

Proposed by: F.R. Moormann, 1961
 Revised by: 1.P. Hemsrichart, 1988
 B. Boonsompophan,
 2. S. Sukchan,
 A. Suchinai, 2004

PHIMAI SERIES

Field Symbol: Pm

Distribution: Moderate extent in Northeast and small extent in North and Central Plain Thailand.

Setting: Phimai soils are formed from alluvium (recent or semi-recent) and occur on river basin and backswamp areas of flood plains. Relief is level which slope is less than 1 percent. Elevation is from 110 to 200 m above sea level in northeast and North and about 10 to 35 m in Central Plain. The climate is Tropical Savanna (Köppen 'Aw'). Average annual precipitation is from 1,100 to 2,000 mm. Mean annual air temperature varies from 26 to 28°C.

Drainage, Permeability and Runoff: Poorly drained soils. They are flooded by river water and rainwater in the wet season. Ground water table falls below 1.5 m, but is not deeper than 3 m during the peak of the dry period. Permeability and surface runoff are slow.

Vegetation and Land Use: Mainly used for transplanted and broad casted rices and some are covered by grasses and shrubs.

Characteristic Profile Features: The Phimai series is a member of the very fine, smectitic, isohyperthermic Ustic Endoaquerts. They are deep soils and are characterized by a dark gray or dark grayish brown clay A horizon overlying a gray or light gray clay cambic B horizon. Mottles of strong brown yellowish brown and/or yellowish red colors occur throughout profile. Distinct slickensides and pressurefaces occur in the cambic B horizon. Reaction is medium acid to very strongly acid to medium acid.

Typifying Pedon: Profile code no.: NE-N-32/29. (colors are for moist soil unless otherwise stated).

Location: about 200m west of Wat, Amphoe Mueang Changwat Kalasin

Sheet Name: Changwat Kalasin

Sheet No.: 5760 III

Coordinate: 1818341

Elevation: 138 m

Relief: nearly flat to flat

Slope: 1-2%

Physiography: black swamp

Parent material: alluvium

Drainage: poorly drained

Permeability: slow

Runoff: slow

Ground water depth:

Flooding depth: -

Duration: -

Frequency: -

Annual rainfall:

Mean temp: 26-28 °C

Climate type: Tropical Savannah

Natural vegetation and/or land use: paddy field

Other: crack about 30 cm deep

Described by: A. Chotimon

Date: Mar 20, 1971

Revised by:

Horizon	Depth (cm)	Description
Apg	0-20	Dark gray (10YR4/1) clay loam; many medium prominent red (2.5YR4/6) and few medium distinct strong brown (7.5YR5/6) mottles; massive; very hard, very firm, very sticky, very plastic; many very fine, fine and medium interstitial pores; many very fine and fine roots; slightly acid (field pH 6.5); abrupt, slightly wavy boundary.
Bssg1	20-49	Gray (10YR5/1) clay; many medium prominent dark red (2.5YR3/6) and distinct strong brown (7.5YR5/6) mottles; moderate fine and medium subangular blocky structures; very firm, very sticky, very plastic; common slickensides and pressure faces; many very fine interstitial pores, common fine tubular pores; few very fine and fine roots; strongly acid (field pH 5.5); clear, slightly wavy boundary.

Bssg2 49-100+ Gray (10YR5/1) clay; many medium distinct yellowish red (5YR4/8) and common medium prominent red (2.5YR5/8) mottles; weak to moderate fine and medium subangular blocky structure; very firm very sticky and very plastic; common slickensides and pressure faces; many very fine and few fine interstitial pores; common very, fine and fine tubular pores; very strongly acid (field pH 5.0).

Type Location: The Phimai series was named for Amphoe Phimai, Changwat Nakhon Ratchasima in which soils of this series were first described and defined in areas of Thung Samrit, Amphoe Phimai.

Range of Profile Features:

The thickness of the A horizon varies from 15 to 30 cm and has 10YR or 7.5YR hues; values of 3 to 5 and chromas of 1 or 2. Textures of clay loam or silty clay may occur. Structure is weak to moderate medium and/or coarse blocky. Field pH value is from 5.5 to 7.0.

The B horizon has 10YR or 7.5YR hues, values of 5 to 7 and chromas of 1 (mainly), but 6/2 may be found. Structure is moderate medium and/or coarse blocky. This horizon contains distinct slickensides and iron-manganese nodules. Field pH value is from 5.0 to 7.0.

The C horizon has 10YR, 7.5 YR or 5YR hues, values of 4 to 7 and chroma of 1 or less. Structure is massive to weak coarse blocky. Field pH value varies from 6.0 to 7.5. The sandy 2C horizon may occur at some depth below 150 cm.

The Phimai series cracks deeply and widely in the dry season and contain distinct slickenside and pressure faces.

Similar Soil Series:

Ratchaburi series (Rb): has browner color; chroma is 2 or higher.

Sing Buri series (Sin): has lower colour values (mainly 4) in the B horizon and more flooded.

Principal Associated Soils: These include Ratchaburi and Si Songkhra soils occupy on the higher position.

ANALYSIS RESULTS

Profile code no.:NE-N-32/29

(oven dry basis)

Soil series : Phi Mai (Pm)

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			
Pb-495	0-20	Apg	8.0	32.0	60.0						c	c	4.8	4.2	1.1	26.2	65
Pb-496	20-49	Bssg1	11.0	23.5	65.5						c	c	4.4	3.5	0.0	17.1	67
Pb-497	49-100+	Bssg2	14.0	4.0	82.0						c	c	5.2	3.5	0.9	5.6	146

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)				
				0-20	3.1	1.33		12.00	4.40	0.90	3.20	20.50	14.50	35.00	30.20			
20-49	3.8	0.82		10.20	4.40	0.40	2.00	17.00	15.40	32.40	35.00	53.4	49	52			0.10	
49-100+	3.6	0.37		9.30	4.10	0.30	2.40	16.10	17.50	33.60	32.00	39.0	5000	48			0.08	