

Proposed by W. Van der Kevie, 1969  
 Revised by:  
 1. C. Changprai, 1987  
 2. S. Udomsri, 2004

## MAHA PHOT SERIES

**Field Symbol: Ma**

**Distribution:** Occupies moderate extent in the southeastern part of the Central Plain.

**Setting:** Maha Phot soils are formed from riverine alluvium mixed with marine sediments under brackish water influence. They occur in former tidal flats or alluvium plain which grade down to marine deposits and now free of tidal flooding which have been in cultivation for some time. Relief is flat. Slopes are about 0-1%. Elevation ranges from 2-4 m above sea level. The climate is Tropical Savanna (Köppen 'Aw'). Annual precipitation ranges from 1,000 mm to 1,400 mm. Mean annual temperature is 27°C.

**Drainage, Permeability and Surface Runoff:** Poorly drained. Runoff and permeability are slow. Deep surface flooding to depths of between 80 cm and 2 m from river water or rain. Sometimes this area flooded by irrigation. The groundwater level falls to about 150 cm. During the peak of the dry season and the soil cracks.

**Vegetation and Land Use:** Mainly used for broadcast rice cultivation.

**Characteristic Profile Features:** Maha Phot series is a member of the Very-fine, mixed, active, acid, isohyperthermic Vertic Endoaquepts. They are deep soils with extremely to very strongly acid reaction in the A and B horizon, and strongly to medium acid reaction in the C horizon. They are characterized by a very dark gray to black clay A horizon overlying a grayish brown or brown clay B horizon, which in turn overlies a reduced dark gray clay C horizon. These soils are mottled throughout with strong brown coatings in root channels and pores in the A horizon, and weak red, red and brownish yellow mottles in the B horizon. Yellow jarosite mottles occur in the deeper subsoil, usually below 1 m from the soil surface. Pressure faces and slickensides occur in the B horizon and the soil cracks at the surface when dry.

**Typifying Pedon:** Profile code number is SE-12/60

**Location:** approx. 200 meter west of Prachinburi-Si Mahosot road at about km 36, Ban Khok Pip, Tambon Khok Pip, Amphoe Si Mahosot Changwat Prachinburi.

**Sheet Name:** Amphoe Khok Pip

**Sheet No.:** 5236 I

**Coordinate:** 597385

**Elevation:** 15 m (MSL)

**Relief:** level to nearly level

**Slope:** 0-1%

**Physiography:** former tidal flats or alluvium plain

**Parent material:** marine sediments mixed with riverine alluvium under brackish water influence

**Drainage:** well drained

**Permeability:** slow

**Runoff:** slow

**Ground water depth:** 1.7 m

**Flooding depth:** 50-100 cm

**Duration:** 4-5 month

**Frequency:** every year

**Annual rainfall:** 2,009.3 mm

**Mean temp:** 28.4°C

**Climate type:** Tropical Savannah

**Natural vegetation and/or land use:** paddy field

**Other:**

**Described by:** Pramote Hemsrichart and Satira Udomsri

**Date:** 17 March, 1997

**Revised by:** S. Udomsri

<b>Horizon</b>	<b>Depth (cm)</b>	<b>Description</b>
Apg	0-18	Black (10YR2/1) silty clay; many medium distinct yellowish brown (10YR5/6) mottles; moderate medium and coarse angular blocky within medium and coarse prismatic structure; very firm, very sticky, very plastic; many very fine and common fine roots; some ash along crack surfaces; strongly acid (field pH 5.5); clear, smooth boundary.

Bssg1	18-61/63	Mixed very dark gray (10YR3/1) and dark gray (10YR4/1) silty clay; common fine prominent red (2.5YR4/8) and distinct yellowish brown (10YR5/6) mottles; moderate medium and coarse angular blocky within medium and coarse prismatic structure; firm, very sticky, very plastic; common very fine roots; some iron pipes; many slickensides and pressure faces; very strongly acid (field pH 4.5); clear, wavy boundary.
Bssg2	61/63-106/110	Light brownish gray (10YR6/2) silty clay; common fine and medium distinct brownishyellow (10YR6/6-8) and many coarse prominent red (2.5YR4/6) mottles; weak medium and coarse angular blocky structure; firm, very sticky, very plastic; many slickensides and pressure faces; some iron pipes, many organic matter, color is very dark gray (10YR3/1), coated on ped faces; very strongly acid (field pH 4.5); clear, wavy boundary.
Bssjg	106/110-154	Grayish brown (10YR5/2) silty clay; common fine distinct pale yellow (2.5Y7/4) mottles; weak medium and coarse prismatic breaking to moderate and coarse angular blocky structure; firm, very sticky, very plastic; some iron pipes; some organic matter, color is very dark gray (10YR3/1), coated on slickensides surfaces; few decay roots; many slickensides and pressure faces; common jarosite; very strongly acid (field pH 4.5); clear, smooth boundary.
Cg	154-180 <sup>+</sup>	Dark gray (5Y4/1) half ripe silty clay; massive; very sticky, very plastic; slightly acid (field pH 6.5).

**Type Location:** Name of Amphoe, Amphoe Si Maha Phot Changwat Prachinburi.

#### Range of Profile Features:

The A horizon is from 20 to 40 cm thick, has 10YR hue, values of 1 or 2 and chromas of 1 or 2. Structure is weak coarse blocky and moderate crumb in the uppermost layer. Field pH values range from 4.5 to 5.5.

The B horizon has 10YR and 7.5YR hues, values of 4 or 5 and chroma of 2 or 1. Structure is moderate medium, breaking to fine blocky, commonly arranged in weak prisms. Field pH values range from 4.0 to 4.5.

The C horizon is a dark gray or grayish brown reduced clay which may have few brown mottles in the upper layers and is half ripe. Field pH values are 4.5 rising to 6.0 or more below 2 m from the soil surface.

#### Similar Soil Series:

Ayutthaya series (Ay): has a similar profile, but contains gypsum crystals in the B and lower A horizons.

Rangsit series (Rs): has an acid soils with yellow jarosite mottles between 50-100 cm of the soil surface.

Ongkharak series (Ok): has an acid soils with yellow jarosite mottles within 50 cm of the soil surface.

Sena series (Se): has an acid soils with yellow jarosite mottles between 50-100 cm of the soil surface and also contains gypsum crystals in the B and lower A horizons.

**Principal Associated Soils:** These include Rangsit, Thanyaburi and Ongkharak series occupying similar positions on former tidal flats.

**ANALYSIS RESULTS**
**Profile code No. : SE-12/80**
**(oven dry basis)**
**Soil series : Maha Phot (Ma)**

Lab No.	Depth (cm)	Horizon	Particle size distribution analysis (% by weight )								Texture		pH		CaCO <sub>3</sub> %	P, mg kg <sup>-1</sup> Bray 2	K, mg kg <sup>-1</sup> NH <sub>4</sub> OAc
			USDA grading			Sand-fraction grading					Lab	Field	1:1 water	1:1 KCl			
			sand	silt	clay	vc	c	m	f	vf	result	estim <sup>n</sup>					
406886	0-18	Apg	1.0	33.5	65.5	0.0	0.0	0.0	0.0	1.0	c	sic	4.4	3.4		13.1	117
406887	18-61/63	Bssg1	3.5	31.5	65.0	0.0	0.1	0.4	1.4	1.6	c	sic	4.0	3.1		3.2	156
406888	1/63-106/11	Bssg2	2.9	33.7	63.4	0.1	0.2	0.4	1.1	1.1	c	sic	3.9	2.9		1.0	195
406889	06/110-15	Bssjg	1.4	33.0	65.6	0.0	0.0	0.0	0.0	1.4	c	sic	3.7	3.2		3.6	312
406890	154-180+	Cg	0.8	30.3	68.9	0.0	0.0	0.0	0.0	0.8	c	sic	4.0	3.7		43.4	429

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol <sub>(+)</sub> kg <sup>-1</sup> )								Base satur <sup>n</sup> (%)	ECEC cmol <sub>(+)</sub> kg <sup>-1</sup> (B+D)	Al KCl extr. cmol <sub>(+)</sub> kg <sup>-1</sup> (B+D)	Electrical conductivity dS m <sup>-1</sup>		
				Ca	Mg	K	Na	SUM cations (B)	Extr. (A)	SUM (B+A)	CEC NH <sub>4</sub> OAc (C)	CEC 100g Clay					
0-18	3.6	3.50		8.10	4.70	0.30	0.70	13.80	25.10	38.90	30.00	45.8	46	35	3.94	17.74	
18-61/63	3.9	1.22		4.20	4.30	0.40	1.50	10.40	27.50	37.90	30.40	46.8	34	27	15.48	25.88	
1/63-106/1	3.6	0.46		1.50	5.20	0.50	1.70	8.90	21.30	30.20	24.20	38.2	37	29	12.54	21.44	
06/110-15	3.5	0.52		3.10	9.80	0.80	3.40	17.10	14.90	32.00	24.70	37.7	69	53	7.99	25.09	
154-180+	3.9	3.11		10.60	16.30	1.10	4.70	32.70	24.60	57.30	31.10	45.1	100	57	8.65	41.35	