

Proposed by F.R.Moormann, 1963  
Revised by:  
O. C. Changprai, 1987  
1. S. Udomsri, 2004

## NONG KAE SERIES

Field Symbol: Nk

**Distribution:** Occupies small extent in the western part of the Central Plain and in the northern part of Peninsular Thailand.

**Setting:** Nong Kae soils are formed from old marine sediments and occur on old marine terraces. Relief is flat to nearly flat with a micro-relief caused by the presence of abundant termite mounds. Slopes are 2% or less. The climate is Tropical Savanna (Köppen 'Aw'). Mean annual precipitation ranges from 900 to 1,200 mm. Mean annual temperature is 27°C.

**Drainage, Permeability and Surface Runoff:** Moderately well drained to somewhat poorly drained. Permeability is slow and runoff is moderate. These soils are water saturated during the rainy season and are subject to temporary flooding (flash floods) by runoff water from the hills. Groundwater level falls below 1.5 m from the soil surface during the dry season.

**Vegetation and Land Use:** Mainly covered with low thorny shrubs (typically *Randia Tomentosa*), although small parts are used for broadcasted rice cultivation.

**Characteristic Profile Features:** Nong Kae series is a member of the Fine-loamy, mixed, active, isohyperthermic Aquic Natrustalfs. They are deep, strongly to medium acid over mildly to moderately alkaline soils. They are characterized by a dark grayish brown grayish brown or brown sandy loam or loamy sand A horizon overlying a brown grading to pale brown very pale brown or pinkish gray loam clay loam or sandy clay loam natric B horizon. These soils are mottled in the B and lower A horizons with strong brown, light olive brown and yellowish brown colours and have dark coloured coatings on ped faces. There is an abrupt boundary between the A and B horizon. Scattered iron/manganese nodules commonly occur in the B horizon which characteristically has a columnar or prismatic structure and very hard consistence when dry. Secondary lime nodules occur in the lower B and C horizons.

**Typifying Pedon:** Profile code number is SW-57/15

**Location:** Between Ban Lai Bon-Ban Pong Kasang, Amphoe Kui buri Changwat Prachuab Khiri Khan.

**Sheet Name:** Ban Yang Chum

**SheetNo.:** 4933 III

**Coordinate:** 850(860)370(380)

**Elevation:** 50-60 m MSL.

**Relief:** nearly level to gently undulating

**Slope:** 2%

**Physiography:** old marine terraces

**Parent material:** old marine sediments

**Drainage:** moderately well drained

**Permeability:** slow

**Runoff:** rapid

**Ground water depth:** >2 m

**Flooding depth:** -

**Duration:** - month

**Frequency:-**

**Annual rainfall:** 998.5 mm

**Mean temp:** 27.5 °C

**Climate type:** Tropical Savannah

**Natural vegetation and/or land use:** grasses, spiny shrubs and cactus

**Other:**

**Described by:** Mormann and Sanan

**Date:** 20 November, 1968

**Revised by:** S. Udomsri

Horizon	Depth (cm)	Description
A	0-3	Brown to dark brown (10YR4/3) loamy sand; weak fine crumb; loose; few interstitial pores; many fine roots; moderately acid (field pH 6.0); clear, smooth boundary.
E	3-12/20	Brown (10YR5/3) loamy sand; weak coarse platy; slightly hard, few tubular pores; few fine roots; strongly acid (field pH 5.5); abrupt, wavy boundary.

Bt	12/20-27/30	Brown (7.5YR5/4) sandy clay; few fine mottles; coarse columnar (10-18 cm) breaking to moderate medium and coarse subangular blocky structure; extremely hard; dark colored coatings on ped faces; few tubular pores; common fine roots; mildly alkaline (field pH 7.0); clear, wavy boundary.
Btg	27/30-40	Pale brown (10YR6/3) sandy clay; common mottles; moderate fine subangular blocky structure; very hard; common tubular and interstitial pores; few lime nodules; few fine roots; moderately alkaline (field pH 8.0); clear, smooth boundary.
BCg	40-94 <sup>+</sup>	White (10YR8/2 dry), very pale brown (10YR7/3 moist) sandy clay loam to clay loam; common strong brown mottles; moderate fine subangular blocky structure; very hard; few tubular pores; common black manganese spots and lime concretions; very few roots; moderately alkaline (field pH 8.0).

**Type Location:** Name of village, Ban Nong Kae, Amphoe Hua Hin, Changwat Prachuab Khiri Khan.

**Range of Profile Features:**

The A horizon is from 10 to 30 cm thick, has 10YR hue, values of 4 or 5 and chromas of 2 or 3. Structure is weak to moderate, fine crumb and field pH values range from 5.0 to 6.0.

The B horizon has 10YR and 7.5YR hues, values of 5 to 7 and chromas of 3 or 4 in 10YR and 2 or 4 in 7.5YR hues. Structure is moderate to strong columnar or prismatic, breaking to moderate, medium and coarse blocky. Field pH values range from 7.0 to 8.0.

**Similar Soil Series :**

Kula Ronghai series (Ki) - is poorly drained and mainly founded in Northeast Plateau with contain rock salt in deeper subsoils.

**Principal Associated Soils:** These include Pran Buri series on adjacent terraces, and Hua Hin series on beach ridges.

**ANALYSIS RESULTS**  
(oven dry basis)

**Profile code No.: SW-57/15**  
**Soil series : Nong Kae (Nk)**

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	1:1			
			sand	silt	clay	vc	c	m	f	vf	result	estim <sup>1</sup>	water	KCl			
P11	0-3	A	71.0	27.8	1.2						ls	ls	6.4	4.6	0.4	2.6	67
P12	3-12/20	E	60.3	30.0	9.7						sl	ls	7.0	5.4	0.6	2.6	40
P13	12/20-27/30	Bt	36.8	41.2	22.0						l	sc	8.8	7.3	1.7	7.1	117
P14	27/30-40	Btg	30.5	47.0	22.5						l	sc	9.0	7.3	1.2	2.9	143

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol <sub>(+)</sub> kg <sup>-1</sup> )										Base satur <sup>1</sup> (%)		ECEC cmol <sub>(+)</sub> kg <sup>-1</sup> (B+D)	Al KCl extr. cmol <sub>(+)</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	(Bx100)/(B+A)				
				0-3	0.1	0.22		0.35	0.53	0.13	0.34	1.35	0.70	2.05	1.89			
3-12/20	2.6	0.30		1.06	1.17	0.08	2.40	4.71	2.09	6.80	5.58	57.5	84	69			0.01	
2/20-27/3	4.7	0.16		10.71	4.03	0.32	9.00	24.06	0.79	24.85	12.75	58.0	100	97			0.08	
27/30-40	3.8	0.02		4.56	1.59	0.36	9.00	15.51	0.79	16.30	11.60	51.6	100	95			0.10	