

Proposed by P. Vijarnsorn, 1973
Revised by :
P. Vijarnsorn and staffs, 1988
W. Sirichuaychoo, 2004

NA THAM SERIES

Field Symbols: Ntm

Distribution: Occupies moderate extent in Peninsular Thailand and some areas in Southeast Coast of Thailand.

Setting: Na Tham soils are formed from alluvium over fine grain clastic rocks (shale and phyllite) and occurred on alluvial fan. Relief is gently undulating to undulating with slopes ranging from 2 to 12 percent. Elevation ranges from 15 to 40 m above mean sea level. The climate is Tropical Monsoon (Koppen 'Am') or Tropical Rain Forest (Koppen 'Af'). Average annual precipitation is above 2,000 mm. Average annual air temperature is from 26 °C to 28°C.

Drainage, Permeability and Runoff: Drainage is well to moderately well drained, permeability is estimated to be moderate and surface runoff is medium. Ground water level lies below 1.5 m throughout the year.

Vegetation and Land Use: Mainly used for para rubber. Some parts are planted to fruit trees.

Characteristic Profile Features: The Na Tham series is a member of the fine-loamy, mixed, semiactive, isohyperthermic Typic (Aquic) Plinthudults (soil taxonomy, 2003). They are moderately deep soils to ironstones and are characterized by a very dark grayish brown or dark brown fine sandy loam surface or A horizon overlying a strong brown or yellowish brown fine sandy clay loam upper argillic B horizon. These in turn overly a mixed brownish very gravelly sandy clay loam (very gravelly clay loam) lower argillic B horizon which is underlain by a mottled clay or clay loam accompanying with plinthite of more than half of the soil matrix. Gravels are mainly composed of ironstones which may include rounded or subrounded rock pebbles. Reddish and grayish mottles are present in common throughout the argillic B horizon. Very strongly acid to strongly acid, reaction values, range from 5.0 to 5.5 in surface soil and very strongly acid, reaction values range from 4.5 to 5.0 in subsoil.

Typifying Pedon: Na Tham fine sandy loam - para rubber, oil palm plantation, from Ban Na Tham, Tambon Khlong Teng, Amphoe Muang, Changwat Trang, 10 m above mean sea level, 3 percent slopes (sheet name Changwat Trang, sheet number 4933 IV).

Profile Code Number: S-65/25, described by P. Vijarnsorn, 23 January 1973 (moist colors unless otherwise stated).

Horizon	Depth (cm)	Description
A	0-8/11	Dark brown (10YR3-4/3) fine sandy loam; moderate medium and coarse subangular blocky structure; firm, nonsticky and nonplastic; few fine tubular pores; many fine roots; strongly acid (field pH 5.5); clear wavy boundary.
BA	8/11-25	Yellowish brown (10YR5/8) fine sandy loam; moderate fine and medium subangular blocky structure; firm, nonsticky and nonplastic; patchy organic matter coating on ped faces; few very fine tubular pores; common fine and few medium roots; very strongly acid (field pH 5.0); clear smooth boundary.
Bt1	25-52	Mixed strong brown (7.5YR5/8) and brownish yellow (10YR6/6) sandy clay loam; common fine and medium distinct yellowish red (5YR4/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; patchy thin clay coating on ped faces; common fine tubular pores; few fine roots; very strongly acid (field pH 5.0); gradual smooth boundary.
Bt2	52-74	Mixed strong brown (7.5YR5/8) and brownish yellow (10YR6/6) clay loam; many medium distinct yellowish red (5YR4/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; broken thick clay coating along roots channels, common moderate thick cutan on ped faces and few thick organic matter coating; common fine and few fine tubular pores; very strongly acid (field pH 5.0); clear smooth boundary.

Bcgv	74-120	Mixed yellowish brown (10YR5/6) light gray (10YR7/2) red (10R4/8) and yellowish red (5YR5/8) very gravelly clay; gravels composed of iron stones diameter up to 1.0 cm, rounded sandstone's which iron coating diameter about 3-4 cm; very strongly acid (field pH 5.0).
BCgv1	120-150	Mixed light gray (10YR7/2) dark yellowish brown (10YR4/6) and yellowish brown (10YR5/8) clay loam; plinthite more than 50% of the matrix; very strongly acid (field pH 5.0).
BCgv2	150-220	Mixed light gray (10YR7/2) weak red (10R4/4) and dark red (10R3/6) clay; moderately thick clay coating on ped faces and few thick organic matter coating; plinthite more than 50% of the soil matrix; very strongly acid (field pH 5.0).

Remarks: below 150 cm from the soil surface is reduction zone.

Type Location:

Name is village, Ban Na Tham, Tambon Khlong Teng, Amphoe Muang Changwat Trang.

Range of Profile Features:

The surface or A horizon sandy loam, is 10 to 15 cm in thickness and has 10YR or 7.5YR hues, values 3 or 4 and chromas 2 to 4. Texture of loam may also occur. Structure is weak and moderate fine subangular blocky. Very strongly acid to strongly acid, reaction values range from 5.0 to 5.5.

The argillic B horizon has 10YR or 7.5YR hues, values 5 or 6 and chromas 4, 6 or 8. The horizon of gravelly fine sandy clay loam or gravelly clay loam is commonly present at some depth between 75 to 100 cm of the soil surface. Mottles are in 5YR or 2.5YR hues, values 4 or 5 and chromas 6 or 8 and may be mixed with grayish mottles. Very strongly acid to strongly acid, reaction values range from 4.5 to 5.5.

The BC or C horizon usually occurs at some depth between 90 to 150 cm from the surface and has 10YR hue, values 6 or 7 and chromas 1 to 2. Reddish mottles or plinthite are prominent in this horizon. Structure is massive or weak medium blocky. Very strongly acid, reaction values range from 4.5 to 5.0.

Similar Soil Series:

Pak Khom series (Pkm): fine-loamy, mixed, semiactive, isohyperthermic Typic (Aquic) Plinthudults, no gravelly horizon within the profile.

Principal Associated Soils:

These commonly include Pak Khom and Tha Sae series.

Tha Sae series (Te): fine-loamy, kaolinitic, isohyperthermic Typic Kandiodults, commonly occur in the higher position of well drained sites.

ANALYSIS RESULTS

Profile code No.: S-65/25

(oven dry basis)

Soil series: Na Tham series (Ntm)

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 water	1:1 KCl			
			sand	silt	clay	vc	c	m	f	vf	result	estim ⁿ					
Pd-148	0-8/11	A	58.0	33.0	9.0						sl	fsl	5.3	4.2	0.3	2.3	53
Pd-149	8/11-25	BA	56.5	32.5	11.0						sl	fsl	4.7	3.6	0.3	2.3	29
Pd-150	25-52	Bt1	50.0	29.5	20.5						l	scl	5.7	3.8	0.0	1.1	12
Pd-151	52-74	Bt2	45.5	27.5	27.0						l	cl	5.6	4.0	0.0	1.7	15
Pd-152	74-120	Bcgv	46.5	25.5	28.0						scl-cl	vgc	5.8	4.5	0.0	1.2	18
Pd-153	120-150	BCgv1	38.5	30.0	31.5						cl	cl	5.6	3.9	0.0	1.1	14
Pd-154	150-220	BCgv2	25.5	30.0	44.5						c	c	5.5	4.8	0.0	1.4	108

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)				
0-8/11	0.3	3.18		1.40	0.74	0.10	0.20	2.44	7.10	9.54	6.9	76.7	35	26			0.07	
8/11-25	0.9	2.96		0.20	0.20	0.04	0.10	0.54	7.70	8.24	6.3	57.3	9	7			0.02	
25-52	1.9	0.49		0.20	0.20	0.10	0.50	1.00	9.10	10.10	7.9	38.5	13	10			0.01	
52-74	1.7	0.43		0.10	0.20	0.10	0.20	0.60	11.00	11.60	9.7	35.9	6	5			0.01	
74-120	2.3	0.32		0.30	0.20	0.10	0.40	1.00	11.20	12.20	10.5	37.5	10	8			0.01	
120-150	2.2	0.25		0.67	0.46	0.10	0.50	1.73	11.20	12.93	12.5	39.7	14	13			0.02	
150-220	3.0	0.38		1.50	0.90	0.30	0.50	3.20	15.70	18.90	20.0	44.9	16	17			0.04	

Surveyor: P. Vijarnsorn

Reported by: W. Sirichuaychoo

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