

Proposed by: R.L. Pendleton, 1953
Revised by:
1. C. Changprai, 1987
2. S. Udomsri, 2004

BANGKOK SERIES

Field Symbol: Bk

Distribution: Occupies large extent in the southern part of the Central Plain and small extent in Peninsular Thailand.

Setting: Bangkok 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. Slopes are about 0-1 %. Elevation ranges from 2-4 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. Runoff and permeability are slow. Surface flooding by impounded rainwater or river occurs for about four months during the rainy season between 20-30 cm. 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: The Bangkok series is a member of the Very-fine, smectitic, nonacid, isohyperthermic Vertic Endoaquepts. They are very deep, slightly to moderately alkaline soils and are characterized by a dark coloured A horizon overlying a paler coloured, predominantly brown mottled B horizon, overlying a reduced marine clay which is low in sulphur. Gypsum crystals may occur in the lower A and B horizon, slickensides and pressure faces founded in the B horizon.

Typifying Pedon: Profile code number is SE-13/2

Location: Ban Khlong Chuat Lat Khao, Amphoe Bang Phli Changwat Samut Prakan.

Sheet Name: Krung Thep Maha Nakhon

Sheet No.: 5136 III

Coordinate: 860105

Elevation: 4 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

Permeability: slow

Runoff: slow

Ground water depth: >2 m

Flooding depth: - cm

Duration: 4 month

Frequency: every year

Annual rainfall: 1,496.8 mm

Mean temp: 27.8 °C

Climate type: Tropical Savannah

Natural vegetation and/or land use: paddy field

Other:

Described by: Kevie, Thumrong and Cowie

Date: 25 March, 1969

Revised by: S. Udomsri

Horizon	Depth (cm)	Description
Apg1	0-12	Very dark gray (10YR3/1) clay; many fine prominent strong brown (7.5YR5/8) mottles mainly along root channels; weak coarse subangular blocky structure to massive; very hard; common very fine roots; moderately acid (field pH 6.0); gradual, smooth boundary.
Apg2	12-30	Black (10YR2/1) to very dark gray (10YR3/1) clay; common fine prominent strong brown (7.5YR5/8) mottles along root channels and coarse on ped faces, few coarse, medium yellowish brown (10YR5/8) mottles; weak coarse angular blocky structure; very firm; slightly acid (field pH 6.5); gradual, smooth boundary.

Bssg1	30-48	Mixed very dark gray (10YR3/1), dark gray (5Y4/1), and olive gray (5Y4/2) clay; many coarse prominent yellowish brown (10YR5/8) mottles; weak coarse angular blocky structure; firm; few big slickensides; neutral (field pH 7.0); gradual, smooth boundary.
Bssg2	48-90	Gray (5Y5/1) few very dark gray (10YR3/1) inclusions, clay; many coarse and medium prominent yellowish brown (10YR5/8), strong brown (7.5YR5/8) and few coarse distinct very dark brown (10YR2/2) mottles; moderate coarse angular blocky structure; firm; common big slickensides; clay coatings in pores; possibly Mn; neutral (field pH 7.0); gradual, smooth boundary.
Bg	90-130	Gray (5Y5/1) nearly ripe clay; many fine and medium prominent yellowish brown (10YR5/8), distinct light olive brown (2.5Y5/4), few very coarse very dark brown (10YR2/2) mottles include small, slightly hard iron pipes, most of the mottles occur along root channels and few coarse prominent black mottles; moderate coarse angular blocky structure; sticky, plastic; neutral (field pH 7.0); gradual, smooth boundary.
BCg	130-140	Dark gray (5Y4/1) half ripe clay; many prominent yellowish brown (10YR4/4), distinct olive brown (2.5Y4/4), dark greenish gray (5GY4/1) mottles mainly along root channels, inside of root channel is still reduced greenish mottles increase with depth; weak coarse prismatic breaking to moderate fine angular blocky structure; sticky, plastic; moderately alkaline (field pH 8.0); gradual boundary.
Cg1	140-200	Dark gray (5Y4/1) nearly unripe clay; many medium distinct dark greenish gray (5GY4/1) mottles which become greener with depth (near 5G4/1) and few dark olive brown mottles; moderately alkaline (field pH 8.0).
Cg2	200-320	Dark greenish gray (5GY4/1), the matrix color becomes slightly greener with depth (near 5G4/1) nearly unripe clay; moderately alkaline (field pH 8.0).

Type Location: Name of Changwat, Krung Thep Maha Nakhon (Bangkok)

Range of Profile Features:

The A horizon is from 15 cm to 40 cm thick, has 10YR hue, values of 2 to 4 or 3 and chromas of 1 or 2 with clay or silty clay textures. Structure is weak to moderate blocky or massive structure. Field pH values range from 5.5 to 8.0

The B horizon has hues of 10YR, 2.5Y or 5Y, values of 4 through 6 with chromas 1 or 2. Mottles have browner coloured. Structure is weak prismatic breaking to moderate blocky. Thin fine sand and silt lenses may occur in the lower B horizon as well as soft, black manganese nodules. Field pH values range from 6.5 to 8.5 and increase with depth.

The C horizon occurs below 125 cm consists of dark greenish gray, reduced clay or silty clay which contains thin lenses of fine sand and silt. Shell fragments may also occur and field pH values range from 7.5 to 8.5.

Similar Soil Series:

Samut Prakan series (Sm): has a similar profile, but although flooded by sea water in sometimes, the surface horizons are still saline and the reduced marine clay occurs at shallower depths.

Bang Len series (Bl): has a thick black A horizon and contains gypsum crystals in the lower A and upper B horizons.

Principal Associated Soils: These include Samut Prakan, Bang Nam Prio, Bang Len, Bang Khen and Chachoengsao series. Samut Prakan soils occur seaward of the Bangkok series soils, whereas Bang Nam Prio, Bang Khen and Chachoengsao soils occur more inland: Bang Len soils are found in close vicinity to the creeks in the old tidal flats.

ANALYSIS RESULTS

Profile code No.: SE-13/2

(oven dry basis)

Soil series : Bangkok (Bk)

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				
P-701	0-12	Apg1	1.8	23.7	74.5							c	c	5.3	4.1	0.4	4.0	420
P-702	12-30	Apg2	1.0	24.5	74.5							c	c	5.9	5.3	1.0	3.1	360
P-703	30-48	Bssg1	1.6	22.4	76.0							c	c	6.5	5.9	0.7	6.7	450
P-704	48-90	Bssg2	1.5	26.0	72.5							c	c	6.8	6.1	0.7	7.9	525
P-705	90-130	Bg	1.6	24.9	73.5							c	c	7.0	6.4	0.2	60.5	540
P-706	130-140	BCg	0.5	31.8	67.7							c	c	7.0	6.7	4.0	31.0	755
P-707	140-200	Cg1	1.2	29.1	69.7							c	c	7.7	7.3	5.9	63.5	860
P-708	200-320	Cg2	-	-	-							-	-	-	-	-	109.5	1,030

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)
0-12	5.1	1.06		6.90	12.90	1.00	2.90	23.70	15.00	38.70	28.10	37.7	84	61			0.69		
12-30	4.9	0.54		7.40	13.10	1.10	3.70	25.30	9.50	34.80	28.90	38.8	88	73			0.34		
30-48	4.8	0.22		7.40	13.10	1.10	4.80	26.40	6.70	33.10	29.40	38.7	90	80			0.39		
48-90	3.9	0.16		8.00	15.70	1.20	5.80	30.70	6.00	36.70	30.30	41.8	100	84			0.36		
90-130	4.4	0.20		9.70	15.80	1.30	7.90	34.70	6.10	40.80	32.00	43.5	100	85			1.30		
130-140	4.4	0.68		8.00	17.40	1.80	9.60	36.80	5.70	42.50	28.80	42.5	100	87			1.50		
140-200	4.1	1.33		19.10	19.30	2.00	12.20	52.60	6.90	59.50	30.30	43.5	100	88			1.01		
200-320	5.0	1.50		20.30	22.20	2.60	17.10	62.20	3.90	66.10	30.80		100	94			2.50		