Proposed by: F. R. Moormann, 1963
Revised by:
1. N. Chorphaka, 1987
2. A. Potichan, 2004

HANG DONG SERIES **Field Symbol: Hd**

Distribution: Occupies large extent in northern Thailand.

Setting: Hang Dong soils are formed from alluvium and occur on flood plain and semi-recent terraces. Relief is level or nearly level, slopes are 2 percent or less with scattered termite mounds. The climate is Tropical Savanna (Koppen 'Aw'). The average annual precipitation is in the range of 1,100 to 1,800 mm.

Drainage, Permeability and Runoff: Poorly drained. Permeability and runoff are slow. These soils are normally flooded by impounded rainwater for 5 months during the rainy season, to a depth of not more than 30 cm.

Vegetation and Land Use: The soils are mainly used for transplanted rice cultivation. some tobacco and garden crops are grown in the dry season if irrigation water is available.

Characteristic Profile Features: Hang Dong series is a member of the fine, mixed, semiactive isohyperthermic Typic Endoaqualfs. They are very deep soils and are characterized by a gray or dark gray silty clay loam or clay loam A horizon overlying a gray clay or silty clay argillic B horizon. Common to many distinct yellowish brown or strong brown mottles occur throughout the profile. Reaction is medium acid to mildly alkaline, increasing with depth.

Typifying Pedon: Profile code no. is NE-N-36/17 (moist colours unless otherwise stated).

Location: Front of Ban San Ton Pui school, Ban San Ton Pui, about 16 km south of Amphoe Mae Sai Changwat Chiang Rai.

Sheet Name: Amphoe Mae Sai **Sheet No.:** 4949 I
Coordinate: 915443 **Elevation:** 385 m (MSL)
Relief: nearly level **Slope:** 1 %
Physiography: semi-recent terrace
Parent material: alluvium
Drainage: poorly drained **Permeability:** slow
Runoff: slow **Ground water depth:** >2 m (dry season)
Flooding depth: 30-50cm **Duration:** 5 month **Frequency:** every year
Annual rainfall: 1,530 mm **Mean temp.:** 24.0 °C **Climate type:** Tropical Savannah (Aw)
Natural vegetation or land use: paddy field
Described by: Thamrong and J.D. Cowie **Date:**
Revised by: Aniruth Potichan **Date:** 24 May, 2004

Horizon	Depth (cm)	Description
Apg1	0-7	Gray (10YR6/1) dry, gray (10YR5/2) moist, silty clay; common fine distinct yellow (10YR7/8) mottles along root channels; moderate fine subangular blocky structure; firm, sticky and plastic; many very fine and fine roots; moderately acid (field pH 6.0); abrupt and wavy boundary.
Apg2	7-18/24	Gray (10YR6/1) dry, gray (10YR5/1) moist, silty clay loam; common fine distinct yellowish brown (10YR5/6) mottles along root channels; massive to weak coarse subangular blocky structure; extremely firm, sticky and plastic; few very fine roots; moderately acid (field pH 6.0); abrupt and wavy boundary.
BAg	18/24-20/29	Gray (10YR5/1-6/1) silty clay with angular quartz sand grains and few fine angular quartz pebbles; common fine distinct yellow (10YR7/6) mottles; weak medium subangular blocky structure; firm, sticky and slightly plastic; very fine roots; slightly acid (field pH 6.5) abrupt and wavy boundary.

Btg1	20/29-74	Gray (10YR6/1) clay; common fine and medium distinct yellow (10YR8/6) mottles inpeds and common medium distinct light yellowish brown (2.5Y6/4) mottles as coatings along root channels especially in the upper part of the horizon; moderate coarse prismatic breaking to moderate coarse and medium subangular blocky structure; firm, sticky and plastic; continuous thick cutans, mainly on ped faces and in pores; few very fine roots; neutral (field pH 7.0); gradual and smooth boundary.
Btg2	74-120+	Gray (10YR5-6/1) clay; many fine and medium distinct yellow (2.5Y7/6) and yellowish brown (10YR5/6) mottles inpeds; moderate coarse subangular blocky structure; firm, sticky and plastic; broken thick cutans, mainly on ped faces and in pores; few strongly developed large and slightly inclined slickensides; few small, hard, spherical iron-manganese nodules of concentric structure; very few very fine roots; neutral (field pH 7.0).

Type Location:

Hang Dong series was named for Amphoe Hand Dong, Changwat Chiang Mai

Range of Profile Features:

The thickness of the A horizon is from 10 to 20 cm. It has 10YR hues, values of 4 through 5 and chromas of 2 or less clay or silty clay as well as silt loam texture may also occur. The structure is moderate fine and medium subangular blocky. A massive or weak coarse subangular blocky structure may be present under the plough layer. Reaction range is slightly acid to strongly acid (field pH 5.5 to 6.5).

The B horizon has clay texture; the clay fraction increasing with depth; hues of 10YR, values of 6 chromas of 2, values of 5 or less chromas of 1 or less. The B horizon is argillic showing evidence of clay translocation in the form of cutans, mainly on ped faces and in pores. Structure is weak to moderate coarse prismatic breaking to moderate medium and fine subangular blocky structure. Few to common small, soft and hard iron-manganese nodules of concentric structure may be present in the subsoil. Very few to few visible mica flakes occur throughout the profile. Reaction is slightly acid to moderately alkaline (field pH 6.5 to 8.0).

Similar Soil Series:

Nan series (Na): has pinkish or reddish gray (7.5YR to 5YR hues) color.

Mae Sai series (Ms): browner in colour with 10YR hue and is in the fine-silty particle size class.

Phan series (Ph): has higher chroma (6-8) in subsoil and contains 5-50 percent of plinthite in subsoil.

Principal Associated Soils:

These include Phimai, Mae Sai series.

ANALYSIS RESULTS

(oven dry basis)

Profile code no.: NE-N-36/17

Soil series: Hang Dong (Hd)

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			
Pa-464	0-7	Apg1	2.3	43.7	54.0						sic	sic	5.4	4.3		29.8	70
Pa-465	7-18/24	Apg2	6.5	54.1	39.4						sicl	sicl	5.8	4.9		6.4	61
Pa-466	18/24-20/29	Btg1	6.5	40.6	52.9						sic	sic	6.7	5.5		3.1	72
Pa-467	20/29-74	Btg2	4.8	35.9	59.3						c	c	7.5	6.4		4.8	70
Pa-468	74-120+	Btg3	3.8	27.8	68.4						c	c	7.9	6.5		5.9	67

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} ($EC \times 10^{6}$) 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)			
0-7	3.5	1.79		5.40	2.60	0.10	0.30	8.40	9.50	17.90	14.3	26.5	59	47			0.04
7-18/24	1.9	1.30		5.40	3.10	0.10	0.30	8.90	6.50	15.40	13.8	35.0	64	58			0.03
18/24-20/29	2.2	0.54		5.80	3.90	0.10	0.30	10.10	3.80	13.90	14.1	26.7	72	73			0.02
20/29-74	2.9	0.36		5.50	7.50	0.10	0.30	13.40	2.40	15.80	17.4	29.3	77	85			0.04
74-120+	2.6	0.26		11.50	0.80	0.10	0.30	12.70	2.20	14.90	15.5	22.7	82	85			0.05

Surveyor: Thamrong and J.D. Cowie

Date: 23 January, 1969