

Proposed by: T. Tongchuta, 1963  
Revised by:  
1. N. Chorphaka, 1988  
2. A. Potichan, 2004

**CHIANG KHONG SERIES**

**Field Symbol: Cg**

**Distribution:** Occupies moderate extent in the north of Thailand.

**Setting:** Chiang Khong soils are formed from colluvial and residual materials of basic to intermediate igneous rocks (mainly andesite, but also gabbro, basalt and basic hypabyssal rocks). Relief is undulating to hilly, slopes range from 3 to 35 percent. The climate is Tropical Savanna (Koppen 'Aw'). The average annual precipitation is 1,100 to 1,600 mm.

**Drainage, Permeability and Runoff:** Well drained. Permeability is moderate. Runoff is slow to rapid.

**Vegetation and Land Use:** Originally mixed deciduous forest. However most of the areas have been largely cleared for upland crops and fruit trees such as corn, upland rice, mungbean, peanut, mango, lychee, longan etc.

**Characteristic Profile Features:** Chiang Khong series is a member of the very-fine, kaolinitic, isohyperthermic Typic Kandiuox. They are strongly weathered, very deep soils and characterized by a dark reddish brown or reddish brown silty clay loam or clay loam A horizon overlying a yellowish red clay kandic B horizon. Reaction is medium to slightly acid, slightly decreasing with depth.

**Typifying Pedon:** Profile code no. is N-36/32 (moist color unless otherwise stated).

**Location:** South slope of Doi Kiu Kaeo approximately 2 km south of Amphoe Chiang Khong Changwat Chiang Rai.

**Sheet Name:** Ban Si Don Chai

**Sheet No.:** 5049 II

**Coordinate:** 473386

**Elevation:** 370 m (MSL)

**Relief:** rolling

**Slope:** 14 %

**Physiography:** dissected erosional surface

**Parent material:** colluvium over residuum from andesite

**Drainage:** well drained

**Permeability:** moderate

**Runoff:** moderate to rapid

**Ground water depth:** >2 m

**Flooding depth:** -

**Duration:** -

**Frequency:** -

**Annual rainfall:** 1,520 mm

**Mean temp.:** 24.0 °C

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

**Natural vegetation or land use:** dipterocarp forest

**Described by:** J.D. Cowie and Thamrong

**Date:** February, 1970

**Revised by:** Aniruth Potichan

**Date:** 23 May, 2004

Horizon	Depth (cm)	Description
A	0-4	Dark reddish brown (5YR3/4) silty clay loam; strong medium and fine subangular blocky and granular structure; very friable, slightly sticky and slightly plastic; very frequent, very fine, few fine and medium roots; medium acid (field pH 6.0); clear and smooth boundary.
AB	4-14	Reddish brown (5YR4/4) clay; strong medium and fine subangular blocky with some crumb and granular structure; friable, sticky and plastic; frequent very fine to medium roots; very strongly acid (field pH 5.0); clear and smooth boundary.
Bt1	14-50	Yellowish red to red (5YR-2.5YR4/6) clay; moderate medium and fine subangular blocky structure; slightly firm, sticky and plastic; patchy and continuous moderately thick cutans, mainly on some ped faces and in pores; common very fine and few medium roots; very strongly acid (field pH 5.0); gradual and smooth boundary.

Bt2	50-70	Yellowish red to red (5-2.5YR4/6) clay; moderate medium and fine subangular blocky structure; slightly firm, sticky and plastic; broken and continuous moderately thick cutans, mainly on ped faces and in pores; few fine and medium roots; very strongly acid (field pH 4.5); gradual and smooth boundary.
Bt3	70-110+	Yellowish red (5YR4/8) clay; moderate medium and fine subangular blocky structure; slightly firm, sticky and plastic; broken and continuous moderately thick cutans, mainly on ped faces and in pores; few small rounded grains of greenish rock; few very fine roots; very strongly acid (field pH 4.5).

**Type Location:**

Chiang Khong series was named for Amphoe Chiang Khong, Changwat Chiang Rai where the typifying pedon was first studied.

**Range of Profile Features:**

The thickness of the solum is usually 1 m or more. The A horizon is about 10 to 20 cm deep and has 7.5 YR or 5YR hues, values of 3 through 4 and chromas of 2 through 4 with silty clay loam or clay loam texture, grading to clay texture in the lower A horizon with 5YR hue, values of 4 and chromas of 4. The structure is commonly strong medium and fine blocky with some granular structure in the uppermost layer. The pH value is 5.5 to 6.5 in the surface horizon.

The kandic B horizon has very fine clay texture, the clay fraction increasing with depth which shows the evidence of clay translocation in the form of cutans on ped faces and in pores. Soil color is hues of 5YR and 2.5YR, values of 5 to 4 and chromas 6 or 8. The structure is weak to moderate medium and fine blocky. Very few to few small gravel-sized fragments of weathered parent rocks may be observed in the deeper solum. The pH value is difficult to measure in the field, but is in the range of 5.5 to 6.0 according to laboratory result.

**Similar Soil Series:**

Chiang Saen series (Ce): derived from granite and granite derived rocks.

Ban Chong series (Bg): is derived from shale and metamorphic equivalents.

**Principal Associated Soils:**

These include Tha Li series.

**ANALYSIS RESULTS**  
(oven dry basis)

Profile code no.: N-36/32

Soil series: Chiang Khong (Cg)

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
P-332	0-4	A	20.0	46.0	34.0						cl	sicl	6.1	5.3		18.4	179
P-333	4-14	AB	9.0	34.0	57.0						c	c	5.0	4.2		6.7	119
P-334	14-50	Bt1	6.5	27.0	66.5						c	c	5.5	4.3		5.1	49
P-335	50-70	Bt2	5.5	25.0	69.5						c	c	5.6	4.4		4.6	42
P-336	70-110+	Bt3	4.5	26.5	69.0						c	c	5.7	4.4		3.8	30

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol <sub>(+)</sub> kg <sup>-1</sup> )									Base satur <sup>n</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)			
0-4	5.0	3.11	0.20	7.90	4.40	0.50	0.30	13.10	15.20	28.30	26.4	77.6	50	46			0.05
4-14	5.0	1.35	0.04	1.10	1.50	0.20	0.30	3.10	16.00	19.10	18.0	31.6	17	16			0.00
14-50	4.7	0.45	0.02	0.20	0.20	0.10	0.40	0.90	12.70	13.60	8.9	13.4	10	7			0.01
50-70	4.6	0.33	0.02	0.20	0.20	0.10	0.30	0.80	11.70	12.50	8.8	12.7	9	6			0.00
70-110+	5.9	0.31	0.05	0.20	0.10	0.10	0.30	0.70	11.10	11.80	8.5	12.3	8	6			0.00

Surveyor: J.D. Cowie and Thamrong

Date: February, 1970