

Proposed by U. Pulsawath, 1972
Revised by :
P. Vijarnsorn and staffs, 1988
W. Sirichuaychoo, 2004

PAK CHAN SERIES

Field Symbol: Pac

Distribution: Occupies moderate extent in peninsular Thailand and some areas in Southeast Coast of Thailand.

Setting: Pak Chan soils derived from fine grain clastic rocks namely shale, phyllite or equivalent rocks and occurred on denudation surface. Relief is undulating to rolling. Slopes ranges from 5 to 20 percent. Elevation is approximately from 20 to 80 m above mean sea level. The climate is Tropical Monsoon (Koppen 'Am') or Tropical Rain Forest (Koppen 'Af'). Average annual precipitation is above 2,000 mm Average annual air temperature is from 26 °C to 28°C.

Drainage, Permeability and Surface Runoff: Drainage is well drained, permeability is estimated to be moderate and surface runoff is medium. Ground water level lies level 1.5 m throughout the year.

Vegetation and Land Use: Originally under Tropical Evergreen Forest, but most parts were cleared for para rubber, oil palm, coconut and fruit trees.

Characteristic Profile Features: The Pak Chan series is a member of very-fine, kaolinitic, isohyperthermic Typic Palehumults (soil taxonomy, 2003). They are very deep soils and are characterized by a very dark grayish brown or dark grayish brown clay loam surface or A horizon overlying a strong brown and/or yellowish brown clay argillic B horizon. The matrix color is commonly mixed with reddish color which looks alike mottles. Very strongly acid to moderately acid, reaction values range from 5.0 to 6.0 throughout the soil profile.

Typifying Pedon: 40th Petchakasem road, Tambon Pak Chan, Amphoe Kraburi Changwat Ranong, 100 m above mean sea level, 8 to 16 percent slopes (sheet number 4742 I, coordinate: 648880).

Profile Code Number: S-59/16, described by: Udom Pulsawath and staffs, 2 January, 1972 (moist colors unless otherwise stated).

Horizon	Depth (cm)	Description
A	0-9	Very dark grayish brown (10YR3/2) and dark yellowish brown (10YR4/4) clay loam; moderate fine and medium subangular blocky structure; friable, sticky and plastic; common interstitial and tubular pores; common fine roots; moderately acid (field pH 6.0); gradual smooth boundary.
Bw	9-22	Strong brown (7.5YR5/6-8) clay; moderate medium subangular blocky structure; firm, sticky and plastic; patchy thin cutan in animal holes; common interstitial and many tubular pores; common fine roots; very strongly acid (field pH 5.0); diffuse smooth boundary.
Bt1	22-42	Strong brown (7.5YR5/6-8) and yellowish red (5YR5/8) clay; moderate medium subangular blocky structure; firm, sticky and plastic; patchy thin cutan on ped faces and in animal holes; many interstitial and tubular pores; few fine roots; very strongly acid (field pH 5.0); diffuse smooth boundary.
Bt2	42-75	Mixed yellowish red (5YR5/6) and strong brown (7.5YR5/6) clay; moderate medium subangular blocky structure; friable, sticky and plastic; common patchy thin cutan on ped faces and in animal holes; many interstitial and tubular pores; few fine roots; very strongly acid (field pH 5.0); diffuse smooth boundary.
Bt3	75-105	Mixed yellowish red (5YR5/6) and few brownish yellow (10YR6/6) clay; moderate fine and medium subangular blocky structure; friable, sticky and plastic; patchy thin cutan on ped faces and in animal holes; many interstitial and tubular pores; few fine roots; very strongly acid (field pH 5.0).

Type Location:

Name of subdistrict, Tambon Pak Chan, Amphoe Kra Buri, Changwat Ranong.

Range of Profile Features:

The surface or A horizon clay loam is from 10 to 15 cm in thickness and has 10YR or 7.5YR hues, values 3 to 5 and chromas 2 to 4. Texture of silt loam or silty clay loam may occur. Structure is weak and moderate fine subangular blocky. Very strongly acid to moderately acid, reaction values range from 5.0 to 6.0.

The argillic B horizon has 10YR or 7.5YR hues, values 5 or 6 and chromas 6 or 8. This commonly mixed with colors of 5YR or 2.5YR hues, values 4 or 5 and chromas 6 or 8 and presence as fine to medium (3 to 15 mm in diameter) spots. Texture of silty clay may occur. Structure is moderate medium and coarse subangular blocky. Very strongly acid to moderately acid, reaction values range from 5.0 to 6.0.

Normally in agriculture are, Pak Chan soils have low organic carbon content (Typic Paleudults).

Similar Soil Series:

Lamphu La series (LI): fine, mixed, semiactive, isohyperthermic Typic Palehumults, 10YR or 7.5YR 5-6/6-8 throughout, no mixed color.

Principal Associated Soils:

These include Na Thon, Khlong Teng and Khlong Chak series. They may also occur associated with Lamphu La soils in some parts where adjacent to alluvial terrace.

Na Thon series (Ntn): fine, mixed, semiactive, isohyperthermic Typic Haplohumults.

Khlong Teng series (Klt): fine-loamy, mixed, semiactive, isohyperthermic, shallow Typic Haplohumults.

Khlong Chak series (Kc): clayey-skeletal, kaolinitic, isohyperthermic Typic Kandihumults.

ANALYSIS RESULTS

Profile code No.: S-59/16

(oven dry basis)

Soil series: Pak Chan series (Pac)

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 water	1:1 KCl			
			sand	silt	clay	vc	c	m	f	vf	result	estim ⁿ				
Pd-21	0-9	Ap	32.0	41.0	27.0					cl-c	cl	5.7	4.8	0.3	6.6	120
Pd-22	9-22	Bw	24.5	26.5	49.0					c	c	5.9	4.6	0.6	3.3	70
Pd-23	22-42	Bt1	19.5	18.0	62.5					c	c	6.0	4.3	1.2	3.7	64
Pd-24	42-75	Bt2	19.0	22.0	59.0					c	c	5.7	4.2	0.3	5.0	44
Pd-25	75-105	Bt3	19.5	18.0	62.5					c	c	5.7	4.5	0.3	6.6	38

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol ₍₊₎ kg ⁻¹)										Base satur ⁿ (%)		ECEC cmol ₍₊₎ kg ⁻¹ (B+D)	Al KCl extr. cmol ₍₊₎ kg ⁻¹ (D)	Electrical conduct ^y (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)				
				0-9	4.3	2.96		1.90	1.10	0.30	0.20	3.50	12.90	16.40	10.6			
9-22	3.5	1.34		0.50	0.50	0.10	0.20	1.30	14.10	15.40	10.0	20.4	13	8			0.02	
22-42	5.1	1.00		0.20	0.44	0.10	0.20	0.94	15.80	16.74	11.7	18.7	8	6			0.01	
42-75	2.5	0.87		0.20	0.36	0.10	0.20	0.86	15.80	16.66	10.9	18.5	8	5			0.03	
75-105	4.0	0.70		1.70	0.44	0.10	0.40	2.64	15.00	17.64	10.2	16.3	26	15			0.02	

Surveyor: U. Pulsawath & staff

Reported by: W. Sirichuaychoo

Date: Dec. 3, 1972

Date: Nov. 24, 1998