

**KHEMARAT SERIES**

**Field Symbol: Kmr**

**Distribution:** Occupies moderate extent in upper part of Northeast plateau

**Setting:** The Khemarat soils are formed from washed deposit overlying on the weathering siltstone and occur on middle part of Peneplain. Relief is gently undulating which slopes range from 2 to 6 percent. Elevation ranges from 150 to 240 m above sea level. The climate is Tropical Savanna (Köppen 'Aw'). Average annual precipitation varies from 1,100 to 1,400 mm. Mean air temperature varies from 26 to 28°C.

**Drainage, Permeability and Runoff:** somewhat poorly to moderately well drained soils. Permeability is moderate. Runoff is medium.

**Vegetation and land used:** Originally dry dipterocarp forest and mixed deciduous forest. Parts are cleared for upland crops such as corn, beans, castor bean, etc.

**Characteristic Profile Features:** The Khemarat series is a member of the fine-loamy, kaolinitic, isohyperthermic Plinthaquic Haplustults. They are deep soils and are characterized by a dark brown, brown or dark yellowish brown loamy sand or sandy loam A horizon overlying a brown to strong brown sandy clay loam argillic B horizon which in turn overlies a pinkish gray or gray clay or silty clay 2B and/or 2C horizons. Many red or dark red mottles (plinthite) occur within 150 cm of the soil surface. Weathered siltstone and siltstone bed rock occur at some depth between 100-150 cm. Reaction is very strongly acid to strongly acid throughout the profile.

**Typifying Pedon:**

**Location:** Ban Thang Khong, Tambon Pra Lan, Amphoe Khemarat Changwat Ubon Ratchathani.

**Sheet Name:**

**Sheet No.:**

**Coordinate:**

**Elevation:**

**Relief:** gently undulating

**Slope:** 2-3%

**Physiography:** middle part of peneplain

**Parent material:** washed deposit over siltstone and/or equivalent rocks

**Drainage:** somewhat poorly drained to moderately well drained

**Permeability:** moderate over slow

**Runoff:** medium

**Ground water depth:** 1.50 m

**Flooding depth:** -

**Duration:-**

**Frequency:** -

**Annual rainfall:** -

**Mean temp:** - °C

**Climate type:** Tropical Savannah

**Natural vegetation and/or land use:** rice field

**Described by:** Buree Boonsompopphan

**Date:** Aug 25, 1993

**Revised by:**

Horizon	Depth (cm)	Description
Ap	0-17	Brown (7.5YR5/4) loamy sand; weak fine and medium subangular blocky structure; very friable, nonsticky, nonplastic; many very fine and fine roots; some pieces of charcoal; very strongly acid (field pH 5.0); clear, smooth boundary.
AB	17-42	Brow to strong brown (7.5YR5/4-6) sandy loam; many fine distinct red (2.5YR4/8) and common fine distinct pinkish gray (7.5YR6/2) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few medium and fine roots; some pieces of charcoal; very strongly acid (field pH 5.0); gradual, wavy boundary.
Bt1	42-75	Strong brown (7.5YR5/6) sandy loam; many fine distinct red (2.5YR4/6) and common fine distinct pinkish gray (7.5YR6/2) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; patchy thin clay coating on ped faces and in pores; few coarse and medium roots; very strongly acid (field pH 5.0); gradual, wavy

		boundary.
Bt2	75-112	Strong brown (7.5YR5/6) sandy clay loam; many fine distinct red (2.5YR4/6) mottles; weak fine and medium subangular blocky breaking to fine subangular blocky structure; friable, sticky, plastic; patchy thin clay coating on ped faces and in pores; very strongly acid (field pH 5.0); gradual, wavy boundary.
BC	112-150	Pinkish gray (7.5YR7/2) sandy clay loam; many fine distinct dark red (10R3/6) mottles; weak to moderate fine and medium subangular blocky structure; friable, sticky, plastic; some weathering siltstone fragments; very strongly acid (field pH 4.5); gradual, smooth boundary.
Cr	150 <sup>+</sup>	Weathering of silt stone {dusky red(10YR3/2-3/4)} or reddish violet

**Type Location:** The typifying pedon were first described at Amphoe Khemarat Changwat Ubon Ratchathani

**Range of Profile Features:**

The thickness of an A or Ap horizon vary from 10 to 20 cm and has 10YR or 7.5 YR hues, values of 3 to 5 and chroma of 2 to 4 Structure is fine to medium blocky. Field pH values vary from 5.0 to 6.5

The B horizon has values 10YR or 7.5YR hues values of 3 to 5 and chroma of 3 to 4. Mottles of 10 YR or 7.5YR hues values of 5 to 7 and chromas of 2 or less need to occur within 75 cm from the soil surface. Structure is weak fine to medium blocky. Field pH values vary from 4.5 to 5.5

The 2B or 2C horizon that occurs below the B horizon or below the thin layer of lateritic concretions(about 50-70 cm below the soil surface) has 10YR or 7.5YR hues, values of 5 to 7 and chromas of 2 or less with common to many plinthite. Structure of weak coarse blocky. Textures of clay loam or sandy clay may occur. Field pH vary from 4.5 to 5.5.

The Cr horizon are weathering of silt stone occurs between the depth of 1-1.5 m or more; color is dusky red somebody called " horse liver color or buffalo liver color "

**Similar Soil Series:**

Pla Pak series (Ppk): is a member of clayey-skeletal family.

Phen series(Pn): is a member of clayey-skeletal family and are (Aeric)Plinthic Paleaquils

**Principal Associated Soils:** These include Phon Phisai, Pla Pak, Phen soils. Phen soils occupy in the lower physiographic position.

**ANALYSIS RESULTS**

**Profile code no.:**

**(oven dry basis)**

**Soil series : Khemarat (Kmr)**

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>1</sup>	water	KCl				
Px218	0-17	Ap	75.4	14.1	10.5	0.1	0.2	3.2	44.2	27.7	sl	sl	4.2	3.8		2.8	16	
Px219	17-42	AB	68.0	15.3	16.1	0.2	0.2	4.5	41.9	21.8	sl	sl	4.7	3.7		3.4	35	
Px220	42-75	B11	62.2	19.8	18.0	0.3	0.2	3.4	38.0	20.3	sl	sl	4.9	3.8		1.2	39	
Px221	75-112	B12	50.5	21.8	27.7	1.0	0.9	3.8	24.7	20.1	scl	scl	5.2	3.7		1.5	44	
Px222	112-150	BC	38.9	29.5	31.6	1.7	1.1	2.7	14.0	19.2	cl	scl	5.5	3.7		0.9	51	
Px223	150+	C	17.4	39.9	42.7	0.3	0.0	1.4	4.5	11.2	sl		5.6	3.5		1.2	68	

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol <sub>(+)</sub> kg <sup>-1</sup> )										Base satur <sup>1</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>2</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)				
				0-17	0.2	0.36		0.30	0.10	0.10	0.10	0.60	2.30	2.90	2.00			
17-42	0.4	0.15		0.50	0.10	0.10	0.10	0.80	4.40	5.20	2.90	18.0	28	15			0.01	
42-75	0.9	0.10		0.20	0.10	0.10	0.20	0.60	6.00	6.60	4.10	22.8	15	9			0.01	
75-112	1.3	0.07		0.20	0.10	0.20	0.30	0.80	8.40	9.20	6.30	22.7	13	9			0.01	
112-150	1.4	0.06		0.50	0.10	0.20	0.30	1.10	10.10	11.20	9.30	29.4	12	10			0.01	
150+	2.1	0.08		1.50	0.10	0.20	0.60	2.30	13.10	15.40	14.10	33.0	16	15			0.01	