ภาคผนวก

คำอธิบายหน้าตัดดิน (soil profile description)

Pedon 1

I Information on the Site

Profile symbol	:	Pedon 1
Soil name	:	Huai Hong Khrai series 1 (tentative)
Classification	:	Typic Haplustert, fine, mixed**,** isohyperthermic
Date of examination	:	January 20, 2012
Described by	:	Niwat Anongrak, Kitsakron kreawromwong, Pasakorn Kawichai and Tanakorn Bungngen
Location	:	Inside Huai Hong Khrai Royal Development Study Center
Elevation	:	358 m (MSL)
Landform		
1. Physiographic position	:	On straignt slope
2. Surrounding landform	:	Mountainous
3. Slope on which profile site	:	Grently sloping (6%), S 15^0 E
Vegetation and Landuse	:	Under agroforesty Teak (*Tectona grandis L.f. Labiatae*) and Rambeh (*Baccaurea ramiflora Lour.* Euphorbiaceae)
Annual rainfall	:	Approximately 1,328.3 mm
Mean temperature	:	Approximately 25.6^0C
Other	:	Nil

II General Information on the Soil

Parent material	:	Derived residuum from sedimentary rock
Drainage	:	Moderately well drained
Moisture condition in profile	:	Moist throughout
Depth of ground water table	:	Nil
Surface stones and rock outcrops	:	No stones and rock outcrops
Evidence of erosion	:	Slight rill erosion
Human influence	:	Nil

III Profile Description

Horizon	Depth (cm)	Description
A	0-10	Dark brown (7.5YR3/2); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; neutral (field pH 6.6); clear and smooth boundary to AB
AB	10-25	Brown (7.5YR4/2); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common

		very fine and fine roots; neutral (field pH 6.8); clear and smooth boundary to Bss1
Bss	25-80	Brown (7.5YR4/2); clay; moderate medium angular blocky structure; few distinct slickensides and pressure faces; few very fine, vesicular pores; few fine roots; neutral (field pH 6.8); clear and smooth boundary to Btc1
Btc1	80-100	Yellowish brown (10YR6/6); clay; moderate medium angular blocky structure; common very fine and fine vesicular pores and few fine tubular pores; very few very fine and fine roots and few coarse roots; common fine, irregular, hard, reddish brown, nodules; slightly acid (field pH 6.2); clear and smooth boundary to Btc2
Btc2	100-140	Brownish yellow (10YR6/8); clay; moderate medium angularblocky structure; common very fine and fine vesicular pores; few coarse roots; common fine, irregular, hard, reddish brown, nodules; moderately acid (field pH 6.0); clear and smooth boundary to Crt1
Crt1	140-180	Yellow (10YR7/6); clay; moderate medium angular blocky structure; weathered rock fragment ; few fine vesicular pores; few fine roots ; slightly acid (field pH 6.2); clear and smooth boundary to Crt2.
Crt2	180-200+	Yellow (10YR7/6); clay; moderate medium angular blocky structure; weathered rock fragment ; few fine vesicular pores; very few fine roots ; slightly acid (field pH 6.2).

Pedon 2

I Information on the Site

Profile symbol	:	Pedon 2
Soil name	:	Huai Hong Khrai series 2 (tentative)
Classification	:	Typic Haplustert, fine, mixed**,** isohyperthermic
Date of examination	:	January 28, 2012
Described by	:	Niwat Anongrak, Kitsakron kreawromwong, Pasakorn Kawichai and Tanakorn Bungngen
Location	:	Inside Huai Hong Khrai Royal Development Study Center
Elevation	:	361 m (MSL)
Landform		
1. Physiographic position	:	On straignt slope
2. Surrounding landform	:	Mountainous
3. Slope on which profile site	:	Grently sloping (6%), S 50^0 E
Vegetation and Landuse	:	Under agroforesty Teak (*Tectona grandis L.f. Labiatae*) and Tamarind (Tamarindus indica L. Leguminosae)
Annual rainfall	:	Approximately 1,328.3 mm
Mean temperature	:	Approximately 25.6^0C
Other	:	Nil

II General Information on the Soil

Parent material	:	Derived residuum from sedimentary rock
Drainage	:	Moderately well drained
Moisture condition in profile	:	Moist throughout
Depth of ground water table	:	Nil
Surface stones and rock outcrops	:	No stones and rock outcrops
Evidence of erosion	:	Slight rill erosion
Human influence	:	Nil

III Profile Description

Horizon	Depth (cm)	Description
A	0-10	Very dark gray (7.5YR3/0); clay; moderate fine and medium subangular blocky; few fine vesicular pores; common very fine and fine roots; neutral (field pH 6.6); clear and smooth boundary to AB
AB	10-25	Dark brown (7.5YR3/2); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; neutral (field pH 6.6); clear and smooth boundary to Bss1

Bss1	25-75	Dark reddish brown (5YR3/2); clay; moderate fine and medium angular blocky structure; many distinct slickensides and pressure faces on vertical faces of peds; few very fine vesicular pores ; few fine roots; slightly acid (field pH 6.4); clear and smooth boundary to Bss2
Bss2	75-140	Dark reddish brown (5YR3/2); clay; moderate fine and medium angular blocky structure; many distinct slickensides and pressure faces on vertical faces of peds; few very fine vesicular pores; few fine roots; neutral (field pH 6.8); clear and smooth boundary to Bss3
Bss3	140-160	Dark reddish brown (5YR3/2); clay; moderate fine and medium angular blocky structure; many distinct slickensides and pressure faces on vertical faces of peds; few very fine vesicular pores ; few fine roots; neutral (field pH 7.2); clear and smooth boundary to Bss4
Bss4	160-200+	Dark reddish brown (5YR3/3); clay; moderate fine and medium angular blocky structure; many distinct slickensides and pressure faces on vertical faces of peds; few very fine vesicular pores; few fine roots; neutral (field pH 7.2)

Pedon 3

I Information on the Site

Profile symbol	:	Pedon 3
Soil name	:	Huai Hong Khrai series 3 (tentative)
Classification	:	Typic Haplustert, fine, mixed, isohyperthermic
Date of examination	:	February 01, 2012
Described by	:	Niwat Anongrak, Kitsakron kreawromwong, Pasakorn Kawichai and Tanakorn Bungngen
Location	:	Inside Huai Hong Khrai Royal Development Study Center
Elevation	:	361 m (MSL)
Landform		
1. Physiographic position	:	On straignt slope
2. Surrounding landform	:	Mountainous
3. Slope on which profile site	:	Grently sloping (8%), S 15^0 E
Vegetation and Landuse	:	Under agroforestry Carambola (*Averrhoa carambola L.* Oxalidaceae) and Rambeh (*Baccaurea ramiflora Lour.* Euphorbiaceae)
Annual rainfall	:	Approximately 1,328.3 mm
Mean temperature	:	Approximately 25.6^0C
Other	:	Nil

II General Information on the Soil

Parent material	:	Derived residuum from sedimentary rock
Drainage	:	Moderately well drained
Moisture condition in profile	:	Moist throughout
Depth of ground water table	:	Nil
Surface stones and rock outcrops	:	No stones and rock outcrops
Evidence of erosion	:	Slight rill erosion
Human influence	:	Nil

III Profile Description

Horizon	Depth (cm)	Description
A	0-10	Very dark grayish brown (10YR3/2); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; neutral (field pH 6.8); clear and smooth boundary to AB
AB	10-20	Very dark grayish brown (10YR3/2); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; neutral (field pH 6.6); clear and smooth boundary to Bss

Bss	20-70	Dark brown (10YR3/3); clay; moderate fine and medium angular blocky structure; few distinct slickensides and pressure faces; few very fine vesicular pores; few fine roots; slightly acid (field pH 6.4); clear and smooth boundary to Btc1
Btc1	70-100	Yellowish brown (10YR5/4); clay; moderate fine and medium angular blocky structure; common very fine and fine vesicular pores; few very fine and fine roots; irregular, hard, reddish brown, nodules; slightly acid (field pH 6.4); clear and smooth boundary to Btc2
Btc2	100-140	Yellowish brown (10YR5/4); clay; moderate fine and medium angular blocky structure; common very fine and fine vesicular pores; few very fine and fine roots; irregular, hard, reddish brown, nodules; slightly acid (field pH 6.4); clear and smooth boundary to Btc3
Btc3	140-160	Yellowish brown (10YR5/6); clay; moderate fine and medium angular blocky structure; common very fine and fine vesicular pores; few very fine, fine and coarse roots; irregular, hard, reddish brown, nodules; slight acid (field pH 6.2); clear and smooth boundary to Btc4
Btc4	160-200+	Yellowish brown (10YR5/8); clay; moderate fine and medium angular blocky structure; common very fine and fine vesicular pores; few very fine, fine and coarse roots; irregular, hard, reddish brown, nodules; slightly acid (field pH 6.2)

Pedon 4

I Information on the Site

Profile symbol	:	Pedon 4
Soil name	:	Huai Hong Khrai series 4 (tentative)
Classification	:	Typic Haplustert, fine, mixed**,** isohyperthermic
Date of examination	:	February 10, 2012
Described by	:	Niwat Anongrak, Kitsakron kreawromwong, Pasakorn Kawichai and Tanakorn Bungngen
Location	:	Inside Huai Hong Khrai Royal Development Study Center
Elevation	:	361 m (MSL)
Landform		
1. Physiographic position	:	On straignt slope
2. Surrounding landform	:	Mountainous
3. Slope on which profile site	:	Grently sloping (8%), S 20^0 E
Vegetation and Landuse	:	Under agroforestry Banana **(***Musa spaientum L.* Musaceae**)** Pepper **(***Pipern nigrum L***.** Piperaceae**)** and Phak paem (*Acanthophanax trifoliatus*. Araliaceae)
Annual rainfall	:	Approximately 1,328.3 mm
Mean temperature	:	Approximately 25.6^0C
Other	:	Nil

II General Information on the Soil

Parent material	:	Derived residuum from sedimentary rock
Drainage	:	Moderately well drained
Moisture condition in profile	:	Moist throughout
Depth of ground water table	:	Nil
Surface stones and rock outcrops	:	No stones and rock outcrops
Evidence of erosion	:	Slight rill erosion
Human influence	:	Nil

III Profile Description

Horizon	Depth (cm)	Description
A	0-10	Very dark gray (7.5YR3/0); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; slightly acid (field pH 6.2); clear and smooth boundary to AB
AB	10-30	Dark brown (7.5YR4/2) clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; neutral (field pH 6.6);

		clear and smooth boundary to Bss1
Bss1	30-70	Dark brown (7.5YR4/4); clay; moderate fine and medium angular blocky structure; many distinct slickensides and pressure faces on vertical faces of peds; few very fine vesicular pores ; few fine roots; neutral (field pH 6.6); clear and smooth boundary to Bss2
Bss2	70-110	Dark grayish brown (10YR4/2); clay; moderate fine and medium angular blocky structure; many distinct slickensides and pressure faces on vertical faces of peds; few very fine vesicular pores; few fine roots; neutral (field pH 6.6); clear and smooth boundary to Btc1
Btc1	110-130	Grayish brown (10YR5/2); clay; moderate fine and medium angular blocky structure; common very fine and fine vesicular pores; few very fine, fine and coarse roots; common fine, irregular, hard, reddish brown, nodules; slightly acid (field pH 6.4); clear and smooth boundary to Btc2
Btc2	130-160	Grayish brown (10YR5/2); clay; moderate fine and medium angular blocky structure; common very fine and fine vesicular pores; few very fine, fine and coarse roots; common fine, irregular, hard, reddish brown, nodules; neutral (field pH 6.6); clear and smooth boundary to Btc3
Btc3	160-200+	Dark grayish brown (10YR4/2); clay; moderate fine and medium angular blocky structure; common very fine and fine vesicular pores; few very fine and fine roots and few coarse roots; common fine, irregular, hard, reddish brown, nodules; neutral (field pH 6.6)

Pedon 5

I Information on the Site

Profile symbol	:	Pedon 5
Soil name	:	Huai Hong Khrai series 5 (tentative)
Classification	:	Typic Haplustert, fine, mixed, isohyperthermic
Date of examination	:	February 28, 2012
Described by	:	Niwat Anongrak, Kitsakron kreawromwong, Pasakorn Kawichai and Tanakorn Bungngen
Location	:	Inside Huai Hong Khrai Royal Development Study Center
Elevation	:	358 m (MSL)
Landform		
1. Physiographic position	:	On straignt slope
2. Surrounding landform	:	Mountainous
3. Slope on which profile site	:	Grently sloping (8%), N 70^0 W
Vegetation and Landuse	:	Under agroforestry Banana **(***Musa spaientum L.* Musaceae**)** and Mango (*Mangifera indica L.* Anacardiaceae)
Annual rainfall	:	Approximately 1,328.3 mm
Mean temperature	:	Approximately 25.6^0C
Other	:	Nil

II General Information on the Soil

Parent material	:	Derived residuum from sedimentary rock
Drainage	:	Moderately well drained
Moisture condition in profile	:	Moist throughout
Depth of ground water table	:	Nil
Surface stones and rock outcrops	:	No stones and rock outcrops
Evidence of erosion	:	Slight rill erosion
Human influence	:	Nil

III Profile Description

Horizon	Depth (cm)	Description
A	0-5	Dark grayish brown (10YR4/2); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; neutral (field pH 6.6); clear and smooth boundary to AB
AB	5-20	Dark grayish brown (10YR4/2); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; slightly (field pH 6.4);

		clear and smooth boundary to Bss1
Bss1	20-70	Grayish brown (10YR5/2); clay; moderate fine and medium angular blocky structure; many distinct slickensides and pressure faces on vertical faces of peds; very few very fine vesicular pores; few fine roots; slightly acid (field pH 6.4); clear and smooth boundary to Bss2
Bss2	70-100	Dark grayish brown (10YR4/2); clay; moderate fine and medium angular blocky structure; many distinct slickensides and pressure faces on vertical faces of peds; few very fine vesicular pores ; few fine roots; neutral (field pH 6.6); clear and smooth boundary to Btc1
Btc1	100-140	Dark yellowish brown (10YR4/4); clay; moderate fine and medium angular blocky structure; common very fine and fine vesicular pores; few very fine and fine roots; common fine, irregular, hard, reddish brown, nodules; neutral (field pH 7.2); clear and smooth boundary to Btc2
Btc2	140-170	Dark yellowish brown (10YR4/4); clay; moderate fine and medium angular blocky structure; common very fine and fine vesicular pores; few very fine and fine roots; common fine, irregular, hard, reddish brown, nodules; neutral (field pH 7.2); clear and smooth boundary to Crt
Crt	170-200+	Yellowish brown (10YR5/6); clay; moderate fine and medium angular blocky structure; weathered rock fragment ; few very fine and fine vesicular pores; few fine roots ; neutral (field pH 7.2)

Pedon 6

I Information on the Site

Profile symbol	:	Pedon 6
Soil name	:	Huai Hong Khrai series 6 (tentative)
Classification	:	Typic Haplustert, fine, mixed, isohyperthermic
Date of examination	:	March 13, 2012
Described by	:	Niwat Anongrak, Kitsakron kreawromwong, Pasakorn Kawichai and Tanakorn Bungngen
Location	:	Inside Huai Hong Khrai Royal Development Study Center
Elevation	:	358 m (MSL)
Landform		
1. Physiographic position	:	On straignt slope
2. Surrounding landform	:	Mountainous
3. Slope on which profile site	:	Grently sloping (8%), N 70^0 W
Vegetation and Landuse	:	Under agroforestry Broken bones **(***Oroxylum indicum (L.) Kurz.* Bignoniaceae) and Pepper **(***Pipern nigrum L***.** Piperaceae**)**
Annual rainfall	:	Approximately 1,328.3 mm
Mean temperature	:	Approximately 25.6^0C
Other	:	Nil

II General Information on the Soil

Parent material	:	Derived residuum from sedimentary rock
Drainage	:	Moderately well drained
Moisture condition in profile	:	Moist throughout
Depth of ground water table	:	Nil
Surface stones and rock outcrops	:	No stones and rock outcrops
Evidence of erosion	:	Slight rill erosion
Human influence	:	Nil

III Profile Description

Horizon	Depth (cm)	Description
A	0-10	Very dark grayish brown (10YR3/2); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; neutral (field pH 6.8); clear and smooth boundary to AB
AB	10-25	Dark grayish brown (10YR4/2); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; neutral (field pH 6.6); clear and smooth boundary to Bss1

Bss1	25-70	Grayish brown (10YR5/2); clay; moderate fine and medium angular blocky structure; common distinct slickensides and pressure faces on vertical faces of peds; few very fine vesicular pores; few fine roots; slightly acid (field pH 6.4); clear and smooth boundary to Bss2
Bss2	70-120	Grayish brown (10YR5/2); clay; moderate fine and medium angular blocky structure; common distinct slickensides and pressure faces on vertical faces of peds; few very fine vesicular pores ; few fine roots; neutral (field pH 6.6); clear and smooth boundary to Btc1
Btc1	120-140	Brown (7.5YR5/4); clay; moderate fine and medium angular blocky structure; common very fine and fine vesicular pores; few very fine and fine roots; common fine, irregular, hard, reddish brown, nodules; neutral (field pH 6.8); clear and smooth boundary to Btc2
Btc2	140-160	Yellowish brown (10YR5/6); clay; moderate fine and medium angularblocky structure; common very fine and fine vesicular pores; few very fine and fine roots; common fine, irregular, hard, reddish brown, nodules; neutral (field pH 6.8); clear and smooth boundary to Btc3
Btc3	160-200+	Yellowish brown (10YR5/6) clay; moderate fine and medium angularblocky structure; common very fine and fine vesicular pores; few very fine and fine roots; common fine, irregular, hard, reddish brown, nodules; neutral (field pH 7.2)

Pedon 7

I Information on the Site

Profile symbol	:	Pedon 7
Soil name	:	Huai Hong Khrai series 7 (tentative)
Classification	:	Typic Haplustert, fine, mixed, isohyperthermic
Date of examination	:	May 5, 2012
Described by	:	Niwat Anongrak, Kitsakron kreawromwong, Pasakorn Kawichai and Tanakorn Bungngen
Location	:	Inside Huai Hong Khai Royal Development Study Center
Elevation	:	368 m (MSL)
Landform		
1. Physiographic position	:	On straignt slope near
2. Surrounding landform	:	Mountainous
3. Slope on which profile site	:	Strongly sloping (12%), N 32^0 W
Vegetation and Landuse	:	Under mixed deciduous forest.
Annual rainfall	:	Approximately 1,328.3 mm
Mean temperature	:	Approximately 25.6^0C
Other	:	Nil

II General Information on the Soil

Parent material	:	Derived residuum from sedimentary rock
Drainage	:	Moderately well drained
Moisture condition in profile	:	Moist throughout
Depth of ground water table	:	Nil
Surface stones and rock outcrops	:	No stones and rock outcrops
Evidence of erosion	:	Slight rill erosion
Human influence	:	Nil

III Profile Description

Horizon	Depth (cm)	Description
A	0-10	Very dark grayish brown (10YR3/2); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; neutral (field pH 6.6); clear and smooth boundary to AB
AB	10-20	Very dark grayish brown (10YR3/2); clay; moderate fine and medium subangular blocky structure; few very fine and fine vesicular pores; common very fine and fine roots; slightly acid (field pH 6.2); clear and smooth boundary to Bss1
Bss1	20-50	Reddish gray (5YR5/2); clay; moderate fine and medium angular

		blocky structure; common distinct slickensides and pressure faces on vertical faces of peds; few very fine, vesicular pores ; few fine roots; moderately acid (field pH 6.0); clear and smooth boundary to Bss2
Bss2	50-80	Reddish brown (5YR5/3); clay; moderate fine and medium angular blocky structure; common distinct slickensides and pressure faces on vertical faces of peds; few very fine vesicular pores; few fine roots; moderately acid (field pH 6.0); clear and smooth boundary to Bt1
Bt1	80-100	Reddish brown (5YR5/2) clay; moderate fine and medium angular blocky structure; few very fine vesicular pores; few fine roots; moderately acid (field pH 6.0); clear and smooth boundary to Bt2
Bt2	100-130	Reddish brown (5YR5/4); clay; moderate fine and medium angular blocky structure; few very fine vesicular pores; few fine roots; neutral (field pH 6.6); clear and smooth boundary to Bt3
Bt3	130-160	Reddish brown (5YR4/3); clay; moderate fine and medium angular blocky structure; few very fine vesicular pores; few fine roots; neutral(field pH 6.8); clear and smooth boundary to Bt4
Bt4	160-200+	Reddish brown (5YR4/4); clay; moderate fine and medium subangular blocky structure; few very fine vesicular pores; few fine roots; neutral (field pH 6.8)

ตารางภาคผนวกที่ 1 ผลการวิเคราะห์สมบัติทางกายภาพของดินที่ทำการศึกษา

Horizon	Depth (cm.)	Particle size distribution			Texture class	Bulkdensity (Mg m-3)	COLE
		Sand	Silt	Clay			
Pedon 1 Typic Haplustert, fine,mixed, isohyperthermic							
A	0-10	21.2	33.2	45.6	clay	1.52	0.08
AB	10-25	19.9	31.1	49	clay	1.44	0.07
Bss	25-80	16.3	28.7	55	clay	1.47	0.11
Btc1	80-100	15.6	26.4	58	clay	1.48	0.08
Btc2	100-140	16.3	23.9	59.8	clay	1.5	0.08
Crt1	140-180	17.5	22.5	60	clay	1.45	
Crt2	180-200+	17	18	65	clay	1.55	
Pedon 2 Typic Haplustert, fine,mixed, isohyperthermic							
A	0-10	17.8	37.6	44.6	clay	1.44	0.09
AB	10-25	16.7	33.5	49.8	clay	1.59	0.1
Bss1	25-75	15.8	32.1	52.1	clay	1.54	0.19
Bss2	75-140	15.5	29.8	54.7	clay	1.49	0.18
Bss3	140-160	18.2	26.5	55.3	clay	1.57	0.17
Bss4	160-200+	19.1	23.3	57.6	clay	1.53	

ตารางภาคผนวกที่ 1 (ต่อ)

Horizon	Depth (cm.)	Particle size distribution			Texture class	Bulkdensity (Mg m-3)	COLE
		Sand	Silt	Clay			
Pedon 3 Typic Haplustert, fine,mixed, isohyperthermic							
A	0-10	23.6	31.2	45.2	clay	1.44	0.08
AB	10-20	29.4	23.1	47.5	clay	1.59	0.07
Bss	20-70	30.9	20.2	48.9	clay	1.54	0.08
Btc1	70-100	29	18.9	52.1	clay	1.49	0.09
Btc2	100-140	28.3	17.7	54	clay	1.57	0.07
Btc3	140-160	23.3	16.8	59.9	clay	1.53	
Btc4	160-200+	22	16.5	61.5	clay	1.46	
Pedon 4 Typic Haplustert, fine,mixed, isohyperthermic							
A	0-10	23.8	32.7	43.5	clay	1.59	0.11
AB	10-30	21.7	33.6	44.7	clay	1.54	0.12
Bss1	30-70	22.5	32.2	45.3	clay	1.49	0.18
Bss2	70-110	22.4	27.8	49.8	clay	1.57	0.15
Btc1	110-130	19.2	26.6	54.2	clay	1.55	0.09
Btc2	130-160	17.7	25.4	56.9	clay	1.45	
Btc3	160-200+	18	23.3	58.7	clay	1.55	

ตารางภาคผนวกที่ 1 (ต่อ)

Horizon	Depth (cm.)	Particle size distribution			Texture class	Bulkdensity (Mg m-3)	COLE
		Sand	Silt	Clay			
Pedon 5 Typic Haplustert, fine,mixed, isohyperthermic							
A	0-5	23.9	31.1	45	clay	1.49	0.09
AB	5-20	20.7	30.5	48.8	clay	1.57	0.12
Bss1	20-70	22.4	28.6	49	clay	1.53	0.1
Bss2	70-100	20.1	26.9	53	clay	1.53	0.15
Btc1	100-140	20.6	25.2	54.2	clay	1.46	0.08
Btc2	140-170	20.6	24.7	54.7	clay	1.54	
Crt	170-200+	19.5	23.9	56.6	clay	1.45	
Pedon 6 Typic Haplustert, fine,mixed, isohyperthermic							
A	0-10	27.1	31.6	41.3	clay	1.44	0.07
AB	10-25	24.5	30.5	45	clay	1.47	0.12
Bss1	25-70	21.2	29.1	49.7	clay	1.48	0.15
Bss2	70-120	21.7	26	52.3	clay	1.49	0.12
Btc1	120-140	19.2	25.4	55.4	clay	1.57	0.1
Btc2	140-160	18.4	23.7	57.9	clay	1.55	
Btc3	160-200+	16.6	22	61.4	clay	1.58	

ตารางภาคผนวกที่ 1 (ต่อ)

Horizon	Depth (cm.)	Particle size distribution			Texture class	Bulkdensity (Mg m-3)	COLE
		Sand	Silt	Clay			
Pedon 7 Typic Haplustert, fine,mixed, isohyperthermic							
A	0-10	29.3	30.4	40.3	clay	1.52	0.08
AB	10-20	29.5	29.4	41.1	clay	1.44	0.09
Bss1	20-50	27.6	28.8	43.6	clay	1.47	0.08
Bss2	50-80	25.7	26.5	47.8	clay	1.48	0.09
Bt1	80-100	23.7	26	50.3	clay	1.65	0.07
Bt2	100-130	21.1	25.3	53.6	clay	1.45	
Bt3	130-160	22.5	22.1	55.4	clay	1.55	
Bt4	160-200+	21.3	21.9	56.8	clay	1.55	

ตารางภาคผนวกที่ 2 ผลการวิเคราะห์สมบัติทางเคมีของดินที่ทำการศึกษา

Horizon	Depth	pH 1:1	EC	OM	Total N	Avail. P	Avail. K	Extractable bases				Sum	CEC	Bs
	(cm)	H_2O	1:5 (d/ms)					Ca	Mg	Na	K	base	NH_4OAc	
				(----g/kg----)		(mg /kg)	(mg /kg)	(cmol /kg)						(%)
Pedon 1 Typic Haplustert, fine,mixed, isohyperthermic														
A	0-10	6.6	0.25	63	1.11	50	71	19.96	3.97	0.07	17.63	41.63	50.64	82.21
AB	10-25	6.8	0.09	34	0.74	76	56	18.3	3.42	0.06	10.11	31.89	40.15	79.41
Bss	25-80	6.8	0.06	22	0.52	9	39	16.56	3.16	0.05	6.74	26.51	30.74	86.23
Btc1	80-100	6.2	0.06	17	0.34	1	48	17.23	3.14	0.04	3.89	24.3	29.87	81.35
Btc2	100-140	6	0.04	8	0.24	1	39	18.52	3.25	0.05	2.63	24.45	30.17	81.05
Crt1	140-180	6.2	0.03	6	0.12	1	26	20.34	3.12	0.06	2.74	26.26		
Crt2	180-200+	6.2	0.03	3	0.04	1	29	23.6	6.45	0.07	2.42	32.54		
Pedon 2 Typic Haplustert, fine,mixed, isohyperthermic														
A	0-10	6.6	0.19	89	1.4	37	126	18.35	6.75	0.05	18.68	43.83	66.74	65.68
AB	10-25	6.6	0.11	54	1.1	17	87	17.33	6.62	0.06	13.95	37.96	60.78	62.45
Bss1	25-75	6.4	0.08	37	0.92	8	71	16.52	5.84	0.06	6.32	28.74	60.64	77.39
Bss2	75-140	6.8	0.05	18	0.84	1	62	14.655	5.74	0.04	6	26.435	30.45	86.81
Bss3	140-160	7.2	0.03	11	0.6	1	62	20.575	5.16	0.03	4.53	30.295	31.05	97.56
Bss4	160-200+	7.2	0.04	11	0.24	1	35	18.975	4.98	0.04	3.89	27.885		

ตารางภาคผนวกที่ 2 (ต่อ)

Horizon	Depth (cm)	pH 1:1 H_2O	EC 1:5 (d/ms)	OM	Total N	Avai. P	Avail. K	Extractable bases Ca	Mg	Na	K	Sum base	CEC NH_4OAc	Bs
				(- - - - g/kg- - -)		(mg/kg)	(mg /kg)	(cmol /kg)						(%)
Pedon 3 Typic Haplustert, fine,mixed, isohyperthermic														
A	0-10	6.8	0.12	60	1.22	43	86	20.57	2.85	0.05	15	38.47	52.64	73.10
AB	10-20	6.6	0.12	38	1.1	39	70	17.45	3.47	0.06	9.26	30.24	50.15	60.31
Bss	20-70	6.4	0.09	23	0.8	12	59	17.27	3.54	0.08	6.63	27.52	30.74	89.53
Btc1	70-100	6.4	0.03	21	0.56	1	67	14.81	3.43	0.06	4.37	22.67	31.45	72.07
Btc2	100-140	6.4	0.03	13	0.35	1	67	13.18	3.87	0.09	3.74	20.88	30.17	69.21
Btc3	140-160	6.2	0.02	7	0.12	1	30	13.15	3.02	0.04	3.63			
Btc4	160-200+	6.2	0.02	7	0.03	1	27	12.86	3.08	0.03	3.74			
Pedon 4 Typic Haplustert, fine,mixed, isohyperthermic														
A	0-10	6.2	0.16	63	1.24	13	121	15.39	4.11	0.1	16.32	35.92	55.5	64.73
AB	10-30	6.6	0.09	47	1.05	8	83	14.23	3.23	0.08	10.53	28.07	50.42	55.67
Bss1	30-70	6.6	0.06	35	0.91	3	73	14.36	3.23	0.04	11.05	28.68	30.74	93.30
Bss2	70-110	6.6	0.05	24	0.81	1	67	12.59	3.4	0.08	8.53	24.6	31.45	78.19
Btc1	110-130	6.4	0.04	15	0.74	1	55	12.36	2.93	0.07	3.74	19.1	30.17	63.31
Btc2	130-160	6.6	0.03	11	0.6	1	39	11.89	2.9	0.06	3.26	18.11		
Btc3	160-200+	6.6	0.03	5	0.07	1	32	11.76	3.06	0.06	2.16	17.04		

ตารางภาคผนวกที่ 2 (ต่อ)

Horizon	Depth (cm)	pH 1:1 H_2O	EC 1:5 (d/ms)	OM	Total N	Avai. P	Avail. K	Extractable bases Ca	Mg	Na	K	Sum base	CEC NH_4OAc	Bs
				(- - - - g /kg- - -)		(mg /kg)	(mg /kg)	(cmol /kg)						(%)
Pedon 5 Typic Haplustert, fine,mixed, isohyperthermic														
A	0-5	6.6	0.12	47	1.15	17	110	15	2.87	0.08	18.42	36.37	58.45	62.23
AB	5-20	6.4	0.06	35	0.9	8	44	14.98	3.08	0.07	16.58	34.71	56.42	61.52
Bss1	20-70	6.4	0.03	28	0.87	1	29	13.89	3.38	0.06	14.74	32.07	40.74	78.70
Bss2	70-100	6.6	0.03	15	0.83	1	23	20.17	2.83	0.05	9.37	32.42	31.45	93.45
Btc1	100-140	7.2	0.03	12	0.75	1	28	20.16	3.38	0.06	9.47	33.07	30.17	89.45
Btc2	140-170	7.2	0.03	5	0.69	1	25	20.12	2.37	0.06	5.26	27.81		
Crt	170-200+	7.2	0.03	7	0.05	1	23	18.64	2.33	0.1	4.68	25.75		
Pedon 6 Typic Haplustert, fine,mixed, isohyperthermic														
A	0-10	6.8	0.09	37	1.26	41	77	18.13	2.65	0.1	15	35.88	53.4	67.19
AB	10-25	6.6	0.1	40	1.09	35	31	15.4	2.35	0.12	16.58	34.45	53.15	64.82
Bss1	25-70	6.4	0.12	33	0.86	11	36	15.28	2.18	0.1	11.32	28.88	32.74	88.20
Bss2	70-120	6.6	0.09	19	0.88	1	46	14.27	2.34	0.14	9.21	25.96	29.87	86.89
Btc1	120-140	6.8	0.07	11	0.73	1	48	15.07	2.28	0.12	8.42	25.89	28.17	91.91
Btc2	140-160	6.8	0.04	7	0.42	1	43	17.36	2.32	0.08	5.89	25.65		
Btc3	160-200+	7.2	0.04	7	0.06	1	40	22.29	2.26	0.07	4.74	29.36		

ตารางภาคผนวกที่ 2 (ต่อ)

Horizon	Depth (cm)	pH 1:1 H_2O	EC 1:5 (d/ms)	OM	Total N	Avai. P	Avail. K	Extractable bases Ca	Mg	Na	K	Sum base	CEC NH_4OAc	Bs
				(- - - - g /kg- --)		(mg /kg)	(mg /kg)	(cmol /kg)						(%)
Pedon 7 Typic Haplustert, fine,mixed, isohyperthermic														
A	0-10	6.6	0.17	60	1.2	6	90	17.95	3.67	0.04	12.11	33.77	53.45	63.17
AB	10-20	6.3	0.07	35	1.07	3.5	43	14.58	3.37	0.06	7.79	25.8	52.42	49.21
Bss1	20-50	6	0.06	32	0.8	3	32.1	15.62	3.1	0.04	6.32	25.08	43.74	57.32
Bss2	50-80	5.9	0.04	21	0.7	1	37.5	14.32	3.09	0.03	6	23.44	38.45	60.97
Bt1	80-100	6	0.04	2	0.44	1	25	14.46	2.79	0.05	6.21	23.51	32.17	73.09
Bt2	100-130	6.7	0.03	14	0.37	1	20	13.12	2.8	0.08	6.42	22.42		
Bt3	130-160	6.8	0.02	11	0.08	1	24	12.98	2.7	0.06	4.16	19.9		
Bt4	160-200+	6.8	0.02	10	0.08	1	22	12.15	2.48	0.05	3.89	18.57		

ตารางภาคผนวกที่ 3 การแบ่งกลุ่มของเนื้อดิน (เอิบ, 2547; Soil Survey Division Staff, 1993)

คำเรียกทั่วไป	ลักษณะเนื้อดิน	ชั้นเนื้อดินต่างๆ (texture classes)
ดินทราย (sandy soils)	เนื้อหยาบ (coarse textured)	ได้แก่ ทรายชนิดต่างๆ (ทรายหยาบ ทรายละเอียด ทรายละเอียดมาก) ทรายปนดินร่วนชนิดต่างๆ (ทรายหยาบปนดินร่วน ทรายปนดินร่วน ทรายละเอียดปนดินร่วน และทรายละเอียดมากปนดินร่วน)
ดินร่วน (loamy soils)	เนื้อหยาบปานกลาง (moderately coarse-textured)	ได้แก่ ดินร่วนปนทรายหยาบ ดินร่วนปนทราย ดินร่วนปนทรายละเอียด
	เนื้อปานกลาง (medium-textured)	ได้แก่ ดินร่วนปนทรายละเอียดมาก ดินร่วน ดินร่วนปนทรายแป้ง และทรายแป้ง
	เนื้อละเอียดปานกลาง (moderately fine-textured)	ได้แก่ ดินร่วนเหนียว ดินร่วนเหนียวปนทราย ดินร่วนเหนียวปนทรายแป้ง
ดินเหนียว (clayey soils)	เนื้อละเอียด (fine textured)	ได้แก่ ดินเหนียวปนทราย ดินเหนียวปนทรายแป้ง และดินเหนียว

ตารางภาคผนวกที่ 4 เกณฑ์การแบ่งระดับความหนาแน่นรวมของดิน (นงคราญ, 2529)

ระดับ (rating)	พิสัย ($Mg\ m^{-3}$)
ต่ำ	< 1.2
ค่อนข้างต่ำ	1.2-1.4
ปานกลาง	1.4-1.6
ค่อนข้างสูง	1.6-1.8
สูง	1.8-2.0
สูงมาก	> 2.0

ตารางภาคผนวกที่ 5 ข้อจำกัดต่างๆ ที่ใช้ในการประเมินระดับสมบัติทางเคมี และการประเมินความอุดมสมบูรณ์ของดิน (Land Classification Division and FAO Project Staff, 1973; Soil Survey Division Staff, 1993)

1. ปฏิกิริยาของดิน (soil reaction), pH (ดิน : น้ำ = 1 : 1)

ระดับ (rating)	พิสัย (pH)
กรดรุนแรงมากที่สุด (ultra acid)	< 3.5
กรดรุนแรงมาก (extremely acid)	3.5-4.4
กรดจัดมาก (very strongly acid)	4.5-5.0
กรดจัด (strongly acid)	5.1-5.5
กรดปานกลาง (moderately acid)	5.6-6.0
กรดเล็กน้อย (slightly acid)	6.1-6.5
เป็นกลาง (neutral)	6.6-7.3
ด่างเล็กน้อย (slightly alkaline)	7.4-7.8
ด่างปานกลาง (moderately alkaline)	7.9-8.4
ด่างจัด (strongly alkaline)	8.5-9.0
ด่างจัดมาก (very strongly alkaline)	> 9.0

2. อินทรียวัตถุ (organic matter) (% organic carbon x 1.724)

ระดับ (rating)	พิสัย ($g\ kg^{-1}$)
ต่ำมาก (very low)	< 5
ต่ำ (low)	5-10
ค่อนข้างต่ำ (moderately low)	10-15
ปานกลาง (medium)	15-25
ค่อนข้างสูง (moderately high)	25-35
สูง (high)	35-45
สูงมาก (very high)	> 45

3. ปริมาณไนโตรเจนรวม (total nitrogen)

ระดับ (rating)	พิสัย (g kg^{-1})
ต่ำมาก (very low)	< 1.0
ต่ำ (low)	1.0-2.0
ปานกลาง (medium)	2.0-5.0
สูง (high)	5.0-7.5
สูงมาก (very high)	> 7.5

4. ปริมาณฟอสฟอรัสที่เป็นประโยชน์ (available phosphorus) (Bray II)

ระดับ (rating)	พิสัย (mg kg^{-1})
ต่ำมาก (very low)	< 3
ต่ำ (low)	3-6
ค่อนข้างต่ำ (moderately low)	6-10
ปานกลาง (medium)	10-15
ค่อนข้างสูง (moderately high)	15-25
สูง (high)	25-45
สูงมาก (very high)	> 45

5. ปริมาณโพแทสเซียมที่เป็นประโยชน์ (available potassium) (NH_4OAc)

ระดับ (rating)	พิสัย (mg kg^{-1})
ต่ำมาก (very low)	< 30
ต่ำ (low)	30-60
ปานกลาง (medium)	60-90
สูง (high)	90-120
สูงมาก (very high)	> 120

6. ปริมาณแคลเซียมที่สกัดได้ (extractable calcium) (NH_4OAc)

ระดับ (rating)	พิสัย (cmol kg^{-1})
ต่ำมาก (very low)	< 2
ต่ำ (low)	2-5
ปานกลาง (medium)	5-10
สูง (high)	10-20
สูงมาก (very high)	> 20

7. ปริมาณแมกนีเซียมที่สกัดได้ (extractable magnesium) (NH_4OAc)

ระดับ (rating)	พิสัย (cmol kg^{-1})
ต่ำมาก (very low)	< 0.3
ต่ำ (low)	0.3-1.0
ปานกลาง (medium)	1.0-3.0
สูง (high)	3.0-8.0
สูงมาก (very high)	> 8.0

8. ปริมาณโซเดียมที่สกัดได้ (extractable sodium) (NH_4OAc)

ระดับ (rating)	พิสัย (cmol kg^{-1})
ต่ำมาก (very low)	< 0.1
ต่ำ (low)	0.1-0.3
ปานกลาง (medium)	0.3-0.7
สูง (high)	0.7-2.0
สูงมาก (very high)	> 2.0

9. ปริมาณโพแทสเซียมที่สกัดได้ (extractable potassium) (NH_4OAc)

ระดับ (rating)	พิสัย (cmol kg^{-1})
ต่ำมาก (very low)	< 0.2
ต่ำ (low)	0.2-0.3
ปานกลาง (medium)	0.3-0.6
สูง (high)	0.6-1.2
สูงมาก (very high)	> 1.2

10. ปริมาณด่างที่สกัดได้ (extractable bases) (NH_4OAc)

ระดับ (rating)	พิสัย (cmol kg^{-1})
ต่ำมาก (very low)	< 2.6
ต่ำ (low)	2.6-6.6
ปานกลาง (medium)	6.6-14.3
สูง (high)	14.3-31.2
สูงมาก (very high)	> 31.2

11. ความจุแลกเปลี่ยนไอออนบวก (cation exchange capacity; CEC)

ระดับ (rating)	พิสัย (cmol kg^{-1})
ต่ำมาก (very low)	< 3
ต่ำ (low)	3-5
ค่อนข้างต่ำ (moderately low)	5-10
ปานกลาง (medium)	10-15
ค่อนข้างสูง (moderately high)	15-20
สูง (high)	20-30
สูงมาก (very high)	>30

12. การอิ่มตัวด้วยไอออนที่เป็นด่าง (base saturation)

ระดับ (rating)	พิสัย (cmol kg^{-1})
ต่ำ (low)	< 35
ปานกลาง (medium)	35-75
สูง (high)	> 75

ตารางภาคผนวกที่ 6 X-ray diffraction spacing obtained from (001) planes of layer-silicate species as related to sample treatment (Whitting, 1965)

Diffraction spacing (nm)	Mineral (or minerals) Indicated
	Mg-saturated, air dried
1.4-1.5	Smectite, vermiculite, chlorite
0.99-1.01	Mica (illite), halloysite
0.72-0.75	Metahalloysite
0.715	Kaolinite, chlorite (2nd-order maximum)
	Mg-saturated, glycerol-solvated
1.77-1.80	Smectite
1.4-1.5	Vermiculite, chlorite
1.08	Halloysite
0.99-1.01	Mica (illite)
0.72-0.75	Metahalloysite
0.715	Kaolinite, chlorite (2nd-order maximum)
	K-saturated, air-dried
1.4-1.5	Chlorite, vermiculite (with interlayer aluminium)
1.24-1.28	Smectite
0.99-1.01	Mica (illite), halloysite, vermiculite (contracted)
0.72-0.75	Metahalloysite
0.715	Kaolinite, chlorite (2nd-order maximum)
	K-saturated, heated (550^0C)
1.4	Chlorite
0.99-1.01	Mica, vermiculite (contracted), smectite (contracted)
0.715	Chlorite (2nd-order maximum)

ตารางภาคผนวกที่ 7 วิธีคาดคะเนระดับความอุดมสมบูรณ์ของดิน โดยการประเมินจากผลการวิเคราะห์ดิน (ดัดแปลงจากกองสำรวจและจำแนกดิน, 2543)

ระดับความอุดมสมบูรณ์ของดิน	ปริมาณอินทรียวัตถุ ($g\ kg^{-1}$)		ปริมาณฟอสฟอรัสที่เป็นประโยชน์ ($mg\ kg^{-1}$)		ปริมาณโพแทสเซียมที่เป็นประโยชน์ ($mg\ kg^{-1}$)		ความจุแลกเปลี่ยนไอออนบวก ($cmol\ kg^{-1}$)		อัตราร้อยละความอิ่มตัวเบส (%)	
ต่ำ	< 10	(1)	< 6	(1)	< 30	(1)	< 5	(1)	< 20	(1)
ค่อนข้างต่ำ	10-15	(2)	6-10	(2)	30-60	(2)	5-10	(2)	20-35	(2)
ปานกลาง	15-25	(3)	10-15	(3)	60-75	(3)	10-15	(3)	35-50	(3)
ค่อนข้างสูง	25-35	(4)	15-25	(4)	75-90	(4)	15-20	(4)	50-75	(4)
สูง	> 35	(5)	> 25	(5)	> 90	(5)	> 20	(5)	> 75	(5)

หมายเหตุ วิธีคิดระดับความอุดมสมบูรณ์ของดิน ใช้วิธีให้คะแนน (ตัวเลขคะแนนอยู่ในวงเล็บในตาราง)
ถ้าคะแนนเท่ากับ 7 หรือน้อยกว่า ถือว่าดินมีระดับความอุดมสมบูรณ์ต่ำ
ถ้าคะแนนอยู่ระหว่าง 8-12 ถือว่าดินมีระดับความอุดมสมบูรณ์ค่อนข้างต่ำ
ถ้าคะแนนอยู่ระหว่าง 13-17 ถือว่าดินมีระดับความอุดมสมบูรณ์ปานกลาง
ถ้าคะแนนอยู่ระหว่าง 18-22 ถือว่าดินมีระดับความอุดมสมบูรณ์ค่อนข้างสูง
ถ้าคะแนนมากกว่า 23 ถือว่าดินมีระดับความอุดมสมบูรณ์สูง

ประวัติผู้เขียน

ชื่อ - สกุล	นายกฤษกร แก้วร่วมวงศ์
วัน เดือน ปี เกิด	7 พฤษภาคม 2527
ประวัติการศึกษา	สำเร็จการศึกษาชั้นมัธยมศึกษาปีที่ 6 จากโรงเรียนลำปางกัลยาณี จังหวัดลำปาง ปีการศึกษา 2544 สำเร็จการศึกษาปริญญาตรี สาขาวิชาปฐพีศาสตร์ คณะผลิตกรรมการเกษตร มหาวิทยาลัยแม่โจ้ ปีการศึกษา 2548
ประวัติการทำงาน	ปี พ.ศ. 2556-ปัจจุบัน รับราชการตำแหน่ง นักวิชาการปฏิบัติการ สถานีพัฒนาที่ดินเพชรบุรี สำนักงานพัฒนาที่ดินเขต 10 กรมพัฒนาที่ดิน กระทรวงเกษตรและสหกรณ์