Proposed by: C. Changprai - 1971
Revised by: 1. B. Boonsompopphan, P. Hemsrichart, 1988
2. K. Malairotsiri, 2004

SA KAEO SERIES — Field Symbol: Ska

Distribution: Small extent in the southern part of Northeast Plateau.

Setting: Sa Kaeo soils are formed from washed deposit over shale, siltstone and/or sandstone and occur on upper part of peneplain.Relief is undulating which slopes range from 2 to 6 percent. Elevation is from 150 to 250 m above sea level. The climate is Tropical Savanna (Köppen 'Aw'). Average annual precipitation is from 1,100 to 2,200 mm. Mean annual air temperature varies from 26 to 28^{o}C.

Drainage, Permeability and Runoff: Well drained soils. Permeability is moderate. Runoff is medium.

Vegetation and Land Use: Mixed deciduous and dipterocarp forest. Parts are cleared for upland crops such as corn, water, melon, caster bean, cassava and kenaf,

Characteristic Profile Features: The Sa Kaeo series is a member of the loamy-skeletal, kaolinitic,isohyperthermic Typic (Plinthic) Paleustalfs. They are shallow soils to iron stone nodules layer and characterized by a dark brown or brown,sandy loam (or gravelly) A horizon overlying a strong brown,reddish yellow or yellowish red very gravelly sandy clay loam argillic B horizon which in turn overlies a light gray or light brownish gray clay (or gravelly) C horizon reddish yellow ,yellowish red and red mottles (plinthite) occur in the subsoil usually with 150 cm of the soil surface. The loose or semi-consolidated ironstone layer formed as continuous phase, thicker than 20 cm up to 80 cm, occurs within 50 cm of the soil surface. Reaction is medium acid over strongly acid to very strongly acid .

Typifying Pedon: Profile code no.: SE-12/41

Location: Ban Huai Chot, Tambon Watthana Nakhon, Amphoe Watthana Nakhon Changwat Sa Kaeo .

Sheet Name: Amphoe Sa Kaeo — **Sheet No.:** 5436 IV
Coordinate: 012244 — **Elevation:** 172 m
Relief: gently undulating — **Slope:**: 3-5%
Physiography: upper part of peneplain
Parent material: washed deposit over shale, siltstone and/or sandstone
Drainage: moderately well drained — **Permeability:** moderate over slow
Runoff: medium — **Ground water depth:** >2 m
Flooding depth: - — **Duration: -** — **Frequency: -**
Annual rainfall: 2,009 mm — **Mean temp:** 27.9 ^{o}C — **Climate type:** Tropical Savannah
Natural vegetation and/or land use: dipterocarp and mixed deciduous forests.
Described by: S. Imsamut — **Date:** 29 October 1998

Horizon	Depth (cm)	Description
A	0-7	Brown to dark brown (7.5YR4/4) sandy loam; moderate medium subangular blocky structure; very friable, nonsticky, nonplastic; many fine roots; few fine and medium ironstones; medium acid (field pH 6.0); clear, smooth boundary.
BA	7-32	Strong brown (7.5YR5/8) sandy loam; moderate medium subangular blocky structure; friable, slightly sticky, nonplastic; many fine and common medium roots; common fine and few medium ironstones; medium acid (field pH 6.0); gradual, smooth boundary.
Btc1	32-75	Yellowish red (5YR5/8) very gravelly sandy clay loam; friable, slightly sticky, nonplastic; many fine and common medium roots; many medium and few fine ironstones; strongly acid, (field pH 5.5); gradual, smooth boundary.

Btc2	75-120	Yellowish red (5YR5/8) very gravelly sandy clay loam; strong medium subangular blocky structure; 80% ironstones; very strongly acid (field pH 5.0); gradual, smooth boundary.
Btc3	120-150	Reddish yellow (7.5YR6/6) and red (2.5YR4/8) very gravelly sandy loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; patchy thin clay bridge holding sand grains together; 80% ironstones and few fine and medium quartz fragments; very strongly acid (field pH 5.0); clear, smooth boundary.
2Bt1	150-170	Light gray (10YR7/1) gravelly clay; many coarse prominent red (10R4/8) mottles; strong coarse subangular blocky structure; very firm, very sticky, plastic; broken moderately thick clay coating on ped faces; 80% ironstones and 20% quartz fragments; very strongly acid (field pH 5.0).
2Bt2	170-180	Light gray (10YR7/1) clay; many coarse distinct reddish yellow (7.5YR6/6) and few fine yellowish red (5YR5/8) mottles; strong coarse subangular blocky structure; very firm, very sticky, plastic; broken moderately thick clay coating on ped faces; few ironstone and quartz fragments; very strongly acid (field pH 5.0).

Type Location: The pedon were initiated and first described at Ban Huai Chot, Tambon Watthana Nakhon, Amphoe Watthana Nakhon Changwat Sa Kaeo

Range of Profile Features*:*

The thickness of an A or Ap horizon vary from 5 to 25 cm and has 7.5YR or 10 YR hues, values of 3 to 6 and chroma of 2 to 4 Texture of loamy sand may occur. Structure is moderate fine and/or medium blocky or granular structure. Field pH values vary from 5.0 to 6.5

The B horizon has 7.5YR or 5YR hues,but redder hues may occur.value of 4 to 6 and chroma of 6 to8 .Texture of very gravelly clay loam may occur Structure is moderate fine and/or medium blocky ,field pH values vary from 5.0 to 6.0

The C horizon has 10YR,7.5YR hues, values of 6 to7 and chroma of 2 or less. Common to many plinthite occur in this horizon.Field pH values range from 5.0 to 6.0

Similar Soil Series:

Phon Phisai (Pp): is a member of clayey-skeletal particle size class and is Paleustults.

Principal Associated Soils: these include Phon Phisai,Phen and Roi-Et series.

ANALYSIS RESULTS **Profile code no.:SE-12/41**

(oven dry basis) **Soil series : Sa Kaeo (Ska)**

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			
PG 1566	0-7	A	76.8	19.4	3.8						ls	sl	6.6	4.4		1.4	12
PG 1567	7-32	BA	74.4	20.8	4.8						ls-sl	sl	5.8	5.1		1.2	14
PG 1568	32-75	Btc1	60.3	20.4	19.3						sl	vg.scl	5.7	4.0		0.8	20
PG 1569	75-120	Btc2	59.6	22.6	17.8						sl	vg.scl	6.5	4.1		1.0	24
PG 1570	120-150	Btc3	51.0	25.2	2.3.8						scl	vg.scl	6.1	4.0		1.2	24
PG 1571	150-170	C1	32.3	20.9	46.8						c	g.c	5.7	3.4		1.2	24
PG 1572	170-180	C2	29.5	26.2	44.3						c	c	5.5	3.5		1.0	29

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations ($cmol_{(+)}$ kg^{-1})									Base satur[n] (%)		ECEC	Al	Electrical condut[y]
				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)	$cmol_{(+)}$ kg^{-1} (B+D)	KCl extr. $cmol_{(+)}$ kg^{-1} (D)	(ECx10^6) dS m^{-1}
0-7	0.3	0.78		1.10	0.30	0.10	0.20	1.70	2.20	3.90	2.50	65.8	68	44			0.04
7-32	0.9	0.41		0.80	0.10	0.05	0.20	1.15	1.60	2.75	1.90	39.6	61	42			0.02
32-75	1.3	0.16		1.20	0.70	0.05	0.20	2.15	3.90	6.05	4.10	21.2	52	36			0.02
75-120	2.3	0.24		0.70	1.00	0.10	2.00	3.80	6.20	10.00	5.90	33.1	64	38			0.01
120-150	2.8	0.14		0.80	1.20	0.10	0.70	2.80	6.20	9.00	5.90	24.8	47	31			0.02
150-170	3.1	0.12		1.40	4.60	0.06	1.40	7.46	9.70	17.16	1.10	28.0	57	43			0.07
170-180	3.3	0.08		1.90	7.00	0.10	1.30	10.30	7.90	18.20	14.70	33.2	70	57			0.13