

Proposed by F.R. Moormann, 1963
Revised by:
1. C. Changprai, 1987
2. S. Udomsri, 2004

MANOROM SERIES

Field Symbol: Mn

Distribution: Occupies moderate extent in the northern part of the Central Plain.

Setting: Manorom soils are formed from alluvium and occur on the terrace or alluvial plains. Relief is flat to nearly flat with a micro-relief caused by the presence of abundant termite mounds. Slopes are about 1%. Elevation is 20-30 m above sea level. The climate is Tropical Savanna (Köppen 'Aw'). Mean annual precipitation is approximately 1,200 mm. Mean annual temperature is 27 °C.

Drainage, Permeability and Surface Runoff: Somewhat poorly drained to poorly drained. Permeability and runoff are slow. These soils are flooded by impounded rainwater or river to depths of up to 50 cm for about four months during the rainy season. Sometimes this area flooded by irrigation. Groundwater level falls below 2 m from the soil surface during the dry season.

Vegetation and Land Use: Mainly used for broadcast rice cultivation.

Characteristic Profile Features: Manorom series is a member of the fine, mixed, semiactive, isohyperthermic Aeric (Plinthic) Endoaqualfs. They are deep, very strongly acid soils. They are characterized by a brown loam, silty clay loam or clay loam A horizon overlying a brown grading to grayish brown or light brownish gray argillic B horizon. These soils are mottles throughout with yellowish brown and strong brown coating along root channels in the A horizon and prominent red and yellowish red mottles in the B horizon. These soils have plinthite in the B horizon with few to common spherical hard iron/manganese nodules occur in the deeper subsoil or throughout the profile.

Typifying Pedon: Profile code number is C-1/29

Location: in front of Wat Hang Kha-yaeng at about km 5.2 (100 m north of road No. 3212 from Amphoe Manorom to Ban Hang Nam Sakhon) Ban Hang Kha-yaeng, Tambon Hang Nam Sakhon, Amphoe Manorom Changwat Chai Nat

Sheet Name: Changwat Uthai Thani

SheetNo.: 5039 IV

Coordinate: 260909

Elevation: 20 m (MSL)

Relief: level to nearly level

Slope: 0-1%

Physiography: alluvium plain

Parent material: alluvium

Drainage: poorly drained

Permeability: slow

Runoff: slow

Ground water depth: 1.2 m

Flooding depth: 50-80 cm

Duration: 4 month

Frequency: every year

Annual rainfall: 1,119.0 mm

Mean temp: 28.3 °C

Climate type: Tropical Savannah

Natural vegetation and/or land use: paddy field

Other:

Described by: Pramote Hemsrichart and Satira Udomsri

Date: 11 March, 1998

Revised by: S. Udomsri

Horizon	Depth (cm)	Description
Apg	0-16	Dark gray (10YR4/1) silty clay; many medium distinct strong brown (7.5YR4/6), dark brown (10YR4/3) mottles; moderate medium and coarse subangular blocky structure; firm, sticky, plastic; many very fine and common fine roots; some charcoal fragments; medium acid (field pH 6.0); clear, smooth boundary.

Bg	16-30	Brown (10YR5/3) silty clay; many medium distinct yellowish brown (10YR5/6), strong brown (7.5YR5/8) mottles and some gray (10YR5/1) spot; moderate medium and coarse subangular blocky structure; firm, sticky, plastic; common very fine roots; few Fe&Mn concretions; slightly acid (field pH 6.5); clear, smooth boundary.
Btgv1	30-60	Grayish brown (10YR5/2) clay; common medium prominent red (2.5YR4/6) and common medium distinct dark yellowish brown (10YR4/4) mottles; moderate medium and coarse easily breaking to fine subangular blocky structure; friable, sticky, plastic; moderately thick clay coatings on ped faces and pore walls; few very fine roots; common plinthite (3-5%), common soft Fe&Mn concretions; some animal holes; slightly acid (field pH 6.5); gradual, smooth boundary.
Btgv2	60-100	Grayish brown (10YR5/2) clay; common fine and medium prominent red (2.5YR4/6) and few fine distinct yellowish brown (10YR5/8) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; moderately thick clay coatings on ped faces and pore walls; few very fine roots; common plinthite (5-15%) few slickensides and pressure faces, some organic matter (very dark grayish brown) coatings on ped faces, common soft Fe&Mn concretions; very strongly acid (field pH 5.0); gradual, smooth boundary.
Bssgv	100-165	Mixed grayish brown (10YR5/2) and light brownish gray (10YR6/2) clay; common medium prominent red (2.5YR4/8) few fine distinct yellowish brown (10YR5/8) mottles; moderate medium and coarse subangular blocky structure; firm, sticky, plastic; common distinct slickensides and pressure faces, common plinthite (5%); very strongly acid (field pH 5.0); gradual, smooth boundary.
Bgv	165-200 ⁺	Gray to light gray (10YR6/1) clay; common medium distinct dark yellowish brown (10YR4/6), yellowish red (5YR5/6), common fine distinct strong brown (7.5YR5/8) and prominent red (2.5YR4/8) mottles; weak medium and coarse subangular blocky structure grading to massive; firm, sticky, plastic; common plinthite (5-6%), common pressure faces; very strongly acid (field pH 5.0).

Type Location: Name of Amphoe, Amphoe Manorom Changwat Chai Nat

Range of Profile Features:

The A horizon is from 10 to 20 cm thick, has 10YR hue, values of 4 or 5 and chroma of 3. Structure is weak to moderate, medium blocky and field pH values range from 4.5 to 5.5

The B horizon has dominant brown (10YR 5/3) colours in the upper part, whereas the lower part has 10YR or 2.5Y hues, values of 5 or 6, and chromas of 2 or 1. Structure is moderate, medium blocky and field pH values range from 4.5 to 6.5.

Similar Soil Series:

Chiang Rai series (Cr): has lower chromas and high value throughout with base saturation lower than 35 %

Chum Saeng series (Cs): has a cambic B horizon and a characteristic pinkish gray subsoil

Nakhon Pathom series (Np): has values and chromas ≤ 4 , and without red mottles and plinthite.

Nakhon Phanom series (Nn): mainly founded in Northeast plateau and base saturation lower than 35 %

Principal Associated Soils: These include Nakhon Pathom, Phetchaburi and Saraburi series occupying similar positions on the low terraces

ANALYSIS RESULTS

Profile code No. : C-1/29

(oven dry basis)

Soil series : Manorum (Mn)

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			
416374	0-16	Apg	12.4	35.3	52.3	0.5	0.9	2.0	5.1	3.9	c	sic	4.8	4.3		10.5	39
416375	16-30	Bg	9.2	27.4	63.4	0.3	0.7	1.1	3.1	4.0	c	sic	5.0	4.0		1.5	39
416376	30-60	Btgv1	11.7	37.7	50.6	0.2	1.0	1.5	3.2	5.8	c	c	5.1	4.4		2.8	39
416377	60-100	Btgv2	10.2	20.9	68.9	0.5	0.9	1.4	2.7	4.7	c	c	5.1	3.7		2.1	39
416378	100-165	Bssgv	7.3	31.9	60.8	0.3	0.6	1.0	2.3	3.1	c	c	4.9	3.7		1.4	39
416379	165-200	Bgv	6.8	29.9	63.3	0.4	0.6	1.0	1.9	2.9	c	c	5.0	3.6		1.3	39

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol _(c) kg ⁻¹)										Base satur ¹ (%)		ECEC cmol _(c) kg ⁻¹ (B+D)	Al KCl extr. cmol _(c) kg ⁻¹ (D)	Electrical conduct ² (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)				
0-16	2.4	1.33	0.17	10.60	1.70	0.10	0.40	12.80	10.20	23.00	18.20	34.8	70	56	13.00	0.18		
16-30	2.4	0.60	0.05	17.10	1.30	0.10	0.40	18.90	10.40	29.30	17.80	28.1	100	65	19.50	0.63		
30-60	1.7	0.73	0.06	7.80	1.40	0.10	0.40	9.70	8.60	18.30	14.90	29.4	65	53	9.80	0.07		
60-100	2.7	0.29	0.05	9.30	0.60	0.10	0.60	10.60	12.70	23.30	19.10	27.7	55	45	11.80	1.15		
100-165	2.8	0.21	0.03	7.50	0.40	0.10	0.50	8.50	12.20	20.70	18.70	30.8	45	41	9.80	1.30		
165-200	2.9	0.17	0.02	7.00	0.40	0.10	0.60	8.10	12.80	20.90	20.50	32.4	40	39	9.50	1.35		