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Revised by: K. Marlairotsiri,
A. Suchinai, 2004

BAN PHAI SERIES

Field Symbol: Bpi

Distribution: Occupies moderate extent in Northeast Plateau.

Setting: Ban Phai soils are formed from washed deposit of sandstone and occur on the middle part of peneplain. Relief is gently undulating to undulating. Slopes range from 2 to 8 percent. Elevation is from 190 to 250 m above sea level. The climate is Tropical Savanna (Köppen 'Aw'). Average annual precipitation is from 1,069 to 1,100 mm. Mean annual air temperature is from 25 to 27°C.

Drainage, Permeability and Surface Runoff: Drainage is well drained, permeability is rapid and over slow runoff is rapid over slow to slow. The ground water level is below 2 meters throughout the year.

Vegetation and Land Use: Cassava, Mango, Tamarind

Characteristic Profile Features: Ban Phai series is a member of the loamy, siliceous isohyperthermic Arenic Paleustalfs. They are very deep soils and are characterized by grayish brown or light brown loamy sand or sand A horizon overlying pinkish gray loamy sand E horizon which in turn overlies a brown, yellowish brown or strong brown sandy loam grading to sandy clay loam argillic B horizon. Common distinct yellowish red with few red mottles usually occur in the Bt horizon. Reaction is medium acid to mildly alkaline over very strongly acid to medium acid.

Typifying Pedon: Profile code no.: 2/2541

Location: Wat Khok Samakkee highway #205 at 342+700 km Ban Nong Kradone, Tambon Sra Phra, King Amphoe Phra Thong Kam Changwat Nakhon Ratchasima.

Sheet Name: Ban Nong Bua Khok

Sheet No.: 5339 I

Coordinate: 074040

Elevation: 250 m

Relief: gently undulating

Slope: 2-3%

Physiography: middle part of peneplain

Parent material: wash deposit from sandstone

Drainage: well drained

Permeability: rapid over slow

Runoff: rapid

Ground water depth: depth: >2 m

Flooding depth:

Duration:

Frequency:

Annual rainfall: 1,180. mm

Mean temp: 27 °C

Climate type: Tropical Savannah

Natural vegetation and/or land use: cassava, sugar cane, tamarind

Described by: Pothichan A, Kanjanaserm C,
Marlairodsiri. K.

Date: 18 June 1998

Revised by: K. Marlairodsiri, A. Suchinai.

Horizon	Depth (cm)	Description
Ap1	0-22	Light brown (7.5YR6/3 dry) brown (7.5YR5/3 moist) loamy sand; single grains and few crumb structure; loose, nonsticky, nonplastic; many very fine irregular and few fine tubular pores; common fine and medium roots; medium acid (field pH 6.0); gradual, smooth boundary.
Ap2	22-38	Light brown (7.5YR6/3 dry) brown (7.5YR5/3 moist) loamy sand; weak medium and coarse subangular blocky structure breaking to single grains; slightly hard, friable, nonsticky, nonplastic; many very fine irregular pores; common very fine, fine and medium roots; medium acid (field pH 6.0); clear, smooth boundary.

E	38-60	Pinkish gray (7.5YR7/2-3 dry) light brown to pink (7.5YR6-7/4 moist) loamy sand; few fine faint reddish yellow (7.5YR6/6) mottles; weak medium and coarse subangular blocky structure breaking to single grains; slightly hard, friable, slightly sticky, slightly plastic; many very fine irregular pores; common very fine and few fine roots; medium acid (field pH 6.0); clear, smooth boundary.
Bt1	60-93/100	Mixed strong brown (7.5YR5/6), light brown (7.5YR6/4) and reddish yellow (7.5YR6/6), sandy loam; common fine distinct yellowish red (5YR5/8) mottles; moderate coarse subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine irregular and few fine tubular pores; few very fine and few fine roots; many verticle crack 1 cm wide; very strongly acid (field pH 5.0); clear, smooth boundary.
Bt2	93/100-115	Strong brown (7.5YR5/6) and brown (7.5YR5/3-4) sandy loam; common medium distinct light yellowish brown (10YR6/4) and yellowish red (5YR5/6) mottles; moderate coarse angular and subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine irregular and few fine tubular pores; few very fine and medium roots; very strongly acid (field pH 5.0); clear, smooth boundary.
Btg2.1	115-150/160	Brown (7.5YR5/2) and pinkish gray (7.5YR6/2) fine sandy clay; common fine distinct strong brown (7.5YR5/8) and few medium prominent red (2.5YR5/6) mottles; moderate coarse prismatic and subangular blocky structure; firm, sticky, plastic; continuous moderately thick clay coating on ped faces and in pores; common fine irregular and few fine tubular pores; few very fine and fine roots; very strongly acid (field pH 5.0); gradual, wavy boundary.
Btg2.2	150/160-180	Pinkish gray (7.5YR6/2) and light brown (7.5YR6/3) fine sandy clay; common fine and few medium distinct reddish yellow (7.5YR6/6) mottles; moderate coarse prismatic and angular blocky structure; firm, sticky, plastic; continuous moderately thick clay coating on ped faces and in pores; common fine irregular and few fine tubular pores; few very fine and fine roots; common soft manganese concretion; very strongly acid (field pH 4.5).

Type Location: The pedon were first described at Amphoe Ban Phai Changwat Khon Kaen

Range of Profile features:

The thickness of an A horizon varies from 20 to 30 cm and has 10YR or 7.5YR hues, values of 4 to 6 and chromas of 3 to 4. Structure is weak and break to single grain loose when dry. many few fine irregular pores; The pH values vary from 5.0 to 6.0.

The E horizon color 7.5YR or 10 YR hue value is 6 to 7 and chroma 2 to 4; some pedon has either reddish yellow mottles or not; structure is subangular blocky; pH 5.0 to 6.0

The B horizon has 7.5YR hue, values of 6 or 7 and chromas of 2 to 6. Structure is moderate prismatic and/or subangular blocky. The pH values vary from 5.0 to 6.0.

Similar soils series:

Maha Sarakham series (Msk): same physiography but line on lower part

Principal Associated soils: Nam Phong, Dan khun Thod

ANALYSIS RESULTS

Profile code no.: Pedon 4

(oven dry basis)

Soil series : Ban Phai (Bpi)

Received no:41-373

Lab No.	Depth (cm)	Horizon	Particle size distribution analysis (% by weight)									Texture		pH		Fe ₂ O ₃ (%)	P, mg kg ⁻¹ Bray 2	K, mg kg ⁻¹ NH ₄ OAc 1N pH7
			USDA grading			Sand-fraction grading						Lab	Field	1:1	1:1			
			sand	silt	clay	vc	c	m	f	vf	result	estim ¹	water	KCl				
418769	0-22	Ap1	87.5	8	4.5	0.3	1.2	16.8	53.5	15.7	ls		5.3	4.8	0.0	4.9	39.1	
418770	22-38	Ap2	86.4	9.6	4.0	0.2	1.1	11.5	54.2	19.4	ls		5.4	4.6	0.0	0.7	39.1	
418771	38-58/60	E	83.4	13.1	3.5	0.1	1.1	18.7	46.9	16.6	ls		5.5	4.4	0.0	0.3	39.1	
418772	58/60-93/100	Bt1.1	75.2	11.6	13.2	0.1	1.3	23.6	41.6	8.6	sl		5.1	3.9	0.0	0.4	39.1	
418773	93/100-115	Bt1.2	77.9	13	9.1	0.4	1.4	12.4	44.2	19.5	sl		5.4	3.9	0.0	0.3	39.1	
418774	115-150/160	Btg1.1	52.8	13.7	33.5	0.5	1.2	6.3	33.8	11.0	scl		5.0	3.4	0.0	0.5	117.3	
418775	150/160-180	Btg2.2	56.3	16.6	27.1	0.4	0.9	6.0	30.1	18.9	scl		5.0	3.5	0.0	0.2	117.3	

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 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)				
				0-22	0.1	0.19	0.015	0.70	0.20	0.10	0.10	1.10	0.90	2.00	1.30			
22-38	0.2	0.1	0.008	0.60	0.20	0.10	0.20	1.10	0.70	1.80	1.30	32.5	81	60	1.1	0.0		
38-58/60	0.2	0.06	0.004	0.70	0.20	0.10	0.10	1.10	0.70	1.80	1.30	37.1	81	60	1.1	0.0		
8/60-93/100	1	0.14	0.014	1.60	0.90	0.10	0.20	2.80	3.40	6.20	5.30	40.2	53	45	3.8	1.0		
93/100-115	0.6	0.04	0.012	0.90	0.50	0.10	0.30	1.80	2.00	3.80	3.40	37.4	53	47	2.7	0.9		
115-150/160	2.7	0.15	0.045	6.40	1.70	0.30	1.30	9.70	8.50	18.20	17.80	53.1	54	53	13.1	3.4		
150/160-180	2.9	0.08	0.009	6.10	1.70	0.30	1.20	9.30	6.10	15.40	15.90	58.7	58	60	11.8	2.5		