

Proposed by: F.R. Moormann, 1962
Revised by:
1. C. Changprai, 1987
2. S. Udomsri, 2004

BANG PHAE SERIES

Field Symbol: Bph

Distribution: Occupies small extent in the southwestern part of the Central Plain

Setting: Bang Phae 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 from tidal flooding and have been cultivated for some time. Relief is flat. Slopes are nearly flat, about 0-1%. Elevation ranges from 4-7 m above sea level. The climate is Tropical Savanna (Köppen 'Aw'). Annual precipitation ranges from 900 mm to 1,400 mm. Mean annual temperature is 27°C.

Drainage, Permeability and Surface Runoff: Poorly drained. Runoff and permeability are slow. These soils are flooded to depths of up to 30 cm for four to five months from river or rainwater during the rainy season. Sometimes this area flooded by irrigation. The soil remains wet for longer than five months. Groundwater level falls below 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: Bang Phae Series is a member of the Fine-silty, mixed, active, isohyperthermic Typic Endoaquolls. They are very deep soils, neutral to moderately alkaline soils and are characterized by dark coloured A horizon overlying a pale coloured B horizon which contains brownish yellow and yellowish brown mottles. Textures are clay or silty clay gradually changing to silty clay loam, loam or fine sandy loam between 50-100 cm of the soil surface. Soft manganese nodules and gypsum crystals are present in the B horizon.

Typifying Pedon: Profile code number is SW-52/149

Location: East of Klong Sam Si Wang about 150 m and far from junction of Ban Hua Pho-Pho Hak 500 m, Ban Pho Hak, Tambon Pho Hak, Amphoe Bang Phae Changwat Ratchaburi.

Sheet Name: Amphoe Ban Phaeo

Sheet No.: 5036 III

Coordinate: 098081

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

Permeability: slow

Runoff: slow

Ground water depth: >2 m

Flooding depth: 50-100 cm

Duration: 3-4 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

Other:

Described by: Pramote Hemsrichart

Date: 25 March, 1997

Revised by: S. Udomsri

Horizon	Depth (cm)	Description
Apg	0-20	Black to very dark gray (10YR2-3/1) clay; many fine distinct brown to strong brown (7.5YR4/4-6) mottles along roots; moderate coarse prismatic breaking to medium and coarse subangular blocky structure; extremely hard, firm, very sticky, very plastic; many very fine and common fine roots; many gypsum crystals; moderately alkaline (field pH 8.0); clear, smooth boundary.
Bssg	20-40	Mixed very dark gray (10YR3/1) and dark gray (10YR4/1) clay; many coarse distinct brownish yellow (10YR6/8) and common medium distinct yellowish brown (10YR5/6) mottles; moderate coarse prismatic

		breaking to coarse and medium angular blocky structure; firm, very sticky, very plastic; few very fine roots; many gypsum crystals, some slickensides, organic clay coated on ped faces and crack surfaces; moderately alkaline (field pH 8.0); clear, smooth boundary.
Bg1	40-63	Mixed light brownish gray (10YR6/2) and grayish brown (10YR5/2) clay; many coarse distinct brownish yellow (10YR6/8) mottles; weak coarse prismatic breaking to medium and coarse angular blocky structure; firm, sticky, very plastic; many organic clay, color is dark grayish brown (10YR4/2), coated on crack surfaces; few very fine roots; many gypsum crystals; moderately alkaline (field pH 8.0); clear, smooth boundary.
Bg2	63-105	Mixed gray (10YR6/1) and light brownish gray (10YR6/2) silty clay loam; many coarse distinct yellowish brown (10YR5/6) mottles and some spot of black (10YR2/1); weak medium and coarse subangular blocky structure; friable, sticky, very plastic; few very fine roots; common organic clay coated on ped faces, common iron pipes, some mica flakes; moderately alkaline (field pH 8.0); gradual, smooth boundary
Bg3	105-170 ⁺	Gray to light gray (5Y6/1) many coarse prominent strong brown (7.5YR5/6) mottles; sandy clay loam; sticky, plastic; many mica flakes; moderately alkaline (field pH 8.0).

Type Location: Name of Amphoe, Amphoe Bang Phae Changwat Ratchaburi.

Range of Profile Features:

The A horizon is from 20 to 30 cm thick, has 10YR hue, values of 3 or less and a chromas of 2 or 1. Structure is moderate blocky but may be granular in the uppermost layer. Gypsum crystals may occur in the lower part of the A horizon. Field pH values range from 6.5 to 8.0.

The upper B horizon has hues of 10YR, values of 5 or 6 and chromas of 2 or 1. Texture is silty clay or clay. Structure is moderate blocky. Field pH ranges from 6.5 to 8.0

The lower B horizon has hues of 10YR, 2.5Y or 5Y, values of 5 or 6 and chromas of 2 or 1. Texture is silty clay loam, loam, sandy clay loam or sandy loam with becoming coarser with depth. Shell fragments and lime concretions may be present. Field pH ranges from 6.5 to 8.0 and increase with depth.

The C horizon is deep, usually below 150 cm from the soil surface and consists of a fine sandy loam with greenish gray colours and may contain shell fragments and lime, concretions. Field pH values are 8.0 or more.

Similar Soil Series:

Bang Len series (Bl): has clay textures to a depth of at least 1 meter from the soil surface.

Phan Thong series (Ptg): has thin dark surface with texture in A or upper B is loam or silt loam and without gypsum.

Principal Associated Soils: Bang Phae soils are found in association with Bang Len and Pan Thong series soils on the former tidal flats.

ANALYSIS RESULTS
(oven dry basis)

Profile code No. : SW-52/149
Soil series : Bang Phae (Bph)

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 water	1:1 KCl			
			sand	silt	clay	vc	c	m	f	vf	result	estim ¹					
4011106	0-20	Apg	9.6	47.8	42.6	0.2	0.0	0.2	2.2	7.0	sic	c	7.2	6.7		7.1	156
4011107	20-40	Bssg	22.8	52.3	24.9	1.0	6.8	5.4	3.7	5.9	sil	c	7.5	7.0		3.6	156
4011108	40-63	Bg1	18.1	51.6	30.3	2.0	3.7	3.2	2.6	6.6	sicl	c	7.7	7.1		2.2	156
4011109	63-105	Bg2	27.7	47.1	25.2	0.4	0.5	0.9	2.4	23.5	l	sicl	7.6	7.0		5.9	156
40111010	105-170+	Bg3	50.5	29.3	20.2	0.1	0.6	9.5	29.2	11.1	l	scl	7.7	7.2		-	117

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol _(c) kg ⁻¹)								Base satur ⁿ (%)		ECEC cmol _(c) kg ⁻¹ (B+D)	Al KCl extr. cmol _(c) kg ⁻¹ (D)	Electrical conduct ^y (ECx10 ⁶) dS m ⁻¹			
				Ca		Mg		K		Na		SUM	CEC				CEC	B/Cx100	(Bx100)/
				(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)				(B)	(A)	(B)
0-20	3.6	0.82		36.00	7.90	0.40	2.20	46.50	1.90	48.40	22.10	51.9	100	96	46.50				
20-40	5.2	0.22		58.30	6.70	0.40	2.20	67.60	0.00	67.60	12.80	51.4	100	100	67.60				
40-63	9.0	0.12		51.70	7.10	0.40	2.40	61.60	0.00	61.60	12.30	40.6	100	100	61.60				
63-105	2.4	0.05		14.30	6.40	0.40	2.60	23.70	0.20	23.90	12.80	50.8	100	99	23.70				
105-170+	2.0	0.08		9.10	5.20	0.30	2.00	16.60	0.20	16.80	10.10	50.0	100	99	16.60				