

Proposed by: F.R. Moomann, 1963  
 Revised by:  
 1. N. Chorphaka, 1988  
 2. A. Potichan, 2004

**TAKHLI SERIES**

**Field Symbol: Tk**

**Distribution:** Occupies moderate extend in the Central Highlands, North East and small extent in South West Thailand.

**Setting:** Takhli soils are formed from transported material over marly beds and occur on gently undulating to undulating terrains with slopes ranging from 2 to 12%. The climate is Tropical Savanna (Koppen 'Aw').

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

**Vegetation and Land Use:** Mixed deciduous and dry evergreen forest. Parts are cultivated to corn, cotton, beans and orchards of custard apples and other fruits.

**Characteristic Profile Features:** Takhli series is a member of the loamy-skeletal, carbonatic, isohyperthermic, Entic Haplustolls. They are shallow and calcareous soils. They are characterized by a black, very dark gray, very dark grayish brown or very dark brown (gravelly) clay loam or silty clay loam A horizon overlying a dark brown or brown, with some whitish marl nodules, silty clay loam, clay loam B horizon. The C horizon with many secondary lime nodules or marl occur as a layer within 50 cm from the surface. The reaction is neutral to moderately alkaline in the surface and moderately alkaline in the subsoils.

**Typifying Pedon:** Profile code no. is Tk-2 (moist colors unless otherwise stated)

**Location:** About 150 m south-west of Ban Sup Phraiwan school, Ban Phu Ta Nuang, Tambon Khala, Amphoe Phayuha Khiri, Changwat Nakhon Sawan.

**Sheet Name:** Amphoe Tha TaKo

**Sheet No.:** 5040 II

**Coordinate:** 419211

**Elevation:** 70 m (MSL)

**Relief:** gently undulating

**Slope:** 2-3 %

**Physiography:** marl terraces

**Parent material:** transported materials over secondary lime and marl

**Drainage:** well drained

**Permeability:** moderate

**Runoff:** slow

**Ground water depth:** >2 m

**Flooding depth:** -

**Duration:** -

**Frequency:** -

**Annual rainfall:** 1,119 mm

**Mean temp.:** 28.3 °C

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

**Natural vegetation or land use:** upland crops; sorghum, sugarcane, corn

**Described by:** S. Kunaporn, P. Suthasut and P. Donsakul

**Date:** 8 March, 1988

**Revised by:** Aniruth Potichan

**Date:** 28 May, 2004

Horizon	Depth (cm)	Description
Ap	0-21	Very dark grayish brown (10YR3/2) clay loam; weak coarse and medium subangular blocky parting to fine granular structure; friable, sticky and plastic; common medium and fine roots; few marl fragment about 5% (0.3-1 cm in diameter); moderately alkaline (field pH 8.0); clear and smooth boundary.
Bw	21-40	Dark brown to brown (7.5YR4/2) clay loam; weak coarse and medium subangular blocky structure; friable, sticky and plastic; few fine and very fine roots; gravels composed of marl about 10-15% (0.3-1 cm in diameter); moderately alkaline (field pH 8.0); clear and smooth boundary.
Ck1	40-87	Dark brown to brown (7.5YR4-5/2) very gravelly clay loam; weak fine and medium subangular blocky structure; friable, sticky and slightly plastic; few fine and very fine roots; gravels composed of marl about 50-60% (0.3-1 cm

		in diameter), one animal hole (2-3 cm); moderately alkaline (field pH 8.0); gradual and smooth boundary.
Ck2	87-119	Brown (7.5YR5/2-4) extremely gravelly clay loam; structureless; few fine and very fine roots; one animal hole (12-15 cm in diameter), gravels composed of marl about 70-80% (0.5-2 cm in diameter); moderately alkaline (field pH 8.0); gradual and smooth boundary.
Ck3	119-220	Brown (7.5YR5/2-4) extremely gravelly clay loam; structureless; same as the upper horizon but no root in this horizon.

**Remark:** below 130 cm depth collected sample by auger.

**Type Location:**

Amphoe Takhli, Changwat Nakhon Sawan.

**Range of Profile Features:**

The A horizons range from 20 to 40 cm in thickness and have hues of 10YR to 7.5YR, values of 2 to 3, chromas of 1 to 2. Dark brown color may occur in the surface horizon. Structure is weak to strong fine to medium blocky and/or granular A horizon.

The B horizon is weakly developed with dark grayish brown to brown of hue 10YR or 7.5YR.

The C horizon mostly consists of marl and/or limestone nodules. The pH values are 7.0 to 8.0 in the surface and above 8.0 in the subsoil.

**Similar Soil Series:**

Hin Son series (Hs): has a more developed profile and redder in color.

Lop Buri series (Lb): has a thicker solum which cracks widely and deeply and is in Vertisols

**Principal Associated Soils:**

These include Lop Buri series on semi-recent terraces, and Chai Badan and Lam Narai series on basalt lava flows.

**Remarks:**

In places, Limestone bedrock is encountered within 50 cm of the soil surface. However, this occurs in few isolated spots and unless greater aerial extent is found a new series will not be proposed, although such soils would be classified as Lithic Calcistolls.

**ANALYSIS RESULTS**  
(oven dry basis)

Profile code no.: Tk-2  
Soil series: Tha Kli (Tk)

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
	0-21	A	17.5	51.8	30.7						sicl	cl	8.2	7.1		16.8	172
	21-40	Bw	20.1	50.3	29.6						sicl	cl	8.4	7.1		5.6	83
	40-87	Ck1	24.4	45.9	29.7						cl	vgcl	8.4	7.2		11.4	87
	87-119	Ck2	44.4	36.8	18.8						l	vgcl	8.5	7.4		7.1	26
	119-220	Ck3	42.1	39.1	18.8						l	vgcl	8.4	7.4		11.9	30

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)	AI 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	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)			
0-21		1.67		44.90	0.90	0.20	0.20	46.20	2.70	48.90	34.3	111.7	100	94			
21-40		0.98		48.40	0.90	0.20	0.20	49.70	2.60	52.30	33.5	113.2	100	95			
40-87		0.45		43.60	0.20	0.20	0.20	44.20	0.80	45.00	21.9	73.7	100	98			
87-119		0.18		37.20	0.20	0.10	0.20	37.70	0.40	38.10	10.2	54.3	100	99			
119-220		0.16		38.40	0.20	0.10	0.20	38.90	0.40	39.30	8.6	45.7	100	99			

Surveyor: S. Kunaporn, P. Suthasut and P. Donsakul

Date: 8 March, 1988