Proposed by: C. Changprai et.al-1967
Revised by: 1. P. Hemsrichart, 1988
B. Boonsompopphan,
2. S. Sukchan,
K. Malairotsiri, 2004

NAKHON PHANOM SERIES **Field Symbol: Nn**

Distribution: Occupies moderately extent in Northeast and small extent in the western part of Central Plain Thailand.

Setting: Nakhon Phanom soils are formed from relative old alluvium and occur on the lower parts of the peneplain . Relief is level to nearly level which slope is 1 percent or less. Elevation ranges from 120 to 150 m above sea level in Northeast and less than 60 m in Central Plain. Climate is Tropical Savanna (Köppen 'Aw'). The average annual precipitation ranges from 1,100 to 2,200 mm in the Northeast. The mean annual temperature varies from 26 to 28^{o}C.

Drainage, Permeability and Runoff: Somewhat poorly drained to poorly drained soils. Flooded by impounded rainwater and river water up to 50 cm for 3-5 months. Water table is below 3 meters during the peak of the dry season. Permeability and runoff are slow.

Vegetation and Landuse: Mainly are transplanted rice

Characteristic Profile Features: The Nakhon Phanom series is a member of fine, kaolinitic, isohyperthermic Aeric Plinthic Paleaquults. They are very deep soils and are characterized by a light yellowish brown or pale brown silty clay loam or clay loam with common to many distinct strong brown and/or yellowish brown mottled A horizon overlying a light gray or very pale brown or light yellowish brown silty clay or clay with dominant prominent red mottled (plinthite) argillic B horizon. Reaction is medium to strongly acid over strongly to very strong acid.

Typifying Pedon: Profile code no. is NE-N-29/12.(colors are for moist soil unless otherwise stated).

Location: Amphoe Tha Uthen Changwat Nakhon Phanom.

Sheet Name: **Sheet No.:**
Coordinate: **Elevation:** 120-150 m
Relief: level to nearly level **Slope:**: 1% or less
Physiography: lower part of peneplain
Parent material: alluvium
Drainage: somewhat poorly drained **Permeability:** slow
Runoff: slow **Ground water depth:** >1.5m
Flooding depth: up to 50 cm **Duration:** 3-5 month **Frequency:** every year
Annual rainfall: 1,100-2,200 m **Mean temp:** 26-28 ^{o}C **Climate type:** Tropical Savannah
Natural vegetation and/or land use: transplanted rice
Described by: C.Changprai et. al. **Date:** 1967
Revised by:

Horizon	Depth (cm)	Description
Ap	0-16	Light yellowish brown (10YR 6/4) silty clay loam; common prominent medium and coarse reddish yellow mottles; moderate medium subangular blocky structure; firm, slightly sticky, slightly plastic; few very fine tubular pores; strongly acid (field pH 5.5); clear, smooth boundary.
Bt1	16-41	Mottled, light brownish gray (10YR 6/2 20%), brown (10YR 5/3 20%) and yellowish red (5YR 4/6 60%) silty clay loam; strong medium and coarse subangular blocky structure; firm, slightly sticky, slightly plastic; broken moderately thick clay coating in pores and on ped faces; common fine tubular and few fine interstitial pores; few soft iron-manganese concretions; strongly acid (field pH 5.5); gradual, smooth boundary.

Bt2	41-73	Light yellowish brown (10YR 6/4) silty clay; common fine and medium prominent red (2.5YR 4/6) mottles; strong fine and medium subangular blocky structure; firm, sticky, plastic; many fine tubular pores; broken moderately thick clay coating on ped faces; strongly acid (field pH 5.5); gradual, smooth boundary.
Btg3	73-100	Light gray (10YR 7/2) silty clay; dominant medium and coarse prominent red (2.5YR 4/6) mottles; hard, firm, sticky, plastic; strongly acid (field pH 5.5); gradual, smooth boundary.
Btg4	100-180+	Light gray (10YR 7/2) clay; dominant yellowish red (5YR 4/6) mottles; firm, sticky, plastic; strongly acid (field pH 5.5).

Type Location: The Nakhon Phanom series was named for Changwat Nakhon Phanom in which soils of this series were first described.

Range of Profile Features:

The thickness of an Ap or A horizon ranges from 10 to 25 cm and has 10YR or 7.5YR hue, values of 3 to 6 and chromas of 2 to 4. Textures of loam or silt loam may occur in places. Structure is moderate medium to coarse blocky. Field pH value is from 5.5 to 6.5.

The B horizon has 10YR or 7.5YR hues, values of 5 to 7 and chromas of 1 to 4 in 10YR hue and 2 in 7.5YR hue; but the dominant chromas are 3 or 4 in the upper B horizon. Structure is moderate to strong medium and/or coarse blocky. Few iron-manganese concretions may occur. Field pH value is from 4.5 to 5.5.

Similar Soil Series:

Phan series (Ph): has higher pH value up to 7.0 or 8.0 in the subsoil.

Chiang Rai series (Cr): Plinthic Paleaquults which has no horizon with dominant chromas or more within 75 cm depth of the surface.

Manorom series (Mn): has a similar profile but has browner color in the subsoil and no plinthite.

Principal Associated Soils: These include That Phanom series occupies on the higher parts of old levee whereas the Chiang Rai occupy on the same lower physiography.

ANALYSIS RESULTS **Profile code no.:NE-N-29/12**

(oven dry basis) **Soil series : Nakhon Phanom (Nn)**

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_4OAc
			USDA grading			Sand-fraction grading					Lab	Field	1:1	1:1			
			sand	silt	clay	vc	c	m	f	vf	result	estim[n]	water	KCl			
	0-16	Ap	5.1	58.8	36.1						sicl	sicl	4.8	4.0	0.0	3.7	46
	16-41	Bt1	4.9	50.6	44.5						sic	sicl	5.1	4.1	0.4	2.0	40
	41-73	Bt2	4.6	50.2	45.2						sic	sic	5.4	4.1	0.0	2.2	37
	73-100	Btg1	4.3	48.0	47.7						sic	sic	5.5	4.0	0.0	2.6	52
	100-180+	Btg2	5.3	52.1	42.6						sic	sic	5..2	4.1	0.0	4.1	46

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 condut[y] (ECx10^6) dS m^{-1}
				Ca	Mg	K	Na	SUM cations (B)	Extr. acidity (A)	SUM (B+A)	CEC NH_4OAc (C)	CEC 100g Clay	B/Cx100	(Bx100)/ (B+A)			
0-16	1.1	1.12		1.00	0.40	0.10	0.30	1.80	11.40	13.20	8.30	23.0	22	14			0.04
16-41	4.1	0.62		0.80	0.30	0.10	0.20	1.40	12.00	13.40	9.80	22.0	14	10			0.01
41-73	13.6	0.28		0.70	0.40	0.10	0.30	1.50	13.30	14.80	9.30	20.6	16	10			0.01
73-100	1.5	0.21		1.00	1.10	0.10	0.30	2.50	9.50	12.00	10.30	21.6	24	21			0.01
100-180+	14.4	0.09		1.40	2.00	0.10	0.30	3.80	9.20	13.00	11.40	26.8	33	29			0.01