

Proposed by: W. Boonyawat, 1969  
Revised by:  
1. N. Chorphaka, 1987  
2. A. Potichan, 2004

**HANG CHAT SERIES**

**Field Symbol: Hc**

**Distribution:** Moderate extent in northern Thailand.

**Setting:** Hang Chat soils are formed from alluvial deposits (mainly from granite) over residuum of granitic rocks on the coalescing fans or fans. Relief is gently undulating to rolling. Slopes range from 2 to 16 percent. The climate is Tropical Savanna (Koppen 'Aw'). The average annual precipitation ranges from 1,100 to 1,800 mm.

**Drainage, Permeability and Runoff:** Well drained. Permeability is estimated to be moderate. Runoff is medium to rapid.

**Vegetation and Land Use:** The soils are covered by dipterocarp and regrowth forest, locally cleared for upland crops and fruit trees such as maize, sugarcane, groundnut, mango, tamarind, pineapple etc.

**Characteristic Profile Features:** Hang Chat series is a member of fine, kaolinitic, isohyperthermic Typic Kandiuults. They are very deep soils and are characterized by a dark brown or dark grayish brown sandy loam overlying a yellowish red, reddish yellow or red clay loam, clay or sandy clay kandic B horizon. Reaction is moderately acid to very strongly acid, decreasing with depth.

**Typifying Pedon:** Profile code no. is N5 of 17<sup>th</sup> WCSS (moist colours unless otherwise stated).

**Location:** Field plots of Hang Chat horticulture research station, Ban Thung Kwian, Tambon Wiang Tan, Amphoe Hang Chat, Changwat Lampang.

**Sheet Name:** Amphoe Hang Chat

**Sheet No.:** 4845 I

**Coordinate:** 47Q NA 319258

**Elevation:** 300 m (MSL)

**Relief:** gently undulating

**Slope:** 3 %

**Physiography:** alluvial fan

**Parent material:** old alluvium over residuum from granite

**Drainage:** well drained

**Permeability:** rapid to moderate

**Runoff:** slow

**Ground water depth:** >2 m

**Flooding depth:** -

**Duration:** -

**Frequency:** -

**Annual rainfall:** 1,076.8 mm

**Mean temp.:** 25.9 °C

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

**Natural vegetation or land use:** Fruit trees such as tamarind, mango etc.

**Described by:** P.Choldamrongkul, S.Udomsri, S.Rianthong,  
A.Pinjongskuldit, Panikorn and W.Pholrachom

**Date:** 22 April, 2000

**Revised by:** Aniruth Potichan

**Date:** 23 May, 2004

Horizon	Depth (cm)	Description
A1	0-6/8	Dark brown to brown (7.5YR4/3) sandy loam; weak very fine and fine subangular blocky structure; very friable, non-sticky and non-plastic; many fine roots; some charcoal fragments and termite activities; very strongly acid (field pH 5.0); clear and smooth boundary.
A2	6/8-14/16	Strong brown (7.5YR4/6); sandy loam; weak very fine, fine and medium subangular blocky structure; friable, non-sticky and non-plastic to slightly plastic; many very fine and fine roots; very strongly acid (field pH 4.5); clear and smooth boundary.
BA	14/16/- 26/29	Mixed dark brown to brown (7.5YR 4/3-4) and yellowish red (5YR 4/6) sandy loam; moderate to strong fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and non-plastic; common very fine and fine roots; very strongly acid (field pH 4.5); clear and smooth boundary.

Bt1	26/29-49	Yellowish red (5YR5/6-8) sandy clay loam; strong fine, medium and coarse subangular blocky structure; hard, firm, slightly sticky and slightly plastic; patchy thin cutan on ped faces and pore walls; common very fine and fine roots and few medium roots; some termite activities; very strongly acid (field pH 4.5); clear and smooth boundary.
Bt2	49-70	Yellowish red (5YR5/8) sandy clay loam; strong fine, medium and coarse subangular blocky structure; hard, firm, slightly sticky and slightly plastic; broken moderately thick cutan on ped faces and pore walls; common very fine and fine roots; some termite activities; very strongly acid (field pH 4.5); clear and smooth boundary.
Bt3	70-93/96	Yellowish red (5YR5/8); sandy clay loam to clay loam; strong medium and coarse subangular blocky structure; hard, friable, sticky and slightly plastic; broken moderately thick cutan on ped faces and pore walls; common very fine and few medium roots; very strongly acid (field pH 4.5); clear and wavy boundary.
Bt4	93/96-117	Mixed yellowish red (5YR5/8) and yellow (10YR7/6) clay loam; common fine prominent red mottles (2.5YR4/6); strong medium and coarse subangular blocky structure; hard, friable, sticky and slightly plastic; patchy thin cutan on ped faces and pore walls; common very fine and medium roots; very strongly acid (field pH 4.5); clear and smooth boundary.
2Bt5	117-148	Mixed reddish yellow (5YR6/6), light yellowish brown to brownish yellow (10YR6/4-6) and red (2.5YR5/6) clay loam; strong fine, medium and coarse subangular blocky structure; hard, friable, sticky and slightly plastic; patchy thin cutan on ped faces and pore walls; few very fine and fine roots; many strongly weathered granite composed of quartz and some feldspar; very strongly acid (field pH 4.5); clear and smooth boundary.
2Bt6	148-200	Mixed white (10YR8/1), reddish yellow (7.5YR6/8) and red (2.5YR4/4) clay loam; strong medium and coarse subangular blocky structure; friable, sticky and slightly plastic; patchy thin cutan on ped faces and pore walls; few very fine and fine roots; many strongly weathered granite composed of quartz and some feldspar; very strongly acid (field pH 4.5).

**Type Location:**

Hang Chat series was name for Amphoe Hang Chat, Changwat Lampang.

**Range of Profile Features:**

The A horizon is from 10 to 15 cm thick and has 10YR or 7.5YR hues, value of 3 through 5 and chromas of 2 through 4 with sandy loam texture. The structure is weak medium and coarse blocky, weak coarse platy may be locally observed in the uppermost layer. Reaction range is strongly acid to neutral (field pH 5.5 to 7.0).

The B horizon has hues of 5YR or 2.5YR values of 4 through 6 and chromas of 6 or 8. The B horizon is kandic evidence of clay and iron translocation in the form of cutans on ped faces and in pores. The structure is weak to moderate medium and coarse blocky. Reaction range is very strongly acid to strongly acid (field pH 4.5 to 5.5). A medium to coarse sand fraction may occur in the B horizon.

**Similar Soil Series:**

Warin series (Wn): derived from alluvium or wash deposits from sandstone.

Nong Mot series (Nm): is a residual soils derived from granite and granite derived rocks.

Mae Taeng series (Mt): derived from alluvial deposits and soil color is hue 2.5YR to 10R in the B horizon.

**Principal Associated Soils:**

These include Nong Mot, Pong Tong series.

ANALYSIS RESULTS  
(oven dry basis)

Profile code no.: C11 N5 of 17<sup>th</sup> WCSS  
Soil series: Hang Chat (Hc)

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			
W38	0-14/16	A	76.9	15.2	8.0	7.3	15.6	24.2	20.3	9.6	LS	SL	4.3	3.7	-	6.0	26
W40	16-26/29	BA	71.9	15.2	12.9	5.4	12.2	24.4	20.9	9.0	SL	SL	4.6	3.7	-	16.0	21
W41	29-70	Bt1+2	54.4	11.4	34.2	11.4	13.2	13.2	10.9	5.8	SCL	SCL	4.9	3.8	-	2.0	12
W43	70-93/96	Bt3	37.9	12.9	49.2	8.5	7.5	7.3	8.3	6.3	C	SCL	4.7	3.7	-	1.0	23
W44	96-117	Bt4	38.2	9.6	52.2	9.6	6.5	6.3	9.3	6.4	C	CL	4.8	3.7	-	1.0	25
W45	117-148	2Bt5	34.1	18.9	47.0	7.1	6.0	5.0	9.5	6.5	C	CL	4.9	3.7	-	1.0	21
W46	148-200	2Bt6	32.7	18.9	48.4	6.5	4.5	4.8	9.9	7.0	C	CL	4.8	3.7	-	1.0	20

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)	Al 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				SUM cations (B)	Extr. acidity (A)				SUM (B+A)	CEC NH <sub>4</sub> OAc (C)	CEC 100g Clay	B/Cx100	(Bx100)/(B+A)
				Ca	Mg	K	Na	Ca	Mg	K	Na										
0-14/16		0.53	0.03	0.50	0.20	0.10	0.10	0.90	3.00	3.90	2.4	30.2	38	23	1.2	0.33	-				
16-26/29		0.27	0.02	0.40	0.30	0.10	0.20	1.00	3.00	4.00	2.3	17.8	43	25	1.7	0.65	-				
29-70		0.16	0.01	0.60	0.60	0.10	0.10	1.40	4.10	5.50	4.0	11.7	35	25	2.7	1.26	-				
70-93/96		0.15	0.02	0.40	0.50	0.10	0.10	1.10	7.20	8.30	6.0	12.2	18	13	3.6	2.49	-				
96-117		0.13	0.01	0.40	0.40	0.10	0.20	1.10	7.20	8.30	5.8	11.1	19	13	3.3	2.19	-				
117-148		0.12	0.01	0.30	0.40	0.10	0.20	1.00	7.50	8.50	6.1	13.0	16	12	3.6	2.62	-				
148-200		0.08	0.01	0.50	0.40	0.10	0.10	1.10	7.30	8.40	6.4	13.2	17	13	3.5	2.40	-				