

Proposed by F.R. Moormann, 1964
Revised by:
1. C. Changprai, 1987
2. S. Udomsri, 2004

SAMUT PRAKAN SERIES

Field Symbol: Sm

Distribution: Occupies small to moderate extent in the Coastal areas of Thailand.

Setting: Samut Prakan soils are formed from marine sediments mixed with riverine alluvium and occur on former tidal flats which grade down to marine deposits within 1 m and occur on more inland parts of the present tidal swamps. Relief is flat. Slopes are 1% or less. Elevation ranges from 1-2 m above sea level. The climate are both Tropical Savanna (Köppen 'Aw') and Tropical Monsoon (Köppen 'Am'). Annual precipitation ranges from 1,000 mm to 3,000 mm. Mean annual temperature is 27°C.

Drainage, Permeability and Surface Runoff: Poorly drained. Permeability and runoff are slow. These soils may be periodically flooded by sea water, but in the main, they are flooded by impounded rainwater to depths of up to 50 cm for four to five months during the rainy season. Groundwater level falls below 1 m during the peak of the dry season.

Vegetation and Land Use: Mainly used for the cultivation of broadcast rice. Rushes and sedges occur in places where the soils are too salty for cultivation.

Characteristic Profile Features: Samut Prakan series is a member of the Fine, mixed, nonacid, isohyperthermic Fluvaquentic Endoaquepts. They are moderately deep, slightly acid to neutral over mildly alkaline soils and are characterized by a dark gray, dark grayish brown or grayish brown clay A horizon, overlying a gray or olive gray clay B horizon which in turn overlies a gray or greenish gray C horizon which occurs below 50 cm and within 125 cm of the soil surface. The A and B horizon contain many strong brown, olive brown and yellowish red mottles mainly as coatings along root channels, pores and ped faces. Few olive and grayish green mottles occur in the C horizon.

Typifying Pedon: Profile code number is 15

Location: 1 km west of Ban Don Mai, Ban Don Mai, Tambon Hat Chao Samran, Amphoe Mueang Changwat Phetchaburi.

Sheet Name: Ban Bang Khun Sai

SheetNo.: 5035 III

Coordinate: 387117

Elevation: 0.5-1.0 m MSL.

Relief: level to nearly level

Slope: 1% (N-S)

Physiography: former tidal flats.

Parent material: marine sediments mixed with riverine alluvium

Drainage: poorly drained

Permeability: slow

Runoff: slow

Ground water depth: >1.25 m

Flooding depth: - cm

Duration: - month

Frequency: every year

Annual rainfall: 1,044.1 mm

Mean temp: 27.6 °C

Climate type: Tropical Savannah

Natural vegetation and/or land use: paddy field

Other:-

Described by: C.Navanugraha, P.Vijarnsorn and
W.Sirichauychoo

Date: 27 May, 1983

Revised by: S. Udomsri

Horizon	Depth (cm)	Description
Apg	0-25	Gray (10YR5/1) and dark gray (10YR4/1) clay; weak fine and medium prismatic structure; hard, very firm, sticky, plastic; common very fine and fine roots; slightly acid (field pH 6.5); clear, smooth boundary.
Bg1	25-46	Gray (5Y5/1) clay; many fine discinct dark gray (2.5Y4/1) and olive brown (2.5Y4/4) mottles; moderate fine and medium angular and subangular blocky structure; firm, sticky, plastic; few very fine roots;

		many pressure faces in cracking channels and black color coated on some cracking channels; moderately alkaline (field pH 8.0); clear, smooth boundary.
Bg2	46-75	Gray to dark grayish brown (2.5Y5/1-2) clay; common fine distinct olive brown (2.5Y4/4) and brown (10YR4/3) mottles; moderate fine and medium angular and subangular blocky structure; firm, sticky, plastic; few fine and medium roots black color coated in cracking channel; moderately alkaline (field pH 8.0); clear, smooth boundary.
Cg1	75-105	Olive gray to light olive gray (5Y5-6/2) half ripe clay; massive; very sticky, very plastic; common fine soft iron nodules and few decay roots and some pieces of wood; moderately alkaline (field pH 8.0); abrupt, smooth boundary.
Cg2	105-140	Gray (5Y5/1) sand; many fine prominent dark yellowish brown (10YR4/4) mottles; single grain; nonsticky, nonplastic; few fine soft iron pipes; moderately alkaline (field pH 8.0); clear, smooth boundary.
Cg3	140-165	Dark greenish gray (5BG4/1) sandy loam; single grain; slightly sticky, nonplastic; few weathered shell fragments; moderately alkaline (field pH 8.0)
Cg4	165-200	Dark greenish gray (5BG4/1) unripe clay; massive; slightly sticky, slightly plastic; moderately alkaline (field pH 8.0)

Remark: Pedon No. 15 from *Characteristics and Potentials of the Coastal Saline Soils in the Central Plain of Thailand*, Charlie Navanugraha, M.Sc. Thesis, Kasetsart University, Bangkok, Thailand

Type Location: Name of Changwat Changwat Samut Prakan

Range of Profile Features:

The A horizon is from 15 to 30 cm thick, has hues of 10YR , 2.5YR and 5Y, values of 3 to 5 and chromas of 2 or 1. Structure is weak to moderate coarse blocky and may be fluffy in the upper few centimeter if not cultivated. Field pH values range from 6.0 to 8.0.

The B horizon has 2.5Y or 5Y hues, values of 4 or 5 and chromas of 2 or less. Structure is very weak coarse prismatic, breaking to moderate coarse and medium blocky. Field pH values range from 6.0 to 8.0.

The C horizon has 5Y or 5GY hues, values of 4 or 5 and chroma of 1. Sandy layers and shell fragments may occur.

Similar Soil Series:

Bangkok series (Bk): has a similar profile, but free from sea water and the reduced gray or greenish gray C horizon occurs below 125 cm from the soil surface.

Tha Chin series (Tc): flood by sea water for some time during the year, structureless and n-value > 0.7

Principal Associated Soils: These include Tha Chin series occupying slightly lower positions in the tidal swamps and Bangkok series which occurs more inland on former tidal flats.

ANALYSIS RESULTS

Profile code No. : 15

(oven dry basis)

Soil series : Samut Prakarn (Sm)

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			
	0-25	Apg	2.6	36.1	61.4						c	c	6.7	5.9		65.2	682
	25-46	Bg1	0.7	45.3	54.0						sic	c	7.7	6.9		175.0	823
	46-75	Bg2	0.2	52.2	47.6						sic	c	7.8	7.0		190.0	847
	75-105	Cg1	2.2	42.1	55.7						sic	c	8.0	7.1		295.0	1,111
	105-140	Cg2	91.0	4.1	4.9						s	s	8.3	7.5		38.2	147
	140-165	Cg3	71.1	23.1	5.9						sl	sl	7.7	7.4		83.0	781
	165-200	Cg4	20.6	58.5	20.9						sil	c	7.5	7.2		247.0	1,359

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol ₍₊₎ kg ⁻¹)										Base satur ¹ (%)		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)				
				0-25		1.51	0.06	8.60	16.60	1.70	7.40	34.30	7.28	41.58	29.10			
25-46		0.22	0.06	14.10	20.50	2.20	12.40	49.20	3.36	52.56	33.30	61.6	100	94			3.42	
46-75		0.20	0.05	12.80	16.90	2.20	14.00	45.90	2.94	48.84	28.30	59.4	100	94			3.83	
75-105		0.30	0.06	19.60	16.60	2.70	17.40	56.30	2.57	58.87	30.50	54.8	100	96			5.61	
105-140		0.05	0.01	9.40	2.60	1.10	9.40	22.50	0.19	22.69	7.60	156.1	100	99			2.86	
140-165		0.52	0.03	20.10	6.34	1.50	9.30	37.24	0.19	37.43	7.10	120.5	100	99			6.12	
165-200		0.31	0.07	23.70	15.29	2.80	25.20	66.99	0.98	67.97	17.20	82.5	100	99			13.77	