

Proposed by: C. Changprai, 1973  
 Revised by:  
 1. N. Chorphaka, 1988  
 2. P. Wiwatwongwana, 2004

**PHON NGAM SERIES**

**Field Symbol: Png**

**Distribution:** Occupies moderate extent in the areas of Central Highlands. especially in Changwat Loei.

**Setting:** Phon Ngam soils are developed from sandy shale and/or fine grain sandstone and occur on undulating to rolling (dissected) erosion surface. Slopes range from 2 to 8 percent. Elevation is from 250 to 350 m above sea level. The climate is Tropical Savanna (Koppen 'Aw'). Average annual precipitation is from 1,100 to 1,400 mm. Mean annual air temperature is 27 °C.

**Drainage, permeability and Runoff:** Well drained. Permeability and surface runoff are rapid. Ground water table falls below 2 m throughout the year. They dry out very deep during the peak of dry season.

**Vegetation and Land Use:** Natural vegetation is Mixed Deciduous Forest with dominant bamboo bearings. Parts are cleared for upland crop cultivation such as corn, kenaf, water melon, cotton etc.

**Characteristic Profile Features:** Phon Ngam is a member of the fine-loamy, mixed, semiactive, isohyperthermic Typic Haplustults. They are deep soils and characterized by a dark brown or dark reddish brown or reddish brown sandy loam A horizon overlying a yellowish red grading to red or dark red sandy clay loam argillic B horizon which inturn overlies a layer of weathering sandstone and sandy shale C horizon. They contain common to many Pseudo-laterite and weathered parent rock fragments between 100-150 cm of the surface. Reaction is medium acid to neutral at surface layer and very strongly acid to strongly acid in subsoil.

**Typifying Pedon:** Profile code no. is NE-S 20/121 (moist colors unless otherwise stated).

**Location:** Near Ban Bu Khanun, Amphoe Khon Buri Changwat Nakhon Ratchasima.

**Sheet Name:** Ban Taling Chan

**Sheet No.:** 5437 IV

**Coordinate:** 955930

**Elevation:** 300 m (MSL)

**Relief:** gently undulating

**Slope:** 2-3 %

**Physiography:** erosion surface

**Parent material:** residuum from sandstone

**Drainage:** well drained

**Permeability:** rapid

**Runoff:** rapid

**Ground water depth:** >6 m

**Flooding depth:** -

**Duration:** -

**Frequency:** -

**Annual rainfall:** 1,118 mm

**Mean temp.:** 27 °C

**Climate type:** Tropical Savannah (Aw)

**Natural vegetation or land use:** dipterocarp forest

**Described by:** C. Changprai, Thawee and Thamanoon

**Date:** 18 March, 1975

**Revised by:** Aniruth Potichan

**Date:** 23 May, 2004

Horizon	Depth (cm)	Description
A1	0-5	Dark brown to brown (10YR4/3) sandy loam; weak fine and medium subangular blocky structure; friable, nonsticky, nonplastic, many fine roots; slightly acid (field pH 6.5); gradual, smooth boundary.
A2	5-18	Strong brown (7.5YR5/6) sandy loam; weak fine and medium subangular blocky structure; friable, nonsticky, nonplastic; many fine and common medium roots; moderately acid (field pH 6.0); clear smooth boundary.
Bt1	18-72	Red (2.5YR4/8) sandy clay loam; moderate coarse subangular blocky structure; slightly firm, slightly sticky, slightly plastic; patchy moderately thick clay coating on ped faces; few fine, medium and coarse roots; strongly acid (field pH 5.5); gradual, smooth boundary.

Bt2	72-100	Red (2.5YR4/6) gravelly sandy clay loam; weak coarse subangular blocky structure; slightly firm, slightly sticky, slightly plastic; patchy thin clay coating on ped face; few fine medium and coarse roots; very strongly acid (field pH5 4.5); gradual, smooth boundary.
Cr	100+	Weathered sandstone layer.

**Type Location:**

The Phon Ngam series was named for Ban Phon Ngam, Amphoe Wang Saphung, Changwat Loei in which soils of this series were first described at a pit mentioned above.

**Range of Profile Feature:**

The A horizon is from 5 to 20 cm thick and has 5YR or 7.5YR hues, values of 3 or 4 and chromas of 2 to 4. Texture of sandy clay loam may occur. Structure is weak to moderate blocky. Field pH values range from 6.0 to 7.0.

The B horizon has 2.5YR or 5YR hues, values of 3 to 5 and chromas of 4 to 8. Texture of sandy clay or clay loam may occur in very deep subsoil. Field pH values very from 4.5 to 5.5.

The C horizon usually occurs below 1 m and consists of highly weathered parent rock fragments.

Mottles usually occur in the weathering zone.

**Similar Soil Series:**

Dan Sai series (Ds): is similar in appearance, but not contain common to many gravels or pseudo-laterite between 100-150 cm.

**Principal Associated Soils:**

These include Wang Saphung, Loei and Chiang Khan series.

**ANALYSIS RESULTS**  
(oven dry basis)

Profile code no.: NE-S-20/121  
Soil series: Phon Ngam (Png)

Lab No.	Depth (cm)	Horizon	Particle size distribution analysis (% by weight)							Texture		pH		CaCO <sub>3</sub> %	P, mg kg <sup>-1</sup> Bray 2	K, mg kg <sup>-1</sup> NH <sub>4</sub> OAc	
			USDA grading			Sand-fraction grading				Lab	Field	1:1 water	1:1 KCl				
			sand	silt	clay	vc	c	m	f	vf	result	estim <sup>n</sup>					
Pf-321	0-5	A1	80.0	16.5	3.5						ls	sl	6.3	5.3	0.3	3.1	56
Pf-322	5-18	A2	81.5	15.5	3.0						ls	sl	6.4	5.3	0.3	2.2	32
Pf-323	18-72	Bt1	64.5	14.5	21.0						scl	scl	5.8	4.1	0.3	3.0	35
Pf-324	72-100	Bt2	62.0	18.0	20.0						scl-sl	gscl	5.6	4.0	0.0	2.5	27

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol <sub>(c)</sub> kg <sup>-1</sup> )								Base satur <sup>n</sup> (%)		ECEC cmol <sub>(c)</sub> kg <sup>-1</sup> (B+D)	Al KCl extr. cmol <sub>(c)</sub> kg <sup>-1</sup> (D)	Electrical conduct <sup>y</sup> (ECx10 <sup>6</sup> ) dS m <sup>-1</sup>
				Ca	Mg	K	Na	SUM cations (B)	Extr. acidity (A)	SUM (B+A)	CEC NH <sub>4</sub> OAc (C)	CEC 100g Clay	B/Cx100			
0-5	0.4	1.02	0.03	2.70	0.80	0.10	0.20	3.80	2.10	5.90	4.2	120.0	90	64		0.28
5-18	2.7	0.61	0.02	1.70	0.60	0.10	0.20	2.60	1.10	3.70	2.8	93.3	93	70		0.15
18-72	2.1	0.25	0.02	0.50	1.20	0.10	0.30	2.10	5.80	7.90	5.5	26.2	38	27		0.03
72-100	1.6	0.23	0.02	0.40	1.10	0.10	0.30	1.90	6.00	7.90	5.7	28.5	33	24		0.03