

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

SENA SERIES

Field Symbol: Se

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

Setting: Rangsit soils are formed from marine sediments mixed with riverine alluvium 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. Slope is about 0-1%. Elevation ranges from 2-3 m above sea level. The climate is Tropical Savanna (Köppen 'Aw'). Mean annual precipitation is about 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 1 m or more from river water or rain occurs for about four to five months during the rainy season. Sometimes this area flooded by irrigation. The groundwater level falls to about 100 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: Sena series is a member of the Very-fine, mixed, active, acid, isohyperthermic Sulfic Endoaquepts. They are deep, extremely acid soils and are characterized by a black or very dark gray clay A horizon overlying a grayish brown or light brownish gray clay B horizon, which in turn overlies a gray or dark gray reduced clay C horizon below approximately 150 cm from the soil surface. These soils are mottles throughout with strong brown and yellowish red coating along root channels in the A horizon, and predominantly brownish yellow mottles in the B horizon. The presence of yellow jarosite mottles approximately between 50-100 cm of the soil surface and contain gypsum in subsoil is diagnostic for the series. Pressure faces and slickensides occur in the B horizon and the soil cracks at the surface when dry.

Typifying Pedon: Profile code number is C 6/8

Location: Ban Lat Sai, Amphoe Wang Noi Changwat Phra Nakhon Si Ayutthaya.

Sheet Name: Changwat Pathum Thani

SheetNo.: 5137 III

Coordinate: 681715

Elevation: 3 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: poorly drained to somewhat poorly drained

Permeability: slow

Runoff: slow

Ground water depth: >2 m

Flooding depth: 100 cm

Duration: 6-7 month

Frequency: every year

Annual rainfall: 1,112.8 mm

Mean temp: 28.2 °C

Climate type: Tropical Savannah

Natural vegetation and/or land use: paddy field and sugar cane.

Other:

Described by: Pons and Van der Kevie

Date: 7 June, 1968

Revised by: S. Udomsri

Horizon	Depth (cm)	Description
Apg1	0-10	Very dark gray (10YR3/1) ripe clay; common fine prominent strong rice rust mottles; weak medium angular blocky structure: hard; many fine roots; strongly acid (field pH 5.0); clear, smooth boundary.
Apg2	10-17/30	Very dark gray (10YR3/1) clay; few fine prominent strong rice rust mottles; weak medium and coarse angular blocky structure: firm; common fine roots; strongly acid (field pH 5.0); clear, wavy or broken

		boundary.
Bssg1	17/30-35/45	Grayish brown (10YR5/2) clay; many coarse prominent red, medium distinct brownish yellow, very few fine yellow and few medium purple mottles; weak medium prismatic with rough faces breaking to moderate fine angular blocky structure: firm; many slickensides and black cutan on vertical ped faces; very fine gypsum crystals; very few fine prominent jarosite (2.5Y 8/6) mottles; few fine roots; very strongly acid (field pH 4.5); gradual, wavy boundary.
Bssg2	35/45-60/70	Grayish brown (10YR5/2) clay; few medium prominent red, many medium distinct brownish yellow, and very few medium distinct yellow mottles; weak coarse prismatic with rough faces breaking to weak fine angular blocky structure: sticky, plastic; many intersecting slickensides and many small pressure faces; very few medium prominent jarosite (2.5Y 8/6) mottles; few fine roots; extremely acid (field pH 4.0); gradual, wavy boundary.
Bjg	60/70-105	Grayish brown (10YR5/2) clay; many coarse distinct brownish yellow, common medium distinct yellow, few distinct yellowish brown and few prominent red mottles, yellow mottles mainly in root holes; weak coarse prismatic breaking to moderate fine angular blocky structure: sticky, plastic; few slickensides and many pressure faces; common medium prominent jarosite (2.5Y 8/6) mottles mainly in root pores; few roots; extremely acid (field pH 4.0); gradual, smooth boundary.
Bg	105-150	Grayish brown (10YR5/2) and dark grayish brown (10YR4/2) clay; few distinct brown mottles along pores; weak very coarse prismatic breaking to irregular weak fine angular blocky structure: sticky, plastic; few slickensides; many very fine pores; few roots; extremely acid (field pH 4.0); gradual, smooth boundary.
Cg1	150-220	Dark gray (10YR4/1) some grayish brown spots; half ripe clay with coarse organic matter; strongly acid (field pH 5.5).
Cg2	220-330	Dark gray (10YR4/1) half ripe to nearly ripe clay; some organic material; neutral (field pH 7.0).
Cg3	330-480	Gray (10YR5/1) half ripe to nearly ripe clay; some organic material; moderately alkaline (field pH 8.0).

Type Location: Name of Amphoe, Amphoe Sena Changwat Phra Nakhon Si Ayutthaya.

Range of Profile Features:

The A horizon is from 20 to 40 cm thick, has 10YR hue, values of 2 or 3 and chromas of 1 or 2. Structure is weak medium and coarse blocky and field pH values range from 4.5 to 5.5.

The B horizon has 10YR and 7.5YR hues, value of 5 and chroma of 2. Structure is weak, medium and coarse prismatic, breaking to fine blocky. Field pH values rang from 4.0 to 4.5.

The C horizon is half ripe to nearly and has predominantly dark gray colours with few brown mottles in the upper part. Field pH values are 4.5 rising to 6.0 or more below approximately 2 m from the soil surface.

Similar Soil Series:

Rangsit series (Rs): has a similar profile, but without gypsum

Ongkharak series (Ok): has the jarosite mottles within 50 cm and without gypsum.

Thanyaburi series (Tan): has a similar profile, but without red mottles or gypsum.

Ayutthaya series (Ay): the jarosite mottles occurs below 1 m from the soil surface.

Maha Phot series (Ma): contains jarosite mottles below 1 m and without gypsum crystals.

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

ANALYSIS RESULTS

Profile code No. C-6/8

(oven dry basis)

Soil series : Sena (Se)

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 ^r	water	KCl			
P-832	0-10	Apg1	11.9	39.7	48.4						c	c	4.4	3.8	0.9	10.9	230
P-833	10-17/30	Apg2	11.3	38.7	50.0						c	c	4.2	3.6	1.0	10.2	140
P-834	17/30-35/45	Sssg1	5.9	33.0	61.1						c	c	3.6	3.1	0.7	5.3	157
P-835	35/45-60/70	Bssg2	1.8	29.0	69.2						c	c	3.6	3.0	0.7	7.9	180
P-836	60/70+150	Bjg	4.4	32.4	63.2						c	c	3.5	3.1	0.7	5.3	172
P-837	105-150	Bg	0.2	34.1	65.7						c	c	3.8	3.3	0.7	35.4	212
P-838	150-220	Cg1	1.6	38.5	59.9						c	c	-	-	0.6	45.0	279
P-839	220-330	Cg2	1.8	40.0	58.2						c	c	3.0	2.7	0.9	20.6	405

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 Extr. SUM		CEC CEC		B/Cx100	(Bx100)/					
				Ca	Mg	K	Na	cations (B)	acidity (A)	(B+A)	NH ₄ OAc (C)	100g Clay	(B+A)					
0-10		1.20		11.00	4.80	0.70	0.80	17.30	14.80	32.10	22.40	46.3	77	54				
10-17/30		1.00		10.10	5.00	0.50	1.20	16.80	15.40	32.20	21.90	43.8	77	52				
17/30-35/45		0.30		11.40	6.70	0.60	1.60	20.30	21.30	41.60	24.40	39.9	83	49				
35/45-60/70		0.20		8.50	8.30	0.70	2.30	19.80	21.90	41.70	28.50	41.2	69	47				
60/70+150		0.30		7.50	7.70	0.70	2.40	18.30	23.10	41.40	27.40	43.4	67	44				
105-150		0.50		8.50	9.10	0.90	2.70	21.20	21.10	42.30	30.30	46.1	70	50				
150-220		2.40		8.00	13.70	0.90	2.60	25.20	35.60	60.80	33.30	55.6	76	41				
220-330		2.30		11.40	22.10	1.10	4.50	39.10	28.60	67.70	36.60	62.9	100	58				