

Proposed by: L. Moncharoen, 1964
Revised by:
1. C. Changprai, 1987
2. S. Udomsri, 2004

CHUM SAENG SERIES

Field Symbol: Cs

Distribution: Occupies small extent in the northern Central Plain and the Central Highlands of Thailand.

Setting: Chum Saeng soils are formed from recent alluvium and occur in the valley bottoms of tributary streams or alluvial plains. Relief is flat or nearly flat. Slopes are less than 2 %. 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 and Permeability and Surface Runoff: Poorly drained. Runoff and permeability are slow. These soils are flooded by impounded rainwater or river up to 40-50 cm for four to five months during the rainy season. Sometimes this area flooded by irrigation. Groundwater level falling below 1.5 m during the peak of the dry season.

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

Characteristic Profile Features: Chum Saeng series is a member of the Fine, mixed, semiactive, acid, isohyperthermic Aeric (Plinthic) Endoaquepts. They are very deep, very strongly to strongly acid soils and are characterized by a dark, predominantly brownish, silty clay loam, clay loam or clay A horizon overlying a clay or silty clay B horizon with brown colours in the upper layer and pinkish gray colours in the lower layers. These soils are mottled throughout with brown or yellowish brown coatings along root channels in the A horizon, fine to medium red and dark brown mottles and some plinthite in the B horizon.

Typifying Pedon: Profile code number is Code NC-48/78

Location: Ban Leam Nok Krathung, Tambon Phikun, Amphoe Chum Saeng Changwat Nakhon Sawan.

Sheet Name: Amphoe Chum Saeng

Sheet No.: 5040 I

Coordinate: 455558

Elevation: 22 m (MSL)

Relief: level to nearly level

Slope: 0-1%

Physiography: alluvium plain

Parent material: riverine alluvium

Drainage: poorly drained

Permeability: slow

Runoff: slow

Ground water depth: >1.5 m

Flooding depth: - cm

Duration: rainy season

Frequency: every year

Annual rainfall: 1,119.0 mm

Mean temp: 28.3 °C

Climate type: Tropical Savannah

Natural vegetation and/or land use:

Other:

Described by: N. Chorphaka and S. Jungnijirand

Date: 11 March 1998

Revised by: S. Udomsri

Horizon	Depth (cm)	Description
Apg	0-14	Dark gray (10YR4/1) silty clay loam; many medium and coarse distinct strong brown (7.5YR4/6) mottles; moderate fine and medium subangular blocky structure; hard, friable, sticky, plastic; many very fine roots; few fine iron stone nodules; strongly acid (field pH 5.5); clear, smooth boundary
B _{Ag}	14-29	Dark brown (7.5YR4/2-4) clay; many medium and coarse distinct strong brown (7.5YR5/6) mottles; moderate medium subangular blocky structure, hard, firm, sticky, plastic, few very fine roots; common fine and medium soft and hard iron stone nodules; moderately acid (field pH 6.0); clear, smooth boundary.

Bg1	29-55	Light brownish gray (10YR6/2) silty clay; common medium prominent yellowish red (5YR5/6) and red (10R4/6) mottles; moderate medium and coarse subangular blocky structure; firm, sticky, plastic, common fine and medium soft and hard iron stone nodules; strongly acid (field pH 5.5); gradual, smooth boundary.
Bg2	55-84	Pinkish gray (7.5YR6/2) silty clay ; common medium prominent red (10R4/8) mottles; moderate medium and coarse subangular blocky structure, firm, sticky, plastic; very strongly acid (field pH 5.0); gradual, smooth boundary.
Bg3	84-122	Pinkish gray (7.5YR6/2) clay; many medium prominent red (10R4/8) mottles; moderate medium and coarse subangular blocky structure; firm, sticky, plastic; very strongly acid (field pH 5.0); gradual, smooth boundary.
Bg4	122-155 ⁺	Pinkish gray (7.5YR6/2) clay; common fine and medium prominent red (10R4/8&2.5YR4/6) mottles; weak coarse subangular blocky structure; firm, sticky, plastic; very strongly acid (field pH 4.5).

Remark: from 55-122 cm deep, they were coated along cracks with brown color (7.5YR5/2).

Type Location: Name of Amphoe, Amphoe Chum Saeng Changwat Nakhon Sawan

Range of Profile Features:

The A horizon is from 10 to 20 cm thick, has 10YR and 7.5YR hues, values of 4 or 5 and chromas of 1 through 4. Structure is moderate coarse and medium blocky and field pH ranges from 5.0 to 6.0.

The B horizon has predominantly brown, 10YR 5/3 or 7.5YR 5/2 to 5/4 colours in the upper layers and pinkish gray, 7.5YR 6/2 or 7/2, in the lower layers. Structure is moderate blocky and field pH values range form 4.5 to 5.5. Few to common manganese or iron/manganese nodules may occur.

Similar Soil Series:

Ratchaburi series (Rb): has higher pH values in subsoils and without plinthite and red mottles.

Manorom series (Mn): has an argillic B horizon and a member of fine family.

Principal Associated Soils: These include the lower Ratchaburi series and higher Manorom series in the Central Plain, and Lom Sak, Pa Sak and Chaliang Lap series occupying similar positions in the Central Highlands.

ANALYSIS RESULTS

Profile code No. NC-48/78

(oven dry basis)

Soil series : Chum Saeng (Cs)

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 ¹	water	KCl			
P41-227	0-14	Apg	17.5	46.9	35.6	3.3	0.7	0.7	2.5	10.3	sicl	sicl	5.0	4.7		7.1	
P41-228	14-29	BAg	17.2	39.3	43.5	3.6	0.7	0.9	3.3	8.7	sic	c	5.2	4.9		3.4	
P41-229	29-55	Bg1	10.0	34.2	55.8	0.3	0.4	0.5	2.4	6.4	c	sic	5.0	4.5		3.5	
P41-230	55-84	Bg2	10.9	32.7	56.4	0.5	0.4	0.7	2.6	6.7	c	sic	4.7	4.1		2.7	
P41-231	84-122	Bg3	13.8	39.3	46.9	0.0	0.5	0.9	2.9	9.5	sic	c	4.7	4.0		1.5	
P41-232	122-155+	Bg4	10.4	43.7	45.9	0.2	0.2	0.5	2.0	7.5	sic	c	4.7	4.0		1.1	

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol _(c) kg ⁻¹)										Base satur ¹ (%)		ECEC cmol _(c) kg ⁻¹ (B+D)	Al KCl extr. cmol _(c) kg ⁻¹ (D)	Electrical conduct ² (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)			
0-14	2.9	1.19		6.80	1.20	0.10	1.60	9.70	7.60	17.30	13.30	37.4	73	56	9.70			
14-29	3.1	0.64		6.50	0.80	0.10	0.80	8.20	6.10	14.30	12.60	29.0	65	57				
29-55	4.0	0.32		8.90	0.40	0.10	0.90	10.30	8.10	18.40	14.70	26.3	70	56				
55-84	3.3	0.20		6.00	0.20	0.10	0.70	7.00	9.90	16.90	14.20	25.2	49	41				
84-122	3.5	0.12		3.10	0.20	0.10	0.60	4.00	10.10	14.10	11.30	24.1	35	28				
122-155+	2.8	0.06		2.60	0.30	0.10	0.50	3.50	9.70	13.20	11.50	25.1	30	27				