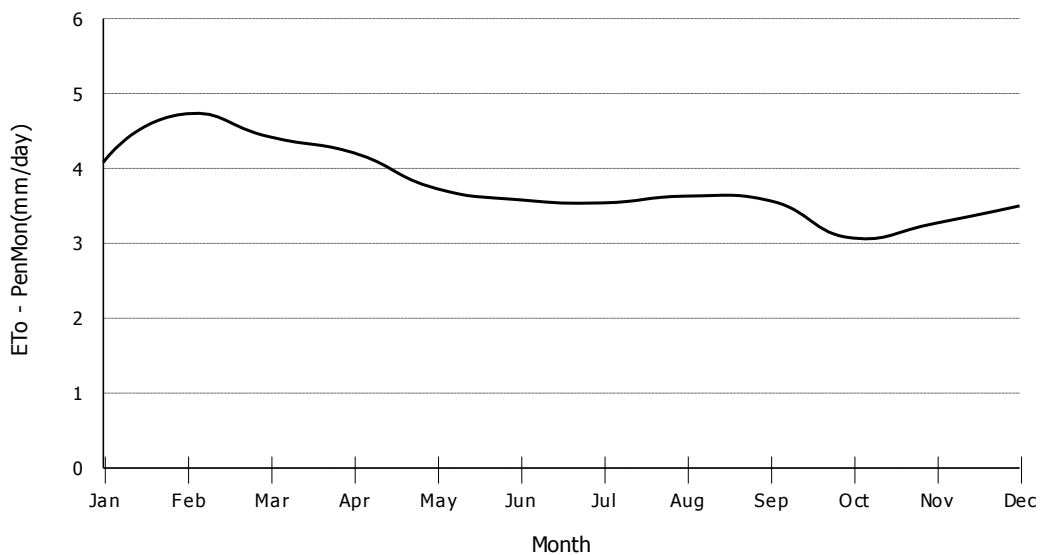
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: KO LANTA		(30 Yrs)	
Altitude : 2 meter		Coordinates		: 7 - 32 N.L.		99 - 03 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	23.9	32.7	75.0	173.0	6.4	17.4	4.23
February	24.1	33.7	74.0	151.0	6.5	18.6	4.51
March	24.6	34.1	76.0	129.0	6.0	18.6	4.47
April	25.0	33.9	79.0	120.0	4.9	17.0	4.11
May	25.3	32.5	85.0	196.0	3.7	14.7	3.61
June	25.4	31.8	85.0	249.0	3.7	14.4	3.58
July	25.0	31.5	85.0	262.0	3.7	14.5	3.58
August	25.2	31.2	85.0	325.0	3.7	14.9	3.72
September	24.8	30.8	85.0	253.0	3.6	14.8	3.58
October	24.4	30.9	85.0	169.0	3.6	14.3	3.34
November	24.1	31.0	85.0	120.0	3.5	13.4	3.06
December	23.6	31.2	79.0	147.0	5.8	16.2	3.68
Average	24.6	32.1	82.0	191.0	4.6	15.8	3.79

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



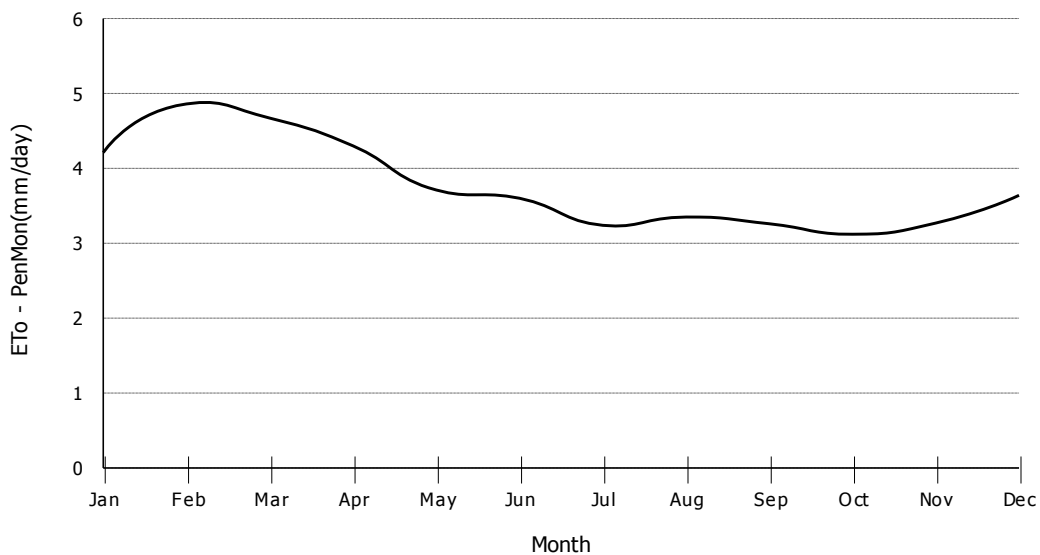
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: KRABI		(17 Yrs)	
Altitude : 8 meter		Coordinates		: 8 - 03 N.L.		98 - 54 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.6	32.9	77.0	169.0	6.4	17.3	4.08
February	22.0	34.2	73.0	147.0	7.6	20.1	4.73
March	23.0	34.3	79.0	107.0	6.5	19.4	4.42
April	23.6	34.1	82.0	71.0	6.1	18.9	4.21
May	23.7	32.9	85.0	71.0	5.0	16.7	3.73
June	23.3	31.9	86.0	80.0	5.0	16.4	3.58
July	23.0	31.5	87.0	76.0	5.0	16.5	3.54
August	22.9	31.4	85.0	89.0	4.9	16.7	3.63
September	22.8	31.2	87.0	89.0	4.8	16.7	3.57
October	22.4	31.3	88.0	76.0	3.5	14.1	3.07
November	22.5	31.1	86.0	138.0	4.6	14.9	3.27
December	21.7	31.4	83.0	142.0	5.8	16.1	3.50
Average	22.7	32.4	83.0	104.0	5.4	17.0	3.78

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



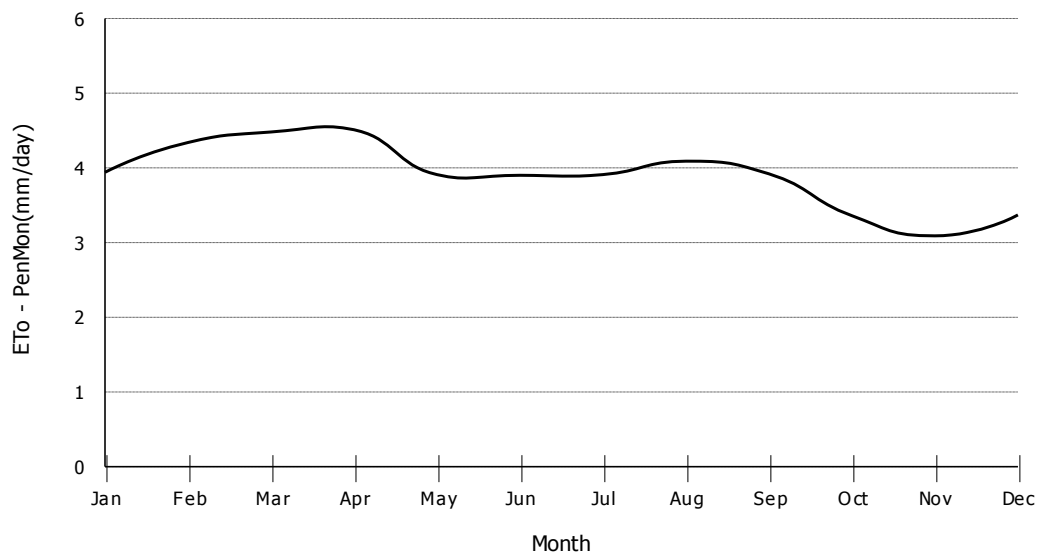
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: TRANG AIRPORT		(30 Yrs)	
Altitude : 14 meter		Coordinates		: 7 - 31 N.L.		99 - 37 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.9	32.6	75.0	182.0	6.4	17.4	4.21
February	21.8	34.4	72.0	160.0	7.6	20.2	4.86
March	22.5	35.3	74.0	120.0	6.6	19.6	4.67
April	23.2	35.2	79.0	71.0	6.1	18.9	4.30
May	23.4	33.6	84.0	62.0	4.9	16.5	3.71
June	23.2	32.8	85.0	71.0	5.0	16.3	3.60
July	22.9	32.3	86.0	71.0	3.7	14.5	3.24
August	23.0	32.2	85.0	80.0	3.7	14.9	3.35
September	22.9	31.9	87.0	62.0	3.6	14.8	3.26
October	22.8	31.8	88.0	58.0	3.6	14.3	3.12
November	22.7	31.3	86.0	98.0	4.7	15.1	3.27
December	22.3	31.2	81.0	160.0	5.8	16.2	3.64
Average	22.7	32.9	82.0	100.0	5.1	16.6	3.77

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



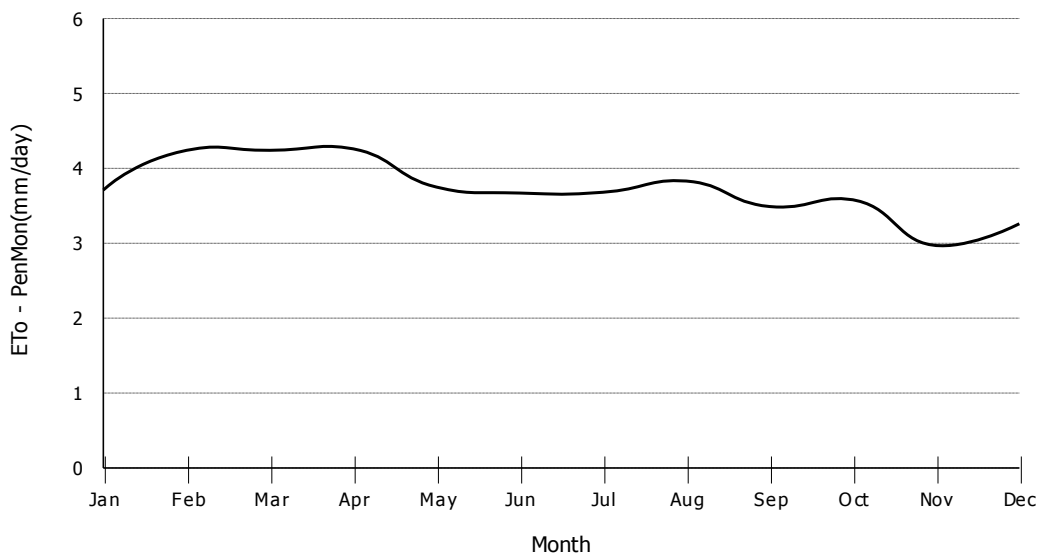
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SONGKHLA		(30 Yrs)	
Altitude : 5 meter		Coordinates		: 7 - 12 N.L.		100 - 36 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	24.7	29.6	78.0	222.0	5.8	16.6	3.94
February	24.7	30.3	77.0	209.0	6.5	18.6	4.34
March	25.0	31.4	78.0	169.0	6.6	19.6	4.48
April	25.4	32.5	78.0	125.0	6.7	19.8	4.51
May	25.4	33.0	78.0	102.0	4.9	16.5	3.91
June	25.1	33.1	77.0	107.0	5.0	16.3	3.90
July	24.8	32.9	77.0	116.0	4.9	16.3	3.91
August	24.7	33.0	76.0	129.0	4.9	16.7	4.09
September	24.5	32.3	79.0	116.0	4.8	16.7	3.92
October	24.3	31.4	82.0	107.0	3.6	14.4	3.36
November	24.3	29.8	84.0	142.0	3.5	13.4	3.09
December	24.4	29.2	82.0	200.0	4.6	14.6	3.37
Average	24.8	31.5	79.0	145.0	5.2	16.6	3.90

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



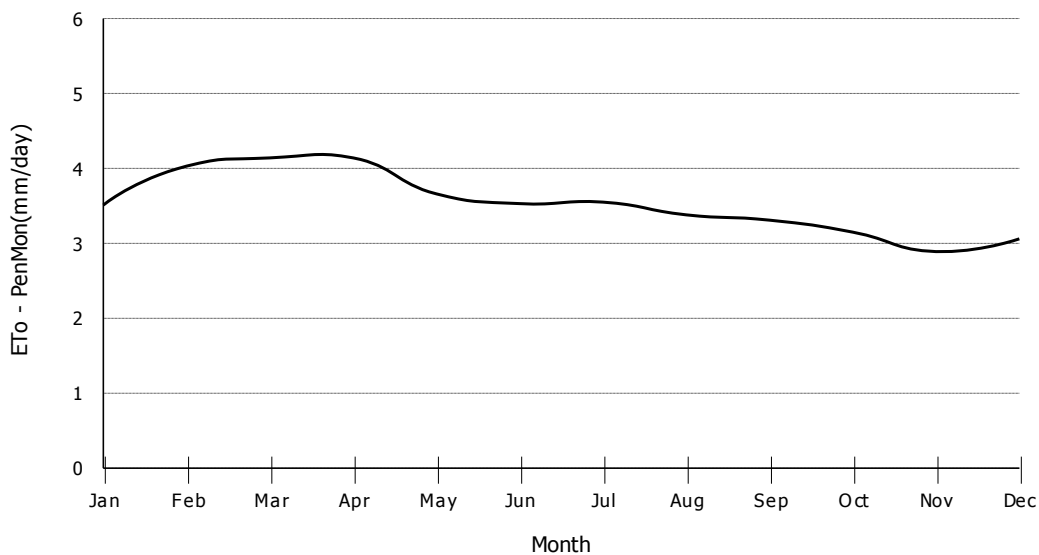
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: KHO HONG AGROMET.		(5 Yrs)	
Altitude : 7 meter		Coordinates		: 7 - 00 N.L.		100 - 30 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	24.1	30.6	77.0	120.0	5.8	16.6	3.71
February	24.3	31.9	74.0	120.0	6.5	18.6	4.24
March	24.6	33.5	75.0	85.0	6.0	18.7	4.24
April	25.1	34.3	77.0	62.0	6.1	18.8	4.26
May	24.9	34.1	79.0	49.0	4.9	16.5	3.75
June	24.6	33.9	79.0	49.0	5.0	16.3	3.67
July	24.4	33.6	79.0	58.0	4.9	16.2	3.68
August	24.4	34.0	77.0	62.0	4.9	16.7	3.83
September	24.3	33.4	79.0	67.0	3.6	14.8	3.49
October	24.1	32.6	82.0	62.0	4.7	16.0	3.58
November	24.1	30.6	85.0	71.0	3.5	13.5	2.97
December	24.3	30.2	80.0	107.0	4.6	14.6	3.26
Average	24.4	32.7	79.0	76.0	5.0	16.5	3.72

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



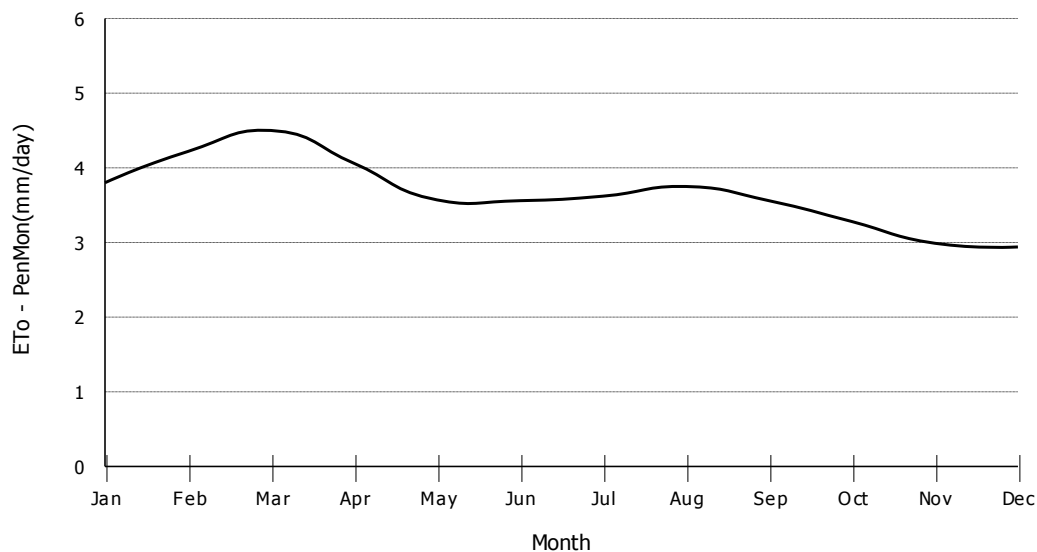
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SA DAO		(13 Yrs)	
Altitude : 25 meter		Coordinates		: 6 - 47 N.L.		100 - 23 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	21.6	31.5	82.0	71.0	5.9	16.9	3.51
February	21.6	33.1	78.0	80.0	6.5	18.7	4.03
March	22.4	34.2	79.0	71.0	6.0	18.7	4.14
April	23.1	34.5	82.0	49.0	6.1	18.8	4.14
May	23.2	33.8	84.0	49.0	4.9	16.5	3.66
June	22.5	33.3	84.0	53.0	4.9	16.1	3.53
July	22.4	33.1	84.0	58.0	4.9	16.2	3.55
August	22.5	33.0	83.0	71.0	3.7	14.8	3.38
September	22.5	32.7	85.0	58.0	3.6	14.9	3.31
October	22.6	32.0	87.0	49.0	3.6	14.4	3.15
November	22.7	31.1	88.0	40.0	3.5	13.5	2.89
December	22.2	30.4	86.0	53.0	4.7	14.8	3.06
Average	22.4	32.7	84.0	59.0	4.9	16.2	3.53

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



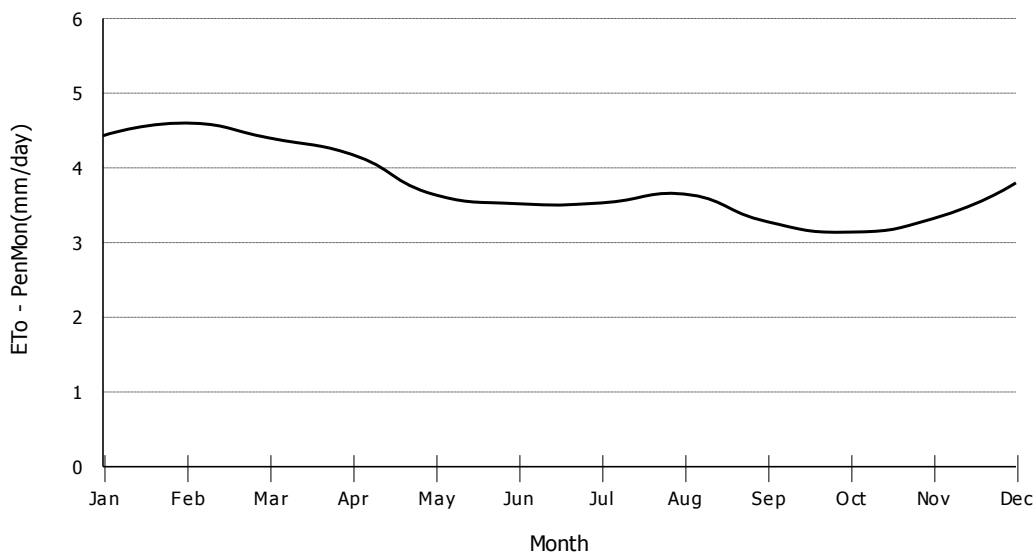
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: HAT YAI AIRPORT		(30 Yrs)	
Altitude : 27 meter		Coordinates		: 6 - 55 N.L.		100 - 26 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.0	31.0	80.0	173.0	5.9	16.9	3.80
February	22.1	32.7	77.0	169.0	5.9	17.8	4.22
March	22.9	34.2	76.0	147.0	6.0	18.7	4.50
April	23.7	34.6	78.0	107.0	4.8	16.8	4.06
May	24.0	33.8	81.0	107.0	3.7	14.7	3.57
June	23.8	33.5	80.0	125.0	3.7	14.3	3.56
July	23.5	33.2	79.0	133.0	3.7	14.4	3.62
August	23.5	33.1	79.0	147.0	3.7	14.9	3.75
September	23.4	32.5	82.0	125.0	3.6	14.8	3.56
October	23.3	31.8	85.0	98.0	3.6	14.4	3.28
November	23.2	30.4	87.0	107.0	3.5	13.5	2.99
December	22.6	29.7	85.0	142.0	3.5	13.1	2.94
Average	23.2	32.5	81.0	132.0	4.3	15.4	3.65

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



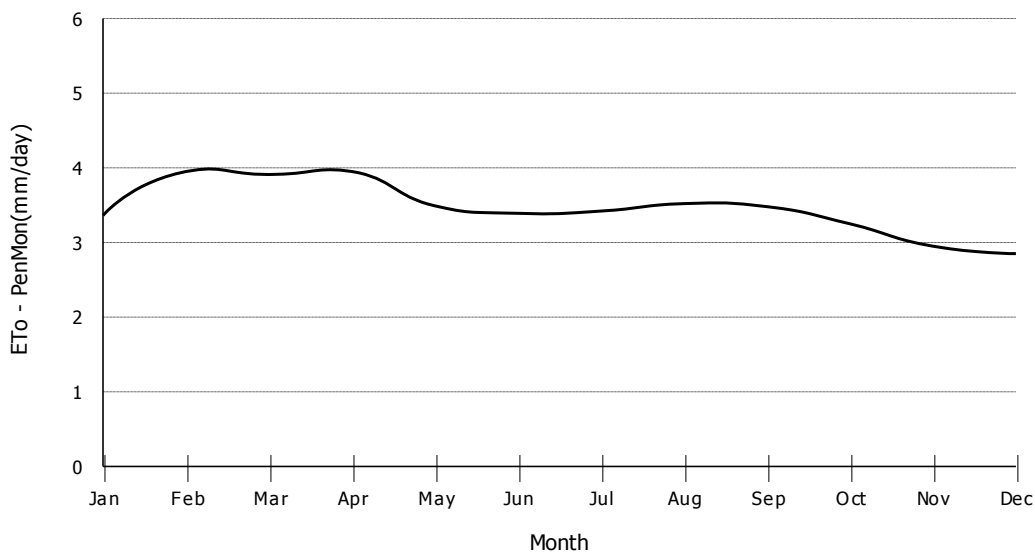
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: SATUN		(30 Yrs)	
Altitude : 4 meter		Coordinates		: 6 - 39 N.L.		100 - 05 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	23.4	32.7	70.0	173.0	6.4	17.6	4.43
February	23.1	34.2	69.0	133.0	6.5	18.7	4.60
March	23.6	34.7	73.0	93.0	6.0	18.7	4.40
April	24.1	34.1	79.0	53.0	6.1	18.8	4.18
May	24.5	33.0	82.0	44.0	4.9	16.5	3.64
June	24.1	32.4	82.0	49.0	4.9	16.1	3.52
July	23.8	32.0	82.0	53.0	4.9	16.2	3.53
August	23.8	31.8	83.0	67.0	4.9	16.7	3.65
September	23.6	31.4	84.0	58.0	3.6	14.9	3.28
October	23.6	31.5	85.0	44.0	3.6	14.4	3.14
November	23.5	31.6	82.0	67.0	4.7	15.3	3.32
December	23.4	31.5	76.0	133.0	5.9	16.5	3.80
Average	23.7	32.6	79.0	81.0	5.2	16.7	3.79

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



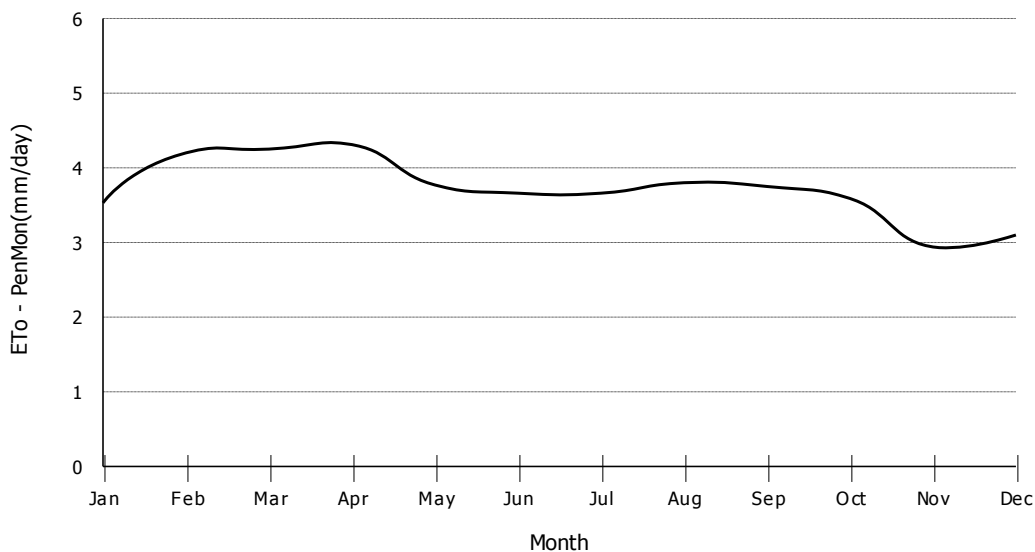
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: PATTANI AIRPORT		(30 Yrs)	
Altitude : 4 meter		Coordinates		: 6 - 47 N.L.		101 - 09 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.3	30.7	81.0	120.0	4.7	15.2	3.36
February	22.1	32.0	79.0	120.0	5.9	17.8	3.95
March	22.7	33.2	79.0	116.0	4.8	16.8	3.91
April	23.6	34.1	78.0	93.0	4.8	16.8	3.95
May	24.2	33.8	80.0	80.0	3.7	14.7	3.49
June	24.0	33.3	80.0	80.0	3.7	14.3	3.39
July	23.7	33.0	80.0	89.0	3.7	14.4	3.42
August	23.7	32.9	80.0	93.0	3.7	14.8	3.52
September	23.6	32.4	81.0	93.0	3.6	14.9	3.48
October	23.6	31.6	84.0	76.0	3.6	14.4	3.25
November	23.5	30.2	86.0	76.0	3.5	13.5	2.95
December	23.0	29.6	85.0	93.0	3.5	13.1	2.85
Average	23.3	32.2	81.0	94.0	4.1	15.1	3.46

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



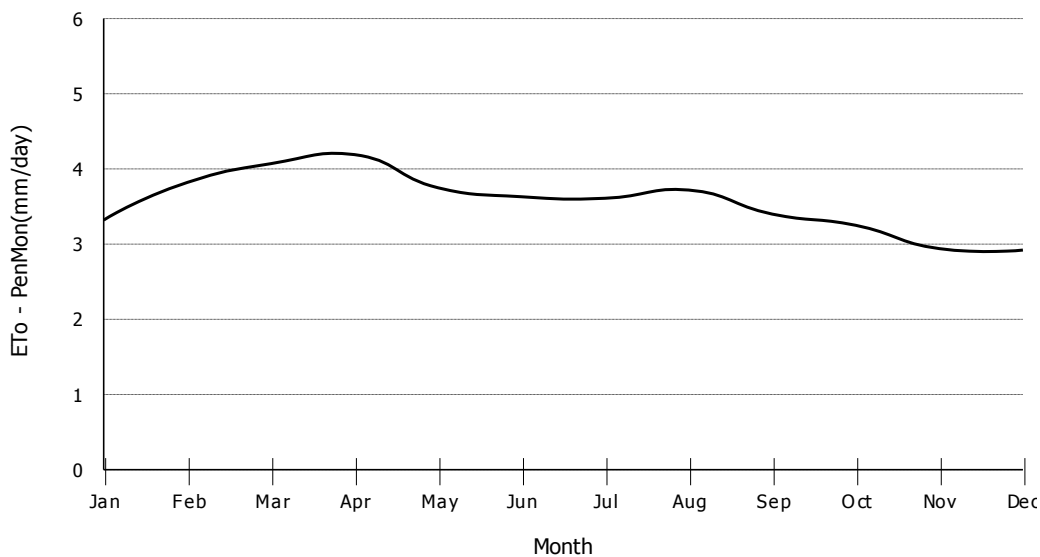
Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: YA LA AGROMET.		(5 Yrs)	
Altitude : 30 meter		Coordinates		: 6 - 31 N.L.		101 - 17 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.5	30.9	82.0	85.0	5.9	16.9	3.53
February	22.4	33.2	77.0	111.0	6.5	18.7	4.20
March	23.2	34.3	78.0	89.0	6.0	18.7	4.25
April	23.9	34.8	79.0	80.0	6.1	18.8	4.31
May	24.1	34.3	82.0	67.0	4.9	16.4	3.77
June	24.0	34.0	80.0	62.0	4.9	16.0	3.66
July	23.8	33.5	81.0	67.0	4.9	16.2	3.66
August	23.7	33.8	80.0	71.0	4.9	16.7	3.80
September	23.8	33.2	81.0	62.0	4.8	16.7	3.75
October	23.6	32.6	83.0	58.0	4.8	16.3	3.59
November	23.4	31.0	87.0	44.0	3.5	13.6	2.94
December	22.9	30.1	86.0	71.0	4.7	14.8	3.10
Average	23.4	33.0	81.0	72.0	5.2	16.7	3.71

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



Reference Evapotranspiration ETo according Penman - Monteith							
Country THAILAND		Meteo Station		: NARATHIWAT		(30 Yrs)	
Altitude : 4 meter		Coordinates		: 6 - 25 N.L.		101 - 49 E.L.	
Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ETo mm/day
January	22.9	29.8	82.0	125.0	4.7	15.2	3.32
February	22.9	30.8	81.0	111.0	5.9	17.8	3.82
March	23.5	31.9	81.0	102.0	6.0	18.7	4.07
April	24.1	33.2	80.0	85.0	6.1	18.8	4.19
May	24.3	33.4	81.0	76.0	4.9	16.4	3.75
June	23.9	33.3	80.0	67.0	4.9	16.0	3.63
July	23.6	32.8	81.0	67.0	4.9	16.2	3.61
August	23.6	32.9	81.0	67.0	4.9	16.7	3.72
September	23.5	32.5	82.0	71.0	3.6	14.9	3.40
October	23.6	31.7	83.0	67.0	3.6	14.4	3.25
November	23.4	30.1	87.0	76.0	3.5	13.6	2.94
December	23.2	29.3	85.0	129.0	3.5	13.2	2.92
Average	23.5	31.8	82.0	87.0	4.7	16.0	3.55

Climatic data of 30 yrs (1981 - 2010) : Meteorological Department , Bangkok, 2011



Penman-Monteith Equation and components

[] Recommended combination formula is :

$$ET_o = \frac{0.408 \Delta (R_n - G) + \gamma \frac{900}{T + 273} U_2 (e_s - e_a)}{\Delta + \gamma (1 + 0.34 U_2)}$$

where :

ET _o	:	reference crop evapotranspiration [mm d ⁻¹]
R _n	:	net radiation at crop surface [MJ m ⁻² d ⁻¹]
G	:	soil heat flux [MJ m ⁻² d ⁻¹]
T	:	average temperature [°C]
Δ	:	slope vapour pressure curve [kPa °C ⁻¹]
γ	:	psychrometric constant [kPa °C ⁻¹]
U ₂	:	windspeed measured at 2m height [m s ⁻¹]
e _s	:	saturation vapour pressure [kPa]
e _a	:	actual vapour pressure [kPa]
(e _s -e _a)	:	saturation vapour pressure deficit [kPa]
900	:	conversion factor

When no measured radiation data are available, the net radiation can be estimated as follows:

$$R_n = R_{ns} - R_{nl}$$

$$R_{ns} = 0.77 \left(0.25 + 0.50 \frac{n}{N} \right) R_a$$

$$R_{nl} = 2.45 \times 10^{-9} \left(0.9 \frac{n}{N} + 0.1 \right) (0.34 - 0.14 \sqrt{e_a}) (T_{kn}^4 + T_{kn}^4)$$

$$G = 0.14 (T_{month\ n} - T_{month\ n-1}) \approx 0$$

where :

R _n	:	net radiation [MJ m ⁻² d ⁻¹]
R _{ns}	:	net shortwave radiation [MJ m ⁻² d ⁻¹]
R _{nl}	:	net longwave radiation [MJ m ⁻² d ⁻¹]
R _a	:	extraterrestrial radiation [MJ m ⁻² d ⁻¹]
n/N	:	relative sunshine fraction
T _{kx}	:	maximum temperature [K]
T _{kn}	:	minimum temperature [K]
e _a	:	actual vapour pressure [kPa]
G	:	soil heat flux [MJ m ⁻² d ⁻¹]

Parameter Used in Equations :-

[] Latent Heat of Vaporization (λ)

$$\lambda = 2.501 - (2.361 \times 10^{-3})T$$

where : λ = latent heat of vaporization [MJ kg⁻¹]
T = air temperature [°C]

[] Slope Vapour Pressure Curve (Δ)

$$\Delta = \frac{4098e_s}{(T+237.3)^2}$$

where : Δ = slope vapour pressure curve [kPa °C⁻¹]
T = air temperature [°C]
e_s = saturation vapour pressure at temperature T [kPa]

[] Psychometric Constant (γ)

$$\gamma = 0.00163 \frac{P}{\lambda}$$

where : γ = psychometric constant [kPa °C⁻¹]
P = Atmospheric pressure [kPa]
 λ = latent heat of vaporization [MJ kg⁻¹]

[] Atmospheric Pressure (P)

$$P = P_o \left(\frac{T_{k_o} - \alpha (z - z_o)}{T_{k_o}} \right)^{\frac{g}{\alpha R}}$$

where: P = atmospheric pressure at elevation z [kPa]
P_o = atmospheric pressure at sea level [kPa]
Z = elevation [m]
Z_o = elevation at reference level [m]
g = gravitational acceleration = 9.8 [m s⁻²]
R = specific gas constant = 287 [J kg⁻¹ K⁻¹]
T_{ko} = reference temperature [K] at elev. Z_o ≈ 273+T [°C]
 α = constant lapse rate saturated air = 0.0065 [K m⁻¹]

Recommended :

$$P_o = 101.3 \text{ [kPa] at } Z_o = 0 \text{ m.}$$

$$T_{ko} = (T_{mean} + 273) \text{ [K] when } T \text{ in } ^\circ\text{C}$$

$$P = 101.3 \left(\frac{(T_{mean} + 273) - 0.0065Z}{T_{mean} + 273} \right)^{5.26}$$

[] Saturation Vapour Pressure at the Air Temperature ($e^\circ(T)$)

$$e^\circ(T) = 0.6108 \exp \left[\frac{17.27 T}{T + 237.3} \right]$$

where :

$$e^\circ(T) = \text{saturation vapour pressure at the air temperature } T \text{ [kPa]}$$

$$T = \text{air temperature } [^\circ\text{C}]$$

$$\exp[.] = 2.7183 \text{ (base of natural logarithm) raised to the power [..]}$$

[] Saturation Vapour Pressure (e_s)

$$e_s = \frac{e^\circ(T_{\max}) + e^\circ(T_{\min})}{2}$$

where :

$$e^\circ(T) = \text{saturation vapour pressure at the air temperature } T \text{ [kPa]}$$

$$T_{\max}, T_{\min} = \text{air temperature } [^\circ\text{C}]$$

[] Actual vapour pressure (e_a) derived from relative humidity data

For RH_{\max} and RH_{\min} :

$$e_a = \frac{e^\circ(T_{\min}) \frac{RH_{\max}}{100} + e^\circ(T_{\max}) \frac{RH_{\min}}{100}}{2}$$

For RH_{mean} :

$$e_a = \frac{RH_{\text{mean}}}{100} \left[\frac{e^\circ(T_{\max}) + e^\circ(T_{\min})}{2} \right]$$

where :

$$e_a = \text{actual vapour pressure [kPa]}$$

$$e^\circ(T_{\min}) = \text{saturation vapour pressure at daily minimum temperature [kPa]}$$

$e^{\circ}(T_{\max})$ = saturation vapour pressure at daily maximum temperature [kPa]
 RH_{\max} = maximum relative humidity [%]
 RH_{\min} = minimum relative humidity [%]

[] Vapour Pressure Deficit (VPD)

$$VPD = e_s - e_a$$

where :

VPD = vapour pressure deficit [kPa]

[] Soil Heat Flux (G)

$$G = 0.14 (T_{\text{month } n} - T_{\text{month } n-1}) \approx 0$$

where :

$T_{\text{month } n}$ = temperature [°C] on month n

$T_{\text{month } n-1}$ = temperature [°C] in preceding on month n-1

[] Extraterrestrial Radiation (R_a)

$$R_a = 37.6 d_r (\omega_s \sin \varphi \sin \delta + \cos \varphi \cos \delta \sin \omega_s)$$

where :

R_a = extraterrestrial radiation [MJ m⁻² d⁻¹]

d_r = relative distance Earth - Sun

δ = solar declination [rad]

φ = latitude [rad]

ω_s = sunset hour angle [rad]

$$d_r = 1 + 0.033 \cos (0.0172 J)$$

$$\delta = 0.409 \sin (0.0172 J - 1.39)$$

$$J = \text{integer} (30.42 M - 15.23)$$

where : J = number of the day in the year

M = month number (1 - 12)

[] Daylight Hours (N)

$$N = 7.64 \omega_s$$

where : N = maximum day light hours [h]

[] Windspeed (U₂)

$$U_2 = U_z \frac{4.87}{\ln(67.8z - 5.42)}$$

where :

- U_z = windspeed measurement at height z [m s⁻¹]
- U₂ = windspeed at 2 m height [m s⁻¹]
- z = height of wind vane or height of windspeed measurements [m]

[] Day Wind (U_{day})

$$U_{day} = \frac{2U(U_{day}/U_{night})}{(1 + U_{day}/U_{night})}$$

where :

- U_{day} = windspeed during day time (07.00 - 19.00 hrs) [m s⁻¹]
- U_{night} = windspeed during night time (19.00 - 07.00 hrs) [m s⁻¹]
- U = average windspeed over 24 hours [m s⁻¹]

For average conditions :

$$U_{day} / U_{night} \approx 2$$

$$U_{day} = 1.33U$$

$$U_{2day} = 1.33U_2$$

[] Conversions : Cloudiness --> n/N ratio

cloudiness oktas	0	1	2	3	4	5	6	7	8
n/N ratio	.95	.85	.75	.65	.55	.45	.30	.15	-

cloudiness tenths	0	1	2	3	4	5	6	7	8	9	10
n/N ratio	.95	.85	.80	.75	.65	.55	.50	.40	.30	.15	-

[] Conversions SI - C.G.S. system

Pressure : 1 mbar = 0.1 kPa (kiloPascal)

Radiation : 1 cal cm⁻² d⁻¹ = 0.041868 MJ m⁻² d⁻¹
 1 MJ m⁻² d⁻¹ = 23.884 cal cm⁻² d⁻¹
 = 0.408 mm d⁻¹
 1 mm d⁻¹ = 2.45 MJ m⁻² d⁻¹
 = 58.6 cal cm⁻² d⁻¹
 1 W m⁻¹ = 0.0864 MJ m⁻² d⁻¹
 = 2.064 cal cm⁻² d⁻¹

Velocity : 1 knot = 0.515 m s⁻¹
 = 1.85 km hr⁻¹
 = 44.5 km d⁻¹

Degree : 1 Radian = $\pi / 180$ Decimaldegrees

คณะผู้จัดทำ

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ฝ่ายเผยแพร่การใช้น้ำชลประทาน
ส่วนการใช้น้ำชลประทาน
สำนักอุทกวิทยาและบริหารน้ำ
กรมชลประทาน



ค่านิยมกรมชลประทาน Core Values

W เก่งงาน เก่งคิด
Work Smart

A รับผิดชอบงาน
Accountability

T ร่วมมือ ร่วมประสาน
Teamwork & Networking

E เชี่ยวชาญงานที่ทำ
Expertise

R นำประโยชน์สู่ประชาชน
Responsiveness