

Proposed by: N. Chorhaka, 1983  
 Revised by:  
 1. N. Chorhaka, 1988  
 2. P. Wiwatwongwana, 2004

**NAM DUK SERIES**

**Field Symbol: Nd**

**Distribution:** Occupies small extent in the Central Highlands, mainly in Changwat Phetchabun.

**Setting:** Nam Duk soils are formed from alluvium on the terrace. Relief is undulating to gently rolling which slopes range from 2 to 8%. Elevation is approximately from 130 to 220 m above sea level. The climate is Tropical Savannah (Koppen 'Aw'). Average annual precipitation ranges from 1,100 to 1,600 mm. Mean annual air temperature ranges from 26 to 28 °C.

**Drainage, Permeability and Runoff:** Moderately well drained. Permeability is estimated to be moderate and surface runoff is medium. Ground water table falls below 2.5 m during the dry season.

**Vegetation and Land Use:** Mainly used for upland crops such as some sorghum and beans.

**Characteristic Profile Features:** Nam Duk series is a member of fine-silty, mixed, active, isohyperthermic Oxyaquic Paleustalfs. They are very deep soils characterized by a brown, dark brown or dark grayish brown loam or silty clay loam A horizon. Argillic B horizon is reddish brown to yellowish red grading to red which intrun overlies brown to strong brown in very deep subsoil. Texture is clay loam grading to clay. Reaction is strongly acid to slightly acid over slightly acid to moderately alkaline. Mottles are strong brown or yellowish red in the subsoil.

**Typifying Pedon:** Profile code no. is NC-47/128 (moist colors unless otherwise stated).

**Location:** Ban Nam Duk Si Thong, Tambon Pak Chong Amphoe Lom Sak Changwat Phetchabun.

**Sheet Name:** Ban Nam Duk Nau

**Sheet No.:** 5242 II

**Coordinate:** -

**Elevation:** 150 m (MSL)

**Relief:** gently undulating

**Slope:** 2 %

**Physiography:** terraces

**Parent material:** alluvium

**Drainage:** moderately well drained

**Permeability:** moderate

**Runoff:** moderate

**Ground water depth:** >2 m

**Flooding depth:** -

**Duration:** -

**Frequency:** -

**Annual rainfall:** 1,124.7 mm

**Mean temp.:** 27.5 °C

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

**Natural vegetation or land use:** upland crops such as sorghum and beans

**Described by:** N. Chorhaka

**Date:**

**Revised by:** Phusit Wiwatwongwana

**Date:** 24 May, 2004

Horizon	Depth (cm)	Description
Ap	0-18	Brown to dark brown (7.5YR3-4/2) loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine roots; medium acid (field pH 6.0); clear, smooth boundary.
Bt1	18-36/47	Yellowish red (5YR4/6) clay loam; moderate medium subangular blocky structure; firm; sticky, plastic; moderately thick continuous clay coatings on ped faces and in pores; many very fine roots; strongly acid (field pH 5.5); clear, wavy boundary.
Bt2	36/47-70	Reddish brown (5YR4/4) loam to clay loam; moderate medium subangular blocky structure; firm, sticky, plastic; moderately thick continuous clay coatings on ped faces and in pores; common very fine roots; moderately acid (field pH 6.0); clear, smooth boundary.
Bt3	70-116	red (2.5YR4/6) and dark reddish brown (5YR3/4) loam; many fine and

		medium distinct strong brown (7.5YR5/6) mottles; moderate coarse subangular blocky structure; firm, sticky, plastic; patchy thin clay coatings on ped faces and in pores; few very fine roots; slightly acid (field pH 6.5); gradual, smooth boundary.
Bt4	116-145	Red (2.5YR4/8) clay loam; many fine and medium distinct reddish yellow (7.5YR6/6) mottles; moderate coarse subangular blocky structure; firm, sticky, plastic; patchy thin clay coatings on ped faces and in pores; very few very fine roots; few fine soft and hard iron-manganese nodules; neutral (field pH 7.0); clear, smooth boundary.
BC	145-180+	Strong brown (7.5YR5/8) slightly gravelly clay loam; many fine and medium distinct yellowish red (5YR4/6) and common medium distinct brown (7.5YR5/2) mottles; weak coarse subangular blocky structure; firm, sticky, plastic; very fine roots; few soft and hard iron-manganese nodules; moderately alkaline (field pH 8.0).

**Type Location:**

Nam Duk series was named for Ban Nam Duk, Tambon Pak Chong, Amphoe Lom Sak, Changwat Phetchabun. This soil used to be named as Phetchabun - clayey variant when the detailed reconnaissance soil survey was conducted in the province.

**Range of Profile Features:**

The thickness of an A horizon varies from 10 to 25 cm and has 7.5YR or 10YR hues, values of 3 to 5 and chromas of 2 to 4. Structure is weak to moderate fine and medium subangular blocky. Field pH value range from 5.5 to 6.5. The argillic B horizon has 5YR to 2.5YR hues, values of 3 to 5 and chromas of 3 to 8. Structure is moderate medium and coarse subangular blocky. Field pH values range from 5.5 to 6.5 and increase to 7.0 or 8.0 in the deeper soil subsoil.

**Similar Soil Series:**

Warin series (Wn): is fine-loamy family and lower pH value.

Phetchabun (Pe): is fine-loamy family and moderately deep.

**Principal Associated Soils:**

These include Warin, Phetchabun, Nam Chun and Nam Len series.

**ANALYSIS RESULTS**  
(oven dry basis)

Profile code no.: NC-47/128  
Soil series: Nam Duk (Nd)

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>n</sup>	water	KCl			
6-16384	0-18	Ap	32.4	47.1	20.5	0.4	0.8	2.6	0.4	28.2	l	l	5.5	4.2		5.1	101
6-16385	18-36/47	Bt1	27.4	44.6	28.0	0.0	1.1	2.5	0.5	23.3	cl	cl	5.4	4.1		1.3	62
6-16386	36/47-70	Bt2	28.1	44.9	27.0	0.1	0.4	1.9	0.5	25.2	l-cl	l-cl	5.9	4.4		0.9	53
6-16387	70-116	Bt3	27.0	48.6	24.4	0.1	0.5	2.5	3.6	20.3	l	l	5.7	4.5		1.4	52
6-16388	116-145	Bt4	20.7	48.2	31.1	0.0	0.3	1.3	0.3	18.8	cl	cl	6.6	5.3		1.8	62
6-16389	145-180+	BC	20.1	44.3	35.6	0.7	0.5	1.4	1.8	15.7	cl	sgcl	6.8	5.3		2.3	62

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)	AI 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			
0-18	1.9	1.14		5.70	2.80	0.30	0.40	9.20	7.80	17.00	11.7	57.1	79	54		0.18
18-36/47	2.8	0.48		9.10	3.10	0.20	0.40	12.80	6.50	19.30	15.5	55.4	83	66		0.18
36/47-70	2.4	0.46		9.80	2.60	0.10	0.30	12.80	5.00	17.80	14.4	53.3	89	72		0.16
70-116	2.2	0.43		9.30	2.40	0.10	0.30	12.10	5.20	17.30	12.7	52.0	95	70		0.17
116-145	3.0	0.26		14.80	2.80	0.20	0.40	18.20	3.30	21.50	16.5	53.1	100	85		0.23
145-180	3.3	0.07		14.40	2.70	0.20	0.40	17.70	3.30	21.00	16.6	46.6	100	84		0.24

Surveyor : N. Chorphaka