

Proposed by:
T. Charasaiya and J.D. Cowie, 1969
Revised by:
1. N. Chorphaka, 1988
2. A. Potichan, 2004

MAE SAI SERIES

Field Symbol: Ms

Distribution: Moderate extent in the North and Central Highlands.

Setting: Mae Sai soils are formed from breach deposits on semi-recent terraces and lower part of natural levees. Relief is level or nearly level with common termite mounds. The climate is Tropical Savanna (Koppen `Aw'). The average annual precipitation ranges from 1,100 to 2,000 mm.

Drainage, Permeability and Runoff: Somewhat poorly drained. Permeability and surface runoff are slow. Soils are usually flooded by impounded rainwater during the wet season but dry out deeply in the dry season. Flooding depth rarely exceeds 30 cm.

Vegetation and Land Use: The soils are mainly used for transplanted rice cultivation with some areas under irrigated crops such as groundnuts, tobacco and soybeans during the dry season.

Characteristic Profile Features: Mae Sai series is a member of the fine-silty, mixed, semiactive, isohyperthermic Aeric Endoaqualfs. They are very deep soils and characterized by a dark gray or dark grayish brown silt loam or silty clay loam A horizon, overlying a grayish brown to brown silty clay loam grading to gray silty clay or clay argillic B horizon with distinct strong brown and yellowish brown mottles occurring throughout. Reaction is moderately acid to alkaline, increasing with depth.

Typifying Pedon: Profile code no. is N-39/66 (moist color unless otherwise stated).

Location: At km17 on Phrae-Rong Kwang road, Ban Mae Khummee, Tambon Mae Khummee, Amphoe Rong Kwang, Changwat Phrae.

Sheet Name: Amphoe Rong Kwang

Sheet No.: 5045 I

Coordinate: -

Elevation: 160-180 m (MSL)

Relief: level to nearly level

Slope: 0-1%

Physiography: semi-recent terraces

Parent material: alluvium

Drainage: somewhat poorly drained

Permeability: slow

Runoff: slow

Ground water depth: >2 m

Flooding depth: -

Duration: -

Frequency: -

Annual rainfall: 1,095.5 mm

Mean temp.: 26.2 °C

Climate type: Tropical Savannah (Aw)

Natural vegetation or land use: paddy rice, in dry seasons, tomato, soybean, tobacco in dry season under irrigation

Described by: P. Hemsrichart, N. Chorphaka and C. Jongpakdee

Date: 20 April, 1979

Revised by: Aniruth Potichan

Date: 24 May, 2004

Horizon	Depth (cm)	Description
Ap	0-17	Grayish brown (10YR5/2) silty clay loam; common fine distinct mottles of yellowish red (5YR5/6) along root zone; moderate medium and coarse subangular blocky structure; hard, friable, sticky and plastic; many very fine roots; slightly acid (field pH 6.5); clear and smooth boundary.
Btg1	17-49	Brown (7.5YR5/2) silty clay loam; common fine and medium distinct mottles of yellowish brown (10YR5/4); strong coarse prismatic breaking into moderate medium and coarse subangular blocky structure; hark, firm, sticky and plastic; broken moderately thick cutans on ped faces and in pores; few very fine roots; common fine soft manganese oxide nodules; moderately alkaline (field pH 8.0); gradual and smooth boundary.

Btg2	49-94	Brown (7.5YR5/4) coated by brown (7.5YR5/2) silty clay loam; strong medium and coarse subangular blocky structure; firm, sticky and plastic; continuous thick cutans on ped faces and in pores; few very fine and fine roots; common fine black spots of MnO ₂ ; slightly alkaline (field pH 7.5); gradual and smooth boundary.
Btg3	94-134	Brown (7.5YR5/4) coated by reddish gray (5YR6/2) silty clay loam; moderate medium and coarse prismatic breaking into strong medium and coarse subangular blocky structure; firm, sticky and plastic; continuous thick cutans on ped faces and in pores; few very fine roots; common fine black spots of MnO ₂ ; slightly alkaline (field pH 7.5); gradual and smooth boundary.
Btg4	134-180+	Brown (7.5YR5/4) coated by reddish gray (5YR5/2) silty clay; common fine to medium prominent red (2.5YR5/8), few fine distinct dark yellowish brown (10YR4/8) and common fine distinct yellowish red (5YR5/6) mottles; strong medium and coarse subangular blocky structure; firm; very sticky and plastic; continuous thick cutans on ped faces and pores; few very fine roots; common fine black spots of MnO ₂ ; few fine and medium brick fragments; slightly alkaline (field pH 7.5).

Type Location:

Mae Sai series was named for Amphoe Mae Sai, Changwat Chiang Rai near Ban Wiang Hom where this soil was first found and described.

Range of Profile Features:

The A horizon is from 10 to 30 cm thick and has 10YR hues or 7.5YR values of 4 through 6 and chromas of 1 or 2 with loam, silt loam, or silty clay loam textures. The structure of the A horizon is weak to moderate fine and medium blocky and pH values range from 5.5 to 6.5.

The argillic B horizon has silty clay loam grading to silty clay textures in the lower B horizon. However, lighter texture like silt loam, sandy loam or loamy sand may occur in the lower horizons especially in the areas contiguous to the levees or the thinner deposition of finer materials. Soil color is hue of 10YR, or 7.5YR value of 4 or 5 and chromas of 2 to 4 in the upper B horizon and has the lower chroma of 2 or less in the deeper subsoil. Structure is moderate medium to coarse blocky. Iron-Manganese nodules are commonly found in the deeper subsoil. The pH values range from 6.5 to 8.0.

Fine mica flakes are common throughout the profile.

Similar Soils Series:

Hang Dong series (Hd): predominantly gray color in the B horizon (chromas 1), poorly drained and heavier texture.

Nakhon Pathom series (Np): has a dark grayish brown matrix color in the B horizon and heavier texture.

Mae Tha series (Mta): has a similar profile but redder color in the argillic B horizon (hues of 5YR).

Principal Associated Soils:

These include Hang Dong and Kamphaeng Phet series. Kamphaeng Phet series are generally found on higher topographical sites. Hang Dong occupy lower positions.

ANALYSIS RESULTS

Profile code no.: N-39/66

(oven dry basis)

Soil series: Mae Sai (Ms)

Lab No.	Depth (cm)	Horizon	Particle size distribution analysis (% by weight)								Texture		pH		CaCO ₃ %	P, mg kg ⁻¹ Bray 2	K, mg kg ⁻¹ NH ₄ OAc
			USDA grading			Sand-fraction grading					Lab	Field	1:1	1:1			
			sand	silt	clay	vc	c	m	f	vf	result	estim ⁿ	water	KCl			
2-9899	0-17	Ap	1.0	63.3	35.7	0.3	0.0	0.0	0.3	0.4	sicl	sicl	6.5	5.2		9.8	43
2-9900	17-49	Bt1	6.6	60.1	33.3	0.6	0.7	1.6	2.7	1.0	sicl	sicl	6.5	6.1		4.8	60
2-9901	49-94	Bt2	7.5	59.3	33.2	0.3	0.7	2.0	2.8	1.4	sicl	sicl	6.4	5.5		4.6	46
2-9902	94-134	Bt3	8.5	53.2	38.3	0.0	0.4	2.6	3.3	2.2	sicl	sicl	6.1	5.4		7.2	49
2-9903	134-180	Bt4	6.4	48.7	44.9	0.2	0.2	1.3	2.6	2.1	sic	sic	6.1	5.3		5.1	55

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol ₍₊₎ kg ⁻¹)								Base satur ⁿ (%)		ECEC cmol ₍₊₎ kg ⁻¹ (B+D)	Al KCl extr. cmol ₍₊₎ kg ⁻¹ (D)	Electrical conduct ^y (ECx10 ⁶) dS m ⁻¹	
				Ca	Mg	K	Na	SUM cations (B)	Extr. acidity (A)	SUM (B+A)	CEC NH ₄ OAc (C)	CEC 100g Clay	B/Cx100				(Bx100)/(B+A)
0-17	3.9	1.04		15.30	4.90	0.10	0.30	20.60	6.30	26.90	22.0	61.6	94	77			0.27
17-49	2.3	0.93		11.20	2.30	0.10	0.40	14.00	3.10	17.10	13.9	41.7	100	82			0.33
49-94	2.6	0.50		9.20	3.00	0.10	0.50	12.80	4.70	17.50	13.3	40.1	96	73			0.30
94-134	4.4	0.66		8.50	4.20	0.10	0.60	13.40	5.20	18.60	14.3	37.3	94	72			0.29
134-180	2.4	0.38		6.40	5.80	0.10	0.70	13.00	2.40	15.40	13.3	29.6	98	84			0.29

Surveyor: P. Hemsrichart, N. Chorphaka and C. Jongpakdee

Date: 20 April, 1979