

Proposed by: S. Panichapong et.al-1961
 Revised by: 1. P. Hemsrichart, 1988
 B. Boonsompophan,
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ON SERIES

Field Symbol: On

Distribution: Occupies small extent in Northeast and in North Thailand.

Setting: On Soils are formed from old alluvium over shale and/or siltstone, fine grained sandstone and occur on the lower part of peneplain. Relief is level to nearly level which slopes are 1 percent or less. Elevation ranges from 120 to 150 m above sea level. The climate is Tropical Savanna (Köppen 'Aw'). Average annual precipitation in the Northeast plateaus varies from 1,100 to 2,200 mm. Mean annual air temperature is from 26 to 28°C.

Drainage, permeability and Runoff: Somewhat poorly drained to poorly drained soils. Permeability is rapid over slow. Runoff is slow. Flooded by impound rainwater up to 30 cm deep for 3 or 4 months. Ground water table is below 2 meters during the peak of the dry season.

Vegetation and Land Use: Used for transplanted rice.

Characteristic Profile Features: The On series is a member of the loamy-skeletal over fragmental, mixed, subactive, isohyperthermic, Aeric (Plinthic) Epiaquults. They are shallow to a layer of semi-consolidated and/or consolidated ironstone (laterite) which usually occurs within 50 cm of the surface and are characterized by a grayish brown or brown sandy loam or loamy sand A horizon, overlying a light gray or pinkish gray very gravelly sandy clay loam argillic B horizon which in turn overlies light gray or whitish clay or sandy clay C horizon. The On soils are mottled throughout in shades of yellowish, brownish and dominant prominent reddish and red colors (plinthite). Reaction is strongly acid to medium over very strongly acid.

Typifying Pedon: Profile code no. is NE-N-29/23. (moist colors unless otherwise stated).

Location: Amphoe That Phanom Changwat Nakhon Phanom.

Sheet Name:

Sheet No.:

Coordinate: long 104° 39' 34" E and lat 17° 05' 36" N

Elevation: 120-150 m

Relief: level to nearly level

Slope: 1% or less

Physiography: lower part of peneplain

Parent material: alluvium over shale and/or siltstone, fine grained sandstone

Drainage: somewhat poorly drained

Permeability: rapid over slow

Runoff: slow

Ground water depth: >1.5 m

Flooding depth: up to 30 cm

Duration: 3-4 month

Frequency: every year

Annual rainfall: 2,163.3 mm

Mean temp: 26-28 °C

Climate type: Tropical Savannah

Natural vegetation and/or land use: transplanted rice

Described by: C. Changprai

Date: 26 February 1969

Revised by:

Horizon	Depth(cm)	Description
Ap	0-12/13	Brown (7.5YR 5/2) fine sandy loam; common fine distinct yellowish red (5YR 5/8) mottles mainly along root channels; weak fine subangular blocky structure; friable, nonsticky, nonplastic; many fine roots; strongly acid (field pH 5.5); abrupt, wavy boundary.
AB	12/13-21/24	Brown (10YR 5/3) fine sandy loam; common fine distinct strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable, nonsticky, nonplastic; few fine roots; strongly acid (field pH 5.5); clear, wavy boundary.
Btcg1	21/24-34	Pinkish gray (7.5YR 7/2) and brown (7.5YR 5/2) very gravelly sandy clay loam; many fine distinct strong brown (7.5 YR 5/6) mottles; slightly sticky, slightly plastic; common patchy thin clay coating on ped faces; many fine

		tubular pores; few fine roots; about 80% of semi-consolidated ironstones; very strongly acid (field pH 5.0); clear, smooth boundary.
Btcg2	34-62/64	Light gray (10YR 7/2) very gravelly clay; common medium prominent red (10YR 4/6) and common medium distinct yellowish brown (10YR 5/8) mottles; sticky, plastic; many broken moderately thick clay coating on ped faces; contain about 80% ironstone nodules; very strongly acid (field pH 5.0); gradual, wavy boundary.
Cg1	62/64-130	White (5YR 8/1) clay; common medium prominent red (10R 4/6) and yellowish brown (10YR 5/8) mottles; massive, firm, sticky, plastic; contain about 20% ironstone nodule; very strongly acid (field pH 4.5); gradual, smooth boundary.
Cg2	130-180+	White (5YR 8/1) clay; many medium prominent red (10YR 4/8) and yellowish brown (10YR 5/8) mottles; massive; firm, sticky, plastic; contain 10% ironstone nodules; very strongly acid (field pH 4.5).

Type Location: The On series was named for Tambon On, Amphoe Mueang, Changwat Roi Et in which soils of this series were first described in the paddy field, 6 km north of Ban On.

Range of Profile Features:

The thickness of the A horizon ranges from 10 to 25 cm has 10YR or 7.5YR hues, values of 4 to 6 and chromas of 2 or 3. Structure is weak fine and medium blocky. Field pH value is from 5.5 to 6.0.

The B horizon has 10YR or 7.5YR hues, values of 5 to 7 and chromas of 2 or less. Textures of gravelly or very gravelly sandy clay or clay may occur in lower of the horizon. Field pH value is from 4.5 to 5.0.

The C horizon occurs at some depth below the ironstone layer and has 10YR or 7.5YR hues, values of 6 to 8 and chromas 1 or 2. Field pH value is from 4.5 to 5.0.

The layer of a semi-consolidated or consolidated ironstone is its wavy surface. In places the ironstone boulder or sheet appears at the surface.

Similar Soil Series:

Phen series (Pn): occurs on the middle part of peneplain and has loose ironstone nodules within 50 cm of the surface which can be penetrated with an auger.

Sakon series (Sk): is moderately well drained soils and has pinkish color above layer of ironstone sheet.

Principal Associated Soils: These include Sakon, and Phen series. The Phen series occupy on higher part of low peneplain. The Sakon series is a main associated soils. They occur on the middle part of peneplain, dipterocarp vegetation; sheet laterite usually occur more than 30 cm.

ANALYSIS RESULTS Profile code no.:NE-N29/23
(oven dry basis) Soil series : On (On)

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	1:1			
			sand	silt	clay	vc	c	m	f	vf	result	estim ¹	water	KCl			
	0-12/13	Ap	67.0	18.2	14.8						sl	fsl	12.6		7.0	22	
	12/13-21/24	AB	67.7	18.8	13.5						sl	fsl	8.4		3.5	16	
	21/24-34	Btc1	59.6	16.5	23.9						scl	vgcl	8.2		2.5	40	
	34-62/64	Btc2	36.2	20.6	43.2						c	vgcl	14.2		3.4	96	
	62/64-130	C1	15.0	23.0	62.0						c	c	10.6		2.0	28	
	130-180+	C2	14.3	29.6	56.1						c	c	5.5		2.0	31	

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol ₍₊₎ kg ⁻¹)										Base satur ¹ (%)		ECEC cmol ₍₊₎ kg ⁻¹ (B+D)	Al KCl extr. cmol ₍₊₎ kg ⁻¹ (D)	Electrical conduct ² (ECx10 ⁶) dS m ⁻¹
				Exchange capacity and cations (cmol ₍₊₎ kg ⁻¹)										B/Cx100	(Bx100)/			
				Ca	Mg	K	Na	SUM cations (B)	Extr. acidity (A)	SUM (B+A)	CEC NH ₄ OAc (C)	CEC 100g Clay	(B+A)					
0-12/13	0.1	0.61		0.20	0.20	0.10	0.10	0.60	3.70	4.30	2.40	16.2	25	14				
2/13-21/2	0.4	0.24		0.20	0.10	0.10	0.20	0.60	1.90	2.50	1.20	8.9	50	24				
21/24-34	0.3	0.38		0.50	0.20	0.20	0.20	1.10	3.70	4.80	2.50	10.5	44	23				
34-62/64	2.0	0.29		0.70	0.30	0.30	0.20	1.50	10.00	11.50	9.70	22.5	15	13				
62/64-130	3.0	0.06		0.30	0.10	0.10	0.20	0.70	14.80	15.50	12.70	20.5	6	5				
130-180+	2.1	0.04		0.20	0.04	0.10	0.20	0.54	14.80	15.34	13.00	23.2	4	4				