

Proposed by S. Charoenpong, 1973
Revised by :
P. Vijarnsorn and staffs, 1988
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KHUAN KALONG SERIES

Field Symbol: Kkl

Distribution: Occupies a small extent in Peninsular Thailand and in Southeast Coast of Thailand.

Setting: Khuan Kalong soils derived from granite or equivalent rocks and occurred on granitic terrain. Relief is gently undulating to undulating with slopes range from 2 to 12 percent. Elevation ranges from 20 to 60 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 Surface Runoff: Drainage is well drained, permeability is estimated to be moderate and surface runoff is medium. Ground water level is below 1.5 m throughout the year.

Vegetation and Land Use: Mainly used for para rubber, oil palm and fruit trees, where abandoned reverted to low secondary shrubs and tall grasses.

Characteristic Profile Features: The Khuan Kalong series is a member of the fine-loamy, kaolinitic, isohyperthermic Typic Kandiodults (soil taxonomy, 2003). They are very deep soils and are characterized by a dark brown to brown sandy loam surface or A horizon overlying a mixed yellowish brown or strong brown and yellowish red medium to coarse sandy clay loam in upper kandic B horizon and gravelly sandy clay loam in lower kandic B horizon. Gravels composed of quartz grains in various size and usually rounded. Ironstone nodules are also occur in common within the profile. Very strongly acid to strongly acid, reaction values range from 4.5 to 5.5 throughout the profile.

Typifying Pedon: Khuan Kalong sandy loam - para rubber, at 21.8 km of Chalong to La-ngu, Ban Pac-va, Tambon Pac-va, Amphoe Khuan Kalong Changwat Satun, 2 to 5 percent slopes (sheet number 4922 II SE).

Profile Code Number: S-67/87, described by Somkid Photong, 24 July 1973 (moist colors unless otherwise stated).

Horizon	Depth (cm)	Description
A	0-13	Dark yellowish brown (10YR3/4) sand loam; weak fine to medium granular structure; very friable, slightly sticky and slightly plastic; porous; plentiful very fine roots; moderately acid (field pH 6.0); clear smooth boundary.
Bt1	13-31	Yellowish brown (10YR5/6) sandy clay loam; moderate medium and coarse subangular blocky structure; slightly firm, slightly sticky and slightly plastic; patchy thin cutan on ped faces and organic coating color yellowish brown (10YR5/8); common very fine interstitial pores, common very fine to fine tubular pores; plentiful very fine and few medium roots; having very few charcoal; very strongly acid (field pH 5.0); gradual smooth boundary.
Bt2	31-95	Yellowish brown (10YR5/8) coarse sandy clay loam; moderate medium and coarse subangular blocky structure; friable, slightly sticky and slightly plastic; moderately thick cutan on ped faces; common very fine interstitial and tubular pores; few very fine and few medium roots; having few charcoal; strongly acid (field pH 5.5); clear wavy boundary.
Bt3	95-120 ⁺	Strong brown (7.5YR5/8) and red (2.5YR5/8) slightly gravelly sandy clay loam; weak fine to medium subangular blocky structure; very friable, slightly sticky and slightly plastic; common very fine interstitial and few fine tubular pores; few very fine and few medium roots; having few charcoal; strongly acid (field pH 5.5).

Type Location:

Name of district, Amphoe Khuan Kalong, Changwat Satun.

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 of 3 to 5 and chromas of 3 to 4. Texture of sandy clay loam may occur. Structure is weak and moderate fine and medium subangular blocky. Very strongly acid to moderately acid, reaction values range from 5.0 to 6.0.

The upper kandic B horizon sandy loam grading to medium or coarse sandy clay loam, has 10YR or 7.5YR hues, values 5 or 6 and chromas 6 or 8. The lower kandic B horizon, which usually occurs at some depth between 50 to 100 cm, has the same colors but texture is gravelly sandy clay loam. Mixed color 5 YR hues, values 4 or 5 and chromas 6 or 8 may occur in lower kandic B horizon. Structure is weak and moderate medium and coarse subangular blocky. Very strongly acid to strongly acid, reaction values range from 4.5 to 5.5.

The C horizon usually occur at some depth within 200 cm from the soil surface. It commonly has a clayey texture with distinct mottles.

Similar Soil Series:

Thai Mueang series (Tim): fine, kaolinitic, isohyperthermic Typic Kandiuults.

Khlong Nok Krathung series (Knk): fine-loamy, kaolinitic, isohyperthermic Typic Kandiuults, dark brown colors (7.5YR, 10YR 3-7/3-4) and has not gravelly texture and mixed colors within 150 cm from the soil surface.

Chalong series (Chl): fine-loamy, kaolinitic, isohyperthermic Typic Kandiuults, yellowish brown colors (7.5YR, 10YR 5-6/6-8) and has not gravelly texture and mixed colors within 150 cm from the soil surface.

Principal Associated Soils:

These include Thai Mueang, Khlong Nok Krathung and Chalong series.

ANALYSIS RESULTS

Profile code No.: S-67/87

(oven dry basis)

Soil series: Khuan Kalong series (Kkl)

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				
P2-1828	0-13	A	77.0	13.5	9.5					sl	sl	4.9	4.3	0.3	3.6	44
P2-1829	13-31	Bt1	65.0	14.5	20.5					scl	scl	5.0	4.1	0.3	2.5	59
P2-1830	31-95	Bt2	64.0	15.0	21.0					scl	co.scl	5.1	4.0	0.3	2.2	67
P2-1831	95-120+	Bt3	49.5	18.5	32.0					scl	sli.gscl	5.1	4.2	0.7	1.9	41

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)				
				0-13	0.8	1.31		0.90	0.40	0.10	0.20	1.60	4.80	6.40	3.4			
13-31	0.9	0.71		0.20	0.10	0.10	0.20	0.60	5.00	5.60	3.8	18.5	16	11			0.04	
31-95	0.9	0.63		0.20	0.10	0.10	0.20	0.60	7.90	8.50	3.2	15.2	19	7			0.02	
95-120+	1.1	0.61		0.20	0.06	0.06	0.20	0.52	7.00	7.52	3.4	10.6	15	7			0.02	

Surveyor: S. Photong

Reported by: W. Sirichuaychoo

Date: July 24, 1973

Date: Nov. 25, 1998