

**UTTARADIT SERIES**

**Field Symbol: Utt**

**Distribution:** Occupies small extent in the Northern part of Thailand.

**Setting:** Uttaradit soils are formed from alluvium and occur on lower part of levee especially along Nan river. Relief is level or nearly level which slopes are 2% or less. The climate is Tropical savanna (Koppen 'Aw'). The average annual precipitation range from 1,100 to 1,800 mm.

**Drainage, Permeability and Runoff:** Somewhat poorly drained to moderately well drained. Permeability and surface runoff are slow. The soils are usually flooded by impounded rain water during the rainy season.

**Vegetation and Land Use:** Used for transplanting rice in the wet season and some upland crops in the dry season.

**Characteristic Profile Features:** Uttaradit series is a member of fine, mixed, semiactive, isohyperthermic Aquic Haplustalfs. They are very deep soils and are characterized by dark brown, brown or dark grayish brown silty clay loam or clay loam A horizon. Argillic B horizon is reddish brown or dark reddish brown silty clay or clay. Reaction is strongly acid to slightly acid over slightly acid to moderately alkaline. Mottles are strong brown and yellowish red throughout profile.

**Typifying Pedon:** Profile code no. is N-41/71 (moist colors unless otherwise stated).

**Location:** Ban Bung Wang Ngiu, Tambon Pa Sao, Amphoe Muang Changwat Uttaradit

**Sheet Name:** Changwat Uttaradit

**Sheet No.:** 5044 III

**Coordinate:** 203473

**Elevation:** 67 m (MSL)

**Relief:** level to nearly level

**Slope:** 1 %

**Physiography:** lower part of levee

**Parent material:** alluvium

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

**Permeability:** slow

**Runoff:** slow

**Ground water depth:** >2 m

**Flooding depth:** -

**Duration:** -

**Frequency:** -

**Annual rainfall:** 1,432.6 mm

**Mean temp.:** 27.1 °C

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

**Natural vegetation or land use:** transplanting rice

**Described by:** Ritkajorn

**Date:** 6 May, 198

**Revised by:** Aniruth Potichan

**Date:** 5 June, 2004

Horizon	Depth (cm)	Description
Ap	0-11	Brown (10YR5/3) silty clay loam; common medium distinct yellowish red (5YR4/6) and common fine distinct strong brown (7.5YR5/6) mottles; weak fine to coarse subangular blocky structure; hard, friable, sticky and plastic; few fine roots; very strongly acid (field pH 4.5); clear and smooth boundary.
AB	11-30	Grayish brown to brown (10-7.5YR5/2) silty clay loam; many fine distinct dark brown (7.5YR4/4-3) and common fine distinct yellowish red (5YR5/6) mottles; weak fine to coarse subangular blocky structure; very hard, firm, sticky and plastic; few fine roots; moderately acid (field pH 6.0); clear and smooth boundary.
Bt1	30-58	Reddish brown (5YR4/4) clay; strong medium and coarse subangular blocky structure; very hard, firm, very sticky and very plastic; broken moderately thick clay coatings along pores and broken thin clay coatings on ped faces; very few fine roots; few Fe/Mn nodules; moderately acid (field pH 6.0); gradual and smooth boundary.

Bt2	58-89	Reddish brown (5YR4/3) silty clay; few fine faint yellowish red (5YR4/6) mottles; strong medium and coarse subangular blocky structure; hard, firm, very sticky and very plastic; broken moderately thick clay coatings along pores and on ped faces; few Fe/Mn nodules; moderately alkaline (field pH 8.0); gradual and smooth boundary.
Bt3	89-144	Reddish brown (5YR4/3) silty clay; few fine faint yellowish red (5YR4/6) mottles; weak fine to coarse subangular blocky structure; hard, firm, very sticky and very plastic; broken moderately thick clay coatings along pores and on ped faces; very few Fe/Mn nodules; moderately alkaline (field pH 8.0), gradual and smooth boundary.
Bt4	144-180	Reddish brown (5YR4/4) silty clay; common fine faint yellowish red (5YR4/6) mottles; weak fine and medium subangular blocky structure; firm, sticky and plastic; broken moderately thick clay coatings along pores and patchy thin on ped faces; very few Fe/Mn nodules; moderately alkaline (field pH 8.0).

**Type Location:**

Uttaradit series was named for Changwat Uttaradit.

**Range of Profile Features:**

The thickness of an A horizon series from 15 to 30 cm and has 10YR or 7.5YR hues, values of 3 to 5 and chromas of 2 to 4. Structure is weak fine to coarse subangular blocky. Field pH values range from 5.5 to 6.5.

The argillic B horizon has 5YR hue, values of 3 to 5 and chromas of 3 to 4. Structure is moderate to strong medium and coarse subangular blocky. Field pH values range from 6.5 to 8.0.

**Similar Soil Series:**

Taphan Hin series (Tph): has similar profile but lighter texture in lower subsoil and is in the fine-silty family. There is no gray color within 75 cm from the soil surface.

**Principal Associated Soils:**

These include Taphan Hin, Mae Tha, Nan series.

**ANALYSIS RESULTS**  
(oven dry basis)

Profile code no.: N-41/71  
Soil series: Uttaradit (Utt)

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			
3-14880	0-11	Ap	4.6	60.3	35.1	1.0	1.7	0.6	0.5	0.8	sicl	sicl	3.9	3.6		40.6	61
3-14881	11-30	AB	17.0	48.4	34.6	3.4	6.6	4.0	2.1	0.9	sicl	sicl	5.5	4.7		8.5	38
3-14882	30-58	Bt1	3.9	34.6	61.5	0.4	0.4	0.4	0.6	2.1	c	c	6.0	4.8		1.8	60
3-14883	58-89	Bt2	1.3	46.3	52.4	0.2	0.3	0.1	0.4	0.3	sic	sic	7.6	6.1		2.1	56
3-14884	89-144	Bt3	2.9	46.5	50.6	0.4	0.5	0.7	0.7	0.6	sic	sic	8.2	6.5		3.2	52
3-14885	144-180	Bt4	4.6	54.8	40.6	0.3	0.7	0.9	0.9	1.8	sic	sic	8.4	6.7		3.8	55

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)	Al 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)				
0-11	3.3	2.06	-	3.20	1.40	0.10	0.50	5.20	18.40	23.60	15.7	44.7	33	22			0.34	
11-30	3.2	0.76	-	5.10	3.60	0.10	0.90	9.70	8.80	18.50	13.3	38.4	73	52			0.16	
30-58	3.7	0.74	-	5.30	6.40	0.10	2.40	14.20	8.70	22.90	17.8	28.9	80	62			0.10	
58-89	2.3	0.79	-	6.70	8.60	0.10	4.60	20.00	2.90	22.90	19.4	37.0	100	87			0.39	
89-144	3.5	0.62	-	8.30	9.10	0.10	5.80	23.30	1.80	25.10	19.9	39.3	100	93			0.54	
144-180	3.2	0.56	-	7.80	9.10	0.10	5.70	22.70	1.60	24.30	16.7	41.1	100	93			0.42	

Surveyor: Ritkajorn

Date: 6 May, 1980